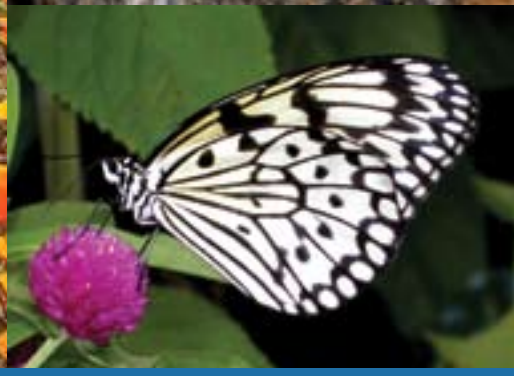
Banking on Conservation 2007

Species and Wetland Mitigation Banking



THE KATOOMBA GROUP'S
Ecosystem Marketplace

2007

Banking on Conservation 2007

Species and Wetland Mitigation Banking

Here at the Ecosystem Marketplace, we have been covering the twists, turns and straight-aways of the mitigation/conservation banking industry in 2007. As mitigation banking continues to grow and diversify, we think it is a good time to highlight some of the intelligence we have amassed over the year. In the following pages, we provide a cross section of the timely reporting, market analysis, personal perspectives, controversial debates, and glimpses of the future that make this industry so exciting.

This collection of feature stories demonstrates the breadth and depth of issues we cover at the Ecosystem Marketplace, and, we hope, it will give you a sense of the practical approach we take to reporting on wetland and species mitigation banking.

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Introduction

Double Digits

Most people can remember their tenth birthday, that much-anticipated moment when your time on the planet crosses the threshold into the terrain of double digits. The initial ten years of any life are full of many firsts. First you learn to crawl, then to walk, and eventually to run. Perhaps most important of all, you learn to stumble, land in the mud and then get up to keep on moving. The importance of all these lessons is what leads us to celebrate double digits with a little extra fanfare, and it is the reason that we at the Ecosystem Marketplace are especially happy to launch this collection of work at the 10th National Mitigation & Conservation Banking Conference.

It is hard to believe that a year has already passed since the Ecosystem Marketplace released its first volume of feature articles about the mitigation banking industry in Portland, Oregon at the 9th National Mitigation & Conservation Banking Conference. Can it really have been a year? We asked the question and then went to look at the many articles we have run about mitigation and conservation banking since our last collection. We were floored when we realized how much has happened in the world of mitigation and conservation banking in 12 short months. Suddenly, our thoughts changed: Can all this really have happened in just a year?

The short answer yes. The past year has been an incredibly dynamic one for the mitigation banking industry in the United States. Some of the growth has been dramatic, but most of it has been relatively small, incremental and diffuse. Only when you pull together all the pieces do you see the big picture. Statewide programs are emerging across the U.S., from North Carolina to Texas to Oregon. Just last year, both Massachusetts and Washington launched pilot programs in mitigation banking. We are seeing States unfamiliar with mitigation banking exploring the idea and adapting it to their context. The same is happening overseas. In the last year, a mitigation banking-like program called Bio-Banking was passed into law in the Australian state of New South Wales. And more than geographic boundaries are being broken. The second bank in the nation to sell anadromous fish (e.g. salmon) credits has opened sales to the public in California. The scientific and accounting hurdles overcome to make this happen will likely set a precedent on which similar fish banks could spread quickly into the Pacific Northwest, a region in need of tools to balance the needs of humans, salmon and the thousands of species that depend on this iconic fish. Trying to categorize the many developments of the past year is no easy task, but we think that several broad themes characterize last year's most interesting stories. Accordingly, we have broken the collection that follows into four sections.

In the first section we look at the evolving policy framework governing mitigation banking in the United States, and the broad idea of biodiversity offsetting. George Dunlop, deputy assistant secretary of the U.S. Army, and Benjamin Grumble, assistant administrator for water at the U.S. Environmental Protection Agency, announced the release of new federal regulation for wetland mitigation on March 27, 2006. Dunlop referred to the new rules - Compensatory Mitigation for Loss of Aquatic Resources – as the most important piece of regulation for the protection of U.S. aquatic resources since the passage of the Clean Water Act in the 1970s. The new guidelines were generally welcomed by mitigation bankers, but met with mixed responses from environmentalists. Just under three months later, however, bankers and environmental groups found themselves on

the same side of the fence when expressing frustration with a split decision from the U.S. Supreme Court concerning a case that challenged the Clean Water Act's authority on private lands. "The worst situation is all this ambiguity," summarized Russ Harding, former director of Michigan's Department of Environmental Quality. Better news for mitigation bankers and advocates of market-based conservation arrived this spring when Agriculture Secretary Mike Johanns unveiled the USDA's plans for the 2007 Farm Bill on January 31, 2007. What did he say? See our selection of stories on an Evolving Framework to get the scoop.

In addition to covering the broad brushstrokes of shifting policies, the Ecosystem Marketplace also dialed in on a number of organizations and conservation efforts in recent months. Our aim: to focus on the lessons emerging from the experiences of those tackling challenges and realizing opportunities in the innovative new world of market-based conservation. In this section we highlighted our belief that it is worth remembering how important criticism can be to the maturation of the mitigation banking market. If banks do not prove themselves ecologically and economically sound over the long-term, they pose a real and present danger to the success of the mitigation banking industry. Where abuses of this system exist, critics are never far behind, and that, we think, is a good thing. We report on the good, the bad and the ugly below in the hopes that the mitigation banking industry continues to build on its successes and learn from its mistakes.

Exploring new terrain is one of the most important parts of building on past successes. The last year has seen mitigation bankers investigate new models of finance, new kinds of credits and new types of habitat. One of the Ecosystem Marketplace's most important goals is to facilitate the cross-fertilization of ideas between sectors and across continents. Follow us as we trace the path of trail-blazing companies looking at biodiversity-banking in Australia, fish-banking in California and stream-banking in North Carolina.

Last but not least, no collection of Ecosystem Marketplace features would be complete without words from the environmentalists, mitigation bankers, and developers that have learned to crawl, walk, stumble and run in this industry in just ten short years. And so, in our final section we cede the floor to two editorial contributors who offer insight into where they think mitigation banking is headed in the decades to come!

Sincerely,

Ricardo Bayon
Amanda Hawn
Nathaniel Carroll

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An Evolving Framework

USDA Farm Bill Proposal Takes Bullish Approach to Market-Based Conservation

by Amanda Hawn and Ricardo Bayon

Agriculture Secretary Mike Johanns unveiled the USDA's plans for the 2007 Farm Bill on January 31, 2007. Since environmental markets are front and center, The **Ecosystem Marketplace** takes a close look.

PHOTO BY MYLES DAVIDSON

Imagine a world in which farmers and ranchers were paid to generate not just standard agricultural goods such as strawberries, hay and corn, but also a slew of ecosystem services such as water filtration, carbon sequestration and wildlife habitat. Imagine a world in which carbon and water-quality credits traded on a commodities exchange alongside oat and wheat futures.

Sound crazy? The U.S. Department of Agriculture (USDA) doesn't think so.

In fact, a number of announcements in the final week of January 2007 brought the brave new world described above one huge step closer to reality. When Agriculture Secretary Mike Johanns unveiled the USDA's plans for the 2007 Farm Bill on January 31, 2007, it was hard to miss the new focus on incentive-based conservation in many of the 65 proposals.

"We started with the 2002 farm bill and propose to improve it by bolstering support for emerging priorities and focusing on a market-oriented approach," said Johanns.

The USDA's proposals would increase conservation funding by $7.8 billion over 10 years, simplify and consolidate conservation programs, create a new Environmental Quality Incentives Program and a Regional Water Enhancement Program. The proposed farm bill would also include $1.6 billion in new funding for renewable energy research, development and protection, with bio-energy and bio-based research initiatives claiming a $500 million slice of the pie and big subsidies targeted for the production of cellulosic ethanol.

Johanns' announcement concerning ethanol probably pleased a number of venture capitalists in Silicon Valley (according to Cleantech Venture Network, venture capital investment in biofuel companies topped $740 million in North America in 2006), but more surprising is the fact that the gist of the larger proposal also won praise from environmental groups who have been watching the bill's creation closely.

Imagine a world in which carbon and water-quality credits traded on a commodities exchange alongside oat and wheat futures.

"The next Farm Bill is a chance to help many more farmers, consumers, communities and the environment," said Environmental Defense Farm Policy Campaign Director Scott Faber. "Secretary Johanns has helped to lay the groundwork for farm and food policy reforms that will ensure the next Farm Bill helps meet America's pressing energy, health and environmental challenges."

The groundwork Faber references includes a series of far-reaching proposals that would introduce market-based auction mechanisms and local bidding pools to allocate conservation funds based on cost per environmental benefit, and create stronger incentives for private markets in ecosystem services, such as increased wildlife and wetland habitat, water-filtration, and carbon sequestration. Title 2 of the proposals, for instance, calls on the federal government to "invest $50 million over ten years to encourage new private sector environmental markets to supplement existing conservation and forestry programs."

More specifically, the document states that, "While private markets for environmental goods and services are emerging, their viability has been hampered by several barriers including: high transaction costs, the small quantity of benefits that can be provided by individual farmers or landowners, performance risks and liability, and uncertainties in quantifying benefits."

"New authorities," it adds, "could overcome these barriers and promote the establishment of markets for agricultural and forestry conservation activities."

Accordingly, the USDA is proposing that the $50 million in "mandatory" funding would "be utilized to develop uniform standards for quantifying environmental services; establish credit registries; and offer credit audit and certification services."

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All of these are essential parts of a robust government infrastructure for environmental markets and they would represent a huge leap forward in incorporating ecosystem services into the economic system.

From D.C. to Doha

In order to understand the forces driving this shift toward market-oriented programs, it is important to look beyond American borders.

In March 2006, The Ecosystem Marketplace reported: "The story of how Brazil crashed the farm bill party begins in 2001 at the Doha Round of World Trade Organization (WTO) negotiations. Agricultural subsidies dominate much of the Doha Agenda, with many arguing that Western nations, by propping up their farmers with subsidies, are limiting one of the few economic arenas where developing nations might enjoy a competitive advantage. In 2003, Brazil formally complained to the WTO that the price support paid to U.S. cotton farmers was a violation of the Uruguay Round Agricultural Agreement, and the WTO ruled in favor of Brazil in September 2004.

The Brazil ruling set up a collision course on several fronts. Chief among them is the fact that, while the White House supports cutting subsidies, trade liberalization is a tough sell to American voters. Since the ultimate burden of ensuring WTO compliance lies with the U.S. House and Senate, the Doha round of talks could fail unless Congressional legislators quickly find ways to keep both American and Brazilian farmers happy in the 2007 Farm Bill. For environmentalists, this challenge raises a tantalizing prospect: If billions of dollars in agricultural subsidies violate international trade law, could the money be redirected to conservation?"

For environmentalists, this challenge raises a tantalizing prospect: If billions of dollars in agricultural subsidies violate international trade law, could the money be redirected to conservation?"

Johann's new announcement suggests the answer might just be: yes.

Brazilian president Luiz Inacio Lula da Silva announced on January 29, 2007 (just two days prior to Johann's announcement of the proposed Farm Bill) that he is now, "more optimistic about the revival of negotiations of the Doha round because there is political willingness for this to succeed. In particular, he pointed to ethanol and biodiesel as promising areas of investment for developing countries and stressed that biofuel projects are eligible for carbon finance under the Kyoto Protocol.

Reading Tealeaves

Recent announcements from for-profit and non-profit organizations alike, suggest that Lula is not the only one who has been reading tealeaves of late.

Agweek Magazine reported on January 30, 2007 that, "Some $2 million in checks should start going out to about 600 farmers in North Dakota by early March for carbon credits that have been aggregated in the first round by the North Dakota Farmers Union."

The North Dakota Farmers Union is one of several organizations in a 14-state region of the U.S. that is aggregating carbon credits from farmers for sale on the Chicago Climate Exchange (CCX), a members-only exchange that trades in pollution permits and offsets.

CCX already has certification standards for soil and forestry carbon sequestration projects and Agweek says the Exchange hopes to approve several other agriculture-based methodologies this spring. One could focus

on rotational grazing programs on native rangelands and others might focus on carbon sequestration in wetlands or the production of switchgrass. “If farmers get into the business of raising switchgrass, selling residue into the cellulosic ethanol market, the planting also could qualify for carbon sequestration credits,” reported the magazine.

Perhaps following the North Dakota Farmers Union’s lead, conservation organizations across the U.S. have begun signaling interest in playing a role in the evolving carbon market. The Trust for Public Land’s website is currently advertising for a Carbon Sequestration Program Director who, “will be responsible for consolidating and developing a carbon credit program at the Trust for Public Land. As such, this position works to generate and market carbon sequestration credits both to address climate change and help underwrite conservation.”

More Than Semantics?

With real money taking an interest in biofuels (as well as the prospect of a federal carbon market in the U.S.), environmental groups expressing measured support for the USDA’s new direction, Brazil’s new optimism about the Doha round of WTO talks, and unusual suspects stepping up to help bring carbon credits to market, negotiations over the 2007 Farm Bill look set to be interesting.

But as anyone familiar with the political process in D.C. will tell you, Johanns’ announcement on January 31, 2007 was merely the opening move in the complicated political game that will decide the ultimate shape of the next U.S. Farm Bill. Look for plot twists and more details in the days ahead.

First published: February 2, 2007

Supreme Court Decision Leaves U.S. Wetlands (and Bankers) Stuck in the Middle

by Alice Kenny

A recent U.S. Supreme Court case challenged the enforcement of the Clean Water Act with respect to wetlands on private land. The **Ecosystem Marketplace** takes a look at the resulting split decision and its impact on the evolving wetland mitigation banking industry.

Thumbing their noses at regulators and threatening to "destroy" a wetland consultant who identified their land as unbuildable under the Clean Water Act, John and June Rapanos bulldozed 230 acres containing wetlands to build a shopping center in Michigan back in 1988. Despite this nefarious start, Rapanos, along with another Michigan wetlands case called Carabell, pushed through the U.S. legal system, landing before the dignified body of the Supreme Court. There, in writings dripping with sarcasm over one another's opinions, the nine black-robed justices issued a 4-1-4 splintered decision in June 2006 that could threaten decades-old protections to the nation's waters.

The nine black-robed justices issued a 4-1-4 splintered decision in June 2006 that could threaten decades-old protections to the nation's waters.

PHOTO BY DAVID LAT

The decision throws into question just how stridently the Act should be enforced, what exactly should be protected, and even the meaning of such basic operational words as "waters," "navigable" and "adjacent." Conversations with regulators, attorneys, developers and wetland mitigation bankers indicate that this cacophony could lead, at least in the short term, to fewer federally protected wetlands and might cut into business for the mitigation bankers who make their livelihood restoring wetlands.

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"The worst situation is all this ambiguity," says Russ Harding, former director of Michigan's Department of Environmental Quality who oversaw mitigation banking during its infancy. "If I were a developer, I'd be scared to do anything. It's not going to help mitigation banking until we get all this clarified."

Tabloid News

The Rapanos case reads like tabloid front-page news, but it actually raises serious legal issues that are important to conservationists, developers and mitigation bankers across the country. Along with the more staid Carabell case, the Rapanos case offers the Supreme Court an opportunity to clarify what many had complained was murky, over-reaching interpretations of environmental law.

The Rapanos case began when, according to court documents, John Rapanos asked his state department of natural resources to inspect the site he owned in Midland, Michigan so he could build a shopping center there. To bolster his contention that the land was developable, he hired a wetland consultant. But when the consultant concluded that the land contained significant wetlands, Rapanos threatened to "destroy" him unless he eradicated all traces of his report. Then, without a permit, Rapanos ordered $350,000 worth of earthmoving and land-clearing work to fill and drain 22 acres of wetlands. He prevented inspectors from visiting the site and ignored cease and desist orders. He and his wife also took similar actions at two other sites, court documents reveal, spending $158,000 to fill 17 acres of wetlands on a 275-acre site and another $463,000 to fill 15 acres of wetlands on a nearby 200-acre site. The Federal Government brought criminal charges against Rapanos.

The second consolidated case before the court also originated in Michigan, but is not nearly so flashy as the Rapanos story. In 1993, Keith and June Carabell sought permits from the Michigan Department of Environmental Quality to fill wetlands and construct 130 condominium units, according to court documents. Although the Department denied the permit, a State Administrative Law Judge later directed the agency to approve an alternative plan that allowed for filling 12.2 acres of wetlands and creating 3.74 acres of retention ponds. But the Army Corps of Engineers determined that the property served water-storage functions that, if destroyed, could cause erosion and degrade water quality. The Corps denied the permit, leading to a series of appeals and, ultimately, a case in front of the United States Supreme Court.

A Split Decision

According to the jingle from the classic T.V. show Mr. Ed, a horse is a horse, of course, of course. If only the same could be said of a wetland.

In the environmental enforcement world created by the Clean Water Act, the meaning of such key words as waters, navigable and adjacent are up for grabs, triggering endless disputes that led, eventually, to the current face off.

Appalled by waterways so polluted that the Cuyahoga River in Cleveland actually burned, Congress enacted the Clean Water Act in 1972 "to protect the nation's navigable waters." Quickly, scientists, courts and regulators agreed that the nation's navigable waters could only be protected if water flowing into them was protected as well. But where should this protection start? And how far up stream should it extend? Since the 1970s people have argued over these questions, constantly wondering whether the spirit or the letter of the law should be applied when attempting to answer them.

For Justice Antonin Scalia and the justices who joined in his decision—Thomas, Alito and Chief Justice Roberts—the answer was straightforward. Relying heavily on Webster's New International Dictionary (2d ed., 1954) for his decision's backbone, Scalia wrote that waters of the United States include only ones that are permanent, standing or continuously flowing. Adjacent (protected) wetlands are those where it is difficult to determine where the wetland begins and water ends. And navigable confers jurisdiction over relatively permanent bodies of waters. Disparaging the four justices who disagreed with this opinion, Scalia wrote that they were "long on praise of environmental protection and notably short on analysis."

But from Justices Stevens, Souter, Ginsburg and Breyer's perspective, Scalia's analysis fixated on the wrong issue. Instead of focusing narrowly on dictionary definitions, Stevens wrote, the case should be considered in light of Congress' intent when creating the Clean Water Act. Criticizing Scalia's "own antagonism to environmentalism," Stevens emphasized that Congress said they wrote the Act to "restore and maintain the chemical, physical and biological integrity of the Nation's waters." Wetlands, then, are protected under the Act, Stevens reasoned, when they significantly affect this integrity.

Oozing sarcasm, Stevens added, "the plurality… defines 'adjacent to' as meaning 'with a continuous surface connection to' other water. It is unclear how the plurality reached this conclusion, though it plainly neglected to consult a dictionary."

> In the environmental enforcement world created by the Clean Water Act, the meaning of such key words as waters, navigable and adjacent are up for grabs, triggering endless disputes that led, eventually, to the current face off.

Into this 4-4 face off entered Justice Anthony Kennedy. Stretching his judicial muscles, the Court's moderate sided in part with both groups, triggering turmoil that many say could take years to sort out. On the one hand, Kennedy agreed with Scalia that the lower court failed to establish a "significant nexus" between the waters on Raponos and Carabell's land and the nation's navigable waters. Because of this omission, the two cases, he agreed, should be remanded for a new decision. On the other hand, Kennedy wrote, Scalia's opinion was "inconsistent with the (Clean Water Act's) text, structure and purpose. " It was likely, Kennedy added, that the lower court would find a significant nexus connecting the Rapanos and Carabell wetlands to navigable water and could then accurately rule, once again, against Rapanos and Carabell.

Most perplexing about Kennedy's hair-splitting decision, attorneys and regulators say, is his additional requirement that the Army Corps of Engineers, rather than following established guidelines, instead evaluate each wetland-petition permit on a "case-by-case basis" until Congress clarifies its intent or the Army Corps of Engineers and Environmental Protection Agency write better-defined regulations.

Echoing the sentiments of nearly everyone affected by this decision, Sanju Misra, a fellow at Georgetown Environmental Institute comments, "lower courts don't know what to do with these sorts of fragmented opinions. It's like fitting a jigsaw puzzle together."

Missing Pieces

Many attorneys say Kennedy's "significant nexus," case-by-case requirement must be followed by courts and regulators since his decision to remand the case back to the lower court gave Scalia's opinion a five-member plurality. Others, including Reed Hopper, a principal attorney with the Pacific Legal Foundation that represented Rapanos, say courts and regulators can choose to follow either Scalia's restrictive adjacency requirements or Kennedy's significant nexus requirement. Still others, including Georgetown University environmental law professor Richard Lazarus, say the split decision broadens the Clean Water Act by allowing water bodies to fall under its protection if they meet either Scalia's or Kennedy's tests.

Exacerbating the problem, no one appears willing to step up to the political plate to sort this out. Since the Supreme Court justices now realize they cannot come up with any clear consensus among themselves, it appears unlikely that the existing court will take on another case, Hopper says. Meanwhile, Congress could vote to accept one of several proposals before it to amend and clarify the Act. But this is also politically unlikely, says Leonard Shabman, an economist and wetland specialist who helped author a study assessing wetlands for the National Academy of Science's National Research Council.

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And while the executive branch's Army Corps of Engineers and EPA could write new regulations, they are so wary of this politically charged subject that Army Corps spokesperson Dave Hewitt would say only that they plan to review the ruling and, in the meantime, have warned their staff to "just be careful."

Stuck in the Middle

There appears little doubt that this mayhem will damage the mitigation banking industry, say experts. "Since no one knows what's jurisdictional and what's not, it will slow down the wetland-permit process, resulting in less land requiring mitigation," says former president of the National Mitigation Banking Association Richard Mogensen.

Not only will this process be slowed, the amount of land requiring mitigation could also be lessened, according to an internal Army Corps of Engineers memo obtained by Ecosystem Marketplace and confirmed by Corps spokesperson Hewitt. The memo instructed staff to delay determinations on cases involving "nontraditional navigable waters" until the agency comes up with new guidelines. It also added, ominously, that "the

"Since no one knows what's jurisdictional and what's not, it will slow down the wetland-permit process, resulting in less land requiring mitigation," says former president of the National Mitigation Banking Association Richard Mogensen.

amount of required compensatory mitigation can be re-evaluated (if appropriate) based on that new guidance."

Should the Army Corps ultimately decide to be aggressive in asserting jurisdiction over wetlands as it has after past court cases, the case-by-case analysis prescribed by Kennedy would increase workloads and slow down wetland identification, says Royal Gardner, a member of the National Research Council's Committee on Mitigating Wetland Losses and a law professor at Stetson University. But if it decides to take a more limited approach, there would be serious wetland losses in states that do not have their own wetlands protection laws.

"The short term implication is a decrease in the number of wetland acres and subsequent decrease in demand for credits and mitigation bankers," Shabman says. "The long term is harder to see. The whole point of this case is that we haven't decided as a nation what a wetland is."

First published: August 8, 2006

Bankers, Developers & Environmentalists Weigh In On New Wetlands Regulation

by Alice Kenny

The U.S. Army Corps of Engineers and the U.S. EPA recently released a draft of the new guidelines for Compensatory Mitigation for Loss of Aquatic Resources. The **Ecosystem Marketplace** finds out what environmentalists, developers, in lieu fee providers and bankers think of the proposed regulation.

In 2003, Walter Jones, a North Carolina congressman, slipped authorization to revamp the wetland mitigation banking industry into a bill funding U.S. troops in Afghanistan and Iraq. Two years later, the draft regulations are now open for comment until May 30; a final version of the regulations should be singed into law within a year.

The new regulations would promote wetland mitigation banks—which restore wetlands in exchange for government credits that can then be sold to developers destroying other wetlands—by requiring developers planning their own mitigation to meet the tighter, more expensive rules governing mitigation bankers.

As proposed, the new regulations would promote wetland mitigation banks—which restore wetlands in exchange for government credits that can then be sold to developers destroying other wetlands—by requiring developers planning their own mitigation to meet the tighter, more expensive rules governing mitigation bankers. The regulations also phase out one of mitigation bankers' main competitors, "in lieu fee providers," organizations paid by developers for promises of future restoration.

PHOTO BY IRUM SHAHID

Not surprisingly, mitigation bankers praise the proposed regulations, saying they are a competent way to shore up their industry while increasing the number of healthy wetlands in the United States. While still wading through dense copy published in the Federal Register on March 28, others have been far more reserved in their assessments.

"If bankers are writing regulations for their own industry and giving it a preference, that tips the scale," says environmentalist Patricia White from Defenders of Wildlife, referring to Congressman Jones' large constituency of wetland mitigation bankers. "Bankers are an important asset to conservation, but they should not be calling the shots."

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Sorry Track Record

In order to understand the aims of the new regulations, it is important to revisit the bleak history of wetlands preservation in the United States. Wetlands—once viewed as mosquito-breeding swamps but today valued for their ability to filter pollutants, restrain shoreline erosion and prevent floods—continue disappearing despite laws enacted to protect them. Plowed over by farmers and filled by developers, fewer than half the wetlands covering the New World at the time of its discovery by Europeans, remain. Congress, alarmed by wetlands' rapid disappearance, passed the Clean Water Act in 1972, mandating that developers replace as many wetlands as they destroy. Still, millions more wetland acres have disappeared.

Fed up, legislators gave developers three options. They could replace the wetlands they destroyed themselves; they could pay in-lieu-fee providers, typically nonprofit corporations, to replace them at some future time; or they could buy "credits" from wetland mitigation banks that proactively restore, enhance or create wetlands.

Nearly three decades later, Congress asked the National Academy of Science's National Research Council to assess mitigation programs' success at preserving wetlands. They also asked the U.S. General Accounting office to evaluate in-lieu-fee mitigation. Results from both studies were dismal. The Army Corps of Engineers, the agency assigned to supervise wetland protection, had been lax in its oversight, and wetlands were disappearing without being replaced. At first glance, a recent Bush-administration report indicates this trend has reversed. But after subtracting water bodies serving few wetlands purposes, such as golf course and storm retention ponds, the new study confirms wetlands' steady, albeit slower disappearance.

In addition to spotlighting problems, the National Academy of Science report also pointed the way toward some potential answers. The report, for instance, determined that more highly regulated mitigation efforts were more likely to succeed. Among the three mitigation options—developers performing their own mitigation, in lieu fee providers and mitigation bankers—bankers are, by far, the most highly regulated group. Unlike their competitors, bankers can only release credits and get paid for wetland rehabilitation when they meet predetermined success criteria.

Among the three mitigation options—developers performing their own mitigation, in lieu fee providers and mitigation bankers—bankers are, by far, the most highly regulated group.

The report also noted that wetland restorations were more successful when considering an overall watershed approach. Leonard Shabman an economist and wetland specialist who helped author the National Research Council study, says that instead of "sticking a wetland in the middle of a parking lot" as developers might do when performing their own onsite mitigation, mitigation efforts should look at what effect a wetland has on the overall watershed. Rather than using acreage to measure replacement value, Shabman suggests analysts should evaluate the functions of soon-to-be destroyed wetlands and then consider how best to replace these functions.

Despite the publicity generated by the National Academy of Science's report, its conclusions initially produced few results. Developers still perform their own mitigation work 60 percent of the time with limited oversight. In seven percent of cases, developers meet their wetland replacement obligations by paying in lieu fee corporations that promise to replace wetlands but do not always do so. And 33 percent of the time, developers buy credits in mitigation banks that, while shown to demonstrate the greatest potential for replacing wetlands, have also been cited for failures.

A Mixed Reception

Drawing on the National Academy of Science's 2001 critique, the proposed regulations are intended to improve the federal track record when it comes to protecting wetlands. Reached at his office in Washington D.C., Shabman said he was pleased to see that the proposed regulations respond to most of the Academy's major suggestions. "They generally pick up on most of the themes, coming pretty close to the NRC report," he says.

The regulations prioritize avoidance and minimization of potential wetland impacts as the first line of defense for wetland preservation. When this is not possible, the regulations say that mitigation efforts should consider a watershed approach, safeguarding the most important wetlands in the watershed instead of focusing only on the area surrounding the disturbed parcel.

Mixing its metaphors while listing its goals, the Army Corps of Engineers writes in the proposed regulations that it hopes to create "a level playing field" among the three compensatory mitigation mechanisms by "raising the bar" so that providers of high-quality mitigation are not disadvantaged by others held to lower performance standards. Specifically, the regulations envision leveling the playing field by doing away with mitigation bankers' main competitors. Some have welcomed this development, but others deplore it.

"The regulations are all about supporting the mitigation banking industry," says Julie Sibbing, senior program manager for agriculture and wetlands policy at the National Wildlife Federation.

To increase the odds that mitigation will actually occur, the proposed regulations encourage developers to rely on mitigation banks when they are locally available and require in lieu fee providers to convert their mitigation efforts into banks within the next five years. Scott Yaich, a wetland scientist and director of conservation programs for Ducks Unlimited, a world leader in wetlands preservation and an in lieu fee provider, says he is disappointed by this decision. "Removing

It hopes to create "a level playing field" among the three compensatory mitigation mechanisms by "raising the bar" so that providers of high-quality mitigation are not disadvantaged by others held to lower performance standards.

this tool reduces flexibility to provide mitigation that replaces the full functional value of wetlands destroyed. The problem," he continues, "has always been with accountability. There were lots of cases in the past where money was provided but wetlands were never mitigated. That's a problem with enforcing accountability, a problem with the Army Corps of Engineers."

Until now, adds White from Defenders of Wildlife, "no one was watching the farm." By holding all providers to the same standards so that the high quality provider is not at a disadvantage to the low quality one, the percentage of successful mitigation efforts could go up, she says, but eliminating mitigation bankers' competition could also come with an environmental price. "If you go into a store with 50 different kinds of bread", she says, "each bakery has to bake their bread as well as it can, so it will sell. If there's only one kind of bread, it can be bad but you have no choice but to buy it."

Developers express similar concerns. When a single mitigation bank with no competition exists near a development site, the bank could charge exorbitant fees. Susan Asmus, vice president for the National Association of Homebuilders, worries that these fees might be passed on to home buyers in the form of higher house prices, but adds, "as a practical matter, homebuilders aren't the right people to build wetlands just like wetland builders aren't the right people to build homes." The new regulations' propose moving from a mathematical mitigation equation (replacing, for example, two acres of wetlands for every acre destroyed) to a functional one that seeks to get the greatest ecological result regardless of size. Asmus thinks this could ultimately save developers money.

But permitting smaller wetlands to replace larger ones—or preserving existing wetlands in exchange for destroying others—will not help realize the "no-net-loss" of wetlands mandated by the Clean Water Act, observes Sibbing of NWF. And eliminating mitigation bankers' main competitors could enable bankers to raise their prices and lower their quality. "Bankers and banks are not all created equally," Sibbing says. "When they succeed, there will be a much larger bank of wetlands. When they fail, there will be a much larger mud hole."

Wetland bankers and regulators counter that the new regulations include enough safeguards to minimize the odds of mud holes. For example, they include requirements that mitigation efforts receive annual inspections. "The new mitigation rules," says Rich Mogensen, a wetlands scientist and immediate past president of the National Mitigation Banking Association, "will bring all forms of wetlands mitigation to a higher and consistent level of review while promoting the use of mitigation banks, the most regulated form of mitigation."

Palmer Hough, a point man at the EPA who helped draft the regulations agrees: "I would encourage people not to prejudge the regulations simply because they are the result of a Congressional Directive. Some have criticized compensatory mitigation as simply a paper exercise."

From Hough's perspective, the new regulations offer a prime example of creating a system that is good for the environment and good for business. Unlike traditional wetland replacements that will be phased out, wetland restoration credits granted to banks are tied to demonstrated achievement of project goals. "The proposed regulations," he says, "would ensure that compensatory mitigation projects are more thoughtfully planned and successfully executed, making our commitment to no-net-loss of wetlands a reality."

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Learning Experiences

Ohio Study Shows Mitigation Banks Not Living Up to Potential

by Alice Kenny

The **Ecosystem Marketplace** finds out what a recent study says about how mitigation banks measure up over time.

In a critical study touted as the most comprehensive to date to evaluate the ecological success of wetlands mitigation banking, the Ohio Environmental Protection Agency took aim at an industry often touted as the panacea to wetlands loss. The recently released report appears to debunk the presumption that mitigation banks, with their economies of scale and consolidation of resources, necessarily produce more successful wetlands than individual mitigation efforts. Still more disturbing, the report highlights what had been the unspoken "elephant in the living room"; that when an individual mitigated acre fails, the loss to the environment is nominal but when thousand-acre wetland banks fail, the loss can be enormous.

PHOTO BY DANIEL WEST

When an individual mitigated acre fails, the loss to the environment is nominal but when thousand-acre wetland banks fail, the loss can be enormous.

The study evaluated only 12 wetland mitigation banks in a single state, clearly limiting its perspective. But since the study highlights shortcomings endemic to many wetland banks throughout the United States, its broader implications for this national industry could be significant. Environmentalists say the report vindicates

their unheeded warnings. The study's author, wetland ecologist John Mack says he finds the study results particularly frustrating because mitigation banking, if properly regulated, could hold the answer to halting wetlands' loss. And even some mitigation bankers, while criticizing what they consider the report's strident tone, agree that regulators may not be holding any type of mitigation—banks, individual mitigations and in lieu fee non-profit agencies—to high enough standards.

President of the National Mitigation Banking Association Craig Denisoff says, "we'd like to see higher ecological standards and adaptive management but we build what we're asked to build."

The study's author, wetland ecologist John Mack says he finds the study results particularly frustrating because mitigation banking, if properly regulated, could hold the answer to halting wetlands' loss.

Now, with the political magnifying glass focused on mitigation banks, the debate intensifies on how to halt the continued disappearance of valuable wetlands. It brings into focus mitigation banking's strengths and shortcomings, and highlights some strategies to shore up the banking system.

Spotty Record

Seeking to obtain fair assessments over time, the Ohio study looked at the 12 oldest of the state's 25 wetland-mitigation banks. What it found was disturbing.

As in other states with wetland banks, these 12 had been monitored for years by the Army Corps of Engineers and the EPA, had been certified as meeting their performance standards and had released their wetlands credits to developers as mitigation for the wetlands the developers planned to destroy. Double-checking the other agencies' work, the Ohio study sought to determine whether these banks actually functioned as wetlands. It examined the contents of over one thousand activity traps for several years and over all four seasons, taking samples of vegetation, amphibians and invertebrate life, soil and hydrology, Mack says. The study found banks successful when they maximized areas defined as wetland, minimized areas of open water, and had similar plant and animal life to natural wetlands.

"The Ohio study sought to determine whether these banks actually functioned as wetlands... Only three banks scored in the successful category."

Using these criteria, only three banks scored in the successful category, the study reported. Five passed in some areas and failed in others. And four failed nearly every assessment, functioning more like anoxic pools than wetlands.

Perhaps more troubling, the study found that the failing banks not only fell short of Ohio's more scientifically advanced wetland assessments, they also fell short—by large margins—of the performance standards the Army Corps of Engineers and federal EPA had set for them.

"No one was calling the banks on this despite data submitted, not the Corps and not the EPA," Mack says. "The credits were released and the next thing you know you have 200 acres of shallow muddy water."

Regulators acknowledge this lapse and attest to Mack's study's validity. Discussing the study, Palmer Hough, an author of the federal EPA's new proposed wetland regulations said "it's fair to say that many of the older Ohio banks were not held to a high enough set of standards and that there are not enough regulators to perform compliance monitoring."

Unfortunately, this lapse is not limited to the state of Ohio. "We've known for a long time that we've had a problem getting banks and all compensation sites equipped with the right performance standards," Hough continues. "Science is evolving rapidly and our understanding of the right things to measure is changing and evolving. We need to equip ourselves with regulations that allow us to adapt as our understanding improves."

Unrealized Potential

As even the casual observer understands since witnessing televised depictions of Hurricane Katrina's wrath, wetlands perform vital functions. If they had not been destroyed in New Orleans, they could have acted as flood barriers, sopping up excess rainfall before it inundated developed land. Wetlands help filter drinking water, sequester carbon that would otherwise contribute to climate change, supply food to downstream fisheries and promote significant biodiversity of plant and animal species. Acknowledging this, Congress passed the Clean Water Act in 1972 demanding that developers establish alternate wetlands to replace any they destroyed.

Palmer Hough, an author of the federal EPA's new proposed wetland regulations said "it's fair to say that many of the older Ohio banks were not held to a high enough set of standards and that there are not enough regulators to perform compliance monitoring."

Initially, developers responded in a piecemeal, often unsuccessful fashion, using their limited scientific backgrounds to create new wetlands or restore destroyed ones. Not surprisingly, the number of wetlands in the United States continued disappearing. Numerous studies, including another Ohio study authored by Siobhan Fennessy in 1997, concluded that this type of project-specific mitigation almost never succeeded. So environmental organizations stepped in, promising to restore wetlands at some future date in exchange for developers' payments. Yet a study just released by the Environmental Law Institute in June found this "in lieu fee mitigation" had equally dismal results.

But mitigation banking, the most highly regulated of these three forms of mitigation, had, since inception, been held out as a success within this morass of failures. Common sense indicates that it should be far easier to restore or create a successful multi-acre wetland bank than to create a single acre of wetland in isolation. And mitigation banking appeared to almost guarantee the no-net-loss goal. Unlike in lieu fee arrangements and individual mitigations, mitigation bankers must demonstrate that wetlands they restore live up to federal standards set for them before they can be used to compensate for the destruction of other wetlands.

With these promises, the industry, initiated by a handful of wetland mitigation bankers in the early 1990s, grew more than ten-fold. There were 46 named banks in 1992 according to an Environmental Law Institute study. By last year, there were 405.

In 2001, the National Academy of Wetlands Scientists named wetland banking the best form of wetland mitigation. And, indeed, mitigation banking offers a long list of achievements. Pairing private-sector bankers with the public goal of no net loss of wetlands pushed science and our understanding of wetlands at an accelerated rate, says Jean Christie from the Association of State Wetland Managers. Wetlands that could not have been restored ten years ago, such as bottomland hardwoods, can now be restored thanks to evolving science. Back in the 1950s, the United States was losing one-half million wetlands per year. This net loss has slowed or halted, according to a recent study by the U.S. Fish and Wildlife Service, although critics of this study point out that restored wetlands may be far inferior at producing wetland functions than the natural wetlands they replace.

There were 46 named banks in 1992 according to an Environmental Law Institute study. By last year, there were 405.

All in all, "banks should perform consistently better than other forms of mitigation," says Mack, the Ohio study's author. "They have more potential, better performance standards, are better designed and monitored. But they aren't yet living up to that potential."

Death by 1,000 Decisions

No single wetland loss produces a catastrophic result. But with half of the approximately 200 million wetlands destroyed since Europeans colonized the United States and the remainder under constant threat by developers catering to our nation's swelling population, losing wetlands when using highly regulated wetland banks, Christie says "is like death by a thousand different decisions."

"Banks should perform consistently better than other forms of mitigation," says Mack, the Ohio study's author. "They have more potential, better performance standards, are better designed and monitored. But they aren't yet living up to that potential."

The concept of wetland replacement through banks, in lieu fee arrangements and individual restorations has often contributed to an odd, second-team amalgam of restored and created wetlands. Most notable is what former Ohio EPA scientist Fennessy refers to as a "reservation" approach to mitigation. Developers build on wetlands in high-priced urban areas, and then purchase credits in recreated wetland banks located in comparatively inexpensive, rural locations. When those locations in turn become valuable, the wetlands are moved again. Exporting wetland functions from urban to rural results in losing their services as flood protectors and bucolic enclaves where they are most needed. Further, easy-to-create wetlands are often substituted for more complex ones. As a result, northern-forested wetlands, for example, are becoming equivalent to an endangered species.

Then there is what Mack refers to as the "myth" of wetlands self design. Wetland bankers often put wetland hydrology in place and plant lightly, waiting for the wind to blow in plant seeds and amphibians and animals to follow. But since wetlands typically depend on perennial plants, they do not colonize readily. And amphibians, unlike cats, do not cross miles of landscape to reach home. This contributes to what environmentalists

refer to as "bathtub banks"—shallow ponds that aren't wetlands, do not perform wetland functions and have no parallel in nature. These would include the golf course water hazards and storm water retention ponds the Bush administration counted in their Fish and Wildlife Service report to conclude that the United States achieved its goal of no net loss of wetlands.

Treating the Disease

The good news, most scientists, regulators, environmentalists and bankers agree, is that these problems can be fixed. The bad news is that just asking bankers to do better cannot solve them.

According to mitigation banker Rich Mogensen in North Carolina, criticizing mitigation bankers for meeting inappropriate performance standards set for them by regulators, "is like treating the symptom instead of the disease."

The good news, most scientists, regulators, environmentalists and bankers agree, is that these problems can be fixed.

To increase the odds of mitigation banks' success, most agree, the Army Corps and federal EPA need to take a more intensified watershed approach to mitigation so that wetlands remain where they are needed most. More rigorous performance standards that remain flexible enough to reflect emerging scientific knowledge should be established. And more regulators —preferably scientists who understand wetland ecology as opposed to agency bureaucrats who understand numbers – should consistently and scientifically monitor banks' status at creating wetlands.

Hough, who helped write the recently proposed wetland regulations, said he believes these regulations will put mitigation banking back on track. The regulations will require banks to meet measurable, objective performance standards. And they will give local experts the flexibility to amend future standards to reflect emerging science.

"The take-home message is that we can do this. Wetland mitigation can hit its targets…we can't afford to fail."

Like all contracts, however, the regulations will not retroactively hold permit applicants to new standards. This leaves unsolved the concern that banks may continue to meet their performance standards without creating thriving wetlands. It also does not address the clear need for more regulators. From National Wildlife Federation spokesperson Julie Sibbing's perspective, this will "lock in place what is already being done wrong."

We can't afford to fail

Interestingly, while Mack's study created consternation among mitigation bankers, he remains among the industry's top supporters. His study pointed out not only bankings' shortcomings, he says, it also proved that banks, such as the three rated as passing in all categories, could succeed. By using better designs, performance standards, enforcement, financing and an appropriate watershed approach, wetland mitigation banking can produce high-quality wetlands, he says. "The take-home message is that we can do this. Wetland mitigation can hit its targets…we can't afford to fail."

First published: August 24, 2006

The Case of the $100,000 Fly

by Eileen Campbell

Mitigation banking is increasingly used to help developers and property owners proceed with development in places where it threatens endangered species or habitats, while protecting the natural assets on other sites. Banks put environmental protection on an economic footing with development. But is $100,000 too much to pay to save a fly? The **Ecosystem Marketplace** looks at the case of the Delhi Sands flower-loving fly.

In scattered patches of sand dune east of Los Angeles, California, the larvae of a fly lie below ground. They've been there for a year now, and they're beginning to stir. In the summer, they'll dig up to the surface and emerge as adult flies. When their wings dry, they'll fly off in search of nectar-filled flowers on which to take their first meals. The flies will live less than a week; after finding mates and laying eggs in the sandy soil, they'll die.

The dunes are quiet, but they're at the center of a clamor about the value of endangered species and the best way to preserve habitat. The fly, the Delhi Sands flower-loving fly, was declared an endangered species in 1993, the first fly ever listed and only the 17th insect. Its habitat, once wide-ranging in this arid Southern California area, has been reduced to 2% of its former extent. In an attempt to balance protection of the fly and its habitat with development demands in this fast-growing region, a species bank opened its doors in 2005 and has since sold 1-acre mitigation credits for $100,000 each.

In an attempt to balance protection of the fly and its habitat with development demands in this fast-growing region, a species bank opened its doors in 2005 and has since sold 1-acre mitigation credits for $100,000 each.

PHOTO BY USFWS

The price has prompted snorts of astonishment from many. The fly provides an easy target for those who question the value of protecting small, obscure species. “A fly isn’t an animal—it’s a vector of disease,” harrumphs one website. But it does raise the serious question: what are we willing to pay to protect a fly and its habitat?

A Flower-loving Fly

The Delhi Sands fly is large, about an inch long, striped orange and brown, and dotted with dark spots. Its supporters take pains to differentiate it from “the common housefly,” comparing it instead to butterflies and hummingbirds. Like a butterfly, it uses a long proboscis to probe flowers for their nectar; like a hummingbird, it hovers and darts quickly from plant to plant. Like all nectar-sippers, it pollinates the plants that feed it. Flies are less-celebrated pollinators than butterflies and bees, but many species do provide this critical ecosystem service. California farmers pay as much as $136 per hive to rent bees, without which their crops will not bear fruit. Wild plants depend on their pollinators just as heavily to fertilize their seeds.

A half-dozen or so unique insects share the fly’s habitat and are probably at the same risk as the fly.

Flowers and pollinators often develop exclusive relationships, such that endangering one partner puts the other at risk. Scientists don’t know if the Delhi Sands fly has any such obligatory ties to the flowers it visits. In fact, what scientists don’t know about this reclusive creature could fill volumes. But it is certain that protecting the fly will also benefit other species sharing its habitat.

The Delhi Sands habitat—named for the underlying geology of fine sand piled up into dunes—once stretched along the foot of the San Gabriel Mountains, covering 40 square miles of San Bernardino and Riverside counties. Also known as the Colton Dunes, they developed a distinct fauna. According to Greg Ballmer, the UC Riverside biologist who authored the endangered species petition, a half-dozen or so unique insects share the fly’s habitat and are probably at the same risk as the fly. Other species of concern, though not restricted to the Colton Dunes, also inhabit the area, including burrowing owls, the LA pocket mouse, and a metalmark butterfly. The official status of the flower-loving fly thus serves as an umbrella, protecting other species and the habitat as a whole.

Population Boom

Riverside and San Bernardino counties have long been farmers to urban Los Angeles. Nearly all of the Colton Dunes were converted to cropland in the 1900s, leaving only scattered patches of dune in native cover, and leading experts to believe the fly no longer existed in the area. When two amateur entomologists found a few specimens in a vacant lot in Colton, they notified Ballmer at UCR. Surveying the area and other potential habitat, Ballmer found the fly in a number of places. “And all the properties around the sites had For Sale signs on them,” he says.

As housing and commercial development spreads onto former agricultural lands, this area is growing faster than anywhere else in the state. Between 2000 and 2005, Riverside’s population grew by 26%. Last year, Riverside and San Bernardino counties ranked second and fifth respectively in the entire U.S. in absolute numbers of new residents. This explosive growth has put the remaining pieces of fly habitat under increasing

Last year, Riverside and San Bernardino counties ranked second and fifth respectively in the entire U.S. in absolute numbers of new residents. This explosive growth has put the remaining pieces of fly habitat under increasing pressure.

pressure. The imminent threat to the rare fly's survival convinced the Fish and Wildlife Service (FWS), in 1993, to list the species as endangered.

Between publication of the initial listing proposal and the actual listing, 45 acres of occupied fly habitat—6-13% of that remaining—were destroyed. In the same time, San Bernardino County gave notice that it intended to make use of a further 7 acres of occupied habitat and 69 acres of degraded land to build a hospital. With the listing of the fly, the hospital project was halted to work out a solution that would not consume further fly habitat. Eventually, the hospital re-sited its parking lot by 250 feet, with an added cost to the project of a reported $4 million.

Various other projects in the two counties were required to alter their plans or mitigate their impacts to protect the fly and its habitat, giving rise to a growing rumble of dissatisfaction. The City of Colton, where much of the remaining high-value habitat is located, went on the offensive. A lawsuit arguing that the federal government had no authority to regulate such local matters made its way up the court system until the Supreme Court refused to hear the case in 1998. In 2002, Colton's mayor vowed that the city would do everything possible to get the species delisted.

The City of Colton, where much of the remaining high-value habitat is located, went on the offensive. A lawsuit arguing that the federal government had no authority to regulate such local matters made its way up the court system until the Supreme Court refused to hear the case in 1998. In 2002, Colton's mayor vowed that the city would do everything possible to get the species delisted.

Banking in the Dunes

As cities, counties, and developers in the region looked for ways to operate with an endangered species in their midst, the Vulcan Materials Corporation, a sand-and-gravel supply company, acquired 130 acres of prime, known fly habitat, the largest contiguous chunk of the Colton Dunes that remained. The company approached the FWS and, working together with the agency and the Riverside Land Conservancy, set up a mitigation bank that would preserve the habitat and make it available for purchase of credits.

"The land is now dedicated in perpetuity to fly habitat. We hold the title, and the Land Conservancy maintains it," explains Brian Ferris, a Vulcan VP. "It's a unique partnership," says Jane Hendron, a FWS spokesperson: "Industry, a non-profit group, and the government linked for a common purpose."

The bank opened for business in June, 2005, and had sold its first three credits by December. Kevin Klemm, owner of the development company that was Vulcan's first customer, credits the mitigation bank with finally allowing him to proceed with his building project. "The Vulcan Materials people were tremendous. They were business-like and accommodating. They didn't waste any time. The bank is a tremendous value." Several developers are currently negotiating conservation strategies with FWS and may eventually purchase credits from the bank. "We think there's a significant demand," says Ferris—and the per-credit price has since risen to $150,000 to reflect it.

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An existing mitigation bank can smooth the process of complying with environmental regulations. Says Klemm, "I spent six years of my life trying to build 18 buildings" before the Vulcan bank opened and provided him a way to mitigate his property. A quicker route is worth a considerable amount to a developer watching building prices escalate week by week.

A Fly's Worth

Jessica Fox, a biologist with Electric Power Research Institute who has studied mitigation banks, says, "It's good that we're assigning dollar values to natural resources. It will make liabilities for some, but opportunities for others." Recognizing an opportunity and a need, Vulcan Materials is turning the endangered species on its land into an economic asset, working out a way to realize a steady income stream from the property while protecting and helping preserve an endangered species.

Is $150,000 too much to pay for protecting a fly? That price per credit is high for a species bank, although some credits for wetland banks sell for nearly twice that. For perspective, the three credits sold so far cost less than a median-priced home in the region. Ultimately, the market sets the price for the mitigation credits. Says Fox, "Fish and Wildlife didn't say, 'Pay this much.' They just said, 'You have to mitigate your property.' Is it a reasonable cost? Well, if the landowners paid it, it was worth it to them, and a better option than any others."

Klemm echoes that assessment. "Responsible developers want to do the right thing. If you take habitat where the species has a fair and even chance to survive, manage it, make sure there's no dumping, make sure there's water and drainage—we're willing to support that, within reason."

Developers may see a new resource that allows them to do business, but the City of Colton is still skeptical. In January, they passed an emergency ordinance constraining any party from dealing with fly-affected property unless there is a general plan amendment or they get a conditional use permit. The action took both Vulcan and the FWS by surprise. "This impedes the developers from using their land," says Ferris. Because the ordinance prevents Vulcan from selling any credits, the company is suing the city to get it rescinded.

The exact value of something like a flower-loving fly is difficult to assess. Ballmer offers a brick wall analogy: "If you keep pulling bricks out, eventually the wall falls down." You need a critical percentage of bricks to make

a sturdy wall, he says, and a critical percentage of species to make a sturdy ecosystem. It's a general sort of theory, but the biologist also has found more concrete hints of how the fly and other dune species are cemented together. It appears that the fly larvae might be tended by ants, like sheep being fed by ranchers, in return for some unknown service.

Is $150,000 too much to pay for protecting a fly? That price per credit is high for a species bank, although some credits for wetland banks sell for nearly twice that.

The deeper biologists dig, the less "common" this fly seems. But beyond its biology, the greatest value of the Delhi Sands flower-loving fly may lie in what people learn in dealing with the endangered species: how to evolve relationships within our complex communities that benefit all its members.

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A Simple Strategy for Complicated Times

EBX Charts Course in Changing Mitigation Banking Sector

by Jason Amundsen

The **Ecosystem Marketplace** finds out how one big mitigation bank in the Southeastern United States plans to diversify its portfolio as it navigates the challenges and opportunities in a dynamic market.

When George Kelly, an environmental attorney, and Dixon Harvey, an outdoor enthusiast, first launched the Environmental Banc & Exchange (EBX) in 1990, they were wary of environmental markets.

"We said we weren't sure about these markets," says Harvey. "We just decided to start EBX with a little bit of startup capital. The basic vision was that we can improve the environment and generate a respectable return at the same time."

More specifically, Kelly and Harvey used their little bit of startup capital to launch one the United States' first private mitigation banks.

The U.S. Clean Water Act requires developers who build on or near a wetland to offset any unavoidable damage to the wetland by restoring an equivalent ecosystem somewhere else. The Endangered

The basic vision was that we can improve the environment and generate a respectable return at the same time."

Species Act makes a similar requirement of developers when they damage endangered species habitat. As a result of these legislative requirements, the last several decades have witnessed a growing demand for habitat restoration in the U.S. To supply this demand, entrepreneurs like Kelly and Harvey have

PHOTO BY DAREK KRZEMINSKI

set up mitigation banks that restore habitat, get credit from the government for doing so, and then sell that credit on to developers who need it to meet permitting requirements.

The company is now one of the largest mitigation banks in the country, with 1,573 wetland acres and 29 miles of streams restored or under contract for restoration.

A report by the Environmental Law Institute estimates that between 1992 and 2002 there was a 376 percent increase in the number of private wetlands banks in the US. No one knows for sure, but some think the market for environmental mitigation is worth several hundred million dollars. It is not surprising, then, that in the nine years since its founding, EBX has far exceeded Harvey's initial modest expectations.

The company is now one of the largest mitigation banks in the country, with 1,573 wetland acres and 29 miles of streams restored or under contract for restoration. And while Harvey elects not to disclose the company's revenues or profits, he doesn't hesitate to say, "Let's just say that on the revenue side it's a positive curve. 2006 has been the best year yet."

How it Works

EBX's twelve employees have varied backgrounds in real estate, engineering, and business. "When we do a mitigation project we hire the engineers and contractors to get the job done," says EBX's Chief Operating Officer Thomas Rinker. "We supervise. We identify the sites. We expend the capital to buy those properties. The best analogy is that we are real estate developers where our end product is a fully functioning ecosystem."

The best analogy is that we are real estate developers where our end product is a fully functioning ecosystem."

EBX expends almost half its time and energy identifying potential restoration sites. On every project it undertakes, the company then lines up the technical experts—the ecologists, civil engineers, and contractors—and pays for most of the costs up front. "This is an extremely risky business," says Randy Wilgis a Principal with EBX. "There's a lot of money up front and we have a lot of conceptual design work that goes into every project."

The company is then paid out over a period of time (usually around seven years) as it releases its credits to the developers or government agencies buying them to offset development elsewhere. Frequently there is a five-year contractual monitoring period where the company's work remains under evaluation to ensure that any corrective maintenance on a site gets completed.

EBX expends almost half its time and energy identifying potential restoration sites.

Both EBX and critics of mitigation banking agree that avoiding environmental impacts is the ideal. "Yet in

situations where there are unavoidable impacts, the restoration of related ecosystems is a whole lot better than doing nothing, which is where our society was not more than 10 years ago," says Rinker. "The issue we need to focus on is whether the regulatory agencies and state legislators have the fortitude to set, and uphold, mitigation ratios that at a minimum attain a 'no net loss' balance."

"The issue we need to focus on is whether the regulatory agencies and state legislators have the fortitude to set, and uphold, mitigation ratios that at a minimum attain a 'no net loss' balance."

While EBX's founders say they are happy about their company's success to date, plenty of challenges await them as they attempt to stay at the top in an ever-expanding field of competition. "We are still in a maturing phase, where all the players-the bankers, credit buyers, and regulators—are working through what this market will look like," says. "The mitigation market is here to stay, but we expect it to look a lot different in ten years from what we see today."

Winds of Change

Mitigation banking as a private industry began to take off in the mid-1990s, but the hodgepodge of regulatory agencies at the federal, state, and local levels make this a confusing and often uncertain industry. For example, this June the U.S. Supreme Court shook up the mitigation industry by introducing the very thing it needs to avoid at all costs: regulatory ambiguity.

In a 4-1-4 split decision, the Supreme Court threw the legislative reach of section 404 of the Clean Water Act, which governs mitigation, into doubt. As The Ecosystem Marketplace reported in August, "The decision throws into question just how stridently the Act should be enforced, what exactly should be protected, and even the meaning of such basic operational words as 'waters,' 'navigable' and 'adjacent.'"

While entrepreneurs like EBX warily wait to see which way the legal winds blow, they are more optimistic about new proposed rules from the Corps of Engineers and Environmental Protection Agency. According to Professor J.B. Ruhl of the Florida State University College of Law the new rules, likely to come into effect in early 2007, will probably increase the demand for mitigation. "The mitigation industry is pushing hard for these rules changes, they definitely want this," says Ruhl.

But despite the attention currently being paid to judicial rulings and new guidelines at the federal level, Ruhl says it is the states—not the Federal Government—that will decide whether or not private-sector mitigation continues to grow in the coming years. Company officers at EBX agree. The company is opening an additional 3-4 offices nationwide in the next couple of years, and it's the states that are determining where EBX hangs its shingle.

Ruhl says it is the states—not the Federal Government—that will decide whether or not private-sector mitigation continues to grow in the coming years. Company officers at EBX agree. The company is opening an additional 3-4 offices nationwide in the next couple of years.

A Simple Strategy

Over the next five years Harvey says he hopes to see the company expand into new areas where the market for mitigation credits is already well established. “There’s things to think about with the E.U., a carbon market in Canada, and such. For now we’re focused on being the dominant players in the U.S. market. In simple terms, if there’s not a market in a specific state then we don’t want to spend a lot of time there.”

“The challenge is ensuring that the regulations for mitigation are well defined and robust. My big question is this: is there an open process for selling mitigation?” asks Wilgis, who is in charge of expanding business at EBX. “Are there defined ratios and defined expectations? For example, some states have strong wetlands regulations but don’t have any stream regulations.”

According to Rinker, EBX also intends to look into carbon sequestration projects, habitat conservation, and water quality.

According to Rinker, EBX also intends to look into carbon sequestration projects, habitat conservation, and water quality. How will a small company span these different areas? “It’s simple,” says Rinker. “It’s great people. We need to keep flexible and keep our fixed costs, namely staffing, real tight. In hiring we’ll bring people into the team who can play multiple roles effectively. Our simple challenge is making sure we are focusing on the markets where we stand a good chance of success.”

First published: August 22, 2006

Ducks Unlimited Wades into the Carbon Market

by Alice Kenny

The **Ecosystem Marketplace** zooms in on an innovative carbon-trading scheme facilitated by Ducks Unlimited. With successes already notched on its belt, the program also has much to teach about the challenges—scientific, political and economic—that face forest sequestration projects in the United States.

Aggregating terrestrial credits for the voluntary carbon market sounds like a fairly esoteric enterprise to most, but for Ducks Unlimited—a 70-year-old conservation organization that has worked with thousands of landowners on projects covering 11 million acres of land—pulling together land for CO2 sequestration was a natural evolution of its services.

And so, when President George W. Bush dangled a carrot in 2002 challenging U.S. smokestack industries to reduce carbon dioxide emissions voluntarily or face possible mandatory emission-reduction legislation, Ducks Unlimited was quick to capitalize on the opportunity. Unlike trading centers or investment funds, Ducks Unlimited aggregates land credits, matching groups of private landowners with energy companies seeking to offset their green house gas emissions.

Now, two years after thousands of hardwood seedlings were planted on 400 acres of former farmland, Ducks Unlimited and the 25 energy companies with whom they partnered can tick off a list of achieve-

Ducks Unlimited aggregates land credits, matching groups of private landowners with energy companies seeking to offset their green house gas emissions.

PHOTO BY WILLIAM PICARD

ments – sequestering greenhouse gas emissions, restoring forests, reducing erosion, preventing floods and improving water quality. Meanwhile, landowners got paid for turning marginal farmland into forests. The reforested land sequestered far more carbon than the tilled land had. Ducks Unlimited acquired rights to sell the carbon that the restored forests sequestered to energy companies, thereby gaining locations and income to protect waterfowl. And energy companies took credit for sequestering carbon without reducing their industry emissions. "We regard CO2 trading as a huge part of our future. Industries developing proactive strategies will stay ahead of the curve while those ignoring the issue will lag behind," says Ed Steadman of the Energy & Environmental Research Center, who is project leader for the Plains CO2 Reduction Partnership, a U.S. Department of Energy funded program.

Ducks Unlimited and the 25 energy companies with whom they partnered can tick off a list of achievements – sequestering greenhouse gas emissions, restoring forests, reducing erosion, preventing floods and improving water quality.

Despite these successes, Ducks Unlimited has also learned the financial, political and technical hurdles involved in orchestrating a carbon-trading program in a nation where it is not yet mandated. Accordingly, people inside and outside the organization have begun evaluating the project's challenges and pitfalls in order to get a better sense of what is needed to foster continued success.

Forests as Super Heroes

In the world of global warming, distinguishing between the good and bad guys at first glance appears fairly black and white. Draped in the dark capes are the carbon-fueled power plants and iron, steel, cement and paper factories spewing CO2, the dominant heat-trapping greenhouse gas. Meanwhile, the green-hooded forests, AKA the Good Guys, use the process of photosynthesis to suck up CO2 while creating sugar and oxygen.

But the good guy/bad guy scenario is not as simple as Man vs. Nature. In fact, natural forces help warm the atmosphere and energy companies are finding ways to reduce global warming. Ducks Unlimited capitalized on this nuance when creating its aggregation plan.

The balancing act begins with the acknowledgement that CO2, methane and other gases stored in the Earth's crust have warmed the planet since its formation. Exhaled into the atmosphere through volcanoes, rotting vegetation and flatulent animals, the gases create a greenhouse effect, warming the Earth's surface by 93 degrees Fahrenheit for thousands of years. The problem with excess warming began when industrialization replaced the days of horse and buggies.

As a result, the earth's average temperature has warmed by one degree during the past century and could increase by between two and 10 degrees by the year 2100, climatologists say, triggering glacier melts, sea level rises and a nightmarish series of disasters. The temperature rise is related partially to the advent of power plants and also to the disappearance of forests. Deforestation contributes 25 percent to the global warming phenomenon, experts say. Meanwhile, no simple, cost-effective technology has been put in place to significantly cut CO2 emissions from the power plants on which we have grown to depend.

Unfortunately, geological sequestration methods, or pushing greenhouse gases back into the earth, are expected to take at least another decade before they are perfected and widely used, says Steadman. So forests have become, at least temporarily, one of the acknowledged heroes in the fight against global warming.

Creating Carbon Sinks

From a struggling farmer's viewpoint, a dollar paid by an energy company is just as good as a dollar earned hawking tomatoes. Stressing this concept, Ducks Unlimited convinced owners of marginal farmland that their land could generate more income if placed under permanent conservation easements. Ducks Unlimited then pooled or aggregated these lands for industry investors, making the purchase worth the investors' time.

Buoyed by a Department of Energy grant, Ducks Unlimited established an infrastructure that used U.S. geologic surveys to track prime land available for carbon sinks and determine which land use activities sequester the most carbon. They targeted potential investors and developed mechanisms to monetize credits from these projects. Dick Kempka, who designed and ran Ducks Unlimited aggregation program, says that with this information in hand, "we're primed and ready to do portfolio management."

Ducks Unlimited convinced owners of marginal farmland that their land could generate more income if placed under permanent conservation easements. Ducks Unlimited then pooled or aggregated these lands for industry investors, making the purchase worth the investors' time.

From the Department of Energy's standpoint, Ducks Unlimited made a perfect partner. "We saw potential for carbon sequestration and Ducks Unlimited saw an opportunity to enhance duck and wildlife presence," says Steadman. What sealed the deal, he explains, was that Ducks Unlimited had already developed a sophisticated geographic information system as well as a respected pool of staff scientists. Unlike other conservation organizations he has worked with, Steadman says, "Ducks Unlimited took the science and reacted to it, like us."

In Ducks Unlimited's trial run as an aggregator, it marketed conservation easements on 400 acres of farmland to a group of 25 U.S. power companies that banded together under the name of PowerTree Carbon Company LLC. The project reestablished bottomland hardwood forest on private land along Bayou Bartholomew, part of the Lower Mississippi Alluvial Valley in Southeastern Arkansas. There, nursery raised native seedlings, planted at 302 seedlings per acre, are expected to reestablish forests of sweet gum, bald cypress, tupelo, green ash and oak trees. Over the project's life, emission reductions are projected at 180,000 US tons of CO2, according to PowerTree Carbon Company president Michael Rodenberg. This allows PowerTree's 25 member companies to take credit for reducing greenhouse gases without incurring the significant expense and energy loss that reducing their own emissions would have cost.

Buoyed by a Department of Energy grant, Ducks Unlimited established an infrastructure that used U.S. geologic surveys to track prime land available for carbon sinks and determine which land use activities sequester the most carbon.

When designing the project, Ducks Unlimited generally copied requirements outlined in the Kyoto Protocol regarding the concepts of permanence, co-benefits, leakage and additionality to help ensure that PowerTree could recoup its investment when regulations hit the States.

In Ducks Unlimited's trial run as an aggregator, it marketed conservation easements on 400 acres of farmland to a group of 25 U.S. power companies that banded together under the name of PowerTree Carbon Company LLC.

PowerTree established a 100-year conservation easement on the land to give it a significant degree of permanence. The project included co-benefits, restoring migratory bird and waterfowl habitat, increasing flood protection and eliminating the polluting fertilizers that used to flow into the water. They chose locations that would not cause "leakage," or clearing of nearby land to make up for property taken out of farming. And they worked on the tricky concept of "additionality," demonstrating that the now untilled land sequestered more CO2 than it would have without PowerTree's investment.

Not as Simple as 2 Plus 2

As environmentalists and industries battle out the details for a possible carbon trading program in the United States, the definition of additionality causes particular controversy, standing in the forefront of a slew of questions that must be answered for Ducks Unlimited's carbon aggregation program to thrive.

Because of concerns about additionality, Ducks Unlimited believes the future for carbon sequestration trading lies in private land, Kempka says. Private land comprises 70 percent of land available for restoration. Meanwhile, turning relatively undeveloped public land back into forests would realize only minimal additional carbon sequestration potential. Further, there is concern about allowing industries to reap credits on taxpayer-subsidized land.

Since, however, no federal dictates exist, innovative energy companies such as PowerTree hedged their bets by also buying partnerships where public land is restored. At least temporarily, this dried up Ducks Unlimited's business as an aggregator for energy companies. So Ducks Unlimited is focused short term on aggregating land for speculative investors anxious to get in on this market's ground floor. They have not closed these deals yet but Kempka says he expects to see them cross the finish line within the next two years.

Ducks Unlimited also faces potential competition from wetland mitigation bankers. Some bankers say they hope to "stack" credits, or get paid for sequestering carbon on land where they already received payment for restoring seasonal wetlands. But stacking, similar to restoring forests on public land, could cause duplicate counting of a property's carbon sequestration value, Kempka and others say.

These controversies make it difficult for Ducks Unlimited to find firm footing in the potential carbon sequestration market. "The biggest difficulty we face is the lack of clarity on what will count as a carbon offset," Kempka says. "We don't know the rules and regulations yet so we try to focus on high-quality credits to get investors. But without clarity, not many people are buying."

Unanswered Questions

With an anemic market unsupported by regulations and a short projected time frame before geologic sequestration fills the technology gap, some question the viability of carbon trading markets for forestry.

"A lot of questions need to be answered before we move on with something like what Ducks Unlimited is doing," says Brandon Scarborough, a research fellow specializing in carbon sequestration and global warming at the Property and Environment and Research Center, a conservative environmental think tank. From an investor's perspective, he continues, what matters is whether sequestration credits will make a good investment over time. The market for forest sequestration credits could dry up when geological sequestration takes off and zero-emission coal-fired plants become cheaper than creating new forests. Also, there is the farmer and world-food-pantry concern that once an easement is placed on land it cannot be farmed even if other methods surpass its ability to sequester carbon. Meanwhile, since markets require monitoring and measuring, they add extra cost to emissions reduction. Finally, since forests are prone to natural disasters, carbon-for-forest trading would allow energy companies to emit CO2 into the atmosphere without guaranteeing permanent sequestration.

Energy companies and Ducks Unlimited spokespersons acknowledge these concerns. Eventually, they agreed, new technologies could supercede the need for carbon markets. But with the earth's rapid warming, many say the program has real value for its ability to fill an immediate, if temporary, need.

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Scientists estimate that power plants will likely learn not only how to limit carbon emissions; they will also learn how to sequester them geologically, burying them safely within the earth and away from the atmosphere. With the earth's rapid warming and no other solutions immediately at hand, most experts agree that the time is now—and not tomorrow—for terrestrial carbon sequestration programs.

"We see these projects as a bridge, allowing us to take action now during the gap in development of technology that will ultimately allow us to remove CO2 from stack gases," says PowerTree Carbon Company president Michael Rodenberg. After all, he adds, "a pound of CO2 is a pound of CO2."

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III New Frontiers

Conservation Banking Tests New Waters

By Cameron Walker

While most conservation banks focus on terrestrial species, fish banking is suddenly a hot topic. The **Ecosystem Marketplace** finds out who is talking and reports on what they are saying.

Nestled in California's Central Valley between Sacramento and Stockton, California's Delta gathers up five rivers, forming a network of approximately 1,000 miles of waterways flowing into the Pacific Ocean. The Delta's rivers, streams and marshes host diverse fish species, from the three-inch-long delta smelt to the green sturgeon, which can span more than seven feet.

Spanish explorers who spotted the Delta in 1772 described it as "a labyrinth of lakes." These days, deep-water shipping channels run to the inland ports of Sacramento and Stockton, and recreational users drop fishing lines off docks or navigate the waters in everything from powerboats to inner tubes. Pollution enters the river from urban and agricultural areas; water pumps from the Delta to Central Valley crops and Southern California's suburbs. An extensive levee system protects valuable farmlands, neighborhoods, and even downtown Sacramento from flooding.

While much of this transformation has helped California's economy become the seventh largest in the world, the changes have not helped the Delta's resident fish. Twelve of 29 original indigenous fish species in the Delta have vanished or are threatened with extinction.

PHOTO BY DAVE GOSTISHA

The tiny delta smelt, with its steely blue sheen and surprising cucumber smell, was once one of the Delta's most abundant pelagic fishes. But populations have plummeted; in 2005, the delta smelt's abundance was less than three percent of what it was in 1993.

To help bring back the delta smelt (and turn a profit), Wildlands, Inc. developed the country's first fish conservation bank in 1997. Conservation banks, which first emerged in California in 1995, are organizations that restore habitat for threatened and endangered species in exchange for government-approved credits to sell to projects impacting habitat elsewhere.

To help bring back the delta smelt (and turn a profit), Wildlands, Inc. developed the country's first fish conservation bank in 1997.

While most conservation banks focus on terrestrial species, fish banking is now garnering attention at the federal level: agencies such as NOAA's National Marine Fisheries Service and the U.S. Army Corps of Engineers are currently considering fish-specific banks for protecting threatened and endangered species.

In particular, NOAA Fisheries has been exploring conservation banking to protect several of the Delta's species—including the threatened Central Valley steelhead and Central Valley spring-run Chinook salmon, and the endangered Sacramento River winter-run Chinook salmon. Using a species-specific bank could create, preserve, and restore habitat for these species, says Howard Brown, a Sacramento-based NOAA Fisheries biologist.

Wildlands' delta smelt project may be the first in a string of efforts to push the boundaries of conservation banking into watery terrain.

Opportunity Knocks

Salt is an important factor in smelt survival. Many fish can pump water in and out of their bodies to balance their salinity levels. Smelt don't have this natural balancing system, so they have to swim in water with the right salinity.

On the shores of Kimball Island, which sits in the heart of the Delta, brackish water rises from Suisun Bay; an inland tidal marsh ebbs and flows with saltwater. While studying the island in the early 1990s, Wildlands' workers realized this salt influx could provide prime habitat for delta smelt. Not long after, the bank began selling credits for delta smelt, planting thousands of cottonwoods, willows, and brush to restore shoreline habitat. The bank quickly ran through two miles of shoreline credits, and then opened up 100 acres of tidal marsh for delta smelt credits as well.

Wildlands' delta smelt project may be the first in a string of efforts to push the boundaries of conservation banking into watery terrain.

Tidal and freshwater marshes can also host juvenile salmon, which linger there for two weeks to two months before heading out to sea. Accordingly, Wildlands is working with NOAA Fisheries to create banks for ocean-bound fish. NOAA Fisheries' interest in conservation banking originally emerged through the agency's work with the U.S. Army Corps' Sacramento River Bank Protection Project, a long-term program to protect the Sacramento River's levees.

Natural river functions—including processes that create and maintain habitat for migratory fish—can be hit hard by bank protection and levee construction, Brown says. In working with Wildlands, Brown and others realized that fish conservation banking could help mitigate other projects impacting Delta habitat as well.

Tom Cannon, an ecologist who manages Wildlands' aquatic programs, says they're investigating 30 potential banking sites within the Delta. "Anybody that's going to impact an endangered fish species could compensate for their takes by buying into the conservation bank," he says. Likely candidates could be anyone from the state highway agency, CalTrans, to a Delta fisherman constructing a dock for a new boat.

Fish conservation isn't limited to the Delta. "In any place that you have growth nearby, you have opportunities for fish banking," says Craig Denisoff, president of the National Mitigation Banking Association.

For fish conservation banks to capitalize on these opportunities, regulatory agencies must first require mitigation for impacts on threatened and endangered species. The U.S. Fish and Wildlife Service, along with state agencies, regulates inland species like the threatened delta smelt. NOAA Fisheries is the federal agency governing salmon species, steelhead, and the newly-listed green sturgeon, all species that migrate from freshwater breeding grounds to the ocean.

An Umbrella Bank

One of the likely candidates for the first salmon and steelhead bank may be Fremont Landing, an old floodplain terrace at the confluence of the Feather River, Butte Creek, and the Sacramento River. Once a forested floodplain, the area spent nearly a century as farmland. Now when it floods, fish swim over what looks like a dirt field, Brown says.

Tom Cannon, an ecologist who manages Wildlands' aquatic programs, says they're investigating 30 potential banking sites within the Delta.

A conservation bank could change that. Replanting riparian areas could provide shoreline habitat for fish from all three flows. And strategically placing downed trees and other woody material toward the center of the flow could also boost protected spots, as fish can move up and down in the water column, ducking behind logs and other debris to hide from predators.

Habitat repair in this biologically-significant spot could help fish from multiple rivers, Brown says.

NOAA Fisheries wants to create an umbrella bank for its species-banking program; individual sites, like the one proposed at Fremont Landing, would function under the larger banking system, with each site tailoring restoration to the intended species.

Brown anticipates that fish conservation banks would mitigate smaller projects, such as docks or boat ramps. In many cases, NOAA Fisheries instructs people to avoid in-river construction during the summer, when fish are most likely to be affected, and to replace vegetation. Conservation banks would increase mitigation options. "In a lot of places, where we wouldn't recommend much else, we could have something for them to do," Brown says.

The Corps, too, has its eye on fish conservation banking. The Delta's complex flooding system requires constant maintenance. Ideally, according to the Corps' Mike Dietl, there would be multiple banks up and down the river. This combination of private and public agencies, partnerships, and mitigation options would possibly reduce regulatory hurdles for projects that require mitigation.

"There's a definite market need out there," he says. How much demand, and how soon, will be determined by how much repair the levees need, and how much the Corps receives in federal funding for those repairs. If the money comes through, the Corps intends to develop on- or off-site mitigation responses, which could take the form of a mitigation bank.

With a bank up and running, the Corps could start purchasing credits as early as this year. "If we knew where we were going to do the mitigation up front, it would be a lot easier to attain regulatory approval," Dietl says.

No Field of Dreams

Despite enthusiasm for fish banking, some basic ecological hurdles remain before the strategy can, or should, be deployed on a widespread scale.

More specifically, the problem with fish conservation banks is that no one has direct evidence for the Field of Dreams-style promise: if they build it, fish will come. Fish suffer from a range of impacts—from dams blocking migratory paths to stream-clogging erosion—and it's not clear that improving habitat can tip the balance in favor of fish.

The problem with fish conservation banks is that no one has direct evidence for the Field of Dreams-style promise: if they build it, fish will come. Fish suffer from a range of impacts—from dams blocking migratory paths to stream-clogging erosion—and it's not clear that improving habitat can tip the balance in favor of fish.

When fish populations are already low, even less is known about their needs. "There has never been a delta smelt egg found live in the wild," Cannon says. "There's not a lot known about these species because they're so rare." The smelt have never been spotted in the inland tidal marsh areas that Wildlands sells for delta smelt impacts, even though the habitat is thought to be suited for the species.

Salmon, both in California and up north, present similar challenges. "Salmon are just so difficult," says Ecotrust's Bettina von Hagen, who has conducted studies on the feasibility of salmon banking in the Columbia River system. There's very little scientific evidence that shows the relationship between habitat quality and salmon abundance, she says.

Clearly, the information gap concerning habitat quality and the population dynamics of different fish needs to be filled before fish banking becomes a 'go-to' strategy for every situation. Toward this end, however, von Hagen observes that conservation banks create incentives to jumpstart more extensive monitoring.

Poised for Growth

In fact, conservation bankers are considering focusing on fish in the Pacific Northwest. In Puget Sound, says Sky Miller, Wildlands' Pacific Northwest regional manager, "we've got properties that we're developing under the wetlands model that would be perfect for threatened Chinook salmon."

There's very little scientific evidence that shows the relationship between habitat quality and salmon abundance.

Based on Wildlands' work in wetland mitigation, it could take several years before a salmon bank was up and running, Miller says. But setting up a conservation bank could be quicker than putting wetland mitigation banks in place, he says, with fewer agencies supervising the review team for individual species compared to those on a wetland bank review.

NOAA Fisheries has been looking at the draft plan for salmon and steelhead banking since October, and the U.S. Fish and Wildlife Service is reviewing Wildlands' plans for more delta smelt banks. It's possible that a delta smelt bank could be approved in the next yaear, Cannon says.

Until then, Kimball Island keeps plugging along. Wildlands has sold 80 percent of the bank's credits for delta smelt. "As soon as it sells out," Cannon says, "we'll hopefully have another bank ready."

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Putting the Revenue into Streams

by Alice Kenny

Following new proposed federal regulations encouraging in-kind mitigation for protected waters in the United States, stream mitigation banking has become a hot topic. The **Ecosystem Marketplace** finds out what people are saying.

Fresh out of college and searching for a vocation in 1996, George Howard watched as his boss, U.S. Senator Lauch Faircloth, tried to push through legislation limiting wetland regulation and promoting mitigation banking. Mitigation banks, unlike financial banks built from bricks and mortar, are actual wetlands and streams created, restored or enhanced by private companies or government agencies. Developers whose expertise and income lies in building on filled wetlands and not in creating new ones can buy credits from these banks to replace the marshes, streams or other forms of wetlands they destroy. Ten years ago, many considered mitigation banking a bad investment.

But to Howard, whose family had founded a large international construction company, mitigation banking seemed the entrepreneurial opportunity for which he had long waited. It could satiate his nascent environmentalist impulses and his goal to launch a lucrative business. So he quit his government gig to become the first full-time mitigation banker in his home state of North Carolina. “Overnight,” he says in his soft southern drawl, “I went from wearing $400 suits to wading hip-deep in muddy swamps.”

Muddy boots not withstanding, Howard remains in the vanguard of the mitigation banking movement. Just two decades into the mitigation business, he has already shifted his focus from repairing wetlands to restoring streams.

PHOTO BY BRIAN LARY

The Bottom Line

“Wetlands are yesterday’s news,” the Gen-Xer says, ticking off reasons for his new enthusiasm for stream restoration. Unlike wetlands that are sparse and relatively scarce, streams are abundant and widespread. As a result, developers typically destroy ten times more streams than wetlands. And since recently released federal

proposed wetlands regulations encourage kind-for-kind mitigation (i.e. destroyed streams should be mitigated with repaired streams, not wetlands), Howard sees significant growth potential for stream banking.

In addition to this seeming dose of opportunity, however, Howard's move towards stream restoration holds significant risk. "It's important to provide more effective in-kind accommodation," says Palmer Hough, a wetlands point man at the federal EPA. "That said, we have a long way to go in building the technical knowledge for stream restoration."

As wetland mitigation bankers break into the emerging field of stream mitigation, they are carefully weighing the opportunities and challenges in front of them.

Indeed, as wetland mitigation bankers break into the emerging field of stream mitigation, they are carefully weighing the opportunities and challenges in front of them.

Rich Mogensen, a wetlands scientist and past president of the National Mitigation Banking Association has first-hand experience with the challenges of restoring streams versus wetlands. When it comes to repairing wetlands, he says that, "if you get the hydrology and the site right, it's pretty easy to do." But putting pattern, profile and dimension back into streams can prove far more difficult. "You have to know exactly what the hydrological dynamics are and that is much harder to predict. Streams are flowing, dynamic systems with a lot of energy. When you build a mitigation project, you need to control it and energy can be difficult to predict and control."

For example, in the Pot Creek Mitigation Bank in Lincoln County North Carolina, Mogensen restored 40 acres of wetlands as well as 4,000 linear feet of stream. Restoring the stream required bringing in expensive earth-moving equipment that heaved out boulders, carved creek bends and stabilized stream banks until the trees and vegetation he planted took hold. Despite the hurdles, Mogensen's Pot Creek project was deemed a success, both financially and environmentally.

Successful stream restoration requires mastering a series of hurdles including overcoming significant financial expenses, real estate challenges, environmental concerns and engineering difficulties. Engineering stream restoration proves far more technical than wetland restoration since streams, unlike wetlands, involve moving water with constantly fluctuating levels of energy throughout the landscape. Mogensen said he witnessed blowouts in other projects where rapidly flowing streams broke through banks and flowed in the wrong direction. Stream restoration also involves increased real estate challenges since projects almost inevitably begin and end on property not included in the mitigation bank. Up and downstream neighbors have to be consulted to avoid "hydraulic trespassing," pushing excess water on to their land or redirecting water they had used from their land.

"Streams are flowing, dynamic systems with a lot of energy. When you build a mitigation project, you need to control it and energy can be difficult to predict and control."

U.S Fish and Wildlife Program Supervisor for Stream Restoration Tamara McCandless emphasized that the first critical step in stream restoration involves obtaining proper baseline information covering streams' dimensions and discharge. Next, the project developer needs to know what the stream was supposed to look like, what kind of pooling, rippling and slopes it had. The stream's hydrology must be understood so that it can be

designed to handle the discharge it will hold without eroding or flooding. The restoration must take a holistic approach that considers project outcomes up and downstream from the actual mitigation area. And, finally, the project needs to have quantifiable criteria to measure its success; data showing, for example, that the project increased fish density or minimized silt.

McCandless says she has seen a lot of stream restoration projects but hasn't always seen data needed to support whether the restorations proved successful. Getting it right is important, she said, because when it comes to watersheds, "streams are the bottom line."

McCandless says she has seen a lot of stream restoration projects but hasn't always seen data needed to support whether the restorations proved successful.

High Risk, High Return

The fact that streams are the bottom line makes this branch of mitigation banking enticing to Howard. A glimpse at the financial opportunities for stream mitigation explains his enthusiasm. Highways that are continually being built and expanded, for example, provide linear transportation that can side step wetlands. But often they cannot avoid streams lacing across the state. In North Carolina, for example, streams make up 80 percent of highway impacts requiring mitigation, says Bill Gilmore, director of the state's Ecosystem Enhancement Program (EEP). The program awarded 217,000 feet for mitigation to bankers last year and plans to award another 135,000 feet within the next two months.

This makes stream compensation a good economic bet in the evolving mitigation market. And, thanks to its complexity, stream mitigation often proves more profitable than wetland banking; there are fewer knowledgeable competitors so mitigation bankers can demand higher premiums for their work. Moreover, bankers can "stack" credits, receiving compensation for restoring streams as well as compensation for rebuilding surrounding wetlands that depend on those streams. Preliminary discussions have also begun that would allow bankers to stack credits in other environmental markets as well, such as possible payment for carbon credits for planting greenhouse-gas-absorbing trees along stream banks and in wetlands. And finally, many find the work environmentally rewarding.

All these features came together, Howard says, in the Causey Farm Stream restoration project he completed in southeastern Guilford County last year. "We restored a cattle-trampled, feces-laden gash in a farm field into a gorgeous, sinuous burbling frog-filled creek," he said. Still, the 7,800 linear-foot restoration effort did not come cheap. Howard's firm planted 45,000 trees from 11 different species, moved 200,000 tons of boulders, built cattle crossings and fencing to keep cows and their manure far from the stream and drilled six wells outside the stream corridor to quench the cattle's thirst.

As long as streams get properly regulated nationwide, stream mitigation will turn into a huge, multi-billion-dollar industry."

Even when expenses are factored in, opportunities for stream mitigation appear to be numerous. "Take a walk for two miles and what's your chance of hitting a wetland?" asked Howard. "Pretty Slim. What's your chance of hitting a stream? Excellent. As long as streams get properly regulated nationwide, stream mitigation will turn into a huge, multi-billion-dollar industry."

First published: July 5, 2006

Australians Revving Up to Bank on the Bush

by Jane Scanlon

After a long period for public comment, New South Wales' legislation concerning biobanking is due out soon. The **Ecosystem Marketplace** listens in on what people are saying about Australia's new Biodiversity Banking and Offsets Scheme.

Mention the bush and most Australians think about unique marsupials and fragrant eucalyptus. Mention the bush to Robert Humphries, however, and he will tell you that something else comes to mind: business.

As the general manager of Eco Trades, a company that generates and brokers credits for the conservation of biodiversity in Australia, Humphries is particularly excited about New South Wales' novel Biodiversity Banking and Offsets Scheme.

"Biobanking provides a real market value to the protection of biodiversity on private land," says Humphries. "And developers will be able to factor into their projects' shorter timeframes for approval, resulting in more affordable land for housing and development."

"Biobanking provides a real market value to the protection of biodiversity on private land," says Humphries.

While Humphries' enthusiasm was characteristic of many of those in the audience at recent Department of Environment and Conservation (DEC) seminar, others were more skeptical of the proposed program. And Georgina Woods, of the Hunter Community Environment Centre, later condemned biobanking for allowing "developers to pay the Government money to escape having to protect biodiversity values."

So just what it that has some people so excited and others so wary?

PHOTO BY ALEXANDER RIST

Essentially, biobanking will enable landowners to conserve and manage biodiversity on their land in exchange for government issued credits that can then be sold to developers who need to offset habitat destruction they have caused elsewhere. The scheme is similar to a U.S. tool called conservation banking, but unlike conservation banking, which assesses particular threatened species and their habitats, Australia's new biobanking assessment tool will examine the total loss and gain of a number of threatened species and their habitats, as well as ecosystem values.

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Originally, DEC's proposed trading program was designed to complement a new system of land zoning in New South Wales, but a new biobanking bill veers away from the lengthy zoning process in an attempt to get the biobanking ball rolling. According to Simon Smith, deputy director general of New South Wales' DEC, the revised scheme, "should reward land owners who may not be able to develop due to high biodiversity values whilst streamlining the assessment process for developers."

Differing Opinions

As developers, landowners and environmentalists wait for legislators to finalize the pending biobanking legislation, many are taking the opportunity to weigh in on what they think of the scheme.

For instance, Scott Woodcock, from the Urban Development Institute of Australia in New South Wales, questions the claim that biobanking "provides quicker development assessments due to the absence of biodiversity certification." Woodcock is also concerned about the price of credits, "if the cost of credits rises dramatically then biobanking will be too expensive and developers will refuse to participate in the market," he says. "It is not so much a matter of how biobanking affects the development industry but how it affects landowners. The cost will be transferred to homebuyers."

Smith, however, says the cost to homebuyers should be negligible and, in fact, he sees potential advantages in the new scheme. "Biobanking is provided as an alternative not an additional requirement for developers to the lengthy [threatened species] approval processes which offer no surety, as regularly occur now, and can be costly to all involved."

"There is potential for the public sector to swamp the market with 'cheap' credits, as they may not have to factor land value into their credit prices."

Humphries has a different gripe about the proposed system for generating credits. Under the current rules, government land can be used for biobanking sites. "This will provide disincentive for private participation," he worries. "There is potential for the public sector to swamp the market with 'cheap' credits, as they may not have to factor land value into their credit prices."

Conservationists, meanwhile, say they are concerned about the ability of biobanking to protect Australia's unique biodiversity. Many fear the assessment tool will allow for landowners and developers to trade one species for another. As Rachel Walmsley of the Environmental Defenders Office puts it, "the government is advocating for statewide trading, based on scarcity of the vegetation type rather than ecological equivalence. Many groups are concerned that this may undermine the 'like for like' offsetting principle."

Smith assures, however, that, "developers will be required to obtain credits from biobank sites that have the same threatened species as those being impacted. At the same time, the biobank site must contain the same ecological community as that being impacted or another community that is even more threatened… biobanking will not allow additional clearing or development to occur. Biobanking will simply make the threatened species part of the environmental planning and assessment process work better than it does now."

Wait and See

From the many differing views about the merits and weaknesses of Australia's new biobanking scheme, a few common themes do seem to emerge. Conservationists and developers, alike, want to see increased clarity, assuredness and simplicity associated with biodiversity protection in New South Wales. Most also agree that some sort of payment scheme should be involved in protecting Australia's unique biodiversity.

Conservationists and developers, alike, want to see increased clarity, assuredness and simplicity associated with biodiversity protection in New South Wales.

And so while banking biodiversity credits hardly constitutes business as usual right now, signs indicate that unique marsupials and fragrant eucalyptus are not the only things that should come to mind the next time someone mentions the Australian bush.

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IV Final Words

Carrots And Sticks: Incentivizing Private Land Conservation

by Bradley I. Raffle

In a guest editorial for the **Ecosystem Marketplace**, Bradley I. Raffle of the Texas-based law firm, Baker Botts LLP, argues that if we are to save much of the U.S.'s suburban and peri-urban land, then we need to look at ways that mitigation and conservation banking approaches can be refined to provide meaningful incentives for conservation on private land.

PHOTO BY STEVE KNIGHT

As I recently navigated the freeways that now crisscross the hills and woodlands surrounding our Nation's Capital's—in the Virginia suburbs—I was struck by the essential irony of the "smart growth" article I had read that morning on the plane ride up from Houston. Although what I was seeing in Virginia probably wouldn't be considered "Smart Growth", the people that designed these roads and constructed these malls, office buildings, and golf courses were certainly not dumb. The economic health of the region is just fine, thank you.

All evidence to the contrary notwithstanding, polls indicate that many Americans—perhaps even most—see the escalating fragmentation of functioning ecosystems associated with this kind of suburban sprawl (sprawl that is wiping out forests, wetlands, wooded river systems and open prairies) as inexorably destroying American's sense of place and undermining a vital part of its quality of life. It can be argued that the evisceration of our suburban open spaces is one of the nation's most significant domestic environmental challenges. If a large oil spill were to

cause half the ecological havoc that we tolerate each month from suburban sprawl, the public outcry would be deafening.

So what is going on here? The obvious answer is that the ecological impact of suburban sprawl (2 million acres of rural land each year, consuming an area the size of Pennsylvania since 1990) is the result of thousands of small decisions, albeit very "smart" ones when considered individually. The decision of a housing developer to clear-cut a 500-acre bottomland hardwood forest is usually a "smart growth" decision for that developer. To attack the developer for pursuing such a plan is to attack the basic underpinnings of our free market system. Is it reasonable to expect (let alone require) the owner of the land to leave the trees alone and forego the profit potential of a first-class housing development on the site? Many preservationists would say, "yes, stop the housing project in its tracks and allow the landowner to charge fees for public bird watching". No "taking" there...provided, of course, that it is not their land.

The ecological impact of suburban sprawl (2 million acres of rural land each year, consuming an area the size of Pennsylvania since 1990) is the result of thousands of small decisions, albeit very "smart" ones when considered individually.

But such an approach will not fly—indeed, is not flying. The conservation community must recognize that the kinds of land we are talking about cannot realistically—or fairly—be preserved by attempting to prevent the landowner from securing a profit from the land or simply demanding that privately owned property remain as public open space. Our constitution and our free market economy do not accommodate this approach and it is short-sighted and naïve to believe otherwise. If land conservation is a worthy goal, then we should be willing to use the power of our market economy to incentivize it.

There may be a smarter and less contentious way of addressing this growing challenge, one that recognizes and takes advantage of the economic self-interest of the private owners of ecologically valuable land. The alternative is a regulatory program **expressly designed** to economically incentivize the owners of environmentally valuable property to actively conserve their land's most important environmental attributes—while simultaneously regulating (i.e., limiting) the right of the landowner to completely destroy the land's environmental attributes. In other circles it is known as "carrots and sticks" and might look something like this: (1) leave half of our developer's 500-acre forest as a contiguous fully protected natural habitat, (2) allow the landowner to be fully compensated for this 50% open space commitment through a combination of mitigation and ecological service payments, discussed below, and (3) enable the developer to make an even greater profit through the property value elevation that will often occur on the developed half of such a site by virtue of its location adjacent to an intact forest. A regulatory program that incentivizes this kind of integrated site planning could begin to build a bridge between the two seemingly irreconcilable worlds of environmental preservation and private property rights. Under such a regulatory system, the owners of environmentally valuable land would earn more, not less, because of the land's environmental attributes.

There may be a smarter and less contentious way of addressing this growing challenge, one that recognizes and takes advantage of the economic self-interest of the private owners of ecologically valuable land.

Although many types of open space are facing fragmentation pressures, coastal and fresh water wetlands are some of the most endangered. Since these wetlands are often found adjacent to ecologically valuable uplands, protecting these areas from fragmentation is a logical priority. If new market-based policies could begin to provide meaningful economic incentives for the protection of wetlands that are subject to the jurisdiction of the Clean Water Act, similar policies could be expanded to other land categories through new statutory programs.

On March 28, 2006, the Corps of Engineers and EPA proposed joint rules to streamline and broaden the scope of its wetland mitigation banking policy. The new policy would actively encourage the use of offsite wetland mitigation banks. Thoughtful conservationists should support this new approach as well as other complementary policies that actively encourage large-scale off-site mitigation banking, moving away from the kind of localized postage-stamp mitigation that often achieves so little real ecological benefit.

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So how might Congress, the U.S. Army Corps of Engineers (Corps) and EPA reshape the Clean Water Act's Section 404 wetland program to lay the foundation for a bridge between land conservation and economic growth?

Reconsider the Avoidance, Minimization, Mitigation Policy

Longstanding Corps rules and policy require prospective wetland permittees to first avoid jurisdictional wetlands (wetlands subject to Clean Water Act protection) and, if avoidance is not practical, to minimize the project's disturbance of these wetlands. Unavoidable dredge and fill activity can be authorized, but the impacts must be mitigated, preferably onsite or close to the impacted wetlands.

Too often, the avoidance/minimization policy leads developers to locate structures near (but not in) the site's wetlands. Where on-site mitigation is provided, the quality of the work, if it is performed at all, is often shoddy and of questionable ecological value. Even if wetland impacts are technically "avoided," without the benefit of the adjacent upland buffers that are often crucial for wetland health, the avoidance/minimization policy has the effect of allowing "protected" wetlands to rapidly degrade. I visited one such "avoided" wetland not long ago. It was a small marshy area within 100 feet of several hydrocarbon storage tanks that were sited to avoid the wetlands. The "protected" wetland, which wasn't much to write home about before the tank project, was now withering and for all practical purposes, lifeless. What a waste.

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In terms of the Clean Water Act's 404 program, this author would go so far as to say that the Corps and EPA rules should be amended to expressly authorize, without an avoidance/minimization review, projects that entail the disturbance or elimination of low-quality wetlands (especially those that are soon likely to degrade due to non-regulated conditions or activities such as projected development of adjacent uplands) if the permittee agrees to provide meaningful financial support for regionally prioritized wetland mitigation projects within the same watershed or an immediately adjacent watershed. There is nothing in § 404 of the CWA that would expressly prohibit such a policy. The Clean Water Act does not require prospective § 404 permittees to avoid or minimize impacts to low priority wetlands. The law merely requires that such impacts be permitted.

Many urbanized regions of the U.S. are beginning to identify vital wetland (and associated upland) resources that are threatened by suburban sprawl. If these areas were targeted for protection as priority mitigation banking sites, the owners of the targeted land would have a logical incentive to investigate conservation as one of their most attractive land use options. Mitigation buyers could become classic "anchor tenants." It would then be possible to supplement these mitigation revenues with revenue from emerging markets for ecological services, (e.g., storm water detention) and low-impact natural resource extraction, (e.g., sustainable timber harvesting). The careful stacking of these conservation-compatible business elements could provide a powerful incentive for land conservation, especially if traditional sources of conservation funding from government and philanthropy were added to the mix.

The Need for Greater Recognition of the Value of Preserving Existing Wetlands

Corps and EPA policies have given low priority to preservation-based mitigation. The argument is that since these wetlands are already "protected" by the Clean Water Act, mitigation credits should not be awarded for simply agreeing to preserve such areas. The reality is that many of the nation's most valuable (and most endangered) wetland ecosystems are threatened primarily by non-regulated activities in and around those ecosystems, including drainage, logging, urban runoff pollution, fragmentation of adjacent uplands and invasive species. Drive around Miami, Florida and take a look at the declining quality of its urban and suburban wetlands. Without the kind of economic incentives for preservation and enhancement that mitigation credits can provide, these wetlands and their vital functions will inexorably degrade, irrespective of the Clean Water Act. The preservation (and enhancement) of such threatened wetland systems (including adjacent uplands) should receive mitigation credit on an equal footing with mitigation projects that restore or create wetland acreage.

The Need for a Level Playing Field for Private Entrepreneurs

As public park and recreation budgets come under ever-greater pressure and as non-profit organizations seek to expand their revenue bases, wetland mitigation has become an attractive source of funding for public agencies and non-profit conservation groups. While both types of entities play a vital role in conservation, this kind of public sector competition could pose a serious threat to the viability of entrepreneurial mitigation banking. Is it realistic to expect a private investor to enter a market where it will be competing with a government agency that not only pays no taxes, but actually derives its entire financial base from taxes? The same concern applies where the competitor is a tax exempt non-profit with a financial base grounded upon donations that reduce the donor's tax obligations.

Compounding this problem is the unfair advantage enjoyed by public agencies when soliciting mitigation buyers. Such buyers may understandably conclude that agency-supplied credits will have some kind of formal governmental standing not shared by credits offered by the private sector mitigation banks. From a policy perspective, this trend is problematic because it inevitably leads to decreased public funding for open space. Why should the legislature allocate tax money to such agencies when these agencies can raise funds through the sale of mitigation credits? If a public agency can sell mitigation credits for merely carrying out its basic public mission, are wetland impacts truly being mitigated? Have "additional" wetland functions been added when an agency simply does what it is logically expected to do under the law? Allowing public park agencies to gain credit for protecting public land, for instance, does not add new wetland functions.

Public sector competition could pose a serious threat to the viability of entrepreneurial mitigation banking.

The Need for a Clear Pro-Stacking Policy

The March 28 Corps / EPA proposal makes it clear that compensatory mitigation under the Clean Water Act 404 program is designed to "compensate" for the wetland "functions" that are lost in connection with the dredge or fill project being mitigated. It follows that conservation activities which add or enhance different wetland functions to the mitigation site should be able to be marketed separately. For example, if a §404 permit authorizes a wetland-impacting project that eliminates wetland acreage primarily valued for its groundwater recharge function, a mitigation project that provides equivalent groundwater recharge offsets should not be required to forego valuable credit if it simultaneously expands the watershed's stormwater detention capacity. It would strengthen the market for conservation if the Corps / EPA compensatory banking policy expressly recognized this stacking concept.

Use Government Mitigation Policies to Support Emerging Markets For Ecosystem Services

There is a potentially vibrant market for certain goods and services provided by intact ecosystems, particularly the services provided by sizeable undeveloped tracts (e.g., 500 acres or more) that are threatened by fragmentation from metropolitan sprawl. These markets are evolving around economically valuable services that intact ecosystem provide to identifiable entities, such as storm water detention (flood control districts), water quality enhancement (water utilities), carbon sequestration (electric utilities), and erosion control/sediment capture that reduces dredging expenses (port authorities). This market is further driven by suburban communities concerned with protecting their property values and quality of life; hunting and fishing groups concerned about disappearing habitat; agencies concerned about the loss of natural hurricane buffering capacity provided by coastal wetlands; and many other interests that are beginning to see the economic

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value of intact ecosystems that they have taken for granted. While this market faces many challenges, since it often relies upon a private party's willingness to pay for services that may be enjoyed for free by the public as a whole, there are many ecological service functions that disproportionately benefit a single identifiable party. These parties can form a buyer base for the owner of the service-providing land.

It is quite possible to identify the most important and threatened parcels of land within any given watershed. These lands will often contain jurisdictional wetlands and associated uplands. Such sites could be formally designated as "regional conservation priority sites," either because of their existing characteristics or because of enhancements that could be made to the property. The mitigation anchor tenant need not be limited to wetlands mitigation buyers. There are several federal and state laws and policies that provide a market for environmental mitigation, including but not limited to NEPA, the Endangered Species Act, the Coastal Zone Management Act and the Supplemental Environmental Project (SEP) policies of EPA and most states. Streamlined governmental approval procedures for mitigation banking proposals targeting these sites could provide a mitigation-based "anchor tenant" for a conservation-based site plan, especially if those policies allowed the bank sponsor to devise and implement multi-faceted land use strategies for the site to generate additional revenue from ecological service purchasers, sustainable development participants (e.g., selective timber harvesters or ecotourism companies), and funding from non-profit or governmental conservation agencies. There is a vital need for mitigation policies that allow this kind of supplemental value stacking.

Recognize That You Need Sticks—Not Just Carrots

As noted above, wetland mitigation has had a very spotty track record in the United States in terms of ecological uplift performance. Mitigation commitments are often performed badly or ignored altogether. Any market-based program of the type described above must reverse this poor performance record. At least three policy changes are essential to ensure that mitigation success is better assured.

First, mitigation (or ecological service) buyers and sellers must face joint and several liability for meaningful sanctions if mitigation commitments are breached. Financial assurance mechanisms, including the creative use of performance bonds, could go a long way to address this fundamental requirement. The Corps / EPA joint rulemaking proposal seeks formal comment on this vital issue. This author would argue that the financial assurance provisions of EPA's hazardous waste management rules provide an appropriate model for the new Corps / EPA mitigation program.

Second, ecological uplift standards for offsite mitigation must be flexible but demanding. While tradeoffs will often be required that fall short of 100% preservation, there is no reason to set a low bar in terms of ecological performance metrics for mitigation sites. The March 28 Corps/EPA proposal offers several positive ideas in this regard that should be supported by the conservation community.

Finally, there is a need for greater simplicity in a market that addresses a subject as inherently complex as ecosystem conservation. The owner of a 500-acre ecologically valuable bottomland hardwood tract within a growing suburban area needs to know, with some reasonable level of certainty, that a commitment to conserve the majority of that tract will generate a certain range of financial returns if that commitment is (1) attractive to prospective investors who stand to benefit from the conservation commitment, (2) implemented in accordance with governmentally-prescribed guidelines that ensure a net ecological gain, and (3) coupled with assurances that the conservation commitments will be honored. Governmental mitigation policies can further this goal by reducing as much red tape as possible and by accommodating the reasonable need of mitigation

bankers for economic certainty, e.g., assurances that the government will not become a direct competitor by setting up a competing mitigation bank within the same service area.

The Triple Win Concept

U.S. conservation policy today relies primarily upon the ability of shrinking government funding and private philanthropy to purchase threatened lands. These sources of funding cannot come close to meeting the challenge. Over 2 million acres of rural open space are converted to urban sprawl each year. If present trends continue, most intact ecosystems surrounding the nation's 280 metropolitan areas will be completely fragmented within a generation, two at most. Even if every state in the continental U.S. were to purchase, for long-term conservation, 1% of their privately-owned suburban/ex-urban land base each year (a land base of approximately 200 million acres), at an average price of $6,000 per acre, the cost over ten years would be $120 billion. This sum vastly exceeds government/foundation budgets for conservation. Market mechanisms are clearly needed to supplement philanthropic and governmental conservation funding. The benefit for future generations would be enormous.

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A market-based approach to conservation could begin to incentivize many landowners to begin seriously evaluating the potential of their property to generate conservation-based revenues. Strategies that combine 2-3 mitigation/ecological services features with conservation-compatible limited development activities can clearly yield competitive financial returns. Without such incentives, many of these landowners will never make such an assessment. Indeed, most landowners will continue to view their land's environmental attributes (wetlands, endangered species, etc.) as liabilities, not as assets. If a new, market-oriented approach to land conservation were coupled with stringent, but flexible performance standards and financial assurance mechanisms to ensure that agreed-to conservation outcomes were actually achieved and maintained, substantial conservation outcomes could be catalyzed by a triple-win concept:

- Allowing conservation-minded landowners to "win" by generating at least as much revenue from conserving a majority of their land as they could generate through a normal arms-length sale to a private developer;

- Allowing each conservation buyer to win by sharing its conservation investment with others; and

- Ensuring that the public wins through the protection or creation of open space and functioning ecosystems.

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I'll Have Mine Double-Dipped

by Bettina von Hagen

Bettina von Hagen, vice-president of Ecotrust, tells the **Ecosystem Marketplace** why thinks more is often more when it comes to the stacking of environmental credits.

These are exciting times for those interested in environmental markets: the issue of ecosystem services and the economy has become central to the environmental movement and humanity as a whole.

PHOTO BY TURBOPHOTO

In the last few years, the environmental world has discovered that market-making can be highly addictive and very compelling: developing the initial concept and structure; the establishment of rules, service areas, and credits; the emergence of new market systems and new companies, the thrill of competition; the first trades and price-setting; the proliferation of intermediaries (traders, reporters, verifiers, consultants, self-proclaimed experts); the market growth, crashes, and self-corrections—all of it is great theater, especially if you have a stake in the market. Of course, when it comes to the natural resources on which we depend—the air we breathe, the water we drink, the plant and animal community that sustains us—we all have a stake in the market.

Excitement makes things interesting, but it can also make them difficult. I want to take this opportunity to highlight a difficult but exciting issue that I think will become central to markets for ecosystem services as we move forward. Let me pose it as a series of questions: As individual markets emerge for water quality, water temperature, carbon, habitat, flood control, salinity reduction, and a host of other ecosystem services, how do these markets relate to each other? Can these individual services be combined in ways that can outperform a more traditional commodity use of the land; uses such as mining, timber production or real estate development? Which services are complimentary, and which are incompatible? And how do we value and account for these different services appropriately?

In general, the stacking or bundling of ecosystem services—allowing a single unit of land to provide and receive compensation for multiple services—has been poorly received by regulators. The risk in allowing this "double-dipping" is that if the system is not well designed, impacts on multiple acres might be compensated for by the protection and restoration of a single acre, and the net amount of intact habitat might decline. For example, in the course of their development projects, three developers might impact an acre of marsh, an acre of cackling Canada goose habitat, and another acre of giant garter snake habitat— three acres in total. Under a multi-credit system the potential might exist for these three lost acres to be compensated for by the purchase of three credits arising from a single acre of marsh which provides habitat to Canada geese and giant garter snakes.

Given the risks, it is good for regulators to be cautious. It would be far worse if they were too liberal, and allowed ecosystem service markets to enable the net loss of valuable habitat and ecosystems. However, while a lack of caution may be costly, excessive caution also comes at a price; in this case, a price that could significantly limit the growth and development of robust environmental markets.

Let me give you an example: Not long ago, the operators of the recently approved Skykomish Habitat Bank in western Washington sought to construct and operate a 239-acre mitigation bank along the north bank of the Skykomish River. The site was formerly farmland, with a county-owned levee severing its connection to the river. Farming was no longer profitable, and the owner had converted the farm to other land uses, such as ball fields and a dirt bike track—detrimental land uses which were not allowed under the zoning. The arrival of mitigation banking in Washington provided an alternative vision—to reconnect the land with the river, recreating wetlands and providing habitat for the endangered Puget Sound chinook salmon and bull trout. The site was ideal for this purpose, located on a bend in the river between the valley floor and the water. The Bank owners first designed the site to maximize its value to fish, creating numerous braided side channels. However, the single resource focus of much of our natural resource legislation can cause agencies to focus on the resource they are most responsible for—rather than the design which can result in the most ecological value—and in this case resulted in a credit structure which did not favor salmon habitat. The bank operators were forced to change the design or forsake $2-3 million in potential wetland credit sales. The bank went forward with the revised design, and –while it still provides some fish habitat and wetlands—it is not as environmentally effective (or as lucrative) as it could have been.

In addition to legitimate concerns about a multiple credit system leading to a net loss of habitat, regulators sometimes resist bundling because of a concern that it might lead to excessive profits—a windfall to the owner of the credits. Such a concern belies an underlying aversion to someone profiting—or perhaps it is "profiting too much"—from conservation, from an activity that was once in the domain of the government and non-profits. In some cases, such sentiments may also serve as subterfuge for a belief that money is inherently impure and corrupting and its production should therefore be limited.

In general, the stacking or bundling of ecosystem services—allowing a single unit of land to provide and receive compensation for multiple services—has been poorly received by regulators.

To address this concern we offer a few observations: First, windfall profits—and spectacular bankruptcies—are a common feature of emerging markets. For every conservation bank developer or carbon trader who is rolling in the money, there are others who have lost their shirts. What regulators could and should do is to try and make emerging environmental markets—whether for habitat, carbon, stream mitiga-

tion credits, or other services—as deep and transparent as possible. The larger the trading or service area, the greater the number of buyers and sellers, and the better the quality and timeliness of market information, the better the market will function. If profits are truly "windfalls", they will quickly attract more project owners and sellers and force the price down. True to form, windfalls don't stick around for long. As the market gains depth and information flows freely, the "invisible hand of the market" will—and the American economic system rests on this premise—find the right price and produce the socially desirable level of ecosystem services.

Second, what appears to be a windfall at first blush might actually be appropriate returns given the risk of the market, the volatility of returns, and the time value of money. Let's take mitigation bankers, for instance. This is a business for highly risk-tolerant people. It requires substantial upfront investment and time to: secure land, develop a restoration and management plan, negotiate the service area, determine the number and timing of release of credits, and institute performance metrics with all of the relevant agencies, all the while remaining highly vulnerable to market and (sometimes fickle) regulatory changes. Throughout this development period (which can last three years or longer) invested capital can total several million dollars or more before seeing a penny of return.

While a lack of caution may be costly, excessive caution also comes at a price

Beside, mitigation bankers have to attract capital, and are generally competing for capital with other types of private equity investments. A rule of thumb is that investors in private equity markets will require a 30% annual rate of return to compensate them for risk and for the lack of liquidity. So, if a mitigation banker puts $5 million into developing a habitat bank, and after five years sells all of the credits for $19 million, is that a windfall profit—after all, it is almost four times the initial investment? Not according to his or her investors—the expectation of a $19 million cash return is exactly what is needed to entice the investor to put their capital to work in this market, given the market's risk, uncertainty, and length of time before capital is returned.

So why should we worry about investors, and whether or not they get an appropriate risk-adjusted return? Surely they can take care of themselves? They can indeed, and can certainly go elsewhere, but we want to entice them to invest in ecosystem service markets—to create value and become a constituency for habitat and clean water, and to compel industry, developers and the rest of us to consider and eliminate—or at least pay for—the negative impacts of our activities.

This ability to double-dip—to stack ecosystem service returns—is particularly important in rural settings where land values are lower and there is less economic activity to spur ecosystem service payments. Rural lands also remain some of the most intact and most valuable from a biodiversity perspective. As farming and forestry become less profitable in the face of global competition and other market forces, ecosystem service markets are important tools in maintaining the integrity of these rural lands. With less activity to support high credit prices for wetlands and habitat for endangered species, rural landowners often need the capacity to bundle an array of ecosystem service sales—carbon credits, flood control, wetlands, habitat, along with timber, livestock, and farm produce—to out-compete land conversion to more detrimental uses.

So, with our environment at stake—and a tool to enhance the value of our natural capital in our grasp —should we worry if a few people profit "excessively" from markets that are just forming? I think not —for in the process, they may well be enriching us all.

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THE KATOOMBA GROUP'S

Ecosystem Marketplace

The Ecosytem Marketplace seeks to become the world's leading source of information on markets and payment schemes for ecosystem services (services such as water quality, carbon sequestration and biodiversity). We believe that by providing reliable information on prices, regulation, science, and other market-relevant factors, markets for ecosystem services will one day become a fundamental part of our economic system, helping give value to environmental services that, for too long, have been taken for granted. In providing useful market information, we hope not only to facilitate transactions (thereby lowering transaction costs), but also to catalyze new thinking, spur the development of new markets, and achieve effective and equitable nature conservation. The Ecosystem marketplace is a project of Forrest Trends. **www.ecosystemmarketplace.com**

FOREST TRENDS

Forest Trends is an international non-profit organization that works to expand the value of forests to society; to promote sustainable forest management and conservation by creating and capturing market values for ecosystem services; to support innovative projects and companies that are developing these new markets; and to enhance the livelihoods of local communities living in and around those forests. We analyze strategic market and policy issues, catalyze connections between forward-looking producers, communities and investors, and develop new financial tools to help markets work for conservation and people. **www.forest-trends.org**

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