

of quantitative analysis has provided a way for the city to demonstrate the results of its efforts to reduce stormwater pollution and restore stream habitat, McConnaha says. "They've done a lot of restoration work, and they want to get credit for it," he says.

Much of ICF Jones & Stokes' ecosystem restoration business in the West is coming from city governments, although non-governmental organizations (NGOs) and state agencies also have a hand in salmon recovery, MacDonald says. "Business has been very good," she says. "Some of the drivers, like salmon recovery, will remain strong. Government projects tend to lag behind the rest of the economy, so we're all holding our breath, but so far, it's all holding up."

To be sure, urban ecological restoration has taken its share of hits in the current down economy. "Business is down from where we were a year ago and where I anticipated it would be, no question," Laska says. "However, we are stable, and we have very long-term projects with clients that are not going to default. I'm not worried. We've shrunk, I've let people go, and we've lost some clients, so it's been a choppy year than I would have liked, but we've taken some steps and will come out of this stronger."

Laska believes that the market has staying power. The visible and dramatic changes to the landscape over time, and the immense problems attributable to sprawl, have engaged and energized both city governments and community groups. "The upshot is, there is tremendous interest and movement in protecting existing habitat and preserving open space as part of the master planning of communities, and in restoring habitat, not just in rural areas where there still might be higher-quality habitat, but especially in urban areas," Laska says. "Because of that, this emerging area of urban ecological restoration is something we see in every time zone and every city we go to."

"I don't see this as a trend while green is popular," he says. "I see this as a point of shift in the mindset of urban dwellers, who want to bring back habitat as part of where they live."—GEORGE STUBBS (gstubbs@zweigwhite.com) ■

WRI AND PARTNERS DEVELOP METHODOLOGY FOR LINKING BUSINESS OPERATIONS TO ECOSYSTEM SERVICES

Intact ecosystems provide businesses with a number of benefits, or "ecosystem services," from the timber and wood fiber, water purification and soil stabilization services, and genetic resources provided by forests, to the freshwater and power provided by river systems, to the waste filtration, flood mitigation, and fish breeding services provided by coastal wetlands. The widespread degradation of ecosystems thus presents risks to corporate operations, while the protection or restoration of these ecosystems offers opportunity, and yet these risks and opportunities often fly underneath the radar screen provided by traditional corporate environmental management tools.

Working with the World Business Council for Sustainable Development (WBCSD) (Geneva, Switzerland; www.wbcsd.org) and the Meridian Institute (Washington, DC; www.merid.org), the World Resources Institute (WRI) (Washington, DC; www.wri.org) has developed a methodology for systematically identifying the connections between corporate operations and ecosystem services and developing strategies for addressing the risks and taking advantage of the opportunities. Craig Hanson, director of WRI's People & Ecosystems Program, and WRI Associate John Finisdore were two of the co-authors of the Corporate Ecosystem Services Review (ESR), with Hansen serving as the lead author. They spoke about the methodology and trends in the growing awareness of the services that ecosystems provide to businesses.

EBJ: Let's start with some context: According to the Millennium Ecosystem Assessment (www.millenniumassessment.org), 15 of 24 categories of ecosystem services have degraded over the past century. Without diminishing the importance of any of these categories, in your view, which areas of degradation really haven't rung the alarm bells to the degree they should have, and which are those that improved corporate management practices can most positively impact?

Craig Hanson: "In terms of those services that improved corporate management practices could affect dramatically, one is the suite of services provided by fresh water. Most companies use fresh water for process-

ing, cleansing, or consumption to some degree, and best management practices could help improve and reduce pressures on nature's supply of fresh water. That's a clear one, and it has a gotten a lot of attention too. Most companies identify resource as a priority when they do an Ecosystem Services Review."

John Finisdore: "One thing to add to the fresh water category is the problem of eutrophication—the release of nitrogen and phosphorus from agricultural operations into lakes and rivers and the resulting creation in 'dead zones' in water bodies around the world, such as the Gulf of Mexico. WRI has done a little bit of work in this area, taking a step forward and surveying some 417 dead zones around the world. We know that the number is quite a bit higher because of the inconsistent monitoring across continents. I think these dead zones will be one of the next big issues. Governments are already developing new regulatory and markets-based mechanisms to respond to this in some areas. Related to that is the issue of soil quality, from the salinization of soil to the erosion of top soil. Trying to improve soil quality and prevent further degradation presents enormous business opportunities for agriculture that will be felt throughout the supply chain."

C.H.: "The challenge of your question is that industries differ so greatly in the underlying ecosystem services they rely on, whether we're talking about a mining company, or a tourism company, or an airline. With that in mind, one way of recasting your question is to ask what underlying ecosystem could changes in corporate behavior across the board most likely benefit."

"I'd argue for forests. You look at forests globally, (and) they provide a multitude of ecosystem services, ranging from fiber—timber and wood—to biomass fuel, erosion regulation, soil retention, and recreation. Forests are one of those ecosystems that are under tremendous pressure given the multiple benefits that people and business try to extract benefit from them. Taking steps to relieve a company's pressure on forests would be of great benefit to a variety of

ecosystem services—for example, by certifying that lumber and paper production is sustainably harvested. Or if you are a business that uses a lot of land, by minimizing the amount of acreage you deplete, when you are building a new shopping mall, for example.”

EBJ: In March 2008, WRI introduced the Corporate Ecosystem Services Review (ESR), which is described as “a structured methodology for corporate managers to proactively develop strategies for managing business risks and opportunities arising from their company’s dependence and impact on ecosystems.” What factors led to the development of this methodology, and what is it designed to do?

C.H.: “The factors are twofold. One was the issuance of the Millennium Ecosystem Assessment (MA) in 2005. One recommendation that the MA’s authors proposed was to develop approaches to help the private sector make the link between ecosystem services and the corporate bottom line. The scientists realize that there is this link. The reason we care about forests, marshes, etc., is not just the biodiversity that these ecosystems contain but the services that flow from them, and companies depend on those services for their functioning. Right now, many companies are not making that link. So the ESR is a response to the Millennium Assessment.

“A second factor was that a number of companies we were talking to and the WBCSD were talking to were saying, ‘Look, the Millennium Ecosystem Assessment has come out. What does this mean for us?’ Go back 10 or 15 years on the issue of climate change, before it was a popular issue, and imagine the reaction when the first intergovernmental panel on climate change reports came out; companies asked, ‘What does that mean for me?’ It’s the same thing today with the Millennium Ecosystem Assessment. Companies are looking for an approach or guide that can translate the scientific findings of the Millennium Ecosystem Assessment into practical actions at the business unit level that can improve the bottom line.”

We partnered with WBCSD and others to develop the ESR and help companies make the link between ecosystem stewardship and corporate performance. The novelty here is the lens of ecosystem services. For 40 years, we’ve been talking about forests as

important because of the spotted owl. Companies may not see it that way, but an intact forest is important in many other ways. Biodiversity is important, and it underlies all of these services, but we have to take a closer look at the services themselves and see the connection to the bottom line. Services like pollination, helping to stop erosion, cleaning water, or providing wood fiber for the paper or timber your business uses—it’s this suite of benefits that’s one step closer than ‘biodiversity’ to corporate performance.”

J.E.: “Essentially there are two ways that the ESR is being used right now. One is as a stand-alone methodology, where you might apply the methodology to a specific facility’s operation, land holding, or to a specific product line, for example. It typically starts with forming an ‘ES-team’ that includes people from the auditing team, the environmental or sustainability department, the due diligence person, certainly an operations person, the finance department, and oftentimes outside experts as well. The most successful reviews include outside experts who bring a lot of new innovative thinking. This is because the concepts of ecosystem service are new, and because outside people can really catalyze those discussions.

“The team comes together and walks through the five steps of the ESR, from identifying the risks and opportunities arising from a company’s dependence and impacts on ecosystem services through to developing strategies to address those risks and opportunities.

“The first step is defining the scope of the ESR. Conducting a ESR on an entire company would be too complex. A review can be conducted up or down the supply chain, or within the company’s own operations. As such, the guidelines for conducting an ESR help managers select the most appropriate facility, product line, supplier group, etc.

“The next step is prioritization, which means identifying the most important ecosystem services for your business or business unit. Excel worksheets can be downloaded from WRI’s web site to help with this step. Using them speeds the determination of which ecosystem services your business unit both depends on and impacts. Only these ecosystem services are taken forward in subsequent steps.

“Companies have found this quick process to be quite powerful, because the entire team can gain, first, an understanding of what ecosystem services are, and second, an understanding of which ones relate to the business unit. It turns the broad global trends identified in the Millennium Ecosystem Assessment, into a manageable set of key issues.

“In the third step, with those priority ecosystem services you’ve identified, you determine what the current status and expected future trends are. First, you determine the status of the ecosystem, for example the quantity and quality of the freshwater, pollination, or other ecosystem service that you identified as relevant to your business unit.

“Next, you identify the direct drivers of change in this ecosystem service. It could be caused, for example, by over-consumption of water or invasive species that use water that otherwise would be flowing. As part of this, you want to look at what role your business unit is having on the service, and what the impact other users of the ecosystem service are having. Your company may be having a small impact relative to others.

“As the last part of the trend analysis, you look at indirect drivers of change. There are a number of things that are indirect drivers of change in ecosystems, such as population growth, or technology changes. New technologies emerge every day, and they can change industrial processes and improve efficiencies.

“Throughout this analysis, you are able to uncover how your business unit impacts ecosystem services. Much of this information is already collected by companies, as regulation encourages them to do so. This can be fed right into your trend analysis. Generally speaking, companies gather and analyze much less information about how they depend on ecosystem services. This is a big value added of the analysis. Also, many companies that have used the ESR have found the unique ecosystem services perspective allows them to look at issues from a unique perspective, uncovering solutions they would not otherwise see.

“The second way the ESR is being used is by embedding the ESR—or components of the ESR—directly into existing environmental management systems. Companies typically approach this in a two-step process.

“First, a company will conduct a ‘gap analysis’ between the ESR and an existing system. A chemical company, for example, might compare the ESR to the existing process used to review the environmental impacts of different compounds in its products. A mining company, on the other hand, might look at what the ESR has that their environmental impact assessments do not, while a manufacturing plant may compare it to its existing auditing and compliance systems.

“In the second step of this process, a company will then adapt the particular part of the ESR that can add value into its environmental management systems. WRI is developing a number of partnerships with consultants and companies to move this integration forward. Results of this will be made publicly available.”

EBJ: You see traditional environmental management systems and environmental due diligence tools as limited. How does your methodology improve or expand upon these tools?

J.F.: “I think the biggest way this method adds value is the way it helps companies identify real dependencies. Existing environmental management systems don’t look at those dependencies. A lot of firms are stumbling upon those risks and opportunities and are uncovering them and are working on them, but most firms haven’t integrated them in a systematic way. The ESR allows them to do that. So, the dependency angle is the first complement.”

C.H.: The ESR looks at all ecosystem services in a systematic way, whereas traditional tools look at only a few services. An environmental impact statement might identify the impacts of a certain type of business operation, but as we’ve said, there are multiple dependencies on these services as well. The tourism industry, for example, depends on a healthy coral reef, not only as an attraction, but as a barrier mitigating the impacts of storms on the built facility. There’s clear monetary value that can be attached to that service.

“In addition, an ESR makes the connection to other people. It’s not just an environmental tool; it makes the link between the environment and people. As such, it can be used to improve stakeholder relations. Finally, it’s not just a due diligence tool. Rather, it is designed to influence corporate strategy— for example, if you are entering

into a new market. If you are an agricultural concern moving into a new region, you want to identify what risks and opportunities are there and what new products or services you can offer the people in the region. It’s not just a checklist to meet government regulations in order to obtain a permit to build a new factory, for example.

“It does require a slight change in perspective on your relation to the environment. Too often, people look exclusively at compliance with regulations. What the ESR can do is show how an ecosystem can be part of the core part of the business. As we’ve noted, it’s not just the environmental, health, and safety staff who are involved, but managers across the business, because it’s about strategy.”

EBJ: Climate change appears to be getting all the attention when it comes to reporting on the environment these days, and “carbon” has become a household word. Do you think that all this attention is coming at the expense of attention to environmental degradation and the development of a better understanding of the value of ecosystem services?

C.H.: “Actually, I think it helps, and is helping. I’d argue that we’re seeing cycles of environmental consciousness. Just as in the late 1980s and early 1990s we saw growing awareness of acid rain and the impacts of sulfur dioxide and nitrogen oxide emissions, today we’re on one of those crests with climate change, and I hope that it pulls a lot of other issues in along with it.

“It’s closely related to the ecosystem services area. Climate change is one of those direct drivers of ecosystem change. As people start talking about climate change, and that gains headlines, pretty quickly you are moving into discussions of ecosystems changes that have meaning for human beings.

“You start seeing discussions, for example, of the mountain pine bark beetle, which is ravaging the forests of the western U.S. and Canada, and British Columbia in particular, and that’s a consequence of climate change. Cold weather suppresses the breeding of the beetle, and because winters haven’t been cold enough, you are seeing an explosion of their populations, leading to massive die-offs of trees. From there, you get into talking about the ecosystem services those trees provide. There’s even a degree to which the timber value of those trees may be

declining as well. You’d think that all that dead wood could be harvested for some degree of profit, but the beetle damages the tissues of the trees. It also affects the carbon cycle, as you lose the role these trees played in carbon regulation.

“As a result, as we see climate change in the headlines and see the physical impacts on forests, coral reefs, wetlands, and so forth, we regard it as one small step to talking about the services of ecosystems that are no longer there or that have changed dramatically. The discussion moves quickly into the territory of ecosystem services.”

EBJ: The ESR methodology encompasses a type of analysis that is analogous to what many companies, municipalities, and other organizations are already doing in terms of “carbon footprinting.” What will have to happen in order to make undertaking an ecosystem service review as popular as preparing a carbon footprint? Do you see the environmental consulting and engineering community adding this type of service to their portfolios as readily as they have carbon footprinting?

C.H.: “I’d argue that, in order to make the ESR more mainstream, we need more examples of companies that have used it. We’ve been developing case studies and identifying stories around the positive benefits of using the ESR. So, that’s part of it. Secondly, it’s just a matter of making more companies aware of ecosystem service issues. Remember, the methodology has been out of for less than a year.

“I think sustainability consultants will eventually adopt this service and present it to their clients. John led an ESR training session with sustainability consultants in Washington, D.C., on Feb. 10 and 11. We are also holding a series of webinars with the Auditing Roundtable (AR). Details can be found on the AR web site, www.wri.org/ecosystems/esr. A training session in Stockholm will take place in April.”

EBJ: How many companies to date have signed up to implement the ESR? How do you work with them in implementing it?

C.H.: That’s kind of a tough question. It is very difficult to track all the uses of the ESR. It’s out there, and there are companies that can download it and use it.”

J.F.: We’ve worked with a little over 40 companies directly, but as Craig said, many more companies are downloading it. The ESR has been downloaded between 7,000

to 10,000 times, and the reason for the broad range is that many downloaded it from an electronic newsletter that cannot be tracked. So, we can't really track all of the downloads. There have been some consulting firms that have adopted it and woven it into their work."

C.H.: Our sense is that the practice of conducting ecosystem service reviews is catching on at a good pace. The fact that we're getting enough calls from consulting firms to do more than one ESR training session, which was the original plan, is very encouraging. In the upcoming training sessions, we'll have participants from Japan, Europe, and South America. There really is a lot of interest."

EBJ: In general, how well do you think businesses are catching on to the concept of "ecosystem services," and to their exposure to the associated risks of degradation or their opportunities to benefit from their protection?

C.H.: "I'd say the awareness is growing. Think about climate change as an issue 15 years ago. It wasn't a common term, and businesses weren't talking about it. Now, everybody is doing a carbon footprint. Companies are looking at how pending regulation is going to affect their operations, and how various stakeholders— customers, local communities, and employees among them— are going to react.

"We're in the early days, but I would argue that the concept of ecosystem services will move faster than climate change in terms of permeating the lexicon. Some companies may use the phrase 'ecosystem services,' some might say 'natural capital,' but whatever the terminology used, the fact that we're hurdling towards 9 billion people on the planet, and that climate change is on everybody's mind, and because of several other factors, the stresses on ecosystems are becoming much more real, and it's becoming more obvious that there are potential risks. Or, if companies have solutions, there are tremendous opportunities. I fully believe it's almost inevitable that a broad range of companies will be looking at their operations through the lens of ecosystem services."

J.F.: "There are a couple of interesting things coming out in the next couple of years that will positively affect that awareness. There is forthcoming report, called *The Economics of Ecosystems and Biodiversity*,

from the European Commission, due out by 2010. It will be a kind of Stern report on ecosystems, looking at the cost of inaction and asking questions like, what will the cost to GDP be if we don't address ecosystem degradation?

"Then, in Japan, in 2010 as well, there will be the Conference of Parties to the *Convention on Biological Diversity*, a meeting of the international conservation community. They'll look at the status of biodiversity, and that should raise awareness of ecosystem degradation and the impacts on business. They will also be directly discussing ecosystem services and its relationship to corporate performance— and there are companies that are already looking at that trend, and the benefits of being first movers."— GEORGE STUBBS (gstubbs@zweigwhite.com) ■

**Now available!
2009 AEC Industry Outlook:
Strategy and Insight
for Design & Construction Firms**

The current economic climate is uncertain at best and AEC firm leaders need solid information to plan their strategy for 2009. What can the environmental and engineering industry expect this year? What is the outlook for the AEC industry by market sector? Knowing the answers to these questions can give environmental firms and industry investors the edge they need. And you'll find the answers in ZweigWhite's 2009 *AEC Industry Outlook: Strategy and Insight for Design & Construction Firms*.

The 2009 *AEC Industry Outlook* will provide you with comprehensive information and forecasts of all the major markets served by the AEC industry: commercial real estate, education, environmental, health care, power and energy, residential real estate, transportation, and more. Find out which markets will be "hot" and which ones will be "cold."

Filled with charts and tables, the 2009 *AEC Industry Outlook* provides a comprehensive forecast for the U.S. economy as a whole, along with breakdowns of economic and AEC industry activity for each region of the U.S. The report also includes information on select international markets, so you can get information on markets around the world or in your backyard— all in one place.

Plus, *Environmental Business Journal* subscribers will save \$100 off the cover price!

For more information and to download this report immediately, go to www.zweigwhite.com/go/09outlook. An executive summary is also available for free.

FEDERAL GUIDANCE ON WETLANDS DELINEATION CREATES POCKETS OF OPPORTUNITY, CONFUSION

In June 2006, the U.S. Supreme Court issued a series of split rulings in *Rapanos v. United States* and *Carabell v. United States* (widely referred to as "*Rapanos*"), a pair of cases involving the destruction of wetlands as a result of development activities. The controversial rulings— one plurality decision, two concurring opinions, and two dissents— left all those parties who have anything to do with wetlands, from property and infrastructure developers to regulatory agencies and the engineering firms with wetlands delineation and restoration practices, wondering how the **Environmental Protection Agency (EPA)** (Washington, DC; www.epa.gov) and the **U.S. Army Corps of Engineers** (Washington, DC; www.usace.army.mil) would handle the implications of the various *Rapanos* findings in the development of new guidance on how to determine when a wetland is, legally speaking, a wetland.

On June 5, 2007, EPA and the Corps issued guidance purporting to clarify Clean Water Act (CWA) Section 404 jurisdiction over wetlands. "Purporting" is the key word. In fact, the guidance has been subject to much interpretation within the regulatory agencies. The result as far as the wetlands delineation and restoration market is concerned has been a patchwork of opportunity and confusion, as some Corps jurisdictions move forward on wetlands decisions while others are in a state of suspension.

CWA Section 404 regulates the discharge of dredged or fill materials into U.S. waters, including wetlands. Any party engaging in an activity that could lead to the impairment of a wetland that is deemed by a delineation to be under Section 404 jurisdiction must first obtain a Corps permit and take steps to mitigate any losses.

The EPA/Corps guidance drew heavily from Justice Antonin Scalia's plurarilly decision in *Rapanos*, which claimed that wetlands are subject to Corps jurisdiction if they bear a "continuous surface connection"