

## Vital Signs

As editor of a journal dedicated to the practice and science of ecological restoration, I regularly troll favored sources of information, searching through a broad swath of current media for pertinent discussions. I always find articles of interest in the ecology and natural resources management literatures, of course, but equally important are mainstream media outlets such as the *New York Times* and the BBC. This past March, the *Times* carried a multipage article on the recent developments in the long-suffering Everglades restoration effort, noting that the state's South Florida Water Management District overseeing the restoration (and apparently paying private landowners way too much for some well-used land) will “end up with six large disconnected parcels under the current deal, including all of United States Sugar's citrus groves. State officials acknowledged that some of that land, which has been ravaged by canker, a plant disease, is useless for restoration” (Van Natta and Cave 2010).

The Everglades restoration effort is not the story a restorationist turns to when seeking to be heartened, but it is certainly an illustrative story of how far we have to go in terms of developing a trustworthy, effective, and timely process for public agencies and private landowners to collaborate in the name of ecological restoration. This conversation would not be happening if it were not for laws such as the Clean Water Act that push the state of Florida to move to protect the Everglades. But the law appears to be akin to firing a gun in the air, inciting everyone to take off in different directions, but not doing much to insure that people cooperate, coordinate, and move together toward a common, hopeful destination. (For an excellent presentation of the story of Everglades degradation and restoration see Michael Grunwald's *The Swamp: The Everglades, Florida, and the Politics of Paradise*.)

The weekly e-bulletin *RESTORE* from the Society for Ecological Restoration International is another great source of coverage of ecological restoration from mainstream and scientific sources. I also regularly scan newsletters from key nonprofits; the Environmental Law Institute's *National Wetlands Newsletter* is an excellent place to read about the implications of different environmental policies, as is the “Legal Planet” blog on environmental policy from the Berkeley and UCLA law schools. Government agency

publications such as the U.S. Fish and Wildlife Service's *Endangered Species Bulletin* and the U.S. Park Service's *Park Science* are very useful. I sometimes scan the table of contents from the *Proceedings of the National Academy of Sciences* as well as a number of environment-related listservers. I also treasure the small stream of newsletters sent to us from grassroots organizations describing recent projects, outstanding volunteers, and future plans.

By listening in on the talk emerging from these sources—some anticipated and some unexpected—I am seeking to read the vital signs of ecological restoration: how strong is the beat at the center points? How well do the capillaries carry a flow of discussion further afield? All this information can create a bit of a din, but our goal for this journal is to reflect some of the breadth of this important, emerging conversation. Yes, much of the time people talk past each other in more of a pontification than a conversation, but in the bigger picture I see emerging from the hubbub a negotiation. We are working to establish what should ecological restoration be doing and where? Who is doing it and how?

Speaking of doers, I was saddened to read about the passing of Professor A. Carl Leopold, the William H. Crocker Scientist Emeritus at the Boyce Thompson Institute on Cornell's Ithaca campus, who died last November. Carl contributed to *Ecological Restoration* most recently in the spring of 2008, reporting on his long-term efforts to restore tropical rainforest in Costa Rica (see *ER* 26(1):22–26). Carl Leopold was a pleasure for this editor to work with, and I am honored that this publication helped publicize his contributions to ecological restoration.

In 1992, with the assistance of colleagues, he founded the Tropical Forestry Initiative (TFI), a demonstration project for restoration of tropical forests in Costa Rica, on 140 ha called Los Arboles, near Dominical. The project is responsible for planting over 40,000 trees of various species, has hosted a number of students who have pursued research on tropical restoration, and has also created a carbon offset program. One offshoot of the initiative was a local community forestry collective begun in 1998, dedicated to forest conservation and replanting multiple seedlings for every tree cut down. The demonstration site at Los Arboles also serves as a nursery that supplies seedlings to local farmers and landowners.

Along with his forest restoration work in Costa Rica, Carl Leopold studied seed physiology at Cornell for 25 years. He also founded the Finger Lakes Land Trust, and

Greensprings, which advocates burial without chemical treatment. He was active in the Aldo Leopold Foundation, continuing his father's mission toward ethical land stewardship.

Carl Leopold clearly valued education and dedicated much of his life to creating opportunities for people to learn restoration by doing it. In an interview with *Grist* in 2007, he stated: "I believe in the environmentalism that is generated by real work out in the real ground. Working with the environment generates good environmentalism. It is mighty difficult to really love something that you know about only through words," (*Grist* 2007).

Leopold's statement is echoed by this issue's special theme editor James Aronson, who notes in his editorial on the following pages that there is no replacement for field work in restoration education. This issue of *ER* contains a number of Restoration Notes and full-length articles dedicated to the special theme: education and outreach in ecological restoration. The need for ecological restoration is growing greater by the day, as increasing numbers of people agree on the many reasons to restore degraded places, and this in turn raises the question of where and how people will be trained to do restoration.

I was reminded of this challenge recently reading an excerpt from Caroline Fraser's *Rewilding the World*, in which she writes:

Along with alternative energy, the emerging professions of ecological restoration and management will help to drive the economy in the future. Already thousands of jobs in developing countries have been created in ecotourism, law enforcement, and agroforestry. From design to implementation, rewilding projects create jobs for a host of specialities—soil assessment, land system mapping, wildlife surveys and management, fire management—and for people in the construction and landscaping fields. Already projects are being designed to store carbon over decades in newly planted native vegetation, to restore connectivity and biodiversity in large-scale protected areas, and to train workers in restoring and maintaining wetlands and removing invasive species. Such projects could constitute the centerpiece of a global jobs program in developing and developed nations alike, training workers in environmental science and carbon sequestration. (Fraser 2010)

Fraser's proclamation insists that we think about how people will be trained for all these new opportunities. In the following pages of this journal you can read about projects pursued by people with a similar vision who have

dedicated themselves to the challenge of training future restoration workers. James Aronson has pulled together an exciting collection of diverse educational efforts, targeted at school children, college-age students, and adults, that take innovative approaches to training, including elements of ecological science, policy, social science, history, art, and project management.

The collection in this journal is by no means comprehensive but shares a taste of the diverse audiences for ecological restoration education. One project we learned about too late to include in this issue provides scholarships for students to work in multidisciplinary teams to conduct in-depth analyses of the ecological, hydrological, and economic impacts of restoration at eight sites across South Africa. Educators associated with the program include James Blignaut, Martin de Wit, Karen Esler, David Le Maitre, Sue Milton, Steve Mitchell, and Leandri van der Elst. For each of the research sites, a team of hydrology, ecology, and economics students assesses the impact of restoration in collaboration with a resident researcher or organization. The flagship of the project is a multidisciplinary PhD program that seeks to create a model useful in policy and strategic decisionmaking through restoration scenario planning.

There are many other programs at work preparing people to take on the challenge of ecological restoration. As the hubbub reflected in the media reveals, ecological restoration is an ongoing conversation, and the skills required are still being negotiated. But the articles presented here indicate that the vital signs are good; a multipronged educational effort is quickly developing, creating restorationists with diverse skills and creative approaches, who are willing to think outside the box, and persevere for the long haul.

## References

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