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Conservation and Corporations: Perils and Promise

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Editor's Note

By **Bob Lalasz**

“Dow” is often shorthand for “the new Conservancy” at TNC, and a word thus charged with both hope and anxiety. Even more than a year after TNC announced it was collaborating with the Dow Corporation to try to incorporate valuing nature into the company’s practices, many at the Conservancy still have doubts about the partnership — and about our work with corporations in general. (If you don’t believe me, see Kent Wommack’s contribution to this issue.) Those doubts are often assuaged by the details of what TNC is doing with Dow; so in last month’s *Chronicles*, I ran [four pieces from our Sustainability Science Team](#), the TNC science group closest to the project, about the collaboration and the work thus far at the first Dow pilot site. For this month’s issue, I reached out to some conservation luminaries not associated with the partnership — three external authors and one internal — to get their thoughts about the risks and opportunities as we continue to deepen our conservation work with

business. I didn’t obligate these authors to comment on the TNC-Dow collaboration directly; however, all did, and at length. In addition, Michelle Lapinski, Jen Molnar and Peter Karevia of TNC respond to the discussants in this issue. The forum isn’t meant to be a comprehensive look at the topic, but when you ask Kent Redford, John Robinson, Wommack and Katrina Brandon to be your discussants, you figure you’re getting a decent head start. Feel free to fill in the gaps you see: send your responses to me, and I’ll publish them in July’s *Chronicles*.

When I first came to the Conservancy almost six years ago to run editorial for our broad digital efforts, I quickly learned about a couple of no-go topics for TNC: green living and education. (I learned about the green living one by accident, when I invented without asking anyone a web feature called “Everyday Environmentalist,” featuring our green tips from our staff and scientists.) Today, of course, green living is a dominant strain of

our communications (I take no credit for the trend), and TNC at last has entered the education arena with [Nature Works Everywhere](#), a partnership with Discovery Education that has the potential to help cultivate conservation awareness in hundreds of thousands of students through classroom lesson plans and activities. Nature Works has made a great start, with six science lesson plans built to standards for middle-schoolers and six accompanying videos starring TNC scientists such as Judy Haner and Stephanie Wear on location, talking about how people benefit from nature’s many different guises, from forests to coral and oyster reefs. Focus groups of teachers are responding well to the offerings, and more videos and lesson plans are on their way. Led by Sanjayan, TNC Science has been integral to the effort, and project director Sara Elliott is the effort’s brilliant mastermind. I hate to use the dreaded phrase “game-changer,” but Nature Works could be one. Check it out. **SC**

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1. To bring you the latest and best thinking and debates in conservation and conservation science;
2. To keep you up to date on Conservancy science — announcements, publications, issues, arguments;
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Forum

Conservation and Corporations

Dow-ism and Nature

By Kent Redford, Archipelago Consulting

Dao (or *tao*) is literally translated as “way,” but can also be interpreted as “road,” “path,” or “doctrine” (<http://en.wikipedia.org/wiki/Daoism>). So on what path or doctrine did The Nature Conservancy embark when, in early 2011, [it announced a “breakthrough collaboration” with the Dow Chemical Corporation?](#)

One thing about this path: Despite being called “breakthrough,” it is well-trodden. In a recent piece, John Robinson (2011) outlined the history of conservation NGO engagement with the corporate sector — a history that began at least as far back as 1990 and which has considerably expanded since. Such conservation-business partnerships are so firmly established that in 2002 the Convention on Biological Diversity recognized private firms as full partners in its efforts. In fact, TNC itself has a well-established practice of working with corporations — the Conservancy’s website says TNC has done so for “decades” and more than 30 companies are listed as partners. The association of conservation with business has been going on so long that it has fostered its own school of critique of what is being called “neoliberal conservation” (Igoe and Brockington 2008) — the “re-regularization of nature through commodification,” making nature available to national and transnational elites. There is even a dyspeptic kiss-and-tell book called *Green Inc.*, criticizing conservation-corporate partnerships, with many pages devoted to TNC (MacDonald 2008).

So how is this Dow partnership different than all these others? In last month’s *Science Chronicles*, Jennifer Molnar stated that the TNC hypothesis behind formation of the collaboration was this: “If companies consider the often unrecognized benefits from nature, that consideration will lead to improved outcomes for both business and the environment.” She went on to say that the collaboration will be a large experiment. I hope that TNC will take this framing of “experiment” as an exercise in adaptive management and, with its powerhouse approach to strategic planning, self-administer a strong dose of conceptual modeling. It would be nice to know — and to be proudly told by TNC — what is being measured and why and how learning will be used to adapt. *That* combination would be a breakthrough.

It is a shame that the Dow collaboration is not being presented by TNC as part of an evolution in learning how a large conservation organization can successfully learn to work with corporations. In our business, things seem not to be valued unless they are new — and, since everything has to be new, by definition no one can have learned from previous efforts. But the Dow effort is not a new type of collaboration — so how is TNC going to capture what it and other conservation organizations have already learned and

“How exactly will the experience with Dow contribute to influencing other businesses? We must learn how to do this because there is no time or money to go about collaborating one company at a time.”

build upon it? And how exactly will the experience with Dow contribute to influencing other businesses? We must learn how to do this because there is no time or money to go about collaborating one company at a time. As lamented by both Jonathan Higgins and Jeanette Howard in last month's *Science Chronicles*, too often model projects end up with no mimics — the promised leverage never appears. I hope that the Dow collaboration will break through this barrier as well — but the leverage mechanisms to promote corporate behavioral changes are unclear at this point.

Then there is the new TNC mission and the attendant push to dramatically increase the number and diversity of TNC members, with a particular push into urban conservation. As many are already aware, pollution and other industrial crimes in urban settings in the United States have left a deep scar and given rise to the environmental justice movement — a dynamic rarely considered by mainstream conservationists. How will collaboration with industrial giants like Dow read to this movement? I hope someone in TNC has this factor covered; but if not, bad perceptions within urban communities of the work with Dow could impede that work.

My last point. "Nature" has been called the most complicated word in the English language. So when TNC says that Dow will "recognize, value and incorporate nature into global business goals, decisions and strategies," exactly which "nature" are we talking about? Is it only those parts of the non-human world that can be shown to be of economic (and attendant public relations) value? Fresh water, coastal wetlands and urban forests are important, but will TNC make sure that these are only the beginning of a long list of components of nature that are included for consideration? (Curiously, "biodiversity," which is much better suited for this concept of collaboration with business, is obscured in the publicity). I certainly hope that TNC will not forget the innumerable life forms which cannot ever form corporations with which collaborations can be formed but in whose name so many of us are such strong supporters of TNC. Corporate collaborations for nature with success measured by conservation of biodiversity — this is the path I hope we will travel together. **SC**

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References

- Igoe, J. and D. Brockington. 2008. Neoliberal conservation: A brief introduction. *Science and Society* 5:432-449.
- MacDonald, C. 2008. *Green, Inc.: An environmental insider reveals how a good cause has gone bad*. Lyons Press, Guilford, Connecticut.
- Jennifer Molnar. 2012. [Science in the TNC-Dow collaboration. Overview: The business case for conservation](#). *Science Chronicles* (April).
- Robinson, J.G. 2011. Corporate greening: Is it significant for biodiversity conservation? *Oryx* 45:309-310.

Conservation and Corporations

What Would Rachel Do?

By Kent Wommack, managing director, conservation lands, The Nature Conservancy

As part of our regular assessment of business practices, the Conservancy recently surveyed staff to ask what they saw as major risks to the organization and our mission. The most mentioned concern was the reputational risk of working with corporations.

No one suggested a complete ban on working with businesses; after all, TNC has worked with companies large and small for half a century. Dozens of preserves, wildlife refuges and parks now exist because we convinced their corporate owners to voluntarily preserve these special places.

We have also partnered with forestry companies to influence the management of hundreds of thousands of acres of working forests. In 1992, TNC even loaned a nearly bankrupt paper company \$50 million in an effort to save both its working forest lands and 1,100 paper mill jobs. We've advised companies on how to harvest trees more sustainably, and even pay them to do it on TNC-owned land. While it seemed like a bold and risky strategy when we pioneered this approach more than a decade ago, today it is considered mainstream conservation — not something that even registers a mention on the Conservancy's risk-assessment survey.

But now TNC is dramatically expanding the types of companies with which we work. Energy, mining, agricultural and chemical companies have joined the ranks of our "traditional" collaborations with forestry companies. In theory, helping each of these sectors learn to operate with a lighter environmental footprint could advance our mission as much or more than promoting sustainable forestry. And unlike a few decades ago, many of these corporations are now actively seeking ways to be more sustainable. They sincerely want advice on how to improve their environmental, human rights and social practices.

So what feels different — and more risky — about these engagements?

For one, we are all protective of TNC's reputation; we take pride in being part of an organization that truly values "integrity beyond reproach." And daily headlines make clear that this value is not a universal corporate trait. We don't want TNC's brand tarred by an unfortunate association with others, and we know that corporate reputations can change overnight. Ten years ago, Walmart was disdained for its employment practices, and BP was an environmental darling for its stated commitment to move "beyond petroleum." By 2010, BP was discredited by the Deepwater Horizon disaster, and Walmart was winning environmental awards for using its market clout to promote sustainable wood products and organic foods. Then came Walmart's recent bribery scandal in Mexico. It's enough to make any well-intentioned NGO wary.

"Reputational risk is real; if our brand is diminished, it undermines our effectiveness everywhere we work. We need to recognize that working with corporations on business practices takes a lot more time, resources and, yes, standardized operating procedures than we have had to date."

The fact is: No company is perfect. Larger corporations often bring higher risks, but also greater ability to lead the way toward more sustainable practices, if they are so motivated. Of course, we need strong government regulations to set minimum standards, and TNC works to promote strong standards based on science. But practices really improve when corporate leaders are willing to go beyond existing regulations and try new approaches, and then join us in advocating for higher government standards based on successful pilot projects. For those companies that aspire to be environmental leaders, TNC has critical scientific knowledge, tools and trusted relationships that can make all the difference.

That said, we need to be realistic and even smarter about how we engage with companies. Reputational risk is real; if our brand is diminished, it undermines our effectiveness everywhere we work. We need to recognize that working with corporations on business practices takes a lot more time, resources and, yes, standardized operating procedures than we have had to date.

We cannot afford to take on too many engagements at once, or to respond to offers in an opportunistic or uncoordinated manner. We must choose carefully which few industries we are best positioned to influence, make clear-eyed judgments about the commitment and motivations of individual companies, and then be completely transparent about our choices and our dealings with them. Working together on a discrete issue or practice should not imply we endorse everything the company does.

We also need to acknowledge that some outcomes from projects like Dow may not be known for years. Even if successful, replicating and leveraging these pilots into broad corporate or government policies will take even longer, if it happens at all. This is really important work, but it is not always as quick or, for some, emotionally satisfying as setting aside a beloved parcel of land.

Perhaps that is why Rachel Carson helped found TNC's Maine chapter in 1956. At the time, she said she wanted "to do something practical" for the environment. When *Silent Spring* was published several years later, this unassuming scientist was vilified by some industry leaders as a radical environmentalist who wanted to ban all chemicals. However, from the start, Carson was clear that she simply wanted to encourage their responsible and carefully managed use, based on good science and an understanding of each pesticide's impact on the whole environment. Thanks to her, the Maine coast today not only has lots of protected habitat but also, thankfully, healthy eagles and songbirds.

Of course, she was right. The world needs real places protected, but we also need much more sustainable practices if we want healthy ecosystems and human communities to endure. Changing social and corporate practices may be even harder than TNC's traditional work, but I think we owe Rachel and future generations our best efforts at both. **SC**

Conservation and Corporations

The Challenge of Aligning Corporations to Conservation

By John G. Robinson, chief conservation officer and executive VP, conservation and science, the Wildlife Conservation Society

Conservationists see engagement with corporations as a powerful way to affect conservation. The sheer financial size of many companies makes them influential in national and international policies and decision making. Many multinational corporations today have more resources to influence conservation than the governments of small countries. With increased globalization, national governments in turn have less ability to effectively regulate private companies. So what corporations decide to do relative to the natural world matters.

Many CEOs of companies have taken leadership roles in the societal dialogue promoting sustainability and the need to minimize the environmental impact of business operations. Corporate leaders helped establish the World Business Council for Sustainable Development in 1992, and they remain active in the United Nations Global Compact (formed under Kofi Annan in 2000) to promote social and environmental best practices. Under informed leadership, many corporations have established Corporate Social Responsibility (CSR) policies that are responsive to environmental concerns, and have sought to implement these policies in their business practices.

CSR policies can be much more than just a constructive response to social and environmental problems. By adopting these best practices, corporations can differentiate themselves from competitors, provide marketing opportunities, attract socially responsible investors, improve employee morale and productivity, and generally provide the corporation with a “license to operate.” In other words, once implemented, CSR practices can also be profitable, and are likely to receive support from corporate stakeholders.

But corporations frequently struggle with implementing the directives from the CEO or the boardroom, and have difficulty translating CSR commitments (such as “sustainability” or “minimizing biodiversity loss”) into on-the-ground practices. For example, mining companies such as Barrick Gold, Freeport-McMoRan, Rio Tinto and Vale have long been recognized for leadership in the corporate community regarding their positive statements about the need to preserve the natural environment. Rio Tinto in particular has sought to achieve a “net positive impact on biodiversity” in its mining operations. Yet mining companies continue to be poster children for environmental disregard in many of their operations.

The contradictions between pronouncement, policy and practice can be understood by recognizing the incompatibility, which is more common than not, between business operations and conservation of biodiversity and ecosystem services. This “reality check”

“There is a strong conservation rationale for engaging with corporations. However, we must also recognize the limited ambition of that engagement.”

is so often disappointing to those of us in the conservation community who work closely with corporations. There are exceptions, of course, such as those in the businesses of ecotourism or carbon trading. But most companies are in the business of exploiting natural resources, producing commodities that ultimately derive from nature, or converting natural areas into land more productive for human commerce. By definition, these business operations have a negative impact on biodiversity and degrade and fragment ecosystems.

Companies can, of course, seek to mitigate the negative impact of their operations. Company CSR policies frequently strive to decrease those companies' reliance on natural resources, offset their impact, minimize their reliance on the services provided by natural ecosystems, and make their ecological or carbon footprint as light as possible. Often companies do so by increasing efficiency and decreasing waste, and as noted earlier, these measures can also improve the bottom line. But while these practices can decrease the negative impact compared to what the corporation might have been doing previously, the net is still negative.

From the perspective of organizations like The Nature Conservancy, even just decreasing the negative impact of a corporation's activities must be seen as a contribution to conservation. The TNC-Dow collaboration is an appropriate alignment of interests, given the impact that Dow has on natural resources worldwide as well as TNC's understanding of the value of ecosystem services. If the collaboration provides a better quantification of the value of ecosystem services upon which Dow's operations depend, that would be a useful gain in knowledge. If Dow were, in addition, to invest in protecting those ecosystem services, and not just treat them as a free good, then it would be a contribution to conservation.

There is, therefore, a strong conservation rationale for engaging with corporations. However, we must also recognize the limited ambition of that engagement. Conservationists strive to conserve the biodiversity and the full range of ecosystem functions and services. The concerns of corporations are more limited and self-interested, and relate to their businesses and ultimately their shareholders. And even if corporations establish strong CSR practices, their activities will still generally continue to degrade the natural world, albeit at a slower rate. **SC**

Conservation and Corporations

Missing Principles of the Dow Collaboration

By Katrina Brandon, independent consultant

As a TNC member and conservation scientist, I welcomed this opportunity to learn and comment on what was announced as a “breakthrough collaboration to help Dow and the business community recognize, value and incorporate nature into global business goals, decisions and strategies.” I firmly believe that conservationists must work with all stakeholders, and I have worked on the socio-economic trade-offs between conservation and development for nearly 30 years. So when I read the three short pieces on the science of this collaboration thus far in last month’s *Chronicles*, I felt something was missing. That’s it? Could it really be that the extensive and positive PR for TNC’s collaboration with Dow was because TNC and partners were crunching some new numbers on ecosystem service valuation (ESV) that Dow could use internally? There had to be more. So I reviewed everything from legal opinions to newspaper articles, scientific articles, Dow’s sustainability information, TNC’s documentation, and publications on business and sustainability.

The more I searched, the more troubled I was. I looked for criteria that would help conservation groups decide when and how to engage with industry. I found that TNC had these, but they were primarily oriented at helping TNC avoid bad PR; to protect it from being accused of greenwashing, a lack of transparency, corruption, etc. I also looked largely in vain for positive principles or criteria for measuring the benefits, impact and leverage of working with corporations. So I offer here a few examples (given imposed word length) of the missing principles or analysis that might have reshaped, or blocked, TNC’s engagement with Dow.

Scope of collaboration/sustainability: This collaboration essentially helps Dow improve its bottom line. Fair enough; that is what its shareholders want. And yes, the findings may convince Dow that they should plant trees, restore wetlands and monitor river water flows — and then do these at all their facilities. All good. But what about sustainability “outside” of Dow’s bottom line? Shouldn’t sustainability analysis be broader, going beyond enhancing profitability to the impacts of business and product lines on biodiversity and ecosystem services? Would TNC advise a major fishing company on all elements of their internal business practices (energy efficiency, processing plant waste, etc.), but ignore the ecosystem-wide impacts of fishing? If not, isn’t this TNC-Dow venture inconsistent across business sectors? This collaboration is solely an “introspective” study, and fails to consider the broader impacts of Dow’s business.

Uniqueness of collaboration: What makes TNC the “best” partner for Dow? What is the special value added that TNC contributes? Sure, it has environmental scientists and economists, but does TNC bring something unique beyond what a consulting firm or

“What makes TNC the ‘best’ partner for Dow? What is the special value added that TNC contributes? Sure, it has environmental scientists and economists, but does TNC bring something unique beyond what a consulting firm or university would? What is the scientific value added?”

university would? What is the scientific value added? TNC is involving numerous partners, but I'm not seeing either TNC's science capacity or global reach used here uniquely, or effectively.

Novelty: What is new about the collaboration or research? The field of incorporating ESV into corporate decision-making has exploded recently, with hundreds of valuation exercises, high technical capacity, and many models. TNC admits as much in last month's *Chronicles*: "There are often existing methods and models that we are able to use or adapt at the pilot site." So the ESV analysis isn't really novel. And hundreds of companies have done analysis on reducing their energy costs, improving water efficiency and wastewater treatment, reducing packaging and waste, and incorporating ESV goods and services into their operations. Where is either the cutting-edge science or new elements of corporate engagement?

A proper list of criteria would go on, adding Leverage, Impact, etc. But I want to examine where the collaboration could have gone.

One component of the TNC-Dow collaboration values how wetlands can mitigate hazards. Justifiably, Dow is highly concerned about the Freeport levee, which helps "protect \$6.3 billion in property, mostly at 75 Dow chemical plants." Given intensifying storms, if the levee fails, the potential impacts to Dow plants and the environment could be catastrophic. Shouldn't a sustainability analysis consider the potential impacts of hazards on the site's 75 chemical plants and the related environmental risks? Wouldn't a sound analysis assess what range of actions, whether nature-based or not, could mitigate those hazards and/or make sure the levee holds? What are the potential impacts, environmental implications and costs of each option within a portfolio of actions that Dow could implement to reduce hazard threat? Wouldn't a skilled benefit transfer analysis provide good-enough estimates of ESV so that a broader assessment could be made (recognizing that economic values change quickly as perceived service need increases)? Does the collaboration really push either the science or economics envelope?

Similarly, for the ESV of Brazos River water value, why is the analysis so limited when there is now a huge, current and complex social, economic, political and legal conflict over water use and ownership of the Brazos River water? TNC will provide information on water flow, quality and value that can add to this litigation over water withdrawals and ownership by a quasi-governmental authority. Is this tailored analysis the best use of TNC science and economics? Couldn't Dow pay someone else to do this analysis, and couldn't TNC have a greater impact examining the impact of Texas water rights law on biodiversity, ecosystem services and ESV beneficiaries (farmers, ranchers, industry, urban, recreation, species) around critical watershed conservation sites in Texas?

The most significant and far-reaching impact and leverage between NGOs and the private sector was via engagement with Wal-Mart, which moved beyond addressing environmental efficiency and sustainability "within" Wal-Mart to looking at the

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sustainability of nature's goods (e.g. wood and fish) across their supply chain, reaching 100,000 global suppliers and leveraging similar commitments from other major retailers, like Carrefour, to adopt similar principles. What if TNC really wanted to move beyond just helping Dow improve its own bottom line to helping Dow change its sustainability metrics to focus "outward," maximizing sustainability science with higher leverage and impact? Wouldn't a key component of such "outward" sustainability be to understand, map and help integrate sustainability into the use of what Dow sells?

For instance, do we understand the impacts of Dow's chemicals and their threshold effects on ESV, and wouldn't a scientific synthesis and plan to scale up better and more proactive management of chemical use across critical landscapes have a huge impact on biodiversity and ESV? I found great, if geeky, analysis for just one Dow chemical, chlorpyrifos, with titles like: "Wildlife Vulnerability And Risk Maps For Combined Pollutants" or "[Effects of Chlorpyrifos and Aldicarb on Flight Activity and Related Cholinesterase Inhibition in Homing Pigeons, *Columba livia*: Potential for Migration Effects](#)" and even "Golf at a Crossroads: Hazardous or Healthy Strategies." Dow sells chemicals, people play golf, and golf courses are supposed to look a certain way; so how do we do all three sustainably, and what does that mean for biodiversity and ES provision? Couldn't a real collaboration push both Dow and TNC a little out of their comfort zones to really address sustainability at broader scales?

Frankly, if I had negotiated this deal for Dow, I would have wanted much more from TNC's scientists; and if I were TNC, I'd either be framing sustainability differently, or getting paid vastly more for providing business consultancy services. **SC**

Katrina Brandon is a social scientist who has published and worked on conservation and development since an undergrad research project involved her in disputes over South Florida development, water rights, the Miccosukee Indians and Everglades National Park. She has worked at WWF, the World Bank, Conservation International, and was the first senior fellow in TNC's science program. She now consults on issues including protected areas, macroeconomic and development policy, poverty, agriculture, climate change adaptation and ecosystem services.

Response: ‘This Work Will Have Enormous Appeal’

By [Michelle Lapinski](#), director of corporate practices, and [Jennifer Molnar](#), director, Sustainability Science Team, The Nature Conservancy

Skepticism about the Conservancy’s collaboration with the Dow Chemical Company isn’t new to us. When we talk with the Conservancy’s staff, partners and donors about this initiative, the first question we often get is: why is TNC working with a chemical company? The answers are about the Conservancy’s vision for the future of conservation and the planet. We want and need to get this work right, for the potential it holds to transform both business and conservation.

For some time, the Conservancy has recognized that we can’t purchase or fund all of the protection and restoration of nature that the growing needs of human population as well as Earth’s still-abundant biodiversity will require. Governments and corporations (as the discussants all acknowledge) are a huge and growing part of the equation; they now drive so much change in our world — for better or worse. That’s why TNC and the conservation community need to partner with both to find new conservation solutions, and why the Conservancy is dramatically increasing its focus on this work.

But we also need to be smart about it. The Dow collaboration represents a new type of corporate project for the Conservancy — one that, with its goal of influencing corporate practices, goes far deeper than our past work, and opens us to both incredible opportunities for conservation as well as considerable risks. We want to be sure that we design and conduct this collaboration in a way that allows us to achieve its bold goals while managing those risks. To those ends, we have asked and continue to ask ourselves the tough questions the discussants have raised and many more.

In addressing the responses specifically, we want to focus on three questions that the discussants raised:

- What is new about this collaboration between TNC and Dow?
- What do we mean by “the value of nature”?
- Are we just consultants for Dow?

What’s New About This Collaboration?

There are two primary ways this collaboration is new — for TNC, for conservation and for business.

1. It takes the Conservancy’s engagement with companies to the next level;
2. Its goals go well beyond what companies have done regarding embedding the value of nature in a business.

“Simply put, our work will ultimately require a strategic and cultural change across Dow.”

TNC has a long history of working with companies, but this initiative goes beyond what we've done in the past to effect change within business practices in the corporate sector. While other companies have begun to look at and test ecosystem valuation, Dow and TNC are going beyond the test cases (which have treated mostly single decisions, sites or ecosystem services) to look at how to embed the value of nature across the entire range of a corporation's business practices. To do this, we are building on past experience and lessons in both of these areas, but taking those to new levels.

Simply put, our work will ultimately require a strategic and cultural change across Dow. This transformation will range from developing new business and sustainability goals, to identifying the types of decisions that should include evaluating nature, to identifying the factors the CFO and business-unit leaders should consider when evaluating new sites, site changes, and new product and service lines. As John Robinson points out, corporations struggle with implementation — how to put policy into practice, how to apply a new technique widely, how to scale up a pilot. This collaboration aims to answer that concern. We want Dow — and, after it, many other companies — to move from novel concept (*why and how do ecosystem services and biodiversity matter to Dow and companies in general?*) to actuality (*what do companies need to do to change their business goals and processes to account for nature and represent its value?*).

While we are focused on detailed analyses at the first Dow pilot site and are now scoping the second pilot, over the course of the five years of this collaboration, our scope of engagement with Dow will be much broader. We designed the collaboration to include three site-based pilots representing diverse conditions and aspects of Dow's business. These pilot sites allow us to bring together both the Conservancy's expertise in assessing ecosystem services and our on-the-ground knowledge of conservation in the region while investigating tangible linkages between business operations and the value of nature. The first pilot addresses Dow's oldest and largest facility — accounting for 20% of the company's global production. We felt it was important to review Dow's core business functions and work within the conditions of a site with long-standing methods and operations. Later pilots, planned for Brazil and Asia, will include new business models, supply chains and other aspects of the business to ensure a diverse portfolio of pilot sites and issues.

Here is the challenge or "newness" of this work: The Conservancy is taking ecosystem valuation — which generally involves complex data sets, economic and geospatial analysis, and models that take months to run — and rendering all of it into new operating instructions for one of the largest companies in the world.

That is pathbreaking. While some companies have made commitments to reduce or even mitigate and offset their impacts to nature, no company, NGO or consultant has figured out how to eliminate those impacts, let alone create restorative ones.

And this work will have enormous appeal across the private sector. Companies increasingly are aware of the economics of their relationship with nature — costs of

“The Conservancy is taking ecosystem valuation — which generally involves complex data sets, economic and geospatial analysis, and models that take months to run — and rendering all of it into new operating instructions for one of the largest companies in the world. That is pathbreaking.”

supply chain disruption, opportunities for new ecosystem-based products and markets, license to operate and corporate reputation affected by impacts on environment, and emerging requirements to access capital or comply with policy. More than ever, companies are looking for examples of how to do business differently to mitigate these risks, and turn a better understanding of their relationship to nature into opportunity.

What is the “Value of Nature”?

This collaboration has the goal of showing companies that it makes sense for their bottom line to consider the value of nature in their business. Demonstrating this value benefits the Conservancy by building conservation into the DNA of some of the actors most influencing how nature is used. And such a demonstration will help corporations capture opportunities and manage risks that they wouldn’t recognize otherwise. It’s this value that motivates companies to include nature in their core business goals and strategies.

We are looking at the private benefits that nature provides a company. But, as Robinson cautions, if we did only that work, it would be an easy sell to self-interested companies and would represent but a narrow slice of the values of nature. So we are also assessing (a) the benefits that that same nature provides to the public, as well as (b) the ecosystem values themselves. Where possible, we will include economic measures of these values, but where we can’t, we will use other measures. Our analysis is comparing scenarios — business as usual with business informed by the value of nature. And we are looking to inform corporate decision makers on how companies and others benefit from and impact these resources. While public and ecosystem values may not be directly tied to a company’s bottom line in the same way as water coming in a pipe from a river or timber from a forest, how a company impacts those values can affect its profitability in indirect ways — including through license to operate in a landscape, reputation locally and at the corporate level, community relations, and even effects on their staff who live in the region.

So we are looking to make the case to companies that all of these values of nature matter to them — to them as companies and to the public as well as the ecosystem value itself. And the collaboration is looking to provide tangible data and tools that companies can use as factors in decision-making alongside more traditional business costs and benefits.

Are We Just Consultants for Dow?

And finally, we wanted to address the question that Brandon raised directly and others alluded to — are we just consultants to Dow? What is unique about TNC’s role in this collaboration?

It bears repeating: Critical to this collaboration is the potential for wide dissemination of evidence and tools and, ultimately, behavior change in the broader

“We are looking to make the case to companies that all of these values of nature matter to them — to them as companies and to the public as well as the ecosystem value itself.”

corporate community. Both Dow and the Conservancy share that goal. It's even baked into the funding for the work: 70% is from Dow's foundation, and it explicitly mandates that we develop tools and share our results publicly. Dow's leadership and prominence in the corporate world and the Conservancy's in the conservation and conservation science community means that this is an ideal collaboration for maximizing the dissemination of our results. But working with Dow is just the first step, as we will engage other companies and industry groups (some in formal collaborations such as this one with Dow) to ensure that our evidence and tools are broadly applicable — and ultimately actually applied across industry. To term the initiative a private consultancy ignores its potential to catalyze dramatic change in a sector increasingly open to the value of nature.

A number of previous examples inspire us that we are on the right track. For instance, the Greenhouse Gas Protocol developed by the World Resources Institute and the Global Reporting Initiative, a spinoff of the Coalition for Responsible Economies, are today mainstream methods for calculating corporate carbon emissions and reporting on corporate sustainability and social responsibility, respectively. But at one point companies did not measure or report either of these, and the tools did not exist. These initiatives began with an NGO working with a small set of companies to develop methods that would work across many companies. In the process, those methods developed into standard protocols for doing business.

Our hope is that one day we'll see every company in the Fortune 500, the Global 1000 and beyond adopt policies that commit to no net impact on biodiversity and ecosystem services, consider the value of nature in the decisions they make, and use these policies to guide new product, service and site investments. But it will take one, then a few, then many, companies working to develop and apply these methods, with the help of experts — NGOs and scientists — in the value of nature, to do so. **SC**

Reaction: ‘The Risk is in Not Doing This’

By [Peter Kareiva](#), chief scientist, The Nature Conservancy

I read all of these essays — and they all make good points — but none of them make the points I would make when asked to think about the promise and perils of engaging with global corporations to advance conservation, and in particular thinking about the Dow endeavor.

First, I bring my background in ecology to the corporation discussion. Ecology has the very important notion of “keystone species” — species in an ecosystem that, by virtue of what they prey on or compete with, shape the entire ecosystem and make it what it is. Ecologists seeking to manage ecosystems pay attention first and foremost to keystone species. Well, global corporations are the keystone species of global ecology — shaping the flow of energy and materials and land conversion around the world. Conservation has to work with them. In the background of many conversations about corporations is the whiff of an old political ideology and worldview about capitalism — the sense that corporations are always dangerous, never to be trusted, always forces of destruction. Obviously, many corporations have damaged and will continue to damage the environment. But corporations also create jobs and organize efforts to produce goods that we all love and use daily. In short, corporations are like any institution — they are run by people who make mistakes or in some cases seriously misbehave — just as is the case with churches, universities, sports teams, governments and families. Leave your political ideology at the door and engage with corporations as the keystone species of the Earth System.

What is New with the Dow Collaboration?

First, the science is very new. This cannot be overemphasized. Application of coastal hazard models to compare green versus grey infrastructure is entirely new — the vague idea of doing the comparison has been around for a while, but no one has done the calculations and analysis in a real place with a real decision on the line. Totally new. Similarly, the thought of taking some simple models and single-tree measurements and scaling them up to ask if replanting a large forest could mitigate ozone pollution is totally new. Yes, the hydrological analyses of the Brazos River rely on off-the-shelf models — but the combination of that off-the-shelf hydrology with climate scenarios is relatively new. Sure, others are doing these types of analyses around the world, although I am hard pressed to come up with any publication that delivers clearly and cleanly the intersection of climate scenarios over a short time frame with whole basin river management and stakeholder consideration.

Second, as John Robinson points out, corporate partnerships have tended to be built on a model of social responsibility, with that social responsibility translating into some market advantage for the corporation. And yes, there are hundreds of sustainability

“Global corporations are the keystone species of global ecology — shaping the flow of energy and materials and land conversion around the world. Conservation has to work with them.”

reports issued by companies and lots of corporate sustainability officers. But their emphasis has been on emissions and energy efficiency, too narrow an emphasis to serve conservation's needs. That is not the Dow collaboration. With this initiative, we are examining the hypothesis that an integrated quantification of ecosystem services (not just carbon and energy) will lead to business practices that favor nature because these ecosystem service analyses reveal a bottom-line payoff from investment in nature. This hypothesis is truly different. Read the 400 sustainability reports from the 80% of Fortune 500 companies that issue such reports; you will discover none of them address this challenge.

Where is the Leverage?

One key component of leverage for this and similar collaborations is the idea that the CEOs of our corporate partners — for example, Andrew Liveris of Dow — will be champions for the effort and will go out and invest money, energy and time in persuading governments and the business world of the good sense of valuing nature. Liveris is doing this; he is an important part of our leverage. It is far better for the CEOs of corporations to be the instruments of leverage than for TNC to be the lever. We should and will pick companies to work with where the CEO of the company is willing to be a champion, and where the company is a significant-enough global player that it matters that its CEO is a champion. Dow exemplifies this profile.

The second and often unfulfilled source of leverage is the power of a good idea. NGOs commonly think that we simply need to just show evidence of a good idea succeeding and then magic happens — it spreads. The shortcoming of this model, as Redford astutely notes, is that it usually does not happen. So, coupled with the good idea, one needs a smart and effective communications and outreach strategy that gets the information out in many different venues, compellingly presented — and with transparent access to all data. I do not simply mean media opportunities — I mean communication that includes leadership panels, serious reports, strong web materials, scientific publications, accessible popular articles — the whole shebang. We have not yet done this with the Dow project, and we need to.

Why TNC?

To make corporate engagement a globally coherent strategy (as opposed to a series of one-off successes or failures), a conservation organization needs to have:

- Operations and staff in the United States and internationally in most key countries;
- Strong academic partnerships — my bias is to think you need the Natural Capital Project;
- A science staff and culture that is cohesive enough and strong enough to touch down in the United States and in countries such as China and Brazil and meet with local science staff who already have some deep knowledge of the area; and

“We should and will pick companies to work with where the CEO of the company is willing to be a champion, and where the company is a significant-enough global player that it matters that its CEO is a champion. Dow exemplifies this profile.”

- Leadership at the top that can meet corporate leaders on their own turf and speak their language.

A few other NGOs meet the above requirements. But if you review the above list, I think you can see that TNC is a good choice. Universities do not have staff on the ground in different countries — they could never do this on their own. Consultant firms need profits at every step and cannot afford a long-term strategy that accepts failures.

Where is the Risk?

The risk is in not doing this. Imagine a world in which global corporations routinely neglect the importance of nature to their enterprise — in which they fail to see that their investments would be undermined if certain thresholds are crossed and ecosystems are so injured that degraded water, depleted soils and extreme weather create a world that is hostile to business productivity. It is better for the Conservancy to tackle the big important problems and fail than to play it safe and do what we know how to do because we are worried about our reputation. We should worry more about the state of the planet in 2030 than our reputation — and the state of the planet in 2030 is going to be largely shaped by corporate practices and operations. **SC**

Drinking from the Fire Hose

A quick monthly roundup of interesting articles, websites and other experiences collected by your editor. Send your suggestions for future roundups to rlasz@tnc.org.

1) [Why Journalism is Dying](#) ([stdout.be](#)): Newspaper readership is a landslide of erosion: While 40% of Americans surveyed three years ago said they'd miss newspapers if they disappeared, only 25% felt the same way this year. Software developer Stijn Debrouwere knows why: The news is being nibbled to death...by "almost news" replacements. Not just Facebook and Twitter and Wikipedia, but [EveryBlock](#) and [Quora](#) and [Curbed](#). This has big implications for conservation, too: It's not enough for us just to *be* on social media; we need to look out for all our competitors who are brokering nature on social, too, and in ways more accessible than we're providing. Small is killing big.

2) [Australian Project Simulates Effects of Runaway Climate Change](#) ([The Guardian](#)): From what I can tell, this decade-long study by the University of Western Sydney is being run by the artist Christo (you know, the guy who wraps whole islands in fabric). The researchers are constructing "six fibre glass and steel ring structures 28 metres high and 25 metres in diameter" that will encase a plot of native woodland in New South Wales to recreate therein an atmosphere where CO2 reaches 550 ppm...all to see how biodiversity in the canopy will react. The hypothesis? Not well.

3) [slaveryfootprint.org](#): How many slaves work for you? I mean, harvesting the cotton in your clothes, the minerals in your iPhone, weaving your carpets and making your kids' soccer balls? According to the Slavery Footprint Network, which made this entirely-too-fun-for-the-subject interactive survey, the supply chain of our consumer society "enslaves more people than at any time in human history" — 27 million. My count? Nine. (Not including my direct reports.)

4) [A Sharp Rise in Retractions Prompts Calls for Reform](#) ([The New York Times](#)): That there's a blog called [Retraction Watch](#) tells you a lot about the rise of retracted articles by scientific journals (tenfold in the last decade) — what one scientist calls a sign of an underlying "dysfunctional scientific climate" of "perverse incentives" that lead researchers to cut corners and fake results. Among the factors: Too many PhDs competing for too few positions; the pressure to get grant funding; and the rush to publish before somebody else does. Reformers want to ditch the priority rule and pressure universities to prize collaboration over competition. "I don't think they have much chance of changing what they're talking about," says Harvard's David Korn.

5) [Workflowy](#): Some of us make lists on index cards, some in fancy Italian notebooks, some in Word docs and text files. We then lose these lists, make new lists, confuse our lists, buy expensive to-do programs to keep track of our lists, buy more such programs, give up on those, just give up, and take up sheep herding. But what if there was a cloud-based software that brought all of your lists together into one? That made those lists infinitely expandable and collapsable? Searchable and tag-able and mobile? So that you could see you whole life or just one tiny piece, in a single place? This is it. **SC**

Viewpoint

A Non-Scientist Takes a Nature Walk

By [Jeannie Patton](#), LANDFIRE program coordinator, The Nature Conservancy



The little creek a half-mile from my back porch has saved my sanity for years.

Image: Coal Creek.
Image credit: Jeannie Patton/TNC

A small footpath parallels Coal Creek near my home in Lafayette, Colorado. There's not much to the creek — born at 9,000 feet above sea level, it meanders through pine and spruce forest, across grasslands and through farm land, through two towns, and ends up in the South Platte River northwest of Denver.

When miners discovered seams of carbon along the creek's course, it was nearly doomed. 1859 through 1956 were tough years; "manhandled" is an understatement. Yet it survived and is recovering nicely, thanks to protected-space rules and caring neighbors.

For years, I've walked a five-mile loop that leads to the next town over, usually stopping halfway at Vic's Coffee Shop to relax with a cup on the patio where the creek and path part ways. I love this path and little creek, but realize that I've taken it for granted.

On my last coffee break, I thought of what Pulitzer Prize-winning author [N. Scott Momaday](#) wrote: “Once in our lives we ought to concentrate our minds upon the Remembered Earth. We ought to give ourselves up to a particular landscape in our experience, to look at it from as many angles as we can, to wonder about it, to dwell upon it. We ought to imagine that we touch it with our hands at every season and listen to the sounds that are made upon it....” *The Way to Rainy Mountain*

I returned home, downloaded The Nature Conservancy's "[Nature Treasure Hunt](#)" (primer for four to seven year olds), printed out the Treasure Hunt checklist and returned to the creek. Like they say, begin simply, one foot in front of the other.

Coal Creek is about 25 feet at its broadest, but mainly it's in the six-to seven-foot range. The trail winds through a riparian ecosystem; therefore, cottonwoods, cattails, bulrush and other grasses are thick. The air smells punky in all seasons, especially when autumn/winter's pungent odors of rot, renewal and revegetation take over.

It's overhung and shady for the first mile, and then opens to the edge-of-the-prairie flat landscape of western plains, with Denver to the southeast. The Rocky Mountain Continental Divide stands like a wall to the west. Horizon-wide views expand in all directions from the high point, a small rise that makes a fine sledding hill.

I know some things from merely seeing and listening with no particular purpose: a fox lives nearby — it scoots away when I approach. Ubiquitous coyotes party all summer and most of autumn. A pair of geese hangs around near what I call the “duck bridge,” and owls watch walkers from the high reaches of cottonwoods standing at the trailhead. Prairie dogs are plentiful, as are hawks, thus keeping things in balance.

That's it. And so to the Treasure Hunt:

1. **Find something round.** Easy. I collect creek rocks. They rest on the fireplace mantle, make up the centerpiece of the dining room table, sit in the gear shift box of my car and are arranged in a mini-sandbox on my desk at work. Though I know it's against the “leave things in place” rule, there are plenty to spare. Forgive me.
2. **Jump like a frog, growl like a bear and flap your wings like a bird.** Well why not? When no one is looking, and quickly.
3. **What's the smoothest thing you can find?** Other than aforementioned creek stones: a peeled cottonwood branch, silvery and dead for ages.
4. **Discover evidence that an animal has been here.** Sorry to say, dog poop — an ongoing problem when humans don't take care of doggie business. Prairie dog holes. Duck feathers on the creek bank.

“I have all the time in the world...I will imprint these five miles so deeply on my consciousness that they appear in my dreams.”

5. **Find something that smells good or bad.** Very good smell: pungent, rotting, wet leaves. Very bad smell: the dog poop I mentioned.
6. **Listen for a bird.** What else can you hear? Squirrels carousing in tree branches. Chipping sparrows. Grackles. Magpies. Prairie dog whistles. Water burble. One goose honking. My splooshy shoes slipping through slush & mud.
7. **Find a place where an animal would be happy.** Only one? Favorite: warm, partly sheltered riverbank bend is a year-round duck and goose spa. There are five blue bee hives on a hill. Three prairie dog towns thrive in spite of the hawks.
8. **How many different colors can you find?** Mid-winter: straw-yellow grasses, green grass on creek bank. Black-coffee-brown and red decaying cottonwood leaves. Chocolatey, muddy path. The hive boxes. Rusty barbed wire fence strung on peeling, weathered silver-ish wood posts.
9. **Dig in the ground with your hand or flip over a rock or log.** Mucky leaves under the log. Wet dirt. Corner of a leaf. Mud.
10. **Find something that moves.** Always moving water, even in winter. Birds flitting & shouting. Prairie dog running from holes A to B. Tail twitch of a squirrel. The owls fly away.

A co-worker suggests that I return to the creek with a “geeky science type” who will identify what’s there, using the Latin names. That highly educated person would observe disturbances, suggest areas for restoration, and comment on the state of the creek’s health.

I’m not interested in that. As Momaday suggests, I will touch, wonder, dwell, imagine and remember. I’ll download the next in the series of Treasure Hunts, and continue to take the exploration slowly, paying attention to the little things right in front of me. I have all the time in the world.

I will imprint these five miles so deeply on my consciousness that they appear in my dreams. **SC**

The Coda Files

George Schuler

Think being or hosting a Coda Global Fellow is mysterious and unattainable? Think again! The Coda Global Fellows program enables staff to apply their talents beyond their regular job to forward the Conservancy's global priorities. Coda Fellows can be anyone. They can be anywhere. They could even be...you. So step with us into...The Coda Files.

“Not a junket in the Caribbean,” George Schuler emphatically notes of his Coda Fellowship. He’s thinking of the long hours he and his host, Kimberly John of the Caribbean Challenge, spent on WebEx meetings and an in-person workshop with the five teams that represent the eight countries formally enrolled as part of the Challenge, a sustainable finance mechanism to bridge the gap in funding needed for conservation for this region.

George used his fellowship to help work through the gaps in logic and focus on how information from monitoring would actually be used, how and by whom, making it crystal clear how data would be translated into action. “People knew how to get this monitoring information to the right audience,” he says. “But it’s very important how you organize what information a program has and then set up how it will be used. This experience helped me crystalize how we at TNC work as teams and I’ve definitely taken lessons learned to my own work.” In his day job, George has reorganized how TNC’s Eastern New York program interacts with its trustees to focus on assessing the program’s measures.

People measures remain a challenge in the Caribbean and elsewhere. “I also learned we need to have more than a sociologist,” George says. “We have to have someone with a real vision of how the human dimension might manifest itself. It has to be someone nimble enough with conservation and people to see how they might come together in

Coda Fellow: George Schuler

Day Job: Director, Conservation Science & Practice; Co-Director, Eastern U.S. Conservation Region Anadromous Fish Program

Assignment: Caribbean Challenge

Duration: January – June 2011

Task: Help 5 country teams prepare, facilitate and follow-up on recommendations from the Caribbean Challenge measures workshop.

Most Important Lesson Learned: “A measures plan doesn’t need the full set of indicators. More important is to identify critical outcomes, exit-points where you need to make management decisions.””



this work. I believe there are already folks in TNC with enough experience to hold a proper dialog about what the project team really cares about.” Kimberly John agrees that the dialogue only started at the program’s retreat in the Dominican Republic. “After weeks of virtual meetings we were finally all together under one thatch-hut,” she recalls. “We realized that, although we’ve been incorporating human well-being into our projects for years, we needed to take our work to another level; to understand and define our social objectives.”

A key finding/conclusion of George’s fellowship, he says, was that the intuitive side of measures are figuring out what a project or program really cares about and the crucial stop/go points. These are critical to making sure that assessments really work toward better conservation. **SC**

— [Jensen Montambault](#), applied conservation scientist, Central Science, The Nature Conservancy

The Coda Global Fellows program enables staff to apply their talents beyond their regular job to forward the Conservancy’s global priorities. Burning science needs? Want to share your skills with a global priority? Contact [Jolie Sibert](#), director of the Coda Global Fellows program!

Science Shorts

What Really Counts

Leinster, T., and C.A. Cobbold. 2012. Measuring diversity: The importance of species similarity. *Ecology* 93(3):477-489.

Conservation's [irrepressible hipness](#) (or at least its potential!) as described in last month's *Chronicles* is called into question by this article, which suggests all currently accepted measures of biodiversity are hopelessly "naïve." They are also, the authors explain, smoke and mirrors: the apparent diversity of diversity indices are really just basic repackaging of the simple species count that blithely calls the difference between a Parrotfish and Pangolin and a Swainson's Thrush and Louisiana Waterthrush exactly the same. Instead, this article offers a nuanced diversity profile which may edge us closer to understanding the way in which the biodiversity concept relates to ecosystem function, or at least a more accurate painting of the living bits of an ecosystem's composition. The authors acknowledge the persistent challenge in getting really accurate field measurements, but guide us back to consider an original scientific principle: *What is a meaningful answer to your question?* **SC**

— **Jensen Montambault**, applied conservation scientist, The Nature Conservancy

Organic? Not So Much

Seufert, V., N. Ramankutty, and J. Foley. 2012. Comparing yields of organic and conventional agriculture. *Nature* 485: 229-232.

When people get together and talk about foods — especially organic foods, the discussion often gets ideological, and leaves science behind. That is a mistake — we need unvarnished scientific assessments of different forms of agriculture in terms of yields, environmental impacts and health. The best study I have ever seen on the topic was just published on 10 May — a meta-analysis of 316 conventional-to organic yield comparisons. Organic foods have several benefits. But they also have drawbacks. Specifically, when matched with conventional agriculture in comparable systems, the yield of many organics is only two-thirds that of conventional agriculture. This would imply we'd need more land to feed people if we relied on organics. But some organic crops fare quite well compared to conventional — most notably fruits. And that extra land organics may require could be more than offset by the reduced nutrient effluent from their fields. **SC**

— **Peter Kareiva**, chief scientist, The Nature Conservancy

Responsible BBQers Choose Chicken

Bouwman et al. 2012. [Exploring global changes in nitrogen and phosphorous cycles in agriculture induced by livestock production over the 1900-2050 period.](#) *PNAS* early edition.

Nitrogen runoff, dead zones and nitrogen pollution are well-known to conservationists. But I bet most do not realize the extent to which livestock — especially beef — contribute to the problem. The expansion of the global market for beef, plus the inefficiency of beef in terms of meat production per unit of N excretion, is bad news in terms of future dead zones and water quality. But as Bob Dylan wrote, “*there must be some kind of way out of here.*” And that way is chicken — the N excretion per kilogram of meat produced for poultry is 1/10th of that for beef! The broader lesson is that livestock systems are highly variable and often have much greater environmental impacts than crop system — warranting attention from conservation. **SC**

— **Peter Kareiva**, chief scientist, The Nature Conservancy

I Have One Word for You, Son

Tharp, A. et al. 2012. [Bisphenol A alters the development of the rhesus monkey mammary gland.](#) *PNAS* early edition.

Bisphenol A (BPA), which is a building block of many plastic packaging materials, has been found in the urine of more than 90% of Americans. Most experimental studies of BPA have examined rats, with uncertain applicability to humans. Now we have results using rhesus monkeys as the subjects in which exposures to BPA, at levels many humans are likely routinely exposed to, affected the development of mammary glands in fetal monkeys. BPA is but one of many chemicals we are exposed to with impacts that may or may not be something to worry about. Toddlers exposed to BPA have shown altered behavior, and high BPA levels in the urine of men are associated with sexual dysfunction. But the toddler and male dysfunction studies are plagued by the weakness of all epidemiology — factoring correlation from cause. In contrast, the experiments by Tharp et al. with monkeys leave no room for ambiguity. To me, it is clear we need to build a complete and synthetic understanding of our chemical world — especially the chemicals we are routinely exposed to, and to ask what alternatives might exist. I am leaning towards focusing on organic fruit off trees with no packaging and my tasty barbecue chicken. **SC**

— **Peter Kareiva**, chief scientist, The Nature Conservancy

New Conservancy Publications

Conservancy-affiliated authors highlighted in bold.

Please send new citations and the PDF (when possible) to: pkareiva@tnc.org and rlalasz@tnc.org. Please include "Chronicles Citation" in your subject line so we don't miss it.

Some references also contain a link to the paper's abstract and/or a downloadable PDF of the paper. When open source or permitted by journal publisher, these PDFs are being stored on the Conservation Gateway, which also is keeping a running list of Conservancy authored science publications since 2009.

Butchart, S.H.M., J.P.W. Scharlemann, M.I. Evans, S.Q.S. Aricò, J. Arinaitwe, M. Balman, L.A. Bennun, B. Bertzky, C. Besancon. **T.M. Boucher** et al. 2012. Protecting important sites for biodiversity contributes to meeting global conservation targets. *PLoS One* 7(3): e32529. doi:10.1371/journal.pone.0032529.

DeFries, R., E. Ellis, F. S. Chapin III, P. Matson, B. L. Turner II, Arun Agrawal, P. Crutzen, C. Field, P. Gleick, **P. Kareiva** et al. 2012. Planetary Opportunities: A Social Contract for Global Change Science to Contribute to a Sustainable Future. *BioScience*. <http://www.jstor.org/stable/10.1525/bio.2012.62.issue-6>

Ehrlich, P, **P. Kareiva** and G. C. Daily. 2012. Securing natural capital and expanding equity to rescale civilization. *Nature*, in press.

Fitzsimons, J. 2012 Cows, cockies and atlases: Use and abuse of biodiversity monitoring in environmental decision making. In: *Biodiversity Monitoring in Australia* (eds D.B. Lindenmayer & P. Gibbons) pp. 91–99. Melbourne: CSIRO Publishing. <http://books.google.com.au/books?id=w7N5TwY94dQC&printsec=frontcover#v=onepage&q&f=false>

Fitzsimons, J.A. 2012. Green Rosellas *Platycercus caledonicus* nesting in artificial structures. *Australian Field Ornithology* 29:50-53. <http://search.informit.com.au/documentSummary;dn=244137431629946;res=IELHSS>

Liermann, C.R., C. Nilsson, **J. Robertson**, and R.Y. Ng. 2012. Implications of dam obstruction for global freshwater fish diversity. *Bioscience* 62(6):539-548.

Lindenmayer, D.B., P. Gibbons, M. Bourke, M. Burgman, C.R. Dickman, S. Ferrier, **J. Fitzsimons**, D. Freudenberger, S.T. Barnett, **C. Groves**, R.J. Hobbs, R. T. Kingsford, C. Krebs, S. Legge, A.J. Lowe, R. McLean, **J. Montambault**, H. Possingham et al. 2012. Improving biodiversity monitoring. *Austral Ecology* 37:285-294.

Montambault, J., and **C. Groves**. 2012. Making monitoring work: Lessons from The Nature Conservancy. In D. Lindenmayer and P. Gibbons (eds.), *Biodiversity Monitoring in Australia* (ch. 15). Collingwood, Victoria, Australia: CSIRO Publishing.

Putz, F.E., Zuidema, P.A., T. Synnott, M. Pena-Claros, M.A. Pinard, D. Sheil, J.K. Vanclay, P.Sist, S. Gourlet-Fleury, **B. Griscom**, J. Palmer, and R. Zagt. 2012. Sustaining conservation values in the selectively logged tropical forests: The attained and the attainable. *Conservation Letters* DOI: 10.1111/j.1755-263X.2012.00242.x.