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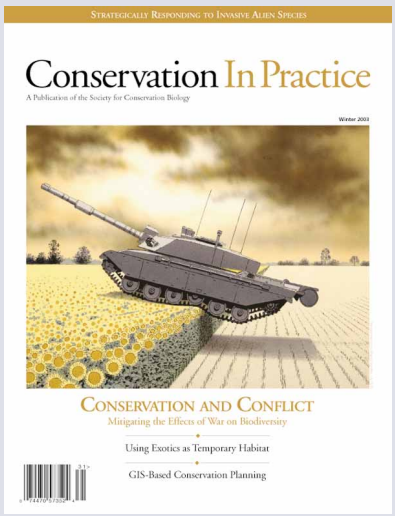

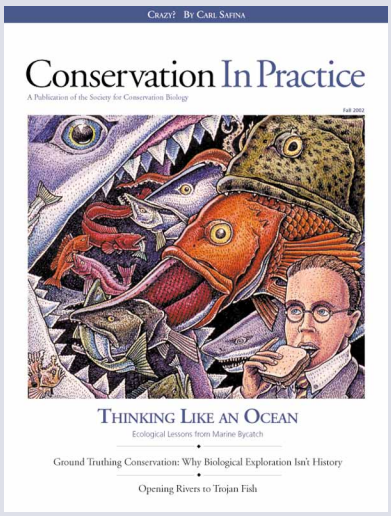

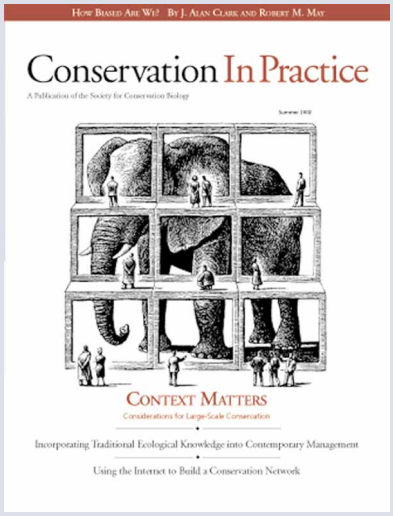

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MAKING CONSERVATION PROFITABLE

Philanthropy and government regulations alone simply aren't up to the task of rescuing nature, and it's time for some well designed appeals to people's self-interest.

By Katherine Ellison and Gretchen C. Daily

Adam Davis was sitting in a Marin County, California café four years ago when he dreamed up an idea he hoped could help save the Earth—and also make some money in the process. In a plan that might have tickled the imagination of science-fiction writer Ray Bradbury, Davis pictured a powerful trading exchange in which "shares" in vital services of nature might be bought and sold.

"Carbon credits" would reap revenues depending on forests' capacity to suck heat-trapping carbon dioxide from the air to help avert climate change. "Biodiversity credits" would fluctuate in value according to the condition of critical habitats on a given piece of land. These and similar shares in the day-to-day work of ecosystems would initially be sold by owners of protected land and bought by business executives as a way to meet moral and legal obligations to compensate for environmental harm done elsewhere. Eventually, however, moms, pops, and moguls would deal in the new-age commodities as if they were as tangible as pork bellies.

Ecosystem assets have the importance of water and are gradually acquiring

Adam Davis is director of environmental programs at EPRIsolutions where he manages the Ecological Asset Management Program. The program is designed to help clients maximize the value of their ecological assets by identifying opportunities to participate in the markets for wetland mitigation, carbon sequestration, and species mitigation, among others.

Davis, a dedicated environmentalist who briefly lived on a commune before becoming a recycling company executive, christened his vision Con Ex, for the Conservation Exchange. He believed it could raise billions of dollars to preserve untrammeled nature by capturing the financial value of the work of nature. "I know these ecosystem services are valuable," he says. "Not just tree-hugging valuable, but economically valuable."

If it seems a wild idea, consider two things. Davis first dreamed his dream back when the stock market was in its bull-run glory, and almost anything seemed possible. Yet despite the market's crash, Davis' Con Ex is now closer to reality than he ever dared hope. Today, many other innovative dreamers share Davis' goal of making conservation financially profitable. They've been convinced that philanthropy and government regulations alone simply aren't up to the task of rescuing nature and that it's time for some well designed appeals to people's self-interest.

A great and unresolved question is whether the drive for profits, which has done so much harm to the planet, can possibly be harnessed to save it. In our search for answers, as a journalist and ecologist, we traveled together from April 2000 to May of 2001, visiting diverse sites where this ambitious hypothesis is being explored. We evaluated projects and spoke to pioneers in the forests of upstate New York, the jungles of Costa Rica, the drylands of Australia, and at the Chicago Commodity Exchange. Below, we offer just a few examples of the increasing number of experiments in progress today. Some have already been thrillingly successful, some questionable, and some quite deservedly controversial. All represent what we believe is some necessary history in the making.

Water and Diamonds

The dream of making conservation profitable—or at least economically justifiable—has materialized in dramatic form in the Catskill-Delaware watershed, the forested landscape that delivers water of exceptional purity to more than nine million New York City residents. Since 1997, municipal planners have been energetically preserving this environmental asset, spending US$1.5 billion on conservation strategies including buying land around reservoirs to serve as buffers, restoring habitat, upgrading sewage treatment plants, and enforcing controversial restrictions on new development.

New York City planners can't claim to have become environmental activists out of the goodness of their hearts. Their decision stemmed from a federal ultimatum that led to a cold-hearted budget analysis. Here's what led up to it: New York, to date, has remained one of the largest cities without a water filtration plant. For decades, the roots and soil in the 518,000-hectare upstate landscape had naturally filtered the city's drinking supplies, born as melted snow and rain trickling down from the mountains. But by the late 1980s, it was becoming clear that pollution emanating from increasing development in the watershed had begun to compromise this efficient natural system.

In 1991, the U.S. Environmental Protection Agency, troubled by increasing pollution of surface-water systems throughout the nation, let New York City know it would have to build

the scarcity of diamonds.

a water filtration plant—costing US$6-8 billion—if it couldn't prove it could guarantee its future water quality. For the next several years, city officials scrambled to put together a watershed conservation plan, while winning cooperation from upstate officials who would have to forego development. The plan went into effect in 1997, and since then the EPA has granted New York City officials two consecutive five-year stays, the second of which came in April 2002, of the order to build a filtration plant. These stays have so far saved the city from a major budget crisis, and residents from huge increases in their water bills.

New York's watershed stewardship program has siblings throughout the world, as governments and at least one big corporation—Perrier Vittel in northern France, which depends on the Rhine-Meuse watershed for its famous bottled water—have also realized the benefits of caring for a precious environmental asset.

Meanwhile, a very different kind of experiment is taking shape in the offices of international traders, who have spotted the potential of an emerging market in carbon credits—a trade that was just beginning when Davis first envisioned his Con Ex. Boosting interest in this market are provisions in the Kyoto Protocol (the draft international treaty to fight climate change) allowing countries to gain credit for reducing their greenhouse gas emissions by investing in "offsets" that yield the so-called carbon credits. These can include paying for energy-related projects—such as Japan's Toyota Corporation's recent decision to supply sustainably produced charcoal to avoid the use of coal for steel production in Brazil—or in new forests that can absorb CO_2 from the atmo-

ECO-ASSET INVESTMENTS

From California to Costa Rica to the Land Down Under

In the riverside town of Napa, in northern California's wine country, local activists and county officials have made a brave environmental investment. For decades, the town had been plagued by floods, costing hundreds of millions of dollars in damage, and on one occasion, three lives. The U.S. Army Corps of Engineers proposed one of its traditional flood-control plans, with high concrete barriers and channels that would straighten the Napa River and nearly hide it from sight. But a coalition called Friends of the Napa River challenged that plan and came up with its own flood protection strategy based on the idea of a "living river." In that scheme, buildings would be moved off the flood plain, freeing it to resume its historic job of sopping up overflow. Bridges would be lowered and levees removed and the river widened in places to even the water's movement. Hundreds of acres of wetlands would be restored. Even though the "living river" plan was more expensive than the Corps proposal, county residents voted to tax themselves to pay for it. Groundbreaking took place in the summer of 2000, and today residents are reaping benefits with new river trails and scenic views, rising property values, and a town renaissance.

In Costa Rica, meanwhile, the government has been showing its own appreciation of the work of ecosystems by actually paying landowners by the month to maintain forest on their properties. The payments are based on environmental services rendered, including carbon sequestration, water purification, and scenic beauty. By using funds from diverse sources including proceeds from a tax on fuel, grants from international aid agencies, and even support from a beer company concerned about water quality, the government so far has disbursed more than US$100 million to landowners who've become forest stewards.

Australia's government has been another world leader in recognizing the financial worth of environmental services. In its efforts to combat increasing soil salinity, a major threat to its agriculture industry, it is moving forward with a major ecosystem-based plan in the Murray-Darling basin, the nation's breadbasket. The plan involves an investment of US$1.4 billion over its first three years, funding projects including a major tree-planting program. Trees and other plants help suck up excess water, lowering the water table and decreasing salt content.

sphere. Although U.S. firms as yet face no restrictions on fossil fuel emissions, many forward-thinking executives in this country have been hedging their bets by buying up forested land in Latin America and elsewhere, seeking the future rights to these climate-stabilizing services.

The carbon-trading trend is controversial, primarily on grounds that firms will be encouraged to take the easy way out by buying what in essence are pollution permits instead of directly reducing pollution at the source. This is particularly troublesome at a time when scientists warn that the world must cut back fossil fuel emissions by no less than 70 percent to start turning things around.

In this and other ways, the new carbon markets may seem to have little in common with the more widely applauded New York watershed project. In fact, however, two basic concepts underlie them both.

One is the notion, championed by a growing number of ecologists and economists, that ecosystems should be thought of as economic assets, supplying vital services that can often be costly to replace. This was especially clear in the case of New York City, which by paying US$1.5 billion on a conservation program, has saved itself at least an additional US$4.5 billion that it would have had to spend on a filtration plant. It also makes sense in the carbon credits market, in which forests are valued for their CO_2-absorbing labor.

The other concept, considerably older, is that linchpin of economic tradition, the law of supply and demand. As human numbers and appetites grow, they're increasing pressure on Earth's supply of natural resources, making them more coveted and theoretically, more valuable. This pressure can be seen in the increasing development and pollution in New York state that made it reasonable to invest money to save the Catskill-Delaware watershed, and in the growing climate crisis inspiring the concept of a "carbon credit" from forests. *Theoretically* is still the operative word, however, since as yet, our accounting systems, while sophisticated enough

FOREST-BASED CARBON DEALS

Leading environmental groups are divided on the merits of forest-based "carbon credits" derived from a firm's investments in forests that can absorb CO_2, a leading greenhouse gas. The Nature Conservancy (TNC), a major landowner in the United States and Latin America, is not only strongly in favor of but has actively brokered such credits. The buyers are mostly U.S. businesses seeking to use the credits to mitigate some of their fossil fuel emissions elsewhere. Although they are under no legal obligation to do so, these companies are seeking to hedge their bets, worried that even though the Bush administration has put climate change on the back burner, future U.S. governments might be much more aggressive. By some estimates, U.S., European, and Japanese executives have already spent more than US$115 million on forestry-based carbon deals. Here are a few examples, all negotiated by The Nature Conservancy:

- In Bolivia's Noel Kempff Mercado National Park, a partnership including American Electric Power, PacifiCorp, British Petroleum, the government of Bolivia, and the Bolivian nongovernmental organization Fundacion Amigos de la Naturaleza, launched a US$9.6-million project that retired logging rights on 1.56 million acres. TNC estimates the project may avert as much as 14 million tons of carbon emissions over 30 years.

- In Belize, a consortium including Wisconsin Electric Power, Detroit Edison, Suncor, and PacifiCorp raised US$5.6 million to conserve more than 146,000 acres of lowland forest.

- In Brazil, Dallas-based Central & Southwest Utilities invested US$5.4 million to restore, protect, and manage about 17,000 acres of Atlantic rainforest that had been cut down for buffalo grazing and to promote local sustainable development.

to note values for feng shui consultants and interest rate derivatives, have few ways to measure the financial worth of nature's "free" services. Today, virtually the only way investors appraise the worth of land is by figuring out what might be built on it, mined from it, or farmed on it.

It all harks back to a problem that perplexed eighteenth and nineteenth century economists, the paradox of diamonds and water. Why do diamonds command such higher prices than water, when water is clearly more important to human survival? The answer, proposed by Englishman Alfred Marshall, was that water seemed in infinite supply (at least in those days in England), whereas diamonds were rare, relative to the number of rich people wanting them.

Ecosystem assets have the importance of water and are gradually acquiring the scarcity of diamonds as human populations and aspirations grow. Now that potable water, along with other goods and services delivered by healthy ecosystems, is becoming scarcer, it seems increasingly likely that "water-purification credits," derived from watersheds and wetlands, would eventually rise in economic value, were they to be traded on Davis' Con Ex.

Some experts see this development as inevitable, a kind of necessary rationing process. "Without prices being set, nature becomes an all-you-can-eat buffet," says Chicago financier Richard Sandor. "And I don't know anyone who doesn't overeat at a buffet."

From SO_2 to CO_2: Trading Pollution Permits

Sandor, head of a firm called Environmental Financial Products, has been a prominent pioneer in the quest to make conservation profitable. Back in the early 1990s, he participated in a breakthrough U.S. experiment: the trading of permits for emissions of sulfur dioxide (SO_2), targeted for contributing to acid rain. The market, created under the 1990 amendments to the Clean Air Act, took place accordingly: the federal government set a cap, or limit, on utilities' right to emit SO_2 and distributed emissions permits that could be bought and sold at yearly auctions. Companies able to reduce their emissions below the cap most cheaply could do so and then sell their unused permits to other, less efficient firms. The Environmental Protection Agency today says the program has reduced SO_2 emissions more than 30 percent from 1990 levels and cost industry a mere 20 percent of what the government originally estimated.

Without prices being set, nature becomes an all-you-can-eat buffet... and I don't know anyone who doesn't overeat at a buffet.

Intrigued by his experience brokering sales in SO_2 auctions, Sandor has since moved on to delve into the emerging carbon market. He has spent the past few years designing a dramatic project he calls the Chicago Climate Exchange (CCX), which he says will start trading in greenhouse gas credits this year.

"The power of the free market is that it can restore nature's wealth as it increases financial wealth," Sandor says. The wealth in question is considerable: Sandor estimates that a global market in greenhouse gases could amount to hundreds of billions of dollars a year.

While greenhouse gas exchanges have been popping up in Europe, the CCX would be the first such U.S. trading forum and potentially the largest of any yet established. More than two dozen major U.S. companies, including Ford, DuPont, and American Electric Power, plus five Mexican and Canadian firms, along with Chicago and Mexico City, have been involved in designing the project and seem ready to participate, in some cases pending further negotiations. As a group, Sandor says, they represent emissions nearly equal to those of Germany.

Chicago Climate Exchange

Richard L. Sandor is Chairman and Chief Executive Officer of Chicago Climate Exchange, Inc., a self-regulatory exchange that administers a voluntary greenhouse gas reduction and trading program for North America.

Under his plan, companies will agree to a small initial target reduction in their greenhouse gas emissions, with the required reductions increasing over time. As in the SO_2 program, those most able to reduce below the target will have credits to sell to others. As envisioned in the Kyoto Protocol, they will also be able to buy credits derived from energy-saving investments and from newly planted forests, with the forest-derived credits eagerly offered from parties including The Nature Conservancy and conservation groups in Brazil.

The European Union is well on the way to having a functioning carbon

Banking on Wildlife and Wetlands

The notion of trading in pollution permits, more politely known as offsets, also applies to another emerging industry known as conservation banking. The stock and trade of this endeavor are offset certifications that might be thought of, according to Adam Davis' worldview, as biodiversity credits.

Michael Jenkins is Executive Director of Forest Trends, a Washington, DC-based coalition of public and private organizations that promotes forest products and services.

The conservation banking industry has grown up as a response to two U.S. federal laws, the Clean Water Act and the Endangered Species Act. Under their auspices, developers—state transportation agencies, for instance, or private builders of residential communities—must compensate for the harm they do to wetlands and habitats critical to threatened and endangered species. If they destroy habitat in one place, they're obliged to restore it someplace else. The for-profit "conservation bankers" have emerged as a way to make life easier for the developers. Prior to their emergence, if a builder found protected flora or fauna on a property slated for development, the choice was to mitigate the damage independently, abandon the project, or adopt the motto "Shoot, shovel, and shut up." Today, the developers can buy credits in properties maintained somewhat like parks.

Since the first bank was formed in Georgia in 1989, some 300 others have been approved by state and federal agencies. In California, for instance, a conservation bank called Wildlands, Inc. recently purchased a small island covered with fallow hay fields in the Sacramento/San Joaquin river delta. The firm invested US$2 million to make the land hospitable to endangered Delta smelt and steelhead trout, digging eight kilometers of meandering channels and planting native sycamores and willows. It has since earned US$9 million by selling credits in the new bank. A land dealer like Morgan can take in from US$1,500 to US$250,000 for each acre of habitat.

Environmental leaders are as divided about conservation banking as they are about carbon-trading. Although some are thrilled by the potential of unprecedented money for conservation, others worry about over optimism or Enron-like scams. An additional worry is that even the best managed wetland and habitat "banks" most often cannot supply the range of services provided by the ecosystems whose destruction they are meant to offset. "For some types of wetlands, there's just no real way to replace them," says Julie Sibbing of the National Wildlife Federation.

Incubating New Markets

Despite the controversies, markets for environmental services have continued to develop. A leading supporter of the trend is an unusual coalition of scientists, business executives, and professional conservationists known as the Katoomba Group, after the site of its first meeting, a resort town outside Sydney, Australia. It was there, in April of 2000, that Adam Davis first unveiled his plan for the Con Ex. To his delight, his new colleagues understood and even applauded his vision.

The group's members, led by founder Michael Jenkins, who is also president of a nonprofit Washington, DC conservation group called Forest Trends, are united in the hope that selling ecosystem service credits from forests can not only help combat climate change and pro-

tect biodiversity but conceivably relieve poverty in undeveloped parts of the world where local residents might earn income as stewards of the land.

In the past two years, the Katoomba Group has reunited in Canada, Brazil, Great Britain, and Japan. Jenkins describes its mission as "incubating new markets for environmental services." This year, he intends to move his group from talk to action, testing the waters for a plan nearly as ambitious as the Con Ex. The idea is to raise US$100 million for what Jenkins calls the Global Forest Ecosystem Fund. The project would allow investors to purchase shares in newly planted forests and earn income from a variety of sources that might include sustainable timber operations, carbon credits, salinity credits, and biodiversity credits.

market by 2005.

Jenkins intends to talk to as many as 100 potential investors in the next few months. "We need to get some strong signals back from people," he says. "We're hoping that by June we'll know if it's a go." Although the decline in the world's economy makes it a difficult time to be launching a new fund, he insists there's a silver lining. "Investors aren't looking for the rate of return that they were before," he says. He estimates the Global Forest Ecosystem Fund would provide a return on investment of eight to ten percent, which he says is typical of forestry funds.

Boosting hopes for the project, as well, is the recent rapid growth in "socially responsible" investment. Assets in socially screened portfolios—those banning investments in firms selling guns or tobacco, for instance, or, increasingly, in those doing environmental harm—rose by more than a third from 1999 to 2001 to top the US$2 trillion mark, according to the Social Investment Forum, which represents the burgeoning industry.

Jenkins believes not only socially conscious investors but mainstream ones will eventually be interested in new commodities based on environmental services. "I have no question in my mind that these are going to be big, robust markets," he says. Already, the European Union is well on the way to having a functioning carbon market by 2005. And regardless of current U.S. policies that would seem to ignore the climate crisis, as U.S. companies find themselves faced with stricter environmental laws in other nations, they'll increasingly be seeking opportunities to mitigate their environmental impacts. For these reasons and others, the emerging greenhouse gas markets promise the most dramatic results, but other projects that re-imagine ecosystems as financially important assets are also moving ahead.

As for Adam Davis, he has discovered a way to earn income with his new expertise in marketing the work of nature, something he says wouldn't have been possible just four years ago. He has joined the Eco-Solutions team of the Electric Power Research Institute (EPRI), a wealthy think tank in California's Silicon Valley serving hundreds of energy firms all over the world. The team has been marketing a cutting-edge service: audits of EPRI's clients, many of whom are big landowners, that list all the ecological assets held on their properties. They include endangered species habitat, carbon-sequestering forests, wetlands, and watersheds, and they've been adding to property values as the implications sink in of new and potentially forthcoming local, national, and international government rules. What might previously have been thought of as a worthless swamp is now a potential conservation bank. Expanses of "empty land" hold promise as a carbon-absorbing new forest. To date, Davis says, he has sold 13 such assessments, which he hopes will eventually convince firms to invest in and restore their environmental assets instead of razing them for development. "The idea is private dollars on private lands, for public benefit," he sums up.

It's still far from the grandeur of the Conservation Exchange. But reality is catching up all the time. ❧

For More Information:

Daily, G.C. and K. Ellison. 2002. *The New Economy of Nature: The Quest to Make Conservation Profitable.* Island Press, Washington, DC.

Katherine Ellison is a consulting writer with the Center for Conservation Biology at Stanford University. Together with Gretchen Daily, she is co-author of *The New Economy of Nature: The Quest to Make Conservation Profitable* (Island Press/Shearwater Books, 2002) upon which this article is based. Recently, she has been specializing in writing about how human beings are managing and mismanaging environmental resources. **Gretchen C. Daily** is Associate Professor (Research) at Stanford University. She is working to develop a scientific basis, along with political and institutional support, for managing Earth's biodiversity and life support systems.