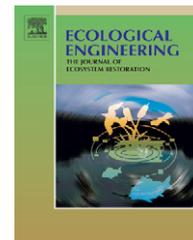




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Editorial

Knowledge overload, wisdom underload

As I was taking a break during a wetland restoration course I was teaching recently at the Olentangy River Wetland Research Park at Ohio State University with Bill Mitsch, I got an e-mail from a journalist providing an early release version of a paper (now published as [Samson and Rollon, 2008](#)) on mangrove restoration. It is a field I have worked and published in for 40 years.

The paper described a two-decade-long effort in the Philippines to restore mangroves after the loss of three-quarters of this important habitat (–337,000 ha). I am very familiar with the situation there, having worked in the Philippines on a USAID mangrove restoration project in the mid-1990s. The take-home message of the paper was that over this 20-year effort, some 44,000 ha of mostly non-mangrove mudflats, sand flats and seagrass beds had been planted with 440 million mangrove propagules, mostly *Rhizophora* species, at an estimated cost of US\$17.6 million, and to quote the authors, “the *Rhizophora* seedlings experienced high mortality” and the few that survived, often through persistent and redundant replanting, “had dismally stunted growth.” Just imagine a 20-year effort to restore just 10% of the Philippines’ lost mangroves, at a cost of tens of millions of dollars, being such a massive failure. A failure occurring because of an inability or unwillingness to apply basic ecological engineering principles previously outlined in this journal ([Lewis, 2000, 2005](#)) and others ([Turner and Lewis, 1997](#); [Primavera, 1995](#)).

The journalist had two simple questions. Does this reflect a relatively common problem in mangrove restoration, or is it unusual and therefore the paper will have an impact in the field? My answers were simple. “Relatively common problem? Yes. I said this same thing in 1999, 2000 and again in 2005. Nothing has changed.” I sent the journalist copies of [Stevenson et al. \(1999\)](#), [Erftemeijer and Lewis \(2000\)](#), and [Lewis \(2005\)](#), to the second question I responded “No, not in my opinion. Ignorance and greed rule.” More on that later.

As happens these days, I was seeing more and more similar comments on the failure of natural resource management and restoration efforts to really work in spite of massive financial efforts to both generate knowledge about what needs to be done, and implement a plan on the ground. Just in recent months a friend passed on a copy of *World Watch* with a paper on wild tiger (*Panthera tigris*) management ([O’Neill, 2008](#)). The author reports the expenditure of more than US\$41 million on tiger management efforts worldwide between 1998 and

2005. She notes that “like tiger conservation spending, having the research and knowledge needed to support effective and timely conservation action is not about quantity—the tiger is easily one of the most researched animals on the planet - but about sufficiency.” She cites the recent shock Indian researchers suffered when they discovered that the entire tiger population of its Sariska Tiger Reserve (more than 20 individuals) had disappeared! She notes that as recently as 2002, India estimated that it had 3500 Bengal tigers. But an actual count in February 2004 yielded only 1411. A drop of more than 65 percent. India is now proposing to spend about US\$150 million over the next 5 years on similar efforts.

Giovanni Bearzi’s editorial in the February 2007 issue of *Conservation Biology* ([Bearzi, 2007](#)) describes his two decades of research on the short-beaked dolphin (*Delphinus delphis*) beginning with these beautiful words “In the transparent blue waters surrounding the island of Kalomos there were plenty of these marine mammals, over 100 in a small area. They surrounded the boat every day and played with our inflatable. For a cetacean researcher, it was paradise.” Followed by “We used to see them every day, now it is once a month.” I would recommend every conservation and restoration professional read this paper and I would not belabor his conclusions or recommendations, but you can guess. Yes, lots of basic research and always a call for “another report, a more detailed investigation, a new meeting. These are fine initiatives, but only if they lead, eventually, to concrete steps to improve the status of the animals. Unfortunately, this is a rare outcome.”

So, my point? Around the world, whether it is mangroves, tigers, dolphins (and the latter two are certainly more charismatic), or hundreds of other plant and animal communities in peril, the job is not getting done, and this cannot in most cases be laid at the feet of research funding limitations. It can however be laid at the feet of a lack of both wisdom and real action on the ground based on the multitude of scientific documents generated each year. I will tackle the lack of wisdom first.

Wisdom is derived from real-world experience. Based on four decades of experience in the field, I have amassed a great deal of wisdom about marine plant community restoration. I teach it to hundreds of students per year, but as I tell them all, I struggled to teach myself what would work and what would not because there were no restoration training courses in my day. I think after these four decades and several hundred

“experiments” (and 50 or so peer-reviewed scientific papers on the subject) I have the basics down pretty well. As a result, I pass on all my “lessons learned,” in print, and in person, in courses like the one Bill and I were teaching when I got the journalist’s e-mail. My restoration work is an open book and I claim no trade secrets. I would suggest you, my colleagues, should do the same. Particularly those among you who are—shall we politely say—“senior professionals.”

I genuinely consider it a professional obligation to share in person and in printed review articles (see for example Lewis, 2005) the sum total of my knowledge so that younger professionals in our field can quickly bypass the painful mistakes I have made, and move on to new research topics and new discoveries. Do you? Let me suggest that as both ecological engineers and restoration science professionals we all consider the future of our young field of dreams. So, I ask whether in your participation in the ecological restoration field, you advance not only knowledge of the field, but more importantly, wisdom? A few suggestions:

1. *Make all your scientific papers as easily available as possible.* Do not just assume that everyone, including resource management professionals, has easy access to electronic versions of your papers from their university library. Put up a web page, and provide .pdf files if possible. If not, provide a URL link for access and purchase if required. Let everyone know with an up-to-date e-mail address that they can also request some or all of your papers by e-mail. Both Bill Mitsch and I do just that (see <http://swamp.osu.edu> and www.mangroverestoration.com)
2. *Consider the preparation of a synthesis or review paper summarizing the state of the science in your field.* Make it short, sweet and readable. Summarize your views. Take a stab at some hard-hitting summary principles and recommendations. You have learned a lot, pass it on. This journal welcomes your submittals.

Now the hard part. When do your professional and personal ethics allow you to take that big step from observer to advocate? When do you follow Bearzi’s advice to note and follow the sage advice of Margaret Mead: “No doubt that a small group of thoughtful, committed citizens can change the world: indeed it’s the only thing that ever has”? I freely acknowledge that action of this sort can place you in the political arena, and up against forces such as described by O’Neill (2008): “The ills of corruption, inefficiency, excessive bureaucracy, and just plain slowness...” To which I would add ignorance and just plain greed as I told the journalist. There is a lot of money spent on restoration work these days, and restoration work

pays well. Paradoxically, success is not required and planting, then replanting again and again pays even better.

I know crossing the divide from science to advocacy is certainly not something we all feel comfortable doing, or even can do legally or ethically in certain arenas. So just ask yourself the question “Is my day-to-day work, research, publishing and teaching leading to a better world?” and follow your heart. That is what I do every day, and because I do, I feel that I am a more successful human being and a better professional restoration scientist and ecological engineer. Please join Bill and me in these efforts.

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