The Age of Consequences

A Chronicle of Concern and Hope

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"Ranching is one of the few western occupations that have been renewable and have produced a continuing way of life."

—WALLACE STEGNER

It was a bad year to be a blade of grass.

In 2002, the winter snows were late and meager, part of an emerging period of drought, experts said. Then May and June exploded into flame. Catastrophic crown fires scorched over a million acres of evergreens in the "four corner" states—New Mexico, Arizona, Colorado, and Utah—making it a bad year to be a tree too.

The monsoon rains then failed to arrive in July, and by mid-August, hope for a "green-up" had vanished. The land looked tired, shriveled, and beat-up. It was hard to tell which plants were alive, dormant, or stunned, and which were dead. One range professional speculated that perhaps as much as 60 percent of the native bunch grasses in New Mexico would die. It was bad news for the ranchers he knew and cared about, insult added to injury in an industry already beset by one seemingly intractable challenge after another.

For some, it was the final blow. Ranching in the American West, much like the grass on which it depended that year, has been struggling for survival. Persistently poor economics, tenacious opponents, shifting values in public-land use, changing demographics, decreased political influence, and the temptation of rapidly rising private land values have all combined to push ranching right to the edge. And not just ranching; according to one analysis, the number of natural-resource jobs, including agriculture, as a *share* of total employment in the Rocky Mountain West has de-

clined by two-thirds since the mid-1970s. Today, less than one in thirty jobs in the region is in logging, mining, or agriculture. This fits a national trend. In 1993, the U.S. Census dropped its long-standing survey of farm residents. The farm population across the nation had dwindled from 40 percent of households in 1900 to a statistically insignificant 2 percent by 1990. The bureau decided that a survey was no longer relevant.

If the experts are correct—that the current multiyear drought could rival the decade-long "megadrought" of the 1950s for ecological, and thus economic, devastation—the tenuous grip of ranchers on the future will be loosened further, perhaps permanently. The ubiquitous "last cowboys," mythologized in a seemingly endless stream of tabletop photography books, could ride into their final sunset once and for all.

Or would they?

After all, for millions of years, grass has always managed to return and flourish. James Ingalls, U.S. Senator from Kansas (1873-1891) once wrote:

> *Grass is the forgiveness of nature—her constant benediction. Fields trampled with battle, saturated with blood, torn with the ruts of cannon, grow green again with grass, and carnage is forgotten. Streets abandoned by traffic become grass grown like rural lanes, and are obliterated; forests decay, harvests perish, flowers vanish, but grass is immortal.*

Few understand these words better than ranchers, who, because their cattle require grass, depend on the forgiveness of nature for a livelihood while simultaneously nurturing its beneficence. And like grass, ranching's adaptive response to adversity over the years has been patience—to outlast its troubles. The key to survival for both has been endurance—the ability to hold things together until the next rainstorm. Evolution favors grit.

Or at least it used to.

Today, grit may still rule for grass, but for ranchers, it has become more hindrance than help. "Ranching selects for stubbornness," a friend of mine likes to say. While admiring ranching and ranchers, he does not intend his quip to be taken as a tribute. What he means is this: stubbornness is not adaptive when it

means rejecting new ideas or not adjusting to evolving values in a rapidly changing world.

This is where ranching and grass part ways ultimately—unlike grass, ranching may not be immortal.

Fortunately, a growing number of ranchers understand this and are embracing a cluster of new ideas and methods, often with the happy result of increased profits, restored land health, and repaired relationships with others. I call their work "the New Ranch"—a term I coined years back in a presumptuous attempt to describe a progressive ranching movement emerging in the region.

But what did it mean exactly? What were the new things ranchers were doing to stay in business while neighboring enterprises went under? How did they differ from new ranch to new ranch? What were the commonalities? What was the key? Technology, ideas, economics, increased attention to ecology, or all of the above?

During that summer of fire and heat, I decided to take a fourteen- hundred-mile drive from Santa Fe to Lander, Wyoming, and back, to see the New Ranch up close. I visited four families and was so inspired by what I saw and learned that I kept driving, in a sense, upon my return home. I needed to keep looking, listening, and learning. Since that summer, I have visited more ranchers, as well as environmentalists, scientists, and others, and asked more questions, all in a continuous quest for pieces to a jigsaw puzzle that eventually grew bigger than the New Ranch.

Initially, however, I wanted to know if ranching would survive this latest turn of the evolutionary wheel. Was it still renewable, as Stegner once observed, or were we destined to redefine a ranch as a mobile home park and a subdivision? But I also wanted to discover the outline of the future, and, with a little luck, find my real objective—hope—which, like grass, is sometimes required to lie quietly, waiting for rain.

The James Ranch
North of Durango, Colorado

ONE OF THE first things you notice about the James Ranch is how

busy the water is. Everywhere you turn, there is water flowing, filling, spilling, irrigating, laughing. Whether it is the big, fast-flowing community ditch, the noisy network of smaller irrigation ditches, the deliberate spill of water on pasture, the refreshing fish ponds, or the low roar of the muscular Animas River, take a walk in any direction on the ranch during the summer and you are destined to intercept water at work. It is purposeful water too, growing trees, cooling chickens, quenching cattle, raising vegetables, and, above all, sustaining grass.

All this energy on one ranch is no coincidence—busy water is a good metaphor for the James family. The purposefulness starts at the top. Tall, handsome, and quick to smile, David James grew up in Southern California, where his father lived the American Dream as a successful engineer and inventor, dabbling a bit in ranching and agriculture on the side. David attended the University of Redlands in the late 1950s, where he majored in business, but cattle got into his blood, and he spent every summer on a ranch. David met Kay, a city girl, at Redlands, and after getting hitched, they decided to pursue their dream: to raise a large family in a rural setting.

In 1961, they bought a small ranch on the Animas River, twelve miles north of the sleepy town of Durango, located in a picturesque valley in mountainous southwestern Colorado, and got busy raising five children and hundreds of cows. Durango was in transition at the time from a mining and agricultural center to what it is today: a mecca for tourists, environmentalists, outdoor enthusiasts, students, retirees, and real estate brokers. Land along the river was productive for cattle and still relatively cheap in 1961, though a new type of crop—subdivisions—would be planted soon enough.

Not long after arriving, David secured a permit from the United States Forest Service to graze cattle on the nearby national forest. The permit allowed him to run a certain number of cattle on a forest allotment. Once on the forest, he managed his animals in the manner to which he had been taught: uncontrolled, continuous grazing.

“In the beginning, I ranched like everyone else,” said David, referring to his management style, “which means I lost money.”

David followed what is sometimes called the “Columbus

school" of ranching: turn the cows out in May, and go discover them in October. It's a strategy that often leads to overgrazing, especially along creeks and rivers, where cattle like to linger. Plants, once bitten, need time to recover and grow before being bitten again. If they are bitten too frequently, especially in dry times, they can use up their root reserves and die—which is bad news for the cattle (not to mention the plant). Since ranchers often work on a razor-thin profit margin, it doesn't take too many months of drought and overgrazing before the bottom line begins to wither too.

Grass may be patient, but bankers are not.

Through the 1970s, David's ranchlands, and his business, were on a downward spiral.

When the Forest Service cut back his cattle numbers, as they invariably did in years of drought, the only option available to David was to run them on the home ranch, which meant running the risk of overgrazing their private land. Meanwhile, the costs of operating the ranch kept rising. It was a no-win bind typical of many ranches in the West.

"I thought the answer was to work harder," he recalled, "but that was exactly the wrong thing to do."

Slowly, David came to realize that he was depleting the land, and himself, to the point of no return. By 1978, things became so desperate that the family was forced to develop a sizeable portion of their property, visible from the highway today, as a residential subdivision called, ironically, "the Ranch." It was a painful moment in their lives.

"I never wanted to do that again," said David, "so I began to look for another way."

In 1990, David enrolled in a seminar taught by Kirk Gadzia, a certified instructor in what was then called Holistic Resource Management—a method of cattle management that emphasizes tight control over the timing, intensity, and frequency of cattle impact on the land, mimicking the behavior of wild herbivores, such as bison, so that both the land and the animals remain healthy. "Timing" means not only the time of year but how much time, measured in days rather than the standard unit of months, the cattle will spend in a particular paddock. "Intensity" means how many animals are in the herd for that period

of time. “Frequency” means how long the land is rested before a herd returns.

All three elements are carefully mapped out on a chart, which is why this strategy of ranching is often called “planned grazing.” The movement of the cattle herd from one paddock or pasture to another is carefully designed, often with the needs of wildlife in mind. Paddocks can range from a few acres in size to hundreds of acres, depending on many variables, and are often created with permanent two-strand solar-powered electric fencing, which is lightweight, cost-effective, and easy on wildlife. It works too. Once zapped, cattle usually don’t go near an electric fence again (ditto with elephants in Africa, as I understand it). Alternative methods of control include herding by a human (an ancient activity) and single-strand electric polywire, which is temporary and highly mobile. In all cases, the goal is the same: to control the timing, intensity, and frequency of the animal impact on the land.

Planned grazing has other names—timed grazing, management-intensive grazing, rapid rotational grazing, short-duration grazing, pulse grazing, cell grazing, or the “Savory system”—named after the Rhodesian biologist who came up with the basic idea.

Observing the migratory behavior of wild grazers in Africa, Allan Savory noticed that nature, often in the form of predators, kept herbivores on the move, which gives plants time to recover from the pressure of grazing. He also noticed that because herbivores tended to travel in large herds, their hooves had a significant ground-disturbing impact (think of what a patch of prairie would have looked like after a million-head herd of bison moved through), which he observed to be good for seed germination, among other things. In other words, plants can tolerate heavy grazing and perhaps even require it in certain circumstances. The key, of course, was that the animals moved on—and didn’t return for the rest of the year.

Savory also observed that too much rest was as bad for the land as too much grazing—meaning that plants can choke themselves with abundance in the absence of herbivory and fire, prohibiting juvenile plants from getting established (not mowing your lawn all summer is a crude, but apt, analogy). In dry climates, one of the chief ways old and dead grass gets recycled is

through the stomachs of grazers, such as deer, antelope, bison, sheep, grasshoppers, or cattle. Animals, of course, return nutrients to the soil in the form of waste products. Fire is another way to recycle grass, though this can be risky business in a drought. If you've burned up all the grass, exposing the soil, and the rains don't arrive on time—you and the land could be in trouble.

The bottom line of Savory's thinking is this: animals should be managed in a manner consistent with nature's model of herbivory.

David and Kay James did precisely that—they adopted a planned grazing system for both their private and public land operations. And they have thrived ecologically and economically as a result. They saved the ranch too—and today the four-hundred-acre James Ranch is noteworthy not only for its lush grass and busy water, but for its bucolic landscape in a valley that is dominated by development.

David and Kay insist, however, that adopting a new grazing system was only part of the equation, even if it had positive benefits for their bank account. The hardest part was setting an appropriate goal for their business. This was something new to the Jameses. As David noted wryly: "We really didn't have a goal in the early days, other than not going broke."

To remedy this, the entire James clan sat down in the early 1990s and composed a goal statement. It reads:

> *The integrity and distinction of the James Ranch is to be preserved for future generations by developing financially viable agricultural and related enterprises that sustain a profitable livelihood for the families directly involved while improving the land and encouraging the use of all resources, natural and human, to their highest and best potential.*

It worked. Today, David profitably runs cattle on 220,000 acres of public land across two states. He is the largest permittee on the San Juan National Forest land, north and west of town. Using the diversity of the country to his advantage, David grazes his cattle in the low (dry) country only during the dormant (winter) season; then he moves them to the forests before finishing the cycle on the irrigated pastures of the home ranch.

That's enough to keep anybody incredibly busy, of course, but David complicates the job by managing the whole operation according to planned grazing principles. Maps and charts cover a wall in their house. But David doesn't see it as more work. "What's harder," he asked rhetorically, "spending all day on horseback looking for cattle scattered all over the county, like we used to, or knowing exactly where the herd is every day and moving them simply by opening a gate?"

It's all about attitude, David observed. "It isn't just about cattle," he said, "it's about the land. I feel like I've finally become the good steward that I kept telling everybody I was."

Recently, the family refined their vision for the land and community one hundred years into the future. It looks like this:

"lands that are covered with biologically diverse vegetation"
"lands that boast functioning water, mineral, and solar cycles"
"abundant and diverse wildlife"
"a community benefiting from locally grown, healthy food"
"a community aware of the importance of agriculture to the environment"
"open space for family and community"

And they have summarized the lessons they have learned over the past dozen years:

"Imitating nature is healthy."
"People like to know the source of their food."
"Ranching with nature is socially responsible."
"Ranching with nature gives the rancher sustainability."

But it wasn't all vision. It was practical economics too. For example, years ago, David and Kay told their kids that in order to return home, each had to bring a business with him or her. Today, son Danny owns and manages a successful artisanal dairy operation producing fancy cheeses on the home ranch that he began from scratch; son Justin owns a profitable BBQ restaurant in Durango; daughter Julie and her husband John own a successful tree farm on the home place; and daughter Jennifer and her

husband grow and sell organic vegetables next door and plan to open a guest lodge across the highway.

In an era when more and more farm and ranch kids are leaving home, not to return, what the James clan has accomplished is significant. Not only are the kids staying close; they are also diversifying the ranch into sustainable businesses. Their attention is focused on the modern West, represented by Durango's booming affluence and dependence on tourism. Whether it is artisan cheese, organic produce, decorative trees for landscaping, or a lodge for paying guests, the next generation of Jameses has their eyes firmly on new opportunities.

This raised a question. The Jameses enjoy what David calls many "unfair advantages" on the ranch—abundant grass, plentiful water, a busy highway right outside their front door, and close proximity to Durango—all of which contribute to their success. By contrast, many ranch families do not enjoy such advantages, which made me wonder: Beyond its fortunate circumstances, what can the James gang teach us?

I posed the question to David and Kay one evening.

"The key is community," said Kay. "Sure, we've been blessed by a strong family and a special place, but our focus has always been on the larger community. We're constantly asking ourselves, 'What can we do to help?'"

Answering their own question, David and Kay James decided ten years ago to get into the business of producing and selling grass-fed beef from their ranch—to make money, of course, but also as a way of contributing to the quality of their community's life.

Grass-fed, or "grass-finished," as they call it, is meat from animals that have eaten nothing but grass from birth to death. This is a radical idea because nearly all cattle in America end their days being fattened on corn (and assorted agricultural byproducts) in a feedlot before being slaughtered. Corn enables cattle to put on weight more quickly, thus increasing profits, while also adding more "marbling" to the meat—creating a taste that Americans have come to associate with quality beef. The trouble is that cows are not designed by nature to eat corn, so they require a cornucopia of drugs to maintain their health.

There's another reason for going into the grass-fed business: it

is more consistently profitable than regular beef. That's because ranchers can market their beef directly to local customers, thus commanding premium prices in health-conscious towns such as Durango. It also provides a direct link between the consumer and the producer—a link that puts a human face on eating and agriculture.

For David and Kay, this link is crucial—it builds the bonds of community that hold everything together. "When local people are supporting local agriculture," said David, "you know you're doing something right."

Every landscape is unique, and every ranch is different, so drawing lessons is a tricky business, but one overarching lesson of the James Ranch seems clear: traditions can be strengthened by a willingness to try new ideas. Later, while thumbing through a stack of information David and Kay had given me, I found a quote that seemed to sum up not only their philosophy, but also that of the New Ranch movement in general and the optimism it embodies. It came from a wall in an old church in Essex, England:

A vision without a task
Is but a dream.
A task without a vision
Is drudgery.
A vision and a task
Is the hope of the world.

The Allen Ranch
South of Hotchkiss, Colorado

STAND ON THE back porch of Steve and Rachel Allen's home on the western edge of Fruitland Mesa, located 150 miles north of the James Ranch, in the center of Colorado's western slope, and you will be rewarded with a view of Stegnerian proportions: Grand Mesa and the Hotchkiss Valley on the left, the rugged summits of the Ragged Mountains in the center, and on the right, the purple lofts of the West Elks, a federally designated wilderness where Steve conducts his day job. Like the James Ranch, the Allens are permittees on the national forest, but what made them unique

was *how* they grazed on public land—they herded their cattle

I met Steve three years earlier at a livestock-herding workshop I organized at Ghost Ranch, in northern New Mexico. I knew that his grazing association, called the West Elk Pool, had recently won a nationwide award from the Forest Service for its innovative management of cattle in the West Elk Mountains. The local Forest Service range conservationist, Dave Bradford, had won a similar award for his role in the West Elk experiment. Intrigued, I invited them both down to speak about their success.

Steve began their presentation that day with a story. Driving to the workshop, he said, he and Dave found themselves stuck behind a slow-moving truck on a narrow, winding road. At first they waited calmly for a safe opportunity to pass, but none appeared. Then they grew impatient. Finally, they took a chance. Crossing double yellow lines, they hit the accelerator and prayed. They made it—luckily there had been nothing but open road ahead of them, he said. It was meant as a metaphor—describing Steve's experience as a rancher and Dave's experience with the Forest Service. The slow-moving obstacle was tradition.

In the mid-1990s, Steve and Dave convinced their respective peers to give herding a chance in the West Elks. They proposed that six ranchers on neighboring allotments, each of whom ran separate operations in the mountains, combine their individual cattle herds into one big herd and move them through the wilderness in a slow, one-way arc. By allowing cattle to behave like the roaming animals that they are (or used to be), Dave and Steve argued, the plants would be given enough time to grow before being bitten again, which in the case of the cattle of the West Elk Pool wouldn't be until the following summer.

There were other advantages, as they discovered. From the Forest Service's perspective, having one herd on the move in the West Elks rather than six relatively stationary herds was attractive for ecological and other reasons, including reduced conflicts with wildlife. For the ranchers, one big herd cut down on the costs of maintaining fences and watering troughs. It was also less labor-intensive, though it didn't seem that way initially. On the first go-around, Steve recounted, they had twenty people working the herd, which proved to be about twelve too many. Today, they move the herd with two to six people and a bevy of hard-

working border collies.

So why was all this so unusual? It is customary practice for ranchers to spread their cattle out over a landscape, especially in times of drought, not bunch them up. It's the Columbus school again—less management is the norm, not more. And herding means more management, even if it requires less people, which might seem counterintuitive. Herding is different because it is less dependent on *things*—fences, troughs, and other infrastructure—and more dependent on *people.* Not only is it an ancient human activity (think Persian nomads), but it dominated the early days of the Old West as well (think *Lonesome Dove*). Herding faded away, however, with the arrival of the barbed-wire fence and, later, the federal allotment system for grazing permits, both of which splintered the wide-open West into discrete units that lent themselves to a less- intensive management style.

Dave and Steve had turned the clock back—or forward, depending how one looked at it. At the workshop, they described the pattern of the herd's movement as looking like a large flowing mass, with a head, a body, and a tail, in almost continuous motion. Pool riders don't push the whole herd at once; instead, they guide the head, or the cattle that like to lead, into areas that are scheduled for grazing. The body follows, leaving only the stragglers—those animals who always seem to like to stay in a pasture—to be pushed along.

The single-herd approach allows the ranchers to concentrate their energies on all of their cattle at once, as well as allowing the Forest Service to more easily monitor conditions on the ground.

In fact, the monitoring data showed such an improvement in the health of the land over time that the West Elk Pool asked for, and was granted, an increase in their permitted cattle numbers from the Forest Service. In other words, since the data supported their contention that herding was improving the health of land that had been beaten up historically by livestock, the ranchers of the West Elk Pool felt it was time to gain financially from their good work. This was significant because the trend in cattle numbers on public land was mostly the other direction—down—for a variety of reasons, not the least of which was pressure from environmentalists who saw cattle as simply destructive to land. But the West Elk Pool was different

in this regard as well. In the planning process, they involved a local environmental group and ultimately got its blessing for the herding experiment.

It was a strategy that paid off, literally.

Once again, as with David and Kay James, it was about a vision. After the herding workshop, Dave sent me the goal statement for the West Elk allotment, which read in part:

> *Our goal is to maintain a safe, secure rural community with economic, social, and biological diversity . . . that respects individual freedom and values education, and that encourages cooperation . . . Our goal is to have a good water cycle by having close plant spacing, a covered soil surface, and arable soils; have a fast mineral cycle using soil nutrients effectively; have an energy flow that maximizes the amount of sunlight converted to plant growth and values the seclusion and natural aesthetics of the area.*

Standing on the Allens' back porch, I asked Steve the question that had been on my mind since the workshop: What set him up for crossing those double yellow lines? A slight, quiet, but affable man, Steve didn't strike me at first as the ringleader type. Spend time with him, however, especially as he gently but firmly works his beloved border collies—he is a well-known trainer in the area—and you get the sense that a strong will is at work. Still, what leads someone to step out of the box like that?

Steve grew up in Denver, he said, where his father was an insurance salesman. He met Rachel at Western State College in Gunnison, where they discovered that they both liked to ski—a lot. Steve joined the ski patrol in Crested Butte, and eventually both of them became ski instructors. It was 1968. They were young and living the easy life. But restlessness gnawed at Steve. "The ski industry is designed to make ski bums, not professionals," he said with his easy smile. "It was fun, but we wanted more."

They were also restless about the changes happening in Crested Butte. Even in those early days, signs of gentrification were visible in town. Although not yet affected by the scale of change that transformed nearby Aspen into a playground for the rich

and famous—a process sometimes called the "Aspenization" of the rural West—Steve and Rachel could see the handwriting on Crested Butte's wall. By the early 1970s, they decided to join the back-to-the-land movement, trading their skis for farm overalls.

"We weren't hippies, mind you," interjected Rachel, laughing. "We took farming seriously. I just want to get that on record."

They moved west, over the West Elks, to the small village of Paonia, where they planted what eventually became a large garden. They grew vegetables, raised chickens, produced hay—and learned from their farm neighbors.

"Because we admitted we didn't know very much," said Steve, "and because we were willing to learn, people were willing to teach."

Which could be a motto for the New Ranch.

In 1977, restlessness struck again. They traded the garden for a run-down farm on the edge of Fruitland Mesa, where the hay was so bad the first few years they had to give it away. Eventually, they bought a few cattle and decided to try their hand at ranching. In 1988, Steve purchased a Forest Service permit in the nearby West Elks, mostly as a forage reserve for his animals in times of drought. His interest was not purely economic, however. Steve had always been attracted to mountains, and soon he had a chance to work in them daily.

Eager to learn more, Steve took a Holistic Resource Management course the same year that Dave James did, and that led him to give herding a try. With the arrival of Dave Bradford to the Forest Service office in Paonia a short while later, the opportunity to cross the yellow lines suddenly presented itself.

As part of the process of pulling the West Elk experiment together, Steve also became a student of a new method of low-stress livestock handling sometimes called the "Bud Williams school"—after its Canadian founder. Its principles fly in the face of traditional methods of cattle handling, which are full of whooping, prodding, pushing, and cursing. Putting stress on cattle is as customary to ranching as a lasso and spurs.

But that was Steve's point: customary, yes; natural, no. And that's where herding comes in: pressure from predators in the wild made grazers bunch in herds naturally. Unfortunately, on many ranches today, the herd instinct has been prodded out of

most cattle.

The whole idea of low-stress handling is to use a "law of nature" to positive effect.

"Nature," Steve said simply, "has the right ideas, but we keep messing them up."

It is this return to nature's original model—such as grass-fed livestock and low-stress herding—that defines the progressive ranching movement underway today. Ranching needs good students, but it needs good teachers too. It needs people like Steve Allen. Grass may lie patiently for rain, but people need inspiration.

Twin Creek Ranch
South of Lander, Wyoming

A FEW HOURS north of Fruitland Mesa, I entered the dry heart of that summer's drought, which was centered on southern Wyoming. After crossing Sweetwater River on the old Mormon Trail, I knew the precise moment when I had reached Tony and Andrea Malmberg's ranch. Rounding a big bend in the road, I was suddenly confronted with the sight of green grass, tall willows, sedges, rushes, and flowing water.

I had arrived at Twin Creek. I was here not only because I knew the Malmbergs to be first-rate land stewards, but also because of their experiences in diversifying their business, which seemed to be a requirement for success as a rancher these days.

Following the lush creek on the road toward the ranch headquarters, I recalled an anecdote Tony had included in an article titled "Ranching For Biodiversity" that he had recently written for the Quivira Coalition's newsletter. It detailed an experience from his youth when he and a brother-in-law decided to blow up a beaver dam on the creek:

> *Jim and I crawled through the meadow grass under his pickup giggling. Jim pulled the wires in behind him, leading to the charge of dynamite.*
>
> *"This will show that little bastard," I said. Jim touched the two wires to the battery. WOOMPH! The concussion preceded*

the explosion. Sticks and mud came raining down on the pickup. As soon as it stopped hailing willows and mud, we scrambled out from under our shield.

"Yeah!" I hollered as we ran down the creek bank. "I think we got it all."

Water gushed through the gutted beaver dam, and we could see the level dropping quickly. The next morning, I rode my wrangle horse across the restored crossing. The water behind the beaver dam had gotten so deep I couldn't bring the horses across. But that was taken care of now. I galloped down the creek. The water ran muddy, and I couldn't help but notice creek banks caving into the stream.

I wondered.

It was another story about tradition, this time about conventional attitudes toward wildlife. But it was also an allegory. Years later, when Tony was a young man, his family ranch "caved in" too—forced into bankruptcy by high interest payments on loans and tumbling cattle prices, costing Tony's family the entire thirty-three-thousand-acre property. Suddenly homeless, Tony began to wonder what had happened. Two years later, he leased the ranch back from the new owner, before eventually buying it. But he knew things had to be different this time if he wanted to stay.

Like David James and Steve Allen, Tony attended a course on Holistic Resource Management and he began to realize that biodiversity was a plus on his ranch, not a minus. "I shifted my thought process to live with the beaver and their dams," he wrote in his article. "With this commitment, I viewed the creek as a fence rather than something I could cross. This attitude gave me an extra pasture, a higher water table, less erosion, and more grass in the riparian area. The positive results energized me, and I began to curiously watch in a new way."

What he noticed as a result of his new land management was an increase in biodiversity. Moose, previously a rare sight on the property, began to appear in larger numbers. He even began to appreciate the coyotes and prairie dogs on the ranch and the role they played in the health of his land. Later, a University of Wyoming study found a 50 percent increase in bird populations over the span of a few years.

All of which led him to formulate two guiding principles:

First, I avoid actively killing anything, and notice what is there. Whether a weed or an animal, it would not be here if its habitat were not. I plan the timing, intensity, and frequency of tools (grazing, rest, fire, animal impact, technology, and living organisms) to move community dynamics to a level of higher diversity and complexity.

Second, I ask myself what is missing. Problems are not due to the presence of a species but rather the absence of a species. The absence of moose meant willows were missing, which meant beaver were missing, and the chain continues.

If I honor my rule of not suppressing life, I will see beyond symptoms to address problems. If I continue asking, "What is missing?" I will continue to see beyond simple systems and realize the whole. When I increase biodiversity, I improve land health, I improve community relations, and I improve our ranch profitability.

To accomplish his goals, Tony employs livestock grazing as a land-management tool. To encourage the growth of willows along the stream and ponds, for example, he grazes them in early spring to assist seedling establishment. By concentrating cattle for short periods of time in an area, Tony breaks up topsoils and makes the land more receptive to natural reseeding and able to hold more water.

What brought me to Twin Creek, however, wasn't just the tall grass, the flowing water, or even the progressive ranch management practiced by Tony and Andrea, though these were important. What I wanted to see was the very nice bed-and-breakfast they operated.

As I pulled up to the spiffy new three-story lodge, I was greeted with a sunny wave by Andrea. A child of the Wyoming ranching establishment—her father traded cattle for a living—Andrea heard Tony speak passionately some years earlier about the benefits of planned grazing at a livestock meeting (where his talk was coolly received) and wrote him an equally passionate letter challenging his beliefs. They corresponded back and forth until she accepted his dare to come to the ranch and see the proof herself.

Tony joined us inside the sunny lodge. Bearded, deep chested, and sporting a leather vest, Tony looks the part of the cowboy. He is also cheery and garrulous, in print and in person.

Over a glass of wine later that evening, I learned that the lodge is the happy ending to a story that had its roots in anger. “When my family lost the ranch,” recalled Tony, “I blamed everyone but ourselves. I blamed consumers, environmentalists, liberals. But most of all, I blamed our new neighbors.”

In 1982, as the family was slipping into bankruptcy, a man from California bought a neighboring ranch for twice what a cow would generate per acre. Although this fact didn’t directly affect his family’s pending insolvency, it angered Tony because it suggested the end of an era. Ranch land had more value to society, he saw suddenly, as an amenity than as a working landscape. Recreation trumped ranching. And Tony didn’t like it.

But then Tony had a revelation: markets don’t lie. Upon returning to the ranch, he decided that in addition to the cattle operation, he would start a ranch-recreation business and market stays directly to people who wanted the cowboy experience. He quickly learned, however, that paying guests wouldn’t tolerate dirt or mice as much as he did, so he and Andrea took the plunge and built a pretty lodge with a capacity for fourteen guests at a time.

But they didn’t stop there. Making it economically meant exploring as many diverse business enterprises as possible. Andrea convinced Tony that the next step was to “go local” and find ways to tap local markets, including their new neighbors, for their beef and other services. They hosted a class on weed control for local ranchette owners and focused on the positive role of goats—which will eat every noxious weed on the state list. It was a big hit.

That was followed by a seminar on rangeland health, which proved popular with their ranching friends. Then came a foray into the grass-fed beef business, which has been successful too.

Next in their efforts at economic diversification was Andrea’s decision to start teaching yoga. A recent winter solstice party packed the lodge with what Tony called the “strangest assortment of people I’d ever seen together.” He continued, “The hodgepodge appeared to be a demographic accident, yet they all

ended up in central Wyoming because they wanted the same things we want: a beautiful landscape, healthy ecology, wholesome food, and a sense of community." In this, Tony drew a parallel with the benefit of increased biodiversity on the ranch.

"In the old days, I didn't have to deal with people different from me," he said. "But this is better."

Tony went on to explain to me how his indicators of success have changed over the years. In 1982, his primary measure of success was a traditional one: increased weaning weights of his calves. By 1995, Tony's measure had shifted to the stocking rate of cattle (the number of cattle per acre on the ranch—more cattle, managed sustainably, equals greater profitability), which, thanks to planned grazing, was up 75 percent from years prior. By 1998, his indicator had shifted to monitoring—data produced by a detailed study of plants—and what it said about ecological trends on the ranch. In his case, the trend was up—which was a good sign. By 2000, Tony used the diversity of songbirds on the property as his baseline (over sixty species currently). By 2002, however, the main measure of success had changed to an economic one: how many activities generated income for the ranch in a year. At the time of my visit, they were up to three.

Tony attributes this success to their ability to speak different languages to different audiences, including recreationalists.

"I realized that if I'm going to survive in the twenty-first century, I need to be trilingual," Tony explained. "Ranchers tell stories. The BLM wants to talk data. And then we've got the environmentalists. Lander has a lot of them. To connect with them, you need to use poetry."

In other words, success in ranching today is as much about communication and marketing as it is about on-the-ground results. As Tony and Andrea's story suggests, it is not enough simply to *do* a better job environmentally, even if it brings profitability. One must also *sell* one's good work and do so aggressively in a social climate of rapid change and the general population's increasing detachment from our agricultural roots.

From all the indicators that I saw, Tony and Andrea are on the right track. The lodge was clean, comfortable, and airy; the food wonderful; and the visitors happy. But this is no dude ranch. Tony makes his guests work. According to his planned grazing schedule,

his cattle need to be moved almost every day—so he has paying guests do it. They love it, of course, and since his cowboy does the supervisory work, Tony is free to explore other business ideas. And the ideas keep coming.

Red Canyon Ranch
West of Lander, Wyoming

When I met Bob Budd at the Nature Conservancy office in Lander, a short drive north from the Malmberg's Twin Creek Ranch, he was pacing the floor, waiting for my arrival.

"The ranch is on fire," he said quickly. "Let's go."

Despite being a foot taller than Bob, I had to hustle to keep up with him as we headed outside. A Wyoming native son, a member of a well-known ranching family, and former executive director of the state's cattlemen association, Bob managed the Red Canyon Ranch for the Nature Conservancy's Wyoming office when I met him. He also served as their director of science. Bob had earned a master's degree in ecology from the University of Wyoming and was in line to become president of the Society for Range Management, a highly respected national association of range professionals.

Without a doubt, he was a man on the move.

I jumped into my truck and followed Bob rapidly to the headquarters of the thirty-five-thousand-acre Red Canyon Ranch, which borders Lander on the south and west. The Nature Conservancy, Bob said, had purchased the property for three reasons: to protect open space and the biological resources held there, to demonstrate that livestock production and conservation are compatible, and to work at landscape-level management and restoration goals.

The first two goals have more or less been achieved, he said as I climbed into his truck in the parking lot. It is the third goal that motivated him now. What Bob wants is fire back on the land, brush and trees thinned, erosion repaired, noxious weeds eradicated, perennial streams to flow fuller, riparian vegetation to grow stronger, and wildlife populations to bloom. And judging by the speed at which we traveled, he wanted them all at once.

Bob was thrilled about the lightning-sparked fire that was burning a chunk of forest and rangeland right where he had been encouraging the Forest Service to light a prescribed burn for years. That's because fire is a keystone ecological process, meaning a process that is fundamental to the health of the ecosystem over time. Research shows that "cool" fires happened frequently in Western forests, perhaps as often as every ten years in some stands. But for much of the twentieth century, humans suppressed all fires in our national forests, mostly to protect the monetary value of the timber, and as a consequence, the forests have become overgrown and dangerously prone to "very hot," destructive fires. To reverse this condition and restore forest health, ecologists and others have encouraged the Forest Service to light controlled burns. To many, however, the pace of bureaucracy has been frustratingly slow.

"I love lightning," Bob said with a twinkle in his light blue eyes, "because there's no paperwork."

As we sped into the mountains in search of a suitable vantage point to observe the progress of the fire, talking energetically about ecological theories that I had only recently begun to study, I recalled something Bob had recently written: "I am an advocate for wild creatures, rare plants, arrays of native vegetation, clean water, fish, stewardship of natural resources, and learning. I believe these things are compatible with ranching, sometimes lost without ranching. Some people call me a cowboy. A lot of good cowboys call me an environmentalist."

Bob has strong words for both camps, especially about their respective defense of myth. He likes to remind environmentalists in particular that nature is not as pristine as many assume. For thousands of years, he observed, Wyoming has been grazed, burned, rested, desiccated, and flooded. In saying so, he consciously tilts at an ecological holy grail called the "balance of nature." This is the long-standing theory that says nature tries hard to hold things in balance; in other words, when a system gets out of balance, nature works to right the ship, so to speak. Predator/prey populations are a good example. According to this theory, too many coyotes and not enough jackrabbits, say, mean nature will bring the coyote population back into balance over time (by starvation).

Today, most professional ecologists reject this theory in favor of one called the "flux of nature," which views nature as dynamic, chaotic, and rife with bouts of disturbance—such as forest fires and floods. Unfortunately, the "balance of nature" theory persists among nonprofessionals, especially environmentalists, resulting in a great deal of conflict with rural residents over ideas of proper stewardship.

"In landscapes where the single ecological truth is chaos and dynamic change," Bob wrote, "we seem obsessed with stability. Instead of relishing dynamic irregularities in nature, we absorb confusion and chaos into our own lives, then demand that natural systems be stable."

He likes to explain to both environmentalists and ranchers that grazing, like fire, is a keystone process. "Like fire, erosion, and drought, grazing is a natural process that can be stark and ugly," he wrote. "And, like fire, erosion, and drought, grazing is essential to the maintenance of many natural systems in the West . . . And because adults tend to overlook other grazing creatures, we forget the impact of grasshoppers, rodents, birds, and other organisms that have long shaped the West."

Just as prescribed fire, once controversial, is now widely accepted, Bob observed, it is simply a matter of time before the same change of thinking happens to grazing.

As we sped through the forest, still searching for a spot to view the fire, I asked him if he thought environmentalists would ever embrace ranching.

"I think they'll have to," he replied, "if they want to protect open space."

Bob explained that in Wyoming, like much of the West today, unbridled development on private land has resulted in habitat fragmentation and destruction. When land is subdivided, the new roads and homes often interrupt wildlife migration corridors, decrease habitat for rare plants and animals, and make ecosystem management difficult. The open space that ranches provide are the last barrier to development in many places. "The economic viability of ranching is essential," he said, "in maintaining open space, native species, and healthy ecosystems."

"Even on public lands?" I asked.

"Absolutely," he replied. "That's because it's all about proper

stewardship. I don't care where you are."

Bob pointed to the trees outside the truck window.

"Our common goal must be to provide the full range of values and habitat types that a variety of species need, including us," he said. "And ranchers can help."

What he meant, I've come to understand, is that ranchers can become restorationists because they are uniquely positioned to deliver ecological services—food, fuel, fiber, and other ecological benefits that society requires—as landowners, as livestock specialists, and as hard workers. This will become increasingly important, I'm convinced, as the twenty-first century wears on and we come to realize just how much restoration work is required—not to restore the balance of nature but to get nature back into a position where it can operate according to natural principles, including disturbance. Cows can have a role here too. As domesticated animals, they can be used effectively to recreate certain kinds of animal impact on the land—a point Allan Savory made years ago.

Suddenly, we stopped. The fire we sought had proved elusive, and it was time to head back to headquarters. It seemed symbolic. While landscape-scale opportunities for ranchers may be plentiful, as Bob suggested, many are elusive, especially on public land, where every action seems to engender an opposite reaction by someone. Even the smallest restoration project, whether it involves livestock or not, can quickly become mired in red tape and conflict. Bob remained optimistic, however. He admitted that he had to be.

Returning to the ranch headquarters, Bob kept moving. He needed to take his son to baseball practice. I followed him into the house for introductions to the family. We talked for a while longer, shook hands, and before I knew it, he was gone.

Rather than drive off immediately too, I walked down to a bridge that spanned a burbling creek. Enjoying a momentary respite from the dust, the cascade of ideas, goals, and practices that dominated conversation for the entire trip, I leaned on the wooden railing and listened to the wind.

One thread that tied Bob Budd to the Jameses, Allens, and Malmbergs, it occurred to me, was the desire to make amends with nature. To paraphrase President John F. Kennedy, each

asked not what the land could do for them, but what they could for the land. Whether it was restoring land to health, bridging urban–rural divides, teaching, feeding, or peacemaking, every person I encountered was engaged in an act of redemption, mostly by trying to heal damaged relationships, particularly our bond with the land. This is good news for grass, especially in these dry times. It is good news for all of us as well.

Grass may seem immortal, but in reality, it needs water, nutrients, animals, and fire to stay vigorous. The health of the whole depends on the health of its essential parts. This is important, as Bob Budd explained, because disruption is inevitable in nature; sooner or later, a calamity of some sort will strike, and those plant and animal populations that are not functioning properly at basic levels will be in jeopardy. Communities of people are no different. Whether it is a ranch, village, small town, or city, every community needs to be diverse, resilient, opportunistic, and self-reliant if it is to survive unexpected challenges.

For example, by setting water to work with a purpose—to earn a living within nature's model—the James family has buffered themselves well against uncertainty, and in the process protected four hundred acres of prime land along the Animas River from subdivision. The potential financial gain from busting their land into small lots for houses is astronomical—but they won't do it because it doesn't fit their goal for their family, their land, or their community.

Take Steve Allen, for example. It took the brave step of crossing yellow lines to achieve his goal. How many of us city folk are willing to take a risk like that? Do we even know where the yellow lines are? Are *we* resilient in our own lives? Or are we in spiritual (as well as practical) danger of supposing, as Aldo Leopold warned, that, "Breakfast comes from the grocery, and heat comes from a furnace."

Another thread was Tony Malmberg's question about the sanctity of life—when might we stop killing things we don't understand, as he did, and start inquiring instead about what might be missing from our lives? And once the outlines of answers become perceptible, what language do we speak so the lessons we've learned can be clearly understood? Must we be trilingual, or at some point will one vocabulary suffice—the language, say,

of grass? Or food? And if we can figure all that out, how do we make it *pay*—as in paychecks—without which little can be accomplished.

Then there was the big picture. How do we work at scale, as Bob Budd advocates—and not just on ranches and farms, but all over the West, the nation, the globe? How do we take a landscape perspective in a world balkanized into countless and often feuding private, state, tribal, and federal fiefdoms? How do we overcome the paperwork, the lawsuits, the power struggles, and the politicking necessary to get the big work done in a century that will likely be roiled by climate change, energy instability, water shortages, and a host of other potential challenges?

I found the clues at nearly every stop along this trip. Stegner was right, ranching *is* renewable—in fact, it feels very much like it's being reborn, one ranch at a time. This is good news. Grass and grazers, after all, are the original solar power. Moreover, humans have been living and working with livestock for a very long time and through a great deal of historical change. The human desire to be near animals, and be outdoors, hasn't altered much over the centuries, though it has recently shrunk, hopefully temporarily, as a result of industrialization. We need ranching, I came away thinking, because it can be regenerative, not only for the food and good stewardship it can provide, but also for the lessons it can teach us about resilience and sustainability. All flesh is grass, as the Bible reminds us, though it has often been forgotten.

Perhaps it is time to consider it again.

Sixteen

An Invitation to Join the Radical Center

(2003)

For more than thirty years, environmentalists and ranchers have fought over the heart of the American West—the wide-open spaces that stretch from our cities to the "purple mountain majesties" we sang of in school.

The combatants have fought long and hard, but as their struggle over the working landscapes of the West pulled in citizens, agency officials, attorneys, and judges, one consequence is clear: during the fight, millions of acres of the West's open spaces and biologically rich lands were broken by development.

There have been other unintended consequences. Forest Service and Bureau of Land Management officials who once physically managed our purple mountain majesties now mostly manage mountains of paper. Endangered species hang on by claw or beak despite hundreds of lawsuits. Rural towns simply hang on.

Meanwhile, human communities divide into factions. Most tragically, the stewards of working landscapes are surrendering their lands at unprecedented rates to the pressure that tears the quilt of nature into rags.

Perhaps the fight had to happen. The West's grasslands and streams and wildlife were in trouble from a century or more of hard use when this fight was joined. The nation had to debate the use of 420,000 square miles of grazed public land across eleven states. But the fight has gone on far too long. In recent years, the American West has witnessed tremendous positive changes, including the rise of models of sustainable use of public and private lands, the shift of conservation and scientific strategies from protection alone to include restoration, and the expanding role of cooperative efforts to move beyond resource conflicts.

As a consequence of these crises and trends, we believe it is time to cease hostilities and enter a new era of cooperation.

We believe that how we inhabit and use the West today will determine the West we pass on to our children tomorrow, that

preserving the biological diversity of working landscapes requires active stewardship, and that under current conditions, the stewards of those lands are compensated for only a fraction of the values their stewardship provides.

We know that poor management has damaged land in the past and in some areas continues to do so, but we also believe appropriate ranching practices can restore land to health. We believe that some lands should not be grazed by livestock but also that much of the West can be grazed in an ecologically sound manner. We know that management practices have changed in recent years, ecological sciences have generated new and valuable tools for assessing and improving land, and new models of sustainable use of land have proved their worth.

Finally, we believe that the people of the West must halt the further conversion of working landscapes to uses that destroy this wellspring of ecological, aesthetic, and cultural richness that is celebrated around the world.

Time is short. The cost of delay is further irrevocable loss.

We therefore reject the acrimony of past decades that has dominated debate over livestock grazing on public lands, for it has yielded little but hard feelings among people who are united by their common love of land and who should be natural allies.

And we pledge our efforts to form the "Radical Center," where:

- The ranching community accepts and aspires to a progressively higher standard of environmental performance;
- The environmental community resolves to work constructively with the people who occupy and use the lands it would protect;
- The personnel of federal and state land-management agencies focus not on the defense of procedure but on the production of tangible results;
- The research community strives to make their work more relevant to broader constituencies;
- The land-grant colleges return to their original charters, conducting and disseminating information in ways that benefit local landscapes and the communities

that depend on them;

- The consumer buys food that strengthens the bond between his or her own health and the health of the land;
- The public recognizes and rewards those who maintain and improve the health of all land;
- And that all participants learn better how to share both authority and responsibility.

As the ranks of the Radical Center swell with those who are committed to these goals, the promise increases that "America the Beautiful" may become an image of the future as well as of the past and, with the grace of good fortune, the West may finally create what Wallace Stegner called "a society to match its scenery."

In the expectation that we face a better future for the West, we hereby sign our names and invite others to add their own:

- Michael Bean, conservationist, Environmental Defense
- Jim Brown, ecologist, University of New Mexico
- Bob Budd, manager of Red Canyon Ranch for the Nature Conservancy
- Bill deBuys, author, conservationist
- Kris Havstad, supervisory scientist at the USDA ARS/Jornada Experimental Range
- Paul Johnson, former chief of the Natural Resources Conservation Service
- Teresa Jordan, author
- Daniel Kemmis, Center for the Rocky Mountain West
- Rick Knight, professor of wildlife biology, Colorado State University
- Heather Knight, the Nature Conservancy
- Merle Lefkoff, mediator
- Bill McDonald, rancher and executive director of the Malpai Borderlands Group
- Guy McPherson, ecologist, University of Arizona
- Ed Marston, journalist and former publisher of High Country News
- Gary Paul Nabhan, author and director of the Center for

Sustainable Environments, Northern Arizona University
- Duke Phillips, rancher,
- Nathan Sayre, anthropologist
- Paul Starrs, professor of geography, University of Nevada, Reno
- Bill Weeks, the Nature Conservancy
- Courtney White, the Quivira Coalition

Seventeen

Hope on the Range
(2004)

Near Brothers,
Central Oregon

Doc and Connie Hatfield like circles. When they give a talk, they often ask the audience to sit in a big circle, so everyone can see one another. Their goal is to encourage participation, which is why they literally refuse to be the center of attention. Circles, they believe, create a feeling of being a part of a large family.

Which is a fair description of Oregon Country Beef (OCB), the food cooperative that Doc and Connie founded in 1976 (known today as Country Natural Beef).

Yet the conversation in a Hatfield circle is hard-nosed and economic- minded as well, which also describes OCB. The frank talk focuses on profit, healthy food, markets, marketing, progressive management, and bankers. They speak from experience, and they have a success story to tell. Bankers love Oregon Country Beef, they tell the circle. So do its customers. So when Connie tells the ranchers in the room to “decommodify or die,” as she

invariably does, the circle listens closely.

In the mid-1980s, the Hatfield family ranch was broke and going out of business. Nothing was working right—beef prices were low, pressure from environmentalists was high, profits were nonexistent, and hope was fading. Desperation ruled, and not just on the Hatfields' place. All across central and eastern Oregon, neighbors and friends on ranch after ranch were struggling to hang on economically and emotionally. Clearly, business as usual was failing.

Fast-forward eighteen years. Today, the situation has been completely reversed. In place of despair, hope rules the range.

"My favorite indicator," says Connie, "is how many babysitters we need at our annual meeting to watch the little ones. In the beginning, we didn't need a single one. Today, we need three."

That's because Oregon Country Beef has grown from fourteen participating ranches to seventy. Families are not only staying put and making a living; some have returned home from distant points. There are other indicators. A discriminating consumer can find Oregon Country Beef in grocery stores from Fresno, California, to Bellingham, Washington, to Boise, Idaho. The market for its locally grown, natural beef continues to expand. In fact, OCB struggles at times to keep up with demand.

"We could add another twenty ranches easy," says Connie. "But we're kinda picky. Not everyone who wants in can adjust to our model. We make decisions by consensus, for instance. That means giving up some cherished independence, which is hard for ranchers. But that's what we do."

Not everyone, in other words, likes to sit in circles.

Oregon Country Beef was born in 1986, when Connie Hatfield, driven to desperation, decided to confront her nemesis. She drove from her ranch near Brothers, in central Oregon, forty-five miles west to Bend, the biggest city in the area. She wasn't going to confront an anti-grazing environmentalist, however, or a federal bureaucrat. Instead, she confronted a health guru.

"I went into a fitness center and asked the owner what he thought about red meat," she recalls. "To my surprise, he told me he loved red meat. In fact, he ate it three times a week. But he wanted healthy meat, which meant he had to buy it from Argentina! That's because it didn't have any hormones or antibiot-

ics in it."

Connie quickly saw two marketing opportunities. "First, we could produce a healthy product for the consumer, and second, it could be local," she says. "They fit together perfectly."

When Connie began to ask around, she found fourteen ranch families willing to give the idea of OCB a try. Together, they made some early critical decisions about membership:

The meat would be certified "natural"—free of antibiotics, steroids, hormones, and other chemicals.
Each family would give at least ten days a year to group meetings, as well as at least one day greeting customers at stores in Portland and other cities.
Ranches would be available to host tours for meat buyers.
Each ranch would abide by third-party certification standards for land stewardship.
Each ranch would help OCB provide a year-round (fresh) product.
Each ranch would craft a set of goals to describe the sorts of lives they wished to lead, the desired condition of their land and livestock, the type of product they strove to produce, and the actions they would take to achieve those goals.

It was a conscious departure from the "branded beef" programs pushed by the major food corporations, which often simply promote one type of animal, such as Angus, over another. The Hatfields weren't buying this strategy.

"Consumers today want to know what's in their food, where it came from, and what's happening to the land," says Connie. "But they're busy too, and they often don't have time think about the details. They want to do the right thing, but they often don't know what that means."

After nineteen years of feedback, the Hatfields have discovered that taste is the consumer's number one concern. "They want a product that is fresh and tastes good," says Connie. "That's why they come back."

The issue of sustainable stewardship, however, remains strong for OCB ranchers. Over the years, they have developed a set of

management principles they call “Grazing Well,” to which all participating ranches conform. They include:

Proper water cycling: dense stands of perennial plants, grass litter on the ground, and native shrubs in the riparian areas—all capturing and holding water.
Using rotational grazing of livestock so that grasses are given time to recover, including the deferment of pastures year to year.
Employing low-stress livestock-handling methods.
Maintaining biodiversity, including predators, birds, and other wildlife.
Planning for long-term health rather than short-term maximization of resources.

Still, for all the goals and principles that make OCB unique, the bottom line is top priority. Doc Hatfield put it this way: “You’ve got to make money every month or you’re not doing something right.”

And it’s all done with a handshake.

“We had $25 million in boxed beef sales without a written contract,” says Connie. “It’s all based on trust and honor.” Best of all, seven young families have returned to their ranches. That’s because they can make a living in the beef business now. Things have gone so well, in fact, OCB isn’t taking on new customers, preferring instead to concentrate on expanding their base. “Unlike other meat operations,” says Connie, “we decided we needed a lot of space in a few stores, not a little space in a lot of stores. And that’s worked well for us.”

According to Doc, a major key to profitability is forecasting. OCB plans eighteen months in advance, guaranteeing a price to the ranchers, free from commodity market fluctuations. Each producer has a good projection of what they will get, and when, for their cattle.

OCB members also control the animals from birth to slaughter. A typical OCB animal spends the first eighteen months of its life on grass. Then it is moved to a family-run feedlot for ninety days before being shipped out. There is no animal fat or blood in the feed, and if an animal needs anything beyond routine vaccina-

tions, it is removed from the program.

Another key is to know the real cost of production, including long-term ecological sustainability.

"Most ranchers have no idea of their true costs," says Doc. "They know what their bills are, but they have no idea about the value of their land over time. The traditional cost of production on a ranch is only what it takes to produce a pound of beef. We include the larger ecological costs, blended into a package and marketed as a whole. When a ranch is ecologically healthy and economically sustainable, you have a perpetual-motion economic engine."

Near Seneca,
Eastern Oregon

"A sign of a true Western town is its honorable poverty," says Jack Southworth, describing his tiny hometown of Seneca, in east-central Oregon.

The Southworth brothers' ranch was one of the fourteen original OCB ranches, and Jack remains an active participant. He drafted the ecological stewardship guidelines by which the Food Alliance, a nonprofit organization based in Portland, certifies each operation. He also continues to volunteer as a facilitator at the regular meetings of OCB members.

Southworth credits his involvement in OCB with turning his ranch, and his life, around. Economically, the fixed price he gets for his cattle gives him a critical degree of financial security and allows him to plan ahead more effectively. "I stopped trying to hit home runs every time and focused on hitting singles instead," he says. "That's helped a lot. We don't get the highest prices this way, but we avoid the downturns too."

Ecologically, OCB's emphasis on good stewardship dovetails with the close attention Jack pays to the health of his land. Socially, OCB membership has created a sense of family that has gone a long way to reduce stress in Jack's life. Overall, OCB enables ranchers like the Southworths to give something back—to the community, to the region, and to the land. "It's not just the food; it's the connection with the customers that I enjoy," says

Jack. “They give you a sense of well-being that I never got from the commodity market.”

For all of his financial security, Jack Southworth may be most proud of his willows. Healthy, dense stands line both sides of Silvies River, which meanders across the ranch. It didn’t look like this when Jack was growing up. In fact, he remembers using a tractor to pull the very last willow clump out of the ground, under orders from his father, when he was twelve.

“My father wanted grass right to the edge of the water and nothing else,” Jack recalls. “The trouble was, that’s not what the river wanted. Soon we had a big problem.”

Without adequate vegetative protection, the riverbanks began to erode. Alarmed, his father began to deposit old cars in the water in a desperate attempt to stem the erosion. It didn’t work. When Jack took over the ranch right out of college, he tried a different strategy. He decided to plant willows and fence the cows out.

His father wasn’t at all pleased. “My dad was a tough old World War II Marine, and he was pretty well set in his ways,” says Jack. “Maybe it was a generational thing. Dad tried to control the land. My approach is to go with what nature gives you.”

Toward that end, Jack and his wife wrote out a three-part goal statement for their ranch. The first two parts focus on community and livestock well-being. The third reads: “To bring about the quality of life and products we desire, we need a dense stand of perennial grasses with some shrubs. We want the ground between plants to be covered with decaying plant litter. We want the streams to be lined with willows, home to beaver, and good habitat for trout. We want the precipitation we receive to stay on the ranch as long as possible and to leave here as late-season stream flows or plant growth.”

And they’ve done just that. A recent inspection report by the Food Alliance noted the following accomplishments on the Southworth ranch:

“Livestock are grazed to maintain and enhance perennial plant communities and spread manure over the ground.”

“The manager does not use herbicide weed control. The manager uses cattle to reduce plant vigor and seed pro-

duction of problem plants, while promoting the growth of desirable vegetation to compete with weeds. No weed problems were observed on this ranch."

"Ranch management has resulted in improved riparian areas and upland vegetation. Willows have been planted along streams to improve the diversity of riparian communities and improve bank stability, benefiting both fish and wildlife."

"Great care was [taken to explain] how stress is kept low for animals and people."

"Manager is continually trying new things, evaluating the results and making improvements on the ranch . . . The Food Alliance has no substantive comments to offer, your scores are exemplary."

Near Steens Mountain,
Southeastern Oregon

At the other end of the scale, at least superficially, is the Roaring Springs Ranch, another OCB member. The Southworth ranch is relatively small in size; the Roaring Springs Ranch, located on the flanks of Steens Mountain in southeast Oregon, is large. Its acreage, combined with a nearby ranch, runs over six hundred thousand acres, making it one of the largest operations in the state. The owners and manager sometimes use a helicopter to get around.

On closer inspection, however, the similarities between the two OCB ranches are more striking than their differences. That's because both operations aim for the same goal: progressive management in service of human, animal, and ecological health. And both achieve this goal through visionary and energetic leadership. On the Roaring Springs, the leadership is provided by Stacy Davies, a studious former employee of Doc and Connie Hatfield. Davies runs over four thousand head of mother cows on the ranch, providing a large part of OCB's annual supply of animals. In doing so, he earns a comfortable living for himself and his family, including his wife Elaine and six sons—thus fulfilling Connie Hatfield's principal criteria for success.

Davies calculates that he can wean a calf at a cost of sixty cents per pound, thanks to low inputs, low labor costs, and good grass. He insists that the employees earn decent salaries and enjoy a good quality of life, so mostly he focuses on lowering other costs of production. “If I could, I’d park every machine on the ranch and never start another engine,” he says.

Like Jack Southworth, Davies believes that making the management fit the land increases profit.

“For the Roaring Springs, the best use of our natural resources is an April calf,” he says. “This way, there aren’t any conflicts with predators, labor costs are lower, and I can still wean a 450-pound calf in the fall.”

Instead of supplementing his calves through the winter, Davies ships them to California for green grass and then brings them back in May for more grass. This way, he can supply eight-hundred-pound feeders to OCB eight months of the year. He doesn’t object to feedlots because he believes the consumer demands consistency in the meat—something that’s much harder to control with grass-only animals. At the same time, he’s no fan of government incentives. He thinks the market should determine who gets paid and how much, which is why he likes the OCB model.

“If it’s truly important to the American people, then they should pay for it directly,” he says.

Davies plows a significant portion of the ranch’s profits into conservation. He does so for a number of reasons, not the least of which is maintenance of profitability. He calls it a “reinvestment” in the ranch’s long-term health. For example, he pays a crew fifty dollars an acre to clear the abundant juniper trees, which he considers to be “big weeds,” on the ranch’s private land. His concern over juniper is a familiar story across the West: the suppression of natural fire over the decades has resulted in an explosion of woody vegetation and a diminishment of historic grasslands. The difference on the Roaring Springs is that Davies has the means, and the desire, to act.

However, in a move that typifies the Roaring Springs, Davies acts in a manner that is at once innovative and frugal. Rather than cut and stack the junipers for eventual burning, Davies has his crew skid the trees into large, circular windrows that act as

cattle exclosures for pastures that need rest or recovery. These "fences" cost him just $1,200 a mile to construct, compared to $4,500 per mile for barbed wire. When the exclosures are no longer needed, he lights a fire and burns them up.

The reintroduction of fire, in fact, is a big part of Davies's conservation mission on the Roaring Springs. So is wildlife, which abounds. Populations of antelope and bighorn sheep dot the ranch, as do herds of wild horses. Sage grouse, a species in peril across the region, flourish on the Roaring Springs, Davies says. He believes his sage grouse populations are healthier than those on two nearby national wildlife refuges. Next year, he plans to hire a full-time wildlife biologist to help him understand better the dynamics at work.

Clearly, Stacy Davies enjoys a challenge—even thrives on it—including the challenge of setting high standards and then meeting them. He also likes to set precedents. A major opportunity to do the latter came in the late 1990s when Bruce Babbitt, then secretary of the interior, publicly considered creating a national monument on Steens Mountain. A classic recipe for conflict was set in motion: urban environmentalists wanted the monument designation to protect the mountain, while the local residents wanted to be left alone. Protect it from what, they wondered?

After a lengthy, and sometimes testy, process of dialogue and wheeling and dealing, a compromise was brokered. No official monument designation was made. Instead, the upper part of Steens was designated as the first official "cattle-free wilderness" in the nation. At the same time, local ranchers, including the owners of the Roaring Springs, were able to consolidate their private holdings by swapping land with the government. Neither side was completely happy, but it could have been worse. Stacy Davies was in the thick of the negotiations from the start. Characteristically, he understates the conflict as a learning experience—whose principle lesson has a message for us all.

"What I learned was this," he said. "Society needs a goal statement."

Eighteen

The Working Wilderness

(2005)

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

—ALDO LEOPOLD

U Bar Ranch
Silver City, New Mexico

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 a friend had recently given to me.

We were taking a break in the shade of a large piñon 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 five-hundred-thousand-acre Altar Valley, located southwest of Tucson, Arizona. What was different about this map, I told them, was what it measured: indicators of rangeland health, such as grass cover (positive) and bare soil (negative), and what they might tell us about livestock management in arid environments.

What was important about the map, I continued, was what it said about a large watershed. 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"—with a color representing a particular intersection of conditions. Deep red designated an unstable, or unhealthy, condition for soil, grass (vegetation), and water, for example, while deep green represented sta-

bility in all three. Other colors represented conditions between these extremes.

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

I paused briefly—now came the controversial part. This big splotch of blood red continued well below the southern boundary of the Palo Alto, I said. However, this was not a ranch, but part of 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 young woman from Tucson cut me off. She knew the refuge, she explained, having worked hard as a volunteer with an environmental organization to help "heal" it from decades of abuse by cows.

The map did not blame anyone for current conditions, I responded; 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 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 be rated, by definition, as being in better ecological condition than adjacent "working" landscapes.

Yet the Altar Valley map challenged this paradigm at a basic 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 reason to rethink the conservation movement in the American West.

From the ground up.

CS Ranch
Cimarron, New Mexico

My decision received a boost a few weeks later while sitting around a campfire after a tour of the beautiful one-hundred-thousand-acre CS Ranch located in northeastern New Mexico. Staring into the flames, I found myself thinking about ethics. I believed at the time, as do many conservationists, 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 that Aldo Leopold suggested in his famous essay "The Land Ethic," 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 earlier, Julia and her sister Kim talked their family into switching to holistic management of the land, a decision that over time caused the ranch to flourish economically and ecologically. In fact, the idea for my query came earlier that 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 *and* ethics, neither without the other, I suddenly saw, are the key to good land stewardship. Her point confirmed what I had observed during visits to livestock operations across the region: many ranchers *do* have an environmental ethic, as they have claimed for so long. Often their ethic is a powerful one. But it has to be matched with *new* knowledge—especially ecological knowledge—so that an operation can adjust to meet changing conditions, both on the ground and in the arena of pub-

lic opinion. Of course, a willingness on the part of a rancher to "go back to school" is a prerequisite to gaining new insights. Tradition, however, seemed to have a lock on many ranchers.

The same thing is true of many conservationists. In the years since I cofounded the Quivira Coalition, I came to the conclusion that it had been a long time since any of us had been back to school ourselves. Tradition was just as much an obstacle in the environmental community as it was in agriculture. It wasn't just the persistence of various degrees of bovine bigotry among activists, despite examples of healthy, grazed landscape like the U Bar, either. It was more a stubbornness about the relation between humans and nature—they should be kept as far apart as possible—expressed in the long-standing dualism of environmentalism that said recreation and play in nature were preferable to work and use.

If conservationists went back to school, as the Davis family did, what could we learn? Aldo Leopold had a suggestion that can help us today: study the fundamental principle of *land health*, which he described as "the capacity of the land for self-renewal," with conservation being "our effort to understand and preserve this capacity."

By studying the elements of land health, especially as they change over time, conservationists could learn that grazing is a natural process. The consumption of grass by ungulates in North America has been going on for millions of years—not by cattle, of course, but by bison, elk, and deer (and grasshoppers, rabbits, and even ants)—resulting in a complex relationship between grass and grazer that is ecologically self-renewing. We could learn that a re-creation of this relationship with domesticated cattle lies at the heart of the new ranching movement, which is why many progressive ranchers think of themselves as "grass farmers" instead of beef producers.

We could also learn that many landscapes need periodic pulses of energy, in the form of natural disturbance—such as fires and floods (but not the catastrophic kind)—to keep things ecologically vibrant. Many conservationists know that low-intensity 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 positive agents of change too, as can drought, windstorms, and even insect infestation. Or that animal impact caused by grazers, including cattle, can be a beneficial form of disturbance.

We could further learn, as the Davis family did, that the key to healthy disturbance with cattle is to control the timing, intensity, and frequency of their impact on the land. 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 is grazed by cattle more than once a year, thus ensuring plenty of time for the plants to recover. The keys are regulating where cattle go, which can be done with fencing or a herder, and the timing of their movement, in which the herd moves are carefully planned and monitored. In fact, as many ranchers have learned, overgrazing is more a function of timing than it is of numbers of cattle. For example, imagine the impact 365 cows would have in one day of grazing in one small pasture versus what one cow would do in 365 days of grazing in the same pasture. Which is more likely to be overgrazed? Hint: have you ever seen what a backyard lot looks like after a single horse has grazed it for a whole year?

We 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 to 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.

A willingness to adopt new knowledge allowed the Davis family to maintain their ethic yet stay in business. Not only did it improve their bottom line; it also helped them meet evolving values in society, such as a rising concern among the pubic about overgrazing. 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.

Kaibab National Forest
Flagstaff, Arizona

A friend of mine likes to tell a story about the 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 and said, "Tell us first if it's grazed by cows or not." In a similar vein, a Santa Fe lawyer told me that a monitoring workshop 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. Many of us who spend time on the land don't know our perennials from our annuals, what the signs of poor water cycling are, what leads to a deeply eroded gully, 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. But that has changed.

In recent years, range ecologists have reached a consensus on a definition of health: the degree to which the integrity of the soil and ecological processes of rangeland ecosystems are sustained over time. These include water and nutrient cycling, energy flow, and the structure and dynamics of plant and animal communities. In other words, when scarce resources such as water and nutrients are captured and stored locally, by healthy

grass plants, for example, then ecological integrity can be maintained and sustained. Without them—if water runs off-site instead of percolating into the soil, or grass plants die due to excessive erosion of the topsoil, for example—this integrity will likely be lost over time, perhaps quickly.

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

Taking it to the next step, range ecologists echo Aldo Leopold's famous quote that "Healthy land is the only permanently profitable land." Producing commodities and satisfying values from a stretch of land on a sustained basis, they insist, depends on the renewability of internal ecological processes. In other words, before land can sustainably support a value, such as livestock grazing, hunting, recreation, or wildlife protection, it must be functioning well at a basic ecological level. 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 for that land may be at risk.

Or as Kirk Gadzia, an educator, range expert, and coauthor of *Rangeland Health,* the pioneering 1994 book published by the National Academy of Sciences, 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 Roger Bowe, an award-winning rancher from eastern New Mexico, echoes. "Bare soil is the rancher's number one enemy."

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

The publication of *Rangeland Health* was the touchstone for a new consensus on the meaning of land health 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. A similar assessment has been made of stream health by a federal interagency group known as the National Riparian Team. The indicators of health include measures of the presence of rills, gullies, bare ground, pedestaling (grass plants left

high and dry by water erosion), litter (dead grass, which retards the erosive impact of rain and water), soil compaction (which can prohibit water infiltration), plant diversity (generally a good thing), and invasive species (generally not)—the same indicators that formed the basis of the Altar Valley map that I described on the tour.

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 that maintains, restores, or expands it should be supported. It should not matter if that activity is ranching or recreation.

Chaco National Historical Park
Southeast of Farmington, New Mexico

In an attempt to understand the issues of land health better, I paid a visit to a famous fence-line contrast. This particular fence separated the Navajo Nation, and its cows, from Chaco Culture National Historical Park, a UNESCO 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 ago when Allan Savory used the boundary to highlight the dangers in the park of too much rest from the effects of natural disturbance, including grazing and fire.

I wasn't a fan of fence-line contrasts myself, mostly because I dislike dichotomies represented by a fence: us/them, either/or, wild/unwild, grazed/ungrazed. The world is more complicated than that. I'd rather take fences down, or move beyond them. But fence-line contrasts have pedagogical value, especially for new students of range health—like me. I decided I wanted to see this contrast in particular, but I knew I needed help interpreting what I saw, so I asked Kirk Gadzia to come along.

Both of us were well aware of the park's history—that a cen-

tury 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 with the tools of federal ownership and a barbed-wire fence. That's how Chaco became a national park. At the time, it was a common and appropriate scenario played out all across the West. But Kirk and I didn't go to Chaco to argue with history or to 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.

We stopped along the road at the eastern boundary of the park (this was during the growing season). 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 plant matter (dead grass turning gray in the sunlight), and a great deal of poor plant vigor. We saw both 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 other hand, 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," 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 continued, “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?”

“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 he added a caveat.

“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 the 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 that 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 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 beyond the fence.

Bandelier National Monument
Near Los Alamos, New Mexico

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 designation and the protection of "wildland," which had been under siege in that era of environmental exploitation. 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 and mental 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."

In their opinion, the Bandelier Wilderness is suffering from "unnatural change" as a result of historic overuse of the area in the late nineteenth and early twentieth centuries—grazing by sheep principally—which 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.

The elimination of livestock grazing with the creation of the park in the 1930s was 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." Without management intervention, they argue, this human-caused case of accelerated soil erosion will become irreversible. "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 all right 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."

I believe new knowledge about the condition of the land leaves us no choice: we must intervene. However, this turns a great deal of old conservation thinking on its head.

For instance, Wallace Stegner once wrote, "Wildlife sanctuar-

ies, 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 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 all of us. 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? 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?

Furthermore, the dualism of protected versus unprotected creates a stratification of land quality and land use that bears little relation to land health. 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, when not as much was known about ecology or the history of land use, 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.”

I believe the new criterion should be *land health*. By assessing land by one standard, a land-health paradigm encourages an egalitarian approach to land quality, thereby reducing conflicts caused by clashing cultural values (theoretically, anyway). By employing land health as the common language to describe the common ground below our feet, we can start fruitful conversations about land use rather than resort to the usual dualisms that have dominated the conservation movement for decades. We can also gain new knowledge about the condition of a stretch of land, and that knowledge can help us make informed decisions.

For example, I know 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 (lots of bare soil, many signs of erosion, and a lack of plant diversity), confronting us 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 (without a cover of grass or litter, soil will often “cap,” or seal when exposed to pounding rain, thus preventing seed germination), so that native grasses can get reestablished again.

Using cattle as agents of ecological restoration is not as novel as it may sound. In fact, in his 1933 classic book *Game Management*, Aldo Leopold wrote more generally 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.

I believe conservationists should share the same goal as these ranchers: transform red to green on maps such as that of the Altar Valley and the land west of Taos. Whether we use cattle or some other method of restoration, the result must be a thousand acts of healing, starting at the level of soil, grass, and water. And healing must extend to communities of people as well, both urban and rural. Restoration jobs could be a boon to local economies, and volunteers from environmental groups could help. Turning red to green could unite us no matter what our values.

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 Wallace Stegner's famous dream of creating a "society to match the scenery."

Nineteen

Thinking Like a Creek

(2006)

During my travels, I heard a story about a man who had put short fences across a cattle trail in the sandy bottom of a canyon in Navajo country so that the cattle were forced to meander in an S pattern as they walked, encouraging the water to meander too

and thus slow erosion.

I thought this idea was wonderfully heretical. That's because the standard solutions proposed for cattle-caused erosion in creeks were (1) kick the cows out (if you were an environmentalist), (2) ignore it and hope the problem fixes itself (if you were a rancher), or (3) spend a bunch of money on diesel-driven machines and other heavy-handedness (if you worked for an agency). Putting fences in the way of cattle and letting them do the work? How cool.

I learned more about it while attending an environmental restoration conference in downtown Phoenix, of all places. Someone told me that Bill Zeedyk would be giving a talk. I pricked up my ears. "You mean that guy who's been trying to keep part of Hubbell Trading Post from washing away by putting sticks and rocks in the nearby creek bed?" I asked. "The guy who refused to use cement, rip rap, or rock-filled wire baskets?" It was, came the reply. Could this be the same person, I wondered?

It had to be. I decided to catch his talk.

Actually, I bumped into him in the hall not much later. Bill is hard to miss—he looks like a Dutch version of Santa Claus, with ruddy cheeks, twinkling blue eyes, a generous salt-and-pepper beard, and a modest roundness that completes his aura of avuncular charm. Only don't tease Bill too much—as I eventually learned. Bill takes what he does quite seriously.

And what he does is help creeks get better. That might sound like an odd job description, but given the standard environmentalist saw that overgrazing has degraded 80 percent of the region's creeks and riparian areas, compromising their high ecological value in the arid Southwest, strategies of restoration had become an important issue economically, environmentally, and politically over the last decade (hence the conference in Phoenix).

After making quick introductions, I asked Bill if the story about the fences and the cattle trail in the canyon bottom was true. It was, he said. Recognizing that water running down a straight trail will cut a deeper and deeper incision in soft soil with each storm event, increasing the probability of serious erosion trouble, Bill talked the local Navajo ranchers into placing fences at intervals along the trail so that the cows would be forced to create a meander pattern in the soil precisely where Bill thought nature

would do so in their absence. Water likes to meander—it's nature's way of dissipating energy—and it will gravitate toward doing so again even if it's temporarily trapped in a cattle-caused rut (or human-caused hiking trail), though it might take a long time. His fence idea was a way to speed up the process, he said.

"What happened after the fences were put it in?" I asked. The water table came up as vegetation grew back, he replied, because the water was now traveling more slowly and had a chance as a result to percolate into the ground, rather than run off like before. Steep, eroded banks began to revegetate as the water table rose, and more water appeared in the bottom of the canyon, which encouraged riparian plant growth.

"Nature did all the heavy lifting," he said, before adding a warm, knowing smile. "It worked too, until someone stole the fences."

I followed him to his talk. Bill's comment reminded me that environmental problems are, as he puts it, "people problems." One is inextricably intertwined with the other. Fixing the environmental problem without addressing the people part, to paraphrase Aldo Leopold, is like fixing the pump without fixing the well.

However, at age seventy, Bill would rather leave the people problem to somebody else. "I'm done arguing," he said to me, "I'd rather focus my energy on fixing creeks and roads."

And that's exactly what he has been doing. Since 1995, five years after his retirement as a biologist with the United States Forest Service, Bill has developed an important set of techniques designed to "heal nature with nature," as I heard in Phoenix that day.

In the presentation, he inventoried this toolbox, illustrating how his low-cost, low-tech methods reduce erosion and sedimentation, return riparian areas to a healthier functioning condition, and restore wet meadows and other wetlands, all at a minimal cost compared to other techniques, such as the backhoe/rock-and-wire gabion-structure approach used by many landowners across the nation.

Bill's toolbox includes:

- one-rock dams (small structures that are literally one-

rock high)
- picket baffles and deflectors (wedge-shaped structures that steer water flow)
- wicker weirs (rows of sticks that create a "riffle" effect in creeks)
- vanes (a row of logs pointing upstream that deflect water away from eroding banks)
- headcut control structures (that stop the relentless march of erosion up a creek)
- worm ditches (that redirect water away from headcuts in wet meadows)
- "zuni" rock bowls (small structures that trap water so vegetation can grow)

Many of these structures are placed directly in a watercourse. Vanes and baffles, for instance, often constructed of wooden pickets (harvested locally), are used to deflect stream flow. Weirs are used to control streambed grade and pool depth. One-rock dams are used to stabilize bed elevation, modify slope gradient, retain moisture, and nurture vegetation.

The goal of these structures, I learned, is to stop downcutting in creeks and streams, often by inducing an incised stream to return to a "dynamically stable" channel through the power of small flood events. Bill calls it "Induced Meandering." Its goal is to restore channel dimensions, reestablish appropriate meander patterns and pool/riffle ratios, restore stream access to its floodplain, and raise the water table, which enables riparian vegetation to grow.

In other words, when a creek loses its riparian vegetation—grasses, sedges, rushes, willows, and other water-loving plants—to overgrazing by livestock, say, it tends to straighten out and cut downward because the speed of water is now greater, causing the scouring power of sediment to increase. Over time (and sometimes not very much time), this downcutting results in the creek becoming entrenched below its original floodplain, which causes all sorts of ecological havoc, including a drop in the water table (bad for trees and wet meadows). Eventually, the creek will create a new floodplain at this lower level by remeandering itself, but that is a process that often takes decades.

Bill's idea was to goose the process along by forcing the creek to remeander itself via his vanes, baffles, and riffles, carefully calculated and emplaced. And once water begins to slow down, guess what begins to grow? Willows, sedges, and rushes!

"My aim is to armor eroded streambanks the old-fashioned way," said Bill, "with green, growing plants, not with cement and rock gabions."

The employment of one-rock dams typifies Bill's naturalistic approach. The conventional response of landowners over the years to eroded, downcut streams and arroyos has been to build a check dam in the middle of the watercourse. The old idea was to trap sediment behind a dam, which would give vegetation a place to take root as moisture is captured and stored. Trouble is, check dams work against nature's long-term plans.

"All check dams, big or small, are doomed to fail," said Bill. "That's because nature has a lot more time than we do. As water does its work, especially during floods, the dam will be undercut and eventually collapse, sending all that sediment downstream and making things worse than if you did nothing at all."

"The trick is to think like a creek," he continued. "As someone once told me long ago, creeks don't like to be lakes, even tiny ones. Over time, they'll be creeks again."

One-rock dams, by contrast, don't collapse—because they are only one-rock high. Instead, they slow water down, capture sediment, store a bit of moisture, and give vegetation a place to take root. It just takes more time to see the effect.

"As a species, we humans want immediate results. But nature often has the last word," said Bill. "It took 150 years to get the land into this condition; it's going to take at least as long to get it repaired." The key is to learn how to read the landscape—to become literate in the language of ecological health.

"All ecological change is a matter of process. I try to learn the process and let nature do the work," said Bill, "but you've got to understand the process, because if you don't, you can't fix the problem."

Why even worry about healing creeks in the first place?

For starters, there is a good reason why many authors and historians, including Wallace Stegner, have labeled the American West the "plundered province." More than a century of very

hard use, including overgrazing by millions of livestock during the boom years between 1880 and 1920, have created a legacy of damaged, degraded, and just plain worn-out landscapes across the region. Add clear-cut logging, thousands of mines, hundreds of thousands of miles of badly designed and poorly maintained roads, extensive oil-and-gas exploration, and a thousand other cuts from the plundering behavior of individuals and corporations over the years, and you have a region that is chronically in need of a good doctor.

This is hard for most Americans to understand because we spend so much time in national parks, wilderness areas, wildlife refuges, and other pretty places that *seem* healthy. That was certainly my impression growing up in the West. Backpacking through one national park after another, even hiking through the desert as an archaeologist, I had no idea what "land sickness" looked like, to use Leopold's phrase, other than the obvious signs of abuse. That changed when I began Quivira and saw the land health map of the Altar Valley in southern Arizona. But it wasn't until I walked up a deeply eroded arroyo one fine sunny day in 2003 that the magnitude of the problem struck me like a bolt of lightning.

It happened at the boundary between the Gila National Forest and Jim and Joy Williams's ranch, located a few miles south of Quemado, in famously cranky Catron County in west-central New Mexico. We were there as a result of a project we were doing with Bill Zeedyk on Loco Creek, located on the Williams's ranch, which is an ephemeral tributary of Largo Creek, a substantial watercourse in the area.

We had met Jim and Joy Williams in Pie Town, New Mexico, in June 1998, when I accepted an invitation to speak at a meeting organized by three local women who despaired over the social and economic cost that constant conflict between ranchers and environmentalists had brought to their communities. Jim and Joy despaired too, but for a different reason—the Williams Ranch was in trouble. In 1995, the Forest Service reviewed the Williams's grazing allotment and decided to cut the number of permitted cattle they could run on the forest. It was the first time the permit had been cut in Jim's lifetime, who was then in his early fifties. Moreover, it had never been cut during the lifetime

of his father, Frank, who had assembled the ranch back in the 1940s. The issue of contention was the condition of the land, which the Forest Service insisted was being grazed too hard by Jim's cattle.

It was a common story at the time—with a common outcome. Angered by what he thought was the Forest Service's intransigence, Jim joined a class-action lawsuit with other ranchers against the agency. He also closely tracked another court case, this one brought by environmentalists upset at the government over cattle grazing on public land. "I thought the only answer was to fight," Jim told me later. "Well, we lost both of those cases, and so I thought that was pretty much the end of everything."

Financially struggling, and with their up-and-down relationship with the Forest Service at an all-time low, the Williams family, the last full-time ranchers in the Quemado area, began to seriously contemplate the one option that remained: to accept the offer of a subdivider to buy their substantial private land. Unwilling to take this option just yet, however, Jim raised his hand at the end of the meeting in Pie Town and invited the Quivira Coalition for a tour of his ranch, which we organized two months later. Liking what he heard us say about land health, progressive ranch management, and collaboration, Jim invited us back for further discussions. He also ordered the Catron County manager, who was on the tour, off his land when he tried to talk Jim out of cooperating.

Working with John Pierson, the Forest Service range conservationist, and range consultant Kirk Gadzia, Jim set new goals for the ranch and began to sketch out a new plan of cattle management. Using existing fences and natural boundaries, they divided the ranch into smaller pastures and planned rapid moves of cattle through them. Jim also agreed to graze his Largo Creek pasture in the winter months instead of late spring, as he had traditionally done. Jim and Joy also agreed to let Hawks Aloft, a nonprofit group hired by the Quivira Coalition, do bird monitoring on Largo Creek on their private land (to document the creek's ecological improvement). Everything went well—the grazing rotation worked, the land improved, and communication and trust between Jim and the Forest Service was restored. Jim even joined in on the bird surveys.

“I got a real kick out of looking for ferruginous hawks on my place,” Jim told me, referring to an elusive and sensitive species of concern. That’s probably not something a Catron County rancher would have said in the late 1990s.

An important fruit of this of trust building blossomed in 2001, when Jim and Joy opened their private land to the Quivira Coalition for a riparian restoration project along Largo Creek.

Not only was the creek in need of doctoring, but the ranch met an important precondition for Bill in any restoration project that he undertook—the livestock grazing had to be under control. There is no point to armoring a stream bank with riparian vegetation if the cattle come in and eat it all to the nub. As a consequence, Bill Zeedyk avoids working with landowners who overgraze, thereby creating a very important link between the New Ranch and riparian restoration. One reinforces the other—good cattle management helps the grass grow along the creek, and the riparian restoration can increase the amount of forage available for animals.

All of this involved a steep learning curve for me, but nothing quite prepared me for what happened when we turned our attention to a side tributary of Largo. It was called “Loco” for a reason—it was crazy to look at. Parts of it were so deeply entrenched that the walls rose above my head as I walked up it. According to Jim, it wasn’t even a creek—it was an old wagon road that had eroded so badly over time that it intercepted the watercourse, redirecting it entirely. And it was eroding so badly that with each major cloudburst, its bottom could drop by a foot or more, kicking huge amounts of sediment into Largo Creek—which is not a good thing. In fact, it is precisely the sort of environmental trouble that has agencies like the EPA (which administers the Clean Water Act) worried across the region.

It wasn’t the sediment that got my attention—it was something farther up Loco Creek.

Walking up the drainage one day, as crews were placing erosion- control structures farther down under Bill’s direction, I came to the boundary between Jim’s ranch and the national forest. Stretched across the creek and ten feet above my head was an old barbed-wire fence, complete with fence posts. I knew from a conversation with Jim that the Forest Service had built the

fence in 1935. And the fence posts rested on the ground. In other words, a *huge* amount of erosion had taken place here in less than seventy years.

My God, I thought. I stared up at the fence for a while longer. Then I took a photo.

Later I asked a man who works for the Natural Resources Conservation Service (the old Soil Service), which is a branch of the U.S. Department of Agriculture that works with private landowners, how much of the rest of New Mexico existed in a degraded condition similar to what I saw in Loco.

"Most of it," he replied.

Enter Bill Zeedyk. How Bill came to his restoration career says as much about his generation, and how far it has come over the decades, as it does about him. Born in New Jersey to schoolteacher parents in 1935, in what was then a rural area, he attended the University of New Hampshire, where he majored in forestry, having decided at the tender age of fourteen that he wanted to be a forester. He liked to hunt, fish, and trap—in fact, he paid for his first year at college by trapping muskrats. This led to his interest in habitat management—because he wanted to trap more muskrats.

"Trapping taught me how to observe wildlife and encouraged a sensitivity to habitat needs. It taught me how to read a landscape."

Despite his burgeoning respect for nature, however, Bill grew up in an era when humans assumed they knew best. "We were always looking for a better tool to control nature," he recalled. "That changed with Earth Day, when we began to see that there are consequences to all that we do. Up until then, we rarely took responsibility for our actions."

This included his employer. Bill joined the Forest Service right out of college in 1962, becoming the first biologist on the Daniel Boone (then Cumberland) National Forest in the mid-Appalachian Mountains. He believed firmly in the wisdom of multiple uses on public lands (and still does) because of its inclusiveness.

"Everyone stood to gain something from the common management of our forests, and this made the public lands system strong," he said. "Unfortunately, today the interests are splin-

tered, and the support for public lands has eroded to the point where I believe their future may be in doubt. There is no longer the bond of common ownership that protected the integrity of the National Forest system."

As he rose through the ranks, he remained focused on the needs of wildlife. While in Washington, D.C., in the early 1970s, he helped draft the first policies for the Forest Service in implementing the Endangered Species Act. He was also on the front lines of the development of riparian management rules within the Forest Service. It didn't make him very popular. "No one valued riparian health back in the 1970s," he recalled. "One forest supervisor told me to my face to get lost. He said there were no riparian areas on his forest. It was all about timber and cows."

The unofficial attitude toward wildlife wasn't much better. There were few biologists employed by the agency, and the ones there were got caught up in intense turf battles with state wildlife agencies and the United States Fish and Wildlife Service. "The old thinking was get the range right [i.e., grazing management], then the wildlife will be okay," he said. "In the old days, 'wildlife' meant deer and elk, not much else."

Things began to change, however, mostly as a result of intense pressure from an environmental movement that was flush with victory at the time. Standards for what constituted healthy ecosystems rose, especially for riparian areas, but so did conflict among various interested parties, and stress among federal employees. In the late 1980s, as the chief wildlife biologist in the Southwest region, Bill got caught in the crossfire between activists on both sides of the endangered species issue. He tried for a while to walk a middle ground but soon exhausted himself from the constant friction.

By 1990, Bill was done arguing. He retired and tried to relax. But a personal tragedy and an enduring desire to make things better pushed Bill into his new career a few years later. Upon completing a series of classes with hydrologist and restoration pioneer Dave Rosgen, who Bill credits with organizing his own ideas, Bill was asked by Tom Morris of the Navajo Environmental Protection Agency to take a look at a serious erosion problem that endangered the western edge of Hubbell Trading Post, near Ganado, Arizona. The straightened, rapidly eroding creek, which

carried tons of sediment from poorly managed lands upstream from the park, needed immediate attention. The park and the EPA were willing to give Bill's unconventional idea a try, and in the process, it became the first project where Bill could try "Induced Meandering" on a practical scale.

The creek responded quickly, sufficiently remeandering itself in a few short years for the park's structures to be considered safe from further erosion.

After his start at Hubbell, Bill fiddled with all of his ideas for riparian restoration over the next few years, only giving them a proper working out while on a consulting job in Mexico. Back in the States, Bill's ideas were greeted with a mixture of skepticism and outright resistance, especially by regulating agencies. Over time, however, as Bill's work proved itself where it mattered, on the back forty, the skepticism faded away. Today, many years after his retirement from the Forest Service, Bill has never been busier. He is, in fact, booked. He has worked across the Southwest, and beyond, and many of his ideas and techniques have been picked up by a new generation of restoration specialists. Of all the indicators employed to monitor the success of his work, this may be the most telling.

Taped to my computer is a postcard I found in a local coffee store. It depicts an ill-looking planet Earth, with its tongue hanging out, imprinted with the message: "The world could be in better shape." Surrounding this image are words: *renew*, *heal*, *reaffirm*, *nurture*, *rekindle*, *revitalize*, *repair*, *revive*, *mend*, *soothe*, *rebuild*, *fix*, *regenerate*, and *reinvigorate*.

I've thought a lot about those words over the years as the Quivira Coalition worked with progressive ranchers to restore land to health and embarked on a series of substantial riparian projects under the direction of Bill Zeedyk. They are words of advancement and action—positive, progressive, healing action. By contrast, much of the vocabulary I learned as an environmental activist focused on defense or safekeeping—*save*, *preserve*, *roll back*, *stop*, *protect*, *prohibit*, *enforce*. This vocabulary is still needed as we head deeper into the century, but I've come to believe that it is more the language of *healing* that gives people meaningful direction and hope.

People respond to restoration work because it involves us in a

giving rather than a taking—a giving back to nature, an honoring, while we necessarily continue to take nature's bounty. We can't stop using nature—we need its air, its water, its food, its animals, its minerals, its beauty, and its inspiration for our well-being. We must take, but *how* we take, as well as what we do with what we take and what we leave behind, lies at the root of many of our environmental troubles. As we take, we can also give—and not just for the gesture's sake. Giving is becoming a requirement. The world not only *could be* in better shape—it *must be*, and soon, according to many experts and elders. The survival of the earth's biota (including us) requires that we renew, heal, reaffirm, nurture, rekindle, revitalize, repair, revive, mend, soothe, rebuild, fix, regenerate, and reinvigorate the planet's natural heritage.

But there is another reason why I like these words, something beyond the practical and the doctoring. They are words of redemption. It has to do with the way we treat each other, the damage we do to relationships with one another, with nature, as well as to the trouble we cause natural processes. We rarely seek redemption in our daily lives, mostly because we live in an age and a society that has almost completely buffered us from the consequences of our actions. We eat, drink, travel, and consume without retribution. Furthermore, a wide variety of cultural agents—including the TV, the grocery store, the automobile, the city—tell me I don't need to worry about giving back. Their message is clear: Keep taking. All is well.

All is not well, of course. But I knew that going in as an environmental activist. What I learned over time, however, is that we *can* make things better, not by shielding a special place from all this taking going on but by *giving,* and in so doing, try, even with small gestures, to redeem ourselves. In other words, the restoration of health—to creeks, grasslands, ourselves—is a kind of moral exercise. I'm not sure that Bill Zeedyk or any number of ranchers I know look at it quite in those terms, of course.

But I do.

Twenty

Conservation in the Age of Consequences

(2007)

"We are not walking a prepared path."

—WENDELL BERRY,
at the Quivira Coalition's Sixth Annual Conference,
in response to a question about the difficulties that lie ahead

In June 2006, forty-nine heifers were delivered to the Quivira Coalition's ranch on the thirty-six-thousand-acre Valle Grande allotment on the Santa Fe National Forest atop Rowe Mesa, southwest of Santa Fe, New Mexico, and just like that, a bunch of conservationists became ranchers.

They were the first installment of what would become a 124-head herd of heifers, plus three Corriente bulls, all under our Valle Grande brand, and all under our management.

This was an intriguing turn of events for the staff and board of the Quivira Coalition, a nonprofit whose original mission was to create common ground between ranchers and environmentalists. It was also a surprising twist for me personally. If ten years ago you had told this former Sierra Club activist that I would be in the livestock business, selling local beef to Santa Fe residents, I simply would not have believed you. But here I am—a dues-paying member of the New Mexico Cattlegrowers' Association.

Maybe it wasn't such a stretch. After ten years of encouraging ranchers to act more like conservationists, it suddenly seemed logical that we, as a conservation organization, begin to act more like ranchers. It wasn't just a matter of walking the walk either—the harder we looked, the more conservation opportunities we saw running the ranch *as a ranch*.

In fact, when discussing this turn of events in my lectures around the region today, I state simply that the Quivira Coalition is "a conservation organization that manages livestock for land health and prosperity."

I thought all this was something new under the sun. But what

exactly?

To gain perspective, I reread Charles Wilkinson's classic study *Crossing the Next Meridian: Land, Water, and the Future West*, published in 1994, which I knew to be a thoughtful analysis of late-twentieth- century conservation. In it, I read that the major challenge for activists nearly twenty years ago was grappling with the legacy of the "lords of yesterday"—the laws, customs, and policies created in the wake of the West's vigorous frontier era.

These "lords" include the 1872 Mining Act, which encouraged a fire sale of public lands to mining interests; the 1902 Newlands Act, which inaugurated an era of frenzied dam building; the implementation of the "Western Range" concept in 1905 (and the follow-up 1932 Taylor Grazing Act), which institutionalized livestock interests on public land; as well as various timber, homestead, and water laws and regulations.

By the 1980s, Wilkinson wrote, these "lords" were out of kilter with the urban public's burgeoning interest in outdoor recreation and the protection of natural resources, resulting in a great deal of conflict with rural residents across the region. From the "timber wars" of the Northwest, the "grazing wars" of the Southwest, the "wolf wars" of the northern Rockies, and the clashes over endangered species nearly everywhere, the struggle between the "old" West and the "new" kicked into high gear.

For nonprofit conservation organizations of the era, their mission was straightforward: fight *for* wilderness areas and national parks and *against* the "lords of yesterday." On the economic side of things, these groups touted the tonic of increased recreation and tourism, whose mostly unquestioned benefits were blossoming at the time of the publication of Wilkinson's book.

This mission caused two types of conservation organizations to bloom. The first was the advocacy-based organization, sometimes called the "watchdog" model, whose mission was to challenge wrongdoers and protect environmental values, principally on public land. Often this meant fighting the federal government—and by extension, miners, loggers, and ranchers—in court as well as in the court of public opinion.

Concurrently, another type of conservation nonprofit formed in response to threats posed to the natural assets of private land. The modus operandi of these groups was preservation by pur-

chase—buy it, save it—sometimes called the "trust" model, though they also leveraged land transfers to federal and state agencies.

Together, the "fight it, buy it" counterpunch to the "lords of yesterday" netted significant results, including a raft of important federal laws, which unquestionably improved the quality of life for wildlife and humans alike.

Fast-forward to 2007, however, and both the problems and the cures for the American West as identified in *Crossing the Next Meridian* seemed out of date. This is not Wilkinson's fault; rather, it is a sign of how much things have changed. For example, Wilkinson makes little or no reference to global climate change, restoration, collaboration, the rise of watershed groups, the expansion of local food markets, or the dynamic energy of agroecology, though he does identify the outlines of the progressive ranching movement. Similarly, there is little mention of the downside to an amenity-based economy, including the damage widespread suburban and exurban sprawl would soon do to communities of people and wildlife.

He does talk about sustainability—much in the news these days—and concludes his book with a call for "sustainable development" in the West, though the main mechanism he proposes for achieving it is the planning and zoning toolbox. Presciently, he speculates that the journey to a sustainable West will be a long one.

My frustration with the divisiveness of the "fight it, buy it" models led me to cofound the Quivira Coalition in 1997 with a rancher and a fellow conservationist. One of our original goals was peacemaking, exemplified by our tagline at the time: "Sharing Common-sense Solutions to the Rangeland Conflict." But ten years later, the question on my mind was this: where did the Quivira Coalition fit in exactly? We weren't a watershed group, nor did we labor to achieve consensus among stakeholders or mediate conflicts over natural resource use. Instead, we worked regionally, aimed our efforts at "eager learners," and promoted a land stewardship toolbox that focused on land health. Later, we moved into land restoration projects. Eventually, we became ranchers.

It felt like we were walking a new path, but to where?

Although no one knows what the decades ahead will bring

precisely, there are enough indicators of change to say with confidence that the challenges will be varied and daunting. Some are already here, including widespread land fragmentation, the expansion of destructive industrial agricultural practices, the compounding effects of population pressures, a burgeoning "overrecreation" of our public lands, a dissolving bond between nature and young people, and the effect of all of the above on biodiversity.

These are all elements of what I call the Age of Consequences. I like to think of this age as a hurricane that has been building slowly over open water and is now approaching shore. We can already feel its winds. We don't know precisely where the bulk of the hurricane will make landfall or how strong its winds will be ultimately, but we do know that it will strike and that its destructive power will be awesome.

A strenuous effort must be made to lower the wind speed of this hurricane as much as possible—such as reducing the amount of greenhouse gases entering the atmosphere or preserving biologically rich natural areas from industrial development—which are great roles for the "fight it, buy it" school of conservation. At the same time, we must acknowledge the inevitability of the hurricane's landfall. That means a simultaneous effort must be made to increase ecological and economic resilience among landowners, organizations, and communities so that they can weather the coming storm of change. It's also what the Quivira Coalition has been trying to accomplish over the past decade, though we didn't think of it in those terms at the time.

We do now. Resilience is the ability to recover from or adjust easily to misfortune or change. In ecology, it refers to the capacity of plant and animal populations to resist or recover from disruption and degradation caused by fire, flood, drought, insect infestation, or other disturbance. Resilience also describes a community's ability to adjust to incremental change, such as a slow shift in rainfall patterns or a rise in temperatures.

The word also has a social dimension. Ranching, for instance, is the epitome of resilience, having endured a century of cyclical drought and low cattle prices, as well as a host of modern challenges. Of course, some ranches were not strong enough to ride out the storm, succumbing to sprawl, bankruptcy, or the loss of

the next generation, but many endure and are finding ways to keep their ranches going.

For those of us who live in cities, there is a lot to think about in resilience. Take food, for instance. If there were a major disruption in our food supply, what would we do? Where would next week's meal come from? Are there enough farms and ranches in the area to feed all of us? Do we have enough resilience to weather an energy crisis or a water shortage?

Building resilience means many things, but for the purposes of conservation work in the future, I believe there are three main areas of focus:

Reversing Ecosystem Service Decline. In 2005, the UN published its *Millennium Ecosystem Assessment*, a global evaluation of the ecosystem services on which human well-being vitally depends. These services include food, fresh water, wood, fiber, fuel, and biodiversity; climate, flood, pests, and disease regulation; nutrient cycling, soil stability, biotic integrity, watershed function, and photosynthesis; and spiritual, educational, recreational, and aesthetic experiences.

The basic conclusion of the assessment is this: globally, ecosystem services are in decline, and as they go, so will human well-being. And as human well-being degrades (and it's already started in many places around the globe), traditional conservation concerns, such as wilderness protection, parks, and recreational experiences, will fall in priority. That's because as conservation strategies, they'll be less and less effective, as basic human needs, such as meeting food and energy requirements, rise in importance.

The assessment's authors make much the same point. To reverse the decline in ecosystem services, they encourage *active adaptive management*—experimentation and monitoring with new management methods—to maintain "diversity, functional groups, and trophic levels while mitigating chronic stress [in order to] increase the supply and resilience of ecosystem services and decrease the risk of large losses of ecosystem services."

In other words, conservation will shift from protection and preservation to restoration and management—from saving land

to working it properly.

Creating Sustainable Prosperity. Ecosystem services have declined partly because their conservation value is not seen to be in the economic self-interest of important portions of society. As a result, conservation, including the restoration and maintenance of natural systems, became primarily a subsidized activity, accomplishing its goals principally (1) by direct or indirect governmental funding, (2) as an indirect product of commercial agricultural activity, (3) by philanthropy, or (4) by some combination of each.

Conservation remains subsidized for a variety of reasons, including its high cost. Another reason is a well-founded concern about the role uninhibited market forces play in the overexploitation of natural resources—a role that has contributed widely to ecosystem service decline around the planet.

But can conservation pay for itself? If it cannot, at least at some significant level, then the objective of reversing the decline of the ecosystem services on which human well-being depends might be impossible. That's because more than a century of conservation work has demonstrated the limitations of subsidized incentives (case in point: the current condition of the planet). Additionally, the scale of the conservation job continues to grow, especially as ecosystems decline, which means the cost of restoration will grow as well.

But even if conservation can be profitable, can it be *prosperous?* For many family-scale progressive ranchers, the answer is "yes." They've done it by working on the original solar power, as grass farmers. Many have been profitable and sustainable simultaneously, and often for the same reason, thus prospering in multiple ways, and not just economically.

Relocalization. The inevitability of rising energy costs means more and more of our daily lives, from food production to where we work and play, will be lived closer to home at local and regional scales. This won't be by choice, as it is currently, but by necessity. The key is to look at relocalization as an opportunity, not just a challenge. It can be a form of redis-

covery—learning about our roots, about community, neighbors, gardens, and doing with less in general. One could even look at relocalization entrepreneurially—those individuals and organizations that get into the game early, by providing relocalized goods and services, will stand a very good chance at a profitable living.

Working landscapes will become critical again. So will local farmers and ranchers. This means figuring out how to keep the current generation of farmers and ranchers on the land, as well as encourage the next generation to stay, come back, or give agriculture a try. Producing local food and energy from working landscapes will also require healthy land and best management practices that work within nature's model. While the toolbox of progressive stewardship is now well developed, a great deal of our land is still in poor condition, requiring restoration and remediation.

Paychecks are among the simplest solution to these challenges.

Lastly, I believe pressure will build on the federal land agencies to adopt comanagement principles with private organizations on public land. Bureaucratic gridlock combined with a persistent inability or unwillingness to innovate on the part of the land agencies means that partnerships with private entities, including a new generation of grazing permittees, are the only viable means to meet ecosystems service and relocalization challenges on public land.

All of this work involves creating a "new path"—to paraphrase Wendell Berry—since many of the challenges that it addresses are novel. The "fight it, buy it" models of conservation, which have an important role to play in slowing the hurricane down as much as possible, alone are no match for the big job of resilience.

The challenges of the Age of Consequences require a new type of conservation organization. In fact, I'll postulate that reversing the decline in ecosystem services on which human well-being depends will ultimately prove to be the primary mission of conservation in the twenty-first century.

Reversing ecosystem service decline, however, requires adopt-

ing a simple but radical new philosophy: that all natural landscapes must now be actively managed. Some may need more management than others depending on the level of resilience required, but under the global effect of climate change, we can no longer turn our backs on our responsibilities, no matter how big or small.

For ranchers and conservationists alike, this means doing things differently. We can get started by restoring land to health, by producing food locally, by sharing information and resources, by working together, and by looking and learning.

One stepping-stone at a time.

Twenty-One

Big Things in Small Places

(2008)

Sandia Pueblo
North of Albuquerque, New Mexico

I love the words range professionals use to describe the elements of ecosystem function: *integrity*, *diversity*, *resistance*, *thresholds*, *transitions*, *recovery*, and so forth. That's where I found *resilience*. It describes the ability of a community to recover from change or misfortune—how it handles surprise, in other words. And nature is full of surprises, as we all know. How a community of plants or animals bounces back from an unexpected flood, drought, disease outbreak, fire, hurricane, or other

perturbation depends largely on its health—its ability to resist degradation while the event is occurring and its capacity to recover once the surprise has ended.

But what does resilience actually look like? To find out, I decided to visit Sam Montoya again.

Sam is a tribal elder of Sandia Pueblo, a Native American reservation located a few miles north of Albuquerque. What he had accomplished on his very small farm, I recalled, was not only impressive, but very possibly quite resilient. So I wanted to see how things were going. When I first met Sam six years ago, I was astonished to see 220 head of cattle grazing on the ninety-three acres of his little farm. That's right: *220 cattle on only ninety-three acres of land.* In the arid Southwest, that many cattle typically need a bigger spread—a *much* bigger spread. For example, the Quivira Coalition runs between two hundred and three hundred cattle on a public allotment that is thirty- six thousand acres large. As you might suspect, the difference is water—Sam's little farm is irrigated, but that only makes his story even more intriguing.

Here is what I learned from Sam during my first visit: after retiring from a career with the Bureau of Indian Affairs, Sam decided that he wanted to return to his agricultural roots. Upon receiving permission from the tribe to rehabilitate ninety-three depleted acres of a former sod farm, located a short distance from his home, he laser-leveled the land, built a central watering source, planted orchard and other grasses, and then divided the ground into thirty-three paddocks—three acres each—with electric fencing. Then he turned the water on. When the last dairy in the area shut down due to subdivision pressures, Sam scored a natural and economical supply of fertilizer. When the grass grew lush, he turned the cattle out.

The animals graze as a single herd in one paddock for one day only. When the twenty-four-hour period is up, Sam drives over from his house, lowers a gate in the electric fence, watches as the cattle drift into the adjacent paddock, secures the fence when the move is complete, and goes to work. The entire process takes less than half an hour, meeting Sam's requirement that he "not work too hard" in his retirement. The rotation through the paddocks takes a little more than a month, by which

time the irrigated grass is ready for another harvesting. And he repeats this cycle all year round.

"I'm trying to mimic what the bison did," said Sam. "They kept moving all the time. You, me, the land—everything needs a break. But you shouldn't sit on the sofa all week. Too much rest is as bad as too much work. It's all about balance."

Pursuing that balance, Sam didn't use pesticides, herbicides, or other chemicals. And other than the delivery and pickup of the cattle, Sam's operation required *no* fossil-fuel-dependent machinery—a fact that pleased the economically minded farmer.

"I don't want anything that rusts, rots, or depreciates," said Sam, grinning. "Plus, I feel good that I'm not polluting the air."

Today, he could add something new to that statement: he's not contributing to global warming either. That's because his operation worked on the original solar power: photosynthesis. In fact, Sam called himself a "grass farmer"—which meant he considered grass to be his principle product, not beef. The cattle are his lawn mowers.

Perhaps as important as anything else, Sam was making money. Profits from the sale of cattle—Sam is a studious observer of business cycles in the livestock industry—allowed him to quickly pay back the loan he took out to get the farm started. After only a few years, he operated in the black—undoubtedly due to his very low costs.

In sum, Sam's little farm seemed to be a perfect illustration of resilience. He operated almost entirely off the industrial grid, producing healthy animals raised on grass managed in a way that mimicked nature's model of herbivory. He recycled everything and wasted nothing. Short of a natural catastrophe, Sam's farm would probably survive whatever surprise the world threw at it.

Or could it? That's why I returned for a visit—how had Sam and his little farm held up over the years? Was he actually *being* resilient?

I knew the quick answer was "yes." That's because every time I drove from Santa Fe to Albuquerque on the freeway, I could see Sam's cattle grazing on their patch of heavenly green near the Rio Grande River. It's quite an anachronistic vision too—a little farm wedged between the busy interstate to the east, smoggy Albuquerque to the south, and rapidly growing Rio Rancho,

home to a major computer chip–manufacturing complex, to the west. Perhaps I should also mention the large casino at the border between Albuquerque and Sandia Pueblo, operated by the tribe, which added to the time-out-of-place feel of the little farm.

But Sam's little ranch was no more a mirage today than it was six years ago. The lush grass is real and the fat cows are real, as are Sam's profits, he reported.

We met near the tall cottonwood tree that dominates the farm. A handsome man with a distinguished amount of gray in his otherwise black hair and a low-key but infectious smile, Sam looked relaxed. He still wasn't working too hard, he said, though most of his time was taken up directing a project for the tribe to preserve his native Tiwa language.

As for the farm, the only thing that had changed was his decision to sell his cattle, at the top of the cattle cycle, some years ago. Now he grazes cattle, for a fee, for other pueblos and individuals. Otherwise, everything was working smoothly, he said.

We walked out to the cattle in a paddock, dodging numerous manure piles in the green grass. The animals watched us docilely. Not far away, a large flock of Canada geese grazed peacefully. "It works pretty well," said Sam of the farm, stopping to rub the head of his favorite bovine. "I guess you could call it resilient. It's been pretty good to me. And I know it's been good for the land. Sometimes too good—I have trouble keeping ahead of the grass sometimes." At least he doesn't have to worry about the market anymore. By feeding other people's cattle for a certain price per head per day, he doesn't have to worry about fluctuations in the market—guaranteeing him a good price regardless of the price of cattle.

Sam confessed to only two disappointments with his work, both of which are interconnected. First, despite his obvious success agriculturally and financially, no other "grass farm" has been established on the reservation since he began his endeavor. None of his peers seem particularly interested in his farm—a fact, Sam says, that is directly related to the success of the nearby casino. But even his farming neighbors aren't curious. One continues to work with big machinery—and burn fossil fuels.

The second disappointment hits closer to home, I think. No one in the pueblo can get members of the next generation very

interested in agriculture. Sam sees a parallel with his work to preserve his native language. Kids today have too many competing interests, he said, including the lure of the expanding digital universe. “Some come out to see what’s going on here,” he told me, “but no one wants to go into agriculture. I don’t blame them. After all, the tribe will pay for school so they can become doctors and lawyers.”

We wandered back across the paddock, examining the fine condition of his cattle. The grass looked pretty good too. Of course, the irrigation helps, but that’s the point: resiliency isn’t abstract. It requires soil, water, air, and sunlight to thrive. And in the arid Southwest, water in particular gives the land fertility—its regenerative capacity to grow, die, and grow again. But not too much water. It’s all about balance, as Sam observed. Too much of a good thing can be bad for you in the long run. That’s why Sam manages his water carefully, applying neither too little nor too much, but just enough to stay resilient.

We reached our trucks near the cottonwood tree. We talked about lessons learned, about money, taxes, the cycles of nature, and the marketplace. Resiliency is a complicated word, we decided. It can’t be accomplished alone—it needs to be part of a community effort. By getting off the industrial grid, Sam made his farm resistant to surprise—he made it sustainable, in other words—but only to a point. He is still working by himself, which raises an important question: what happens when Sam *really* decides that he doesn’t want to work too hard?

Mine Tailings
Globe, Arizona

Pulling up at a stoplight in Globe, Arizona, during a spring break journey with my family, I casually glanced at the hill to my right—where I saw something moving. Craning my neck, I peered through the windshield and saw maybe thirty cattle grazing peacefully on the slope, bunched together in a tight herd.

The hill was actually a huge pile of mine tailings—where the waste rock from decades of open-pit copper mining was hauled and dumped. From a distance, it looked like a giant steep-sided

ziggurat—an ancient Mesopotamian edifice that rises in levels from a massive base—only with cattle grazing on its side! This might seem incongruous to many people, correctly, but I knew what was going on.

The main problem with mining, of course, is not the mineral extracted but the waste left behind. Whether it is a lone prospector hauling ore out of a shaft or a multinational corporation moving mountains, mining is messy, to say the least. Since the rock is excavated far below the surface, it is essentially sterile—colorful, perhaps, but lifeless. When piled high, it quickly erodes, especially after a torrential summer thunderstorm.

Unregulated, poorly designed, and poorly executed mining has caused a litany of environmental damage around the world. I won't go into their sins here, which have been well documented, other than to say that there's nothing redeeming about an open-pit mine other than its awesome scale. And the grass. This was no sterile pile of rock any longer—it was covered with vegetation. For confirmation, I turned the truck around and drove to the eastern side of the ziggurat, where, as I expected, I saw grass—lots of it. The cows had worked, over time, around the tailing, and apparently it had rained in the interim. We had tried something similar years ago on a mine tailing in New Mexico, albeit on a much smaller scale. Our goal had been to grow grass—life—on largely lifeless soil. And for a while, it worked.

At this point, you may be wondering: Cattle grazing on a mine tailing? What is he talking about?

The quick answer is that it's called a "poop-n-stomp"—a name I made up to describe our little mine reclamation project. Not only did it convey our employment of cattle as agents of restoration, but it was also a literal description of the process.

In early 1999, I received a phone call from an EPA administrator in Dallas, Texas, who said they had some extra money in a Clean Water Act account and asked if I might be interested in conducting a restoration project with it. He knew that our little start-up nonprofit, which focused on the ecological benefits of good livestock management, was eager to implement demonstration projects. When he specifically suggested mining, whose eroding tailings are a perpetual source of headaches for his agency, I said, "You bet."

That's because I knew who to call.

I had recently met Terry Wheeler, a feisty and outspoken rancher from Globe, who had successfully pioneered a mine-reclamation strategy that used only livestock, hay, grass seed, electric fencing, a portable water source, one or two humans, and not much else. His idea was as simple as it was brilliant: build a small paddock on a patch of eroded slope, spread the grass seed and hay across the ground, turn out the cows for a few days, and watch as they press the seed into the ground with their hooves while eating the hay. Add the bodily functions of the livestock, rain, and presto! Green grass.

It was no different, Terry liked to observe, than the instructions on the back of a packet of seeds that you buy to plant in your garden: Press seed firmly into soil. Just add water. The only variables in this case were the hay (a carbon source), the nature of the fertilizing process, and the seven-hundred-pound animals who did most of the work on a forty-degree sterile slope.

As Terry tells the story, when he first approached the owners of a copper mine in Globe with his idea, they were both curious and skeptical. Curious because mine reclamation is a big challenge for many companies—it's expensive, time consuming, difficult, a source of conflict with regulating agencies, and prone to failure. They were skeptical because no one had proposed using animals to do this work.

Many traditional reclamation strategies involve costly combinations of water pipelines, mechanical sprayers, chemical fertilizers, diesel-powered machines, and human labor. The goal is to stabilize the tailings so they won't erode into a nearby creek, and if the process is not designed properly, implemented correctly, or maintained adequately, then all that work and money is often literally washed away in a few years. So when Terry told the mine owners that he could reclaim one of their massive tailings for less money and with better results, using an organic process instead, he got their attention. Their skepticism kicked in when he said he would do the work with cattle.

"One mining executive," Terry told me, "liked to joke that they should line up BBQ grills at the bottom of the slope for all the cattle that would come tumbling down."

The cattle didn't, of course, come tumbling down. They did

just fine, pooping and stomping their way back and forth across the tailing, pressing the grass seeds firmly into the soil with their hooves. When the rain came and the grass grew, Terry said, the jokes stopped.

When I hired Terry to do our little project—a twenty-acre patch of eroding soil on an abandoned copper mine near Cuba, New Mexico—using the EPA funds, I had a different objective in mind. I was intrigued by the possibility of using cattle in the service of environmental restoration. In fact, he didn't think of his cattle as cattle. Instead, he called them FLOSBies—Four-Legged Organic Soil Builders.

And that's exactly what they did for us over the course of two summers on that New Mexico copper mine—build soil and grow grass. But they did more than that. Though we didn't talk about it in these terms at the time, what Terry's FLOSBies were doing was building resilience—and not just in the soil. For a society fixated on technical and petroleum-based solutions to every problem—many of which are proving to not be very sustainable—it was inspirational to discover an organic alternative that could be effective, redeemable, and profitable! I saw all of the above on our little reclamation project in New Mexico.

Unfortunately, for all of its achievement, our little restoration project outside Cuba eventually turned into a pumpkin, teaching me, in the process, a lesson about a deeper definition of success—and, ultimately, resilience. Ecologically, our reclamation results were great, at least initially. Over two summers, Terry's herd of FLOSBies poop-n-stomped those twenty acres back to life. Winter snows and spring rains caused the slopes to grow a great deal of grass. Soil stabilized, gullies healed, rain soaked in instead of running off, and the ground turned green during the summer. Various agencies, including the EPA, were pleased.

Returning to the mine two years later, however, I was surprised to discover that nearly all the grass was gone. At first I suspected the ongoing drought, but as I walked through the project site, I came across the real culprit: trespass cattle. Unfenced, the grass had disappeared into the bellies of local herbivores.

I reflected on this unexpected turn of events. Although we had the cooperation of the private landowner, a local rancher, I realized that we had failed to engage him meaningfully in the mine

project. He gave us permission to do the work, but he gave us little else. He never became a real partner. It was our project, not his—or the community's. When we left, cows appeared. Nobody was to blame, but it taught me a lesson about local buy-in. Innovation can't be imposed from outside.

Three years after a wet winter, I returned to our former restoration project and was pleasantly surprised to see grass. I parked my truck, grabbed the camera, and climbed the steep slope of the tailing. Apparently there was enough seed and straw still in the soil to get grass growing again. It was a pretty sight to see.

It was resilience in action.

All of this came rushing back to me during our brief stop in Globe, observing what were very likely Terry's cattle at work. I was happy to see that Terry's unorthodox idea was still alive on another waste pile, his FLOSBies still creating life. I snapped a photo. That's what I like about resilience—the only thing that matters in the long run is what sticks around.

Twenty-Two

No Ordinary Burger

(2009)

Can a hamburger save the family ranch in the twenty-first century?

If you're the Diablo Burger, a bite-sized eatery located in the busy old-town heart of Flagstaff, Arizona, that serves up natural, fresh, trendy, and tasty hamburgers supplied by two local ranches, the answer is: possibly. *Hopefully*. The restaurant also features Belgian-style fries; hormone-free whole milk milkshakes; herbs, onions, and tomatoes from local farms; bread and cookies from a

bakery in Phoenix; citrus from McClendon's Select farm in Peoria, Arizona; and ice cream from the Straus Family Creamery, located north of San Francisco, California.

This is hopeful news because the entrepreneurial, privately owned restaurant is an example of an effort by the Diablo Trust, a pioneering collaborative nonprofit, to encourage diversified business opportunities for ranches in the area. It's no ordinary burger, in other words, not simply because of the fancy fries or trendy music, but also because of what it symbolizes: the rise of a local economy that serves the cause of ranchers, city residents, and conservationists alike.

The Diablo Trust believes that strong family ranches maintain a healthy rural economy and culture while protecting open space from development. The question is: what does this mean in the early twenty-first century? For ranchers, it means innovating their age-old business model in order to develop new markets for their products. For city residents, it means participating in a local economy, especially as farmers' markets and other forms of sustainable agriculture expand. For conservationists, especially those who worry about the loss of open space to subdivisions, it means rethinking the way private land traditionally gets protected in the West, including age-old prejudices about livestock. For each, it means keeping the "work" in working landscapes—which is good business for everyone.

But let's back up and put Flagstaff's devilish burger in a broader context.

Of the American West's approximately one million square miles (roughly a third of the nation as a whole), half is publicly owned as national forests and parks, military reservations, wildlife refuges, or by the Bureau of Land Management (BLM). The other half of the West—approximately the size of California, Oregon, Washington, Arizona, and Nevada combined—is privately owned or part of sovereign Native American nations. Furthermore, homesteaders in the late nineteenth and early twentieth centuries took the best land first, meaning the most productive, well-watered, and least snowy (lower elevation) parcels. Not coincidently, this privately-owned land is the site today of high concentrations of biodiversity, especially in riparian corridors and wetlands. According to some estimates, as much as 60 percent of

endangered species in the West exists on private land, much of it owned by ranchers. For these reasons and more, private ranches are seen now as critical pieces in the conservation puzzle out West.

Unfortunately, it is precisely this land that came into the crosshairs of developers in the early 1990s as the economy boomed and many urban refugees fled to the rural West. By 2005, the process of ranch and farm conversion to subdivisions reached an alarming rate of *one acre per hour*. This fact caused many of us in the conservation movement to realize that subdivisions were a greater threat to the region's biological diversity than the overgrazing crisis on public land that I had been repeatedly told by my peers was supposedly ruining the West. Instead, I learned that grass, when given enough rain, is quite resilient. The deleterious effects of a subdivision on the land, in contrast, were not so easily reversed. I also learned that ranches are resilient too, given the right economic and social conditions.

And yet, the typical response of conservation organizations to the open-space crisis was to buy a farm or ranch outright when it came on the market, at high cost, or facilitate the purchase of its development rights via a conservation easement. This strategy has been effective, but only up to a point, for two reasons: first, it requires a lot of money, which means conservationists will always be at a disadvantage to developers; and second, this "buy it" strategy often means the cessation of the land's agricultural productivity, resulting in a loss of community, history, culture, natural resources, and other benefits. This is why the effort to save ranch and farmland from development over the past two decades or so, while successful in some spots, has come up short in others, such as the Front Range of Colorado, for instance.

Fortunately, there is another way to protect private land—a way that ranchers, city residents, and conservationists can work together. From my experience, I believe the most economical and long-lasting way to protect privately owned open space in the American West from development is to keep productive ranches in business. It is far cheaper to help ranchers diversify income streams and create supportive collaborative relationships than it is to purchase their ranches on the open market or ar-

range for easements on their properties.

I call it the "Not 4 Sale" strategy. But implementing it requires cracking a difficult paradox: while many ranchers don't want to sell out to developers, many can't afford to stay in business either. Many landowners stay in ranching, I've observed, not *because* of the economic returns of commodity livestock production, but *in spite* of them. This is why ranching is sometimes described by academics as an "irrational" economic enterprise, for its dismal profit margins. This fact is supported by ranchers themselves who almost always list the social and cultural benefits of their way of life ahead of profit making. Still, ranchers have bills to pay like everyone else. Hanging a "Not 4 Sale" sign on the front gate of a ranch means finding a way to pay those bills, which has become more difficult in recent years.

The answer is to blend the needs of ranchers, city residents, and conservationists into a diverse suite of options that the keep the "work" in working landscapes. They include:

Increased Profitability. Many ranchers have begun to diversify their income streams in an effort to remain profitable. Examples include (1) increased stocking rate as a result of progressive livestock management; (2) fees from hunting, fishing, camping, wildlife viewing, bed-and-breakfast services, dude ranching, and other amenity-based activities that attract urban visitors; (3) grants from foundations and agencies for a variety of ranch and watershed-based improvements, including the creation of local 501c3 organizations; (4) participation in local cooperatives that add value to ranch products; and (5) involvement in wind or solar energy projects, conservation projects (easements), or small-scale developments (a few home sites), that create additional revenue for the ranch operation.

Collaborative Networks. Starting in the mid-1990s, landowners across the West began to see the strength in partnerships. Initially, most collaboration was defensive—pushing back against this or that threat—but over time, they evolved

into proactive enterprises that brought economic opportunities to the region. They also spurred innovation—partners often have different skill sets, a new perspective, or access to resources unavailable to a single landowner. Also, friendship is critical to the political process and to policy reform.

Restoration. The entrepreneurial opportunities for landowners to restore damaged or degraded land to health are growing rapidly. Examples include using livestock to control noxious weeds; using "controlled grazing" impacts (similar to controlled fires) to achieve desired ecological goals; conducting riparian and upland restoration work for water quality and wildlife habitat goals; tackling forest health concerns through thinning and other projects; repairing and upgrading low-standard ranch roads so they can restore natural hydrological cycles; and working collaboratively on watershed-scale initiatives to improve the overall health of the area, which increases productivity, which helps the bottom line.

Local Food Production. There has been an explosion of interest in recent years among city residents in local, organic, natural, and food, which can mean increased social and economic profitability for ranchers. Grass-fed beef, for instance, can command 50 percent more per pound in price than commodity (feedlot) beef. Almost as important are the social and emotional benefits of getting into local food markets, including direct contact with customers, who often become advocates for the farm or ranch.

Other Ecosystem Services. For centuries, well-managed farms and ranches have been delivering "ecosystem services" to cities, such as healthy topsoil, wildlife habitat, clean water, fuel sources, food, functioning wetlands, and buffers against floods and fires. It is only recently, however, that these services have come to be recognized, and therefore valued, as something worthy of protecting, restoring, and maintaining, especially as urban populations grow and pressure mounts on natural resources.

The story of the Diablo Trust is a good illustration of how family ranches are employing these strategies in order to stay intact during rapidly changing times. The story began in 1993, when the owners of the Flying M and the Bar T Bar ranches, located southeast of Flagstaff and comprising 426,000 acres of public and private land, decided to join forces and try a new idea: collaborative conservation.

Both ranches were struggling economically and emotionally. Despite adopting innovative range-management practices, including short-duration grazing, the ranches were forced to take stock reductions to alleviate what were perceived by state and federal agencies as conflicts between cattle and wildlife. The toll wore down the owners of the Flying M and the Bar T Bar. They contemplated selling out.

Instead, they formed the nonprofit Diablo Trust in order to enlist diverse community support for the ranches and assist with many of the nonranching challenges that confronted them on a daily basis. It was a big gamble. When over one hundred people attended the first meeting, including many members of agencies and some environmentalists, they knew they were onto something important. Committees were quickly established to focus on specific concerns, such as recreation and wildlife. A facilitator was hired to help the members of the trust reach consensus, a volunteer director was hired, and a mission formulated, which read: “The purpose of the Diablo Trust is to maintain ranches as long-term, economically viable enterprises managed in harmony with the natural environment and the broader community.”

Did they succeed? Yes. The trust meets every second Friday of the month; has a variety of working groups; raises money for science, education, and monitoring projects; conducts community outreach programs, including an annual art-on-the-ranch day; publishes a regular newsletter; and strives to accomplish its vision through collaboration and innovation.

But perhaps the best measurement of success is this one: not one acre of private land on either ranch has been developed since the trust’s founding. By working proactively with federal and state agencies, instead of reactively; by seeking partnerships with conservation groups, rather than assuming a defensive attitude all the time; and by reaching out to the public constructive-

ly, the trust helped the ranches stay in business. In other words, the "Not 4 Sale" signs on their gates were never taken down, thanks to success of the partnerships fostered by the trust and its programs. But is it enough to keep the ranches going until the twenty-second century?

This is where the tasty burger comes in.

The tiny restaurant that opened in early 2009 and has become a successful enterprise. The meat for its hamburgers is supplied by the Flying M and Bar T Bar ranches, which is part of the restaurant's pitch to its primary customers: residents, not tourists. Local food for local people. The restaurant takes only cash—in order to keep the money in the local economy.

Why local? Here's what the Diablo Burger menu said when I visited: "Because local food retains more nutrients; because it supports the local economy; because it keeps local agricultural land in production, ensuring that future generations will still be surrounded by lots of open fields, grazing lands, and wildlife habitat; because local food increases community food security by retaining the experts that know how to produce food; and because local food has a story—knowing where your food comes from means that its source is not anonymous, but accountable. Lastly, by eating local, you are integrating ecology, community, and gastronomy . . . you are doing well by eating well."

I did well. The food was delicious. I went back for a second burger the next day.

But it's good economic sense too. According to a recent study, while livestock accounted for 93 percent of all agricultural sales in Coconino County, which encompasses Flagstaff, only 0.5 percent of ranch products were sold directly to local consumers. Meanwhile, eaters purchased $37 million of meat, poultry, fish, and eggs from the commodity food system. When the study expanded its analysis to include Navajo, Coconino, and Yavapai counties, it found that only $343,000 of food products were sold directly to consumers versus $635 million of food annually bought from outside sources. *That means roughly $700 million of potential wealth could be captured by local ranches and farmers.*

While a burger joint may not be enough by itself to keep these family ranches in business, it does represent an effort on the part of producers, eaters, and conservationists to try something new

under the sun: working together economically.

This is where the hope comes in.

Author and eater Gary Paul Nabhan puts it this way: "You walk away from Diablo Burger with a lingering sense that your decision to eat there has been good for you, for the land, and for the local rural community. What more could you want?"

Twenty-Three

Redefining Local

(2010)

Oklahoma Food Cooperative
Oklahoma

What does "local" mean exactly when you live on a remote farm or ranch?

It's an important question because no matter where you go today, it seems, "local" is on everybody's lips—and for good reason. Its many advantages address some of the most pressing problems of our time: it gives us access to fresh, healthy food in an economy dominated by industrial agriculture; it reduces our carbon footprint and lessens our dependence on fossil fuels (both of which help fight global warming); it keeps money circulating in the local economy, where its multiplier effect can be significant; it builds a sense of community among all participants; and it pokes globalization in the eye.

But when we talk about "local," we almost always do so from

the perspective of the urban dweller, i.e., those products grown or made closest to the customer. Farmers' markets are a good example. "Local" in their case means a radius around a point located in a city or suburb. This means it is self-selecting—it is limited to those farms and ranches that consider themselves to be "local enough" to afford the drive into town every weekend. In other words, from the perspective of a city resident, any farmer selling produce in-person is a "local."

What about all the producers who are not able to make it to a farmers' market but would like to?

If you live on a remote farm or ranch, especially out West where the distances to markets can be staggering, "local" looks very different. You might be able to sell your products in the nearest small town, but this market is likely to be limited in the long run, especially as competition with neighbors, and diesel prices, rise. If a bigger market exists two hours away instead, does that constitute "local?" It's a significant challenge for many rural residents. Without a Santa Fe or Denver or Portland nearby, how can an organic farmer or grass-fed beef rancher participate in the burgeoning local food-and-crafts movement and reap its benefits, especially its profits, if he or she lives way out in the back forty?

Fortunately, the Oklahoma Food Cooperative has come up with an ingenious solution. I think everyone should take a look at what they've accomplished, as I did when I recently drove to western Oklahoma for a tour organized by a few of the producers in the cooperative. What they've come up with is innovative, effective, and (so far) successful. When the cooperative began in 2003, it took thirty-six orders from customers for $3,200 in sales. By 2006, it had nine hundred members, both producers and consumers. Today, it has over two thousand members and does $500,000 in annual sales.

The key to the cooperative's success was a radical idea: they redefined "local" to include the entire state—with significant help from the Internet. Here's what I knew about the cooperative's model before venturing on my field trip:

All products provided by the cooperative are produced within the state of Oklahoma.

Beginning on the first day of every month, members can go on the cooperative's Web site and purchase any food or craft product listed.

Then on the second Thursday, this electronic ordering "window" closes. The orders are then sent to the participating farms and ranches so they can be filled.

On the third Thursday of the month, designated drivers (usually producers) visit all the participating farms and ranches to pick up the orders.

All drivers then converge at a warehouse in Oklahoma City, where the products are separated into piles and then rebundled according to the customers' orders.

The drivers drive back home, dropping off the individual orders at designated locations, where the customers pick them up.

Here are more details:

The one-time membership fee is $52—the same for producers and customers.

Each farm and ranch creates its own page on the cooperative's Web site, each sets its own price for its products, each designs its own label and controls the advertising, and each is in charge of its monthly inventory.

Customers can buy as much or as little as they want each month, the purchase is made through the cooperative, and customers can earn credits toward a purchase by volunteering for the organization at the Oklahoma City Warehouse.

The cooperative pays every farmer and rancher ninety cents of every dollar spent by the customer; the other ten cents supports the cooperative, which also adds a 10 percent markup on all products (combined, this twenty cents covers the operating expenses of the organization).

Let me repeat that second-to-last point: all farmers and ranchers get ninety cents of every dollar spent on their products. In the industrial agricultural model that dominates food production today, producers typically get nineteen cents of every food

dollar. The rest goes to middlemen, including packers, truckers, grocery stores, and other corporate interests. This is one of the reasons why farmers and ranchers have struggled with profitability over the decades. Not only are they required to be "cost takers" from a corporate system that dictates prices for their products (such as feedlot beef), but the few alternatives available to them to increase their cut of every food dollar (such as farmers' markets) have their own challenges.

Of course, it is a little more complicated than this, but the bottom line is that most cooperative producers come out ahead because they are now "price givers" instead of "price takers." They can set their own prices and control, to a certain degree, their costs. This is something relatively new under the sun and is one of the reasons I made the long drive from Santa Fe to check it out.

Another reason was the impressive list of products available each month to members. There are nearly two thousand items on the cooperative's Web site, all made in Oklahoma, and many organic, natural, or grass-fed. A sampling of items include bakery goods, beverages, candy, canned foods, condiments, dairy products and eggs, entrees, fruits, gift boxes, grains, flours and pastas, herbs, jam, and jellies, meats, natural sweeteners, nuts, poultry, prepared foods, side dishes, and vegetables. Also: apparel, art, baby products, bath and beauty supplies, books, classes, fiber arts, fishing supplies, health items, jewelry, laundry care, garden supplies, live plants, and seeds.

The cooperative's model differs in important ways from traditional methods of obtaining local products. For example, members can order what they want, when they want it, and what they can afford, which means they are not locked into the weekly produce list of, say, a Community Supported Agriculture (CSA) farm. No more kale and bok choy this week, thanks! For producers, participation in the cooperative means making only one trip a month into town (and only then if they are a designated driver) instead of the weekly trips required by the farmers' market model. Not only is this easier on the farmer, it's easier on the planet too.

One downside to the cooperative's model, however, is less face-to-face interaction between producers and customers. In

both the CSA and farmers' market models, the meet-and-greet relationship between grower and eater is an important part of doing business. By contrast, by working through the Internet, as the Oklahoma Food Cooperative does, growers and eaters don't get much face time (a big problem with the Internet, in my opinion).

But for remote farmers and ranchers, this downside is offset by a big upside: they get to participate in a "local" food economy. By offering products for sale via the Internet at a one-stop shop provided by the cooperative, and then driving to a central hub to distribute the goods, "local" is extended to the state line. Suddenly, "remote" doesn't seem so remote anymore.

It's not as crazy as it sounds. In fact, it's part of a trend. According to the USDA's recent Census of Agriculture, the value of direct farm sales increased 167 percent between 2002 and 2007, which also listed 3,194 farmers as offering direct sales to consumers.

This is great news, and that's another reason I drove to western Oklahoma: to see hope in action. And I found what I was looking for on the very first stop of the tour, at a small farm called Cattle Tracks a mile or so north of Fairview, a certified organic wheat farm and grass-fed beef operation, owned by John and Kris Gosney. Their story was typical of the 125 producer members of the cooperative. Not long ago, John was a conventional wheat farmer, soaking his fields with pesticides, harvesting the wheat with a ton of fossil fuel, and watching his spirit decline along with the land's health. He became depressed, he told the tour group, often finding himself sitting on a bale of hay wondering where his life was heading.

John said that he never gave organic farming a thought until a neighbor asked him to take over his farm, as he was about to retire and didn't want to let his hard work developing an organic wheat operation come to naught. John was immediately struck by the profitability of his neighbor's farm and decided to certify his own farm as organic as well. He saw a drop in yield initially, but he also saw a drop in expenses, especially since he stopped using conventional fertilizers and pesticides. Eventually, as the yield came up, so did his profits.

However, the main benefit of the switch, he said, was none-

conomic: he began to have fun again. Going organic cured him of his depression, he explained. He liked the challenge of organic as well as the hard work it requires. A recent musk thistle invasion, for example, necessitates that he spend at least an hour a day with a shovel eradicating the plants. Under the conventional model, of course, he would have sprayed herbicide on the baleful weed.

Today, John and Kris grow cattle to eight hundred pounds on their wheat fields and finish them on native grass (an all-wheat diet influences the taste of the meat, he said). In addition to selling his products through the cooperative, an organic restaurant in Oklahoma City called Sage takes their beef. He proudly pointed to a recent analysis by Oklahoma State University of the CLA (conjugated linoleic acid—a cancer-fighter) content of Cattle Tracks beef. According to the analysis, it was "in the highest range of CLA content reported in the literature for beef."

He also spoke at length about his latest project: brewing microbes in large vats of compost tea. Repeated applications of herbicides and pesticides on his farmland over the decades had effectively destroyed the microbiotic life of the soil. To remedy this, he brewed microbes in a big container in his barn and sprayed them on the land—restoring the natural fertility of the soil organically. As he talked, it was evident how pleased he was with his work.

After the formal question-and-answer period was done, I stepped up and brought up the topic of his depression. "What exactly," I asked him, "makes you happy about organic farming?" He paused and turned inward for a moment. "I feel like I'm finally doing God's work," he said quietly. It was a sentiment, I learned, shared by many on the tour.

To me, John's story is a great example of old-fashioned American know-how in action—applied in this case to the cause of organic farming instead of industrial agriculture. This practical, can-do attitude of farmers, much vaunted over the decades by politicians and others as quintessentially American, was much in evidence on the tour. Unfortunately, when we talk about American know-how today, it is almost always in the context of high technology. Rarely is it discussed in the context of low technology—such as local food systems or organic farming. This is a shame

because I believe a great deal of innovative American know-how is alive and well on the back forty—and we should give it a closer look.

I traveled to the next stop on the tour with Kim Barker, a rancher and one of the founders and organizers of the cooperative. He told me that the cooperative, while effective, isn't a cure-all for remote farms and ranches. In fact, some cooperative members still drive long distances to farmers' markets on weekends to sell their products. It's all part of what needs to be done, he said, to make a living as a direct marketer of local food.

Kim is careful to point out that the Oklahoma Food Cooperative is a producer *and* consumer cooperative—not just a collection of farmers and ranchers. In fact, the initial idea for the cooperative came from Robert Waldrop, a "foodie" in Oklahoma City who had a vision for a virtual marketplace that was also locally based. Today, he still serves as president of the enterprise.

"Among our producer and customer members, we find a diversity of lifestyles, beliefs, cultures, and religions," writes Waldrop on the cooperative's Web site. "Even so, we find common ground based on our mutual need for a marketplace where we can find good, healthy nutritious local foods. We are focused on meeting local needs with local resources."

They have succeeded so far because their eyes are firmly fixed on a vision of community, social justice, environmental sustainability, and economically viable local food systems. That vision continues to sustain the cooperative today. And as I mentioned earlier, I'm certain this model can be replicated in any region where there is a need to redefine "local" to include remote farmers and ranchers. Thanks to the Oklahoma Food Cooperative, this vision has become a reality.

The Carbon Ranch

(2011)

> *"Carbon is the basic building block for life. It is only a pollutant when in excess in the atmosphere or dissolved in water. Over millennia, a highly effective carbon cycle has evolved to capture, store, transfer, release, and recapture biochemical energy in the form of carbon compounds. The health of the soil, and therefore the vitality of plants, animals, and people, depends on the effective functioning of this cycle."*
>
> **—DR. CHRISTINE JONES, SOIL SCIENTIST**

Novelist and historian Wallace Stegner once said that every book should try to answer an anguished question. I believe the same is true for ideas, movements, and emergency efforts. In the case of climate change, an anguished question is this: what can we do right now to help reduce atmospheric carbon dioxide (CO_2) from its current (and future) dangerously high levels?

In an editorial published in July of 2009, Dr. James Hansen of NASA proposed an answer: "cut off the largest source of emissions—coal—and allow CO_2 to drop back down . . . through agricultural and forestry practices that increase carbon storage in trees and soil." I consider these words to be a sort of 'Operating Instructions' for the twenty-first century. Personally, I'm not sure how we accomplish the coal side of the equation, which requires governmental action, but I have an idea about how to increase carbon storage in soils.

I call it a *carbon ranch*.

The purpose of a carbon ranch is to mitigate climate change by sequestering CO_2 in plants and soils, reducing greenhouse gas emissions, and producing co-benefits that build ecological and economic resilience in local landscapes. "Sequester"

means to withdraw for safekeeping, to place in seclusion, into custody, or to hold in solution—all of which are good definitions for the process of sequestering CO_2 in plants and soils via photosynthesis and sound stewardship.

The process by which atmospheric CO_2 gets converted into soil carbon is neither new nor mysterious. It has been going on for millions and millions of years, and all it requires is sunlight, green plants, water, nutrients, and soil microbes. According to Dr. Christine Jones, a pioneering Australian soil scientist, there are four basic steps to the CO_2/soil carbon process:

- photosynthesis
- resynthesis
- exudation
- humification

Photosynthesis: This is the process by which energy in sunlight is transformed into biochemical energy, in the form of a simple sugar called glucose, via green plants—which use CO_2 from the air and water from the soil, releasing oxygen as a byproduct.

Resynthesis: Through a complex sequence of chemical reactions, glucose is resynthesized into a wide variety of carbon compounds, including carbohydrates (such as cellulose and starch), proteins, organic acids, waxes, and oils (including hydrocarbons)—all of which serve as fuel for life on Earth.

Exudation: Around 30-40 percent of the carbon created by photosynthesis can be exuded directly into soil to nurture the microbes that grow plants and build healthy soil. This process is essential to the creation of topsoil from the lifeless mineral soil produced by the weathering of rocks over time. The amount of increase in organic carbon is governed by the volume of plant roots per unit of soil and their rate of growth. More active green leaves mean more roots, which mean more carbon exuded.

Humification: This is the creation of humus—a chemically stable type of organic matter composed of large, complex molecules made up of carbon, nitrogen, and minerals. Visually, humus is the dark, rich layer of topsoil that people associate with rich gardens, productive farmland, stable wetlands, and healthy rangelands. Land management practices that promote the ecological

health of the soil are key to the creation and maintenance of humus. Once carbon is sequestered as humus, it has a high resistance to decomposition and therefore can remain intact and stable for hundreds or thousands of years.

Additionally, high humus content in soil improves water infiltration and storage, due to its spongelike quality and high water-retaining capacity. Recent research demonstrates that one part humus can retain as much as four parts water. This has positive consequences for the recharge of aquifers and base flows to rivers and streams, especially important in times of drought.

In sum, the natural process of converting sunlight into humus is an organic way to pull CO_2 out of the atmosphere and sequester it in soil for long periods of time. If the land is bare, degraded, or unstable due to erosion, and if it can be restored to a healthy condition, with properly functioning carbon, water, mineral, and nutrient cycles, covered with green plants with deep roots, then the quantity of CO_2 that can be sequestered is potentially high. Conversely, when healthy, stable land becomes degraded or loses green plants, the carbon cycle can become disrupted and will release stored CO_2 back into the atmosphere.

In other words, healthy soil = healthy carbon cycle = storage of atmospheric CO_2.

Any land management activity that encourages this equation, especially if it results in the additional storage of CO_2, can help fight climate change. Or as Dr. Christine Jones puts it, "Any . . . practice that improves soil structure is building soil carbon."

What would those practices be? There are at least six strategies to increase or maintain soil health and thus its carbon content. Three sequestration strategies include:

Planned grazing systems. The carbon content of soil can be increased by the establishment of green plants on previously bare ground, deepening the roots of existing healthy plants, and the general improvement of nutrient, mineral, and water cycles in a given area. Planned grazing is key to all three. By controlling the timing, intensity, and frequency of animal impact on the land, a "carbon rancher" can improve plant density, diversity, and vigor. Specific actions include the soil cap–

breaking action of herbivore hooves, which promotes seed-to-soil contact and water infiltration; the "herd" effect of concentrated animals, which can provide a positive form of perturbation to a landscape by turning dead plant matter back into the soil; the stimulative effect of grazing on plants, followed by a long interval of rest (often a year), which causes roots to expand while removing old forage; targeted grazing of noxious and invasive plants, which promotes native species diversity; and the targeted application of animal waste, which provides important nutrients to plants and soil microbes.

Active restoration of riparian, riverine, and wetland areas. Many arroyos, creeks, rivers, and wetlands in the United States exist in a degraded condition, the result of historical overuse by humans, livestock, and industry. The consequence has been widespread soil erosion, loss of riparian vegetation, the disruption of hydrological cycles, the decline of water storage capacity in stream banks, and the loss of wetlands. The restoration of these areas to health, especially efforts that contribute to soil retention and formation, such as the reestablishment of humus-rich wetlands, will result in additional storage of atmospheric CO_2 in soils. There are many cobenefits of restoring riparian areas and wetlands to health as well, including improved habitat for wildlife, increased forage for herbivores, improved water quality and quantity for downstream users, and a reduction in erosion and sediment transport.

Removal of woody vegetation. Many meadows, valleys, and rangelands have witnessed a dramatic invasion of woody species, such as pinon and juniper trees where I live, over the past century, mostly as a consequence of the suppression of natural fire and overgrazing by livestock (which removes the grass needed to carry a fire). The elimination of overabundant trees by agencies and landowners has been an increasing focus of restoration work recently. One goal of this work is to encourage grass species to grow in place of trees, thus improving the carbon-storing capacity of the soil. The removal of trees also has an important cobenefit: they are a potential source of local biomass energy production, which

can help reduce a ranch's carbon footprint.

Three maintenance strategies that help keep stored CO_2 in soils include:

The conservation of open space. The loss of forest, range, or agricultural land to subdivision or other types of development can dramatically reduce or eliminate the land's ability to pull CO_2 out of the atmosphere via green plants. Fortunately, there are multiple strategies that conserve open space, including public parks, private purchase, conservation easements, tax incentives, zoning, and economic diversification that helps to keep a farm or ranch in operation. Perhaps most importantly, the protection of the planet's forests and peatlands from destruction is crucial to an overall climate-change-mitigation effort. Not only are forests and peatlands important sinks for CO_2; their destruction releases large amounts of stored carbon back into the atmosphere.

The implementation of no-till farming practices. Plowing exposes stored soil carbon to the elements, including the erosive power of wind and rain, which can quickly cause it dissipate back into the atmosphere as CO_2. No-till farming practices, especially organic ones (no pesticides or herbicides), not only protect soil carbon and reduce erosion, but they often also improve soil structure by promoting the creation of humus. Additionally, farming practices that leave plants in the ground year-round both protect stored soil carbon and promote increased storage via photosynthesis. An important cobenefit of organic no-till practices is the production of healthy food.

Building long-term resilience. Nature, like society, doesn't stand still for long. Things change constantly, sometimes slowly, sometimes in a rush. Some changes are significant, such as a major forest fire or a prolonged drought, and can result in ecological threshold-crossing events, often with deleterious consequences. Resilience refers to the capacity of land, or people, to "bend" with these changes without "breaking." Managing a forest through thinning and prescribed fire so that it can avoid

a destructive, catastrophic fire is an example of building resilience into a system. Managing land for long-term carbon sequestration in soils requires building resilience as well, including the economic resilience of the landowners, managers, and community members.

All of these strategies have been field-tested by practitioners, landowners, agencies, and researchers and demonstrated to be effective in a wide variety of landscapes. The job now is to integrate them holistically into a "climate-friendly" landscape that sequesters increasing amounts of CO_2 each year.

> *"Let's be clear . . . We will still have to radically reduce carbon emissions, and do so quickly. We will still have to eliminate the use of fossil fuels and adopt substantially more sustainable agricultural methods. We will still have to deal with the effects of ecosystems damaged by carbon overload."*
>
> **—*WALL STREET JOURNAL*, 2009**

Reality check: the increased sequestration of CO_2 in soils won't solve climate change by itself. It won't even be close if the emissions of greenhouse gases are not dramatically reduced at the same time. According to experts, this reduction must be on the order of 50-80 percent of current emissions levels within fifty years. Accomplishing this goal will require a massive rearrangement of our energy sector toward low-carbon technologies as well as big changes in the everyday lives of Americans.

A carbon ranch can help in three ways: by measuring and then reducing the amount of greenhouse gas emissions an agricultural operation contributes to the atmosphere; by producing renewable energy "on-ranch," which it can use itself and/or sell to a local or regional power grid; and by participating in local food and restoration activities that lower our economy's dependence on fossil fuels.

A carbon ranch can also help by confronting the controversy over "offsets" and carbon "credits"—the two strategies most frequently touted by governments, businesses, and others for encouraging the creation of a so-called "carbon marketplace." In

this marketplace, "credits" created by the sequestration of CO_2 in one place can be "sold" or traded to "offset" a CO_2 polluting entity, such as a coal plant or airline company, someplace else, supposedly to the benefit of all. In reality, these schemes appear to mostly offset our guilty feelings rather than actually affect atmospheric levels of CO_2.

Here are these ideas in more detail:

Reducing the "footprint" of a carbon ranch. This is a two-step process: assess the amount of greenhouse gas emissions that are rising from a particular landscape or operation, follow this assessment with a concerted effort to reduce these emissions. One way to measure this carbon footprint is to conduct a Life-Cycle Assessment (LCA) of an enterprise, which is an inventory of the material and energy inputs and outputs characteristic of each stage of a product's life cycle. This is a well-recognized procedure for tracking the ecological impacts of, say, a television set or a refrigerator, and different types of LCAs exist for different types of products.

For a carbon ranch, there are four important measures of its LCA:

- cumulative energy use
- ecological footprint
- greenhouse gas emissions
- eutrophying emissions

The first three measurements are relatively straightforward, and there are many credible methodologies today to calculate energy use, ecological footprints, and emissions, though most are designed for urban contexts or industrial agriculture.

However, the fourth measurement—eutrophying emissions—has been the source of considerable controversy in recent years. It refers to the amount of methane produced by the digestive system of livestock during its time on the ranch, farm, or feedlot—and in the public's mind, the connotation is negative. That's because the public has conflated a natural biological process—belching cows—with fossil fuel-intensive industrial livestock production activities, including chemical fertilizer production, deforestation for pasture, cultivation of feed crops (corn), and the

transportation of feed and animal products. As a result, there is an impression among the public at large that one answer to the climate crisis is to "eat less red meat"—an opinion that I have heard repeatedly at conferences and meetings.

Personally, I think an answer is to eat more meat—from a carbon ranch.

For the purposes of a carbon ranch, the methane emission issue is just one part of the overall "footprint" assessment. The goal of a Life-Cycle Analysis is to measure an operation's energy use and emissions so that it can reduce both over time. Ultimately, the goal is to become carbon-neutral or, ideally, carbon-negative—meaning the amount of CO_2 sequestered is greater than the ranch's carbon footprint.

Producing renewable energy. Anything that a carbon ranch can do to produce energy on-site will help balance its energy "footprint" and could reduce the economy's overall dependence on fossil fuels. This includes wind and solar farms; the production of biodiesel from certain on-site crops for use in ranch vehicles; biomass for cogeneration projects (this is especially attractive if it uses the woody debris being removed from the ranch anyway); micro-hydro, micro-wind, and solar for domestic use; and perhaps other as yet unrealized renewable energy alternatives.

Participating in a local economy. A carbon ranch should carefully consider its role in the "footprint"of the greater economy. Are its products traveling long distances or otherwise burning large amounts of fossil fuels? It is generally accepted that involvement in a local food market, where the distances between producer and eater are short, shrinks the fossil "footprint" of a ranch considerably. There is some contradictory research on this point, however. In my opinion, the technical issues of local versus global food systems in terms of food miles traveled is largely neutralized by the wide variety of cobenefits that local food brings economically and ecologically.

The trouble with offsets. Many observers—myself included—have become increasingly skeptical of the offset concept at regional or national scales. Objections include:

We need actual *net* reductions of atmospheric CO_2, not just the neutralizing "offset" of a polluter by a sequesterer. And we need these net reductions quickly.

It is not acceptable to let a big, industrial polluter "off the hook" with an offset.

It is unrealistic to expect the same system that created the climate problem in the first place—i.e., our current economy and specifically its financial sector—to solve this problem and to do so with the same financial tools.

At best, offsets may be illusory; at worst, they're fraudulent—thus imperiling the whole purpose of the approach.

While offsets and carbon credits may not be the economic engine of the future, they highlight an important challenge for carbon ranching: profitability. If not offsets, then how can a landowner who desires to mitigate climate change earn a paycheck, without which there will no carbon ranching?

One idea is to include "climate-friendly" practices as an added value to the marketing of ranch products, such as its beef. Another is to create a "carbon market" at the local level. A county government, for example, could help to create a local carbon market to help offset its judicial buildings or schools or prisons. It could possibly do so through its ability to tax, zone, and otherwise regulate at the county level. It would still have to deal with some of the other challenges confronting offsets, but at least it would keep the marketplace local.

Another idea might be to reward landowners financially for meeting sequestration and emissions goals. The federal government routinely subsidizes rural economic development enterprises, such as the ongoing effort to bring high-speed broadband Internet to rural communities. Additionally, the government often provides incentives to businesses for market-based approaches, including corn-based ethanol production, solar power development, and wind technology (and don't forget the federal government's catalyzing role in the birth of the Internet). It would be perfectly logical, therefore, to reward early adopters of carbon ranching with a direct financial payment as a means to stir up new markets.

None of this will be easy. In fact, the obstacles standing in the

way of implementing a carbon ranch and sharing its many co-benefits are large and diverse. Is it worth trying anyway? Absolutely. If a carbon ranch could make a difference in the fight against climate change—now developing as the overarching crisis of the twenty-first century—then we must try. The alternative—not trying—means we consign our future to politics, technology, and wishful thinking, none of which have made a difference so far.

Best of all, a carbon ranch doesn't need to be invented. It already exists. We know how to grow grass with animals. We've learned how to fix creeks and heal wetlands. We're getting good at producing local grassfed food. We'll figure out how to reduce our carbon footprint and develop local renewable energy sources profitably. We don't need high technology—we have the miracle of photosynthesis already.

Answers to anguished questions exist, but too often our eyes seem fixed on the stars and our minds dazzled by distant horizons, blinding us to possibilities closer to home. A carbon ranch teaches us that we should be looking down, not up.

At the grass and the roots.

Twenty-Five

The Fifth Wave

(2012)

"All things alike do their work, and then we see them subside. When they have reached their bloom, each returns to its origin . . . This reversion is an eternal law. To know that law is wisdom."

—LAO-TSU (SIXTH CENTURY, BCE)

The First Wave

In the fall of 1909, twenty-two-year-old Aldo Leopold rode away from the ranger station in Springerville, Arizona, on his inaugural assignment with the newly created United States Forest Service. For this Midwesterner, an avid hunter freshly graduated from the prestigious Yale School of Forestry, the mountainous wilderness that stretched out before him must have felt both thrilling and portentous. In fact, events over the ensuing weeks, including his role in the killing of two timber wolves—immortalized nearly forty years later in his essay "Thinking Like a Mountain," from *A Sand County Almanac*—would influence Leopold's lifelong conservation philosophy in important ways. The deep thinking would come later, however. In 1909, Leopold's primary goal was to be a good forester, which is why he chose to participate in a radical experiment at the time: the control and conservation of natural resources by the federal government.

Beginning in 1783, the policy of the federal government encouraged the disposal of public lands to private citizens and commercial interests including retired soldiers, homesteaders, railroad conglomerates, mining interests, and anyone else willing to fulfill America's much-trumpeted manifest destiny. However, this policy began to change in 1872, when President Ulysses Grant signed a bill creating the world's first national park—Yellowstone—launching the U.S. government down a new path: retention and protection of some federal land on behalf of all Americans. In 1891, four years after Leopold's birth, this trend accelerated when Congress created the national forest reserve system, which protected large swaths of valuable timberland from development. These reserves were renamed national forests and were dramatically increased in size in 1907 by President Theodore Roosevelt, who burned the midnight oil with Gifford Pinchot, his visionary secretary of agriculture. Three years earlier, Roosevelt had created the first national wildlife refuge—Pelican Island—in southern Louisiana.

These parks, forests, refuges, and monuments (the latter cre-

ated by the Antiquities Act of 1906) were part of an audacious conservation philosophy that emphasized state and federal control and scientific management of natural resources. For Pinchot and other leaders in the budding conservation movement, the need for a new approach could be summed up in one word: scarcity. Take timber, for instance. Appalled by the razing of the great white pine forests of the upper Midwest by private industry after the Civil War, Congress created the forest reserve system and gave it the mission of conserving valuable timberlands for future national needs. It was a mission vigorously supported by Pinchot, who believed that a nation's natural resources should serve the greatest good for the greatest number of citizens. This new conservation philosophy was captured in the U.S. Forest Service's first field manual: "Forest Reserves are for the purpose of preserving a perpetual supply of timber for home industries, preventing destruction of the forest cover, which regulates the flow of streams, and protecting local industries from unfair competition in the use of forest and range. They are patrolled and protected, at Government expense, for the benefit of the Community and home builder."

Reversing resource scarcity and arresting the associated land degradation would now be the job of government.

Meanwhile, scarcity of a different sort motivated John Muir, an itinerant mountain lover and amateur geologist from Scotland. Worried about the loss of wildness and beauty to development, Muir campaigned vigorously for the creation of national parks and monuments, adding his voice to what quickly became a chorus of support for the protection of wilderness, wildlife, and natural wonders for nonutilitarian purposes. It worked. The national park system expanded from two dozen units in 1916—the year Congress created the National Park Service—to over four hundred only eight decades later. The federal role in the West continued to expand after World War II, when the vast public rangelands were organized into the Bureau of Land Management (BLM). In 1964, Congress added an additional layer of protection with the passage of the Wilderness Act, which ensured that roadless areas on public lands would remain "untrammeled" for generations to come.

It was all part of the first wave of conservation, which I'll call

federalism.

These were heady days for professionals such as Leopold, but also exciting times for day-trippers and vacationers across the nation, newly liberated by rising affluence and declining prices of automobiles. Recreation quickly took its place alongside resource protection as part of the mission of federal land agencies. Starting in the 1920s, America embraced its parks and forests with fervor as citizens hit the roads in rising numbers. In the process, a benevolent and ever-helpful "Ranger Rick" became synonymous with the U.S. government in the public's eyes.

Meanwhile, the nation's embrace of the great outdoors had an important collateral effect: federalism as a conservation philosophy began to extend beyond land ownership and management to the belief that governmental regulation of the environment was needed in order to protect citizens from harm. Thanks to pressure from activists, more and more regulatory work was assigned to the federal government over the decades, culminating in the creation of the Environmental Protection Agency (EPA) in 1969 and a raft of historic environmental legislation in the early 1970s.

Federalism, it seemed, was destined to keep rolling ashore.

Today, however, it is clear that this first wave of conservation has faded. In retrospect, its apogee as an effective conservation strategy in the West was reached in the early 1950s, just prior to the eruption of major controversies involving the government's dam-building program on the Colorado River and its overharvesting of timber on our national forests—controversies that began to sour the public on some of our federal agencies. This souring mood grew during the 1960s and 1970s as activists fought the government over hard-rock mining, cattle grazing, and endangered species protection on public lands, causing many urban residents to shift their view of federal agencies from the good guys to the bad guys. It was a shift shared by many rural residents, who began to view the government as captive of urban interests, environmental activists especially. As a result, federal employees began to find themselves in the crossfire of an increasingly rancorous struggle between activists and rural residents across the West. It added up to one inescapable conclusion: federalism as an effective conservation strategy was fading

away.

That's not to say the *idea* of public land staled—the democratic ideal represented by public ownership of Western lands is still strong. What has changed is the government's ability *to do* conservation effectively. It has faded in recent years for a variety of reasons, including shrinking budgets, reduced personnel, increased public demands, a bevy of conflicting laws and regulations, and the rising hostility of political interests. But the conservative and conformist nature of bureaucracies had a role too. Over time, a resistance to innovation grew among the agencies, as did a certain degree of arrogance. Toss in a lack of synchronicity with the times, as public opinions changed and new ideas came along, and by the 1970s, the result was increased ineffectualness. Not that federalism didn't try to evolve with the times. Over the years, it embraced a variety of new conservation concepts, including wilderness protection, sustained yield, adaptive management, endangered species protection, an ecosystem approach, and so on. But none of them altered the fact that what had once been federalism's chief asset—its role as a buffer between nature and its exploiters—had by the 1970s become its chief liability: it now stood between the land and innovation.

I experienced this firsthand with Quivira's work with federal land agencies, including our promotion of progressive livestock management, our direction of riparian restoration projects, and our operation of the only public lands grassbank in the West (where Quivira became a Forest Service livestock permittee). I'll cite three examples. First, it became clear that the default position of agencies on anything out of the box was "no"—no to this idea, no to that activity; no, you can't do this; no, you can't do that. Getting to "yes" wasn't impossible with the agencies, but their regulatory mandates, musical-chair personnel changes, and ever-rising workloads make getting to "yes" a time-consuming, expensive, and very frustrating process for potential partners. It is much simpler for the federal agencies to say "no."

Second, there were few positive internal incentives for agency employees to try anything new. In fact, disincentives abounded, including the perpetual threat of lawsuits by watchdog groups. Innovating within the system is rarely rewarded and sometimes punished. Thinking out of the box might mean getting pushed

out of your job. There is much less stress for employees if they act by the book—which often made partners feel like they were talking to a stone wall.

Third, there is a culture of command and control within the federal agencies, the Forest Service especially, that discouraged partnerships and innovation. Agencies often have the last word on a project, and they know it. This means that when they enter into a collaborative effort, the partnership is unequal. The agencies have the ability to shut things down, and all it takes is one person in a position of power. Throw in the inevitable change of leadership among line officers every three to four years, and the risk of "no" rises substantially. For example, of the approximately twenty Forest Service employees involved in the creation of the grassbank in 1998, nineteen had moved to new jobs within five years, essentially orphaning the project from the government's perspective.

It all adds up to an ineffective Status Quo on public lands today. The trouble is that in the twenty-first century, the Status Quo isn't really an option anymore. Managing land for climate change, for instance, will require rapid, flexible, and innovative responses—a tall order for federal agencies. To their credit, agencies sense this and are trying to find ways to respond, but reform, innovation, and breaking gridlock look largely out of their reach now. Perhaps federalism will reinvent itself, gather strength, and rise again as a new wave of conservation. I hope so. There is still a big need for federal oversight and expertise, and the idea of public land ownership is an important one in a democracy.

The Second Wave

the next wave of conservation in the American West is what we today call *environmentalism*. The early stirrings can be traced back to the mid-nineteenth century as the destructive effects of the Industrial Revolution began visibly to impact the natural world, especially wildlife populations. Early prophets included Henry David Thoreau, George Perkins Marsh, and John Muir. A vocal advocate for federalism, Muir also played a key role in the development of the second wave when he founded the Sierra

Club in San Francisco in 1892. Initially a hiking and camping association for outdoor enthusiasts, the Sierra Club quickly drew activists into its fold, no doubt inspired by Muir's relentless campaign to protect Yosemite National Park from a proposed dam in Hetch Hetchy Valley (a dam that Gifford Pinchot enthusiastically supported). Although Muir lost the fight, his defeat propelled the Club and other budding conservation organizations to become vigilant in defense of the nation's parks, forests, and refuges—and to keep a watchful eye on the federal agencies entrusted to protect them.

As the nation's love affair with the great outdoors took off, conservation groups swelled with new members and advocates, beginning a period of vigorous activity, including a highly public fight in 1955 to stop another dam project, this one located in Echo Park, deep inside Utah's Dinosaur National Monument. Led by the Sierra Club's president, David Brower, an avid mountain climber, the conservation community set itself squarely against Congress and the federal government in a high-stakes showdown. It won. The dam was never built. Riding the momentum of this victory, the second wave swelled in 1963 with the publication of Rachel Carson's *Silent Spring*, which propelled activists into the arena of human health and industrial pollution, transforming the conservation movement into what today is simply called *environmentalism*.

There are two principle reasons why this movement grew large and effective: (1) it built on the strengths of federalism while confronting its weaknesses, and (2) it synchronized itself with the rapidly changing times, including changing demographics, embracing new ideas and values, and putting them to work effectively.

Although the early phase of the second wave was consonant with the goals of federalism, especially the push to create new parks and monuments, as early as the 1930s, it started to have doubts about governmental effectiveness. Led by Aldo Leopold, who had left Forest Service employment in 1924, conservationists began to question the ability of agencies in the wake of the Dust Bowl to implement what Leopold later dubbed a "land ethic." Some government programs worked, but many did not, especially after the positive incentives they employed (direct

payments to landowners, technical assistance, etc.) ended. That left many agencies holding the "stick" approach to conservation, rather than the "carrot." However, Leopold came to believe that both approaches were ineffective in the long run because a land ethic needed to come from the heart, not a bureau. He urged the conservation movement to lift its sights to change America's ethics, not just its policies.

Activists responded vigorously to Leopold's call, and environmentalism swelled, especially as America's economy rocketed into the stratosphere after World War II. They began by pushing federal agencies to adopt higher environmental standards. Activists raised alarms, for example, when the Forest Service embarked on a vast timber-cutting program in the 1950s that included widespread clear-cuts. They also criticized the BLM for its poor oversight of livestock grazing and hard-rock mining on public lands and they maintained their struggle with the Bureau of Reclamation, winning a widely publicized fight to stop two dams in the bottom of the Grand Canyon. They also criticized the U.S. Fish and Wildlife Service for its inadequate oversight of endangered species, and they even turned up the heat on the National Park Service, which they thought was dragging its feet on wilderness designation.

In this work, the second wave both shaped public opinion concerning environmental protection as well as followed its lead. In the mid-1960s, a series of natural disasters and slow-boil crises caught the public's attention, including smog in big cities, toxic-waste dumps, oil spills, rivers catching on fire, urban sprawl, and a growing concern about nuclear power. The consequence of this rising concern was the passage of a raft of federal legislation in the early 1970s aimed at ensuring clean air, clean water, endangered species protection, wild and scenic river designation, and an open planning process for the management of public land.

Environmentalism also tapped into changes on the economic front out West, as recreation and tourism became significant engines of prosperity—a development that would eventually be called the "New West." It was a booming amenity-based economy that emphasized recreation (hiking, fishing, biking) over traditional forms of work (mining, logging, farming, cattle ranching). However, the denigration of work in favor of play, especially on

public lands, led to numerous clashes with rural residents, many of whom staunchly opposed this new economy. Feelings on both sides hardened during the 1980s, causing environmentalists to dig in and redouble their efforts, which proved successful on many fronts.

In reality, it was a sign of the wave's inevitable fading.

Today, despite environmentalism's continued hard work, high profile, and large memberships, it is clear that the movement is no longer an effective conservation strategy in the West. Two important metrics support this observation: (1) the continued steady decline of animal and plant species populations and their habitats around the planet, and (2) a steady loss of interest in nature and outdoor activities among Americans, especially the younger generation, a trend with alarming ramifications for both nature and people—a condition that author Richard Louv calls "nature deficit disorder." Environmentalism didn't cause these two developments, of course, but it has become increasingly ineffective at reversing, or even curbing, them. There are three primary reasons why.

The first is author and farmer Wendell Berry's long-standing criticism that environmentalism never developed an economic program to go along with its preservation and health programs. It had no economic retort, in other words, for industrialism. It never truly confronted our economy, the source of most environmental ills, and without an effective alternative, the average American had no choice but to participate in a destructive model of economic growth. I saw this played out during my time in the Sierra Club, where I learned that most activists considered environmental problems to have environmental solutions, ignoring their economic sources. This meant we spent too much time and energy on symptoms instead of causes. Aldo Leopold flagged this problem decades earlier when he cautioned us against trying to "fix the pump without fixing the well." We didn't heed his advice, and for fifty years, we focused our attention on the pump while the well began to run dry.

Many environmentalists might argue, in contrast, that they did have an economic agenda: tourism and recreation. This is true—and for a while, the benefits of both looked generous. But over time, recreation and its associated side effects—congestion, ex-

urban sprawl, transitory populations—began to take on darker hues and may have even made the situation worse. As the twenty-first century progresses, with its concerns about climate change, carbon footprints, oil depletion, food miles, and sustainability in general, an economy based on tourism looks increasingly shaky.

Second, environmentalism is ebbing because it left the land behind. The movement lost the feeling of "the soil between our toes," as Leopold put it, meaning it lost an intimate understanding of how land actually works. As a result, it lost what Leopold described as the role of individual responsibility for the health of the land. "Health is the capacity of the land for self-renewal," he wrote, and "conservation is our effort to understand and preserve this capacity." But by losing the feel of soil between our toes, the movement missed the opportunity to understand, and thus preserve, land health—the foundation on which all health depends.

For example, I learned early in my work with Quivira that while activists and others could recognize poor land use, such as overgrazing, and rightly worked to correct it, they lost an understanding of *good* land use, particularly those for-profit activities such as logging and ranching that could be conducted sustainably. Instead, as the movement drifted away from land, it began to equate non-use with the highest and best use of land, especially on the public domain. The exception was recreation, of course, though it has become increasingly clear that as far as twenty-first-century challenges go, play can't handle the weight.

Third, the environmental movement never really walked the walk of a land ethic. While trumpeting Leopold's famous call to enlarge our ethical sphere to include plants and animals, environmentalists ignored his insistence that people and their economic activities be included too. "There is only one soil, one flora, one fauna, and one people, and hence only one conservation problem," Leopold wrote in *A Sand County Almanac*. "Economic and esthetic land uses can and must be integrated, usually on the same acre." Or this from his essay, "The Ecological Conscience": "A thing is right only when it tends to preserve the integrity, stability, and beauty of the community, and the community includes the soil, waters, fauna, and flora, as well as people."

A land ethic encompassed it all. But environmentalists didn't heed Leopold's advice. Instead, many engaged in a form of environmental isolationism. Work was segregated from nature, and nature was largely confined to parks, wildernesses, refuges, and other types of protected areas. Not only was there no attempt to integrate people into nature economically under this preservationist paradigm, but an energetic effort was made by some activists to curtail certain land uses, such as ranching, whether they maintained the integrity, stability, and beauty of the community or not. The land, in their minds, had to be saved apart from the people, and their pitch to the public emphasized dehumanized landscapes—pretty pictures of wild country and charismatic wildlife. In general, while activists were quick to invoke Leopold in their campaigns to save this or that, they ignored his holistic view that "bread and beauty grow best together."

In its time, environmentalism accomplished an astonishing amount, and the world has benefitted immensely from its diligent efforts. As with federalism, however, it reached its "bloom" and began to fade away.

The Third Wave

The next wave of conservation, which stirred after World War II, had two principal components: an emphasis on science and a focus on private land. This was no accident—these components represented important shortcomings of the previous two waves. Federalism, by definition, focused on public lands, which meant that one-half of the American West—its privately owned land—had been largely neglected by the conservation movement. This became a pressing concern after the war as the suburban and exurban development of private land sped up considerably. Meanwhile, the rise of ecology and other environmental disciplines meant that data and scientific study could now complement, and sometimes supplant, the emotional and romantic nature of environmentalism. An illustrative example is the rise and growth of the Nature Conservancy, a landmark nonprofit organization that is now one of the largest conservation groups in the world.

In 1946, a small group of scientists in New England formed an organization called the Ecologists Union with the goal of saving threatened natural areas on private land, especially biological hot spots that contained important native plant and animal species. The protection of biologically significant parcels of land had traditionally been the job of the federal government, state wildlife agencies, or private hunting and fishing groups. Parks, forests, refuges, wilderness areas, and game preserves were the dominant means by which protection was provided to critical areas in the years leading up to World War II. But a growing number of scientists believed this strategy wasn't sufficient any longer because it largely overlooked privately owned property—land that was rapidly being paved over in the postwar boom.

The Ecologists Union changed its name in 1951 to the Nature Conservancy (TNC) and embarked on a novel strategy: private land acquisition for ecological protection. In 1955, the organization made its first purchase—sixty acres along the New York–Connecticut border. Six years later, it donated its first conservation easement, which restricts development rights on a property in perpetuity, on six acres of salt marsh, again in Connecticut. This new strategy of buying and preserving land caused the organization to grow rapidly. By 1974, TNC was working in all fifty states, often in tandem with state and federal agencies. It wasn't all about acquisition, however. Frequently, TNC acted as the middleman buyer between a willing seller and the federal government. In the process, TNC became adept at real estate deals, developing a business acumen that was as novel for a conservation organization at the time as was its land-protection strategy. TNC also started an ambitious land trust program to accept conservation easements on property it did not own.

Soon, TNC was working internationally, buying land and facilitating major conservation projects. In 2000, it launched the "Last Great Places" campaign, raising over one billion dollars for land acquisition and research. By 2007, TNC was protecting more than 117 million acres of land and five thousand miles of rivers in the U.S. alone.

But it wasn't just about buying land. Employing hundreds of scientists, TNC has based much of its conservation work on re-

search, including a science-based modeling approach to large landscapes that helps the organization determine where to work, what to conserve, and what strategies should be employed. Their work was no longer simply focused on saving the rarest species here and there, as it had been in the 1950s. Now they worked at the ecosystem level across a large landscape so that all species might thrive—a strategy TNC calls "enough of everything." They do this by establishing science-based priorities and then setting out to influence the social, political, and economic forces at work in these biologically important landscapes.

TNC's approach has been replicated by many other third-wave conservation organizations, including Conservation International, the Trust for Public Land, and the World Wildlife Fund. It also helped to ignite a land trust movement around the world. Today, there are over seventeen hundred individual land trusts in America alone, focused on private property of every shape and size, from small community or regional trusts to statewide agricultural organizations.

A great deal of science-based conservation work was also integrated into various nonprofit organizations, public agencies, and private operations. The growing impact of ecology in conservation during the 1940s—thanks in no small part to Aldo Leopold—also led schools and universities to embrace science-based curriculums and implement numerous environmental-study programs across the country. Professional journals in ecology proliferated as a result. At the same time, many public lands–focused environmental organizations incorporated science into their advocacy work, especially those focused on saving large predators, wildlife corridors, and endangered species.

In contrast to environmentalism, however, the third wave eschewed the noisy emotionality and confrontational tactics of the second wave, preferring the quiet diplomacy of research and deal making to accomplish its goals. Although it still adhered to a protection paradigm that it shared with the first two waves, it was guided by data, not poetry, and it sought cooperation, not regulation or litigation, to accomplish its objectives. And as the success of TNC demonstrates, this wave was extraordinarily effective—for a while.

The bloom began to fade in 1990, when TNC purchased the

beautiful and biologically rich 322,000-acre Gray Ranch, located in the boot heel of southwestern New Mexico. Sheltering more than seven hundred species of plants, seventy-five mammals, fifty reptiles, and 170 species of breeding birds, the Gray Ranch was considered one of the most significant ecological landscapes in North America, which is why the U.S. Fish and Wildlife Service had coveted the Gray as a wildlife refuge for decades. Indeed, in the 1980s, a similar-sized ranch in southern Arizona, called the Buenos Aires, was purchased by the U.S. Fish and Wildlife Service from the same Mexican millionaire who owned the Gray Ranch. This time, however, the financial terrain was different, and TNC was needed to broker a deal, which it did at a high financial cost to the organization. No matter—TNC had every intention of quickly reselling the Gray Ranch to the federal government and recouping its investment.

Except the transfer never took place.

When local residents heard of the Gray's purchase and pending resale to the federal government, they raised vigorous objections. Going first to their elected representatives and then to the media, their opposition became front-page news across the West, and for a reason: it fit a changing mood in the region. Across the West, pushback against federalism and environmentalism had been gathering steam, often expressed noisily as an exercise of private property-rights. It was more complicated than that, of course, but the bottom line was the same: push had come to shove in the rural West. The Animas-area residents raised three objections to what TNC was trying to accomplish: (1) the Gray was still a working cattle ranch and thus a tax-paying, cowboy-hiring member of the local economy, and residents wanted it to stay that way; (2) a wildlife refuge would destroy the cultural and historical significance of the Gray, which was part of the historic Diamond A ranch, one of the area's legendary operations; and (3) it was time to stop this pattern of transferring private land to the federal government.

It was this latter point that made the headlines.

Local residents took their complaints directly to TNC officials where, to their surprise, they found a sympathetic reception. That's because TNC was hearing similar complaints in other places around the West. It gave the organization pause—not simply be-

cause they didn't like controversy, but because TNC had always considered itself to be a *cooperative* conservation group. Their method was to buy land and easements from willing sellers, to work collaboratively with government agencies, and to create deals that benefitted people and nature while keeping a low profile. But local residents disagreed, saying TNC was *not* being cooperative—not with them, anyway. The complaints stung, causing TNC to ask itself an important question: could it accomplish its scientifically guided conservation goals while maintaining the Gray Ranch as a privately owned working cattle ranch? And perhaps just as importantly: could it find a conservation buyer who would help them recoup their substantial financial stake in the property?

The answer to both questions proved to be "yes."

In 1993, the Nature Conservancy sold the Gray Ranch to Drum Hadley, a local rancher who also happened to be an heir to the Budweiser beer fortune. After the sale, Hadley and members of his family created the Animas Foundation, named for the nearest town, to manage the ranch for conservation as well as community goals. That seemed like a contradiction to many environmentalists, who subsequently objected to TNC's new plan, though to no avail. It all added up to a new approach toward conservation. Success would require that TNC, the Gray Ranch, local residents, and public agencies effectively cooperate together. To that end, a year later, TNC and the Animas Foundation became charter members of the Malpai Borderlands Group, a pioneering collaborative partnership of ranchers, conservationists, and government agencies in the region—setting the stage for the next wave of conservation in the West.

The third wave faded for two reasons mainly: first, the benefits of a protection paradigm, whether science based or not, grew less effective over time as environmental troubles diversified. Climate change, for instance, largely defies the paradigm—what does "protection" mean under rising temperatures, water scarcity, and climatic disorder? Piecemeal protection also exposed the paradigm's limitations as subdivision developments boomed across the West. TNC and other organizations were confronted with a growing dilemma: What benefit is there in buying a large property for protection purposes if the neighboring ranches sell out to a subdivider, thus fragmenting the surrounding land? Also,

the top-down approach of the third wave, which shared a command-and-control philosophy with federalism and environmentalism, met increasing resistance from bottom-up groups, limiting its effectiveness. Locals wanted to be heard and involved now. Directives by outsiders, no matter how well-meaning, provoked pushback among the grassroots.

Second, this wave failed to develop a viable economic program to go along with its protection paradigm. While supportive of working landscapes, it struggled to help local residents find paychecks in conservation-friendly enterprises. For example, while TNC could afford to manage its own land without a profit motive, it had great difficulty finding an economic strategy that would keep its neighbors in business (and thus keep "For Sale" signs from appearing). As the subdivision crisis in rural counties heated up in the 1990s, TNC realized that it could not buy all the critical land needed to protect species. There simply wasn't enough money. Nor would conservation easements complete the job. Some sort of conservation economy would be necessary—other than tourism and recreation. To this end, TNC tried a variety of economic strategies, including a "Conservation Beef" pilot project in Montana, but it wasn't enough. Despite TNC's success, it became clear to many that in order to accomplish the landscape-scale effort needed to help species *and* local people, especially if it involved public lands, a new approach would be required, one that featured partnerships and profits.

The Fourth Wave

In 1991, the Forest Service extinguished a five-hundred-acre fire burning on private land along a stretch of the remote Geronimo Trail Road, located in the southeastern corner of Arizona. On the surface, it was an unremarkable event—the Forest Service had long reacted to wildfires with the same response: put it out. Period. Except this fire proved to be different. The local ranchers did not want it extinguished, agreeing with scientists that fire had an important role to play in ecosystem health. They asked the federal government to let the fire burn, arguing that it posed no appreciable threat to life or property. The landowner was supportive

too; in fact, he had thinned the overgrown brush recently in order to create the right conditions for fire's return. But the Forest Service didn't listen. It put the fire out over all protest. This routine act, however, ignited the community into action. "No more," it said aloud. Consequently, within three years, the nonprofit Malpai Borderlands Group was born. They were determined to do things differently within the nearly one-million-acre borderland they called home. They decided to give collaboration a try.

It was a similar story around the West at the time. When a federal judge shut down logging in old-growth forests throughout the Pacific Northwest in 1991 in response to a lawsuit by environmentalists over the spotted owl, it ignited a storm of protest in rural communities. It also lit two small, but important, bonfires of change. The first was in the Applegate Valley of southwestern Oregon, where a small coalition of activists, loggers, and Forest Service personnel met for potluck suppers and peacemaking. The second was a similar group that met in the only place they considered neutral in the logging-dependent town of Quincy in Northern California—the public library. The goal of both groups was the same: better forest management through collaboration, not confrontation.

In Montana, the Malpai Borderlands Group quickly inspired two groups of ranchers to give collaboration a try, one in the Blackfoot River Valley northeast of Missoula, and the other in the Madison Valley, northwest of Yellowstone National Park. Like Malpai, residents in both valleys grappled with a host of challenges, including the threat of land fragmentation due to subdivisions, curtailment of livelihoods due to endangered species regulations, and changing demographic trends. Instead of fighting the future, however, they chose to link arms with conservationists, scientists, and agency employees with the goal of making progress where it mattered: on the ground. It wasn't easy, especially in the beginning. In many places, trust had to be rebuilt or created; in others, key players wouldn't come to the table. This changed over time, however, as people began to see genuine results. The process was messy, difficult, time-consuming, and frustrating, but it worked.

One name for this new wave is the "radical center"—a term coined by rancher Bill McDonald of the Malpai Borderlands

Group. It was radical because it challenged various orthodoxies at work at the time, including the belief of environmentalists that conservation and ranching were part of a zero-sum game—that one could only advance if the other retreated. The "center" referred to the pragmatic middle ground between extremes. It meant partnerships, respect, and trust. But most of all, the center meant *action*—a plan signed, a prescribed fire lit, a workshop held, a hand shook. Words were nice, but working in the radical center really meant *walking the walk.*

I know because I did a lot of the walking myself.

The fourth wave drew strength from the first three waves, while filling in blanks and correcting important deficiencies. It aimed to protect open space and wildlife, valued working landscapes, incorporated public lands, employed ecology and other sciences, and required trust and fairness. But it also strove toward economic realities, often by exploring and promoting the diversification of business enterprises on private lands.

In doing this work, the fourth wave emphasized profits along with protection, arguing persuasively—as Aldo Leopold tried to do years earlier—that good stewardship flowed from ethical and regenerative attitudes toward land, business, and people. Profit could be a force *for* conservation, the fourth wave said, not *against* it, as so many environmental activists had insisted. The proof was in the pudding of these early collaborative efforts: conservation and capitalism (of the local sort) worked effectively side-by-side across the West. The keys were partnerships and dialogue—handshakes and countless meetings. It all led to a rapid expansion of collaboratives of varying stripes in the late 1990s, including the formation of many watershed-based nonprofit organizations. The radical center united, rather than divided.

One area where it worked best was ecological restoration. Ecology had led to a deeper understanding of land sickness—to use Leopold's term—and what to do to restore forests, rangelands, and riparian areas back to health. Ranchers, conservationists, agency personnel, and others began to implement these ideas in pilot projects around the region, including the use of livestock to control noxious weeds, riparian and upland restoration work for water-quality and wildlife-habitat improvement, tackling forest

overgrowth through thinning and prescribed fire, and repairing and upgrading low-standard roads in order to restore natural hydrological cycles. Success, however, required cooperation among multiple stakeholders, particularly across private/public and urban/rural divides.

For all its success, however, the fourth wave will too, in time, begin to fade. As the wave evolved from its gridlock-breaking and peacemaking roots into an effort that has brought ecological and economic health to the region and its people, the world evolved too, bringing with it new challenges and opportunities. In short, the times are changing again, especially as we enter into a period of increased climate instability and economic stress.

The Fifth Wave

> *"The agrarian population among us is growing, and by no means is it made up merely of some farmers and some country people. It includes urban gardeners, urban consumers who are buying food from local farmers, organizers of local food economies, consumers who have grown doubtful of the healthfulness, the trustworthiness, and the dependability of the corporate food system—people, in other words, who understand what it means to be landless."*
>
> —WENDELL BERRY

I traveled up New York's Hudson Valley to visit a young leader of the emerging agrarian movement by the name of Severine von Tscharner Fleming. I had met Severine a few times before, and I knew her to be an astonishingly energetic and successful advocate for young farmers like herself. For starters, in 2007, she founded the Greenhorns, a nonprofit organization that has become an influential grassroots network dedicated to recruiting and supporting young farmers and ranchers. Severine also cofounded the National Young Farmers Coalition, manages a weekly radio show on Heritage Radio Network, writes a popular blog, speaks at countless conferences, and organizes endlessly via the Web. *And* she's a farmer too.

Severine told me young people are inspired to get into farming

for a wide variety of reasons. It starts typically with a journey through apprenticeships and internships as each young farmer discovers which parts of a farming life he or she wishes to pursue, followed by hard work to gain proficiency in, say, carpentry, horse wrangling, or irrigation system maintenance, without going into debt, and usually before starting a family.

Who are these young farmers? According to Severine, most are from cities and suburbs—thus the "greenhorn" moniker—and many come from the social justice or food poverty movements. Another portal is the Food Corps, which is a project of AmeriCorps and places young people in food-oriented jobs, often building school gardens. Many young farmers attended farms when they were kids or went on field trips to local farms through their elementary schools. A few participated in 4-H, though not as many as one might think, she said. The educational backgrounds of young farmers today varies widely, including engineering, public health, computer science, literature, anthropology, and earth science, but the decision to go into farming after examining all the options is the same: to live a life with dignity and purpose and have a positive impact on the community.

"We'll seize opportunities to buy inexpensive battered pastures and compacted soils," she said at a conference, "and then heal those lands using good land stewardship techniques. We'll reclaim territory from commodity crops and try our best not to churn or ruin our own soils while we build up enough capital to stop rototilling. We'll process our own darn chickens and build our own darn websites. We are just as stubborn and innovative as farmers have always been."

According to the USDA Agricultural Census, the number of young people farming in the U.S. is on the rise. Though it is still a minority of the tiny minority of Americans who are farmers, it reinforces the argument that a movement is growing, called by many a *New Agrarianism*.

What does "agrarian" mean exactly? In Latin it means "pertaining to land." My dictionary defines it as relating to fields and their tenure or to farmers and their way of life. Berry broadens this definition, calling it a way of *thought* based on land—a set of practices and attitudes, a loyalty and a passion. It is simultaneously a culture and an economy, he says, both of which are ines-

capably *local*—local nature and local people combined into "a practical and enduring harmony." The antithesis of agrarianism is industrialism, which Berry says is a way of thought based on capital and technology, not nature. Industrialism is an economy first and foremost, and if it has any culture, it is "an accidental by-product of the ubiquitous effort to sell unnecessary products for more than they are worth."

An agrarian economy, in contrast, rises up from the soils, fields, woods, streams, rangelands, hills, mountains, backyards, and rooftops. It embraces the coexistences and interrelationships that form the heart of resilient local communities and local watersheds. It fits the farming to the farm and the forestry to the forest. For Berry, the agrarian mind is not regional, national, or global, but local. It must know intimately the local plants and animals and local soils; it must know local possibilities and impossibilities. It insists that we should not begin work until we have looked and seen where we are; it knows that nature is the "pattern-maker for the human use of the earth," as he describes it, and that we should honor nature not only as our mother, but as our teacher and judge.

I first ran across the term New Agrarianism in 2003 in a book of essays on the topic collected and edited by Eric Freyfogle, a law professor at the University of Illinois. The term resonated with me because it described exactly what I was seeing on the land. In fact, I could have used Freyfogle's own words from his essay "A Durable Scale" to describe my experience. "Within the conservation movement," he wrote, "the New Agrarianism offers useful guiding images of humans living and working on land in ways that can last. In related reform movements, it can supply ideas to help rebuild communities and foster greater virtue. In all settings, agrarian practices can stimulate hope for more joyful living, healthier families, and more contented, centered lives."

In his essay, Freyfogle produced a list of New Agrarians that was spot on:

> The community-supported agriculture group that links local food buyers and food growers into a partnership, one that sustains farmers economically, promotes ecologically sound farm practices, and gives city dwellers a known source of wholesome food.

The woodlot owner who develops a sustainable harvesting plan for his timber, aiding the local economy while maintaining a biologically diverse forest.

The citizen-led, locally based watershed restoration effort that promotes land uses consistent with a river's overall health and beauty.

The individual family, rural or suburban, that meets its food needs largely through gardens and orchards, on its own land or on shared neighborhood plots, attempting always to aid wildlife and enhance the soil.

The farmer who radically reduces a farm's chemical use, cuts back subsurface drainage, diversifies crops and rotations, and carefully tailors farm practices to suit the land.

The family—urban, suburban, or rural—that embraces new modes of living to reduce its overall consumption, to integrate its work and leisure in harmonious ways, and to add substance to its ties with neighbors.

The artist who helps residents connect aesthetically to surrounding lands.

The faith-driven religious group that takes seriously, in practical ways, its duty to nourish and care for its natural inheritance.

The motivated citizens everywhere who, alone and in concert, work to build stable, sustainable urban neighborhoods; to repair blighted ditches; to stimulate government practices that conserve lands and enhance lives; and in dozens of other ways to translate agrarian values into daily life.

To this list I could add from my recent research:

The carbon farmer or rancher who explores and shares strategies that sequester CO_2 in soils and plants, reduces greenhouse gas emissions, and produces cobenefits that build ecological and economic resilience in local landscapes.

Freyfogle shares Berry's belief that agrarianism is the proper countervailing force to industrialism and its surfeit of sins, includ-

ing water pollution, soil loss, resource consumption, and the radical disruption of plant and wildlife populations—the focus of the earlier waves of conservation. Freyfogle goes on to add broader anxieties: the declining sense of community; the separation of work and leisure; the shoddiness of mass-produced goods; the decline of the household economy; the alienation of children from the natural world; the fragmentation of neighborhoods and communities; and a gnawing dissatisfaction with core aspects of our modern culture, particularly the hedonistic, self-centered values and perspectives that control so much of our lives now.

In contrast to these negative attributes of modern life, the new agrarianism is first and foremost about living a life of positive energy and joy, says Freyfogle. Nature is the foundation of this joy, but so are the skills necessary to live a life. At its best, the agrarian life is an integrated whole, with work and leisure mixed together, undertaken under healthful conditions and surrounded by family.

"When all the pieces of the agrarian life come together," Freyfogle wrote, "nutrition and health, beauty, leisure, manners and morals, satisfying labor, economic security, family and neighbors, and a spiritual peacefulness—we have what agrarians define as the good life."

And it is to this good life that the fifth wave aspires.

I credit Aldo Leopold for laying the foundation for this resurgent agrarianism. Over the course of a diverse and influential career, Leopold eloquently advocated a variety of critical conservation concepts, including wilderness protection, sustainable agriculture, wildlife research, ecological restoration, environmental education, land health, erosion control, watershed management, and, famously, a land ethic. Each of these concepts resonates today—perhaps more so than ever, as the challenges of the Age of Consequences grow more complicated and more pressing. But it was Leopold's emphasis on conserving whole systems—soil, water, plants, animals, and people together—that is most crucial today. The health of the entire system, he argued, is dependent on its indivisibility, and the knitting force was a land ethic—the moral obligation we feel to protect soil, water, plants, animals, and people together as one community.

After Leopold's death in 1948, however, the idea of a whole

system broke into fragments by a rising tide of industrialization and materialism. Fortunately, today a scattered but concerted effort is underway to knit the whole back together, beginning where it matters most—on the ground. Leopold's call for a land ethic is the root of a New Agrarianism—a diverse suite of ideas, practices, goals, and hopes all based on the persistent truth that genuine health and wealth depends on the land's fertility.

The New Agrarians practice what Aldo Leopold called a unifying force, something "that reaches into all times and places, where men live on land, something that brackets everything from rivers to raindrops, from whales to hummingbirds, from land estates to window-boxes. I can see only one such force: a respect for land as a living organism; a voluntary decency in land-use exercised by every citizen and every landowner out of a sense for and obligation to that great biota we call America."

A New Agrarianism is that decency. And as we move deeper into the twenty-first century, the issues of decency, food, hope, joy, and good land use couldn't be more important. Our health and wealth depends on what we choose to eat, how we produce our energy, where our water comes from, and who benefits from sustainable practices—and each has its root in the land.

This is the fifth wave—sustainable food production from farms and ranches that are managed for land health, biodiversity, *and* human well-being. It is a vision of New Agrarians working to sequester carbon in soils, improve water quality and quantity, restore native plant and animal populations, fix creeks, develop local energy sources, and replenish the land for people and nature alike. It is a vision of coexistence, resilience, and stewardship—a place for people in nature, not outside it.

As Severine demonstrates, this wave is being led by youth—as every wave before it has been. The difference, however, is that today's young agrarians can stand on the shoulders of their predecessors and thus see farther. I have no doubt that what they see is both energizing and daunting, but I am equally confident they have the skill sets and the right attitudes to tackle these challenges. Fortunately, the toolbox at their disposal is full of ideas and practices that have been tried and tested in the field already. Undoubtedly, they will innovate new ones to go along with what we know works. Our role is to provide as much men-

toring, inspiration, and encouragement as we possibly can.

I can't wait to see what happens next.