

ENVIROPRENEUR ISSUE

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PERC REPORTS

FOR FREE MARKET ENVIRONMENTALISM

SQUEEZING PROFITS FROM ENDANGERED SPECIES *p.6* THE SECRET LIFE OF TREES *p.12*
THE UNDERWATER ENVIROPRENEUR *p.20* WHERE FREE MARKETS MEET FAITH *p.26*



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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The intersection of environmentalism and entrepreneurship is a popular place these days. Many people are flocking from the business community, some are from environmental organizations, and a few come from the halls of academia. What they have all realized is that “commerce is the engine of change.”

At PERC we have a special hybrid: the enviropreneur—born with green DNA but equipped with the tools of property rights, markets, and contracts. Enviropreneurs thrive in the marketplace by providing goods and services to customers for profit while improving the environment at the same time. “They see unwritten contracts where others see unwritten regulations. They see new frontiers for free market environmentalism where others see only market failures,” writes PERC’s Enviropreneur™ Institute co-director REED WATSON.

Spend time with KENT CARTER, for example, “and you see a savvy new breed of capitalist, one who is planning to make green by going green,” in the words of JAMES WORKMAN. Read how Carter is creating a previously nonexistent market by forming habitat credits, trading them for cash, and then reinvesting in replenishing ecologically degraded landscapes.

Going below the surface, BRETT HOWELL is developing a market for coral reef restoration off Florida’s coast. Don’t miss Watson’s article to see how Howell hopes to link the buyers and sellers of coral restoration and how you might adopt a piece of transplanted coral.

If coral is not your thing, perhaps you would like to purchase a pen to help restore ancient forests? DAVE WAGER created Tree Ring Pens to share a unique resource through a commonly used object. The pens are crafted from dated tree ring cores and come from forest restoration projects in Montana—specifically projects that aim to bring back old-growth forests.

FLETCHER HARPER and STACEY KENNEALY, two Enviropreneur™ Institute graduates, are taking a path less traveled by mixing free markets with faith-based organizations for the environment. The overarching concept shaping GreenFaith’s work has been the idea of getting the incentives right, writes PAUL SCHWENNESEN. “People think that in the religious sector, belief and good intentions are what fuel people’s behavior,” said Harper. “Our experience is that beliefs and intentions alone fail to get the job done.”

Yes, this sounds suspiciously businesslike but, as Harper and others remind us, if you really want to get a job done then you must appeal to peoples’ interests. This sixth annual enviropreneur issue features people who are getting the job done. After having nearly 200 enviropreneurs pass through PERC, we have seen that free market environmentalism is working on the ground, underwater, and in the air.



Tell me what YOU think
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Laura E. Huggins

Laura E. Huggins | EDITOR

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ENVIRONMENTAL Luddites

Entrepreneurs are my heroes because of their optimism. Instead of seeing problems, they see opportunities. In the case of the environment, entrepreneurs—enviropreneurs—give us cause to celebrate the future of our planet by finding ways that work. Lest we celebrate too soon, however, beware of environmental Luddites who can thwart even the best enviropreneurs. Like their 19th-century counterparts who opposed industrialization by destroying machines, they see solutions as problems.

To understand the negative effect of environmental Luddites, consider the recent story on CBS's *60 Minutes* showing the proliferation of exotic and, in some cases, endangered African wildlife on Texas ranches. Some Texas ranchers have switched from using their land, water, and capital for cattle to using it for wildlife. As a result, Texas now has more than a quarter-million exotic species, of which three—the scimitar-horned oryx, the addax, and the Dama gazelle—have been brought back from the brink of extinction.

Early on, ranchers made the switch because they liked having the wildlife around, but if wildlife ranching was to be sustainable, ranchers had to find a way to make it profitable. They have done so by marketing hunts which can cost as much as \$50,000 for scarce species such as the Cape buffalo. Though they are called “wildlife ranches,” hunting is not like “shooting fish in a barrel.” The bush is thick and the ranches large enough so that not every hunter goes home with the trophy he or she is after.

A similar business model is at work in Africa where landowners who could barely eke out a living with livestock grazing are sustaining wild game populations on their land for a profit. They market the wildlife to hunters, to photo safaris, and to other

ranchers wanting wild stock for their land. As Michael 't Sas-Rolfes points out in “Saving African Rhinos: A Market Success Story” (*PERC Case Study*), “Strong property rights and market incentives have provided a successful model for rhino conservation, despite the negative impact of command-and-control approaches that rely on regulations and bans that restrict wildlife use.”

Who could be opposed to environmental entrepreneurship, which has successfully propagated endangered species, even if a few animals are hunted so that the populations will be sustained? The answer: environmental Luddites. As CBS told the upbeat story of how Texas ranchers have saved species, Priscilla Feral, president of Friends of Animals, decried hunting and condemned having African animals on U.S. soil. Despite the fact that the scimitar-horned oryx went extinct in Africa, Ms. Feral believes the species found on Texas ranches should only live on African reserves which are neither natural (many of them are also fenced) nor sustainable.

Unfortunately, the environmental Luddites often win at the expense of enviropreneurs and the environment by using politics and government-

tal regulations. For years the U.S. Fish and Wildlife Service lauded Texas ranchers for their conservation efforts, saying that “[h]unting . . . provides an economic incentive for . . . ranchers to continue to breed these species” and that “hunting . . . reduces the threat of the species’ extinction.”

Now, however, the U.S. Fish and Wildlife Service must require hunters to obtain a permit to hunt three endangered antelope species. Although the Service recognizes that these animals are thriving because of hunting, it must wrap the ranchers in red tape because environmental Luddites led by Feral won a procedural law suit using the Endangered Species Act, which requires such permitting. Everyone agrees that obtaining permits will be virtually impossible. As a result, Charly Seale, a fourth generation rancher and the executive director of the Exotic Wildlife Association, speculates that there will be half as many of these species in five years and that there will be none in ten years.

A similar result occurred in Montana when the Bitterroot River Protective Association won a court case opening access to a privately created fishing stream. In this case a few wealthy landowners had spent millions of dollars converting an irrigation ditch into trout habitat (see “On Target,” *PERC Reports*, Spring 2009). When the court forced the landowners to open access to everyone for fishing and hunting on the “unnatural” stream, their response was to shut off the water to the ditch except for when it was needed for irrigation. In the name of protecting the stream, the environmental Luddites in this case have left dry gravel where trout used to thrive.

If enviropreneurs are thwarted at every turn by environmental Luddites, we all have reason to be pessimistic about our environmental future. Instead of being able to celebrate the environmental fruits of human ingenuity, we will have to watch wildlife and its habitat suffer. In this season of politics, let us hope that some political entrepreneurs emerge who are willing to support free enterprise by unshackling entrepreneurs from the red tape of governmental regulation, not just for the sake of the economy, but for the sake of nature, too.

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

How to donate

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Delhi Sands flower-loving fly



California red-legged frog



Squeezing Profits From Endangered Species

BY JAMES WORKMAN

This magazine has documented how the good political intentions of environmental protection laws can create perverse economic incentives to do just the opposite. You already know, for example, how the Endangered Species Act set out in 1973 to prevent threatened plants and animals from going extinct. You know how despite glossy images of rescuing big and furry charismatic megafauna like grizzlies, panthers, and bald eagles, the biodiversity law quickly morphed into a world of projects frozen by small and slimy uncharismatic mini-uglies with ridiculous names like snail darters, blind salamanders, kangaroo rats, fairy shrimp and, my personal all-time favorite, the Delhi Sands flower-loving fly. You know the discovery of these federally listed species can result in the U.S. Fish and Wildlife Service unilaterally designating private property as ecologically valuable critical habitat, limiting freedom to develop it. And you know that, rather than risk loss of economic value under the imposition of heavy-handed regulations, rational landowners are motivated by self-interest and fear to quietly destroy—



San Joaquin kit fox



Kent Carter

aka “shoot, shovel, and shut up”—both the rare critters and the critical habitats they need to recover and thrive.

Given all that, what should you make of Kent Carter? First, he invited scientists to scour the 1,500-acre ranch of which his family is a shareholder. Next, he asked these ecologists to look hard for signs of threatened and endangered plants, fishes, amphibians, birds, and mammals. Finally, when they informed him that they found several federally listed species, he recalled, “We had a celebration.”

Celebration? Wait, surely he meant to say lamentation. What’s going on here? Carter is way too young to be eccentric; too deep in debt to be philanthropic; too entrepreneurial to be woolly-minded.

So if Carter’s crazy, well, then he’s crazy like a...San Joaquin kit fox, which happens to be another endangered species that he hopes will den on another East Bay property he’s scoping as an investor.

A NEW BREED OF CAPITALIST

Spend enough time with Carter and you see a savvy new breed of capitalist, one who is planning to make green by going green, squeezing profits from the ragged margins of both spreadsheets and landscapes. Carter readily acknowledges that the Endangered Species Act has its flaws. He’s seen it polarize older patri-archs, who fume that modern Americans value wild, rare, vermin species like coyotes or bobcats more than the domesticated plants and animals these ranches and farms produce.

“I see where they’re coming from, but, look, the ESA is what it is,” Carter says with a shrug. “It’s been around for four decades. So let’s move on and figure out how to find opportunities to do what we need to do.”

Opportunities? Well, yes, it turns out that if you look closely (as Carter has), there is flexibility built into the ESA. Habitat Conservation Plans, Conservation



Banking Agreements, Safe Harbor—these tools offer legal protections and incentives in the form of mitigation credits, much like the credits for conserving or creating wetlands, which, naturally, is something else Carter has begun to aggressively implement on the ranch.

MAKING A MARKET APPEAR

Here's how a previously nonexistent market becomes visible: whenever Carter slows runoff and creates two acres of an upland wetland, he can earn money by selling certified credits to a neighbor who destroys one acre nearby. When Carter halts erosion, adds shade trees, and improves riparian lands, he can sell those endangered steelhead credits. When he kills alien bullfrogs and restores or creates new marshy areas for endangered red-legged frogs, he can sell those habitat credits as well. He points out patches of other rare, indigenous plant species he can't name, and isn't emotionally attached to, but which the botanists got excited about and so he expects will have value in exchange for habitat credits down the road.



California tiger salamander

San Diego fairy shrimp

Cash Carter earns from trade in habitat credits can be reinvested into further replenishing the landscape—ecologically degraded over the past century of heavy ranching. Or he can take the money and sink it into shares of ecologically (and thus economically) undervalued farms and ranches elsewhere.

POTENTIAL PROBLEMS

Too good to be true? It seems to work, although two potential challenges will test the long-term viability of his business model: demand and scalability.

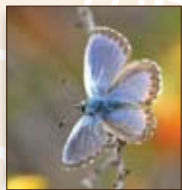
Will the market for his ecosystem service “product” keep growing? The U.S. economic crash was largely due to a glut of new real estate development; 5 million homes sit vacant. It may be a long time before backhoes, bulldozers, chainsaws, and shopping centers get back to the task of destroying critical habitat and, hence, fueling demand for the credits he generates for sale.

So Carter invested his time at PERC to better focus his crosshairs on those degraded landscapes that lay within striking distance of cities. He found one primary demand driver is infrastructure growth. Driving half an hour north of the Golden Gate Bridge, he’s point-

ing left and right while occasionally slamming on the brakes whenever the traffic jams. “See how Highway 101 went from four lanes down to two? That’s going to change; this artery will widen. That airport over there? They’re expanding the runway 1,100 feet into wetlands and critical habitat to accommodate more and larger airplanes. The SmartRail sign? A mass transportation corridor is cutting right through the ecologically rich San Petaluma River watershed. They don’t have a choice, responding to pressure. All of this paid for with gas taxes and federal stimulus funds; the government is trying to show itself a good neighbor, playing by the rules, and complying with environmental laws. Public demand for conservation credits is there.”

A secondary demand driver is escapism. People who live and work in big cities often want very badly to get out of those cities and into nature. City parks don’t cut it. Carter himself is Exhibit A. “I spent years riding the dotcom wave but much of that time as a desktop rancher, wanting to get out and breathe, and ride, and hike. I’m not the only one.”

A harder challenge is scalability. Carter worked in the start-up world long enough to know what venture capital wanted, and it wasn’t a lone consultant. It is



Smith's blue butterfly



Tiburon mariposa lily



one thing for a Kent Carter or an Aldo Leopold to invest time, sweat equity, and money into restoring a degraded farm or ranch. But until human cloning becomes viable, there is no way to replicate a custom-tailored-expert-service-business-of-one-employee into a venture that can be grown, marketed, and perhaps one day sold. But two weeks at PERC suggested an additional potential revenue stream, right under his nose.

MORE THAN A MIDDLE MAN

When scientists are free to do what they love, they do what they love to do: analyze the complex dynamics of indigenous plants and beasts. But scientists are typically lousy at what they have to do: interact with people who pay them for their analysis and recommendations. Nature wonks are rarely social animals; most would rather avoid people altogether if they could. So Carter saw how he could step in as the middle man, link his marketing skills to their know-how, and package the overarching venture as a server/provider with reliable, clear, and timely reports to investment funds that need to make sound and informed decisions.



The pieces for this part of his venture are still falling in place. But his advantage, again, comes through his experience. “When I go to landowners, I’m not just a visiting consultant with no skin in the game. I can tell them and show them ‘Hey, look, I’m doing this on my own property and it’s helping me pay off my mortgage to the bank,’ at a time when others are facing foreclosure.”

When he talks this way, Carter comes off as a hard-nosed, calculating, short-term salesman. But then thirty seconds later he sounds like a visionary trying to help the old guard recognize the real worth of their land through a fresh and unorthodox lens.

“The thing about all this,” he says, throttling up a steep slope, shouting over the motor, “is that red-legged frogs aren’t in danger so much as the habitat, and that means the value of the property itself is what’s at risk. We can use the law to secure the property, to improve its health. We have the frogs here. It’s not like we have to truck them in. But if we can get them to spread out here—and by example on neighboring farms—then we’ll have something solid.”

When we reach the summit and kill the engine there’s a panoramic view in all directions. But our attention is drawn over to something moving slowly off into the bushes. Bobcat. Only the second one I’ve seen in my life. Some ranchers would have reached for a gun to clean their property of this vermin. It’s not endangered, and Carter can’t earn any habitat points for having it on the land, but as he watches it his voice gets hushed and you sense that, for all the wheeler-dealer talk about buying and selling abstract credits for cash on the margins, there might be an even deeper driver for Kent Carter.

For more information: www.carterecosvc.com



JAMES WORKMAN, a visiting professor at Wesleyan University’s College of the Environment, wrote the award-winning *Heart of Dryness: How the Last Bushmen Can Help us Endure the Coming Age of Permanent Drought*, a book which lay the basis for his co-founding SmartMarkets LLC, a business venture that partners with utilities to let people earn, own, and trade the water and energy they save. Workman is a PERC Enviropreneur™ alum. He can be reached at jamesgworkman@gmail.com.



You can tell a lot about the past from tree rings. Dendrochronology, or tree ring dating, has been used by scientists for decades to analyze the historical records kept by tree rings.

The Secret Life of Trees:

HOW PENS ARE PRESERVING OLD-GROWTH FORESTS

BY SHAWN REGAN

When Dave Wager fells a tree, he gets a glimpse into the past. As we trudge through a forest in the mountains of western Montana, the extent of this history becomes apparent. Surrounding us is a tall stand of ponderosa pines, their thick, red bark attesting to their age, which Wager estimates to be 300 years old. Their size and color are the defining features of the forest, but it is the younger, more abundant Douglas-fir trees that now dominate the understory. Stopping beneath an old ponderosa, we examine the debris left from Wager's latest harvest: a young Douglas-fir that had taken up residence a few yards from the giant pine.

By the time Lewis and Clark passed through the area in 1805, this ponderosa pine was already well established. But the forest that surrounded the tree back then was quite different. Frequent low-intensity fires, both naturally occurring and man-made by Native Americans, maintained a sparse, open understory suitable for hunting and resulted in a forest dominated by large, fire-adapted species such as ponderosa pines and western larch. With fires occurring on average every five to 30 years, the pine-larch forests relied on fire for regeneration.

Over the next century, logging removed most of the pine's brethren, and by the early 20th century a policy of fire suppression came to dominate forest management. What remained of the historic pine-larch forests existed either as an act of preservation or due to a forester's oversight—or because the terrain was simply too steep for logging. Around this time, Douglas-firs, like the one Wager felled, began to engulf the forest.

Wager is working to protect what remains of this old-growth pine forest, and he is doing so in an unusual way—by selling pens. His company, Tree Ring Pens, restores small forest stands such as this one by removing dense understory trees and crafting them

into high-end pens. Each pen displays the tree's annual growth rings, which reveal the events that shaped the tree, the surrounding forest, and the American West.

STORIES OF THE FOREST

You can tell a lot about the past from tree rings. Dendrochronology, or tree ring dating, has been used by scientists for decades to analyze the historical records kept by tree rings. Past forest and climate conditions, including the incidence of fire, drought, and disease, all reveal themselves in the patterns of annual growth rings.

Standing over a log from his most recent thinning project, Wager points out events that occurred during the life of the hundred-year-old Douglas-fir. There was the drought of 1918–1922, indicated by a narrow set of rings, which brought the Homestead boom to an end in Montana. There was another drought in the 1930s, associated with the Dust Bowl. Then, in 1998, marked by a wide ring near the log's outer layer, was La Nina, which brought the region one of its wettest years on record.

Notably lacking from the rings is any indication of fire, but this doesn't come as a surprise to Wager.



With the understory thinned out (left), trees can devote more energy to fighting off insects and disease.

By the time Lewis and Clark passed through the area in 1805, this ponderosa pine was already well established.



Since the Great Fire of 1910 roared through these mountains a century ago, fire has been a missing element in the forest. The fire, which burned three million acres and killed 85 people, was the largest in recorded U.S. history. In part because of the fire, the U.S. Forest Service adopted a policy of widespread fire suppression that lasted throughout the century.

A RACE TO THE TOP

Today, scars from the “Big Burn” are visible in the rings of fallen old-growth trees, but few of them remain. The absence of fire fuels the proliferation of small diameter Douglas-firs, which are encroaching upon the older pines and larches. In the open-access race for resources that is forest ecology, this competition does not bode well for the giants.

“We’re trying to perpetuate this 300-year-old stand so that it will hopefully live another couple hundred years,” says Wager as we examine an old-growth stand of ponderosa pines in Pattee Canyon outside of Missoula. Here, on a

section of state trust land, he has permits to remove Douglas-firs that are choking out the old growth. “It’s hard to put numbers on it, but when we thin out the understory, there’s less competition for resources and the trees are able to devote more energy to fighting off insects and disease.”

Without the restoration thinning, the fire that enabled the trees to flourish in the past could eventually be their undoing. “If there was a fire in here now, with all this understory fuel, fire is much more likely to get into the crown,” says Wager, peering up at a pine crowded in by Douglas-firs. “These trees can’t survive a crown fire.”

Wager sources the wood for his pens from hard-to-reach spots that have been neglected by larger forest restoration projects. “Remnant old-growth stands exist today, in part, because they were too inaccessible or too steep to be logged economically,” explains Wager. “Ironically, the same cost challenges that explain their existence also serve as an impediment to their conservation today.” By crafting a luxury product from the low-valued timber that surrounds these stands, Wager is providing the necessary economic incentives to accomplish their restoration.

A BUDDING IDEA

Trained as a forest ecologist, Dave Wager came up with the idea for tree ring pens back in graduate school at Utah State University. While spending hours in the dendrochronology research lab counting and measuring tree rings, he discovered that a tree’s rings could be displayed beautifully on a wooden pen. By removing a cross-section of wood from a log, Wager could form a pen blank that included each of the tree’s growth rings, from the center pith to the outer layer of bark.

The pen-making remained a hobby while Wager pursued a career conducting audits for the Forest Stewardship Council, an independent organization that promotes responsible forestry practices through certification assessments. Over the next few years, FSC audits took him to more than 100 forestry operations across 16 different countries. But when the opportunity to combine pen-making with forest restoration presented itself, Wager decided to give it a shot. In 2008, he received a patent for the pens, and by 2010, he cut back his certification work to pursue the business full time. Today, his pens sell in a small but growing retail market across many western states and on his website, TreeRingPens.com.



Trained as a forest ecologist, Dave Wager came up with the idea for tree ring pens back in graduate school at Utah State University.

In the shop, Wager cuts the blanks to reveal the entirety of the tree's rings.



FINISHING TOUCHES

After felling the tree, Wager hauls the logs back to his workshop in Missoula where the pens are crafted and assembled by hand. In the shop, Wager cuts the blanks to reveal the entirety of the tree's rings. After the blanks have dried, he sands them smooth on a lathe and applies a protective coating. The pens are then assembled with high-quality components to create a variety of pen types ranging from click ballpoints to fountain pens. A one-foot section of log will typically create ten pens.

Each pen comes with a wooden box and a display card describing the tree's history and its role in old-growth forest restoration. In addition, Wager inscribes the first and last growth ring on each pen, a timeline that often spans more than a century. One recently completed pen dates back to 1864, the year Montana

became a U.S. territory. Another goes back to 1861, the start of the Civil War. Wager is also able to mark years of personal significance on the rings. Customers often request to have birthdays, anniversaries, and other important dates inscribed on the pen to connect the tree's natural history to a family history.

Word of Wager's pens is spreading quickly. Pen World, a premier luxury pen magazine, highlighted Tree Ring Pens in 2010. The pens have also been popular at pen trade shows. But the connection of the pens to old-growth forest restoration remains the focus of Wager's project. Five percent of the sale prices are donated to organizations working on forest conservation and restoration.

"Part of the allure of the pen is holding 100 years of history in your hand and feeling a connection to a tree that lived through the last century," says Wager. The other is something less tangible: "The user of the pen is also connected to the preservation of the old-growth forest, whose centuries of stories are preserved in the rings of these ancient trees." They are stories that, for now, will remain untold.

For more information: www.treeringpens.com



SHAWN REGAN is a fellow at PERC and a former backcountry ranger in the rainforests of Olympic National Park, where the trees are even bigger. He can be reached at shawn@perc.org.



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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*

BYE, BYE. bison

Late in the 19th century, in a frenzy lasting little more than a decade, 15 million bison were slaughtered on the Great Plains. This fact is well known, but there is disagreement over why the decimation occurred, and no explanations for why it happened so quickly. Recent research by M. Scott Taylor (2011) shows that both the origin and speed of the slaughter are traceable to an innovation in tanning that opened the huge European leather market to North American bison hides.

Sixteenth century North America contained 25–30 million bison. By 1850, subsistence hunting and habitat destruction had removed all of the bison east of the Mississippi, leaving perhaps 15 million on the Great Plains. Over the years 1871–1884 this population was slaughtered, with most of the carnage occurring by 1879. Only a few hundred animals survived on the Plains, all on private ranches. Taylor shows that the magnitude and speed of the devastation were directly linked to two key factors: an innovation in tanning that sharply raised the commercial value of bison hides, and a huge European market able to absorb a million or more hides a year at roughly constant prices.

Prior to 1870, hunting pressure on bison west of the Mississippi was modest. Plains Indians effectively managed bison herds as common property, engaging in subsistence hunting and in harvesting the vaunted “buffalo robe” (used for carriage throws and heavy fur coats) for sale to eastern markets. Though the robes were valuable, they could be harvested only in the winter and only from bison living in high northern latitudes—an arduous and risky undertaking at best. Hence, the western bison continued to thrive.

In the early 1870s, however, a cheap commercial process for tanning bison hides was developed in England and Germany. Bison hides from which the hair had been removed (called flint hides) were superb for making

the soles of boots and industrial belts. European armies and factories were a huge market, and within months of the tanning innovation, orders for bison hides poured into America. The price that hunters received for a flint hide jumped from \$0 in 1870 to about \$2.80 in 1871, and stayed in the range of roughly \$2.30–2.80 for the next 15 years. A good hunter could bring several thousand hides to market in a season, but could expect pay of only about \$50 per month as a ranch hand. It is little surprise then, that many hundreds of men quickly entered the business of hunting bison. The slaughter had begun.

The 1849 discovery of gold in California initiated a relentless stream of prospectors and other settlers through the Platte River Valley. Heavy subsistence hunting along the trail divided the existing bison herd into separate Southern and Northern herds. Construction of the Union Pacific through the valley in the 1860s made the division of the herd permanent, as the wary bison simply evacuated the railroad corridor.

When intensive commercial hunting began in 1871, it focused on animals in southern Nebraska and Kansas, those closest to the railroad. The elimination of the three million head there led hunters further south into what is now Oklahoma, western

Texas, and eastern New Mexico. By 1879 the Southern herd was gone, the hides shipped to the tanneries of Europe. The Northern herd initially survived, effectively protected by the hostile Sioux. But after Custer's defeat in 1876, the U.S. Army began a concerted—and successful—campaign against the Sioux. Northern Pacific railroad construction followed the army west from Bismarck, and hunters soon flooded the Dakotas, Wyoming, and Montana. Hunting of the Northern herd rapidly accelerated, and by 1884 the last of the flint hides was shipped out. The slaughter was over.

A striking feature of the process is that the price of bison hides remained remarkably stable, despite the surge and subsequent collapse of hide production. Over the years 1871–75, the price to hunters varied little from an average of about \$2.80. And although hide prices dropped to about \$2.30 in 1876, they stayed close to this through the end of the hunt. Of particular note, hide prices did not rise as either the Southern or the Northern herds were depleted. Taylor attributes the remarkable constancy of hide prices to two facts. First, in applications such as sole leather, harnesses, and industrial belts, bison hides were a good substitute for cattle hides. Second, while the bison hunt had a profound impact on the American Plains, the harvest was easily absorbed by the massive European market, where cattle hides outnumbered bison hides by 25 to 1.

The stable price of hides, combined with the fact that, as P.J. Hill (2011) notes, it was prohibitively expensive to move live bison to eastern markets, doomed the once-vast herds to become boots and belts, a relic of the past. That the species did not become extinct is due only to the vision of a few entrepreneurial ranchers, who protected the remaining handful of bison for their amenity value. Once 20th century innovations in trucking slashed the costs of getting bison to the dinner table, commercial herds grew quickly, now numbering some 500,000 head. And thus, just as the market brought the bison to near extinction, so too has it brought them back from the brink.

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DANIEL K. BENJAMIN is a PERC senior fellow and Alumni Distinguished Professor Emeritus at Clemson University. This column, "Tangents," investigates policy implications of recent academic research. He can be reached at wahoo@clemson.edu.

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The Underwater Enviropreneur

BY REED WATSON

What distinguishes enviropreneurs from other environmentalists? One answer is their vision; enviropreneurs see the world in a unique way. They see the prospect for cooperation where others see unsolvable conflict. They see unwritten contracts where others see unwritten regulations. They see new frontiers for free market environmentalism where others see only market failures.

Brett Howell sees the world through an enviropreneur's eyes. As a frequent scuba diver, he often sees it through a dive mask as well, so it's hardly surprising that he went off the proverbial deep end and took enviropreneurship underwater. Shortly after attending PERC's Enviropreneur™ Institute, Howell left his job at a large consulting firm and joined the Georgia Aquarium (featured above) as the Walker Conservation Fellow. In this role, he is exploring how contracts, cooperation, and markets can enhance marine resources.



Howell's first objective is to develop a market for coral reef restoration off Florida's coast. That's no small task, as a number of physical, regulatory, and political barriers stand in the way. But spend any time with Brett Howell and it's obvious that few things, other than needing a fresh tank, will bring him to the surface.

DIVERSITY & ECONOMIC VALUE

Florida's coral reefs are a hotbed of biodiversity. Stretching more than 350 miles from Dry Tortugas National Park to the St. Lucie Inlet, the Florida Reef Tract contains more than 45 species of stony coral, 37 species of octocoral (sea fans and other soft corals), and 70 species of sponges. Staghorn and Elkhorn coral, two species found off Florida's coast, are so rare that they are listed as threatened under the Endangered Species Act.

Aside from the coral itself, the reefs also support marine species from sea urchins to sea birds. Indeed, most of Florida's sport fish species inhabit the

reefs during some portion of their lives. Additionally, many medicines as well as health and beauty products come from the marine plants, animals, and algae found on Florida's reefs.

These environmental resources have an enormous economic impact. A joint federal and state study released in 2001 estimated Florida's reef-related economy, including money spent by eco-tourists for diving and charter boats, generates \$4 billion annually. Similar studies quantifying the reefs' economic impact state they support an estimated 36,000 jobs in the region.

THE CORAL COMMONS

Despite their ecological and economic importance, Florida's coral reefs are teetering on the verge of collapse. The Florida Department of Environmental Protection estimates that coral cover declined by 44 percent between 1996 and 2005. Throughout the Caribbean Basin, the loss in hard coral coverage has been even more dramatic—estimated at 80 percent since the 1970s.



The cause of this decline is the focus of extensive scientific research. Several studies point to the impact of effluent discharges from municipal storm and wastewater treatment facilities along the coast. Their impact on water quality is thought to promote various types of coral disease. Other reports document the physical destruction caused by boat groundings, fishing equipment, and dive fins.

One could easily describe this situation as an instance of market failure requiring corrective action by the state or federal government, and many have. Proposals for more stringent regulation on coastal point sources and increased fines for boat collisions fill the blog rolls. The familiar rationale is that the social costs of effluent discharge and careless boat operation exceed the private costs and, until taxes or fines equilibrate those two, Florida's coral reefs will suffer.

To an enviropreneur like Brett Howell, however, the issue is simpler than deteriorating water quality, inattentive boat captains, or more taxes. The issue is one of property rights. Because Florida's coral reefs are an open-access commons, there is neither an incentive nor a mechanism for the users of healthy coral to steward the resource. Those who recreate by coral reefs and those who depend on reef recreationists for their livelihood have no claim against those whose actions deteriorate the resource—that is, unless they can use contracts to close the commons.



Q&A with Michael Higuera on Enviropreneurship and Land Conservation

For more of PERC's ongoing Q&A series visit percolatorblog.org

Michael Higuera attended PERC's Enviropreneur™ Institute (PEI) in 2011. Higuera works for the Nature Conservancy in Boulder, Colorado, where he protects land through conservation transactions. He began his career practicing transactional law, but discovered that finding solutions and bringing people together resonated with him more than the process of litigation.

Q: What types of conservation transactions are you currently facilitating?

A: I am primarily responsible for obtaining conservation easements on large ranches (over 10,000 acres) in eastern Colorado in order to preserve shortgrass prairie and protect native bird and wildlife species. In addition, I am working with a small group of people to determine ways to bring private capital into our conservation work and land transactions. We have been exploring ways to engage the private sector in acquiring properties with significant biodiversity value and are considering using an investment vehicle such as a real estate investment fund. The fund would manage the properties for a profit while also protecting their biodiversity by placing a conservation easement on the land. The sale of the conservation easement would help the fund acquire the property at a lower basis thereby increasing the operating return on its investment.

Similarly, my project at PERC's PEI program sought to find ways to work with oil companies to manage drilling operations in an environmentally sensitive manner. The common element between the real estate fund and the oil company idea is finding market-based incentives that make it attractive for those ventures to promote conservation on their properties.

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BUYERS & SELLERS

This February, Howell and PERC hosted a workshop in Key Largo exploring the question of whether contracts can help save coral reefs. The basic idea was to link the buyers and sellers of coral restoration. Not coincidentally, that is exactly who attended the workshop.

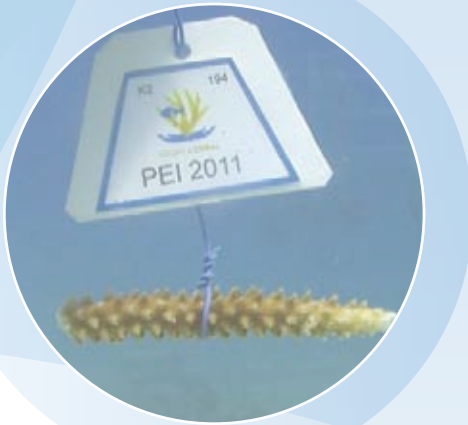
Who sells coral restoration? First and foremost, nonprofit groups like the Coral Restoration Foundation (CRF) that grow Staghorn and Elkhorn coral in ocean-based aquaculture nurseries and transplant them to wild reefs. To date, CRF has developed the largest offshore coral nursery in the United States and transplanted more than 3,000 corals at 22 different reef locations in the Upper Florida Keys. This approach to active reef management has the potential to increase the resilience and biodiversity of the reefs.

Other potential sellers of reef restoration include those whose actions currently degrade reef health, such as wastewater dischargers, commercial fishing boats, and cruise line operators. Although some might object to the concept of paying an emitter to emit less, an angler to fish less, or a cruise captain to divert off course less, such objection fails to recognize the reciprocal nature of costs and the practical effectiveness of forbearance contracts. Because coral growth is measured in inches per year, and because a single boat anchor can quickly destroy an acre, limiting the harmful activities is just as important, if not more so, than transplanting new coral.



The list of potential coral restoration buyers is eclectic. The most obvious beneficiaries of a healthy coral ecosystem are the local dive shop operators, charter boat captains, hotel owners, and restaurateurs who profit from the reef visitors. These groups might be willing to invest in reef restoration not only for the business insurance it provides but also for the reputation premium they might collect as restoration supporters.

A less obvious but potentially significant source of restoration funders are the existence consumers—those who may or may not plan to visit the reefs but who nonetheless are willing to pay some amount to know that it exists and that they contributed to restoration. Defenders of Wildlife demonstrated the effectiveness of targeting this consumer group by raising the wolf compensation trust fund with sales of posters depicting gray wolves reintroduced to Yellowstone National Park.



LET'S MAKE A DEAL

There are currently more questions than answers about whether and how all of these potential buyers and sellers can negotiate a deal to restore Florida's coral. The most obvious question is whether the buyers' willingness to pay exceeds the sellers' costs of production—whether the margins are sufficient.

Next is the important question of transaction costs. Monitoring, measuring, and enforcing performance of contractual obligations will not be cheap, be they affirmative obligations to plant coral or forbearance obligations to not destroy them. If these transaction costs overwhelm the margin, then access to the resource will remain open. On the other hand, if these costs are minimized with efficient risk allocation, creative deal structuring, and a bit of trust, then, as Monty Hall would say, "let's make a deal."

When it comes to minimizing transaction costs, closing commons, and eliminating externalities, it helps to have an enviropreneur like Howell in the room. His vision for a coral restoration market and his eagerness to make it a reality make him all the more ready to dive deeper.

For more information: www.walker-foundation.org



REED WATSON is the Director of Applied Programs and a Research Fellow at PERC. He holds a J.D. and M.A. in Environmental Economics from Duke University and a B.S. in Economics from Clemson University. He can be reached at reed@perc.org.

Q: What might some incentives be for companies to conserve land tracts used in part for drilling?

A: We cannot use a conservation easement to address drilling for oil because mineral rights are very different than surface rights, but my idea was inspired by the success of the conservation easement as a way to facilitate the acquisition of property rights that are valuable to the Nature Conservancy's (TNC) mission to protect biodiversity. The crux of my project at PEI was exploring ways to create incentives for oil companies to work with conservation organizations to plan their projects to avoid sensitive areas and minimize impacts. The most ambitious way to do that would be for companies to create a product that is differentiated in the marketplace from others by the way in which it was extracted. We certainly see this in the organic food and forestry markets. Unlike the conservation easement model that relies in part on public funding and tax incentives, this model would rely on the consumer to pay for the conservation benefits.

A conservation drilling plan would provide protections for biodiversity, which is a win for TNC and others who value nature. It could also be a win for the oil company by allowing them to differentiate their product, increase market share, and command a premium at the pump. Consumers who want to be part of the solution would win too.

Q. You have discussed the possibility of an eventual fourth pump at gas stations. What would this new "conservation gasoline" be, and how would it work?

A: The fourth pump is really the home run for this idea and represents something that I think needs to happen in conservation more generally. It represents a way to empower consumers with choices. If conservation is important to people, then people need to step up and vote with their dollars. Part of the reason that I have come to this conclusion is because I have more faith in people's ability to make change through the market than at the ballot box. The lobbying efforts of the oil industry have proven pretty effective at limiting new regulations. Consumer demand and pressure at companies such as Walmart (that's now carrying organic food and taking steps to be energy efficient) have resulted in changes that I do not think could have originated from a legislative process. Another reason this kind of consumer or market-generated conservation has the potential

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Where Free Markets Meet Faith

BY PAUL SCHWENNESEN

On first blush, there doesn't appear to be much in common between those placing their faith in markets and those putting faith in the divine. Wasn't it the moneychangers, after all, who incurred the physical wrath of an otherwise pacifist Jesus? The Qu'ran notes with little room for quibbling, "They who hoard up gold and silver and spend it not in the way of Allah, unto them give tidings of a painful doom." The Buddhist Dhammapada says, "Not by a shower of coins does contentment arise."

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GreenFaith isn't just about teaching people that God wants a healthy environment. It's about mobilizing the faith-based sector—one of the largest social networks in the country—to make it actually happen.

So much for heavenly endorsement of the price-conscious. Yet GreenFaith, a religious interfaith coalition, takes a less critical view of the role of markets, particularly as they bear on environmental resources.

Fletcher Harper and Stacey Kennealy, two graduates of PERC's Enviropreneur™ Institute ('07 and '10 respectively) believe that the overarching market concept shaping GreenFaith's work has been the idea of getting the incentives right. "People think that in the religious sector, belief and good intentions are what fuel people's behavior," said Harper, Executive Director at GreenFaith. "Our experience is that beliefs and intentions alone fail to get the job done."

This revelation may be the key to GreenFaith's success. Its mission to inspire, educate, and mobilize people of diverse religious backgrounds for environmental leadership is informed by the recognition that decisions are rarely reached in a vacuum. GreenFaith has an advantage, admittedly, in leveraging the shared beliefs of the world's great religions—that protecting the earth is a religious value, and that environmental stewardship is a moral responsibility. But simply insisting that people "do what's right" doesn't capture the full measure of GreenFaith's work; the group calls for their members to address the mundane as well as the celestial. Values need to be specific and actionable.

to be so powerful is because it creates self-funded conservation that does not rely on public funding and, if successful, it ends up being replicated by competitors who see that it creates value. This kind of domino effect is where you really end up having change happen on its own and at scale.

Q: What challenges lie ahead in creating market incentives for oil companies to conserve land?

A: I think that the primary challenges are building a cooperative relationship with an industry that has not seen it in its interest to proactively work to promote conservation. Another key challenge will be developing a market for this type of product in a market space that did not previously exist. It will be critically important to create a market that has a mechanism to assure consumers that their dollars are making a difference on the ground and really advancing conservation while at the same time that mechanism needs to be user friendly for the oil companies.

Q: What did you take away from PERC's Enviropreneur™ Institute that will help you develop your project?

A: I came away from PERC with a fresh way of looking at problems and new tools for doing so. Additionally, I forged relationships with a great network of people who renewed my enthusiasm for my work and with whom I hope to collaborate in the future. PERC also helped deepen my understanding of markets, incentives, and property rights as a way to advance conservation.



The overarching market concept shaping GreenFaith's work has been the idea of getting the incentives right.



SAVING MONEY

One of GreenFaith's primary arguments for sustainable stewardship is the market-centered concept of *saving money*. Few activities are as earth-friendly as reducing wanton waste of costly resources. Temple Beth Rishon, for example, a successful case study under GreenFaith's popular Certification Program, saved \$34,000—with the small up-front investment of \$500—by adhering to a set of energy-saving principles that GreenFaith helped implement.

Through the Certification Program, houses of worship undergo a two-year process through which they integrate environmental themes into their worship services and religious education, their facility management, and their advocacy—focusing on issues that create a healthier environment for low-income communities. Participating faith communities also educate their members about adopting sustainable consumption habits, and carry out multi-generational activities and programs on the environment with institutions from different religious traditions.

The goal is to address “greening” comprehensively and holistically. “This is a big commitment for participating institutions,” said Stacey Kennealy,

director of the Certification Program, “and it pays off in a big way. We have seen time and time again that it creates significant environmental and financial benefits, and that it helps houses of worship become revitalized. For example, younger members of temples, churches, and mosques often get more involved when they see their congregation engaging the environment. But it took us quite a while to understand how to market those benefits effectively.”

Initially, GreenFaith marketed its Certification Program as an environmental leadership program. Over time, however, the marketing message has focused increasingly on the benefits of attracting and engaging younger members and financial savings, with environmental benefits as the third point of emphasis. “We realized that for the top leaders in most faith-based sites, the overall wellbeing of their congregation—its vitality, its ability to attract new and younger members, and its financial viability—represented the top-tier concerns,” said Harper. “We’ve begun to market the Certification Program as an answer to these challenges.”

This approach is having results. In the past year, GreenFaith has entered relationships with three national denominations that are promoting the Certification Program to their member congrega-



One of GreenFaith's primary arguments for sustainable stewardship is the market-centered concept of saving money.

tions nationwide. "These denominations recognize that the program is a way that they can help their congregations grow, both financially and as a community," said Kennealy. "By identifying our customers' primary needs, we've been able to reach a larger audience."

GreenFaith has also applied lessons gained at the Enviropreneur Institute in shaping the staff compensation structures in several of its programs. During 2010, for instance, GreenFaith was hired by PSE&G—one of the largest utility companies on the East Coast—to enroll moderate-income households into a home energy audit program. GreenFaith established a compensation structure through which representatives were paid for every household they enrolled. The group also established a referral program through which homeowners could receive a gift card for each successful referral they made. GreenFaith involved members of more than 150 urban congregations in the outreach effort. The results? More than 4,000 homes enrolled in the program over a 10-month period—results superior to those that PSE&G had experienced from their traditional billboard, bus stop, and bill insert advertising.



Q & A with Shira Kronich on Peace Building through Wastewater Treatment

For more of PERC's ongoing Q&A series visit percolatorblog.org

PERC Enviropreneur™ Institute 2011 alumna Shira Kronich is working to find solutions to shared environmental problems in the Middle East. As a project manager for the Arava Institute of Environmental Studies in Southern Israel, Kronich coordinates the first UNDP transboundary Israeli-Palestinian project, "Peace Building through Wastewater Treatment." The tensions in the Middle East are exacerbated by the scarcity of clean water, as well as from the polluted wastewater that traverses geopolitical boundaries. By encouraging environmental cooperation, Kronich is working toward peace and sustainable wastewater development.

Q: What is the current situation regarding wastewater in the West Bank? How does this affect Israeli aquifers?

A: The Palestinian Authority's centralized wastewater collection networks do not service the majority of residents in the West Bank, where only 54 percent of wastewater is collected and about 90 percent of sewage produced is discharged untreated into the environment. Generally, the cesspits that are used for storing wastewater are unlined—allowing sewage to percolate into the ground and pollute the groundwater. In addition, most of the pits are emptied with vacuum tankers that often dump the waste in open areas or in valleys. Roughly 60 million cubic meters of raw sewage are discharged into the environment in the West Bank every year. This degradation not only poses serious environmental and public health risks, but also causes cross-border conflict as the sewage generated upstream in the West Bank flows downstream into Israel. As the raw sewage flows downstream it hinders Israeli attempts to rehabilitate surface and groundwater, further reducing already limited transboundary water resources.

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GreenFaith is applying the psychology of incentives to their 2012 residential solar program, a partnership with solar developer AP Solar.



INCENTIVES MATTER

Recognizing incentives is clearly an important pillar of an economic way of thinking and a critical aspect to free market environmentalism. For many, incentives exist only as quantifiable metrics: cash payments, dividends, and return on investment. For others, incentives only exist in the ethereal sense: obligation, avoidance of censure, moral duty. GreenFaith does a remarkable service by demonstrating that good things occur if incentives can be looked at from both perspectives simultaneously.

GreenFaith is applying the psychology of incentives to their 2012 residential solar program, a partnership with solar developer AP Solar. Through this partnership, GreenFaith will identify candidates to have a solar array installed on their home at no cost, and purchase the electricity generated by the solar array at a discount to the utility price.

GreenFaith will employ commission-motivated representatives who will organize “solar screening events” throughout a number of New Jersey religious institutions. At these events, homeowners will have their homes screened initially via satellite photo, and the GreenFaith representative will be paid for each home that “goes solar” through the event. In addition, to incentivize the institution to publicize the event widely, GreenFaith will make a contribution

to the congregation for each “solar home” that results from their event. “Initially, we set the incentive level for the host sites relatively low,” said Harper. “But then we realized that to reach the volume that we want, we need their enthusiastic support, so we increased it substantially.”

GreenFaith and AP Solar are launching the program in February, and hope to have at least 500 solar installations completed by the end of the year. “AP Solar came to us because they wanted to generate higher sales volume as efficiently as possible,” said Harper. “We’re approaching this as aggressively as we can.”

MERGING MARKETS & FAITH

All this sounds suspiciously businesslike, quite unlike the idealism so common in the nonprofit sector. But GreenFaith’s national reputation for encouraging environmental leadership at churches, mosques, synagogues and other houses of worship all over the country speaks to the value of the approach. “It’s been an interesting cross-cultural experience to combine free-market and faith-based principles on the environment,” said Harper. “While there are a number of ways in which we’ve seen markets fail

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“It’s been an interesting cross-cultural experience to combine free-market and faith-based principles on the environment,” said Harper (featured right).



to protect the environment, we also recognize that market and business principles are extremely powerful tools to create positive environmental change.”

“In the end, GreenFaith isn’t just about teaching people that God wants a healthy environment,” said Harper. “It’s about mobilizing the faith-based sector—one of the largest social networks in the country—to make it actually happen. PERC has helped us understand new tools and perspectives on how to achieve this goal. We’re very grateful.”

It is said that it is “easier for a camel to go through the eye of a needle than for a rich man to enter heaven.” This may indeed be true; laboratory tests so far have been inconclusive. But the larger point is, of course, that a single-minded devotion to financial incentives can be ruinous to the soul. GreenFaith helps remind us that our motivations ought to be more broadly understood.

For more information: www.greenfaith.org



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 schwenneesen@mac.com.

Q: What services does “Peace Building through Wastewater Treatment” provide?

A: Our project is a pilot program which, if extended, will represent a sustainable and comprehensive wastewater infrastructure solution for Al’Oja village in the West Bank. This project is grounded on a decentralized and collaborative approach. Collaboration is envisaged by combining Israeli and Palestinian expertise in wastewater treatment and reuse. The cross-fertilization of ideas will allow for both Israelis and Palestinians to resolve the wastewater treatment problem in the West Bank to the benefit of both parties. In short, this project has two outputs: improved wastewater management systems in the targeted communities and promotion of dialogue between Palestinians and the Israeli.

Q: How will solving wastewater disputes help relieve tensions in the region?

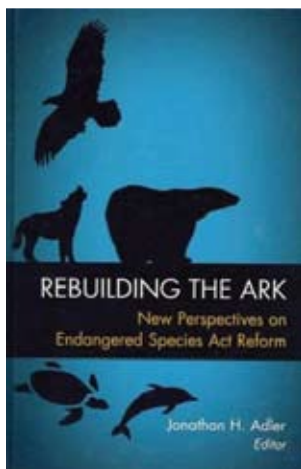
A: A guiding assumption for the project is that relationships yield partnerships, regional environmental projects, and inter-municipal agreements and thereby reduce conflict. If such relationships can be replicated, then local communities will share the responsibilities—costs and benefits—from joint wastewater treatment projects. There is great benefit in rethinking the water scarcity situation in Israel and Palestine, not from a national view, but rather from a supra national perspective. The gap in public perception, understanding, and policy is still large in relation to issues traditionally regarded as national, such as water distribution and wastewater infrastructure. The project aims to strengthen dialogue between the Palestinians and Israelis at different levels through the transfer of knowledge and training activities.

Q: What did you take away from PERC’s Enviropreneur™ Institute?

A: The access to very experienced and knowledgeable professionals for information exchange and guidance was immensely positive. Additionally, it was rewarding to meet new people and broaden my professional network. Market-based solutions and a sounder understanding of the need for incentives has helped me develop my project and I hope to implement these issues into my work in the Israeli-Palestinian context.

The Ark in Dry Dock

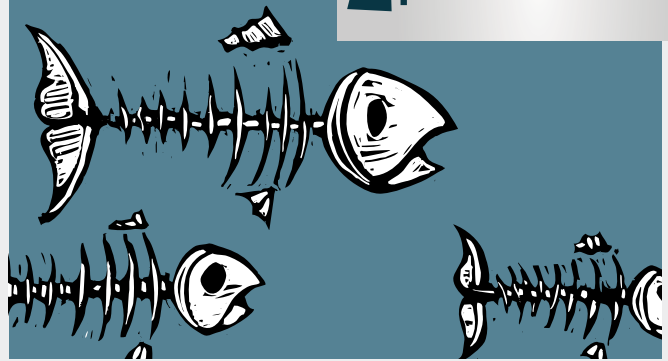
Let us stipulate that the Endangered Species Act (ESA) of 1973 is right up there with the Superfund law and the Clean Water Act rules impacting wetlands, as one of the “most criticized and controversial of all environmental laws,” as described by Jonathan H. Adler, professor at Case Western Reserve University School of Law, PERC senior fellow, and editor of *Rebuilding The Ark: New Perspectives on Endangered Species Act Reform*.



Private landowners, farmers, businesses and government officials have all been entangled with regulation and lawsuits to protect endangered or threatened species listed pursuant to this very powerful statute, once deemed the “pitbull” of environmental law. It’s “short, compact, and has a hell of a set of teeth,” according to one environmentalist.

Bald eagles, wolves, grizzly bears, snail darters, and the Delhi Sands flower-loving fly, and 1,300 listed species, have generated much controversy and litigation, which may become more acrimonious as the issues of climate change and variability begin to manifest themselves in the decline or extinction of some species.

As J. B. Ruhl, professor at Vanderbilt Law School and a contributor to this stimulating collection of essays has observed, a wave of “mitigation liti-



gation” is coming. In 2009, the Center for Biological Diversity, one of the more litigious environmental organizations, which had previously sued to list the polar bear due to climate change, dedicated \$17 million in the formation of the Climate Law Institute to “establish legal precedents requiring existing environmental laws...to be fully implemented to regulate greenhouse gas emissions.” The ESA was specifically mentioned.

Professor Ruhl recommends a statutory exclusion of “covered greenhouse gas emissions,” i.e., those already regulated by some other law or regulatory regimes so as to avoid collapsing the ESA under the weight of regulating, well, everything which might, arguably, lead to negative effects on listed species. The structure of the ESA and the impossibility of establishing causal links between a specific emitter or actor and a particular species justify this exclusion. However, Ruhl also wants to recast the law to replace the goal of recovery with that of transition over the next fifty years for “climate-threatened species” and adaptation to climate change. This new category would be defined as “any endangered or threatened species the threats to which are attributable substantially to climate change and its impacts on the ecological conditions upon which the species depends for its survival.”

Notwithstanding all the controversy and lawsuits, the law has always drawn upon deep wellsprings of support from many quarters of American society and its political class—like Newt Gingrich.

In his 2007 book, *A Contract with the Earth*, co-authored with Terry L. Maple, former president and CEO of Zoo Atlanta, Gingrich, not for the first time, discussed his love for wildlife and reiterated his staunch defense of the ESA as “an excellent example of the value of civility, consultation, and collaboration.” He acknowledged that subsequent changes to the law “have produced good results, a function of shared values and democratic ideals.” Moreover, the Act may be “America’s best environmental success story.”

The former Speaker was referring to various amendments to the law and regulations, which provide Safe Harbors and “No Surprises” for landowners

Q & A with Kelly Sands Siragusa on Conservation Banking

For more of PERC’s ongoing Q&A series visit percolatorblog.org

Kelly Sands Siragusa is the Conservation/Mitigation Manager for Corblu Ecology, LLC, a private firm in Atlanta, Georgia, that specializes in ecosystem restoration and mitigation banking. Siragusa came to PERC’s Enviropreneur™ Institute (PEI) in 2011 to focus on emerging market-based approaches for nutrient reductions and water quality improvements for Total Maximum Daily Load implementation. She soon discovered the lessons from PEI applied evermore to existing Corblu projects. In particular, Siragusa has applied insights from PEI to the development of a conservation banking program in the Etowah River Basin for three federally listed fish species.

Q: What are the endangered species issues in the Etowah River Basin? What are the challenges to implementing protection for these species?

A: The Etowah River Basin has experienced tremendous growth pressure from metro-Atlanta and five of the fastest growing counties in the country. As a result, demands placed on water resources and increased urbanization have led to aquatic habitat loss and diminished habitat quality. The three listed aquatic species targeted by this initiative, the Cherokee darter, Etowah darter, and amber darter, are especially vulnerable to land-use changes. Mitigation for adverse impacts has primarily been provided through on-site actions such as stormwater management to minimize impacts and, in some instances, off-site mitigation handled on a case-by-case basis. Corblu identified the need and opportunity for a conservation banking program to provide additional conservation in the watershed.

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who voluntarily protect habitat and incidental take permits. These amendments, while hard to measure for ecological effectiveness, have introduced flexibility into what would otherwise be unforgiving regulatory mandates.

The debate still rages as to the benefits and costs of the ESA, not to mention constitutional issues relating to property rights and unlawful takings, be they categorical or regulatory. Even the metrics of success and failure are controversial. Critics cite the very small number of species that have recovered or been delisted. Professor Adler says 47 were delisted of which nine went extinct as of August 2009. Defenders cite the avoidance of outright extinctions. Again, Adler cites a 1999 study which estimated that the ESA prevented just 192 domestic extinctions during its first 26 years or, using the same methodology, 227 species in the first thirty years.

Supporters, critics, and reformers of the law do agree that perverse incentives, a very real challenge to species health and protection on private lands, influence the behavior of property owners who readily anticipate the loss of significant economic value in their land if a listed species is found. Their resulting behavior has sometimes been described as “shoot, shovel and shut up.” Cut the trees or shoot the critters before the feds prohibit you from using the land for any financially viable activities. Adler calls this behavior “preemptive habitat destruction.”

Law Professor David Dana of Northwestern University, in his contribution on “Reforming Section 10 and the Habitat Conservation Program,” notes the “central dilemma” of the ESA: “how to foster species conservation and recovery on private land.” Some estimates indicate that more than two thirds of listed endangered species can be found on private property. “Even in areas where there is substantial federal land that contains critical habitat, the federal land often is part of a patchwork of federal, state, local, and purely private holdings,” says Professor Dana.

There is some evidence that ESA mandates and the expenditure of real money on public lands can accomplish statutory objectives. Such is not the case on private lands given the lopsided use of the

former without the benefit of the latter. Adler quotes one study which finds that “the ratio of declining species to improving species is 1.5 to 1 on federal lands, and 9 to 1 on private lands.”

Most of the contributors to *Rebuilding The Ark* focus on various aspects of the challenge of providing incentives for private stewardship for the benefit of endangered species and biodiversity, up to and including protection of ecosystems at scale, and overcoming the barrier of “information asymmetry between government regulators and private land-owners.” There are more of the latter than there are of the former out there across the country.

In truth, information, like lunch, is not free. Accurately assessing the impacts of Habitat Conservation Plans, for instance, is a daunting challenge requiring much data collection and evaluation. And any movement toward incentive- or market-based approaches such as conservation banking or recovery crediting will impose similar costs to achieve transparency and measure results. All of these efforts require “independent evaluation and public scrutiny,” according to R. Neal Wilkins, director of the Institute of Renewable Natural Resources at Texas A & M, who wrote a chapter on “Improving the ESA’s Performance on Private Lands.” Still, these innovative approaches “would be superior to the more cautious approach taken thus far.”

“An ESA that provides a framework for innovative approaches to stimulating conservation on private lands will be much more effective than an ESA that approaches private lands as a regulatory problem,” argues Professor Wilkins.

Professor James L. Huffman of Lewis & Clark Law School offers a spirited article on “Protecting Species through the Protection of Water Rights.” He characterizes the governmental preference for uncompensated regulation over the use of eminent domain, as well as agricultural water-users’ resistance to competing with environmental users on price, as the “species protection-takings dance.” He makes a strong case, based on his analysis of current litigation, that the courts will, ultimately, find that state water rights are property rights entitled to just compensation for use value as reflected in

the market, if taken by reason of ESA restrictions deemed to be a taking. He cites the success of the Oregon Water Trust as a model of things to come in terms of water markets for environmental values not just consumptive use.

Emory Law Professor Jonathan Nash makes a cogent case for recalibrating tax deductions for income, gift and estate tax deductions “to reflect the value of an [conservation] easement to a threatened ecosystem” rather than relying “upon the fair market value of the donated easement, that is, upon the reduction in value in the underlying piece of property resulting from the donation of the easement.” Notwithstanding the challenge of valuing ecosystems, this approach would certainly improve incentives for private conservation as would reform of the ESA and international treaties to allow for commercial trade in certain species to encourage local support for species conservation and habitat protection, worldwide, as recommended in a concluding chapter by Michael de Alessi of Stanford University. De Alessi quotes the late Jacques Cousteau, “If the green sea turtle is to survive, it must be farmed.”

The contributors assembled by Professor Adler in *Rebuilding the Ark* are an innovative, informed, and insightful group of experts—a broad spectrum of policy and legal thinkers—who will stimulate a useful dialogue on endangered species legal reform and the protection of nature in America.

A review of *Rebuilding the Ark: New Perspectives on Endangered Species Act Reform*, Jonathan Adler, Editor. AEI Press, 2011.

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Q: Why conservation banking?

A: Federal guidance has recommended the use of conservation banks under the Endangered Species Act as a means to conserve listed species in instances where impacts are unavoidable. A conservation bank is basically privately or publicly owned land managed for its natural resource values. In exchange for protecting the land, the bank operator is allowed to sell habitat credits to developers who need to satisfy legal requirements to offset their environmental impacts. In short, conservation banking shifts the administrative burden of managing projects to private entities specialized in the field. Often these approaches provide superior outcomes and are more cost effective than traditional mitigation approaches.

Q: How will Corblu develop a conservation bank to provide listed species protection in the Etowah River Basin?

A: Corblu has worked with the Southeast Ecological Service Center to develop a framework for conservation banking in the basin and to develop the proposed Deerleap Preserve Conservation Bank—the first of its kind in Georgia and the region. The proposed conservation bank will provide protection and management of 940 acres of pristine occupied stream habitat and associated riparian and upland habitat in the headwaters of the Etowah River. The bank is being developed in accordance with federal guidance and will provide conservation credits for the target species.

Q: Did the lessons from PEI in business planning, help you gain a more comprehensive understanding of how to participate in these markets?

A: Attending PEI helped me think critically about factors pertinent to establishing sustainable markets and successful projects. The case studies presented at PEI provided real-life examples of project implementation, creative funding sources, and adaptive management. Lessons on the importance of economic incentives, for example, reinforced the need to assure that credit methodology adequately incentivizes participation in the market while also providing the needed environmental benefits. Most importantly, PEI drove home the importance of balancing conservation and business and looking for win-win scenarios for both people and the environment.



The Mobile Bazaar: Connecting Farmers to Markets

Deepa Bachu, a native of Bangalore, spent ten years working for the high-tech firm Intuit in Silicon Valley before she returned to India determined to make a difference. She found a place to put her skills to work in the agricultural markets.

Roughly 70 percent of India's economy is tied to agriculture, but small rural farmers did not know how to get the best prices for their produce and were at the mercy of market agents. Lack of information was their biggest problem.

With the backing of a small Intuit team, Bachu launched a research project that revealed the obstacles in the marketplace and the painful consequences for farmers and their families—ranging from wasted resources, hunger, and even suicide in the most desperate situations.

Eventually the team settled on an approach that could make major improvements to how agricultural markets work in India. By using a SMS-based mobile phone system (Simple Message System) buyers could send farmers market prices three times a day—morning, mid-day, and evening—with closing prices and a prediction for the next day's prices. Farmers could sign up for the service at the market or by calling a toll free number. Representatives from the new service would then visit the farmer's village, collect detailed information on the crop,

and soon messages on market prices were on their way to the farmer.

With this information, farmers could identify which market in their area was offering the best prices and move their perishable goods as quickly as possible to avoid waste. If they encountered lower prices than expected, they could use their SMS-delivered information to leverage a higher price.

Not only did the farmers benefit from the availability of market prices but so did the agents. Farmers brought produce to those agents offering higher prices, meaning they had more products to sell—up to three times as much produce in a single day than their competition.

By utilizing technology to provide the most current market information to even the most remote rural areas, Bachu has improved the lives and the futures of many Indian farmers. The same goes for the buying agents, who are equally excited about their future prospects.

What has come to be called the mobile bazaar has far reaching implications for other parts of the world where 60 to 70 percent of the population and the GDP are based on agriculture.

For more information: www.farmingfirst.org



Predator Free Possums Meet CO₂ Powered Piston

New Zealand is being overrun by a pack of possums 30-million strong. The cat-size animals with pointy ears and long bushy tails are eating their way through native forests, destroying habitat and food for rare bird species, and keeping homeowners awake at night with their endless shrieks and whistles as they feast on the family vegetable garden. Introduced from Australia in 1837 by British immigrants hoping to kick start a fur industry, they are creating what some biologists call an ecological disaster. Past efforts to curb their numbers have had limited success.

The possums, marsupials unrelated to the American opossum, have no natural enemies in New Zealand. Even the trees are at their mercy as they munch them to death, while in their native Australia many trees have spines, prickles, and poisonous leaves that keep the possums on the ground. Serendipitously, several businesses are profiting from possum products and at the same time reducing the possum population.

The pelts have always been used in a range of garments for cooler climates, but more recently the fur has been combined with merino wool and silk to make an ultra-soft, lightweight material that has attracted the attention of top fashion outlets. Untouched World, a New Zealand company and the first fashion business to be recognized by the United

Nations for sustainability, is selling sweaters, hats, gloves, and socks at their stores and online.

The supple skin of the possum also has been discovered by sports enthusiasts for both golf and rugby. Fila, one of the world's largest sportswear manufacturing companies, is selling gloves made from possum skin and rave reviews have come from Singapore, Korea, and the United States, among others. As the demand goes up, the number of possums goes down; trappers are back in the forests because providing possum pelts can also provide a good living.

Exterminating possums is usually done with traps or poison. Although considered pests and a danger to the environment, many people, including potential customers, are uncomfortable with these methods. To solve that problem, the company Goodnature, founded by three industrial design graduates, has developed a humane and non-toxic method of killing possums. Their device delivers a fatal blow to the head by a CO₂ powered piston.

While the battle to protect the birds and forests of New Zealand from an army of voracious, predator-free possums has not been won, the power of markets is joining forces with the Department of Conservation to protect one of the world's most unique environments.

For more information: www.goodnature.co.nz



Nature's Styrofoam Solution

Styrofoam and other petroleum-based products that are used for packaging and insulation as well as the ubiquitous white coffee cup may one day be replaced by a combination of barley husks and mushroom roots. You may laugh, but this material is being grown by Ecovative Design, a start-up company operated by two twenty-something graduates of Rensselaer Polytechnic Institute in New York.

While still in school, company co-founders Eben Bayer and Gavin McIntyre noticed the strong bond that mycelium—mushroom roots—formed with wood chips. That observation has become the basis for a rapidly expanding business that is supplying protective packaging for companies such as Dell and Steelcase as well as the National Oceanic and Atmospheric Administration (NOAA).

A wide variety of agriculture byproducts can be used as the raw material from buckwheat hulls to cotton burrs. The material is cleaned and blended, then inoculated with mycelium. Molds are made specifically for each product: a wine bottle, a computer, a steel table, or an ocean buoy. Once they are filled with the mixture they are left alone to grow in a storeroom without light, water, or any additives.

Five to seven days later, the forms are removed, and the material goes through dehydration and a heat treatment process to stop growth and ensure there will be no spores and related allergen concerns. Now they are ready to protect products loaded on trucks, trains, planes, ships, or even a wagon.

Nature has supplied the raw materials as well as most of the energy to produce the product. Known as EcoCradle Packaging, its cost is already competitive with the big players in the field as well as being completely biodegradable. NOAA purchased the material for use in the ocean where it will biodegrade in five months.

Packaging is only the beginning for Ecovative Design. With a multidisciplinary team of biologists, mycologists, engineers, environmental scientists, and manufacturing experts, they are already creating new applications and products that could revolutionize any number of industries from aerospace and building to fashion and food storage.

For more information: www.ecovatedesign.com

California's Redevelopment Nightmare Coming to an End



In a landmark victory for private property owners in the Golden State, the California Supreme Court recently upheld a statute abolishing the nearly 400 redevelopment agencies across the state. The court also struck down a law that would have allowed these agencies to buy their way back into existence. The final outcome of the case is that, in 2012, California's decades-long redevelopment nightmare will finally come to an end.

California redevelopment agencies have been some of the worst abusers of eminent domain, violating the private property rights of tens of thousands of home, business, church, and farm owners. The Institute for Justice has catalogued more than 200 abuses of eminent domain across California during the past ten years alone. In *California Scheming: What Every Californian Should Know About Eminent Domain Abuse*, the Institute for Justice exposed the enormous amounts of taxpayer money used to fund these illegitimate land grabs. In fiscal year 2005–2006 alone, redevelopment agencies' revenues were an astonishing \$8.7 billion. In other words, 12 percent of all property taxes in California that year were sent to these bureaucrats.

As part of the state's response to its fiscal emergency and to stop this drain on the state's resources, the legislature passed, and Governor Jerry Brown signed, two laws: Assembly Bill 1X 26, which dissolves redevelopment agencies, and Assembly Bill 1X 27, which exempted agencies that agreed to make payments into funds benefiting the state's schools and special districts. The California Redevelopment Association and the League of California Cities, among others, challenged both laws, arguing that they violated the California Constitution.

The court held that AB 1X 26, the law barring the agencies from engaging in new business and providing for

their windup and dissolution, was "a proper exercise of the legislative power vested in the Legislature by the state Constitution." The court concluded that the Legislature has both the power to create such agencies "and the corollary power to dissolve those same entities when the Legislature deems it necessary and proper." In contrast, the court concluded that AB 1X 27, which allowed the agencies to continue to exist if they made certain payments, violated a provision of the California Constitution that prohibits the Legislature from requiring payments from redevelopment agencies to the state.

"This decision represents the worst of all worlds for California redevelopment agencies—and the best of all worlds for California property owners and renters," said Dana Berliner, a senior attorney with the Institute for Justice. "The agencies managed to achieve a decision that upholds their dissolution while striking down a law that gave these agencies a way to stay in existence. The agencies' arrogance, so often employed against property owners, finally proved their undoing."

While the decision focused on specific provisions of the California Constitution, its practical effect represents a significant victory for California property owners. "Redevelopment in California has been a billion-dollar, state-subsidized boondoggle that has completely eroded private property rights through the abuse of eminent domain for private gain," said Christina Walsh, the Institute's director of activism and coalitions. "With the court's decision, redevelopment has finally met its long-overdue end, and property owners who have been living in terror across the state can finally rest safe in what they've worked so hard to own."

The decision reaffirms the common-sense conclusion that state agencies do not have a constitutional right to perpetual existence. More importantly, it means that California is no longer lagging behind the rest of the country in respecting private property. Rather than interfering with California's recovery, this decision should encourage it, as people considering moving to or staying in California now know that their property cannot be seized and transferred to a private entity by out-of-control, unaccountable redevelopment agencies.



WILLIAM MAURER is the Executive Director of the Institute for Justice's Washington chapter. The Institute for Justice is a public interest law firm that is the nation's leading defender of victims of eminent domain abuse. This article originally appeared at www.ij.org.



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