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Unrecognized Assets

Environmental liabilities — even abandoned oil platforms and polluted wetlands — are hidden sources of value.

by Molly Finn, Gary M. Rahl, and William Rowe Jr.

Within Eglin Air Force Base, managed by the United States Air Force in northwest Florida, are 400,000 acres of longleaf pine forest. The longleaf pine is the official tree of two states in the region, North Carolina and Alabama; it has long been known for its resistance to fire, its relatively slow growth and long lifespan (typically 300 years), and its valuable lumber and resin. Over the years, longleaf pine has been logged almost to extinction and rarely replanted, and Eglin Air Force Base's stand represents about 72 percent of the remaining old-growth (naturally occurring) population of this species in the world.

Is there any value to these forests, beyond the support and buffer they provide for military training exercises? The United States Air Force thinks so. A series of studies, conducted for the Air Force beginning early in 2004, has attempted to assess the potential value of the forests for the environment, economy, and surrounding communities. For instance, tradi-

tional timber sales currently generate about \$1.2 million per year at Eglin. With 280,000 acres of woodlands open to the public, Eglin also offers recreational opportunities, including hunting, fishing, and camping. If the base charged for these, they could be worth \$8 million to \$12 million per year. And Eglin's forests provide valuable carbon sequestration, removing carbon gas from the atmosphere and thus potentially helping to mitigate climate change. If carbon emission trading markets develop in the United States, as many observers believe, then the forests could be worth significantly more. In short, the option of managing an old-growth forest, once seen as a responsibility and expense, is now worth a great deal to the Air Force.

"These assets have military, ecological, and economic value," says Colonel Rod Croslen, who directed the initial studies for the Office of the Deputy Assistant Secretary of the Air Force for Environment, Safety, and Occupational Health.

Similar stories could be told about airports, shipping ports, and many other government assets; and about factories, distribution centers,



oil wells, and large industrial sites in the private sector. In all of these arenas, enterprises have found ways to turn even seemingly hazardous environmental liabilities into assets. For example, BP is investing about \$1 billion in its Carson Refinery in the Los Angeles area to build a new power plant capable of providing electricity for about half a million homes. Designed in partnership with the local power utility (the Edison Mission Group, formerly Southern California Edison), the facility will take carbon created as a waste by-product of the petroleum refining process and separate it into hydrogen and carbon dioxide. The hydrogen will be used to generate electricity. The CO₂ will be injected into underground oil reserves thousands of feet below the surface, flushing the petroleum closer to the surface and rendering it more accessible, while the greenhouse gas remains sequestered away from the atmosphere. (BP has posted an animation depicting the process at www.bpalternativenenergy.com/live/assets/bp_internet/alternativenenergy/how_it_works_hydrogen.html.)

In the state of Georgia, International Paper turned more than 5,000 acres of unused land into a conservation bank, or habitat, for the endangered red-cockaded woodpecker. In addition to fostering valuable public goodwill, the conservation bank allows International Paper to legally expand operations into other forests. The company can also sell its credits for endangered species protection — recently valued at \$250,000 — to other developers. Another case is Talisman Energy, an independent oil company that is spending \$58 million to put two energy-generating windmills on one of

its North Sea gas platforms. The *Economist* reported that for now, the company intends to use the energy to power the platform's operations; in the future, the company may use the platform as a generating station to send power ashore. With the North Sea oil and gas industry in decline, Talisman could succeed in turning liabilities — abandoned oil platforms — into assets.

What keeps most companies and agencies from realizing similar benefits? It's not lack of opportunity; most organizations have assets that could be developed in a sustainable fashion. The gap is in their imagination. Thinking of environmental assets as cost centers, or as something separate from their core business, organization leaders simply do not envision the ways in which paying attention to their land, water, waste stream, pollution-management knowledge, and environmental enterprise can all lead to long-term income and wealth.

Wetlands and Wealth

When most chief executives contemplate environmental management — if they think about it at all — they see it as a bottom-line expense. They may be aware of the liabilities associated with natural resources — the costs of maintaining the land, water, and air related to their property and satisfying federal, state, and local pollution or emissions regulations. They have staff who focus on regulatory compliance, seeking to minimize missteps and avoid risks that might drain finances and jeopardize the organization's reputation.

But this narrow focus fails to recognize the full value inherent in a company's environmental assets. These assets include not only air,

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land, and water rights, but also the actions an organization takes to sustain, restore, and modernize its resources. For example, pollution prevention is a quantifiable investment that does more than simply reduce the cost of environmental compliance. It can enhance an organization's ability to expand operations, and, in some instances, it can provide a credit in market-based regulatory regimes, such as the trading market for sulphur dioxide (SO₂) established by the 1990 U.S. Clean Air Act, or the comprehensive

Even without market regimes, wetlands and other ecologically sensitive habitats are increasingly recognized as assets. Restoration of a lake- or marsh-based ecosystem can potentially provide an airport, military base, mining operation, or large industrial plant with a buffer against encroachment or an alternative to building a wastewater treatment plant. A successful restoration can also help a business support its case for expanding activities elsewhere, both by "trading off" the wetlands site against other sites, and by

with regulations. The framework itself introduces creative problem solving and meaningful analysis about such issues as the value of wetlands for water filtration, flood control, and recreation in the region around each base.

Whether used in the public or private sector, an EAA transforms organizational thinking by linking assessments of four areas that would otherwise be considered separately: the environmental liabilities and requirements mandated by law; the innate value of natural resources in contributing to the quality of life of the enterprise and the ecology of its surrounding area; the technical capabilities of the organization (and the value of improving those capabilities); and the corporate or mission goals of the enterprise.

This holistic approach often makes people uncomfortable at first. Some worry about taking a businesslike approach to natural resource management. It can seem reductionist, even harsh, to place a monetary value or price on a waterfall or forest or eagle habitat. If natural resources are treated simply as assets or commodities, no matter how benignly, will their use for human beings overwhelm their innate ecological value?

Those with such misgivings might be relieved to learn that the valuation approach has actually been shown to strengthen conservation efforts. That's because the valuation of resources reframes environmental costs as incentives for minimizing waste, pollution, and environmentally harmful activities. In addition, this approach enables organizations to make better decisions about investments because they understand the true cost-benefit trade-offs of their activities.

The Kyoto Protocol of 2004 created a multibillion-dollar market in emissions credits.

market in pollution credits created in the 2005 European Union Greenhouse Gas Emission Trading Scheme. Worldwide, the number of environmental markets for credits is growing in such areas as wetlands preservation, reductions in greenhouse gas emissions, and conservation banks for endangered species. The Kyoto Protocol of 2004, for example, may ultimately be remembered less for the controversy it engendered, and more for the multibillion-dollar market that it is creating in greenhouse gas emission credits. According to the information service *Ecosystem Marketplace*, some experts predict that carbon credits will be worth nearly \$40 billion by 2010 and eventually as much as \$200 billion. By allowing organizations to sell or lease their pollution rights, these schemes are credited with providing businesses an incentive to reduce emissions, and thus turning the capability of pollution reduction into a marketable asset.

demonstrating a level of trustworthiness and competence in environmental management. Finally, an emerging body of accounting standards now defines how organizations can recognize and claim environmental assets on their balance sheets.

The key to recognizing the value of these assets is not simply a change in perspective or terminology, but a deliberate process that might be called an environmental asset assessment (EAA). This process identifies environmental assets and the value derived from or created by managing those assets. The U.S. Air Force has created one such rigorous EAA process, which it calls the natural infrastructure management (NIM) framework. NIM has been a powerful force for change because it goes beyond merely gathering an Air Force installation's environmental experts to figure out better ways to use resources. It is designed to help decision makers move beyond a focus on compliance

Experience has shown that an EAA-based approach provides a framework for collaboration — rather than confrontation — among organizations that traditionally have disagreed over environmental policy, such as manufacturing plants and regional environmental groups.

Other corporate decision makers are skeptical of the EAA concept because it isn't businesslike *enough*. They worry that any environmental assessment, no matter how well intended or well designed, could be used by interest groups to put pressure on corporate decision makers and increase their liabilities. And they know that it isn't always possible or appropriate to assign a monetary value to every environmental asset, so they mistrust anyone's ability to account for them.

But those concerns don't make environmental assets any less valuable. Organizations that recognize the value of the ecosystems they control, their waste streams, and their knowledge capital — and that begin to use these resources to create wealth — can dramatically strengthen their strategic planning, risk mitigation, and portfolio management activities. In fact, the process of paying closer attention to the benefits and costs of environmental assets strengthens organizations' ability to make better decisions in general.

Anatomy of an Assessment

An environmental asset assessment typically takes three to six weeks, depending on the size of the organization and whether it has previously conducted an EAA. The process follows four basic steps:

Step 1. Define the requirements for natural resources — the things that nature provides that make it possible

for the facility to operate. In this step, organizations identify uses they make of natural resources and related environmental assets, just as they would for the human resources, capital, or infrastructure needed to keep operations going. In fact, most organizations already have detailed requirements for air, land, and water use. For example, flight operations at an Air Force base require airspace for launching aircraft and for training pilots and other crew members. The base also needs land for facilities and weapons testing, and to serve as a noise buffer for surrounding communities. Water is needed for drinking, cleaning, sanitation, and other uses. As a result, an installation needs a variety of permits, water-use rights, emissions and discharge allowances, and other legal approvals related to resource use and pollution.

An airport, factory, or oil refinery has similar requirements. An airport, for example, requires airspace for its jets. Most facilities, whether public or private, require such resources as air access for emissions, water discharge rights, noise buffers, and a host of permits to ensure the continued use of resources while they operate.

Step 2. Inventory your environmental assets. Most public- and private-sector organizations already have on hand much of the needed information for an environmental asset inventory. The sources include planning documents, baseline surveys, environmental impact statements, biological assessments, and geospatial data holdings. It's also worth talking to resource managers at other local facilities of interest, along with experts in local government agencies and nongovernmental organizations who can help

decision makers understand the way a local facility, like a plant, fits into the ecosystem around it. Make a thorough list of the land and water that your organization owns or influences, and the effluent releases and other environmentally relevant processes for which it is responsible.

Step 3. Determine the goods and services potentially available with these assets. What types of goods and services could (or do) your assets provide? Timber, water supply (from reservoirs or streams), minerals, crops, fish, and game are obvious examples. The inventory of assets would also include permits, water rights, and pollutant and restoration credits. These often have market value as well as trading value in market-based regulatory regimes.

Finally, identify less obvious environmental assets. Many commercial and government organizations own wetlands that provide such services as water filtration and flood control. Other potential values are climate regulation, waste assimilation, disturbance prevention, nutrient regulation, biodiversity, soil formation, pollination, recreation, aesthetics, and habitat provision for endangered species. For example, the Marine Corps Base Camp Pendleton, near San Diego, is home to several endangered species, including fairy shrimp, gnatcatcher, and snowy plover. By setting aside a large portion of its land as natural habitat, the base supports its continuing claim to 125,000 acres and 17 miles of beachfront coastline in one of the fastest-growing regions in the United States.

Step 4. Specify the potential value of your environmental assets. Monetary valuation is relatively straightforward for assets and services that are sold in markets. Conducting a

monetary valuation is more difficult — often impossible — for non-market assets and services. For any given asset, there are three possible ways to spell out the value so that the organization's leaders can make investment and portfolio decisions:

- **Monetize it:** The most common approach to financial valuation is market appraisal. This approach derives an estimate of an asset's worth on the basis of market data (by tracking sales of comparable assets), income streams, and the cost to replace the asset. Markets for timber and oil leasing rights make it easy to calculate their monetary value. Comparable studies enabled military officials at Eglin and other military bases to assign a monetary value to the recreational services they provide. Credits in pollution or emissions markets can also figure into a monetary value.

- **Quantify it:** Even when natural resources can't be monetized, it is often possible to quantify their ecological value or their value to the enterprise. Several indicators have been developed for use by environmental agencies and others to compare practices and resources. For instance, the habitat equivalency analysis estimates the ability of a land parcel to provide habitat for wildlife. Environmental benefit indicators estimate the economic value of potential services from a watershed or ecosystem. One source on these valuation approaches is the writing of James Boyd, a fellow at the Resources for the Future institute in Washington, D.C.; these materials are available at www.rff.org.

- **Describe it:** Most natural resources can be qualitatively described in terms of their value to the mission and ecosystem. For instance, the leaders of Eglin Air Force

Base might not have been able to put a dollar figure on the value of 400,000 acres of longleaf pine forest, but by cataloging and describing the forest, they made its value clear to themselves, to the Air Force, and to the surrounding community. A descriptive analysis might also evaluate the quality and relative importance of the asset's ecological services. For instance, wetland assets could be designated as high, medium, or low quality, which would lead to different assessments of value for habitat provision, aquifer recharge, or other services.

Embracing a New Philosophy

Now the creative thinking begins. With the information and analysis in hand, decision makers can get a sense of their total assets. They can see potential alternative uses (timber or recreation, for example) and challenges (such as new housing developments nearby). And they are finally equipped to ask two questions: Can environmental assets meet future operational requirements (for example, will the organization be able to meet its water needs)? And can the organization, with its current practices, sustain its natural resources into the future?

Actions that sustain future growth and viability can take a number of forms. In North Carolina, for example, officials at Camp Lejeune Marine Corps Base saw that the development of new training ranges on the base would destroy existing wetlands. So the base created 1,250 acres of new wetlands to offset the anticipated destruction. Camp Lejeune now draws credits from its wetlands mitigation bank whenever its activities affect existing wetlands. Similarly, at least two airports in the U.S. are adopting air

quality controls that go beyond strict compliance with regulations; this extra "headroom" helps position the airports for future growth.

Planning for future sustainability requires organizations to look beyond their boundaries at potential environmental issues. For example, a nearby housing development or farm could tap into a needed water supply, pollute the site's natural filtering systems, or shrink buffers around a military installation or industrial plant. Similarly, a local community could pressure an airport to restrict late-night flights or protect endangered species on its property. An organization, appreciating how developments outside its fence line will affect its environmental assets and its ability to carry out its operations, can now operate proactively, in collaboration with neighbors, to prevent future problems.

Corporate environmentalists might argue that this concept isn't novel; some experts have been making this liabilities-into-assets case for 20 years or more. But a convergence of several important trends has made the idea far more compelling now, especially as a planning tool. One is increased public awareness about environmental issues, fueled in recent years by debates over global warming and deforestation. People recognize the historic trade-offs between economic growth and environmental protection, and now look to government and business to devise creative and more effective solutions.

Meanwhile, within companies and governments, a second trend is under way: a major philosophical shift that posits the ecosystem as a provider of services. In this new view, for example, what is provided by a forest — the water control, climate regulation, habitats for diverse

species, and recreational services — is far more valuable than the market value of its lumber. Organizations, even lumber companies, thrive not by cutting down the trees but by managing them as sustainable resources. Consider these examples:

- When New York City officials realized that runoff from farm animal waste, pesticides, and fertilizer — along with other land-use practices in the Catskill Mountains and surrounding region — was threatening the quality of the city's drinking water, they weighed several alternatives. One solution would have been to install water-filtration plants at an up-front cost of \$4 billion to \$6 billion, plus an annual operating cost of \$250 million. Instead, the city is spending \$250 million on land in order to prevent development in the

reduce or offset greenhouse gas emissions. The *Washington Post* reported that as part of this effort, AES will spend \$250 million to generate greenhouse emissions credits under the Kyoto Protocol and the European Union's trading system. The company is already working on a reforestation project in Brazil that will cover 25,000 acres and produce credits for 100,000 to 150,000 tons of carbon emissions per year. The value of those credits, currently more than \$20 per ton, will likely rise over the years.

- Eglin Air Force Base and the state of Florida recently collaborated on the state's \$15 million purchase of 7,587 acres adjoining the base. Eglin received a needed noise buffer for its jets, while the state protected important black bear migration corridors in the northwest panhandle.

proach being discussed would establish a forestry insurance company that would use financial markets to allow companies dependent on the canal to pay for reforestation activities. These payments would be considered an investment in the natural infrastructure — similar to investments in the physical infrastructure that supports this important transportation route.

In all of these cases, the environmental asset assessment is a powerful approach for managing environmental assets. But an EAA goes further; it can and should be an integral input into general strategic planning, risk management, and investment decisions.

And that is the third trend: The growing recognition of the innate value of the operational and ecological awareness that stems from better environmental management. We know this firsthand from our work at Booz Allen Hamilton, which has helped the U.S. military conduct natural infrastructure asset assessments at nearly 30 sites. Around the world, similar approaches have greatly benefited large organizations such as airport and port authorities, multinational corporations, and any institution that puts demands on air, land, or water resources. As the EAA approach gains wider acceptance, organizations will abandon the old mind-set that views environmental management as an unavoidable cost. Instead, they will manage environmental resources as a group of strategic assets, crucial to the organization's goals, important to ecosystem health, and beneficial to the surrounding communities. Where decision makers once saw liabilities and constraints, they will now see opportunities. +

Lumber companies thrive not by cutting, but by managing trees as sustainable resources.

Catskill–Delaware watershed, west and north of the city, and is paying farmers \$100 million a year to minimize water pollution, according to the *Economist* (“Are You Being Served?” April 23, 2005). Several other U.S. cities, following New York's approach, have calculated that every dollar invested in environmental protection would save between \$7.50 and \$200 of money otherwise spent on filtration and water-treatment facilities.

- The AES Corporation, a global power company, announced in April 2006 that it would invest \$1 billion over the next three years to expand its alternative energy business and develop projects to

Similar cooperative purchases are expected to follow.

- Sustaining ecosystem services has become central to the operation of the Panama Canal in Central America. The Panama Canal provides a well-known trade route for many of the goods that are distributed throughout North America. But the viability of this route has been threatened over the decades by rapid deforestation, which reduces the amount of water available within the canal while increasing harmful sedimentation and nitrification. The dangers have been generally recognized, but there has been no consensus about how to pay for reforestation. One innovative ap-

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