

COMMENTARY

Selling out on nature

With scant evidence that market-based conservation works, argues **Douglas J. McCauley**, the time is ripe for returning to the protection of nature for nature's sake.

Probably the most important trend in conservation science at the moment is 'ecosystem services', typically seen as economic benefits provided by natural ecosystems¹. They form the basis of most market-oriented mechanisms for conservation. The underlying assumption is that if scientists can identify ecosystem services, quantify their economic value, and ultimately bring conservation more in synchrony with market ideologies², then the decision-makers will recognize the folly of environmental destruction and work to safeguard nature.

But market-based mechanisms for conservation are not a panacea for our current conservation ills. If we mean to make significant and long-lasting gains in conservation, we must strongly assert the primacy of ethics and aesthetics in conservation. We must act quickly to redirect much of the effort now being devoted to the commodification of nature back towards instilling a love for nature in more people.

Gold rush

The proponents of market-based mechanisms for conservation bolster their argument by repeatedly citing one example: the Catskill/Delaware Watershed. Through this project, New York City invested in conserving a watershed that filters its water as effectively as a filtration plant, and more cheaply.

A growing number of ecologists, economists and environmental scientists hold this shining example aloft and proclaim that where there



The incentive to conserve the Catskill watershed could be lost if technology replaces natural filtration.

is one golden nugget, there must be others. They describe, mostly in hypothetical terms, a world of win-win scenarios. It is a message with broad appeal: for the public, which is notoriously averse to bad news; for business-oriented politicians, who see an opportunity to further liberalize markets while appeasing the environmentally anxious; for philanthropists who wish to do good without straying too far from their economic comfort zones; and for foundations that want to use the familiar capitalist rhetoric of ecosystem services to draw out new or wary donors.

It is both true and obvious that 'ecosystems', in some sense of the word, are necessary for human survival. It is also true that there will be cases in which it will be lucrative to protect nature, and that people will derive benefits from this conservation effort. However, ecosystem services are rapidly assuming an importance in discussions on conservation that is far out of proportion to their actual utility.

As conservation tools, ecosystem services are limited in four fundamental ways. First, the logic of ecosystem-service-based conservation rests on the implicit assumption that the biosphere is benevolent — that it provides us with useful services and protects us from malevolent

abiotic forces such as hurricanes, floods and rising temperatures. This reasoning ignores basic ecology: environments don't act for the benefit of any single species. There are myriad examples of what might be labelled 'ecosystem disservices'. Trees take water out of watersheds³; forests may be contributing to global temperature increases⁴; wild animals kill people and destroy property⁵; and wetlands can increase the risk of disease⁶. Market-based conservation strategies, as currently articulated, offer little guidance on how we are to protect the chunks of nature that conflict with our interests or preserve the perhaps far more numerous pieces of nature that neither help nor harm us.

Markets in flux

Second, although most conservationists would argue that nature should be conserved in perpetuity, the strength and direction of market forces that are now being called upon to motivate nature conservation are anything but perpetual. The often illusory and ephemeral relationship of the market to conservation is well illustrated by the case of a former coffee plantation, Finca Santa Fe, in the Valle del General of Costa Rica⁷. A recent study found that native bees from two forest fragments



Profit-oriented conservation strategies may fail to protect animals that conflict with our interests.

adjacent to Finca Santa Fe yielded approximately US\$60,000 a year in pollination services to the coffee plants. This was hailed as an example of how conservation can yield 'double benefits' for biodiversity and agriculture.

Shortly after the conclusion of the study, however, Finca Santa Fe, probably affected by one of the worst dips in coffee prices this century, cleared its coffee and planted pineapple instead. Pollinators are irrelevant to pineapple production. So simple logic suggests that over a period of several years, the monetary value of the pollinators in forest fragments around Finca Santa Fe dropped from \$60,000 per year to zero.

To make ecosystem services the foundation of our conservation strategies is to imply — intentionally or otherwise — that nature is only worth conserving when it is, or can be made, profitable. The risk in advocating this position is that we might be taken at our word. Then, if there is a 'devaluation' of nature, as in the case of Finca Santa Fe, what are we to tell local stewards who have invested in our ideology, and how can we protect nature from liquidation?

Watershed down

Third, conservation based on ecosystem services commits the folly of betting against human ingenuity. The entire history of technology and human 'progress' is one of producing artificial substitutes for what we once obtained from nature, or domesticating once-natural services. One of the primary selling points for protecting the Catskill/Delaware Watershed was that the costs associated with constructing and operating a filtration plant would have driven up water prices in New York City. However, recent reports⁸ indicate that increased turbidity might ultimately force New York to turn to technology to filter its water, in essence negating this much-ballyhooed economic incentive for conservation.

Several other major US cities still rely on natural filtration, and in some of these cases it is difficult to imagine that technology will soon produce a cheaper artificial alternative to these natural watersheds. Yet it would also once have been difficult to imagine cost-effective manufactured alternatives to rubber and timber. Although we will never replicate all of the 'services' offered by nature, I would argue that conservation plans that underestimate the technological prowess of humans are bound to have short lifespans.

Lastly, although it has been suggested that in most cases the services that come from nature are valuable enough to make conservation profitable, making money and protecting nature are all too often mutually exclusive goals. Take the case of Africa's Lake Victoria, where the introduction of the invasive Nile perch (*Lates niloticus*) contributed significantly



Locals around Africa's Lake Victoria benefit from trading in the ecologically detrimental Nile perch.

to the decimation of local biodiversity while dramatically boosting the economic value of the lake. Local people profiting from trade in the fish hail its introduction as a success, whereas biologists have condemned the event as "the most catastrophic extinction episode of recent history"⁹. John Terborgh¹⁰, discussing similar issues in tropical-forest conservation, remarked that these forests are "worth more

dead than alive". If Terborgh's assessment is not always true, it is true all too often. So we must directly confront the reality that conservation may be expensive and stop

deceiving ourselves and partners in conservation with hopes that win-win solutions can always be found.

Infinite value

Are there other socially viable paths for conservationists besides the commodification of nature? Yes. Nature has an intrinsic value that makes it priceless, and this is reason enough to protect it. The idea is not new. We view certain historical artefacts and pieces of art as priceless. Nature embodies the same kind of values we cherish in these man-made media. Some ecologists claim that these intrinsic values, often referred to as cultural services, figure prominently enough in their valuation programmes. However, this co-option seems in many cases incongruous. I suggest that the aggregate value of a chunk of nature — its aesthetic beauty, cultural importance and evolutionary significance — is infinite, and thus defies incorporation into any ecosystem service programme that aims to save nature

by approximating its monetary value.

All of this is not to deny a role for ecosystem services in our general efforts to protect nature. Individual ecosystem services will occasionally prove to be useful bargaining chips in specific conservation plans and, as such, can meaningfully support programmes aimed at protecting nature for nature's sake. However, to avoid trading in significant long-term conservation successes for marginal short-term gains, philosophical clarity is essential and caution is needed. When we employ the aid of ecosystem services to help pay the bills of conservation, we must make it abundantly clear that our overall mission is to protect nature, not to make it turn a profit.

Some will argue that this view is simply too optimistic. They may believe that the best way to meaningfully engage policy-makers driven by the financial bottom line is to translate the intrinsic worth of nature into the language of economics. But this is patently untrue — akin to saying that civil-rights advocates would have been more effective if they provided economic justifications for racial integration. Nature conservation must be framed as a moral issue and argued as such to policy-makers, who are just as accustomed to making decisions based on morality as on finances.

The track record of achievements by conservationists motivated by a moral imperative to protect nature for nature's sake is impressive: consider the international ban on commercial whaling, the national parks of the United States, and the CITES ivory-trade ban. Meanwhile, the only 'successful' large-scale ecosystem-service-based conservation project yet achieved is the imperilled Catskill watershed. But this 'nugget' may turn out to be fool's gold.

We will make more progress in the long run by appealing to people's hearts rather than to their wallets. If we oversell the message that ecosystems are important because they provide services, we will have effectively sold out on nature.

Douglas J. McCauley is in the Department of Biological Sciences, Stanford University, Stanford, California 94305, USA.

"We will make more progress in the long run by appealing to people's hearts rather than to their wallets."

1. Daily, G. C. *Nature's Services* (Island Press, Washington, DC, 1997).
2. Millennium Ecosystem Assessment. *Ecosystems and Human Well-Being: A Framework for the Assessment* (Island Press, Washington, DC, 2003).
3. Hayward, B. *From the Mountain to the Tap: How Land Use and Water Management Can Work for the Rural Poor* (NR International, UK, 2005); available at www.frp.uk.com/assets/Water_book.pdf.
4. Gibbard, S., Caldeira, K., Bala, G., Phillips, T. J. & Wickett, M. *Geophys. Res. Lett.* **32**, L23705 (2005).
5. Woodroffe, R., Thirgood, S. & Rabinowitz, A. (eds) *People and Wildlife, Conflict or Co-existence?* (Cambridge Univ. Press, New York, 2005).
6. Willott, E. *Restor. Ecol.* **12**, 147-153 (2004).
7. Ricketts, T. H., Daily, G. C., Ehrlich, P. R. & Michener, C. D. *Proc. Natl Acad. Sci. USA* **101**, 12579-12582 (2004).
8. DePalma, A. *New York Times* New York's water supply may need filtering (20 July 2006).
9. Wilson, E. O. *The Diversity of Life* (Belknap Press of Harvard Univ. Press, Cambridge, Massachusetts, 1992).
10. Terborgh, J. *Requiem for Nature* (Island Press, Washington DC, 1999).