



FROM THE EDITOR

I was fortunate enough to observe PERC's first official Enviropreneur Camp (ECamp)—a crash MBA course for environmental entrepreneurs. I left the graduation ceremony feeling inspired. These green gurus are not just talking about improving the environment; they are making, managing, and marketing environmental deals around the world. Raul Figueroa, for example, brought tears to my eyes as he talked about his quest to turn wildlife into an asset and at the same time reduce poverty in Kenya. He quickly turned his vision into a reality, organizing an international conference in Nairobi on "Conservation, Wildlife, and Markets."

One of the stars of this year's ECamp is JOE SEHEE. President of Conservation Burial Partners, Sehee introduced himself the first day of ECamp as a former flaming, roller-blading lounge act performer. He quickly demonstrated that his resume goes way beyond roller blades. In his article, Sehee describes his deep commitment to creating sustainable deathcare and using the burial process as a means of acquiring, restoring, and stewarding natural areas.

Other groups of enviropreneurs working to restore natural areas include Naturalia, the Northern Jaguar Project, and Defenders of Wildlife. Wildlife expert CAROLYN NISTLER points out that with local collaboration and innovative solutions like the "Wildcat Photo-Survey Contest," jaguar habitat and populations are being restored. As a result, people in North America actually may start seeing spots again.

New York City is known for Broadway shows, bagels, and big buildings, but not for being green. Journalist and New York native DEROY MURDOCK blows this notion out of the water by showcasing the private efforts of the Central Park Conservancy. Thanks to "Market-friendly Environmentalism in Midtown Manhattan," Central Park is flourishing beneath the skyscrapers.

In "Water Logged," JAMES LUCAS, another graduate of PERC's enviropreneur training, explains how underwater forests were once forgotten. Triton Logging Inc. is ensuring that the submerged trees will not be ignored again. Discover how Triton improves the health of the natural ecosystem, creates safer reservoirs, and also makes a profit.

Speaking of making a profit, GIJSBERT NOLLEN (ECamp 2007) is making green waves in Asia as he leads his company to create economic incentives for industries to clean up wastewater using a process that converts methane and other biogases into energy.

Once again, our regular columnists deliver thought-provoking material. Don't miss TERRY L. ANDERSON'S "On Target," DANIEL K. BENJAMIN'S "Tangents," TIM CRANSTON'S "Impressions," and LINDA E. PLATTS' "Greener Pastures."

Last but not least, if you value *PERC Reports*, please show your support by making a tax-deductible investment in PERC. REED WATSON writes to you in the centerfold and reflects on his conversion to free market environmentalism after attending PERC's annual seminar for undergraduates. It is these kinds of stories in combination with the work of enviropreneurs that demonstrate what is reaped from an investment in PERC.

Laura E. Huggins

Laura E. Huggins | EDITOR

PERC REPORTS

THE MAGAZINE OF FREE MARKET ENVIRONMENTALISM

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PERC REPORTS | VOLUME 25 | WINTER
NUMBER 4 | 2007

ISSN 1095-3779 © 2007 BY PERC

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BACK ISSUES: Available in PDF format on our Web site at
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PHOTO CREDITS: cover and page 23: Brandon Remler, www.brandonremler.com



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OPINIONS



PERC Reports offers optimism and encouragement to climate change doomsayers. PERC advocates free market solutions for environmental problems, finding solutions where others find only frustration. The current issue (Fall 2007) uncovers a reason for faith in capitalism, the system that PERC fellow Brian Yablonski argues has fostered the reemergence of the American bison through ranching and revenue-generating “trophy hunts.” Also in the issue, author Mitch Tobin lauds the federal government’s proposed \$400 million tax break program for landowners who help protect threatened species on their property. In Tobin’s estimation, the bill could help bring landowners and public interest together.

—Eric Kelsey
Utne Reader

Great editorial from Terry Anderson and good piece on “Bisonomics” in your last issue. Maybe it’s my accelerating age but your work has found increasing resonance. Keep up the good work.

—Todd Wilkinson
Author, Freelance Writer

Brian Yablonski (Fall 2007) does an excellent job of describing how an entrepreneur can take a resource that isn’t worth much and transform it into a valuable commodity. However, he errs in saying “the tragedy of the bison is one of the starkest examples of the tragedy of the commons.” A tragedy of the commons occurs when a resource is consumed more rapidly than it would be if well-defined and enforced property rights existed. In other words, the institutional framework leads to over-use. The primary reason bison did not remain abundant on the Great Plains after 1880 is not because they were unowned, although that fact might have sped up their slaughter. But, bison were a costly way to convert grass to meat in comparison to cattle, and if there would have been rights to bison on the parts of nineteenth century ranchers most of them would have been killed and cattle would have replaced them.

In the 1880s, a buffalo hide (the only part of a bison that could be easily shipped to eastern markets) was worth \$3 in Miles City, Montana. A cow was worth \$20 to \$25 (see *The Not so Wild, Wild West* by Anderson and Hill 2004). Ranchers understood the economics of bison ranching versus cattle ranching and hence made no efforts to stop the hide hunters.

Yablonski is correct in his description of private entrepreneurial efforts to save bison, but those entrepreneurs took action when the numbers had been decreased enough that the marginal value of a bison for ecological or curiosity reasons had increased. When there were 10 million bison on the range, the value of a bison preserved for the future was small; when the number approached 1,000, some future-minded entrepreneurs decided to take steps to preserve the species. The fact that there are now more than 250,000 bison in North America attests to their farsightedness.

—P.J. Hill
Professor of Economics, Wheaton College
PERC Senior Fellow



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GREEN BURIAL

It's Only Natural

By Joe Sehee



An early morning panoramic view of the conservation burial ground at the Galisteo Basin Preserve. The property has most recently served as a cattle ranch and backdrop for Western film shoots. Half of the proceeds from the burial program will be used to acquire and steward an adjacent 1,000-acre “memorial landscape.” An additional 5,000 acres will be made available for private family burial grounds.

Green burial may sound like another trend of the eco-chic, but it's actually the way most of humanity has cared for its dead for thousands of years. The idea calls for returning to the earth without the use of non-biodegradable toxins or materials—no embalming, no metal caskets, no concrete vaults. Remember that “ashes to ashes” thing?

Though green burial is not a new concept, what is new is that it is being done in conjunction with restoration planning and conservation management techniques, providing a powerful new tool for protecting endangered habitat at a time when innovative, market-based solutions are sorely needed.

When I talk about my work—integrating conservation and deathcare—I'm usually met with either a nervous smile or a “you know, that makes so much sense, is there anything like that around here?” Some find it is because the concept requires the communion of seemingly incongruous concepts. I've known for a while, however, that it is often at these unusual intersections where the best ideas are born.

A decade ago, I led a research project for IBM to help the company better understand how major innovations are cultivated. One of my most important takeaways was that breakthroughs often come about when disparate things are brought together in ways previously unimagined. This explains why so many Nobel laureates made their discoveries while working in more than one field. Or why so much creativity came out of the renaissance pe-

riod, when there was a bleeding (literally at times) among the areas of art, science, and religion. It even makes sense of those old ads for Reese's Peanut Butter Cups.

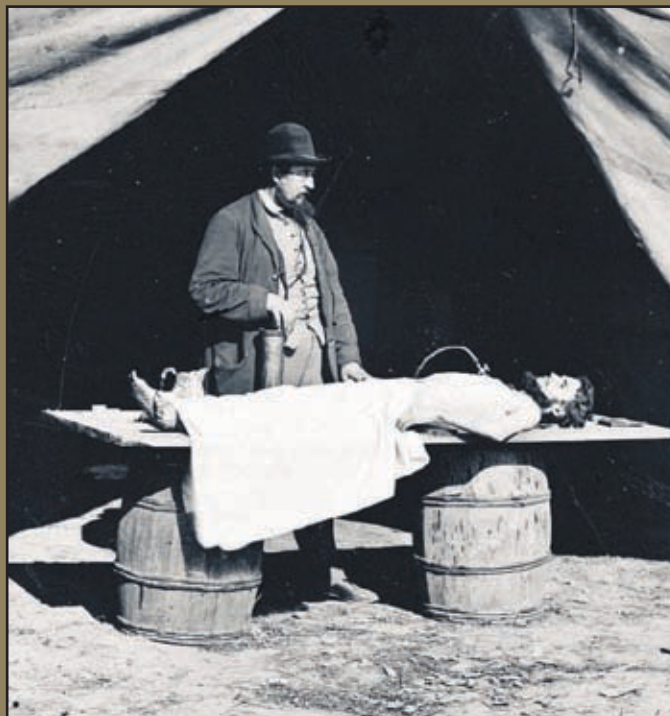
I had my big “who put chocolate in my peanut butter” moment in 2002 when I moved to the Mojave Desert to develop an eco-retreat after working as a strategic communications consultant for a client in the cemetery/funeral field. My wife Juliette, who had recently left her job with an environmental planning firm, and I hoped to create a retreat that would provide solace in the fierce landscape that is Joshua Tree, California. And we were especially interested in making our place suitable for those needing to heal from loss—people who, from my experience in the deathcare industry, seemed terribly underserved.

BEFRIENDING DEATH

A former spiritual director with whom I worked during my days as a Jesuit lay minister suggested that we look into the pilgrimages made by early-century monastics to the Egyptian desert as a means of “befriending death.” This led us to consider various end-of-life rituals we might accommodate at our place, which we dubbed “The Pilgrimage.” And it made us eventually wonder whether scattering ashes, or even whole-body burial, might be used to protect both our vast view shed as well as a fragile ecosystem home to many threatened plants and animals.

In exploring these ideas, I became aware of what

PHOTO COURTESY OF JONATHAN TERCERO (WWW.TERCEROPHOTOGRAPHYSTUDIOS.COM)



the British were doing with “woodland burial”—a form of green burial requiring the use of trees as grave markers; nice but nothing that would work in a place like the Mojave Desert. I also came to know Dr. William “Billy” Campbell. Since the late 1990s, Campbell had been operating the nation’s first exclusively green cemetery; a laboratory of sorts that had helped him figure out how burial could best contribute to ecological restoration.

Campbell and I were on the same page about how green burial might be used as a conservation strategy; so much so that we decided to try to create a facility together that could serve as a prototype for rolling the idea out nationally. We worked on our first green burial project with another partner from the conventional cemetery/funeral industry. It eventually became apparent that not everyone involved with the venture shared the ethic we knew was essential to make it succeed. Campbell and I were eventually forced to pull away from the project. But the experience taught me some invaluable lessons.

Green burial would only facilitate conservation if it were able to involve established conservation organizations willing to serve as stewards. To bring in these entities, it became clear to me that there had to be a legally enforceable mechanism of ensuring that everyone involved in the development and operation of a green cemetery was committed to transparency and accountability, as well as environmentally sound principles/protocols. I also came to understand that green burial needed to be done in a way that engaged rather than threatened the conventional cemetery/funeral industry. Most importantly, I realized that I just couldn’t give up on this idea.

Out of concern that green burial might get co-opted and due to our limited financial resources, my wife and I decided to sell our place in the high desert and use

ASHES TO ASHES?

For thousands of years, and throughout most of the world, burial customs have been used to honor the dead and heal the living. And the great religious traditions, which gave us our end-of-life rituals, have invited us to find solace in the fact that we are all connected to the same natural cycle of birth, death, decay, and rebirth. Then something happened.

- ☞ During the American Civil War, the Union Army, wanting to transport slain soldiers from the battle fields back home for burial, consulted with Dr. Thomas Holmes who developed a technique that involved the draining of a corpse’s blood and embalming it with a fluid made with arsenic for preservation.
- ☞ The manufacturers of embalming fluid established some of the nation’s first mortuary schools, making embalming a cornerstone of the American way of death, even with the advent of refrigeration and dry ice. Other products added to the movement including the coffin and the concrete burial vault.



EACH YEAR WE BURY

Coffins, vaults, and embalming (except under rare circumstances) are not required by law in any state, yet all are commonly used. In the United States, deathcare has become a \$15 billion industry—and a wasteful and toxic one at that. Each year we bury:

- ☞ Enough embalming fluid (now made up of formaldehyde, a known carcinogen according to the World Health Organization) to fill eight Olympic-size pools;
- ☞ More steel (in coffins alone) than was used to build the Golden Gate Bridge; and
- ☞ So much reinforced concrete that we could construct a two-lane highway from New York to Detroit.

the proceeds to let me establish, and lead on a voluntary basis, the Green Burial Council (GBC). The GBC is an independent, nonprofit organization, which aims to encourage sustainable deathcare and use the burial process as a means of acquiring, restoring, and stewarding natural areas.

With input from the nation's leading experts from such fields as restoration ecology, sustainable landscape design, conservation management and consumer affairs, along with people representing organizations like the Trust for Public Land and AARP, the Council established the first set of certifiable standards for two levels of green cemeteries. The standards, which can be seen at www.greenburialcouncil.org, require that a burial ground be permanently protected via a conservation easement or deed restriction, and that an operator engage in restoration planning as well as adhere to a set of ecologically sound protocols.

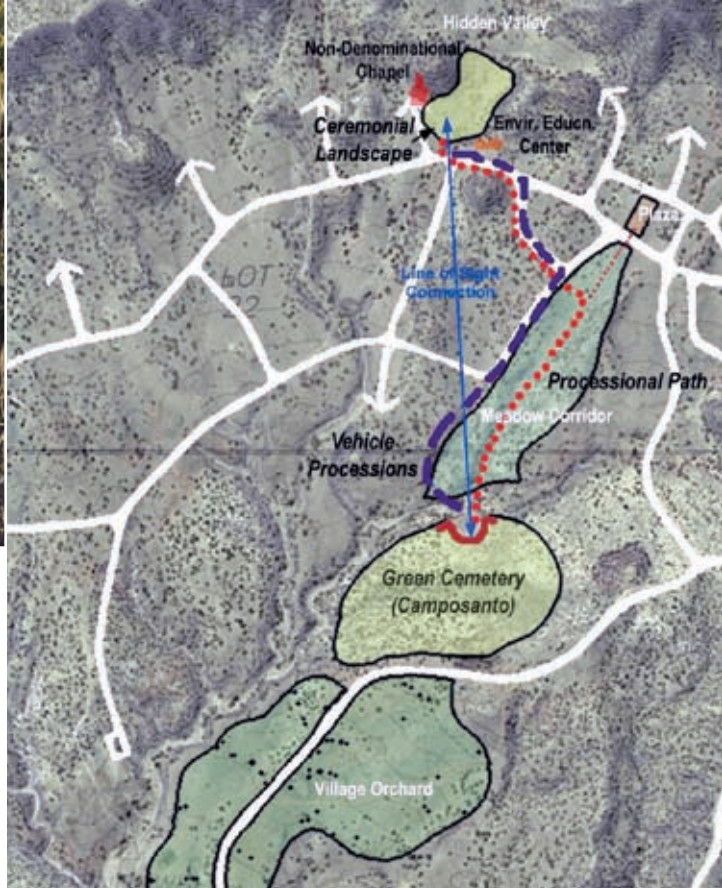
HERE LIES A SOLUTION

Last year, I established Conservation Burial Partners, LLC (CBP) to engage in work that falls outside of the scope of GBC's mission as standard bearer in this emerging field to directly assist in the creation of burial projects. With an executive team comprised of a former head of a prominent national environmental organization, a retired senior vice president of a large cemetery/funeral concern, and a management consultant who specializes in green start-ups, CBP aims to make green burial a more legitimate conservation tool and a readily available option for Americans desiring simple, sustainable and meaningful deathcare by bringing together conservation entities (i.e., land trusts, park service agencies, conservation developers) with deathcare concerns (i.e., cemetery operators, funeral providers, and cremation companies).

Conservation Burial Partners' business concept calls for our firm to first obtain the rights from a landowner to scatter and/or bury human remains. Once a property is entitled and compliant with all laws, we line up a conservation partner to serve as steward and a cem-



Grave markers at the cemetery will include those that are either living or ecologically functional. Both examples can be found in the photo above of a yucca plant and field stone. The site plan of the burial ground was done by renowned sustainable landscape design specialist and Santa Fe resident, Kim Sorvig.



etary operator to manage the facility in accordance with the Green Burial Council standards. CBP also provides marketing support in a number of ways including, via an exclusive arrangement with the nation's largest direct-cremation company—the Neptune Society—which will begin making available to its clientele scattering options that generate money for conservation purposes.

Our flagship facility is in the Galisteo Basin Preserve just south of Santa Fe, New Mexico (see map). The project is a joint venture with the nonprofit Commonweal Conservancy and Santa Fe Funeral Options and Memorial Gardens, a local cemetery and funeral home. Half the proceeds generated from the burial program (tax-deductible for the consumer) will be used to acquire and permanently protect an adjacent 1,000-acre “memorial landscape.” There are several more projects in different stages of development in Alaska, California, Colorado, Michigan, Texas, and Virginia. And we are in the midst of raising money to expand these opportunities.

Green burial has been gaining support among entities whose buy-in is critical, as evidenced by my recent invitations to address the national conventions of the country's leading conservation organization and several elite associations of cemetery/funeral industry professionals. Favorable articles on the subject also have appeared over the past year in leading journals and trade publications published by organizations like the Land Trust Alliance and the International Cemetery, Cremation, and Funeral Association. And a recently published study by AARP—the first organization that has conducted a study related to deathcare in eight years—has identified

as a “key finding” that a “substantial portion of individuals in the 50+ age group expressed an interest in environmentally friendly alternatives to traditional funerals and burials.” That's not to say that the concept doesn't and shouldn't have its detractors.

In the wrong hands, protecting natural areas, not to mention caring for the dead, will always be problematic. This work is undoubtedly done best by those who are not motivated solely by profit. But it doesn't mean that market mechanisms should not be fully utilized to help solve these problems; particularly when government funding for conservation continues to erode, and legislative attempts, over many decades, to reform the highly entrenched cemetery/funeral industry have been entirely ineffective.

In the end, the success of this venture may lie less in connecting the dots between conservation and deathcare, and more in the ability to demonstrate that a couple of other seemingly disparate concepts—economic viability and ecological sustainability—are capable of co-existence. And that may be what it's going to take to make “ashes to ashes, dust to dust” once again meaningful.



Joe Sehee is the founder of the Green Burial Council and a principal of Conservation Burial Partners, LLC. A former Jesuit lay minister and Peabody Award-winning journalist, Sehee was a 2007 fellow with PERC's Environpreneur Camp, and is a national fellow with the Environmental Leadership Program. He can be contacted at Joe@greenburialcouncil.org.

Visit www.greenburialcouncil.org for more information



GET 'ER DONE

WHEN PERC
STARTED IN
1980, IT WAS
A SMALL THINK TANK.



Russ Miller (standing in white shirt), general manager of Turner Enterprises Inc., talked to ECamp 2007 fellows about conservation efforts at Ted Turner's Flying D Ranch in Bozeman.

People at PERC did research and published it in academic journals and university press books. Mainstream for us was having op-eds in newspapers—even some in the *Wall Street Journal*.

As PERC matured, we knew that we were having an impact on the academy, but we also realized that much of our research was gathering dust on professors' bookshelves. To remedy this, PERC expanded its mission to include educational programs. Audiences in these programs included journalists, congressional staffers, professors, and college students. Especially with journalists, we aimed at wholesaling the idea of free market environmentalism to a much broader audience.

Now with publications such as *PERC Reports* and the *PERC Policy Series*, we are marketing free market environmentalism ourselves. The readership of these publications continues to grow and will do so even more as we begin distributing *PERC Reports* in bookstores and on newsstands. Readers might even assist in broadening the distribution of these ideas by asking that complimentary subscriptions be sent to their friends or by requesting extra copies to place in their doctor's or dentist's office, or other places of business.

Through this evolution, PERC has transformed from a think tank to "PERC University." We have researchers, teachers, classes, outreach, and publications, all the trappings of a university.

What we have not had at PERC University until recently, however, is a business school—a department of the university where free market principles are applied. That changed with the addition of TEAM (Teaching Entrepreneurs About Markets), of which Enviropreneur Camp is a component.

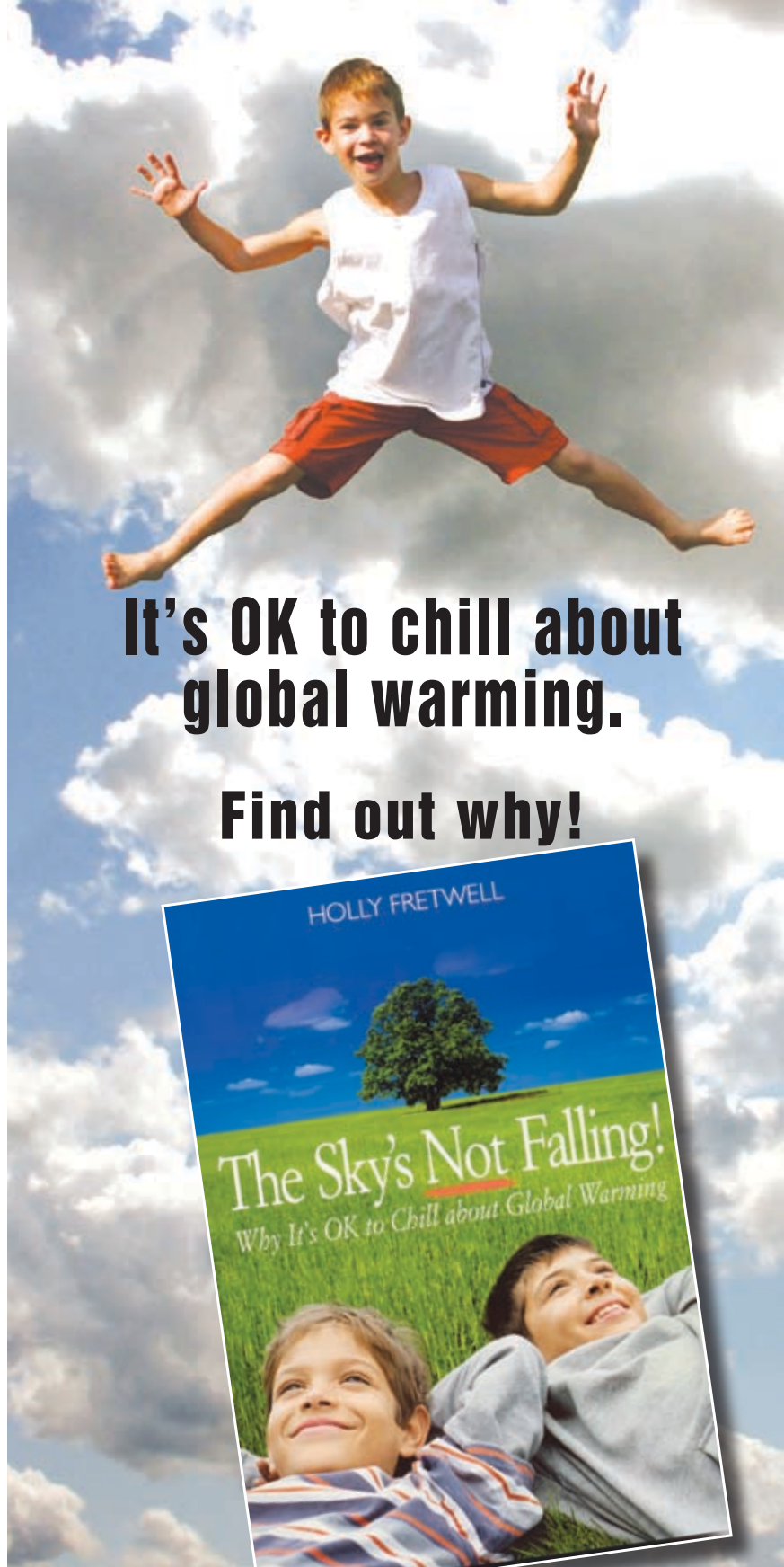
With the addition of TEAM, PERC has evolved from thinking to teaching to tinkering. As this issue of *PERC Reports* illustrates, we are now working with active environmental entrepreneurs. For these entrepreneurs, the environment is not a problem; it is an asset to be cultivated for future environmental and economic returns.

The environmental community has numerous programs that expand the use of science and develop leadership skills for solving environmental problems, and PERC lauds this approach. Both science and leadership are crucial for managing ecosystems, but without business skills, managers will fall short of finding economically sound and environmentally effective methods of enhancing ecosystem services.

Instead of focusing on economic theory, benefit-cost analysis, non-market valuation tools, and governmental policies that mimic markets, TEAM provides entrepreneurs with concepts and tools necessary to make deals for ecosystem services. Returning to the university analogy, TEAM shifts the emphasis from the economics department where research on markets is done to the business school where markets are applied.

This issue of *PERC Reports* tells the stories of entrepreneurs—environmentalists who, to use the popular comedian's phrase, "get 'er done." As PERC helps entrepreneurs tinker with applying free market environmentalism, we can rest assured that the environment, the economy, and freedom are all being enhanced.

In his "On Target" column, PERC's executive director TERRY L. ANDERSON confronts issues surrounding free market environmentalism. Anderson can be reached at perc@perc.org.



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SEEING SPOTS

THE RETURN OF THE JAGUAR

By Carolyn Nistler

A JUNGLE STORY

Conjure an image of hunting prowess in dark, steamy jungles and a jaguar might leap into mind. Ancient Mayans, in fact, celebrated him as a deity. Like all large predators, jaguars evoke fear, awe, and respect—sometimes simultaneously.

While jungle stories and legends abound, and the magnificent creatures indeed inhabit lush, green corridors and tropical rainforests, we don't realize that jaguars are just as happy to carve out an existence in the upland habitats of the southern United States and northern Mexico. In fact, jaguars have the ability to make a living wherever prey is plentiful and human disturbance is minimal.

The jaguar (*Panthera onca*) reigns supreme as the largest felid in the western hemisphere. He is immediately recognized by his large size (males may exceed 300 pounds and 8 feet in length) and, of course, those spots. Melanistic (black) jaguars are also in the wild, and often referred to as "black panthers."

The historical range of the jaguar extended north from Mexico into southern Arizona, New Mexico, Texas, and Louisiana. The current range reaches as far south as Argentina but toward the north their range barely spills over the U.S.-Mexico border. While breeding populations exist throughout Mexico and Central America, jaguar presence has been sporadic in the United States for the past 100 years. This is due in part to early ranching communities that viewed jaguars as a threat to livestock. Without protection, jaguars did not stand much chance of survival in northern latitudes during the 1900s.

Currently protected in the United States by the Endangered Species Act, jaguars are the focus of several conservation groups that are working with landowners to restore the jaguar to its historical habitat. Ironically, the very same market responsible for effectively reducing jaguar numbers last century may offer the greatest hope for successful jaguar restoration this century.

A SHOT IN THE DARK

Independent jaguar sightings by two Arizona hunters in 1996 prompted local landowners, conservation groups, and agency personnel to form the Jaguar Conservation Team, which has been meeting for more than 10 years. Participation on the team is voluntary and has resulted in the formation of numerous jaguar conservation initiatives.

The Borderlands Jaguar Detection Project was established to confirm jaguar presence along the border between southern Arizona and Sonora, Mexico. Fifty automated, motion-detecting cameras have been placed in probable jaguar movement

The Wildcat Photo-Survey Contest converts predators, including jaguars, from ranch liabilities to ranch assets. Jaguars benefit from being worth more alive than dead. Photos were taken with an automated, motion-detecting camera..





The very same market responsible for effectively reducing jaguar numbers last century may offer the greatest hope for successful jaguar restoration this century.

“SAVE A SPOT” FOR JAGUARS

Naturalia, in cooperation with the Northern Jaguar Project and Defenders of Wildlife, purchased the 10,000-acre Rancho los Pavos in 2003 to establish the Northern Jaguar Reserve. The partners are currently negotiating a contract to purchase the adjacent 35,000-acre Rancho Zetasora to complete the Northern Jaguar Reserve in early 2008. The partners are currently raising funds through their “Save a Spot” campaign. For more information on this program, visit www.NorthernJaguarProject.org.

corridors along the U.S.-Mexico border. Cameras are sponsored and monitored through partnerships between the Arizona Department of Game and Fish and private donors. Photos obtained from the project are being used to identify suitable jaguar habitat and movement corridors.

Project co-founder Emil McCain first became involved with jaguars while tracking cougar movement and activity for his master’s thesis project at Humboldt State University. He became fascinated with the jaguars near the Mexico border and the combined market and conservation potential for these spotted cats. He is interested in developing a sustainable market system for jaguar conservation, perhaps promoting “jaguar-friendly” beef—ranchers agree to not take lethal measures against predators, which creates a potentially profitable selling point to consumers. Efforts such as this draw focus to positive conservation developments that can be mutually beneficial. As McCain says, “money speaks!”

Two collaborative efforts are taking an enviropreneur approach to jaguar conservation in northern Mexico. The Northern Jaguar Reserve is the result of a three-way partnership between Naturalia, the Northern Jaguar Project, and Defenders of Wild-

life. This tri-partisan effort has led to the acquisition of 10,000 acres of jaguar habitat in Sonora and is in the process of purchasing an additional 35,000 acres to set aside for jaguar conservation (see sidebar).

In a related entrepreneurial effort, the Northern Jaguar Reserve has essentially doubled its area of protection through the Wildcat Photo-Survey Contest. Ten ranches neighboring the reserve participate in this program. Remote motion-triggered cameras, similar to the cameras used by the Borderlands Jaguar Detection Project, are strategically placed on ranches and are monitored monthly by trained vaqueros. Participating ranchers receive \$50 to \$300 per photo taken of jaguars, cougars, ocelots, and bobcats obtained on their private land. This demonstration project is proving very successful, and is currently being evaluated for the addition of new cameras, and increased rancher payment amounts. Between January and May 2007, 31 photos were taken, and 34,000 pesos (about US\$3,400) were paid to participating ranchers.

The novel approach of the Wildcat Photo-Survey Contest converts predators, including jaguars, from ranch liabilities to ranch assets. Jaguars benefit from being worth more alive than dead. With similarities to the Defenders of Wildlife-sponsored predator-livestock compensation programs, this program is decidedly proactive in nature, rather than reactive. Ranchers can receive payments simply for providing wildlife habitat, whether or not livestock depredation ever occurs.

To the detriment of beef lovers everywhere, damage to livestock can occur. Fortunately, private markets have developed a solution for this as well. The Malpai Borderlands Group, comprised of local ranchers and stakeholders devoted to ecosystem health, agricultural sustainability, and preservation of open spaces, was formed in 1994 and covers nearly 1 million acres in southern Arizona and New Mexico. Through rancher participation and conservation easements, the group addresses a variety of issues related to grazing, conservation, and ecosystem management.

Coincidentally, a founding Malpai Borderlands Group member, Warner Glenn, is one of the aforementioned hunters who spotted and photographed the first live Arizona jaguar in the wild in 1996. His book, *Eyes of Fire*, contains his photos and story of the face-to-face encounter with a jaguar. A portion of the book proceeds goes to the Malpai Borderlands Group Jaguar Fund, which provides dollars for research and rancher reimbursement for livestock that have been killed by jaguars. Since the 1996 sightings, only one U.S. livestock depredation has been attributed to a jaguar. The Malpai Borderlands Group reimbursed the rancher even though the ranch was outside of the Malpai area. In addition, the group purchases conservation easements throughout the area, made possible through grants

Despite obstacles, or perhaps because of them, jaguar conservation efforts remain more focused than ever, and innovative solutions are being created to restore jaguar habitat and populations.

and private donations. While the primary purpose of these easements is to keep the land in agricultural production and out of development, benefits to large carnivores that need hundreds of square miles of contiguous open space, are obvious.

SPORT HUNTING FOR CONSERVATION

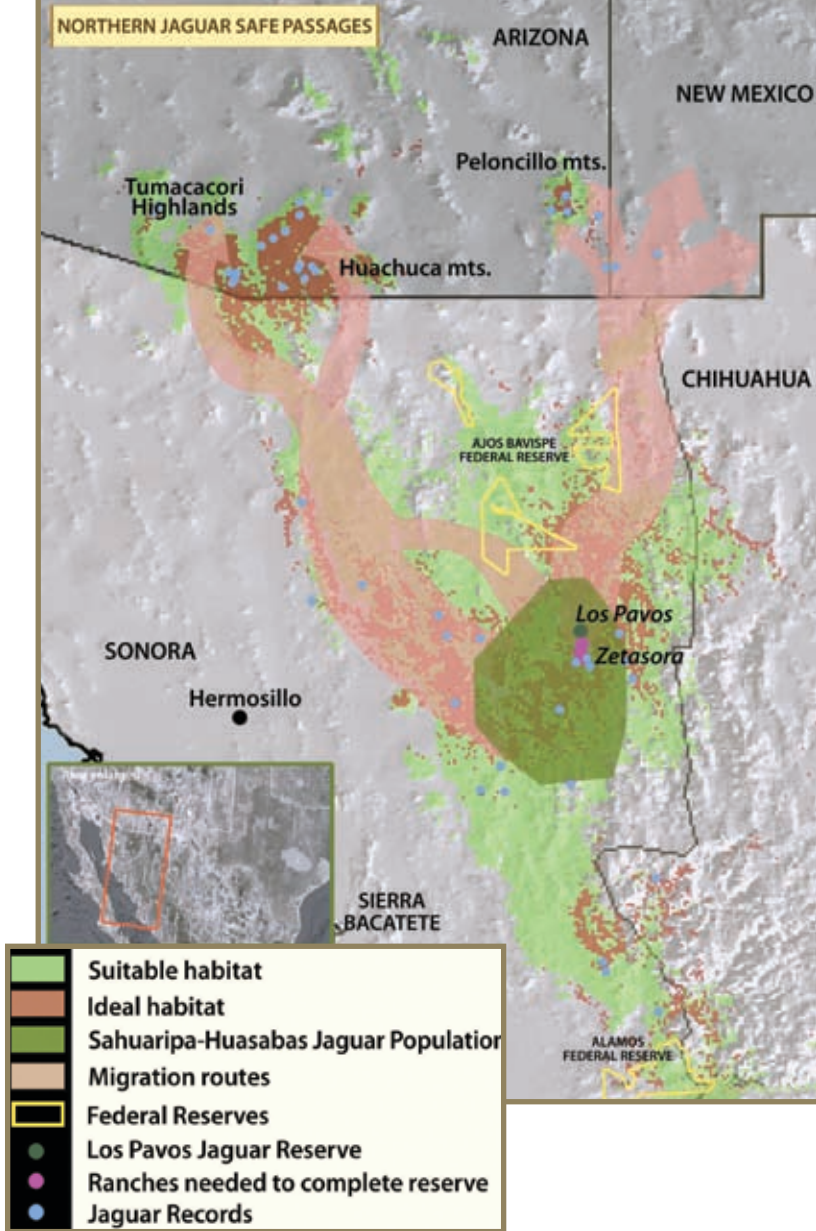
Research has shown that one of the most effortless ways to conserve a species is with hunter involvement. Many game species have repopulated areas throughout North America through hunter-related conservation efforts. So can an endangered species be protected through hunting markets?

Primerio Conservation Outfitters thinks so. This enterprise was born through the research efforts of Dr. Octavio Rosas Rosas, wildlife researcher and professor at Campus San Luis Potosi, Mexico, and partner Ron Thompson, retired wildlife biologist and law enforcement officer in Pinetop, Arizona. An outgrowth of Rosas' "Conservation Program for Jaguars in the Uplands of the Sierra Madre Sonora," Primerio Conservation Outfitters markets legal deer hunts on Mexican ranches within jaguar habitat.

With Rosas' assistance, these ranchers develop and implement wildlife management plans on their private lands. One stipulation is that ranchers agree to conserve jaguars and jaguar habitat. All hunt proceeds are donated back to the participating ranchers as a form of compensation for providing habitat. According to Rosas, because jaguar habitat is fragmented, and both human populations and agriculture are increasing in areas where jaguars are distributed, innovative solutions are necessary to assign value to top predators such as jaguars. He believes that natural reserves are important, but it will be difficult to declare large reserves to protect jaguars in countries with priorities other than the conservation of large predators. Economic incentives for stakeholders are crucial to develop tolerance for wildlife. Despite their protected status, Rosas believes human tolerance will ultimately determine the fate of jaguars. Primerio Conservation Outfitters' program is proof that private markets can indeed conserve jaguars throughout their habitat.

FOR EVERY ACTION...

The jaguar conservation effort provides a wonderful illustration of the role of economic markets in natural resource conservation. Nonetheless, this jaguar "tail" is far from over. While legal hunting markets conserve jaguar populations, illegal poaching continues to destroy them. While conservation groups work cooperatively to maintain large, unbroken tracts of land for wildlife habitat, adjacent lands continue to be fragmented to satisfy an



ever-growing human population. And while measures are being taken to ensure migrating jaguars have access to important habitat corridors for population expansion, an impenetrable border fence, proposed by the current U.S. administration, threatens to abruptly halt all jaguar immigration into the United States. Despite obstacles, or perhaps because of them, jaguar conservation efforts remain more focused than ever, and innovative solutions are being created to restore jaguar habitat and populations. Through these efforts, it is possible that people in North America may very soon have the opportunity to see spots again.



Carolyn Nistler is the founder of Ecologic, LLC, a research and consulting business that focuses on wildlife and land-use issues. Prior to Ecologic, she worked for the Forest Service, Bureau of Land Management, and Montana State University's Extension Wildlife Program. Nistler can be contacted at carolyn@ecologicmontana.com.



I owe my career path and my passion to the people and ideas of PERC.

As a reader of PERC Reports you have a good idea of how free market environmentalism (FME) is being applied. You may not know, however, how PERC educates so many people to help carry out its mission of improving environmental quality through property rights and markets.

When I was an undergraduate at Clemson University, professors Dan Benjamin and Bobby McCormick urged me to attend PERC's Student Seminar. It is difficult—perhaps even impossible—to convey just how much that one week in the summer of 2004 influenced my understanding of environmental issues. The seminar presented me with a new lens for seeing how markets could improve the environment, and I wasn't about to look away.

I returned to PERC as a graduate fellow where my research spanned from net carbon emissions to plastics recycling to endangered species. Seeing how important property rights were in solving these “problems,” I realized that I wanted to push the frontiers of FME with my own research and that I needed some additional credibility in the form of a graduate degree to do so.

I enrolled in a joint law and master's program at Duke University's School of Law and School for the Environment. Now, as graduation approaches, I plan to return to PERC to do research while starting a consulting firm that values and brokers market transfers of environmental resources.

I owe my career path and my passion to the people and ideas of PERC.

Whether it is students, journalists, policy makers, environmental entrepreneurs, or ideas that you want to influence, PERC is an excellent place to make an investment. If you are already a PERC supporter, thank you for that investment from which I and the environment have benefited greatly. Please continue. If you have not invested in PERC, **I can assure you that a tax-deductible donation will pay high dividends and urge you to make your contribution to PERC today by mailing a check or credit card information in the attached envelope or donate online at www.perc.org.**

Sincerely,

Reed Watson

Duke University Law School/Nicholas School for the Environment

IMPRESSIONS

Compiled by Tim Cranston

UP IN SMOKE:

“A problem that the Forest Service created—excess fuels—prevents appropriate burning, and so the problem grows. It is one of the great paradoxes of fire suppression that the more effective we are at fire suppression, the more fuels accumulate and the more intense the next fire will be.”

—USDA Forest Service quoted in Forest Policy Up In Smoke: Fire Suppression in the United States, Alison Berry 2007 (Available from PERC)

INSANITY OF SUBSIDIES:

“When your current approach is digging you into a hole, the sensible thing to do is not to dig faster. It is to stop digging.”

—Arnold Kling, economist, on how subsidies make things worse (including those to corn-based ethanol)

THE NOBEL PRIZE IN HUMILITY:

“There are so many people who could win. It’s like winning the lottery, actually.”

—Eric Maskin, 2007 co-winner of Nobel Prize in Economics

KENNEDY THE FRIEDMANITE:

“In a true free market economy you can’t make yourself rich without enriching your community. What polluters do is they raise the standards of living for themselves, while lowering the quality of living for everybody else, and they do that by escaping the disciplines of the free market. You show me a polluter, I’ll show you subsidy.”

—Robert F. Kennedy, Jr. in 11/06 issue of *The Progressive*

DOING WELL BY DOING GOOD:

“Every time I’ve done the right thing for the environment, I’ve made a profit.”

—Yvon Chouinard (founder of Patagonia)

FROM THE MESSIAH TO THE LAB:

“Some people will do anything to save the earth ... except take a science course.”

—P.J. O’Rourke, “Greenhouse Affect,” *Rolling Stone*

RECALIBRATE FOR POLAR BEARS?

“Even if we take the data at face value, we have lost 15 bears per year due to global warming, but 49 bears per year have been killed by hunting. So if we want to preserve the polar bear, the best thing we could do would not be to spend a trillion dollars to reduce the global temperature by a fraction of a degree by the end of the century, but to get the hunters to hunt something else elsewhere.”

—Bjorn Lomborg, author of *Cool It: The Skeptical Environmentalist’s Guide to Global Warming*



CONFLICT RESOLUTION:

“The key to solving the problem of conflict between livestock and grizzly bears is found in understanding the economics....Markets and incentives can really be powerful engines for change.”

—Hank Fischer (6/25/07 speech)

SELDOM IS THERE A PERC:

“In America, alas, beauty has become something you drive to, and nature an either/or proposition—either you ruthlessly subjugate it, as at Tocks Dam and a million other places, or you deify it, treat it as something holy and remote, a thing apart, as along the Appalachian Trail. Seldom would it occur to anyone on either side that people and nature could coexist to their mutual benefit.”

—Bill Bryson, *A Walk in the Woods: Rediscovering America on the Appalachian Trail*

HOT OFF THE PRESS:

“The commodity-based visions of the Old West and the amenity-based visions of the New West can intermix if the institutions that govern who controls how resources are used are determined by people who have a direct incentive to find win-win solutions to competing uses....Only our imaginations limit the innovative institutional arrangements we can craft.”

—*Accounting for Mother Nature: Changing Demands for Her Bounty*, edited by Terry L. Anderson, Laura E. Huggins and Thomas Michael Power (available Dec. 17, Stanford University Press)

MARKET-FRIENDLY ENVIRONMENTALISM IN MIDTOWN MANHATTAN

By Deroy Murdock

Most people consider New York City more a concrete jungle than an environmental oasis. Gotham's seemingly endless cement, asphalt, and steel keep it almost beyond nature. Yet an environmental hot spot has bloomed within America's largest, most dense metropolitan center. Central Park's 843 acres of lawns, trees, and lakes, make excellent

habitat for, among others, nesting woodpeckers, migrating chickadees, and vacationing *Homo sapiens*. Thanks to an initiative that employs many of the free-market-environmentalist principles that PERC espouses, Central Park may be in its most magnificent shape since opening in 1859.

After its mid-1970s near-bankruptcy, New York and



Central Park's Great Lawn, before (inset) and after the Conservancy rescued it in 1997. Privatizing Central Park's management has helped improve its condition to perhaps its best since it opened in 1859.



Harlem Meer Boathouse, before and after the Conservancy rehabilitated it. The Harlem Meer (Dutch for lake) and its landscapes offer an array of activities that include catch-and-release fishing and playgrounds with water features.

Central Park were in similarly precarious shape. This former urban refuge had devolved into a rectangular showcase of despair. The Great Lawn was nicknamed “The Municipal Great Dustbowl.” Next to a torched building, trash floated in the Harlem Meer. Few could sit and lament this, since so many benches were broken.

“It was another park and another era when I was a university student and our horticulture class made a field trip to Central Park,” Douglas Blonsky recalls. “It was in such disrepair—landscapes were reduced to bare ground, historic buildings and structures were dilapidated and covered with graffiti, garbage was strewn everywhere—that we soon retreated to a bar on Madison Avenue.”

In 1980, several philanthropists and activists launched the organization that Blonsky now leads. The Central Park Conservancy informally began to address the Park’s urgent needs. It privately funded overdue repairs to Gotham’s battered retreat and rehabilitated the Great Lawn, Turtle Pond, and Azalea Walk, among other areas.

The Conservancy turned a literal tragedy of the commons into acres of accountability. Under “Zone Management,” the Conservancy divided the Park into 49 separate sectors.

“Each Park supervisor and uniformed gardener is now held accountable for the condition of his or her zone,” explains Con-

servancy spokesperson Kate Sheleg. “Accountability is the single most important factor that the Conservancy employs in the management of Central Park.” She says this policy “fosters a sense of ownership and pride among the gardeners as well as the volunteers assigned to each zone.” Merit-based pay for Conservancy employees partially reflects how well they clean and cultivate their respective zones.

“Graffiti is removed within 24 hours,” Sheleg adds. “Visible litter is removed by 9:00 each morning and continuously throughout the day; trash receptacles are emptied daily; lawns are carefully maintained; broken benches and playground equipment are fixed on the spot.” Roughly 180 regular volunteers help perform this ongoing maintenance.

After 18 years of what some called “living together,” the Conservancy and New York City “got married,” with then-Mayor Rudolph W. Giuliani conducting the wedding ceremony. In one of his most innovative, yet overlooked, reforms, Giuliani signed an eight-year contract with the Conservancy that essentially privatized Central Park’s management.

“This is really ensuring, documenting, and making permanent an arrangement that has grown over the years,” Giuliani said as he and the Conservancy’s then-chairman Ira Millstein inked the February 1998 deal. “We are going to leave Central Park better than it is today because of this relationship,” Giuliani predicted.

The Conservancy's contract has spared New Yorkers most of the Park's operating costs. The Conservancy privately raises approximately 80 to 85 percent of the Park's budget, while local taxpayers cover the balance. Better yet, rather than simply ladling out ever-higher sums of public dollars, the Conservancy must meet specific targets before the Department of Parks and Recreation taps the fisc. The Conservancy must raise and allocate \$5 million annually for maintenance, repairs, landscaping, and public programs. Its contract then grants it \$1 million in city funds, dedicated to specific services. If the Conservancy exceeds its initial \$5 million expenditure threshold, it can receive up to \$1 million more from city coffers.

The Conservancy also collects 50 percent of net revenue, above \$6 million, from Park concessions, which include Wollman Rink's ice-skating fees, and food sales from 70 pushcart vendors and The Boathouse and Tavern on the Green restaurants. In fiscal year 2006, this generated \$1.6 million in additional city payments to the Conservancy. In turn, the Conservancy says 80 percent of what it raises directly covers horticulture, maintenance, recreation, education, and public activities.

In April 2006, New York City and the Conservancy renewed their contract for eight more years. City Hall committed \$25 million to the Conservancy's \$100 million "Campaign for Central Park" capital-repairs plan. (After just three years, this seven-year fundraising appeal already has collected \$111 million.) From 1980 through FY 2008, the Conservancy will have spent some \$500 million in the Park, only \$100 million of it from the city treasury.

While privatizing Central Park's management has benefited taxpayers, how has Mother Nature fared?

Blonsky recalls a December 11, 1992, Nor'easter that barreled up the Atlantic coast, dumping two inches of rain on New York City. This deluge forced silt, leaves, and branches into Central Park's catch basins, clogging them and causing widespread flooding. Some cars in the Park were swamped, further cluttering things. Ball fields washed away, and footpaths turned to mud. Much of Central Park remained impassable for a week.

Another Nor'easter struck Gotham last April 15. The Park barely noticed. Despite a 7.6-inch downpour, it re-opened the next day.

"Clearly, that is because the Park is now green, well planted, and healthy," Blonsky says. "We clear our catch basins regularly. In the past, they weren't cleaned. Also, well-maintained lawns, plant beds, and landscaping really absorb rainwater. Over the years, the Park has been transformed in such a way that we now can handle floods."

The park thrives in dry weather, too. "My main focus in working in the Park's 130 acres of woodlands is to create healthy soil and a diversity of plants," says Regina Alvarez, the Conservancy's Director of Horticulture and Woodland Management. "This supports a diversity of wildlife." From manual weeding to careful use of herbicides to planting trees, shrubs, and wildflowers, Alvarez says the Conservancy has helped rebuild the Park's food web—from the bugs that birds gobble to the flora on which dragonflies spread their wings. "For decades, the general public was damaging the soil and habitat," Alvarez says. "The Conser-

vancy has begun to reverse that."

On her desk, just steps from several scarlet and gold maples, a small collection of insects is suspended in a clear rectangle of Lucite that could adorn a 10th-grade science classroom. "We are right under the Atlantic Flyway," Alvarez notes. "It's like Interstate 95, only higher up." Beyond the owls "who winter in New York City," warblers, hummingbirds, and American robins are among the avian species that visit Manhattan as they travel seasonally between north and south. "They pass through the Park anyway, but we make it a more comfortable place for them when they come here to refuel on their migration routes."

Some Conservancy fundraising efforts directly sponsor improvements to flora. Its Women's Committee arranged for 2,326 of 9,993 seating areas and their nearby landscapes to be underwritten by the Adopt-A-Bench program. For as little as \$75, contributors can fund the planting of 50 tulip or daffodil bulbs in honor of friends or loved ones. Since 2001, 150,000 bulbs have been planted. A record 60,000 new bulbs first bloomed last spring. Most significantly, the Tree Trust has made the Park's 26,000 trees available for donors to support in perpetuity. To date, about 1,000 have been endowed.

Meanwhile, longtime Conservancy trustee William Golden sponsored a new Soil & Water Lab, which helps Alvarez and other specialists keep the Park verdant and vibrant. It also doubles as a learning center where primary and secondary school students learn soil and water science.

"The Conservancy's efforts have benefited not only New York, but cities around the world," Gotham Mayor Michael Bloomberg has observed. "Its success in Central Park has raised the standards for all city parks and now serves as a model for park management." Park officials from Canada, Chile, Holland, South Korea, and Turkey visited in 2006, to learn from the Conservancy's experiences.

According to Brazilian park manager Francisca Cifuentes, "some of the ideas" the Conservancy showed her last August "have already been implanted into Ibirapuera Park in São Paulo, including the bench sponsors and breaking the area down into sectors to better micro-manage the maintenance and make people accountable."

Central Park now greets some 25 million guests annually. Only Times Square hosts more visitors. "Typical weekdays now get as many people as we saw on weekends," says the Conservancy's Douglas Blonsky. "At times, we wonder if we can keep up with these crowds, but the better we maintain the Park, the better the public respects the Park."



New York commentator Deroy Murdock is a nationally syndicated columnist with the Scripps Howard News Service and a senior fellow with the Atlas Economic Research Foundation in Arlington, Virginia. He was a PERC Media Fellow this fall.

Visit www.centralparknyc.org for more information



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

DAMS: DO COSTS EXCEED BENEFITS?

Dams are often touted as engines of economic development, able to markedly reduce poverty. Irrigation made possible by dams, for example, is said to increase agricultural productivity and thus per capita income. But it is increasingly recognized that dams can have significant adverse environmental impacts. It thus seems prudent to examine whether the beneficial effects of dams are all that they are said to be. Recent research by Esther Duflo and Rahini Pande (2007) finds that much of the economic benefits accruing to people downstream of dams is in fact offset by economic damages inflicted on persons upstream of those dams. Hence the supposed benefits of dams are much smaller than commonly supposed—even negative in some cases—making it more important than ever to scrutinize dams’ environmental effects.

Worldwide there are more than 45,000 large dams (upwards of 15 meters tall or having a reservoir capacity exceeding 3 million cubic meters), and nearly half of the world’s rivers are obstructed by a large dam. The construction of new dams, financed locally or by international agencies such as the World Bank, remains a key tool of government-sponsored economic development. In China, for example, the massive Three Gorges Dam project has been the centerpiece of government efforts to reduce flood damage, increase irrigation, and increase hydroelectric generation in the central and eastern part of that nation.

Duflo and Pande examine the economic impact of dams in India, where nearly 10 percent of the world’s large dams are located. They find that populations downstream of large dams in India have indeed benefited from those dams, due to reduced dependency on rainfall and to irrigation-enhanced agricultural productivity. But the authors also find that people *upstream* of dams suffer substantial economic losses. When dam reservoirs are filled, agricultural and forest lands are destroyed. Between 1980 and 2000, for example, more than 10 million acres of land in India were submerged behind newly constructed dams, and perhaps as many as 40 million people were forced to move (typically with little or no compensation). Further damage occurs upstream because increased salinity and excessive saturation of land in the dam’s catchment area cuts agricultural productivity there. Moreover, to fill the dam reservoir, water use upstream is often restricted, particularly in rain-scarce years. The result is a substantial increase in the vulnerability of upstream agriculture to shortfalls of precipitation. The authors conclude that upstream losses produced by dams often may fully offset any downstream gains.

Although critics of dams have previously noted the potential for adverse effects such as these, the innovation of Duflo and Pande lies in using topographic characteristics of the land to separate the effects of dam construction from other confounding factors. For example, river gradients steep enough to yield large reservoirs, but not so steep to cause erosion when the water is released, make for the best irrigation dams. Because the relevant topographic features vary considerably across districts in India (roughly the equivalent



of counties in America), the authors can isolate the effects of dams from other relevant factors, such as fertilizer use and regional climate differences.

The authors find that each new dam increases the irrigated area and crop yields in the district downstream of the dam; the irrigation brought by the new dam also helps insulate downstream lands from shortfalls in precipitation, reducing year-to-year variations in output there. The consequences upstream are far different: Not only does the district in which the dam is built enjoy no increase in agricultural productivity; just as importantly, the district suffers from *greater* year-to-year output variations due to rainfall fluctuation.

Tragically, the net impact of dams in India on the people at the bottom of the income distribution appears to be negative. Although new dams reduce poverty slightly among people downstream, they increase poverty even more markedly upstream of the dams. On balance, the net effect is that building a new dam in India actually increases the proportion of the population below the poverty line. So much for development.

Obviously, the effects of dams can vary widely depending on local circumstances, and what is true for dams in India may do little to inform us about dams in the United States. Nevertheless, reports coming out of China (such as by Oster [2007]) strongly suggest that the adverse economic effects upstream of dams are not isolated to India. About 1.4 million people already have been forced to move from the catchment area of the massive Three Gorges Dam, and it now appears that an additional 4

million may have to move due to erosion caused by rising water levels. Combined with the new evidence presented by Duflo and Pande, it seems possible that upheaval and economic deprivation for individuals upstream of new dams may be the rule rather than the exception in developing nations. The Chinese experience with the Three Gorges Dam also suggests that the adverse environmental effects of large dams can be substantial, with huge accumulations of sewage and other pollution, and sharp reductions in fish harvests.

This combination of questionable economic benefits and large potential environmental costs make it clear why there is growing opposition to new dam projects. Indeed, as suggested by James Workman (2006), the next question may be: When will it start making sense to get rid of some dams that are already out there?

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WATER LOGGED

By James Lucas



It is the holy trinity of the new Green Economy—a company which improves the health of the natural ecosystem, makes places safer for people, and at the same time makes a profit. Triton Logging Inc., of Victoria, British Columbia, is positioning itself to achieve all three.

FORGOTTEN FORESTS

For much of the past century, decisions have been made to flood vast areas of land to harness the power of water that collects in reservoirs behind large dams. In many of these areas, forests remain locked in time beneath the newly formed lakes.

Limited harvesting took place in these forests prior to flooding. The relatively short timeframe to plan and build a dam (2 to 5 years) versus the relatively long timeframe to log the standing timber (10 to 20 years) made the economics of logging untenable. In some cases, either the technology was not available at the time to harvest or mill these quantities of timber, or the species in the forests was considered undesirable or so abundant that forgoing the resource was deemed an acceptable loss.

In the United States alone, there are more than 6,500 large dams. According to the International Commission on Large Dams, there are nearly 45,000 large reservoirs (more than 15 meters or 45 feet in height), many of which hold submerged forests. The quantity and potential value of this resource is vast—estimated at 300 million trees worldwide—with an approximate worth of \$50 billion.

THE YELLOW SUBMARINE

Enter Triton. The company has built the world's first deep-water logging machine, appropriately called the Sawfish. The machine is an unmanned submarine, tree harvester, and tree recoverer—all in one. Similar in size to an Austin Mini Cooper car, the Sawfish, which can dive to 300 meters (900 feet), has a

As the world's appetite for wood products grows and the effects of deforestation spread, finding solutions that balance environmental, social, and economic interests will require innovation at an entirely new level.

grapple system capable of wrapping its arms around a tree with a 4-foot diameter. Once the machine attaches itself to the base of the tree it is to harvest, an airbag is screwed into the base of the tree and inflated to 350 pounds of lift. When the airbag is full, a chainsaw cuts through the trunk, and the tree then floats (or in some cases launches) to the surface of the water. The Sawfish pilot, who sits safely on a barge, finds each tree via a sonar system on the Sawfish. When visual contact is made, eight fully remote video cameras allow the pilot to “fly” the machine closer to the tree. The Sawfish contains approximately 50 airbags so that it can stay below the surface for a few hours if necessary. It takes two to four minutes to cut each tree.

Once the tree reaches the surface, it is collected by a small tug boat which has a specialized grapple system for pulling the logs to a central collection point, where a floating log loader places each log onto a barge. Once enough logs are collected, they are sent to a landing location and processed like any other land-based log. From here they are hauled to the sawmill and processed into a number of products such as dimensional lumber, timbers, flooring, poles, interior and exterior siding, cabinetry stock, and glue laminated beams.

Currently, Triton's harvesting costs are similar to equivalent land-based operations. Triton's eventual goal is to harvest timber at costs less than its land-based competitors. It incurs very few of the costs of conventional forestry operations—there are no replanting or fire protection costs, no roads to maintain below the watermark, and planning costs are a fraction of those on the surface.

SAFER AND ENVIRONMENTALLY FRIENDLY

The advantages of underwater logging with Triton's Sawfish system are not just efficiency and economics. It also removes many of the hazards associated with other forms of underwater logging, including the use of divers and chainsaws. Since no workers are in Triton's underwater cutting theatre (and because trees float up rather than fall down), the risks to loggers are almost non-existent.

Triton's underwater logging also makes reservoirs safer for those who use the water for recreation. In many reservoirs, due to the limited harvesting that took place and the often significant decrease of water levels at certain times of the year, the tops of standing trees are sometimes only a few feet below the surface. These “dead heads” can be significant boating and safety hazards.

In April 2006, more than 100 passengers died when an overloaded ferry boat struck a submerged tree stump in Lake Volta, Ghana, the world's largest reservoir. By harvesting these hazardous trees and marking cleared navigational channels

with GPS coordinates, Triton helps improve the safety and recreational potential of reservoirs. And by providing new, environmental wood industry potential, Triton helps communities create vital economic development opportunities from a previously dangerous and intrusive situation. Lois Lake, a small hydro-power reservoir on British Columbia's Sunshine Coast, has literally gone from a snag-infested safety hazard to a safe pleasure-boating experience in the areas where Triton has harvested thousands of standing Douglas fir, hemlock, and Sitka spruce trees.

The environmental performance of Triton's underwater harvesting system has allowed it to be certified by the Rainforest Alliance's SmartWood (www.smartwood.org) program. This strict set of operational standards is audited every year and covers everything from in-water activities and safety, to habitat protection and community/First Nations consultation. Harvest plans are created only after undergoing extensive wildlife and habitat surveys, which take into account nesting and spawning areas. The Sawfish causes little sedimentation and leaves the root system intact to keep the lakebed stable.

JUST ADD WATER

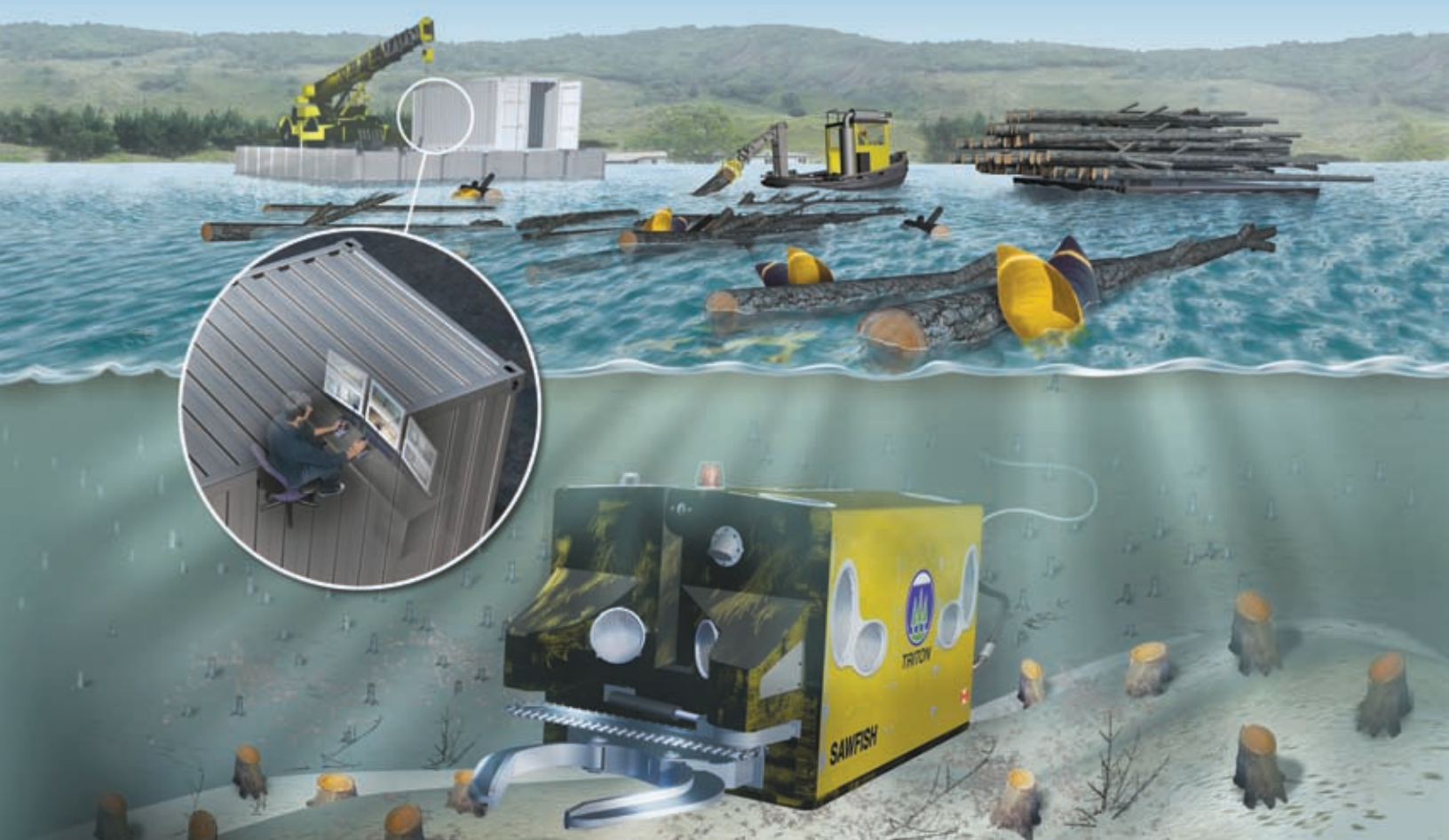
In addition to the environmental attributes of Triton wood, the wood often contains unique characteristics due to its age and the time spent submerged. Reservoirs in North America flooded in the first half of the twentieth century can contain large diameter old-growth trees with inherent tight grain. In some tropical areas, rare tree species (due to previous logging activity) can only be found underwater and their harvest can combat the allure of illegal logging activities.

Another characteristic of submerged trees is the actual quality of the wood itself. While land-based trees are prone to decay and collapse as fungi attack, the oxygen-poor underwater environment is mostly free of these and other organisms. The deeper and colder the water, the better preserved the wood.

Triton's extensive testing of submerged wood qualities, conducted with Forintek, Canada's national wood research institute, has shown that trees recovered from reservoirs in British Columbia perform comparably to land-based trees in the areas of strength, bend, shear, and machinability.

MIXING PRINCIPLES AND PROFITABILITY

Chris Godsall, the founder of Triton, has worked incredibly hard over the past seven years to transform his vision into a company which is grounded in business fundamentals but infused with the principles of sustainability. It has been



challenging for Triton—as it is for any new company with substantial up-front technological capital costs and medium term goals of profitability—to balance the two without compromising its principles.

The social and environmental conscience underpinning Triton was evident early in Godsall’s career when, at the age of 25, he co-founded an award-winning nonprofit in Montreal called Santropol Roulant (www.santropolroulant.org), a meals-on-wheels service for isolated senior citizens in Montreal operated by youth who deliver (by bicycle) healthy meals to elderly citizens in need.

After leaving Santropol Roulant and fresh from completing his master’s degree in Responsibility and Business Practice at the University of Bath (United Kingdom), Godsall moved to British Columbia and began working in the underwater log salvage business with Wet Wood Underwater Fibre Recovery, which salvaged sunken logs from lakes and riverbeds. Godsall soon realized that while the sunken logs in lakes were on the scale of thousands in isolated locations all over the province, submerged trees in reservoirs numbered in the millions and were concentrated in three key monster reservoirs in British Columbia. Godsall started Triton Logging with small investments from family and friends, and some larger research and development support from the Canadian federal government. As the company grew and the technology was proven successful, later rounds of larger investors were added, but the company is still privately owned with Godsall at the reins.

GREEN WOOD IS GOOD

As the world’s appetite for wood products grows and the effects of deforestation spread, finding solutions that balance environmental, social, and economic interests will require innovation at an entirely new level. Triton Logging is leading the way in the nascent underwater logging industry. By offering consumers, manufacturers, and green builders a clear and compelling alternative to virgin timber, Triton can help reduce the pressure on living forests while raising expectations for responsible wood ownership. As vast, but finite resources, underwater forests will require responsible management and committed partnerships between all stakeholders to realize their potential and share their value. Left out of sight and out of mind, these forests were once forgotten. Triton Logging is ensuring that they will not be ignored again.



James Lucas is a professional forester in British Columbia where he works with PricewaterhouseCoopers (PwC) Sustainable Business Solutions Practice. Prior to joining PwC, Lucas was the Forestry and Timber Sales Manager for Triton Logging for two years. He earned his Masters of Forestry from the Yale School of Forestry and the Environment in 2003 and was a PERC entrepreneur fellow in 2003. He can be contacted at james.g.lucas@ca.pwc.com.



Visit www.tritonlogging.com for more information



Sanitary and covered lagoon collecting methane, which will be used as fuel in a biogas engine to produce energy. No release of pollutants and pathogens takes place in the process.

TRANSFORMING POLLUTION INTO PROFITS

By Gijsbert Nollen

Every year, Thailand's largest agroindustrial companies discharge approximately 175 million cubic meters (6.18 billion cubic feet) of water into open air lagoons, polluting stream, rivers, bays, and water tables. The discharge, a byproduct of the agroprocessing industry, contains agricultural pollutants such as manure, sewage sludge, and polluted wastewater. The wastewater also contains several greenhouse gases, including methane, which pound for pound contributes 21 times more than carbon dioxide to global warming.

Because Thailand's effluent emission standards are hardly enforced, companies have no incentive to do much about pollution control.

A recently established company, Prime Energy Development (PED), is creating economic incentives for industries to clean up the wastewater using a process that converts the methane and other biogases into much needed energy and allows the agroindustrial company to buy its energy back at a reduced cost. All excess energy will be sold to the local utilities at market cost—a win-win-win-win business proposition for PED, industry, utility customers, and the global environment.

POLLUTION IN THE NAME OF SHAREHOLDER VALUE

In Southeast Asia, the environment is suffering for the wealth of the local elite and the western shareholder. The world should have learned by now (will we ever?) that “the West” is investing in industries in this region, not only for cheaper labor, but for lack of environmental protection as well. One should not generalize, and both the industry and nations involved will claim they do their utmost to protect the environment, but the facts speak for themselves and pollution in the name of shareholder value prevails.

Research has shown that countries in the process of wealth creation ultimately demand and achieve environmental stewardship. In the meantime, a few entrepreneurs are trying to clean up the short-term mess. There is no lack of ideas or technology to develop projects as such, but patient capital to make these projects financially sustainable (and thus replicable) is hard to find. For many investors, short-term return on equity is more important than the long-term internal rate of return.

Additionally, local banks do not provide debt financing for an industry they do not know. Therefore, having proved that biogas technology works, the challenge now is to secure the money. Luckily for PED, the world's perceived fear of global warming is making funds available for biogas development.

BRING ON THE BIOGAS

Thailand, a country with huge agriculture and agro-industrial production, is one of the world's largest producers of wastewater—making it a prime location for PED to build biogas facilities. Significant industries such as cassava starch and sugar cane (bio-ethanol) processing, breweries and distilleries, and large livestock operations, generate most of this waste, which is dumped into open lagoons that end up polluting the waterways.

Most agro-industrial plants currently use an aerobic treatment, which requires oxygen, as the primary wastewater process to reduce pollution levels of the plant. While the aerobic lagoon treatment is widely used and serves to meet government effluent standards, it allows large amounts of biogases to be emitted into the atmosphere. No sanitary precautions are taken, resulting in polluted water.

PED has developed a system to convert this waste to gas through anaerobic conversion. The process of anaerobic conversion is what happens naturally at the bottom of ponds and results in the production of methane. By altering the water treatment from aerobic to regulated anaerobic digestion using a biogas collection and power generation facility, the wastewater pollutants, including harmful pathogens, can be substantially reduced while reducing emissions of methane and other gases. The environmental benefits are threefold: 1) Methane captured by the system can be used as a clean fuel for a gas engine equipped with a generator to produce electricity; 2) Levels of greenhouse gas emissions are reduced; 3) The waste from the biogas facility can be used as fertilizer.

Prime Energy Development's objective is to construct, own, and operate biogas facilities throughout Thailand and eventually develop projects in the Philippines, Malaysia, and Vietnam. It will reach this objective by taking agro-industrial companies' wastewater and, through the anaerobic conversion process, capture the methane to produce electricity that can be sold back to those plants and to the national grid. PED will implement this goal through its so-called "Build, Operate, Own, and Transfer" (BOOT) model by which PED will operate these facilities for a period of ten years before transferring ownership to the companies producing the wastewater.

The BOOT model is about to be tested as PED has recently signed its first agreement to build a 1.5 megawatt biogas plant at one of Thailand's largest agro-industrial producers. This contract calls for PED to finance, construct, and operate a power facility to produce clean, renewable energy. The "host" company will provide the wastewater at no cost. PED will supply the biogas for energy at below market prices. The company gets a convenient and clean disposal process for its wastewater and PED gets a revenue stream that more than

covers its capital and operating costs. Additional revenues come to PED from electricity sales to the local utility through the national grid system, and by earning carbon credits from emissions reduction through the Clean Development Mechanism of the Kyoto Protocol.

The potential growth prospects are strong. The Thai government's Power Development Plan for 2007 details the demand and planned power production growth. Since Thai law requires local utilities to purchase all electricity produced by small plants (less than ten megawatts), the growth prospects for the market are only limited by the supply a company can produce. Each PED site will have a legally enforced power-purchasing agreement and at least one customer (the local utility) that is required to purchase the electricity at market price. The fuel supply is expected to increase in the future because of projected growth in ethanol and agricultural production. Moreover, the Thai government has set policy to help stimulate renewable energy markets.

GREEN MAKES GREEN

Prime Energy Development—along with its parent company, International Consultancy Europe BV (ICE)—has a mission to develop projects that conserve biodiversity, alleviate poverty, contribute to the environment, and make money at the same time. By taking into account a company's goal to generate profits, ICE and PED develop economic, social, and environmentally sound projects, which tackle key development challenges, but also generate profits and jobs.

As important, companies like PED are structuring local agreements that will bring knowledge transfer to the host companies and countries. For example, PED is currently developing other Renewable Energy projects in Asia with local partners such as Full Advantage Pvt. Ltd., a firm specializing in renewable energy development and carbon trade, and TOPEC BV, a company that designs, manufactures, and supplies turnkey Biogas and Biomass power plants.

By transforming pollution into profit, PED hopes to set a precedent. Success in project development lies in the potential to create a business model that is financially attractive and operationally replicable. As an enviropreneur, I believe that in emerging markets, we can combat the collapse of environmental resources by turning waste into revenue streams. Now it is effluent, next it will be solid waste or other pollutants. Finding capital will remain a struggle; however, ICE and PED are working hard to overcome this challenge. It will be fight, fail, and fight all over again; we're ready for it.



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GREENER PASTURES

Compiled by Linda E. Platts



MONTANA UNDER GLASS

All around Montana, broken beer and wine bottles are showing up on roads and walkways. Admittedly, these are not the sharp, jagged pieces normally associated with broken glass, but rather the pulverized variety giving the glass both the consistency and appearance of gravel with the added attraction of multicolors.

A crusher turns the glass into cullet, the coarse material that resembles gravel, but can be produced without the dust or the cost of extraction. Rather than digging up the landscape, the Montana Department of Transportation (MDOT) used 900 tons of discarded glass bottles to help repave a Jefferson County highway. The first pulverizer was purchased by the state's department of environmental quality in hopes of creating interest in the new product among local municipalities. So far, it seems to have been a wise move.

Livingston will be the first city in the state to purchase its own pulverizer. And for those that have not yet invested in the new machinery, the MDOT is still happy to help out. Helena, the state capital, is using glass cullet in several areas around the city, and Missoula has lined up some big projects, which call for pulverized glass to make concrete for sidewalks and parking lots, reports the *Helena Independent Record*.

While it took a small push from a state agency, the private sector is also seeing the benefits of using pulverized glass. Contractors and their customers are requesting the multicolored glass product for a variety of projects, including garden walkways.

LESS IS MORE WHEN IT COMES TO PACKAGING

If you have ever purchased an item at Target or Wal-Mart, taken it home, and then literally wrestled it to the floor trying to free it from its packaging, then this bit of news is for you.

Reuters reports a growing demand in the United States for smaller and greener packaging. Hopefully, this trend will also translate into making it easier to open. While some consumers are pleased that bio-based packing products such as PaperFoam, made from starches by International Paper, are showing up more frequently, the real engine for change is simply profits. Also proving to be a powerful incentive is the looming possibility of legislation that will regulate packaging.

Wal-Mart, the world's largest retailer, is ahead of the curve on this one. Last year, it announced a planned reduction of 5 percent in packaging by 2013. If this is accomplished, it will save the giant retailer \$3.4 billion.

It works like this: Less packaging means more of the product can fit in a single shipping container. When the container is unloaded onto a truck, that too holds more products and, thus, less fuel and energy is expended to transport more items to the stores. Once at the store, more of the product can fit on the shelf, thus reducing the time workers spend restocking.

As for eco-friendly packaging—it has been a bit slower to develop. When bio-based plastics are priced competitively with their hydro-carbon based brethren, then another revolution in packaging may rock the marketplace. And no additional regulations will be needed—consumers will lead the way.

SIMMERING MEDITERRANEAN KEEPS ITS COOL

A five-story building in southern Athens is being hailed as possibly the most energy-efficient building in the world. Considering the public's growing interest in green building, this structure could provide valuable lessons.

It combines several types of energy-saving technologies, uses no fossil fuel, and produces zero emissions. In addition, it meets 95 percent of its own energy needs with solar and geothermal sources.

The project is the result of a public-private partnership between Sol Energy Hellas, a private firm that provided two-thirds of the funding, and several government entities including Greek ministries, universities, and research centers. The Associated Press calls it "the only building of its kind in Europe and possibly the world."

From the outside, it resembles a typical block of apartments with some balconies and decorative iron railings. The roof, however, is covered with photovoltaic panels, and the basement is a maze of pipes, pumps, and dials. Heat exchangers lie buried in the walls and 900 sensors measure carbon monoxide, temperature, and humidity.

The initial costs for the various energy-saving technologies will be recouped within seven to ten years. Because of this relatively short payback period, the building will operate virtually free for most of its life span. Proof of the efficiency achieved by this project was clearly demonstrated this past summer. While temperatures in Athens rose to nearly 115 degrees Fahrenheit, the building's interior remained at a comfortable 72 degrees Fahrenheit, which penciled out at a total cost of \$14 per day—a fraction of what it would cost to cool a normal building of comparable size.

FROM DEMOLITION TO DECONSTRUCTION

Normally, when a home or commercial building needs to be torn down, the owners call in the muscle—heavy equipment such as a trackhoe (backhoe on tracks) for the general bashing, and trucks to carry the debris to the dump. Now there is an alternative—one that could be more cost effective while saving landscaping from being destroyed along with the building.

In many cities, a new category of businesses has emerged—deconstruction companies. These cutting-edge companies take buildings apart piece by piece and then donate everything from the floorboards to the doorknobs to a nonprofit. In turn, the nonprofit sells the used building materials, right down to the nails and screws that are removed and sold to metal recyclers. The company is paid for its work, but there is an added benefit for the owners. At the end of the year, they can claim a sizeable, tax-deductible donation. Not a bad deal for all concerned.

The deconstruction company also saves by not having to pay a fee at the landfill or face the prospect of having some of the debris rejected. The *Seattle Post-Intelligencer* reports that, last year, one-third of the city's total trash, when measured by weight, came from demolition projects. Some counties are now considering rejecting recyclable wood and metal at their landfills.

Admittedly, the deconstruction process takes days longer than the backhoe method. When comparing costs, however, the deconstruction companies seem to have a small edge.

As for creating more new jobs, the nonprofits are thriving by selling the old materials to a steady stream of customers who prefer the well-worn door knob with the deep patina to the bright, new brass fixture at the local home supply store. It is a matter of taste of course, but it is beginning to also be a matter of money.