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PERC REPORTS

FOR FREE MARKET ENVIRONMENTALISM



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FROM THE DIRECTOR

Reed Watson

Why Private Land?

A fundamental principle of free market environmentalism is that property rights can turn environmental resources from liabilities into assets by giving resource owners the right incentives for stewardship. Specifically, when property rights are clearly defined, secure from theft, and tradable, the competitive marketplace tends to *enhance* rather than diminish environmental quality.

This intuitive yet profound principle guides the research, publications, and programs at PERC. From forests to fisheries, from the urban environment to the developing world, the first questions we ask are: who owns the resource, how are those rights defined, and how easily can they be traded.

Typically, ownership by all leads to stewardship by none. Consider public lands in this country. The four federal land agencies—the National Park Service, Bureau of Land Management, Fish and Wildlife Service, and Forest Service—have a total of \$19 billion in deferred maintenance. That is \$19 billion in crumbling roads, leaking water pipes, and dilapidated trails that the agencies themselves admit should be repaired, but go unrepaired because there is insufficient funding (or, more accurately, insufficient incentive) for stewardship.

As you read in the last issue of *PERC Reports*, PERC's message on public lands was simple: We can do better. Through user fees, innovative management structures like franchise parks, privatization of services, and public-private partnerships, we can increase the environmental and economic returns from public lands.

We also made the point that the federal government should not acquire more lands—it should not take private lands and make them public—when it cannot manage the lands it already owns. As Congress considers several proposals that would increase federal landholdings, PERC has argued that conservation, at its core, means first taking care of what you already have.

As important and controversial as public lands are, *private* land ownership remains the bedrock not only of free market environmentalism, but also a free society. It is for that reason that private lands have been and will remain at the top of PERC's research agenda.

This issue of *PERC Reports* features stories of “private conservation in the public interest.” Environmental entrepreneurs around the globe are harnessing market forces to enhance wildlife habitat, clean water, and provide recreational opportunities on private lands. And, importantly, the benefits of their efforts spill over property boundaries, often to the benefit of the non-paying public.

Are there market mechanisms that would allow beneficiaries to pay? How would payment influence the provision of these goods and services on private lands? And how would functional markets for so-called “ecosystem services” affect land use patterns, such as the development of working lands in this country at the rate of one acre per hour?

PERC is partnering with the Samuel R. Noble Foundation, Texas A&M's Institute of Renewable Natural Resources, and the East Wildlife Foundation to answer these important questions. Together as part of the Center for Private Land Stewardship, we will conduct research on the conservation benefits of secure property rights, connect that research to policy reforms that bolster property right protections, and stand up for the private landowner who conserves the public interest.

PERC

The Property and Environment Research Center is a nonprofit institute dedicated to improving environmental quality through property rights and markets.

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© Todd Klassy

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by Gregg Simonds

On the cover: Beartooth Capital restores private land by enhancing environmental assets. This creek in Montana's Madison Valley has been transformed from a shallow ditch into a meandering spring creek renowned for its fishing. *Photo © Turner & Fitch.*

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Private Conservation in the

BY TERRY L. ANDERSON

Aldo Leopold, one of the founding fathers of the modern environmental movement, advocated the importance of a “land ethic.” In his well-known book *A Sand County Almanac*, Leopold writes that a land ethic “reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of land.” Since the publication of his book in 1949, the notion of an “ecological conscience” has become ingrained in the minds of all of us who call ourselves conservationists.

A land ethic is one reason why so many private landowners incorporate stewardship into their land management decisions—and generate many public environmental benefits as a result. Here in southwest Montana, ranches such as the Granger Ranch manage their streams in ways that improve water quality, increase fish populations, and provide riparian habitat for wildlife. The Flying D Ranch, owned by Ted Turner, is home to thousands of bison which supply meat for restaurants, but the ranch also supports a vibrant elk population and a healthy stream for the native Westslope cutthroat trout. On the other side of the globe, Jake Grieves-Cook, an entrepreneur in Kenya, contracts with Maasai cattle herders to provide more wildlife habitat. Stories such as these are the focus of PERC’s research initiative on “private conservation in the public interest.”

But Aldo Leopold was no “Pollyanna” when it came to encouraging landowners to invest in conservation. He

understood the importance of balancing the needs of resource managers to earn a return on their assets while staying true to a land ethic. To Leopold, creating this balance required understanding “Conservation Economics,” the title of one of his many essays. “Conservation will ultimately boil down to rewarding the private landowner who conserves the public interest,” he wrote. As Leopold saw it, “Incentives are more promising than penalties.”

For the most part, Leopold was not sanguine about the potential for political solutions to encourage conservation. “We tried to get conservation by buying land, by subsidizing desirable changes in land use, and by passing restrictive laws,” he wrote. “The last method largely failed; the other two have produced some small examples of success.”

Writing at a time when wildlife populations had been decimated, he asked, “Does anyone still believe that restrictive game laws alone will halt the wave of destruction which sweeps majestically across the continent, regardless of closed seasons, paper refuges, bird-books-for-school-children, game farms, Izaak Walton Leagues, Audubon Societies, or other feeble palliatives which we protectionists and sportsmen, jointly or separately, have so far erected as barriers in its pay?” His solution was to “build a mechanism whereby the sportsmen and the Ammunition Industry could contribute financially to the solution of the problem, without dictating the answer themselves.”

Finding ways to compensate landowners for their

Public Interest

“Conservation will ultimately boil down to rewarding the private landowner who conserves the public interest.”

— Aldo Leopold

© Turner & Fitch.

conservation efforts is at the heart of free market environmentalism, which holds that property rights and markets provide an avenue for rewarding private landowners who conserve the public interest. In addition to developing a land ethic and educating landowners about the value of wildlife conservation, Leopold advocated “marketing the surplus [of wildlife] by sale of shooting privileges to sportsmen.” While criticizing profit seekers that put development above conservation, he did not favor “rejecting and all economic tools for [wildlife] restoration, on the grounds that such tools are impure and unholy.”

Whether it’s bird hunters renting prairie potholes to provide duck habitat, fishermen leasing instream flows for salmon habitat, or environmental groups compensating livestock owners for wolf depredation, free market environmentalism, like Leopold, recognizes that incentives matter and focuses on contracting with private landowners to provide environmental amenities. These private conservation efforts often produce public benefits that extend far beyond property boundaries, resulting in what we at PERC call “private conservation in the public interest.”

Once private landowners provide public environmental benefits, however, some groups demand that they must continue to do so without compensation. Some even call for laws that would force landowners to produce public goods, or provide public access to their private land. But these efforts can undermine the very conservation efforts

the public seeks to encourage. For instance, declaring that streams restored by riparian landowners must be open to free recreation, as Montana has done, can stifle private conservation. Penalizing landowners who provide habitat for threatened or endangered species by imposing land-use restrictions can discourage the private provision of wildlife habitat. Requiring landowners to allow public hunting access can make property owners less likely to manage their land in ways that benefit wildlife.

Rather than calling for policies that force private landowners to produce public goods, we follow the lead of Aldo Leopold by reinforcing a land ethic that rewards landowners who engage in private conservation. In the pages that follow, we offer several examples of the public environmental benefits produced by private conservation based on property rights and markets, and we encourage conservationists to find other ways, as Leopold did, of “rewarding the private landowner who conserves the public interest.”



Terry L. Anderson is the William A. Dunn Distinguished Senior Fellow at PERC.

PRIVATE CONSERVATION



1. Entiat River Habitat Farming

Landowners in the Columbia River basin created the Habitat Farming Enterprise Program which pays orchardists to replace their riparian fruit trees with a fish-friendly vegetative buffer.



2. O'Dell Creek

Rancher Jeff Laszlo has restored 500 acres of wetlands in Montana's Madison Valley, providing habitat for fish and wildlife, sequestering carbon, and providing clean, cold water to those downstream. **Page 28**



3. Rey Creek

After decades of neglect and misuse had left nothing but a muddy ditch, hydrologist Scott Gillilan and his team of aquatic and land restoration experts brought a sparkling creek back to life in Montana's Madison Valley. **Page 12**



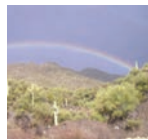
4. American Prairie Reserve

On the plains of eastern Montana, APR is creating a 3.5 million acre reserve, all of it open to the public while providing habitat for bison, badgers, bobcats, and more than 300 other wildlife species. **Page 23**



5. Ridge Top Ranch

Conservation bankers in California turned a hazardous waste dump into protected habitat for two endangered species: the California red-legged frog and the Callippe silverspot butterfly. **Page 14**



6. Doublecheck Ranch

Near Winkelman, Arizona, along the San Pedro River, Paul Schwennessen is reinventing local, small-scale agriculture. His family's holistic land management protects open space, wildlife habitat, and riparian corridors.



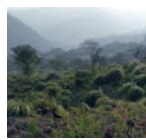
7. La Red RSP

This network of private wildlife reserves was formed by 62 landowners dedicated to protecting Nicaragua's natural beauty. Together, they are conserving 23,000 acres for biodiversity conservation and wildlife habitat.



8. Comunidad Nativa Infierno

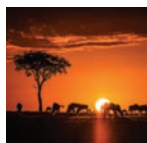
One of 16 private conservation areas in Peru, this community in the "Biodiversity Capital of Peru" set aside 7,400 acres to protect the forest and provide migratory corridors for wildlife.



9. Natura Bolivia

In Bolivia, enviropreneur Maria Teresa Vargas developed a payments-for-ecosystem-services system, exchanging beehives and barbed wire for the conservation of over 21,000 acres of cloud forest. **Page 10**

IN AROUND THE WORLD



10. Ol Kinyei Conservancy

Next to Kenya's Maasai Mara National Reserve, two entrepreneurs established a private conservancy and safari camp. Now over 18,700 acres, Ol Kinyei provides a valuable home for wildlife. **Page 10**



11. Rhino Ark

In Kenya's Aberdare National Park, this private conservation group has put up an electric fence to protect wildlife from poaching and neighboring communities from dangerous animals leaving the park.



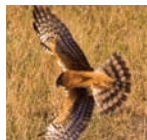
12. Balule Private Game Reserve

Bordering South Africa's Kruger National Park, this private game reserve demonstrates how tourist dollars from photographic and hunting safaris help protect wildlife and their habitat.



13. The 77 Ranch

This Texas rancher restored tall grasses to overgrazed land, creating a landscape that allows him to harvest water, which will soon become the most valuable crop he sells.



14. Fennessey Ranch

Brien Dunn restored meadows, forests, and wetlands on his Texas ranch, benefiting over 400 species of birds and wildlife, as well as hundreds of visitors who visit the beautiful property each year. **Page 9**



15. Flint River Basin

Farmers in Georgia's Flint River Basin are adopting new technology to conserve water, control erosion, and keep more water instream for fish and wildlife.



16. Deer Camp

For generations, hunting families in western Pennsylvania have formed cooperatives to purchase large tracts of forested land for outdoor recreation, providing habitat for deer, bear, turkeys, and other wildlife.



17. Cheney Lake Watershed

In addition to growing crops, hundreds of farmers in Kansas now manage their lands in ways that provide water quality and enhanced habitat for fish and wildlife species. **Page 8**

Visit perc.org/map for more examples of private conservation in the public interest.

Farming Water Quality in Kansas

Private landowners provide a city with clean water.



© U.S. Dept. of Agriculture

Agriculture is big business for farmers in south-central Kansas. Now, thanks to an innovative partnership, farmers are being paid to produce another valuable output: clean water.

The city of Wichita relies on Cheney Lake for its drinking water. In the early 1990s, however, algal blooms and increased sedimentation in the lake alerted area residents and farmers that water quality could no longer be taken for granted. In a region dominated by agriculture, the source of declining water quality was clear, and local farmers accepted responsibility.

The environmental and economic costs were far reaching. Declining water quality resulted in increased water treatment costs for the city of Wichita. Furthermore, it compromised the ecological integrity of the watershed, affecting local fish and wildlife habitat and opportunities for local anglers and recreationists.

Recognizing the economic value of reducing pollution in the watershed, the city partnered with local farmers to encourage conservation practices that would improve water quality. Since 1994, the city of Wichita has provided partial reimbursements (typically 30 to 40 percent) to farmers for implementing practices that reduce pollutants entering

streams. The city also provides up to 50 percent of the cost to landowners to install perimeter fencing for maintaining grasslands.

In response, many farmers in the Cheney Lake watershed have incorporated a conservation ethic into their agricultural practices. In addition to growing crops, many farmers now manage their lands in ways that provide water quality and enhanced habitat for fish and wildlife species.

Among the roughly 1,000 farmers in the region, more than 2,000 conservation practices have been implemented on a voluntary basis. These efforts illustrate that responsible land management begins with the landowner, and that a bottom-up approach to watershed management works.

The partnership between the city and farmers is mutually beneficial. Farmers improve their land use practices while maintaining their lands in agricultural production. The city of Wichita, in return, reduces water treatment costs and extends the lifespan of the Cheney Lake reservoir while providing more than 300,000 people with clean water.

FOR MORE INFORMATION, see PERC's case study "Cheney Lake Watershed: Farming Water Quality in Kansas" at perc.org/CheneyLake.

Ranching for Wildlife in Texas

Conservation efforts transform a cattle ranch into a wildlife haven.



© Todd Steele

Fennessey Ranch was once a classic south Texas cattle ranch. But after more than 170 years in operation, the cattle were beginning to take their toll on the land. Brien Dunn realized the impacts his livestock were having on the environment, and he decided to make a drastic change. Although it is still an active cattle ranch, the 4,000-acre property is now actively managed for wildlife.

Dunn's first step was to address the effects of the cattle. He reduced the number of cows on the ranch and put in fences to keep them out of sensitive areas such as wetlands and lakes.

Other projects included prescribed burns, installing wildlife-friendly fencing, and wetland restoration. Altogether, these steps were successful in restoring many meadows, forests, and wetlands on the ranch.

As a testament to the health of the land, wildlife are repopulating the area. Wetlands provide nesting habitat and forage for more than 400 species of birds found on the ranch. Amphibians that had previously disappeared from the area are now returning. Renewed water sources and meadows are also attracting native species such as javelinas, boars, and whitetail deer.

These conservation projects are financially self-sustaining. The ranch is open to a variety of activities, with visitors paying user fees based on the type of use. Popular activities include bird watching, photography, hiking, and hunting. Dunn and other Fennessey Ranch staff help arrange the outings and ensure that users do not interfere with each other. For example, certain days are set aside for wildlife photography, during which time all other uses are put on halt. This way, wildlife disturbances are minimized so photographers can get the best shots.

Visitor fees diversify income from the traditional cattle ranch and are reinvested in maintenance and restoration projects on the ranch.

Restoration projects on Fennessey Ranch not only benefit the Dunn family, but also the hundreds of visitors who experience the beautiful property each year, as well as the wildlife populations that now have more room to roam. Brien Dunn does good while doing well, demonstrating how private conservation is often just good business.

Trading for Water in Bolivia

Farmers contract with upstream land users to conserve cloud forests.



Farmers in Bolivia's Los Negros Valley rely on water from the Los Negros River for their agricultural livelihoods. But when water levels suddenly began to drop in the valley, something had to be done.

Downstream farmers pointed fingers upriver, blaming deforestation for the lack of water. The water-producing cloud forests upstream were being cleared for timber and agriculture, changing runoff patterns and causing dry seasons in the valley to be even drier.

Natura Bolivia, a company led by Maria Teresa Vargas, stepped in to help bridge the gap between the water users in the valley and upstream loggers in the early 2000s. The idea was that downstream water users should compensate upstream land users for protecting forests and providing water.

A creative arrangement emerged: Downstream users agreed to pay one beehive for every ten hectares of water-producing cloud forest protected from logging by upstream land users. Along with beehives, upstream land users also received training in honey production. All parties voluntarily enrolled in the program, with payments made annually to create a lasting partnership.

Natura Bolivia's program has flourished. In 2003, 60 beehives were exchanged for the protection of 600 hectares of cloud forest. Three years later, the amount of land protected had tripled in size. The program continues to expand, with barbed wire now being offered along with bees in exchange for forest protection.

Why bees and barbed wire? Upstream land users wanted an alternative source of income and to develop a long-term revenue stream without harming native flora and fauna. Selling honey provides a reliable income, and because bees depend on healthy vegetation for honey production, upstream users have an incentive to protect the forest. Barbed wire also helps keep cattle out of sensitive areas and strengthens existing land claims.

Following its success in the Los Negros Valley, Natura Bolivia has applied similar concepts throughout Bolivia, with agreements underway throughout the country. Natura Bolivia's work allows local people to benefit directly from conservation. The preservation of cloud forests provides downstream farmers with the water they need, while diversifying the income of upstream land users.

Partnering for Habitat in Kenya

A safari group and local tribe join together to protect wildlife.



© Rolf Klavyel

Lions, wildebeests, elephants, and cheetahs—all are found in the Serengeti-Mara region of eastern Africa. Kenya’s Maasai Mara National Reserve protects much this wildlife, with throngs of tourists flocking to snap photos of these iconic species.

Yet all is not well for the wildlife of the Massai Mara. Mounting pressures from development and poaching are causing wildlife populations in the national reserve to plummet.

Enter the Maasai tribe, a pastoral community who owns the land bordering the reserve. Jake Grieves-Cook, a safari camp operator, and Sammy Ole Mpusia, a member of the Maasai, recognized the land’s importance for threatened animal populations. They sought to set aside 8,500 acres of Maasai land as a wildlife conservancy and a small safari camp in 2004.

To do so, they offered to pay the Maasai a fixed fee per acre of land leased, plus a percentage of tourism revenues. In return, the Maasai agreed to keep their livestock off the conservancy to improve wildlife habitat. The deal created the Ol Kinyei Conservancy, with Grieves-Cook’s company, Porini Camps, operating an exclusive safari camp on it.

“Unlike other conservancies, our lease payments go to individual landowners’ bank accounts, not group ranch officials,” says Ole Mpusia. The result is a greater tolerance for wildlife among the Maasai community. The safari camp also directly employs Maasai members as camp staff, tour guides, wildlife spotters, and rangers.

Now more than double in size, Ol Kinyei provides a valuable home for Kenya’s wildlife. The lack of humans and livestock allows wildlife populations to flourish. It is not uncommon to spot four of the “Big Five” wildlife species—Cape buffalo, elephants, leopards, and lions, missing only the rhino. As wildlife numbers decrease in the neighboring national reserve, Ol Kinyei is experiencing a substantial increase in wildlife numbers.

Ol Kinyei is a win for all involved. The Maasai earn additional revenues, safari visitors catch a glimpse of spectacular wildlife, and threatened species are now flourishing where they were once in decline.



Hannah Downey is a research assistant at PERC.

A Different Kind of Green

Restoring private land is big business—and the benefits flow well beyond property boundaries.



An aerial view of Rey Creek west of Bozeman, Montana. *Photo © Kestrel Aerial.*

Plodding through knee-high grass and high stepping electric fences, Scott Gillilan makes his way to a crisp, clear creek dotted with spawning areas for fish. An occasional trout swims past as Gillilan weaves his way through a thicket of cattails to proudly survey his work from the water's edge. Rey Creek, nestled in a valley west of Bozeman, Montana, looks every bit as old as the picturesque mountains which serve as its backdrop.

Just two years ago, however, this creek was nothing more than a muddy ditch, with pockets of stagnant water that hid discarded tractor tires and faded beer cans. "Before the restoration work there probably weren't more than a few trout per mile because the habitat was so degraded," Gillilan said. "But now, this is a 'blue ribbon' fishery."

Over the years, this now sparkling creek was diverted for irrigation, had its banks crushed by grazing cattle and, eventually, once it became filled with silt and the water ran too shallow for fish, it became a trash dump for local ranchers.

Any Sierra Club devotee or environmental regulator would be heartened to see the makeover that restored the land much as it was before the first settlers set foot in this rugged region. But it wasn't government orders that

restored the creek bed or environmental activists who hauled debris from the stream's bank.

Instead, it was the prospect of a different kind of green, the almighty dollar, which triggered the impressive restoration of this creek.

Land developers bought the dirty, polluted creek and a couple hundred neighboring acres in hopes of selling plots of land to people seeking a break from city life—a place where they could build their dream lodge at the base of the Montana mountains.

And, of course, no Montana dream lodge would be complete without easy access to a fly fishing stream.

That's where Gillilan, a hydrologist and aquatic and land restoration expert, and his team came in.

By restoring the long-neglected creek and turning it into a fishing paradise, the property's owner transformed a plot worth "maybe a few thousand dollars an acre," Gillilan estimated, into land that sold for more than \$16,000 an acre, according to property records.

There are no losers when acts of private environmental preservation and restoration occur, like painstakingly reestablishing a lost creek. Property owners, the environment, and the general public all benefit. The restored creek provides enhanced water quality, increased fish populations,

and wildlife habitat, which flow well beyond the property's boundaries.

For environmentalists, restoration projects such as this one ensure that many more people will have the opportunity to enjoy unspoiled land that might have otherwise been used for cattle or large-scale farming, or may have simply been disregarded and unappreciated.

Restored areas also offer species the possibility to thrive once again in their native habitat. Private stream restoration projects in the cold waters of Montana's higher elevations have even given hope to the Arctic grayling, a native fish once threatened with extinction. While government efforts to save the fish have done little to help, the beautiful sail-finned trout has found miles of new habitat and hundreds of additional spawning areas as private preservation and restoration projects continue to spread across Montana and beyond.

And when landowners or investors restore their properties, not only are jobs created for people like Scott Gillilan who perform the restoration, but the land itself often becomes more valuable. The value of surrounding properties increases as well, and additional property tax revenues find their way into government coffers.

Finally, private efforts that reclaim and restore previously undesirable land literally creates more land for Americans hoping for the chance to enjoy pristine land for vacation properties, retirement homes, or simply to create a better quality of life for their families.

In recent years, doing right by the environment has become big business. Dams are being removed, streams are being reclaimed, and native plants are being reintroduced, all by people



© Robert Keith



© Ed Spotts



© Brett Seng

Scott Gillilan and his team of aquatic and land restoration experts restore a long-neglected creek and turn it into a fishing paradise.

whose motives could be viewed as self-serving. But unlike the government, which has a spotty history when it comes to protecting or restoring land, private investors who see the value in returning land to a more natural state have a strong incentive to restore the environment from years of damage and abuse. They also have a strong track record of success.

There's an important lesson in the little stream that Scott Gillilan brought back from the verge of

destruction—and in the hundreds of other land and water restoration projects throughout America: Government will never preserve or restore land as well as people who stand to make money off of it.



Drew Johnson is a senior scholar at the Taxpayers Protection Alliance and a columnist at *The Washington Times*.

Banking on Endangered Species

How assigning property rights to protected species turned a landfill into a conservation bank.

BY BEN GUILLON, GEOFF SMICK, ROB SCHELL, AND LIZ AGRAZ

Not far from the city of Benicia in Solano County, California, sits an old hazardous waste dump. The site was once owned by the IT Corporation, whose primary business was the disposal of industrial waste. But today, part of the site is known as Ridge Top Ranch, and it's home to an innovative conservation project to preserve endangered species.

The landfill was capped in 2002, and the state banned development around the facility to protect public health. When the IT Corporation entered into bankruptcy, the LandBank Group, a company that acquires and rehabilitates contaminated properties, obtained ownership of a majority of the ranch.

Despite its proximity to the San Francisco Bay Area, the property was devoid of development potential because the ranch is part of a buffer zone established around the hazardous waste site. Most landowners would have considered the property stranded and perhaps donated it to a land trust. But LandBank decided to turn a liability into an asset by creating a conservation bank.

HOW CONSERVATION BANKS WORK

Under Section 7 of the Endangered Species Act, when a development project impacts a listed species, developers are often required to offset those impacts. Historically, this was done by enhancing and conserving nearby habitat for the endangered species. But this process is time consuming and expensive with no guarantee for success.

More recently, a new type of entrepreneur came up with another approach: Create a for-profit conservation bank. The idea is to take over the liability of species and habitat mitigation from developers. Conservation bankers purchase land that can be preserved and managed for the benefit of protected species. Long-term management is ensured through a conservation easement and an endowment fund to pay for habitat maintenance and monitoring.

California red-legged frogs have found a new home in the ponds of Ridge Top Ranch in California.





The U.S. Fish and Wildlife Service issues credits to the conservation banker for the specific habitat that is preserved or restored. The conservation banker can then sell the credits to developers at a profit. Now, instead of having to find and secure endangered species habitat themselves, developers can buy existing credits from conservation bankers.

For several years, this model has helped mitigate impacts to wetlands and creeks. Credits are issued through mitigation banks, which are specific to wetlands and other sensitive aquatic resources. Conservation banks, on the other hand, are species-specific and relatively new to the marketplace, especially outside of California.

IDENTIFYING HABITAT POTENTIAL

In the case of Ridge Top Ranch, WRA, a leading developer of conservation banks, first identified 745 acres of the ranch as potential habitat for the Callippe silverspot butterfly and the California red-legged frog based on its proximity to other occupied properties. Both species are listed under the Endangered Species Act, and much of their original habitat has been lost to development in central California.

Given the fast pace of residential development in the area, WRA determined there would likely be a profitable market for conservation credits for these two species. After conducting surveys, biologists identified several butter-

flies on the property and suitable habitat for both species. The California red-legged frog, however, was absent from the ranch. None were found in the cattle stock ponds on the ranch, even though they were known to live on nearby ranches. With the help of WRA, LandBank initiated a project to reintroduce the frog to the property.

TRANSLOCATING FROGS

In collaboration with the U.S. Fish and Wildlife Service, WRA worked to enhance habitat in two cattle stock ponds on the property for the threatened frog. This included planting wetland vegetation on which the frogs could attach their eggs and willow trees for overhead shade and cover.

Two egg masses were taken from a pond of a neighboring property and transferred to the restored ponds. Within a few weeks, tadpoles emerged, and later that year, juvenile frogs were observed. Once the frogs reached a certain size, they were implanted with tiny microchips so their location, weight, and size could be tracked. The following year, adult frogs were found in both ponds.

In February 2015, three new egg masses were observed. As of this publication, the egg masses have hatched and the tadpoles have metamorphosed into juvenile frogs, suggesting that the frogs are establishing themselves in their new habitat, despite multiple years of drought in California.

PROTECTING BUTTERFLY HABITAT

Habitat for the Callippe silverspot butterfly is also being restored on Ridge Top Ranch. The caterpillars rely on one species of native plant for their food: the golden violet, a low-growing wildflower that thrives in California's perennial grasslands. Over the past century, however, European annual grasses and other exotic weeds have choked out many native plant species. This, in addition to habitat loss through development, has led to the decline of several species dependent on the native plants, including the Callippe silverspot butterfly.

WRA created a habitat management plan to improve habitat for the butterfly, primarily through managed grazing. By allowing livestock to graze the European grasses early in the growing season, there is less competition between them and the native golden violet.

Artichoke thistle, an invasive plant, has also invaded the property. A widespread eradication program is currently targeting the largest and densest patches of thistle. After that, weed management will focus on annual spot treatments of new or remaining patches. To date, the eradication program has reduced the amount of thistle on the property, and as a result, butterfly habitat is improving.

FINANCIAL AND ECOLOGICAL SUCCESS

Ridge Top Ranch demonstrates how conservation bankers are able to transform a property from a liability into an asset. If the LandBank Group had turned the property over to a land trust they would have received a tax write off but no additional revenue. Instead, for enhancing habitat, the mitigation banker received 739 frog and butterfly credits worth more than \$20,000 each, based on current market values. As the San Francisco Bay Area grows and development expands further into the region, these mitigation values are likely to increase.

This project is a true win-win. Endangered species and their habitats are protected and enhanced without encumbering a profitable venture for the landowner. By harnessing markets for conservation banking, more properties will be protected and restored, creating important habitat for threatened species and generating broader environmental benefits for all.

Ben Guillon is the managing director in charge of conservation finance at WRA and a 2010 PERC Enviropreneur Institute alum, **Geoff Smick** is president of WRA, specializing in butterfly ecology. **Rob Schell** is an Associate Herpetologist at WRA, specializing in California's threatened amphibians. **Liz Agraz** is WRA's marketing director.

Preserving Endangered Species through a Conservation Bank in California



The Ridge Top Ranch is home to two endangered species—the California red-legged frog and the Callippe silverspot butterfly. Operating as a conservation bank, the landowner earns credits from the U.S. Fish and Wildlife Service for restoring and preserving habitat for protected species. The credits can then be sold to developers, who are required to mitigate impacts to endangered species. As development expands from San Francisco, the value of these credits will likely increase.

Hatching a Better Plan for the Sage Grouse

Private landowners are the driving force behind sage grouse conservation.

BY BRIAN SEASHOLES



Sage grouse on private grazing land in the West. *Photo courtesy of U.S. Department of Agriculture.*

The greater sage grouse, a ground-dwelling, chicken-sized bird found across 171 million acres in the western United States, is making headlines as a wide range of groups in the public and private sectors work to protect it. In recent years, the possibility of regulatory actions by the federal government aimed at protecting the species have many in the West worried about potential negative impacts to the region's energy and agricultural industries.

But despite the spotlight on the sage grouse, there are widespread misconceptions about the species, leading to

misguided conservation efforts, especially at the federal level. In particular, the federal government's conservation strategy overlooks the critical role that private landowners play in determining the fate of the species.

The sage grouse is generally thought of as a federal land species because 64 percent of its habitat is on federal land. Yet private land is arguably the most important factor for sage grouse conservation. A 2014 study by federal and state biologists shows why. The study found as much as 81 percent of the moist habitat that sage grouse rely on for forage during the summer, such as streamsides and wet

meadows, is privately owned. Indeed, the saying that “life follows water” in the West is as true for sage grouse as it is for any species.

“Wetlands are keystone features that structure [sage grouse] populations,” said Patrick Donnelly, a U.S. Fish and Wildlife Service biologist and lead author of the study. Sage grouse breeding sites, known as leks, are largely found on drier habitat, which is primarily federally owned. But Donnelly and his coauthors found that most leks are located within just a few miles of moist habitat, which is generally privately owned.

“In other words, the scarcity of wet habitats in sagebrush ecosystems drive the location of grouse breeding sites on uplands: hens choose to mate and nest within a reasonable walk of where they can find late summer foraging for their broods,” according to a summary of the study by the U.S. Department of Agriculture’s Sage Grouse Initiative.

This has profound implications for sage grouse conservation. “How do you conserve grouse that split their time between private and public lands?” asks Donnelly. “With 81% of sparse summer habitat in private ownership, sage grouse success is inextricably linked to ranching and farming in the West.” Despite the importance of moist habitat for sage grouse, federal conservation efforts, led by the Interior Department, focus almost exclusively on lek locations on drier lands.

There is a need for a shift to a “wetland-centric” focus for sage grouse conservation, and that means working with the ranchers and farmers who own the vast majority of this habitat. These landowners are best positioned to conserve the species on private lands, as well as approximately 100 million acres of federally owned sage grouse habitat on which they graze livestock, making them by far the greatest potential conservation force for the species.

Sage grouse conservation requires active management, such as monitoring, controlling invasive species, and maintaining wet habitat. Due to the importance of both private and public lands, the species needs a cooperative “all-lands” approach that encourages participation by landowners. This is already happening through state-led partnerships that include landowners, counties, energy companies, conservation groups, universities, and the federal Sage Grouse Initiative. The success of this approach is part of the reason

that greater sage grouse populations have been stable or increasing over the last decade.

Unfortunately, this conservation approach, which has proven successful, is in jeopardy as the federal government pursues a top-down, penalty-based approach focused on federal lands and regulations that will likely negatively impact private landowners. In September, the Interior Department decided not to propose listing the grouse under the Endangered Species Act, which is good news because the punitive approach of the law can create perverse incentives for landowners to make their property inhospitable to endangered species. Instead, the Interior Department promulgated fifteen amended federal land-use plans which set aside 72.8 million acres of federal lands as sage grouse habitat subject to restrictions on grazing and other land uses.

Pushing ranchers off federal lands is likely to have unintended negative consequences for sage grouse conservation. “The failure of a national strategy to recognize sage grouse dependence on private lands may result in regulations which ultimately increase sage grouse habitat loss and fragmentation on private lands if landowners are forced to intensify management actions to offset lost revenues from public grazing allotments,” according to comments filed by Utah over the state’s amended federal plan. Moreover, the Interior Department’s top-down, unilateral approach creates mistrust and disrupts existing partnerships.

As the state-led approach demonstrates, landowners are often willing to pitch in to help the species, so long as they are not punished. Although the sage grouse has become a hot-button political issue, there needs to be a fundamental reorientation of sage grouse conservation efforts, especially among federal agencies, reflecting the reality that private landowners are key to conserving this iconic species.

“How do you conserve grouse that split their time between private and public lands?”



Brian Seasholes is the director of the Endangered Species Project at the Reason Foundation. His work deals with wildlife and land-use issues, including private approaches to conservation in the United States and around the world.



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PERC has appointed four new senior fellows



Spencer Banzhaf

Banzhaf is a professor of economics at Georgia State University and a research associate at the National Bureau of Economic Research. His research focus is on the urban environment and issues related to air quality and energy.



Sheila Olmstead

Olmstead is an associate professor of public affairs at the University of Texas, Austin. Her research interests cover environmental and natural resource economics and policy, with a focus on shale gas development, water, energy, and wildfire.



Randal Rucker

Rucker is a professor of economics at Montana State University and the director of graduate studies. His research focuses on agricultural policy, pollination markets, energy, and fisheries. He will direct PERC's graduate fellowship program.



Matthew Turner

Turner is a professor of economics at Brown University. His research focuses on the economics of land use and transportation. Current projects investigate the relationship of public transit, the growth of cities, and patterns of trade.

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THE NEW WEST

A quiet revolution is sweeping across the West, forging a new approach to conservation in the 21st century.

BY TODD WILKINSON

People often wonder, “Where is the New West?” When the question is posed to Laura Huggins, she shares a story. Several months ago while attending a meeting in Billings, Montana, it came to the attention of one cattleman that Huggins was affiliated with American Prairie Reserve. APR, as it is known, has made national headlines for aspiring to build a bison reserve on private and public lands near Montana’s legendary Missouri Breaks. The ultimate goal is to create an interwoven fabric of three million acres where most of the original prairie species that existed at the time of Lewis and Clark again enjoy a home in a U.S. version of the Serengeti.

However dreamy that is, the high plains rancher that Huggins encountered was not impressed. Fearful, as some in his part of the world are, that APR intends to wrest away control of public lands grazing allotments and drive working class agrarians out of business—none of which is true—he approached Huggins declaring, “You are my enemy.”

This isn’t a tale that begins or ends with visions of Sagebrush Rebels agitating for a clash with the federal government or conservation groups. A jaw-dropping example of precisely the opposite—at least it was to me when I learned about the outcome—it is a case study instead about how one 21st century cowboy can be won over by incentives.

WILD SKY BEEF

Today, by joining a grassroots effort begun by APR, the rancher and his family are earning more pennies per pound for their prized grassfed beef. They’re embracing more tolerance and appreciation for wildlife—even predators.

And they've softened hardline cultural attitudes, clearing the way for a more hopeful and inclusionary bigger vision.

The innovative initiative Huggins oversees is called Wild Sky beef. Its goal is to promote wildlife-friendly ranching and it follows a for-profit, market-driven model. Not only are ranchers paid more for their cows, but they are rewarded for providing proof

Some environmentalists claim regulation is the only way to achieve desired outcomes. But it isn't regulation that changed the minds of the ranchers working with APR and Wild Sky.

if bears, cougars, or other animals pass through their pastures. But how?

Scientists with APR install remote, motion-sensing cameras and if the animals are documented on their land, ranchers are paid a bonus. Produce a picture of a black bear: collect \$300; a cougar: \$200. If grizzlies or wolves arrive in the area, the non-lethal visual bounty will rise even higher.

"A rancher can make an extra \$12,000 a year for having a pack of wolves," says Sean Gerrity, APR's president. With payments such as this, wolves become worth more alive than dead. If ranchers can find a way for wolves to co-exist with their cattle, they could come out much further ahead. APR is exploring other options as well, including range riders and Anatolian bear dogs to use as non-lethal deterrents against predators.

Gerrity notes that Wild Sky will pay ranchers more for their beef if their pastures contain burrowing owls. How do they get owls? Burrowing owls only live on prairie dog colonies. The message: Rather than shooting or poisoning prairie dogs, safeguarding the rodents could translate into more money in the bank. Along with bison, prairie dog colonies are associated with the survival of many prairie species, including black-footed ferrets, the most endangered land mammal in America.

Gerrity, who proposed the concept of incentives to his staff, became a convert, he says, after traveling to eastern Africa and seeing how well they worked with the cattle-growing Masai in Tanzania to build social tolerance for lions.

Launched in 2014, Wild Sky sells around 50,000 pounds of beef a month at a premium, shares the higher yields with its participants, and pours part of its profits back into the rewards program.

The lesson out in the rural West where ranchers struggle with change everyday is that money talks, especially when it honors hard work, local knowledge, and turns things that would normally be regarded as liabilities—predators and other wildlife competing with cattle for grass—into assets, Huggins says.

A QUIET REVOLUTION

Wild Sky is one piece of a quiet revolution marking a sharp contrast to the war of words and ideology raging in many corners of the West. I've seen the difference this revolution, which incorporates market principles, is making firsthand. Still, even among some environmentalists, there remains, ironically, an inexplicable, deep-seated antagonism toward private property owners, especially

those who have large tracts.

When I began writing my book about former media mogul-turned-bison baron Ted Turner a decade ago, a common perception among green activists was that the "Mouth of the South" had secret ambitions to become a neo-aristocrat who would lock up millions of acres of western ranchland, as well as the public wildlife found on it, behind a physical and metaphorical gate. "Terrible Ted," as his antagonists describe him, represented a real-life Charles Foster Kane, hell-bent on retreating to his own version of Xanadu.

Behind the accusations were two premises: first, that the only "good" conservation resulting in natural resource protection is practiced on public lands where federal and state environmental laws rule supreme; and second, wealthy people can't be trusted to "do the right thing" with their land.

One prolific writer, who has been part of the call to eliminate cattle grazing from public lands, informed me that "ranchers with livestock are enemies of the environment" and that "guys like Turner don't understand the importance of the Public Trust Doctrine" in which wildlife belongs to the people.

A worker for Montana's fish and wildlife agency also ridiculed Turner for having thousands of public elk on his properties, for selling expensive trophy sport hunts of bull elk to generate cash for operating expenses, and for not granting the public unfettered access. What the state game official didn't acknowledge is that Turner is managing his 113,000-acre Flying D Ranch outside of Bozeman with the health of public wildlife in mind. In addition to providing forage for 5,000 bison he owns, he welcomes more than 1,500 elk and countless other animals. Today, all of the major mammals

present 200 years ago can be found there, and many of the game animals spend time on adjacent federal public lands where hunters enjoy the spill-over bounty.

Here, as with APR in central Montana, as everywhere, healthy landscapes are a result of private and public ownership replete with mutual benefits flowing across them. Wildlife migrations, habitat, clean water, open space, and other assets valued by the public do not begin or end at fence-lines. Remove conscientious private property owners from participating in the equation of landscape protection and all of the above would not persist as they do today.

Of course, various kinds of incentive-laden conservation initiatives have been around for a long time. As a journalist, I've waded into prairie

potholes located in the back pastures of American and Canadian farmland. Wetlands are vigorously safeguarded in part because of incentives offered to property owners who maintain habitat for waterfowl. Those ponds, in turn, benefit a wide range of migratory avian species besides those that are hunted.

NEW ALLIANCES

More than a decade ago, Michael Bean of the Environmental Defense Fund and a group of like-minded colleagues published a report titled "The Private Lands Opportunity: The Case for Conservation Incentives." They touted a message that PERC has been expounding for years.

The EDF report begins with this statement: "Engaging the nation's private landowners is the most impor-

tant challenge facing conservation today." Despite the proliferation of public land in the West, 73 percent of the contiguous United States is comprised of private property. "Even in the western states, where private land comprises a smaller share of the land base, its importance is disproportionate to its size as private lands typically have the best access to water and the most productive soils." It adds that "even outside the west, however, the public land base is not particularly well-suited to conserve America's biological diversity."

Bean and his ideas are on the ascent. Today he serves as principal deputy secretary for the U.S. Fish and Wildlife Service. He played a crucial role in crafting the recent unprecedented habitat-protection strategy for the greater sage grouse, involving



A camera trap captures a black bear passing through an APR/Wild Sky ranch.



Ranchers round up cattle on a Wild Sky ranch near Hays, Montana. *Photos © Todd Klassy.*

private-public collaboration, being advanced in 11 states as an alternative to listing the species under the Endangered Species Act.

In assessing where investment needed to occur, the General Accounting Office found that half of all threatened and endangered species have at least 80 percent of their habitat on non-federal land. Many species have some of their healthiest populations on private land, and some occur only on private land. “Beyond individual species at risk, private land will determine the survival and recovery of many of this country’s formerly expansive and now imperiled ecosystems,” the report stated.

Drilling deeper into the realities, Bean and his colleagues delivered this assessment: Less than 10 percent of the tallgrass prairies that once occupied 143 million acres on the eastern plains survives, as does less than 30 percent of intact shortgrass prairie in the western plains where APR is doing its work. Species that rely on

the range and shrub lands of southern California will disappear unless at least a few hundred thousand acres of grazing land can be preserved in the face of new development. The bottomland hardwood forests memorialized by Mark Twain and William Faulkner that once covered 25 million acres on the lower Mississippi have vanished from 80 percent of their former range.

What serves as a critical but vulnerable stopgap? Private lands. The Western Landowners Alliance, which is made up of many of the largest landowners in the West, including Turner, aspires to stake a positive presence in the New West frontier, says its executive director Lesli Allison, who managed a ranch in New Mexico for 16 years.

Since the first meeting in 2011, the alliance has grown to around 120 active members. When totaled, they hold title to more than 10 million acres of private land in 11 western states. That’s equivalent to five Yellowstones. In turn, the alliance

has created an expanding network of 650 other landowners, resource scientists, and professional conservationists, all interested in sharing information and insights.

Notably, the bulk of the properties are located in many of the ecologically richest parts of the West, along rivers and between much larger sweeps of public land representing crucial linkages for wildlife migration and habitat connectivity.

“The common ground of alliance members is they share a deep contemporary land ethic that supports human prosperity but is driven by their desire to sustain the health of open lands and wildlife populations,” Allison says. “They bought the land because they love it and their stewardship is part of a commitment they’re making to future generations.”

Managing land, especially when one owns lots of it, she says, is an expensive endeavor. Very few have the resources to scale up cutting-edge conservation efforts. The alliance is



Not only are ranchers paid more for their cows, but they are rewarded for providing proof if bears, cougars, or other animals pass through their pastures.

Turner is not in any way anti-government, but he believes that the market rewards innovation—something he proved by pioneering 24-hour news with CNN and creating a satellite-enabled super cable TV channel. The private sector acts more quickly, is more efficient, and strives to find cheaper solutions than government does, he says. It's an approach to stewardship that resonates strongly with Turner's collaborators in the alliance who, Allison notes, cover every corner of the political spectrum.

Maybe the most discussed concept among those plying the intersection of private and public land is "ecosystem services." Consider: billions—if not trillions—of dollars' worth of valuable ecosystem services flow off of private lands, from clean water vital to healthy fish populations and municipal water supplies that doesn't have to be cycled through costly treatment plants before it reaches consumers, to forage filling the bellies of public wildlife, carbon captured in well-stewarded forests and rangelands, even scenic views that increase land values on adjacent properties and define the character of communities. Society can't afford to pay for every asset a private property owner might monetize, but public policies can be promulgated to reward landowners who protect those assets.

using market principles to lead by example on the ground and chart a different course that emanates as far as Capitol Hill and the White House.

"In the U.S., we've not had public policies that encourage people to do right by the land. In fact, we've had some policies that run contrary to the land ethic," Allison notes. "I can tell you there's a desire to do right by the land all across the West but it's the capability part we need to tackle."

In particular, she addresses a topic that has arrayed people behind battle lines: regulation. Some environmentalists claim regulation is the only way to achieve desired outcomes. But it isn't regulation that changed the minds of the ranchers working with APR and Wild Sky.

"We know regulation is a necessary tool of last resort and it can stop bad things from happening. But it doesn't have the scope to reach into the minds and hearts of landowners who are out there every day making decisions," she explains. "An incen-

tive or suites of incentives can generate 1,000 positive things and inspire 1,000 more, whereas a regulation might stop one bad thing, and yet it might stymie creative approaches and flexibility."

Do the math, she says, on what delivers more positive outcomes.

"Another way to think of stewardship is 'voluntary decency' toward the land," Allison says. Voluntary decency has a much greater chance of being widely embraced if it is championed. Incentives are one thing, she adds, but in some respects it really comes down to landowners not being penalized, needlessly burdened with bureaucratic red tape, or hassled for doing the right thing. The mantra that a person should be able to do what one wants with their land, so long as they don't harm others, has frequently been framed only within the context of protecting property rights to carry out industrial activities; the new emerging 21st century version involves free market environmentalism.



O'Dell Creek on the Granger Ranch near Ennis, Montana.

WATERSHEDS

Breathtaking, the Madison River Valley in western Montana is a pastoral idyll. Comprised of old-guard ranching families as well as recreation properties, the common denominator is an appreciation for open space untrammelled by subdivisions. Jeff Laszlo is a fourth-generation owner of the 13,000-acre Granger Ranches and an alliance member. Schooled in New England, he now lives in Montana full-time, wooed away from the city by a hands-on wetland restoration project, located right in the middle of his cattle operation, which has been held up as a national model.

Putting the wetlands back in place decades after they were drained has yielded unforeseen dividends. Holding water is a smart strategic business move as insurance against drought and climate change. Laszlo says the greatest satisfaction has been carrying out native fish restoration, seeing rare trumpeter swans finding refuge, and watching an abundance of large animals and avifauna return. The public doesn't regard ranchers as oper-

ating waterworks, but that's essentially what they do, Laszlo says.

Most Americans reside in cities, and few probably realize that 88 percent of the rain and snow in the United States falls first on private land. The quality of the water that gets passed downstream and reaches the taps of millions of people depends on private land stewardship practices. Runoff laden with pollution is the major threat to water quality and the health of aquatic ecosystems. Outside of Alaska, 60 percent of U.S. private land is used to graze cattle or grow crops. Another 27 percent of private land is forest.

As Laszlo says, doing right by the bottom line is not mutually exclusive of protecting the environment. Aided by federal grants and support from the Trust for Public Land, the O'Dell Creek project is a striking example of public-private partnerships. Laszlo firmly agrees with something that was mentioned in the Bean report: "Less tangible, though equally important, economic incentives also engender landowner enthusiasm for

conservation initiatives. When the public is willing to assist landowners in protecting environmental resources, landowners are subsequently willing to do more themselves." As Turner has noted time and again, private land conservation that doesn't pay for itself and passes along environmental protection only as a debt proposition from one generation to the next, doesn't last. It's an ethos also embraced by Laszlo.

RANCHING ECOLOGY

Brian Ulring, manager of the J Bar L Ranch in Montana's Centennial Valley, is a co-founder with Harlowton, Montana, rancher Zach Jones of Yellowstone Grassfed Beef. Ulring and Jones work only with cattle producers who practice solid stewardship that yields ecological benefits.

Ulring is wary of top-down programs implemented afar from Washington D.C. The ability of consumers to vote for stewardship with their wallets is far more effective, he says, than trying to engineer outcomes. He likes keeping things simple instead

of exacerbating complexity that only drives up costs.

“I’m sort of a free market guy,” he says. “I’d love it if people who care a lot about grizzly bears and wolves would pay a little extra for our beef because of the associated risk and cost of managing proactively to mitigate conflicts. I’m familiar with the customary rebuttal that bears and wolves have the same right to be on the landscape as cows. I couldn’t agree more and, in turn, the public needs to recognize the benefits it receives from private landowners.”

Ulring’s boss is no ordinary landowner. Peggy Dulany is the daughter of David Rockefeller and granddaughter of oil tycoon John D. Rockefeller. The latter’s private land purchases in Jackson Hole led to the expanded boundaries of today’s Grand Teton National Park.

Dulany’s convictions as a conservationist are resolute. She supports Ulring’s quest to ensure that her cattle grazing operation, which occurs on 20,000 acres of deeded and leased land, is accomplished with the best interests of wildlife in mind. For part of the year, J Bar L cattle are turned out onto Red Rock Lakes National Wildlife Refuge, a place where bison historically grazed and, in the process, dramatically shaped the grasslands.

An advocate for building sustainable human communities on the international scene, Dulany has been an active participant in the local grazing association that has taken great strides to be wildlife friendly, including adopting ranching practices that are friendly to wolves and grizzlies. It’s only happened, Ulring says, because there is a shared sense of stakeholder-ship and recognition from federal land managers that public wildlife enjoys a place on private land.

Mike Phillips, director of the Turner Endangered Species Fund and a member of the Montana state legislature, told me that if conservationists want to have real impacts then the big players—the largest landowners in the West—need to be brought into the dialog. Alienating them, by casting aspersions and not recognizing what they bring to the table, is just naïve thinking, he says.

A NEW FRONTIER

That American Prairie Reserve is located along the flanks of the Missouri Breaks—a stretch of the Upper Missouri River that snakes through broken landscape—is no accident. Karl Bodmer painted scenes of wildlife abundance here in the early 1830s and Charles M. Russell, after whom a national wildlife refuge is named, venerated the elk, wolves, and grizzlies there as the wild frontier came to a close.

Historically, the number of prairie elk that wandered through the Missouri Breaks country was between 50,000 and 70,000. Today there are 6,000. APR would like to increase that number to between 25,000 and 30,000, but some ranchers see that many elk as competition for grass and potential destroyers of fenceline. On top of bolstering the elk population, APR would like to support the full diversity of native megafauna, including grizzly bears, cougars, and wolves.

Normally, such talk would be a nonstarter, but the number of those enrolled with Wild Sky is growing,



Todd Wilkinson is a journalist based in Bozeman, Montana. He is the author of *Last Stand: Ted Turner’s Quest to Save a Troubled Planet* and the new book *Grizzlies of Pilgrim Creek, An Intimate Portrait of 399, the Most Famous Bear of Greater Yellowstone* featuring images by renowned nature photographer Thomas Mangelsen, available at mangelsen.com/grizzly.

The lesson out in the rural West is that money talks, especially when it honors hard work and local knowledge, and turns things that would normally be regarded as liabilities into assets.

and the entity hopes to be working with a dozen and a half ranchers in the coming years. (Full disclosure: Both Huggins and colleague Pete Geddes are both PERC alumni.)

Grizzlies and wolves will never reach the Missouri Breaks in large enough numbers to establish a viable population if they have to navigate a gauntlet of bitter hostility, APR’s Gerrity says. Culture doesn’t often change fast but attitudes can be “softened,” by getting people to at least consider an alternative way of thinking that cannot easily be achieved through regulation or mandates, he notes.

“In Montana and the rest of the West, people think of public versus private as two things that must be pitted against each other but it’s a false dichotomy,” Gerrity says. “That kind of perception is way oversimplified and it traps us into small thinking. What we really need to be doing is thinking big.”

SAILING THE S

AGEBRUSH SEA

Ranchers navigate ecosystems of perpetual change.

BY GREGG SIMONDS

A cattle rancher surveys his land, gazing across a vast expanse of the western range. The land surges and rolls, lifting sharply in waves of stone, and receding softly onto the open plains. Before him is a living sea—a Sagebrush Sea, as vast and as variable as any ocean.

Each year, ranchers set sail on the Sagebrush Sea, and by grazing livestock, they convert relatively low-valued plants into higher-quality protein. Like sea captains, ranchers must deliver their cargo in good shape while maintaining their capacity to make the next voyage, navigating the ever-changing conditions of the high seas. These wildly variable conditions—wind and currents on the ocean, rainfall and temperature on the land—are both influential and unpredictable. A salty sailor is one who learns how to respond to these changes and navigate conditions that would sink a less canny sailor's ship.

On the Sagebrush Sea, success depends on the flexibility the rancher is afforded to adapt his management to changing environmental conditions. Regulations that restrict a rancher's ability to maneuver his ship in response to these changes can threaten the voyage. For instance, policies that restrict the duration or season of grazing—known as “time” and “timing”—can undermine the very management practices that are needed most. Strict limits on the frequency or intensity of grazing can also hinder what we now understand to be proper rangeland management.

Today, federal grazing policies assume we can navigate the Sagebrush Sea with a static view of the natural world. In effect, we are locking the captain's sail-set and tiller position based on the average wind speed and direction of the South Pacific. But averages are useless on the Sagebrush Sea, just as they are on the open seas, and every voyage is doomed without the capability to constantly adjust to the vagaries of nature.

Moreover, the terms and conditions of federal grazing permits are based on rangeland assessments made infrequently on small plots that are then extrapolated across vast regions. It would be like peering over the gunnels to

The reality is that we are blindly sailing the Sagebrush Sea, with rudder and sails in a locked position—and we have little or no way to understand which direction we're heading. Until now.

observe the waves at a single moment and assuming this observation will predict sea conditions over the next year, or even the next decade.

Making matters worse, many ranchers lack the basic instruments of navigation—the feedback mechanisms necessary to understand and adapt to changes on the landscape. They lack the equivalent of a compass to tell them which direction their enterprise is heading. They lack a sextant to inform them of their position and to assess just how far they have deviated off course.

The reality is that we are blindly sailing the Sagebrush Sea, with rudder and sails in a locked position—and we have little or no way to understand which direction we're heading. Until now.

THE BACKGROUND

“There is perhaps no darker chapter nor greater tragedy in the history of land occupancy and use in the United States than the story of the western range,” claimed a 1936 report by the Interior Department. Since much of the Sagebrush Sea was never homesteaded, the land remained largely under public ownership. As a result, a textbook example of the “tragedy of the commons” unfolded, as destructive grazing practices gradually eroded public rangelands.

In response, the federal government created new standards designed to prevent overuse of the western range. The federal rangeland was partitioned into public grazing allotments administered by the Bureau of Land Management or U.S. Forest Service. Ranchers lease the allotments and graze livestock based on ten-year permits with fixed terms and conditions that dictate the time, timing, and number of livestock that can be grazed on each allotment. Every five to ten years, rangeland assessments are made to re-set stocking rates for each allotment.

In the 1970s, a broader vision of rangeland health began to emerge—one that included recreation, watershed health, species protection, and other environmental values. New groups were afforded a seat at the rangeland planning table through policies such as the National Environmental Policy Act, which requires environmental assessments and public input for management actions on federal lands.

These new definitions of rangeland health, however, did not include the development of new tools that could adequately measure them. As a result, ranchers today face a growing set of management demands but are left adrift without the basic instruments to chart a course for long-term land stewardship.

And there's yet another problem: The fixed terms and conditions of federal grazing permits often do not provide ranchers the flexibility needed to adapt to the unpredictability of the Sagebrush Sea. Even a low level of rangeland use does not necessarily stop overgrazing. A good manager must continually adjust the number of livestock, the amount of time livestock are allowed to graze, and the location and season that grazing occurs. Understanding the relationship between these management tenets and their effects on the land requires practice—as well as a feedback system that provides the information necessary to constantly adjust our sails.

NEW DIRECTIONS

I have sailed the Sagebrush Sea many times. For more than 40 years, I worked as a ranch manager and consultant for many of the largest ranch enterprises in the United



Photo © Tom Koerner/USFWS

States. For the last 18 years, I have worked to develop rangeland assessment technologies that provide better measurement tools to help other sagebrush captains navigate the dynamic conditions of the Sagebrush Sea.

What I have discovered over my career is this: Although the sagebrush ecosystem is extremely dynamic, sagebrush captains can adjust their sails and rudder to the waves of change that surround them. With the right tools and the freedom to use them, they can harness these natural forces to promote the long-term health of the land. This is what is known as results-based, adaptive management.

Due to the history of the western rangeland, overgrazing has unfortunately been oversimplified to mean “too many cows.” This view has led to policies and conventions that fixate on reducing livestock grazing, and thus restrict ranchers’ abilities to implement adaptive grazing management. We now know, however, that this simplistic view is wrong.

In reality, grazing is simply the removal of tissue from a living plant. As long as a plant is free to regrow what has been removed, the type or number of organisms removing that tissue is of little consequence to the plant during the growing season. The situation only becomes “overgrazing” when the plant is not able to replace the lost tissue during the growing season because of repeated grazing before full recovery. But this has nothing to do with the number of grazing entities. One goat, one grasshopper, one lawn mower, one wild mustang, one cow, or one elk chewing a blade of grass can all have the same effect on a plant. The

proper management approach is the same: Leave the plant alone until it regrows all of the removed tissue, however long that takes. In some places, this can take more than a year.

All rangeland plants evolved with defoliation, even severe defoliation under insect swarms, hail storms, and wildfires. Over the ages and around the world, grazing is the primary form of defoliation on rangelands. Grazing is integral to plant health but must be balanced with adequate rest periods. Plants respond to grazing by producing new growth, beginning a cycle that converts sunlight into biomass. But the process of generating new growth is taxing. If animals are not moved onto new pastures at the appropriate time, they will continue to eat their preferred plants as they produce new growth. This can prevent plants from recovering and eventually kill them.

These basic facts are why the timing of grazing is so important—to ensure that plants, once eaten or trampled, have time to recover. When done at the right times, grazing can strengthen and stimulate plants to produce even more tissue. If plants are allowed time to recover, then the initial damage of grazing has much the same strengthening effect as muscles torn down through exercise and then allowed to rest. Over time, the cycle between use and rest increases the ecosystem’s productive capacity.

The basic task of the rangeland manager, therefore, is to achieve a proper balance between grazing and recovery. And, like sailing, it is simple in the abstract but frustratingly complex in practice. Among the most important



parameters an experienced manager must account for are season of use (timing), length of use (time), and intensity of use (stocking rate). These factors help the rancher determine the duration of the rest plants need to recover.

Along with this comes the recognition that grazing during the growing seasons of plants has the most severe effect and most influences the need for recovery. When plants are actively growing, it is the growing points that are most likely to be grazed, which can have dramatic implications on a landscape. The active growing season is the only time that plants can make new leaves and recover from the demands of maintaining themselves through the dormant seasons, when the lack of water and temperatures don't allow them to use sunshine for photosynthesis. This active growing season is short, usually only May and June, and it is the only season of the year in which plants can store up nutrients to be used to maintain themselves during dormancy. Pastures that have been used during the active growing season have to be rested over this same period in subsequent years to ensure that they recover. The use or rest of a pasture during any other season of the year besides the active growing season is of little importance to long-term plant health.

The most critical insight from this basic understanding is that the timing of grazing is more important than the intensity or amount of use. This insight, however, runs counter to most federal grazing policies, which overemphasize stocking rates. As a result, the proposed solution to rangeland degradation is almost always to “de-stock.”

While this might be necessary at certain times and places, it is equally likely to be detrimental to rangeland health. Too much rest can be damaging to plant health. Old plant growth can begin to shade out young shoots, and plants begin to die from a shortage of sunlight. Strange as it may seem, intensive, short-term grazing might be exactly what's needed to rejuvenate plant health in some cases.

Today, federal rangelands are often considered to be in poor condition. But this is not because there are too many cows. In fact, the amount of livestock grazing on federal lands declined by more than half since the 1950s. Instead, a lack of understanding of the interactions between time, timing, and stocking rates is the primary reason federal rangelands generally remain in bad shape.

THE SEXTANT AND THE COMPASS

And here lies the crux of the great debate over the western range: We lack the tools necessary to measure our position on the Sagebrush Sea and to objectively assess the effects of our management practices. In essence, we lack a sextant and a compass that can accurately gauge the swells and tides of an ever-changing ocean. Such tools would assure a flow of information that would allow sailors of the Sagebrush Sea to adapt and improve in the face of new conditions and new demands upon the land.

Until recently, our ability to measure and monitor changes on rangelands have been limited in time and space. Traditional field-based monitoring is not done frequently enough or on a large enough scale to account for the tremen-

dous variations on this ever-changing sea. As a result, our policies are focused on inputs rather than outcomes—the number of livestock grazing rather than measurements of vegetation, water quality, and other public benefits provided by western rangelands.

I have spent the last 18 years developing a monitoring assessment technology that uses high-resolution photography and remotely sensed imagery to evaluate rangelands and their responses to specific management practices. The assessment protocol, recently published in the journal *Ecological Indicators*, models the percent of bare ground, shrub, and other vegetation cover across sagebrush landscapes in the West. It provides accurate information on rangeland conditions at scales ranging from millimeters to kilometers across multiple decades, costs one-tenth the amount of traditional methods, and can be readily assessed by computer or smartphone.

This technique has great potential to help us understand land cover change and rangeland health in a way that had not been available before. Ranchers can use this method to evaluate past management practices based on their effectiveness in altering basic cover components of rangelands. They can also develop improved management strategies, providing a valuable tool to assess public grazing allotments for land health, or even to gauge habitat quality for threatened species like the greater sage grouse.

This protocol vastly improves upon our current field-based monitoring techniques, which are used to measure individual plant species on a small plot and extrapolate the findings over enormous landscapes. Assessing rangeland conditions at a landscape level consistently is the only legitimate way to understand the effects of land management decisions. This feedback system, combined with a manager's experiential knowledge of the landscape, allows managers to regularly assess conditions and chart a proper course on the Sagebrush Sea.

FUTURE VOYAGES

Today's rangeland assessment methods are flawed because they fail to recognize that nature is dynamic and, at times, reliant upon disturbances to promote health. Furthermore, many assessments of rangeland health are based on the outdated assumption that there is a "natural" plant community for each soil type. By knowing the correct endpoint, the theory goes, rangeland health can be assessed relative to its proper plant community. But these static endpoints are an illusion, and they have long been disputed in ecological science.

We lack the tools necessary to measure our position on the Sagebrush Sea and to objectively assess the effects of our management practices. In essence, we lack a sextant and a compass that can accurately gauge the swells and tides of an ever-changing ocean.

Flexible, results-based grazing policies are the only way to allow sagebrush captains sufficient latitude to navigate an unpredictable and variable environment and also achieve the results that the public cares about. We don't need to dictate how our rangelands are improved. We just need to determine the desired results, establish the proper incentives, and step back to give rangeland managers the flexibility to achieve those results on their own.

We now have the tools to measure important land health characteristics in great detail across time and space. We can formulate precise and measurable goals for our rangeland ecosystems—whether it's more riparian area, fewer wildfires, or more sage grouse. Ranchers can then figure out how to best achieve these goals. The simplest incentive is to allow ranchers to implement the practices best suited for the dynamic landscapes they inhabit, while holding them to objective, measureable outputs that ensure the rangeland conditions we care about are provided and protected.

This is possible today. But there needs to be regulatory flexibility to achieve these goals, given the tremendous unpredictability and dynamics of the Sagebrush Sea.

It is time for a serious examination of the state of modern rangeland management on the Sagebrush Sea. New technologies to provide adequate feedback and flexible administration, coupled with the long-term view of the ranchers who live and work there, could offer the public the kind of management required to manage this vast resource. Ahead, full sail.



Gregg Simonds is an award-winning, internationally renowned natural resource consultant and ranch manager working in the western United States. His rangeland assessment technology was recently published in the journal *Ecological Indicators*.

Property Rights to Fish

When it comes to protecting fisheries, not all property rights are created equal.



A small fishing port in the Tauranga Harbour, New Zealand, which has operated its fisheries under the ITQs system since 1986.

Photo © Abaconda Management Group.

As I have noted before (2008), the world's fisheries are in decline. The problem, it is widely recognized, is the failure of traditional government command-and-control approaches to fisheries management. Faced with the collapse of their fisheries, many nations are instead switching to systems of property rights for fisheries, the most important of which are individual transferable quotas (ITQs). But as recent research by Corbett Grainger and Christopher Costello (2014) illustrates, not all property rights systems are created equal. Thus, not all are equally effective at protecting fish stocks.

New Zealand was among the first nations to adopt ITQs in 1986 and now uses them to manage commercial harvesting of 98 species. The United States began using ITQs not long after New Zealand, but has done so with

far fewer fisheries. More importantly, the property rights implicit in the ITQ systems of the two nations are fundamentally different.

In New Zealand, ITQs are viewed as perpetual rights to a share of the harvest; an ITQ is a legal asset that can be used as collateral in establishing credit with banks. In this regard, ITQ ownership in New Zealand is much like home or automobile ownership.

Matters are much different in the United States. Indeed, the governing federal law holds that quota shares "shall be considered a permit" that "may be revoked, limited, or modified at any time." This legal structure makes ITQ property rights insecure in the United States and creates uncertainty about the future of the program. One consequence: Owners of quota shares are generally unable to use their quota as collateral at banks.

Grainger and Costello devise an ingenious way to measure the relative security of property rights in ITQs. Many ITQ owners routinely lease their quota to other harvesters on a yearly basis, and sometimes sell them as well. Thus, both one-year lease prices and permanent sale prices can be observed. Someone who is leasing quota bears none of the risk of future changes in the ITQ program—unlike quota owners who must face that uncertainty. In New Zealand, where rights are secure, harvesters are willing to buy quota for an amount that is 12 times higher than the annual lease rate on that quota. In the United States, by contrast, harvesters will pay no more than half that much for quota. And because Grainger and Costello adjust for interest rates, type of species, and health of the fisheries in the two nations, these figures directly reflect the difference in the security of rights.

The impact of insecure property rights far transcends the inability of quota holders to get loans based on their property. Indeed, the insecurity threatens the health and future of the fisheries involved. Under catch share systems such as ITQs, government biologists set the total allowable catch (TAC) for each fishery—that is, the number or poundage of fish that may be harvested each year. Each ITQ owner is entitled to harvest a percentage share of the TAC. In a true property rights system such as New Zealand, harvesters play a pivotal role in helping the biologists set the appropriate TAC. In the conduct of day-to-day fishing, harvesters acquire the latest information on the state of the fishery. When ITQs are true property rights, harvesters have the incentive to communicate their knowledge to the biologists, and to cooperate with them to ensure a TAC that yields a healthy long-term fishery. In New Zealand, for example, it is not uncommon for harvesters to insist on a lower TAC than that originally called for by government biologists.

Incentives are different when property rights are insecure, as they are in the United States. Although the “quasi-rights” to ITQs here are far better than the command-and-control systems they replace, they are not as effective as the New Zealand system. Compared to New Zealand, owners of ITQs in the United States have less to lose if the future health of the fishery declines. Thus, harvesters have less incentive to push the biologists to set a TAC that is best for the long run. Instead, they have an incentive to push

When ITQs are true property rights, harvesters have the incentive to communicate their knowledge to biologists and cooperate with them to ensure a healthy fishery.

for a higher TAC, one that generates more profits now, but possibly at the expense of the future health of the fishery.

Make no mistake: Even the insecure rights of the current ITQ system in the United States are far superior to command and control. But enhancing the security of rights by modeling the property rights more closely after the New Zealand system would increase the health of fishing stocks, reverse fishery collapse, and enhance the economic viability of commercial fishing. For those who think that healthy fisheries are a key element of a healthy environment, the correct policy direction here seems obvious.

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Redefining the Waters of the United States

The EPA's new water rule could discourage private conservation efforts.

The Environmental Protection Agency and U.S. Army Corps of Engineers have issued a new definition of “waters of the United States” (WOTUS). This definition is important because it defines the scope of the agencies’ regulatory jurisdiction under the Clean Water Act. The Act authorizes the regulation of activities that may pollute the nation’s “navigable waters,” which are, in turn, defined as the “waters of the United States.” The more expansive the WOTUS definition the agencies adopt, the more authority they have over private land-use decisions.

The new definition was prompted by the failure of prior agency definitions to withstand judicial review. In 2001, and again in 2006, the U.S. Supreme Court rejected the agencies’ overly expansive notion of their own jurisdiction. Authority to regulate activities touching upon “waters of the United States” is broad, but not infinite, the Court ruled, and must ultimately connect to the nation’s navigable waters. Already multiple suits are pending in federal court challenging the new WOTUS definition for failing to heed this guidance.

The new definition seeks to reclaim much of the regulatory jurisdiction cut back by the Supreme Court. The underlying premise of this definition seems to be that the Army Corps and EPA best fulfill their environmental missions by casting the widest net possible. Maximizing environmental conservation under the Clean Water Act, the theory goes, requires maximizing federal regulatory authority.

Yet more regulation does not always translate into more conservation, particularly if regulatory resources are spread thin and applied in an unfocused manner. By expanding regulatory authority, the agencies may crowd out potentially complementary efforts by state and local governments and conservation organizations.

Consider the case of wetlands, which are subject to the Clean Water Act under the new WOTUS rule insofar as they are adjacent or otherwise connected to navigable waters and their tributaries. If federal regulation does

not cover all wetlands—and it does not—other steps are necessary to maximize wetland conservation. Yet conservation groups and state and local governments cannot know where their efforts are most needed if they do not know where federal regulatory authority ends and the need for additional efforts begins.

The expansion of federal regulatory jurisdiction also threatens to penalize and discourage conservation efforts more directly. Among other things, the Clean Water Act prohibits the discharge of pollutants, defined to include clean “fill material” such as dirt, in the nation’s waters without a permit, and the WOTUS rule defines waters to include many wetlands. This means that even the most

well-intentioned conservationists may need a federal permit to undertake ecological restoration on private land. Why does this matter? Because obtaining such permits can be costly and time-consuming—and failure to comply can bring criminal penalties. And as has been shown in the context of endangered species, excessively punitive regulations can discourage voluntary conservation on private land.

To the extent that the new WOTUS rule subjects private conservation efforts to federal regulatory control, it may discourage private conservation. There are more than 100 million acres of wetlands in the United States, and approximately three-fourths of these are on private land. This means that insofar as federal regulatory efforts discourage private conservation, they can have significant, unintended consequences. The unrestrained expansion of regulatory jurisdiction may be good for federal agencies, but it’s not always good for conservation.

The unrestrained expansion of regulatory jurisdiction may be good for federal agencies, but it’s not always good for conservation.



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Bringing the Sharing Economy to Private Land

Want public access to private land? There's an app for that.

Not a day goes by without someone bemoaning the lack of public access to private lands in the West. Gone are the good old days, many say, when landowners welcomed visitors. Today, it seems like there are “no-trespassing” signs across every gate and orange paint on every fence post, blocking access to fishing, hunting, and other recreation opportunities on private lands.

Why are landowners so reluctant to provide public access? The problem might be that we just haven't figured out a simple and effective way to contract with them.

That might be changing. Consider the sharing economy, which is revolutionizing the way we tackle similar problems elsewhere. From Airbnb and Uber to countless startups in between, entrepreneurs are finding new ways to “rent” underused assets such as vehicles and spare bedrooms. Technology reduces the transaction costs between suppliers and demanders, making sharing easier and cheaper than ever before.

The challenge is to build a platform that creates trust between users. On Airbnb, homeowners invite complete strangers into their homes. On Uber, drivers shuttle around people they don't even know. Online reviews, ratings systems, and background checks provide assurances for both sides, fostering trust among suppliers and demanders.

The same is possible with public access in the West. Imagine if, with a few taps on your smartphone, you could rent access to a local property, book a fishing pass to a neighbor's spring creek, or lease short-term hunting access on a nearby ranch. Landowners could enroll, define certain conditions and limits, and gain assurances that their property would be respected. In the process, they could diversify their incomes and have greater incentives to conserve their land.

To some extent, this is already happening. Hipcamp, a venture capital-funded startup, is providing camping opportunities on private lands. The company has about 60 landowners enrolled, with prices ranging from \$30 to

\$300 per night. Likewise, a college student in Michigan is creating a land-sharing app, called Rod, Gun, and Bow, that would allow hunters and anglers to lease private land on a short-term basis.

All across the West there are potential suppliers of outdoor recreation opportunities. Most are not opposed to public access. They simply don't want their private land open to everyone, just like homeowners on Airbnb don't want just anyone sleeping in their spare bedroom. Landowners, like all property owners, need to have some control and protection against damages. The sharing economy can provide that.

Thought of in this way, the public access issue is not about greedy landowners locking up the West. It's about finding the right ways to contract with landowners to reduce the risks of allowing access.

This is a radical departure from the ways we typically approach public access issues. Here in Montana, we pass laws that mandate stream access on private lands and often penalize landowners who don't allow public hunting. But these approaches

can backfire, straining relationships with landowners and making them even more reluctant to allow access.

So, instead, what if we took an Uber approach to public access in the West? What if we stopped complaining about the good old days and started trying to solve the problem? The West, and the people who share it, would be better off for it.

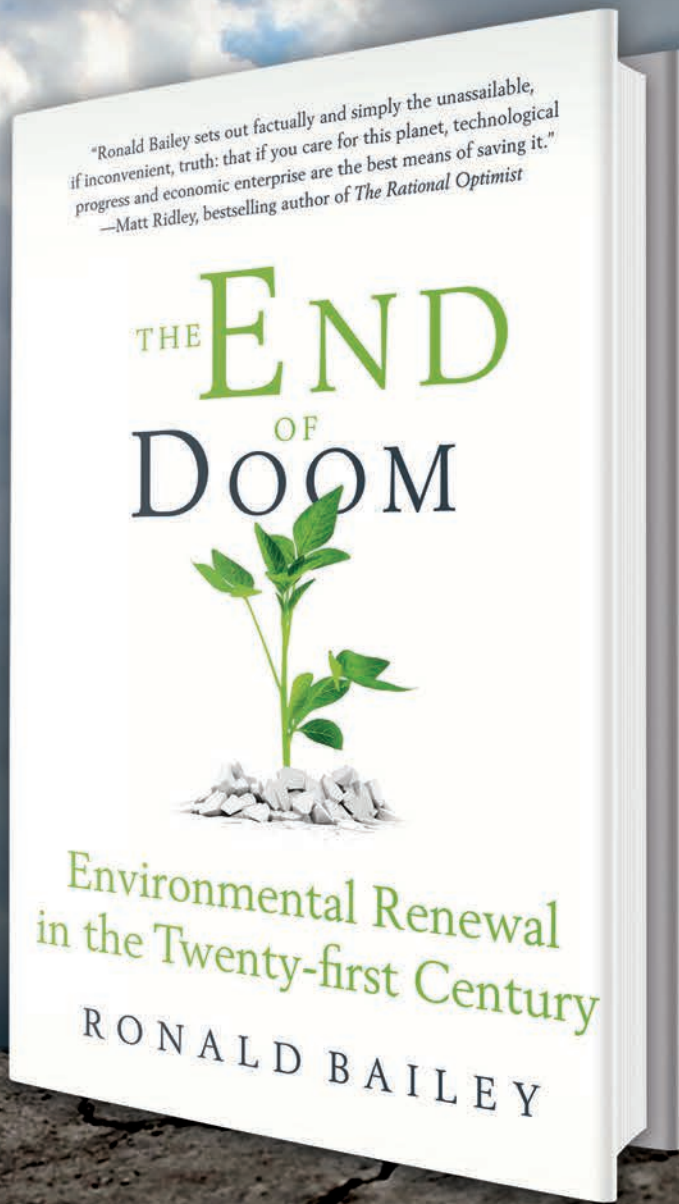


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