

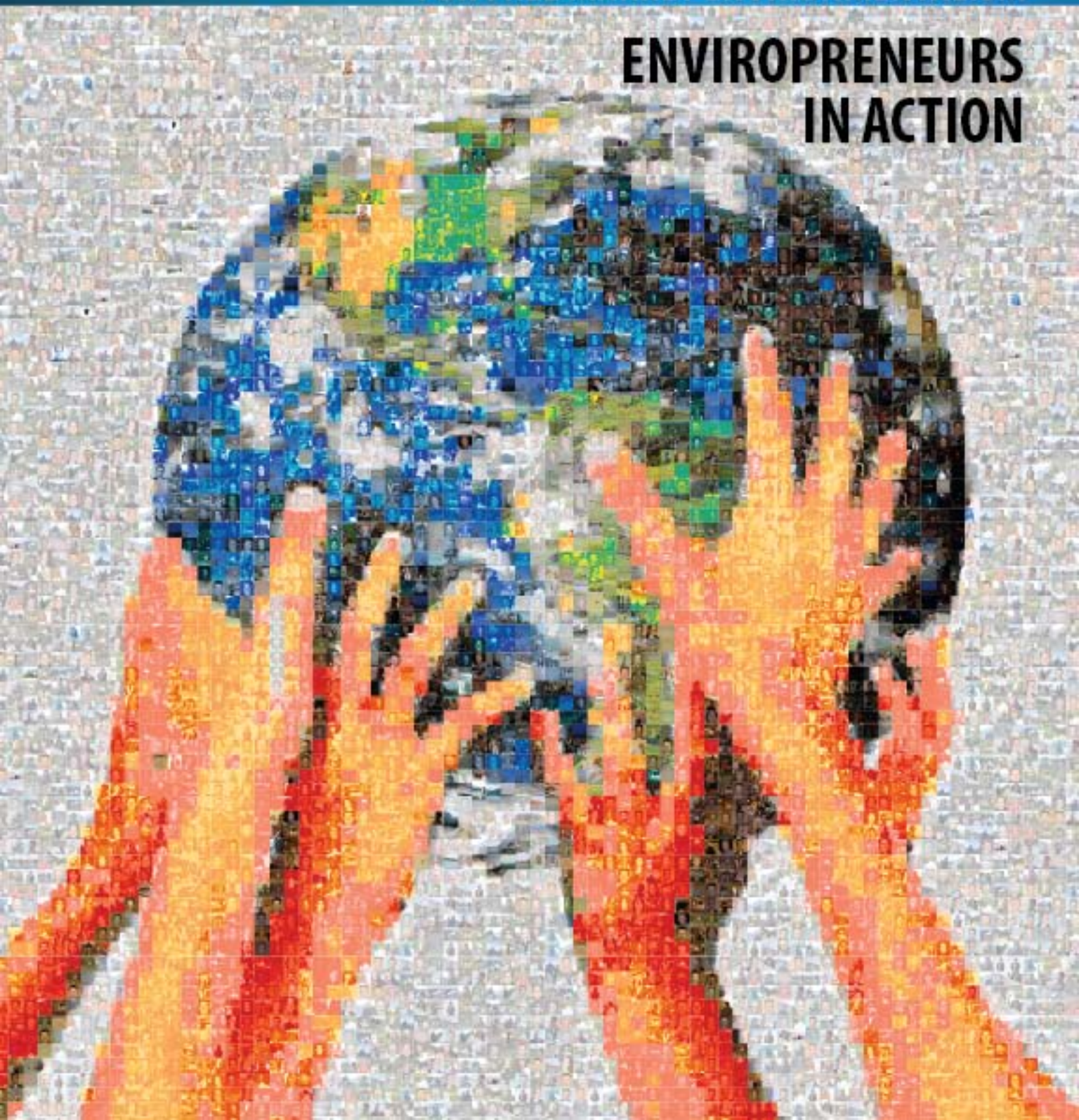
Enviropreneur Issue

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PERC REPORTS

FOR FREE MARKET ENVIRONMENTALISM

**ENVIROPRENEURS
IN ACTION**





FROM THE EDITOR

BY LAURA E.
HUGGINS

PERC, the Property and Environmental Research Center, is a nonprofit institute dedicated to improving environmental quality through markets.

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Think tanks are accused of being preoccupied with ivory tower ideas rather than real world problems. With the help of PERC's 150 enviropreneur alumni we have a ground level perspective. As you will see in our fourth annual enviropreneur issue, this vantage point helps PERC test the merits of free market environmentalism and create tools to further improve environmental quality.

Speaking of ivory towers, PAUL SCHWENNESEN recently returned from Harvard to raise cows on his family ranch in Arizona. With an innovative business model combining management intensive grazing, grassfed hormone-free beef, and no middleman, he is proving that ranching can still be a rewarding way of life.

As program director for water and policy implementation for the Western Governors' Association, TOM ISEMAN has teamed up with water users in Colorado to explore how a water bank would work to help avoid a looming water crisis. Ultimately, the bank could protect high-value water uses in growing cities and sustain senior water rights in traditional agriculture.

TODD GRAHAM, manager of Madison Valley Expeditions, is turning a liability (wildlife) into an asset (profit) for ranchers. A conglomeration of ranches are allowing tourists onto their land for a unique western experience—the more guests a rancher hosts, the more they get paid.

Seagrass is considered the canary in the coal mine for estuaries. When pollution leads to the darkening of a bay's waters, sunlight-deprived seagrass is the first victim. The reverse is happening in Sarasota Bay, thanks to the help of people like KELLY WESTOVER with the Sarasota County Government in Florida.

TODD GARTNER, a consultant to the American Forest Foundation, is developing a market-based habitat credit trading system to circumvent the need to add the eastern gopher tortoise to the Endangered Species list. If this scheme works, precompliance credits will be less expensive than compliance credits and more habitat will be conserved.

Like the rugged cowboy roaming the lonely plains of the American Wild West, the untamable gaucho is embroidered into the fabric of the Argentine consciousness. But South America's grassy rangelands are turning into a desert and drying up the sheep ranching industry at the same time. CARLOS FERNANDEZ and ANDREA NOGUÈS, with the Nature Conservancy, are embracing opportunities to work with local landowners to implement long-term conservation strategies.

Thanks to the help of JULIE MORGAN, executive director of the Upper Columbia Salmon Recovery Board, orchardists in Washington plan to save endangered salmon and make money by getting paid to grow fish rather than fruit.

As TERRY ANDERSON discusses in "On Target" this year marks the ten-year anniversary of PERC's Enviropreneur Institute. PERC has witnessed graduates of this program make, manage, and market environmental deals around the world. We are looking forward to seeing what's in store for the next decade!

Laura E. Huggins

Laura E. Huggins EDITOR



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enviropreneur story?

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and share.

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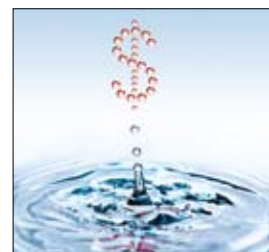
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Teaching kids what to think is a problem

Holly Frewtett's article, "Environmental Education: The Science of Fear" in the Winter 2009 issue of *PERC Reports* is wonderful. Fretwell succinctly states a very fundamental problem with our education system. "Using the science of fear teaches people what to think, not how to think." This captures the essence of today's primary and secondary education and is not only appropriate to environmental education, it could be applied to many other areas of primary, secondary, and even higher education. I am especially struck at how her commentary would apply to the field of economic education, a field in which I have a particular interest. I am also struck with the idea that this article could be expanded into a book about contemporary education in general. Thanks for writing it.

—Jim Remmert
Boulder, Colorado

Enjoying the dirt, bugs, and sun

I read the most recent *PERC Reports* from cover to cover. As mostly a stay at home mom of two, this issue was relevant to my life in so many ways. Thank you for the inspiration to keep my kids outside with the dirt, the bugs, and the sun. While we own many green propaganda books (*Gumfounded* is my favorite), I found "Scary Green Monsters" very compelling. Teaching our kids how to think is a lost art and sadly not found in many schools either. I'm devoting the rest of my day to asking "why" just like my 4 year old.

—Amanda Thimmes De Rito
Ashton, Idaho

Disney Corp and Park Stewardship

Brian Yablonski writes in "The National Parks: America's Best Idea Made Better" that public control can be effectively combined with private interests to secure the viability and beauty of our National Parks. I disagree. This is a gross creature of a "mixed economy," where no one truly enjoys or controls the parks except government bureaucrats. Yablonski claims that gateway communities benefit from their proximity to National Parks. This is true. However, he makes the common mistake of not seeing what didn't happen, and what would have happened if the government did not "own" the Parks. What he does not see is that local businesses would thrive even more with completely private ownership of the Parks. Yes, the Disney Corporation would indeed do a better job of park stewardship. . .

Having said this, I can't wait to view Ken Burns' documentary "The National Parks: America's Best Idea." Even though it is an awful idea, and even though PBS is another government-run propaganda mill financed by many unwilling taxpayers, I'm sure Ken Burns will portray the full glory of these publicly owned gems. It will probably be less frustrating and a lot cheaper than visiting my nearest National Park.

—Maria Folsom
East Glacier Park, Montana

Tell me what you think!

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Enviropreneurs Expunge EXTERNALITIES

Wikipedia—**externality**: an impact on a party that is not directly involved in the transaction.

PERC—**enviropreneur**: a person who has no patience for externalities.

For several years, I have been on a campaign to expunge the term “externality” from the vocabulary of economists, policy makers, and environmentalists. My campaign is not motivated by a belief that markets perfectly account for all costs and benefits. Rather it is driven by the lessons learned from entrepreneurs—people with a passion for solving problems by finding win-win solutions. Indeed, entrepreneurs thrive in the space where there are impacts not accounted for in market transactions. It is in that space that they create gains from trade.

Consider the example of irrigation water withdrawals reducing stream flows for fish habitat. Viewed through the externality lens, trout fishers might argue that farmers are imposing costs on them and that the government should regulate water use. An environmental entrepreneur, however, sees an opportunity to convince trout lovers to contribute to the cause and to contract with farmers to increase instream flows.

Or consider the desire for open space. Through the externality lens, demanders of open space might say developers are imposing costs on them by building houses and that land use regulations are necessary. Land trust enviropreneurs, on the other hand, accept the landowner’s right to develop and obtain conservation easements to determine future land use.

There is a big difference between the externality approach and the entrepreneurial approach to improving environmental quality. Asserting the existence of an externality pits one user of a resource against another in a zero-sum game where property rights are not clear. California’s Mono Lake is a quintessential example. In the early 1980s, environmentalists filed suit to stop Los Angeles from diverting water out of the Owens Valley even though the city had purchased the water by buying farmland and its accompanying water rights. The environmentalists “won” the suit, but

it was not until the late 1990s when the legal wrangling ended and some water started flowing back into Mono Lake.

In contrast, entrepreneurship encourages conflict resolution and results in positive outcomes for all parties involved. Chris Corbin, a PERC enviropreneur fellow, epitomizes entrepreneurship. His firm, Lotic, increases cash flows by encouraging efficient water use, by protecting and maximizing the value of water rights, and by developing water projects with ecological benefits (see www.perc.org/articles/article1120.php). Rather than promoting conflict like that in the Mono Lake case, Corbin utilizes cooperation to keep more water in streams.

Free market environmentalism focuses on who owns the environment. When property rights are well defined and enforced, markets can work their magic. When property rights are not so clear, environmental entrepreneurs who clarify them do good for the environment while doing well for themselves.

Elinor Ostrom won the 2009 Nobel Prize in Economic Sciences for her work recognizing the role that local entrepreneurs play in eliminating the “tragedy of the commons.” Whether it is forests, fisheries, pastures, oil fields, or irrigations systems, Ostrom provides examples of entrepreneurial institutions that resolve conflicts by defining and enforcing boundaries and sanctioning those who violate those boundaries.

Now in its 10th year, PERC’s Enviropreneur Institute has used the principles enumerated by Ostrom to enhance the abilities of more than 150 environmental entrepreneurs. These enviropreneurs are skilled at clarifying and marketing property rights. To them there are not environmental problems caused by externalities, but environmental opportunities enhanced by property rights and markets. The more they can replace externalities with entrepreneurship, the more we will see conflict replaced with cooperation and environmental rhetoric replaced with environmental improvement.

In “On Target,” PERC’s executive director TERRY L. ANDERSON confronts issues surrounding free market environmentalism. He can be reached at perc@perc.org.



GRASSFED BEEF

and the Politics of “Local”

BY PAUL SCHWENNESEN

“Local,” they say, “never goes out of season.” The people making this claim usually drive expensive hybrids and consume above average quantities of whole-grains, but they nevertheless have a point. The counterpoint, however, is subtly delivered in weekly specials of “89 cents a pound!” and is made by well-rounded grocers driving SUVs. They also have a point. Like all catchphrases they both ignore some important truths. At Double Check Ranch, we’re caught between the two as we fervently try to discover the proper balance among pragmatic economics, sustainable stewardship, and our own personal pursuit of happiness. And you thought we just raised cows.

BACKGROUND

As a way to counter an often fickle, steadily worsening cattle market, our family began direct marketing grassfed beef 14 years ago. My mother and father patiently pioneered Tucson’s earliest farmers’ markets, diligently explaining the benefits of grassfed beef to people who assumed that all cows ate grass all the time. Now, a decade and a half later, my wife and I are trying to meet the increasing, dare I say *insane*, demand for local grassfed beef. In the process we’re hoping to demonstrate a sustainable new model for family-scale ranching.

Our operation is unique in that we own the entire beef cycle. From “pasture to palate,” we control every aspect of the product our customers eat. We raise cattle on twelve thousand acres of Arizona/New Mexico range, finishing them on irrigated pasture along the San Pedro River north of Tucson. After finishing, we slaughter and process right on the ranch in our own state-inspected packinghouse, which enables us to control the critical final stages of beef production.

At Double Check

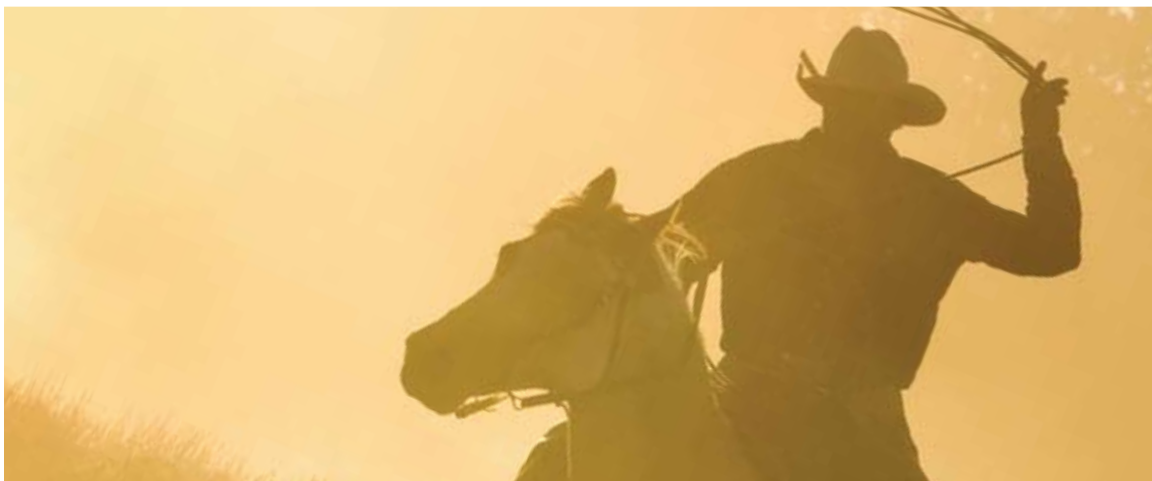
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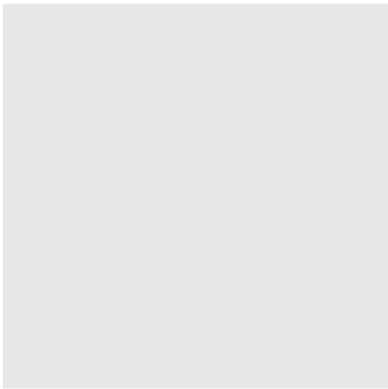
This vertically integrated process more than doubles the per head return of a standard cow-calf ranching operation, allowing us to contemplate stewardship projects that might otherwise go undone and to focus on the things that make us happy. It's too early to call our model lucrative, but it certainly appears to be financially and emotionally sustainable.

ECONOMICS

"Ah," the flinty-eyed economist in you says, "but isn't your scale of production terribly inefficient, supported only by the bubble-heads infatuated with local food?" And you're right; I would be the first to admit that this particular method of converting solar energy into cash flow is subject to the whims of a health- and eco-conscious clientele. But frankly, I'll take my chances with the whims of a clientele I can see and know over a clientele that insists on ninety-nine cent Whoppers for two decades in a row. For years now, corporate cattle buyers have been offering lower prices even as they grow feedlot production and processing systems beyond any resemblance to the picture-perfect farms they display on their packaging. In 1970, a pound of beef cost nearly five adjusted dollars. Now it costs two. In 1970, a rancher could buy a new pickup (the standard western asset index) with 15 steers. Now it takes 44.

As to clientele, I have to say that the genuine appreciation we get for our product is a large part of our compensation package. Our customers are *interested* in what they eat, justifying their purchase on far more than price-point.





They love the proximity of their food production, they love their connection to it, and they are willing to pay for our lack of economies of scale. I suppose it's somewhat akin to the hunter who, if he actually breaks it down, finds he's "paid" \$35 a pound for elk meat. What you eat is about more than just shelf price.

And speaking of economics, one of the creative joys in this business is the entrepreneurial pursuit of turning liabilities into assets. To paraphrase British economist Lionel Robbins, economics is about finding alternative uses for scarce resources. We've turned a horrible, disgusting problem of offal disposal into rich, high-octane compost. We've turned beef fat from a health hazard into biodiesel that runs our trucks and tractors. We've turned old fence wire into absurdly high-priced Christmas wreaths. And on and on. I suppose "industrial" beef operations do an even better job of utilizing every ounce of a beef carcass by selling every scrap and drop to the highest bidder, but I doubt they have as much fun.

SUSTAINABLE STEWARDSHIP

Sustainable stewardship is one of those wince-inducing phrases that means all things to all people. For us, it means profitably harvesting a wholesome food source with practically no external inputs beyond sunlight, water, and our own energy; an activity that can reasonably be expected to continue unchanged for generations to come.

Our stewardship begins by countering the common misunderstandings that livestock are destructive toward landscapes and that their impacts should be limited or mitigated by agencies with the wisdom and resources to control them. Viewing livestock as an inherently destructive force to be minimized entirely ignores the well-established relationship between herbivory and

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grassland ecology. Grasslands, and to some extent riparian and forest systems, have co-evolved with grazing ungulates and generally respond positively to periodic tissue removal. To be sure, livestock impacts can be detrimental, but the overgrazing effects that can lead to landscape denuding, erosion, and biodiversity loss are not a factor of livestock activity or numbers per se. Rather, they result from the mismanagement of that livestock.

A landscape's ecological health is dependent on rest as well as grazing, and it is vitally important that livestock impacts be concentrated, pulsed, *and removed* after the impact. These concepts were articulated by Allan Savory more than twenty years ago in his book on *Holistic Resource Management* and have had remarkable success around the globe, turning barren landscapes into vibrant grasslands, improving watershed rainfall effectiveness, and restoring biodiversity. In short, managed grazing, which capitalizes on a natural structure of concentrated grazing followed by established rest periods, can turn livestock into an ecological asset rather than a necessary evil.

But are we “green?” Another wince. People who emotionally relate to our way of life commend us for our “greenness” all the time. Calling someone green used to lead to gunfights out here, but now it means we can charge more. I doubt if we’re as green as they think. People are terribly excited about the notion of “food-miles,” the premise that the fewer miles food travels to reach one’s mouth, the better. This may resonate in some quaint corner of our minds, but I doubt that the carbon footprint a pound of my beef creates in traveling to Tucson towed in a diesel pickup (biodiesel notwithstanding) is significantly lower than a pound of Uruguayan beef traveling by shipping container.



Still, far be it from me to dissuade people from their madness. . . If being green means that we produce our beef without relying on taxpayer funded, artificially cheap corn feeds; without externalizing our costs into local aquifers and impinging on our neighbor's property with obnoxious noise, dust, and pollutants; then I guess we're "green." I care deeply about the landscape that supports me, in part because my good management benefits *me*, not Mother Earth. Maybe it's not politically correct, but brazen self-interest (well understood) is the only way to make the world a better place.

PURSuing HAPPINESS

Paraphrasing Madison, every question is one between freedom and security. In our general pursuit of happiness, we confront this dichotomy more intimately, perhaps, than most. Giving up a comfy, predictable, well-paid lifestyle for one that depends wholly on one's own wherewithal is a truly frightening thing. But freedom is a strong incentive, and we now allocate our time and energy to whatever *we* deem best. We eat our meals as a family; we play and work outside; we read, ride horses, play the piano, watch chickens, and go for walks when we want to. Of course, we aren't on vacation all the time, far from it. We work longer days doing harder labor than ever before. Being free from the direct caprices of bosses and bureaucracies does not mean you are free from want or from the necessity to feed and clothe one's family. Inevitably we find ourselves stressed and unhappy at times. But there seems to be a big difference when pressure comes from within.

I care deeply about the
landscape that supports me,
in part because my good
management benefits *me*,
not Mother Earth.





Family members of the Double Check Ranch

All in all, I suspect that we've found our own particular version of Aristotle's "middling way," while attempting to negotiate the balance between excess and deficiency. I wouldn't congratulate ourselves for doing this intentionally; we bounce through the ruts like anyone else. But I must confess a certain contentment of spirit, an appreciation for what we craft that I suspect is lacking in many lives.

Anyway, this has become a far preachier article than I had intended. I like what I do, I find myself doing it even on "days off," which is probably a good sign.

At the end of the day, the model of sustainable ranching that we promote is by no means perfect. It's costly to consumers, it's physically and financially demanding for producers. But if nothing else, it is *honest*; the costs are a direct reflection of the necessary inputs. We live in intimate proximity to the processes that give (and take) life. We, in turn, give back to the land, leaving it richer and more fecund than we found it. As long as we have consumers who value that, our business will thrive.

More online at www.doublecheckranch.com



PAUL SCHWENNESEN manages Double Check Ranch with his wife Sarah. After graduating from the U.S. Air Force Academy and separating as a captain, he received a master's degree in government from Harvard University, something that impresses the livestock not at all. He is a PERC Enviropreneur Institute graduate and can be reached at schwenneisen@mac.com.

In Praise of THE 10,000 MILE DIET

The *100-Mile Diet*, inspired by Alisa Smith and J.B. MacKinnon who participated in a one-year experiment in local eating, led thousands of individuals to change the way they eat. “Eat local” has become a mainstream mantra of those who claim that increased local food production and consumption have significant economic, environmental, and social benefits. Although its original goal was to support local culinary and agricultural initiatives, this movement is now promoting increased local food purchases by public institutions such as schools, hospitals, and prisons as well as banning the conversion of agricultural land to other purposes. While no one denies that local farmers’ markets are pleasant places, the alleged larger benefits of the locavore philosophy are mythical.



MYTH 1:

Eating locally produced food reduces our environmental impact.

Facts: *Productivity differences:* Locavores ignore that some locations are better suited to produce certain types of food than others. Peru, for example, is the largest fresh asparagus exporter in the world because of warm weather, loose soil, and abundant agricultural labor. As a result, Peru's asparagus yield is 2.5 and 3.7 times higher than in China and the United States. This insures that while Peruvian asparagus are air freighted to the United States, their overall input and energy requirements are actually lower than that of the U.S. grown asparagus displayed next to them.

Production technologies matter: "Food miles" refer to the distance food travels from farms to retailers. In the American case, the food production stage (planting, irrigating, harvesting, using heated greenhouses, applying fertilizers and pesticides, etc.) contributes far more greenhouse gas emissions (83%) than the food miles segment (4%). Therefore, the resources needed to produce food matter a lot more than how close a production venue is to consumers. As a rule, the alleged energy savings attributable to increased local purchases is dwarfed by the additional inputs required in less productive locations. Turning our backs on the global food supply chain for increased reliance on less efficient local producers implies a huge waste of resources.

MYTH 2:

Local food is inherently safer.

Facts: *There is safety in numbers:* Locavores tell us to put all our food sources in one local basket. All types of agricultural productions and locations, however, suffer from bad years because of factors ranging from poor weather to pest or fungus infestations. Relying on multiple foreign suppliers insures a more stable and affordable supply than would otherwise be the case.

Food safety and quality lay golden eggs: While locavores typically distrust big agri-producers, distributors, and supermarket chains, no business can survive without delivering safety and quality. Not

surprisingly, big supermarket chains that buy directly from producers insist on rigorous standards in both the developed and less developed world. Paradoxically, most of the food sold at local farmers' market does not undergo the same kind of scrutiny.

MYTH 3:

Local food promotes economic growth and social justice.

Facts: *Expensive local food harms the local economy:* The number of U.S. farmers' markets has almost doubled in the last decade, but most of the items sold in these venues are much more expensive than in regular grocery stores. In our modern economy, nearly 99 percent of people are food consumers, not producers. The more money is spent on expensive local food, the less money is available for other items and services. Vibrant local economies are not built on "feel good" charity, but on their capacity to produce marketable items.

Buy local policies harm the development of less advanced economies: Encouraging the purchase of uncompetitive local products benefits some farmers in advanced economies at the expense of agricultural producers in less developed countries whose economic development depends on their capacity to export agricultural products. Furthermore, farmers in less developed economies typically use less inputs (other than human labor) than their competitors in advanced economies, thus ensuring that their products have a lower carbon footprint.

In short, the best way to reduce the carbon footprint of agricultural production is to produce food where it can be done most efficiently and to engage in international trade. Selecting food based on its affordability, availability, and quality is a better way to help the planet than focusing on food miles.

HIROKO SHIMIZU, a visiting research fellow at PERC, is most recently the author of articles on food security issues published in the *National Post* and *Reader's Digest* and the coauthor with Pierre Desrochers of "Yes We Have No Bananas: A Critique of the 'Food Miles' Perspective." She can be reached at hshimizu50@hotmail.com

 Submit your *Impressions* of markets and the environment to: Laura@perc.org

Banking on Colorado Water

BY TOM ISEMAN



Members of the Colorado River Commission

The drought of 2002, and the dry years following, forced Coloradans to open their eyes to the real threat of the lower Colorado River Basin states demanding more water from the upper basin. A call for more water from Arizona, Nevada, and California would affect Front Range cities, agricultural communities, ski resorts, and energy development across Colorado. The consequences could be dire. But they don't have to be.

Pundits have long predicted the emergence of markets to reallocate water in the West. Water is a limited commodity, and the rapid growth of the West is only increasing competition for new supplies. Markets are the ideal tool to allocate scarce resources. So when water users in western Colorado confronted perhaps the biggest challenge to the future security of water use in Colorado—a curtailment of water under the multi-state Colorado River Compact of 1922—they envisioned water markets as a key component of the solution. In fact, they proposed a Compact Water Bank to respond to a potential curtailment.

But it is not so simple. Water markets have failed to gain widespread traction in the West. Even in Colorado, which has one of the most active water markets,

efforts to scale up and institutionalize water markets have struggled. In 2001, for example, when the state legislature authorized the Arkansas River Water Bank, hopes were high; but nine years later, there has not been one transaction through that bank.

A variety of factors confound the establishment of water markets in the West. Transaction costs to quantify and legally transfer water are significant. Many parties with direct (downstream water users whose water rights would be affected by a transfer) and indirect (boaters and fishers who recreate on local streams) interests in water can enter into transfer proceedings. The western heritage and culture in rural agricultural communities often resist transfers to growing cities. And perhaps most importantly, water in the western United States stubbornly defies commoditization due to the variability in hydrology, location, and priority of water rights. Progressive water users in Colorado are seeking ways to resolve these challenges and to employ markets to address the challenges of a new century.

LOOKING BACK

There's a long and rich history of the Colorado River. From a water manager's perspective, one salient feature is that the vast majority of water originates



as snowpack in the Upper Colorado River Basin, so the hydrography favors the Upper Basin States, which include Colorado, Utah, Wyoming, and New Mexico. But in the early 1900s, the lower basin states were growing quickly, and under the prior appropriation doctrine, there was concern that they could lay claim to the majority of the water in the Basin. Both sides had an incentive to negotiate, so in 1922, the seven Basin states signed the Colorado River Compact to allocate the waters of the Colorado River Basin.

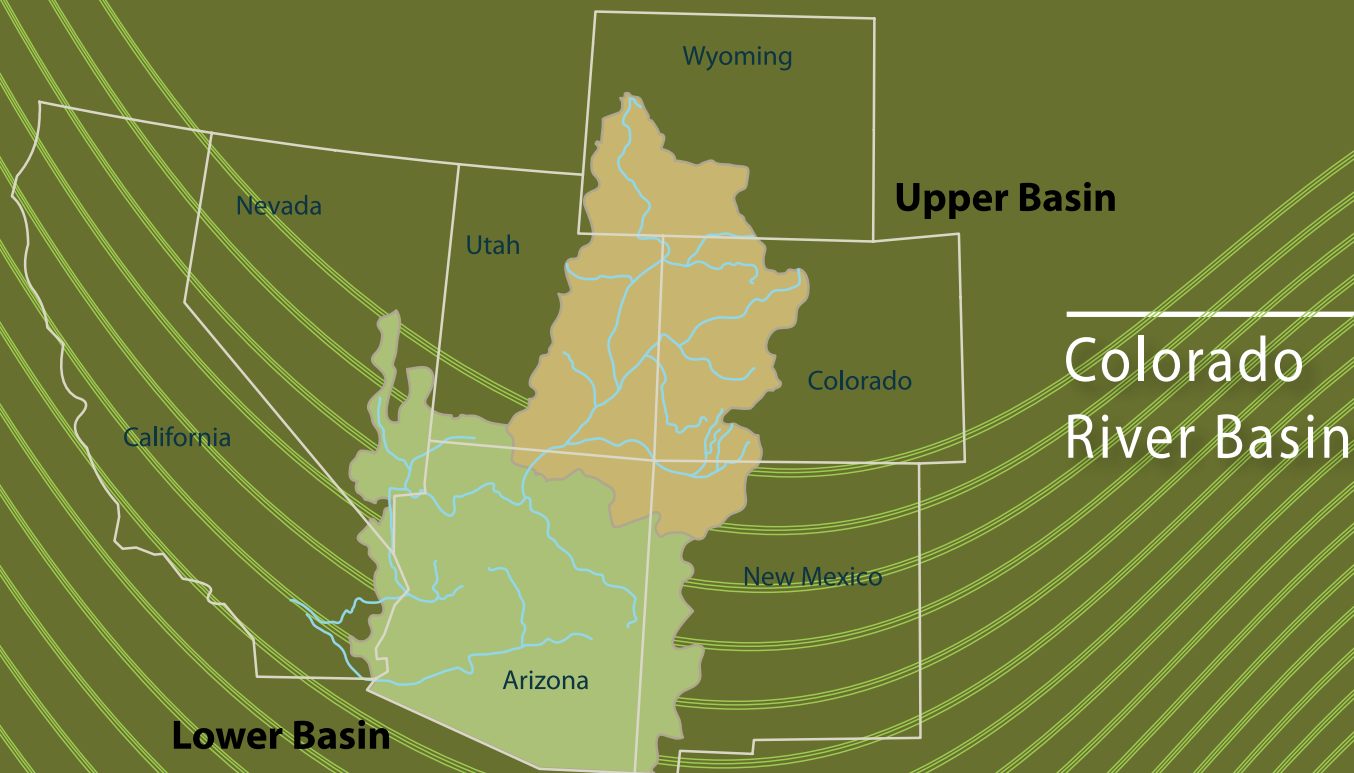
At the time, measurements indicated an average of 15 million acre-feet (MAF) of water annually at Lee's Ferry at the entrance to the Grand Canyon, the agreed upon measuring point. Essentially, they split that sum equally between the upper and lower basins. However, the Compact actually reads that the Upper Basin cannot cause deliveries to fall below 7.5 MAF on a 10-year rolling average. Thus the risk of low-flows resides with the Upper Basin.

As researchers developed a longer hydrologic record, it became apparent that 15 MAF was an overestimate of the amount of water in the Basin; current estimates place that number closer to 13.5 MAF. Couple this with concerns about climate change and models that show Lake Powell drying up, and the Upper Basin has been compelled to take a closer look at its ability to comply with the Compact.

This means the Upper Basin states may have to do more with less water, which is particularly pressing in Colorado due to the current allocation of water. We've all heard the maxim, "first in time, first in right." In Colorado, it means that the senior water rights, those least vulnerable to a compact curtailment, are in agriculture, which was the first major use to appropriate water. Many of the water rights for cities and resort communities are junior and would be the first to be curtailed. In essence, Denver, Colorado Springs, Pueblo, and the rest of the growing Front Range could be left thirsty.

INSIDE A WATER BANK

In the most basic sense, a water bank is an institution that uses free-market transactions to facilitate the temporary or permanent transfer of the rights to use water among water users. It does this by acting as an intermediary to bring together those holding legally valid water rights with those in need of additional water supplies. A water bank has a regular, transparent, institutionalized process for transferring water rights, which serves to reduce the confusion and costs associated with trading water. A typical bank also has a public sanction or purpose, for example, to alleviate the



impacts of water shortage in a basin. In short, the goal of a water bank is to move water to where it is needed most.

There is no common template for a water bank; the participants, purposes, and rules of a bank can be tailored to meet the unique needs of a situation. In a review of western water banks, Clay Landry, a former PERC fellow and director of WestWater Research, found water banking activity in 9 of 12 western states, much of which commenced in the early 1990s to early 2000s. As applied to the Colorado River, this means that a water bank could be used to respond to a Compact curtailment. A Compact Water Bank would provide an institution for post-1922 water users (those vulnerable to a curtailment) to establish agreements with pre-1922 water users (those most secure against a curtailment). In the event of a Compact curtailment, these agreements would allow the post-1922 water use to continue by committing to the downstream delivery of the pre-1922 water use. The agreements would all be through willing seller-willing buyer transactions.

INTERESTING BEDFELLOWS

The proposal for a Compact Water Bank has created some interesting bedfellows. I came to the

project from an environmental perspective while working as the Water Program Manager for the Nature Conservancy in Colorado. We had a long working relationship with many of the water users in Colorado. While relations were collegial, we were often coming at issues from different perspectives; for example, on instream flows, water quality, and mitigation for the impacts of diversions.

Given my long-standing interest in using markets to reallocate water, I approached the water users when they first floated the concept of a Compact Water Bank and offered free labor to the water users. I proposed to examine the economic and institutional aspects of a water bank. While the water managers are experts in hydrology, delivery infrastructure, and water law, economics is often a forgotten discipline. They took me up on my offer. Each time I've spoken in public on this project, I've said, "I'm employed by the Nature Conservancy, but on this project, I report to the water users."

The water managers were willing to explore new partnerships and new ways of thinking about water allocation in a future where water use in Colorado might be constrained by Compact limitations. For one, they agreed to let an environmentalist from Boulder, Colorado, help them develop their concept for a water bank. More importantly, water users from



western Colorado reached out to the cities on the Front Range to hear their views on how a water bank could protect critical uses of water.

For those not from Colorado, this was an unlikely partnership to say the least. While demarking a physical drainage divide, the Continental Divide is also culturally significant in Colorado, at least with respect to the culture of water. The water users on the West Slope proudly call themselves a “counter-irritant” to the cities that take water from western Colorado, and traditionally have done their best to thwart excessive diversions out of the Basin. Yet here they recognized the significant implications for the entire state and the need to engage prospective investors in a water bank.

Further, the water banking concept signals a new way of thinking about water in Colorado. The West Slope water users recognize the significant value they hold in their senior water rights. Not only can they do good by the state by participating in a water bank, but they can do well for themselves by extracting the highest monetary value for their water under a curtailment scenario. Yes, they still want to provide for the local economy and sustain the cultural heritage of agriculture in the West; but at the most basic level they are considering how to use market mechanisms to their advantage.

NEXT STEPS

There’s a lot of work remaining. The proponents of a bank need a better understanding of the hydrology, water rights, and curtailment scenarios. They need to develop a more detailed model for how the bank would work to facilitate transactions. Most importantly, they need to continue to do outreach with water users on both sides of the Continental Divide to build a broad consensus for a Compact Water Bank.

Despite these hurdles, the trends in the West will demand new institutions and creative solutions to share water among competing users. If markets are intended to allocate scarce resources to the highest-value uses, this is a perfect opportunity to put one in place. Yes, it took a crisis. Yes, we’re a long way off. But a success here, at this scale, with these partners, and with so much at stake, could provide a model for water markets throughout the West.



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ECONOMIST, n. A scoundrel whose faulty vision sees things as they really are, not as they ought to be. —after Ambrose Bierce

The Importance of TRANSFERABLE OWNERSHIP

Property rights enable humans to acquire, use, and dispose of assets. There is a burgeoning literature on the importance of secure property rights in promoting economic prosperity, improving environmental protection, and ensuring individual liberty. A recent addition to this literature by Randall Akee (2009) shows just how important it is that the transfer (sale or lease) of property rights be unfettered by government restrictions.

In the late 1800s, the area now known as Palm Springs, California was evenly divided by the federal government into a checkerboard of 1-mile square blocks. Property rights were assigned in alternating blocks to the Southern Pacific Railroad and to the Agua Caliente band of Cahuilla Indians. From then until the late 1950s, federally imposed restrictions on the sale and lease of the Agua Caliente Reservation land created high costs of developing the land. These costs impeded investment and sharply reduced the value of tribal lands. In contrast, the non-Indian blocks of Palm Springs assigned to Southern Pacific had fee-simple ownership status, making them free of such restrictions. Development proceeded on this property, resulting in land values more than five times higher than observed for otherwise identical Indian land. In the 1950s, the restrictions on Agua Caliente lands were relaxed and development on them soared. Not surprisingly, once development became feasible, the value of these lands rose rapidly, eventually converging with the value of non-Indian lands in Palm Springs.

The origins of the restrictions on the transferability of Indian lands dates backs to the nineteenth

century. Although the lands assigned to the Agua Caliente tribe nominally belonged to individual members of the band, they were held in trust by the U.S. government. As a practical matter, trust lands could not be sold and, until 1955, legally could not be leased to developers or others for more than five years. Hence, the land effectively could not be used as collateral for loans that would enable the tribe to develop it. Moreover, non-tribal members were unwilling to invest their own funds in projects to which they would lose their rights after only five years. The result was that by the late 1950s, Palm Springs was a checkerboard of two different worlds. Non-Indian, fee-simple land had expensive homes and prosperous businesses located on it, and sold for high prices. Agua Caliente land stagnated in value and was largely undeveloped except in low-value residential uses, such as mobile homes.

In 1955 the U.S. government granted tribal members permission to lease their land for 25 years; in 1959 the government increased the maximum lease duration to 99 years and made it feasible for tribal members to sell their land holdings. Developers could now be assured of receiving full return on their projects, and the result was an explosion of both residen-



tial and commercial development activity on Agua Caliente lands. Over the next half century, the value of the Agua Caliente lands rose from a mere 13 percent of the value of neighboring fee-simple lands to parity. Today tribal and non-tribal lands in Palm Springs are virtually indistinguishable, both in appearance and in market value.

The transformation brought about by the enhanced transferability of Agua Caliente lands is useful in helping us understand two broader issues. First, the economic condition of American Indians lags considerably behind most of the rest of the American population. Per capita income among Indians is not much more than half the national average, and the poverty rate is roughly double the average. There are many reasons for this, but, as Terry Anderson and others have shown, one key element lies in legal institutions that limit the ability of Indians to sell or lease their lands or to use it as collateral. Akee's research adds importantly to our understanding of the destructiveness of such restrictions.

The second lesson of this Agua Caliente story can be found in the use of property rights to protect the environment. It is becoming increasingly accepted, for example, that individual fishing quotas (IFQs) are the single most important tool for efficiently and effectively protecting the world's fisheries. One crucial element of achieving the maximum performance from IFQs is that they be transferable, through both

lease and sale. But not all IFQ systems permit unrestricted transfer, a fact that impairs the power of such systems to protect fisheries. Similarly, in a world of growing water scarcity, government-imposed restrictions on transferability of water rights don't merely reduce economic efficiency; they threaten the survival of many aquatic species dependent on that water. Environmental damage is also caused by restrictions on the full transferability of federal grazing permits, restrictions that impede the movement of permitted lands out of grazing and into habitat protection.

Clearly defined, secure, transferable property rights are a necessary element of the voluntary exchange on which human prosperity is founded. But such rights are also our best hope for protecting and enhancing the environment. The Agua Caliente story makes it clear that property rights that are not transferable make mockery of the concept of property rights, a mockery that in other venues threatens species and degrades environmental quality. For those interested in environmental protection, it is a lesson we ignore at our peril.

REFERENCE

Akee, Randall. 2009. Checkerboards and Coase: The Effect of Property Institutions on Efficiency in Housing Markets. *Journal of Law and Economics* 52(2): 395–410.

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LIVING IN THE NEW WILD WEST

By Todd Graham



Ecological abundance. That's not a pairing of words you hear too often these days. It's more common to hear of ecological distress. However, both opportunities and problems associated with great ecological abundance may be seen in Montana's Madison Valley. Lying just northwest of Yellowstone National Park, the Madison presents an eye-ful. Vast herds of elk, pronghorn, and deer, along with migrating waterfowl and raptors frequent the area. With ungulates come the predators. Wolves, grizzly bears, black bears, mountain lions, and wolverines all call the Madison home. As winter drives big game animals from the high elevations of Yellowstone and neighboring forest service lands, they migrate to the valley floor and find forage and cover on private lands.

Madison Valley ranchers are well aware of this abundance. The immense elk herds graze forage reserved for cattle and push through freshly mended fences like a snowplow through a drift. Throw the wolf and its killing of cattle into the mix, and you find conflict. By definition, these factors make wildlife a liability to landowners who secure a living running livestock.

As it turns out, land management practices that grow high quality grass for cows are the same practices that provide high quality wildlife habitat. Ranchers are doing elk a favor and are helping to keep the Madison Valley an ecological jewel. Fortunately, valley ranchers enjoy seeing wildlife. Watching a large elk herd move across the open landscape can be breathtaking—an experience one can't find



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in many other places. But ranchers don't enjoy carrying the financial hardship that abundant wildlife brings. Seeking change, ranchers began talking about these issues.

How could they turn this ecological abundance into something other than financial hardship? In their meetings, the idea of forming a tourism company surfaced. Madison Valley Expeditions, LLC (MVE) was born.

MVE escorts guests to private ranches where they participate in a wide variety of activities. A typical wintertime wildlife viewing tour begins on a ranch with huge, open spaces where large elk herds roam and wolves may be glimpsed. Then, the conversation shifts to agriculture and how that industry fits amidst ecological abundance. Agriculture is still the financial backbone of many ranches, but the open spaces and wildlife are what draw people's attention. Balancing these needs is the job of the resource steward. The day ends with guests working through a case study. If they were ranch owners and wolves were killing their cows, how would they best manage this difficult situation?

For their efforts, ranchers are compensated by MVE based on the number of visitor-days they host. The more guests, the longer the visit, the more they get paid. Ranchers produce publicly valued open spaces and habitat, and MVE handles administration, financing, and marketing of the business. Economy of scale allows for minimal business overheads, while guests have access to multiple ranches and hundreds of thousands of acres of wild things in wild places.

With this compensation model, ranchers have an incentive, not only to maintain open spaces and manage their lands well, but also to create additional guest experiences on their properties such as bird watching, hiking, biking, horseback riding, cross country skiing, or exploring archaeological sites. In this way, guests experience the New Wild West in ways not available to them otherwise.

Madison Valley Expeditions likely cannot have enough economic impact to offset the losses ranchers incur from elk grazing their grass or wolves running weight off their cattle, but it can help. On the day an excited rancher calls and wants us to bring eager guests out because he's seen wolves and elk on his place is the day we make wildlife an asset and take a giant leap toward preserving the wildness of the Madison Valley.



MADISON VALLEY
EXPEDITIONS

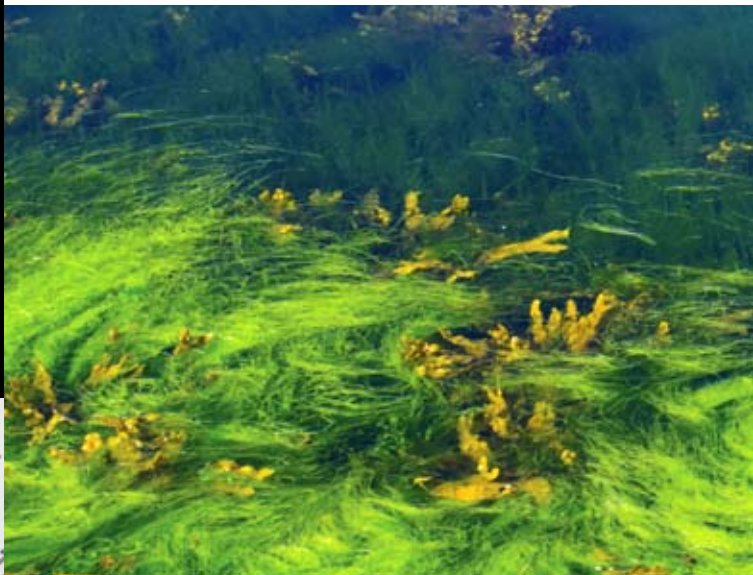
More online at www.madisonvalleyexpeditions.com



TODD GRAHAM is manager of Madison Valley Expeditions, a newly formed tourism company based in Ennis, Montana. He also provides ranchland management consulting services to landowners across the West. He can be reached at todd@aerosceneland.com.

SEAGRASS CREDITS FOR SALE

By Kelly L. Westover



The quality of life in Sarasota, a coastal community anchoring the middle of the western coast of Florida, is intimately connected with its surrounding water resources. In community surveys, the environment—natural lands, healthy bays, and pristine beaches—was identified as the highest priority. Enjoyment of the environment is intimately related to healthy water quality conditions for swimming, fishing, and recreation. And at the heart of it all is seagrass.

Seagrass is considered the canary in the coal mine for estuaries. When pollution leads to the darkening of a bay's waters, sunlight-deprived seagrass is the first victim. Extensive seagrass meadows line the sandy bottom of the intricate bay systems throughout Sarasota. This precious resource is an environmental asset due to its ability to filter the water, ensuring clearer water for swimming and recreation. Teeming with life, seagrass also provides vital habitats for fish and shellfish species and attracts sport fish, which feed throughout the seagrass meadows.

The integrity of the seagrass meadows is currently threatened by years of land use changes, which have altered the natural landscape and changed the way water makes its way to bays in Sarasota. The city's landscape was significantly altered in the early 1900s when extensive ditching and draining occurred to dry out land for agriculture. Originally, the natural landscape had pockets of isolated wetlands that would occasionally flow to the bays, but would mostly filter rainwater into the ground. In the 1950s, extensive urban growth flourished along the shore and gradually moved inland—



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encroaching further into the natural landscape. A proliferation of hardened surfaces from buildings and roadways covered the land, reduced natural landscape, and prohibited water from percolating into the ground. The result of these changes altered the timing and increased the freshwater and nutrients leaving the land and entering the bays.

The problem with increased freshwater and associated nutrients entering Sarasota's water resources is that it creates an unlimited food source for algae, which in turn blocks sunlight and reduces water quality necessary for seagrass. Clean, clear water is essential to support healthy seagrass meadows. In recent years, Sarasota County has been working with regional agencies such as the Southwest Florida Water Management District to develop science-based water quality targets to support healthy seagrass and to specify the amount of nutrients entering water resources.

One approach to meet the targets and improve water quality is to reduce the amount of freshwater flow and nutrients by mimicking the hydrology of natural landscapes through Low Impact Design (LID) techniques. These techniques simulate the way water historically filtered into the land by capturing and retaining water where it falls, thereby reducing the amount entering the bay and impacting seagrass. LID techniques consist of rain gardens, green roofs, cisterns, pervious systems, and storm water harvesting. These designs act like filters absorbing rain water, unlike hardened surfaces that cause rain water to quickly run off the land into bays.

There are multiple options to promote LID techniques to reduce nutrients entering Sarasota's water

resources. Local agencies could spend millions of taxpayer dollars on expensive LID retrofits of old infrastructure, or stringent regulations could require LID techniques in new and redevelopment, passing the cost on to the development community. Neither of these options would be positively perceived by the locals.

A better way to promote LID is to use a market-based approach. Through the creation of a program for property owners to retrofit their property using LID techniques, "credits" could be generated. For example, if residents install a green roof on their house, they could potentially get a certain amount of credit. Local agencies that permit development could inspect and certify the newly installed LID technique and act as a credit bank. When a developer comes in for a permit, he or she can perform a cost-benefit analysis to determine if it is more effective to install LID on their site or purchase credits to meet their needs without the use of LID techniques.

There is a minimal but effective government role for permitting and managing the credit bank. Only the future will tell if Sarasota is successful in implementing a market-based approach to protect an important environmental asset, seagrass. Protection of this resource will help to ensure a robust economy for future generations in Sarasota.



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HABITAT CREDIT TRADING

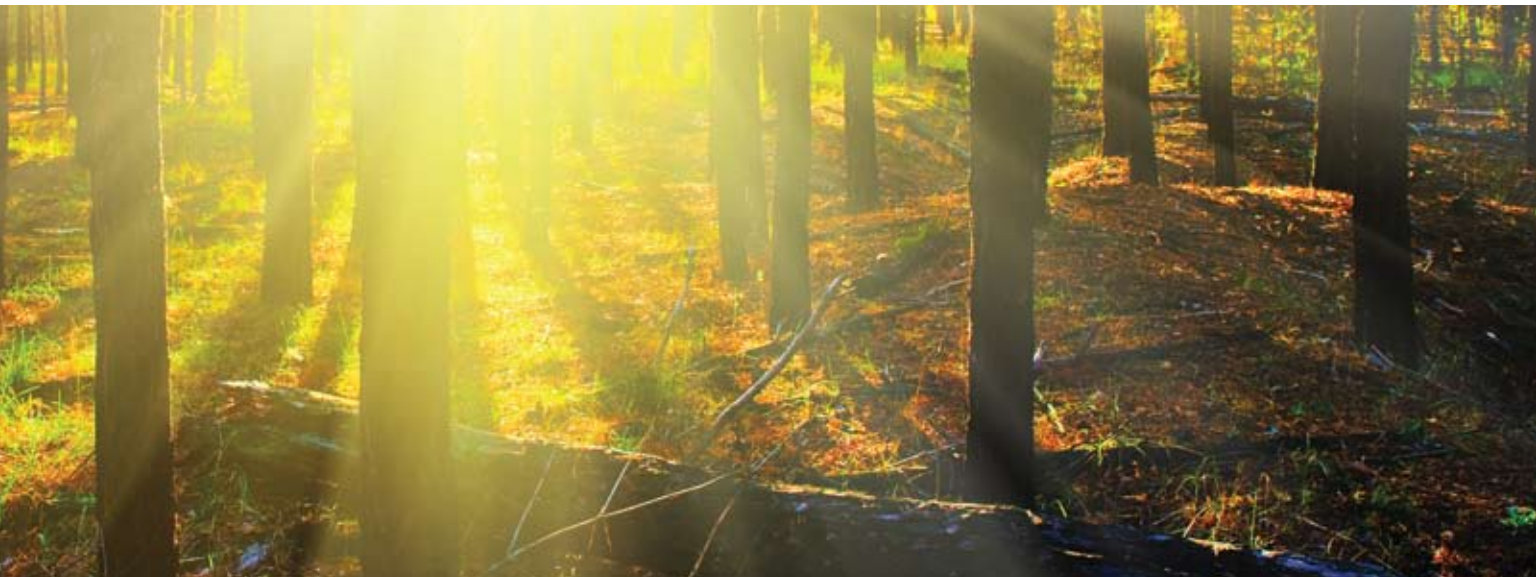
By Todd Gartner



Fire-maintained longleaf pine once occupied 90 million acres in the Southeast. Today, roughly three million acres remain. Land conversion and lack of fire on the landscape have decreased habitat for a variety of species dependent upon an open canopy and diverse ground cover. Consequently, many species have experienced population decline, including the gopher tortoise. The gopher tortoise is federally listed as threatened under the Endangered Species Act in the western portion of its range, and the U.S. Fish and Wildlife Service is considering listing the eastern population. With more than 80 percent of land in private ownership in the Southeast, the greatest potential for conservation, restoration, and management of pine habitat for declining species lies in the hands of family woodland owners.

To address these issues, I am helping the American Forest Foundation develop a market-based habitat credit trading system in portions of Georgia and Alabama. The incentive-based framework will complement other efforts in the region to keep the eastern population of the gopher tortoise off the Endangered Species list.

Under the program, interested family woodland owners become eligible for habitat management assistance and conservation credit payments through a reverse auction process; where the buyer and seller switch roles. Landowners selected to participate will be issued credits for verifiable gopher tortoise habitat and/or agreed upon management activities. These credits can then be voluntarily purchased by



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federal agencies, state, or county governments, or private companies to offset impacts on gopher tortoise habitat. These banked credits may also assist the credit holders in meeting their regulatory obligations should the eastern population of the gopher tortoise become federally listed in the future.

The “currency” involved in the habit trading system is habitat credits. A credit is a unit of trade that places monetary value on habitat preservation or restoration. Credits are sold to offset impacts to species and/or species’ habitats and will be quantified in acres. The acreage will be weighted based on ecological factors, priority locations, and other variables.

The relationship between credits and debits reflects the value of the compensatory habitat provided to the habitat impacted and is expressed as a mitigation or trading ratio. For example, a 2:1 trading ratio could represent 200 acres of restored habitat for every 100 acres of negatively impacted land.

This innovative payment for ecosystem services approach aims to develop a voluntary precompliance market for a non-listed species and will generate new income streams for private landowners so their lands remain as well-managed forests. A holistic habitat focus will address the primary causes for gopher tortoise population decline while simultaneously addressing the suite of other species that utilize the longleaf ecosystem. This approach is different from traditional species conservation banking, which often fails to address the true driver of species imperilment—habitat loss.

A proactive approach, focusing on mitigation

before listing occurs, provides numerous benefits and increases the likelihood of success. Precompliance credits are expected to be dramatically less expensive than compliance credits, hopefully leading to increased acres conserved.

Initial credit transactions are anticipated to occur this year—stay tuned.



American Forest Foundation

More online at www.affoundation.org



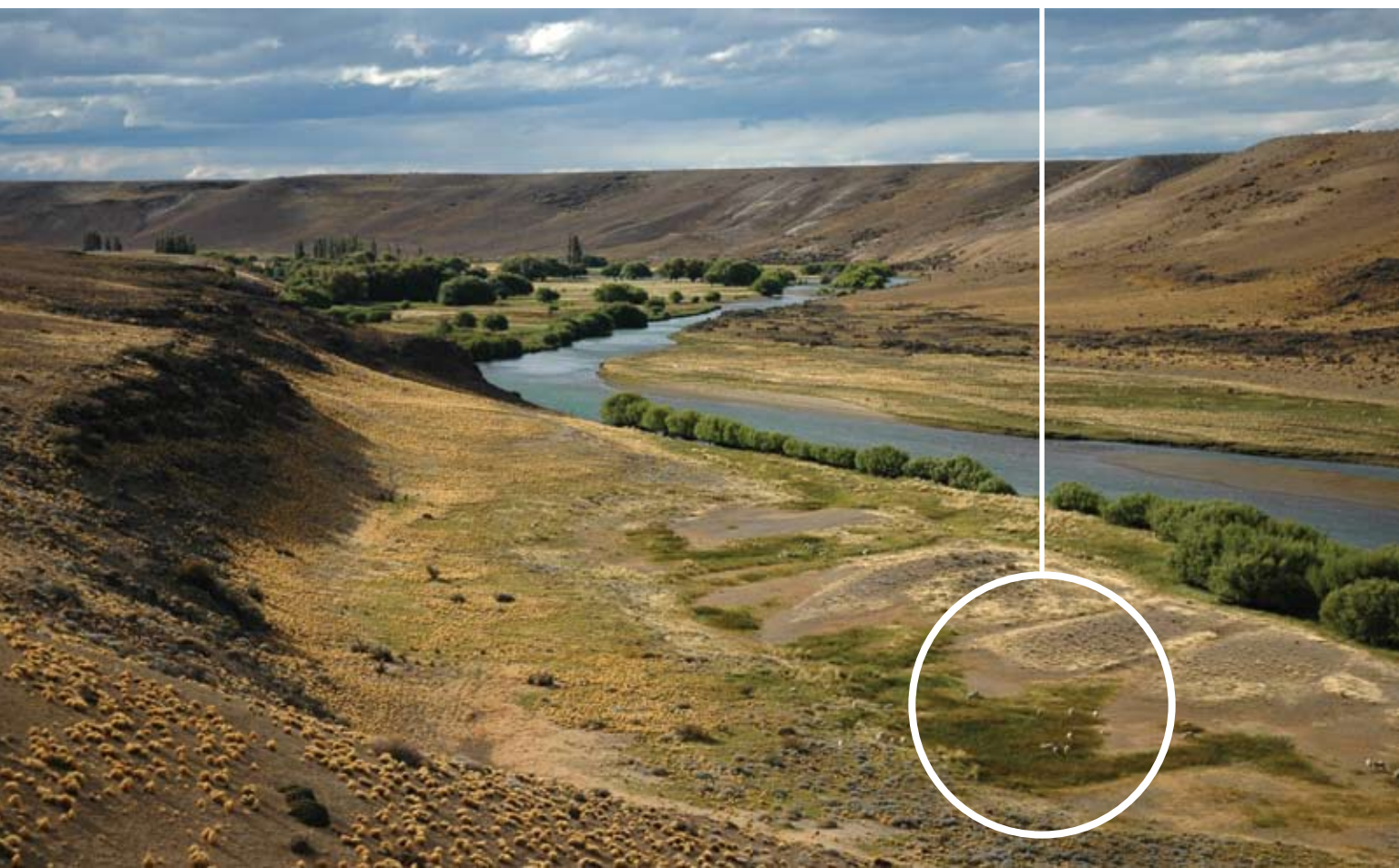
TODD GARTNER is the Conservation Incentives Manager for the American Forest Foundation and is a PERC Enviropreneur alum. He can be reached at tgartner@forestfoundation.org.

Preserving Patagonian Grasslands & Gauchos

“Even travelers in Patagonia forget that its giant, wild looking estancias are really just overgrazed sheep farms.”

—Yvon Chouinard

BY CARLOS FERNANDEZ & ANDREA NOGUÉS





Like the rugged cowboy roaming the plains of the American Wild West, the image of the untamable gaucho is embroidered into the fabric of the Argentine consciousness. But this image is fading as the gauchos' traditional sheep grazing practices are turning Patagonian grasslands into a desert.

Argentina is home to the majestic southern temperate grasslands comprised of vast rippling meadows harboring an array of wildlife and plant life. This unique ecosystem absorbs and stores large amounts of carbon and grows grass to feed sheep. Ranching on grasslands has shaped the economic and cultural development in Patagonia, but overgrazing has led to desertification in much of the region. And Argentina's unstable economic and political conditions aren't helping the cause.

While Argentina's grasslands cover an area almost the size of Alaska, only a small percentage is protected. The Nature Conservancy is working with ranchers, government officials, landowners, and other organizations to preserve a swath of Argentine grasslands as large as Florida.

BACKDROP

Nearly 90 percent of the grassland in southern Argentina is privately owned and most of this region is used for grazing sheep. Brought to the Americas by European settlers, sheep have been ranched in Argentina since the late 19th century. Patagonian sheep are raised primarily for their wool and produce some of the finest merino in the world—most of which is sold on international markets.

Often grazed year-round, however, and in flock sizes too large for rancher's lands, sheep in Patagonia are causing problems. A flock of sheep can gobble up great expanses of native grasses, and in southern Argentina, they're clearing some serious vegetation. A typical sheep, for example, spends between 7 to 8 hours a day eating and consumes between 2 and 4.5 pounds of vegetation a day. In addition to vegetation loss, overgrazing equates to lost habitat for other animals and damages waterways by polluting them with runoff and silt from erosion.

In addition to overgrazing, this rugged region's dry climate, strong winds, and cold winters are natural contributors to the desertification processes. These environmental factors paired with conventional grazing management have resulted in drastic consequences. Some ranches, for example, have been abandoned due to a loss of habitat and an inability to sustain sheep.



THERE IS STILL HOPE. . .

When flock sizes, lands, and riparian areas are properly managed, ranchers, sheep, and native plants and animals can thrive together. The Nature Conservancy's new Patagonian Grasslands of Argentina Conservation Project is currently coordinating efforts to bring scientists together with land managers to develop a truly sustainable grazing model. However, as management decisions lay solely in the hands of property owners, the Conservancy's most critical challenge is to identify incentives for landowners to adopt and implement such a model.



OPPORTUNITIES FOR FUTURE GENERATIONS

Argentina is the eighth largest country in the world, but only a small portion of the country is under official environmental protection. Furthermore, an unstable national economic environment creates a political climate where public policies do not readily provide landowners with incentives for conservation or for adopting sustainable management principles.

There are two ways to look at countries with no real concept of conservation: a lost cause for the environment, or an opportunity to let markets do what they do best—create incentives for ranchers to enhance rather than exploit the environment. The latter is the opportunity that the Patagonian Grasslands Office of the Conservancy is working on. Some of the Conservancy's initial tools to preserve the southern grasslands include:

Corporate Support

Contracts have been initiated with U.S. and Australian clothing companies that have strong corporate social responsibility and a serious commitment to improving the environmental quality of their production process. This is not a new concept. The Orvis Company donates to the nonprofit Malpai Borderlands Group for every Malpai shirt sold. Patagonia Inc., with proceeds from the sale of “Sin Represas” (stop the dams) T-shirts, supports the fight against dam construction in Chile. The grasslands project plans to utilize similar arrangements.



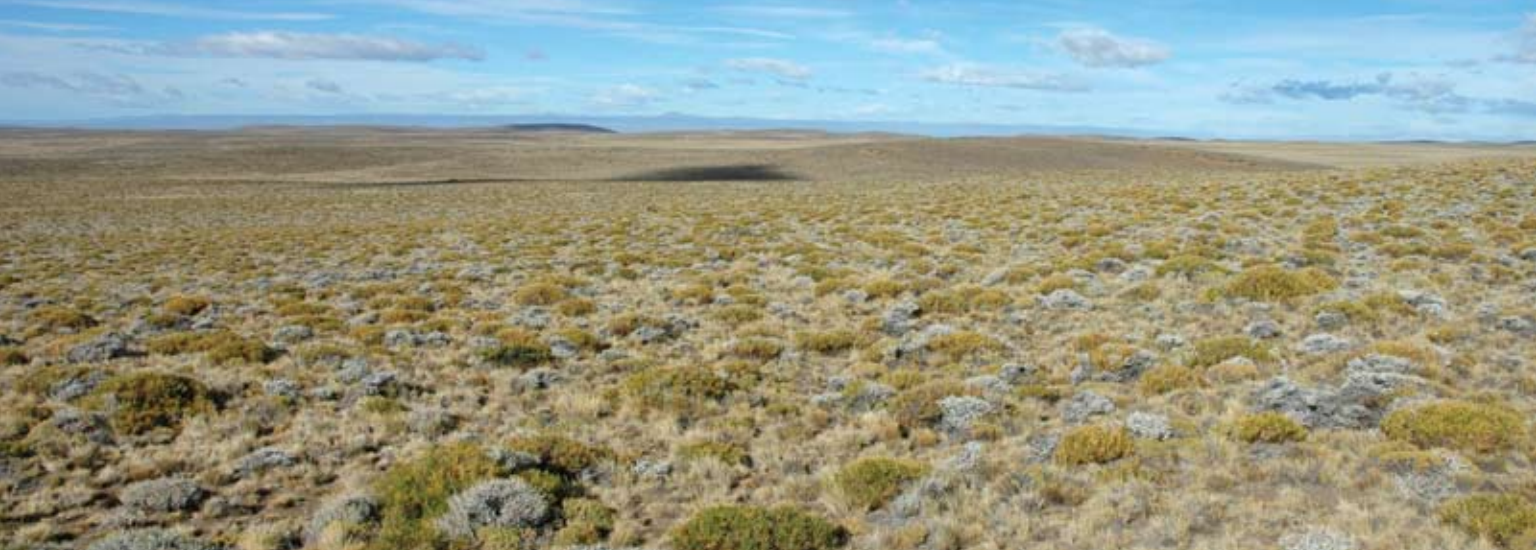
Grassland Stewardship Council

The wool and lamb industries are replete with commercial certification labeling systems; some convey critical steps toward promoting sustainability, others merely offer buyers the illusion of sustainability. The crux of the issue is that for a certification label to be a true reflection of ecological sustainability, its requirements must include sufficient environmental standards to address the needs of local biological and riparian systems. Moreover, for a sustainable grazing model to really work, landowners must be assured of the ability to directly or indirectly absorb the costs associated with the transition from conventional to sustainable management and must feel confident that they will have market access to ongoing price premiums.



Given that grasslands are one of the least protected and most fragmented and replaced terrestrial habitats on earth, this project is working to capitalize on this niche by designing and implementing the *Grasslands Stewardship Council*. The council will include a set of standards which, once certified by independent third parties, will offer customers around the world the ability to choose grasslands-derived products from socially and environmentally responsible ranching and at the same time provide good profits for local landowners.

This council will be similar to the *Forest Stewardship Council* (FSC). The FSC, now an international nonprofit multi-stakeholder that promotes responsible management of the



world's forest, was born as a set of standards setting independent certification and labeling of forest products. This path offers customers the ability to choose products from socially and environmentally responsible forestry. Similarly, a *Marine Stewardship Council* (MSC) exists as an independent nonprofit organization with an ecolabel and fishery certification program. Fisheries that are assessed and meet the standard can use the MSC blue ecolabel. In this way, MSC rewards sustainable fishing practices.

THE ROAD AHEAD

At the Patagonian Grasslands of Argentina Conservation Project, we are aware that the 89 million hectares (219 million acres) of Patagonian grasslands are severely threatened by desertification. We are also aware that to date, no large scale unified model for combating desertification through sustainable grazing methods exists. We do know, however, that there is a rich, yet disjointed, base of scientific knowledge combined with a local population seeking economic stability that offers the potential to restore degraded lands while continuing to contribute to the production of fine merino wool.

The most critical challenge to implementing conservation tools is the lack of incentives for landowners to produce ecologically sustainable wool. Using existing knowledge and market mechanisms such as those described above, we will be partnering business and the environment to support innovative ideas that will grow green on the ground and in the pocketbooks while at the same time protecting millions of acres of grasslands in Patagonia! This may seem an impossible task, but as Paul Hawken once said, "If everyone thinks you have a good idea, you're too late."

More online at www.nature.org/wherewework/southamerica/argentina/



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Farming for fish

BY JULIE D.E. MORGAN

FISH



◀ Orchardists
planted apple,
pear, and cherry
trees right up to
the river bank

Streams that once meandered across open valley floors, providing essential fish habitat, are now channeled by roads, railroads, and agricultural operations. This loss in tributary habitat is a limiting factor in efforts to recover declining fish populations in the Pacific Northwest.

In the Entiat River Valley, a tributary of the Columbia River Basin, agricultural activities and transportation development simplified the riverine system and erased significant fish habitat. An environment essential to river system health and the survival of salmon and steelhead populations was gradually replaced; healthy cottonwoods and dense, overhanging shrubs gave way to fruit trees.

For several generations, many farmers within the Entiat Valley enjoyed fishing for wild steelhead and salmon from the banks of their orchards. In fact, orchardists planted apple, pear, and cherry trees right up to the river bank, as this was the general practice. While farming continued in the Entiat Valley and throughout the Northwest, recognition was building that the fish in the Columbia River Basin were in

precipitous decline. With this awareness came tension between salmon recovery efforts and farming operations. Despite such tensions, the Entiat Valley community endorsed salmon recovery efforts in their watershed.

HABITAT FARMING ENTERPRISE

The landowners of the Entiat Valley, organized through the Entiat Watershed Planning Unit, teamed up with the Institute for Rural Innovation and Stewardship to find ways to integrate fish and wildlife habitat restoration with economically sustainable strategies for orchardists. Their collaborative efforts produced the Habitat Farming Enterprise Program—a venture designed to provide growers with an appropriate economic return for planting and maintaining riparian habitat as an alternative to growing traditional crops.

Such incentive programs to compensate landowners for improvements to habitat are not new. The Federal Conservation Reserve Enhancement Program, for example, seeks to provide landowners



with cost-share assistance and rental payments for installation and maintenance of long-term conservation practices, such as riparian habitat. Seemingly an ideal fit, this conservation program has gained little traction. In Chelan County, where the Entiat Watershed resides, there are only two such contracts under the Conservation Reserve Enhancement Program, totaling 4.5 acres.

The principal reason for the underutilization of existing incentive programs in the Entiat Valley and the surrounding watersheds of the Upper Columbia region is economic in nature. Orchardists identify low rental rates, high administration costs, and shortage of technical support as key problems.

Tellingly, the Conservation Reserve Enhancement Program has been successful in other areas. For example, dryland wheat farmers in Walla Walla County, located south of Chelan County, have more than 100 river miles of riparian habitat in the Conservation Reserve Enhancement Program. For those farmers, where both the cost of farming and property values are lower, the reserve program rental rates appear sufficient to cover the opportunity costs for dryland farming. As such, the growers in Walla Walla County

are not being asked to bear the cost for restoration and long-term management. That is not true for more costly irrigated farming operations such as tree fruit production in the Entiat River Valley.

Rather than acquiesce to the fact that existing incentive programs are not necessarily designed for tree fruit crops, the Entiat Watershed landowners developed a conservation plan that responds to the actual costs of conservation in the Upper Columbia region.

FEASIBILITY FOR FARMERS

The Entiat Valley growers, operating under the principle that they need to succeed economically while farming ecologically, worked with multiple partners to develop a feasibility study. Chelan County provided the funding for the study, which explored ways that the Habitat Farming Enterprise Program could be set up and operated to provide value to both farming operations and to fish and wildlife habitat. This study investigated the ways that the program could be structured, and considered eligibility, program administrations, and technical assistance for project implementation. One of the study's key recommendations was to develop a remuneration model to accurately compensate the farmers for switching a small part of their agricultural production from tree fruit crops to production of riparian habitat.

The Institute for Rural Innovation and Stewardship, in consultation with the Entiat Watershed Planning Unit, hired Six Mile Consulting Group working in conjunction with the Property and Environment Research Center, to complete the economic remuneration model. Six Mile Consulting developed a model for estimating the costs of converting commercially viable orchards into riparian habitat for fish and wildlife. The model estimates opportunity costs as well as costs associated with installation and maintenance of riparian habitat.

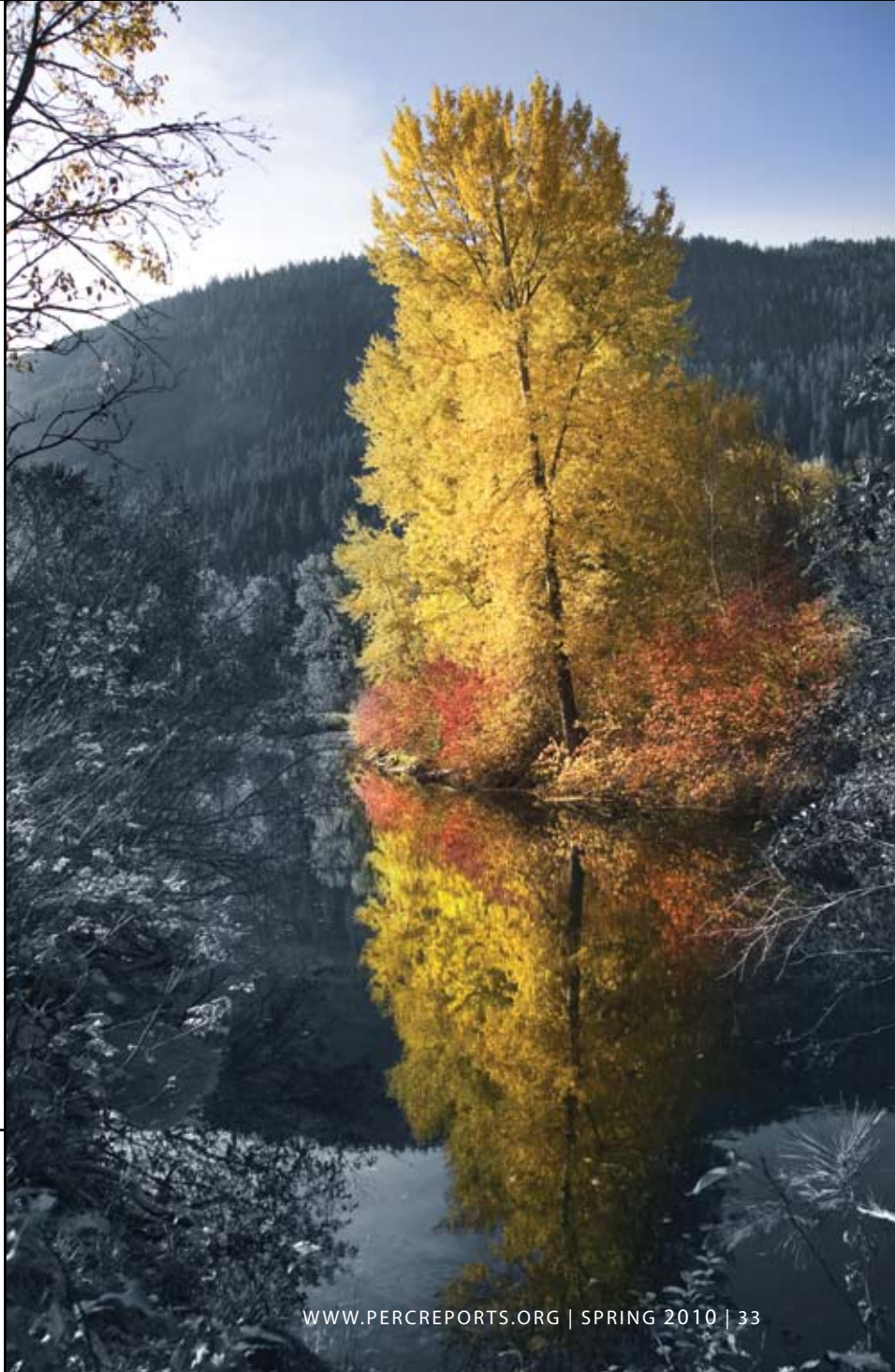
With the study and model complete, the key task for the Habitat Farming Enterprise Program is to find funding for this effort. The Upper Columbia Salmon Recovery Board in partnership with the Institute for Rural Innovation and Stewardship, the Chelan-Douglas Land Trust, and the Entiat Watershed Planning Unit, are working to secure funds.

◀Orchards along the Columbia River





▼ Habitat restoration of the lower Entiat River





BEST BANG FOR THE BUCK

If successfully implemented, the Habitat Farming Enterprise Program will have significant and broad reaching economic and ecological benefits throughout the region. Importantly, it would reduce the unintended consequences of outright acquisition of parcels. Salmon recovery dollars are often used to purchase riparian habitat and associated uplands. When this happens, those lands are permanently taken out of agriculture. In so doing, these acquisitions decrease the agricultural lands available for production and erode a key driver for the local economy. Declines in tax revenue have proven to be a significant problem in Chelan County, where the Entiat Valley is located. At the same time, such acquisitions inevitably reduce the supply of marketable property, driving up land prices and further impacting the local economy.

By contrast, habitat farming would keep nontarget uplands in agricultural production. In addition to growing fruit trees, these farmers would be growing and maintaining riparian habitat, hence avoiding “over buying” of land. Rather than purchasing the entire parcel, the program would encourage habitat farming on the most critical riparian areas, while allowing the remainder of the parcel to stay in traditional agricultural use. Conservation dollars are thus focused where they can do the most good.

The Habitat Farming Enterprise Program would also have significant conservation benefits. The Chelan-Douglas Land Trust, one of the largest local proponents of the acquisition model, recognizes the need for additional land conservation tools beyond fee



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simple acquisition and permanent conservation easements. Long-term stewardship of lands is not without cost. The local land trust views habitat farming as a solid approach to long-term maintenance of riparian habitat. Moreover, farmers who work on-site, are more readily available to maintain the riparian zones adjacent to their orchards.

Riparian farming also creates ecological benefits by sheltering waterways from pesticides and fine sediment and by shading the water—contributing to cooler temperatures in the summer. Native vegetation, especially large cottonwoods, is the key component to building instream complexity and habitat for fish.

A few protected parcels along miles of river will not be enough to save endangered salmon and steelhead. Rather, miles of riparian habitat restoration are needed. The Habitat Farming Enterprise Program is a vehicle to create successful transactions between willing sellers of riparian habitat and those willing to pay for restoration of fish, improved wildlife habitat, and clean water.

More online at www.ucsr.com



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TRASH CANS TWITTER TOO

Overflowing trash cans are not usually an inspirational sight, but they were for Jim Poss. They inspired him to found a company that manufactures a solar-powered trash compactor that he calls BigBelly. It is saving hundreds of thousands of dollars in labor and fuel costs in American cities.

Garbage cans, even ones that appear stuffed to overflowing, contain a great deal of air. Heavy trucks grind through the streets burning fuel and puffing emissions in order to collect the garbage that is loosely piled in the cans and surrounded by air. In addition to fuel costs and polluting exhaust, salaries for a driver and the entire trash collection process struck Poss as profoundly inefficient. He saw a simple solution—get rid of the air so the cans could hold more trash and thus reduce the number of pickups.

The idea made so much sense that Poss launched a business while still completing his MBA. By using a compactor, he reduced the volume of trash in the can. A solar panel attached to the can charged a battery powered compactor. Applying 1,200 pounds of force to the trash in the can produced a 5-to-1 reduction in volume. The result is fewer trash pickups and a reduction in costs and emissions.

Angel investors were intrigued by the idea and pumped cash into the fledgling company until Poss

had raised almost \$10 million. The first BigBelly solar-powered trash compactor was manufactured in Vermont and sold to Vail Resorts in Colorado. At remote areas such as ski areas and state parks, the units can produce savings quickly by reducing the number of pickups. Some of the compactors are wireless enabled—essentially letting them twitter a text message when they are full. Large urban areas where frequent pickups are necessary have also found the BigBelly to be a good investment.

Of course the compactor is not cheap. It costs \$3,000 to \$3,900, or it can be leased for \$80 a month; but Poss says the machine pays for itself quickly. Philadelphia leased 500 BigBellies for densely populated downtown areas where trucks were making 17 trash pickups a week. That number is now down to five and the city is saving \$800,000 a year in labor and fuel costs. Over the product's ten-year lifespan, savings can total \$10 million or more, says Poss.

Massachusetts state parks, the city of Boston, and even trash removal giant Waste Management are buying the BigBelly. Although they are expensive replacements for the hardware store variety, on a large scale and over time, they can produce significant savings.

For more information visit www.bigbelly.com



PAPER COMPANY PRESERVES TREES

In an ironic twist, a giant Indonesian paper and pulp company, responsible for deforesting vast areas of the country, wants to save a one-million-acre peat swamp forest in Sumatra. Carbon credits from the United Nations are the financial incentive propelling this unusual turn-about.

The peat swamp forest on the Kampar Peninsula is one of the world's largest, with decomposed trees and plants piled 50 feet deep in spots. Billions of tons of carbon dioxide are locked away in this waterlogged land, but when drained or cleared, it releases many times more carbon dioxide than even a clear-cut rain forest.

Into this once nearly impenetrable wilderness, home to Sumatran tigers, bears, crocodiles, and other wildlife, humans are slowly encroaching. Small fishing camps are found along the creeks, a growing village borders a large canal, and illegal loggers have established bases on the edges of the forest. As a result, an area serving as a vault for vast amounts of carbon dioxide is beginning to leak.

Asia Pacific Resources International Holding Limited, known as "APRIL," proposes to protect the peninsula's peat swamp core by surrounding it with industrial tree plantations, which are a vital component of Indonesia's economic development. The plan

would allow the company to expand its operations while also potentially collecting valuable carbon credits. It could sell the credits to industrialized nations attempting to meet reduced emissions targets.

Environmental groups are generally unhappy with APRIL's plan. They see the credits as a reward to a company that has destroyed large tracts of rain forest in Sumatra and as much as two-thirds of the forest in some provinces. Yet the threat posed by illegal loggers who clear-cut large chunks of land and migrants who use slash-and-burn techniques to clear the land for agriculture is imminent, and the Kampar Peninsula is already showing signs of degradation.

APRIL claims that the ring of acacia plantations it plans to build around the core will block further encroachment, and even environmental groups acknowledge that the company's system of dams and canals have minimized leakage from the peat. Incentives make strange bedfellows or, in another light, encourage cooperation.

For more information visit www.aprilasia.com



WATER OUT OF THIN AIR

A looming global water crisis has been a springboard for new water generating technology. With the United Nations reporting one in five people worldwide lack access to safe drinking water, companies have pushed forward with innovative designs to make water from thin air.

Their challenge is to wring water from the air more efficiently while also purifying it for drinking. Some use older technologies similar to those found in a dehumidifier and others have developed new proprietary methods for producing water even in the driest conditions.

Element Four, a Canadian firm, has created the WaterMill for household use. It draws air through a filter and cools it until water condenses. The water then passes through another filter and is exposed to ultraviolet light to kill bacteria. The WaterMill weighs about 45 pounds, runs on electricity, and can produce as much as 13 quarts of water per day. It sells for \$1,300. The company is also designing a similar product for humanitarian agencies to use in remote locations. The WaterWall will have the capacity to serve an entire village and be able to run on alternative energy sources such as photovoltaic panels as well as car batteries. Rick Howard, CEO

of Element Four, is optimistic about quenching the world's thirst. He says it is one of his company's core principles—"to do good as we do well."

Aqua Sciences of Miami Beach has one of the most unique water technologies. It is manufacturing 40-foot-long mobile units that can produce 350 to 1,200 gallons of potable water a day. The model for this technology is the lowly salt shaker that clogs in humid climates. Using hygroscopic salts, the machine attracts water molecules from the air, and then extracts the water from the solution. The salts also act as a natural decontaminant. While machines that rely on condensation may need humidity of 30 percent, the Aqua Sciences machines require only 14 percent humidity.

The Federal Emergency Management Agency in Florida has purchased two of the machines for a test run, and the U.S. Army is using the mobile units in Iraq. Until now, the army has transported bottled water on C-17 cargo planes and then trucked it to the troops. By plane, the cost is \$30 per gallon; from the mobile unit in the field, it is 30 cents per gallon. If the Aqua Sciences machines become standard army equipment, the savings could amount to billions of dollars.

For more information visit www.elementfour.com

One Step Closer To SUPERFUND SANITY

The federal Superfund program was enacted in 1980 to speed the cleanup of abandoned hazardous waste sites and hold polluting companies responsible. It was supposed to be “shovels first, lawyers later.” Instead, lawsuits proliferated and cleanups stalled. Though premised on the “polluter pays” principle, Superfund often caused polluter and non-polluter alike to overpay for minimal environmental benefit.

One of Superfund’s most notorious aspects is the expansive liability regime. The law imposed strict liability on past and present owners of waste sites and those in any way involved with the waste disposed there. Superfund liability is also joint and several, so a single firm can be held liable for an entire cleanup, even if only responsible for a fraction of the harm. The average cost for cleaning up a single waste site is approximately \$20 million, which leads potentially liable firms to pursue litigation or other means of spreading the cleanup costs among additional potentially responsible parties. This is but one reason the statute may have done more to generate legal fees than to protect the environment or public health.

This past term, the Supreme Court took a small step toward restoring sanity to Superfund liability. In the combined cases of *Burlington Northern and Santa Fe Railway Co. v. United States* and *Shell Oil Co. v. United States*, the Court considered the scope of “arranger” liability and when it is appropriate for federal courts to apportion cleanup costs among potentially responsible firms. In an 8-1 decision, the Court trimmed unnecessarily expansive interpretations of the Act and moved toward a more workable liability regime.

Superfund’s definition of potentially responsible parties—those who can be liable for waste site cleanup—includes any person or firm “who by contract, agreement, or otherwise arranged for disposal or treatment” of hazardous waste. A federal appeals court interpreted this language to extend liability to a firm that sold hazardous chemicals with knowledge some leakage could occur during its transport and delivery. Although the company was selling a useful product, the court held it also “arranged” for disposal because “disposal of a hazardous substance was . . . a necessary part of the sale and delivery process.” The federal government agreed, arguing that firms selling poten-

tially hazardous chemicals should be held liable if they are aware that improper disposal of the product could eventually result.

Writing for an eight-justice majority, Justice Stevens made quick work of this expansive interpretation. To “arrange” for disposal, he explained, is to take action directed at disposal. Selling a product that could be improperly disposed of by another is not the same thing. Further, “knowledge alone is insufficient to prove that an entity ‘planned for’ the disposal, particularly when the disposal occurs as a peripheral result of the legitimate sale of an unused, useful product.” With this opinion, Justice Stevens ensured that “arranger” liability would only apply to those who *actually arrange* for the disposal of hazardous waste.

In another portion of the opinion Justice Stevens made clear that cleanup costs should be apportioned among potentially responsible parties when there is a reasonable basis for determining each party’s relative contribution. This reduces the likelihood that a single firm will be left holding the bill for another’s bad acts. Firms seeking to avoid joint and several liability still bear the burden of demonstrating apportionment is possible, but where such evidence is available, cleanup liability can be assigned in a more equitable fashion.

Making polluters pay is an admirable goal. Polluting firms and individuals should be held responsible for the environmental damage they cause, but not for the harms caused by others. A focus on liability for actual harms caused was a virtue of the common law approach to environmental harm. Federal law governing hazardous waste cleanup and remediation is still a long way from the common law ideal, but with the *Burlington Northern* and *Shell Oil* decisions, the Supreme Court brought hazardous waste liability one step closer to sanity.



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