

A Bull Market in...

Glenn Hawes owns a 900-acre plot of land in California that has been in his family for three generations. He used to lease the land for cattle grazing, but recently found what may be a much more profitable undertaking: a “conservation bank” that will protect the land’s natural ecosystems. Thanks to incentives created by environmental laws, the bank could one day generate handsome revenues for Hawes. He has already collected \$300,000 from customers including Safeway and Wal-Mart. With time, he can expect to raise 30 times that amount just for protecting the environment.

Meanwhile, in a small corner of southeastern Georgia, International Paper is busy doing what smart companies everywhere dream about: transforming a chronic envi-

ronmental liability into a marketable asset. In this case the liability/asset is an endangered bird: the red-cockaded woodpecker (*Picoides borealis*). IP is breeding woodpeckers, partly in the hope of one day selling “woodpecker credits” for as much as \$250,000 each. Woodpecker credits have already traded for \$100,000 on a market that resembles a nascent Chicago Board of Trade.

Finally, in the Canaan Valley of West Virginia, Allegheny Power is busy changing the way forests and wetlands are valued. It is putting the finishing touches on a deal to sell 12,000

acres of ecologically important land to the federal government. But it is not just charging the government for the land, it is planning to take a \$16 million tax write-off for the “unique environmental values” of the natural ecosystems found in the Canaan Valley.

What makes all of this possible – the alchemy that has turned Hawes, IP and Allegheny into accidental environmentalists – is a phenomenon known as “mitigation

Making Money in Environmental Derivatives

By Ricardo Bayon

Woodpeckers?



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banking.” The idea is to take living plants, animals and ecosystems and turn them into fungible assets that can be sold through newly formed markets.

MITIGATION BANKING

To understand how mitigation banking works, go back to the passage of the Clean Water Act and the subsequent involvement of United States Army Corps of Engineers in wetlands management. Approved in 1972, the act was designed (among other things) to minimize damage to wetlands. It set about achieving this goal by prohibiting the discharge of fill or dredged material into wetlands without a permit from the Army Corps.

Before granting a permit, however, the Corps must assay the potential impact. First, it must decide if the damage is truly unavoidable – whether there is any benign alternative that is practical. Second, if the Corps determines that the damage is unavoidable, it must look for ways to minimize harm. Finally, the Corps must require unavoidable harm to be “mitigated.” If a project harms a wetland at point A, the developer is required to compensate by creating, restoring or – in rare cases – protecting a similar wetland somewhere else.

This has led to the creation of an environmental currency: the wetland mitigation credit. And the credit, in turn, has created a variety of businesses specializing in enhancing or restoring wetlands in order to sell the credits to needy developers.

The General Accounting Office estimates that developers have paid \$64 million to mitigate damage on 1,440 acres of wetlands. Since a report by the National Academy of Sciences estimates that 24,000 acres were sub-

ject to mitigation from 1993 to 2000, a bit more than \$1 billion was probably spent to obtain permits.

That suggests wetlands mitigation is a good business. But does it actually protect the environment? Julie Sibbing of the National Wildlife Federation is skeptical. “The concept is a good one,” she acknowledges, “but it is not being implemented correctly.”

Sibbing argued that the availability of mitigation credits had made it more difficult to tell whether the damage to a particular wetland is truly unavoidable. In theory, she said, the Army Corps must make sure that damage is unavoidable but, in practice, the Corps often finds it easier to require mitigation instead of “just saying no.”

Another problem, she added, is that developers are sometimes given permits to damage a wetland before the mitigation is undertaken. This, coupled with inadequate monitoring and verification, often means that developers do not deliver on their promises.

But not everyone is skeptical. Doug Lashley, president of Greenvest, a company that specializes in valuing ecological assets, said much of the criticism is off the mark. Some development is unavoidable, he said, and in many cases mitigation represents the best possible outcome. “Most wetlands mitigation,” he explained, “is done for public projects such as the construction of highways, airports, etc. Sooner or later these projects will be done – they are unlikely to be completely shelved – so mitigation allows us to get some environmental benefit from what is essentially an inevitable loss of wetlands.”

Lashley claims that when the mitigation is done through “wetlands banks,” using large plots of land to mitigate for dozens of small development projects, the process can be extremely successful. In these cases, he said, society is exchanging small, usually nonvi-

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STILLWATER PLAIN CONSERVATION BANK

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able, wetlands for larger, more ecologically valuable systems.

Additionally, the benefit of mitigation may come in a variety of subtle forms – for example, by setting a price on the destruction of wetlands, mitigation banking incorporates these ecosystems into the market system. When wetlands destruction costs in the ballpark of \$44,000 an acre, developers are likely to think twice before causing the damage. Thus, mitigation banking is altering the way developers analyze project viability to include ecological values.

THE COASTAL CALIFORNIA GNATCATCHER

Wetlands mitigation using a credit system has sparked imitators. Consider the coastal California gnatcatcher. Before 1995, because of increased development in the songbird's

coastal sage scrub habitat, the population was shrinking rapidly. California decided the only solution was to protect areas of coastal sage scrub that were particularly important to the gnatcatcher. So it set about trying to create a system of preserves on coastal sage scrub. But there was simply not enough public money to protect all the crucial areas. So California developed an alternative approach.

It first began in 1993, when the gnatcatcher was finally added to the endangered species list and when Bank of America foreclosed on a 263-acre parcel in San Diego County known as the Carlsbad Highlands. Because this property was important habitat for the gnatcatcher, few believed it would be possible to build on the land. The bank decided to look for other options.

Meanwhile, the California Department of Transportation found itself saddled with a

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gnatcatcher problem of its own. The agency was building a highway on prime gnatcatcher habitat and, given the bird's new endangered status, the agency was obliged to mitigate damages. CalTrans agreed to pay Bank of America an undisclosed sum to put a conservation easement on 83 acres of its property – thereby allowing the agency to proceed with the construction of its highway. Two years later, the Carlsbad Highlands became the state's first government-sanctioned conservation bank. It has since sold all of its available gnatcatcher mitigation credits (about 180) at \$10,000 to \$15,000 apiece. Today, mitigation credits sell for upward of \$25,000 each in San Diego County.

Since the creation of the Carlsbad Highlands Conservation Bank, Californians have created some 40 conservation banks. And many more are on the way. According to Deblin Meade, an expert on conservation banking who works in the Sacramento office of the U.S. Fish and Wildlife Service, the conservation banks have been extremely successful at protecting some of the state's most endangered species. Echoing Lashley's views, she argued that the banks have allowed the destruction of small chunks of habitat whose value to wildlife is limited in return for the permanent protection of large parcels more suitable for endangered plants and animals.

Meade added that there are a number of differences between California's conservation banks and the wetlands mitigation banks around the country. "All of California's banks have tight conservation easements attached to them," she noted – "easements that are held by the government or by nonprofits." In other words, once all of a bank's conservation credits are sold, the land is managed as a nature preserve in perpetuity. This is possible, she pointed out, because part of the money from



the sale of the credits (usually 10 percent) is set aside as an endowment, the return from which is used to pay for the reserve's ongoing management.

THE STILLWATER PLAIN CONSERVATION BANK

This is exactly how Glenn Hawes is operating his Stillwater Plain Conservation Bank. In 1995 the California Department of Fish and Game identified Hawes's land as having an extremely high proportion of unique and endangered wetlands. This meant the development options were very limited. Using the land for housing (something Hawes had considered in the 80s) was no longer economically viable. On the other hand, Hawes did own a newly marketable commodity: endangered wetlands. This gave him the option to turn his land into a conservation bank and sell credits to others seeking to mitigate development impact.

"To be frank," Hawes said, "when I first heard about the idea of a conservation bank,



SOUTHLANDS FOREST

I was a bit scared.” Still, not seeing other options, he decided to give it a try. Hawes said the process was slow, bureaucratic, costly and painful. But after six long years, the bank was finally approved by the state government in the spring of 2001. By the end of that year, Hawes had sold five mitigation credits. Although Hawes won’t say how much money he has collected, each credit sells for \$65,000 to \$70,000. And he may be able to carve as many as 150 credits from his 900 acres.

“At first people were skeptical of what I was doing,” Hawes recalls. “They didn’t understand how I could make money conserving the environment.” But now he has become renowned as an entrepreneur with the ability to transform lemons into lemonade.

THE RED-COCKADED WOODPECKER

Which brings us back to International Paper and the red-cockaded woodpecker. After seeing how California was using mitigation banking to protect endangered species, a number of organizations began exploring the use

of similar mechanisms at the national level. One was Environmental Defense, a nonprofit group based in Washington.

Michael Bean, senior attorney at Environmental Defense, explained that the red-cockaded woodpecker is a perfect species for mitigation banking. These birds, he noted, thrive only in forests of very old pines that are regularly ravaged by fire to clear out the underbrush. And they need large areas of land – between 75 and 150 acres per group – on which to feed. Currently, red-cockaded woodpeckers survive in a few large populations across the Southeast, as well as in a large number of smaller, more fragmented populations on some very degraded habitats. These small populations are not likely to survive. Thus, unless the land is managed and fires are allowed, the birds will disappear.

With this in mind, Bean and his colleagues thought mitigation banking would give them an opportunity to trade the smaller, doomed populations living on unmanaged habitat for larger, more aggregated populations living on managed habitat – a recurring theme in discussions of mitigation banking.

Just as Bean was looking at how mitigation banking could serve the red-cockaded woodpecker, International Paper began looking for ways to resolve its woodpecker problems. Among the hundreds of thousands of acres that International Paper manages, the company found it had 18 family groups of the woodpecker spread across 1,300 acres of land in four states: Georgia, Louisiana, South Carolina and Alabama. This effectively put large chunks of IP land off limits to development.

IP realized that if it could somehow aggregate the 18 groups of woodpeckers on one plot, it could free up a lot of land. But moving woodpeckers is no easy proposition – many birds don’t survive the voyage or simply fly

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away once they have been resettled. So IP decided that the best way to achieve its goals was to breed woodpeckers somewhere and then use these new birds to mitigate harm to the old ones.

It found the perfect breeding spot in southwest Georgia, in an IP experimental forest called the Southlands Forest Preserve. Southlands consists of 5,300 acres of 70- to

for Southlands is to have at least 18 groups on the preserve to mitigate damage that might be done elsewhere. So far, the 30-some woodpeckers at Southlands make up nine family groups, so IP is halfway there.

Along with mitigating for woodpecker losses on its own land, IP hopes to sell woodpecker credits to others. And since Southlands can theoretically support as many as 30 woodpecker groups, IP may one day have as

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80-year-old pines, a relatively sparse underbrush that is kept clear by regular fires and – since the company decided to turn it into a woodpecker haven – at least 31 red-cockaded woodpeckers.

Before 1996, there were only three of the birds at Southlands. “And these three,” said Craig Hedman, manager of forest ecology and water resources at International Paper, “were doomed to extinction since they were all male.”

Since then, IP has been importing birds from other reserves in Georgia and Florida. And every year more red-cockaded woodpeckers are born there. Meanwhile, the other 16 groups of woodpeckers on IP land remain intact, although the company has had a permit to harm these birds since 1999. “We have decided to take a cautious approach,” Hedman explained. “We want to be sure Southlands works.”

The Fish and Wildlife Service measures red-cockaded woodpeckers in groups, not as individual birds. Because IP had 18 groups on the company’s land before 1996, IP’s target

many as 12 woodpecker credits for sale. Given that woodpecker credits are said to be worth \$150,000 and \$250,000 each, Southlands could one day bring in \$1.8 million to \$3 million for IP. Not bad for a forest that probably wasn’t going to be harvested anyway.

Selling a living, breathing endangered species as a commodity may not be to everyone’s liking. But Ralph Costa, the recovery coordinator for the red-cockaded woodpecker at Fish and Wildlife, said these sales are ultimately helping the woodpeckers. He manages a program that allows individuals and companies to trade in woodpeckers – a kind of Chicago Board of Trade for rare birds. Every year Costa brings together all those who have woodpeckers with those who want them.

The biggest suppliers tend to be the national parks – such as the Apalachicola National Forest in northern Florida – and, oddly enough, Army bases like Fort Benning in Georgia and the Eglin Air Force Base in Florida. Birds from these public land “donors” are allocated by the Fish and Wildlife Service according to a clear set of criteria.

“We’re looking for recipients with large tracts of good woodpecker habitat,” Costa said, “and easements or agreements that ensure that these birds will be protected for long periods of time – 30 years or so.”

So far, most of the birds allocated by Fish and Wildlife have been given away for free (or in return for such in-kind services as biological monitoring), though there have been a few cash transactions. Costa explained that since national and state governments already have a mandate to conserve endangered species, they cannot sell mitigation credits – only private landowners can.

To date, there have been just a few cash transactions for woodpecker credits. The last of these involved a private developer in South Carolina, the Litchfield Corporation, which paid \$150,000 to mitigate the loss of one group of red-cockaded woodpeckers on the site of a golf course and housing development. Costa said, however, that the asking price of a woodpecker credit today is about \$250,000.

Tom Goldtooth, the director of the Indigenous Environmental Network in Minnesota, has a philosophical objection to the concept. “How did we get to the point,” he asks, “where we think that the only way to protect nature is to turn it into a tradable commodity?”

Although Goldtooth’s group is not out there protesting against this sort of thing – “we need to pick our battles, you know” – he claims that the idea of trading wetlands and woodpeckers does not “mesh with” indigenous people’s thinking. “For us these things are sacred,” he said, “and how can you own, let alone ‘commodify,’ the sacred? To us it is yet another example of how our modern society is losing touch with what is really of value.”

Costa and mitigation bankers nationwide are unfazed by such criticism. For them, the

ultimate proof is in whether mitigation banking helps a species survive. And by this measure, Costa said, the jury is in for the red-cockaded woodpecker.

Thanks in large part to mitigation banking, landowners are becoming increasingly interested in harboring and breeding red-cockaded woodpeckers. Before, Costa said, landowners were more likely to want to get rid of birds. Today, the supply of woodpeckers never meets the demand. “And that,” he added, “is a good sign for this endangered species.”

Building on the success with woodpeckers, Robert Bonnie, an economist at Environmental Defense, has helped the Mobile Sewer and Water Commission in Alabama set up a mitigation bank for gopher tortoises (where credits, by the way, sell for \$3,500 per acre and a half). If such pilot programs are successful, mitigation banking might one day be applied to a wide range of species across the United States. And, just as the value of wetlands destruction is now being incorporated into project analysis by commercial land users, so, too, may the value of endangered species.

CANAAN VALLEY ECO-ASSETS

Nowhere is the potential economic impact of mitigation banking more visible than in the remote Canaan Valley of West Virginia. The valley sits on the edge of the Monongahela National Forest, just west of the Appalachian watershed. It is best known as a popular ski resort serving Philadelphia, Washington, Baltimore and parts of Virginia. Two centuries ago, the valley was near-pristine wilderness; today it is slowly being overrun with ski chalets, golf courses and second homes for wealthy urbanites.

The largest landowner in the Canaan Valley is Allegheny Power. The company bought 21,600 acres in the Canaan Valley in 1925,

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hoping to use it for a hydroelectric dam. Getting the power to a large customer base, however, would have been a problem. So Allegheny left the Valley alone.

Then, in the early 70s, Allegheny began exploring its use for a pump-storage facility, where electric motors pump water uphill at night and then recapture the energy during the day by letting it flow through turbines. Though some energy is lost in this process, the difference between the value of power at midnight and at midday can make such ventures profitable.

When Allegheny finally got around to submitting the plans for its pump-storage facility it was 1973, and to damage the local wetland the company needed a permit from the Army Corps of Engineers. The Corps refused on the grounds that the Canaan Valley contained unique remnants of boreal wetlands. For years, Allegheny tried to get this decision overturned, but finally gave up. The company was left with a large piece of land of little value to its core business.

After a restructuring in 1997, Allegheny Power created a special land management team charged with making use of marginal properties like the Canaan Valley. Richard Herd, an ecologist who is now water resources manager at Allegheny, was part of that team. Herd had earlier worked with the Electric Power Research Institute (EPRI) in California, which was developing a program to give value to what it called “eco-assets.” If the Canaan Valley was ecologically unique, Herd reasoned, the company should be able to capture some of the underlying value.

Of the 21,600 acres in Canaan, Herd realized that 9,600 had a limited development potential, while 12,000 had extraordinary ecological value. So they decided to develop or sell the 9,600 and study the ecological val-

ues of the remaining 12,000. They knew that land in the Valley was selling for about \$1,000 an acre, but given the unique nature of the valley’s wetlands they thought they might be able to get more for the 12,000 acres.

EPRI and Allegheny spent two years conducting an academic ecological and economic study of the Canaan Valley. What they got, Herd said, was “a fairy tale.” The academics estimated that the notional value of ecological services provided by the Canaan Valley was around \$336 million, give or take \$10 million. Allegheny and EPRI went back to the drawing board.

This time, they contracted with Lashley and Greenvest to assess the “marketable” values of the ecosystems in the Canaan Valley. In other words, Greenvest was asked to identify ecological services provided by the valley that had real markets in which value could be turned into cash.

Foremost among these, it seems, was the potential to create a wetlands mitigation bank and sell credits, as well as the potential to sell carbon sequestration credits in the newly emerging markets addressing global warming regulation. Greenvest put the value at about \$16 million. “With the Lashley numbers,” Herd said, “we finally had a practical, pragmatic number we could work with.”

Concurrently, Allegheny discovered that the Fish and Wildlife Service was interested in buying the land in order to expand an existing wildlife refuge. Armed with the latest valuations of the area’s ecological services, Allegheny began negotiating to sell 12,000 acres. But it quickly became apparent that the government was not going to pay Allegheny outright for both the real-estate and ecological values of the Canaan Valley – an estimated \$32.6 million – so Allegheny began looking at other options.

The company found it could sell the land



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to the government for its real-estate value (\$16 million) and claim a “bargain sale” tax credit for the difference (\$16.6 million). While the deal had not been finalized late in 2001, the transaction is likely to take place in early 2002.

Because of its experience in the Canaan Valley, Allegheny has begun pursuing similar approaches on four other parcels in Pennsylvania, Maryland and West Virginia. “As far as we’re concerned,” Herd said, “this is an excellent model, one that goes a long way toward encouraging private companies to value and care for the environment.”

At EPRI, the lessons of the Canaan Valley have also been taken to heart. In 2000, EPRI entered into a strategic partnership with Greenvest to create EPRI Eco-Solutions, whose mission is to help electric utilities and other private companies better understand, value and manage their environmental assets. They have since taken on a number of clients, including American Electric Power in Ohio

and Progress Energy in North Carolina.

With all of this potential, it is no wonder that Bill Coleman, the manager of EPRI Eco-Solutions, waxes enthusiastic about what he calls eco-asset valuation: “These markets may still be young and mostly disaggregated,” he said, “and they are certainly inefficient, but they lie at the heart of all productivity. In a few years this market could be worth billions upon billions of dollars.”

“Could” does not mean “will.” But Coleman is almost certainly right that, in the long term, markets for environmental derivatives will facilitate a fundamental shift in how our economy values nature.

Perhaps even Goldtooth can appreciate the irony here: as capitalism runs amok, consuming the natural world at a fearful rate, it will increasingly find that standing forests, running waters, functioning wetlands and living woodpeckers are extremely valuable, useful resources — something indigenous groups have known all along. **M**