

Conceiving the Science, Business, and Practice of Restoring Natural Capital

by James Aronson, Sue Milton and James Blignaut

Meeting at the
Missouri Botanical
Gardens brings
ecological
economists and
ecological
restorationists
together to discuss
natural capital.

Although not a new term, restoring natural capital is still very much the "new kid on the block" when one considers either ecological restoration or ecological economics. In essence, the term refers to the need for augmenting our natural resource stock if we wish to maintain or, ideally, increase flows of ecosystem goods and services to support an ever-growing global population. Capital augmentation as a strategy towards welfare enhancement is not new either. John Hicks (1946) referred to it for the first time shortly after World War II, although he only focused on manufactured capital. In brief, Hicks noted that if you do not keep your capital stock intact, you seem to desire to be worse off in the future than you are now! The principle that now bears his name can be applied equally well to natural capital.

Restoration of natural capital differs from, yet complements, conservation, which, although essential for preserving the current stock of natural capital, does not take sufficient consideration of human livelihoods, sustainable economic development, and the delicate relationship between man and nature. The Millennium Ecosystem Assessment (2005) has underscored this fact in no uncertain terms. Two of the four main conclusions from the assessment read as follows: Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet

rapidly growing demands for food, fresh water, timber, fiber and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth.

The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development, but these gains have been achieved at growing costs in the form of the degradation of many ecosystem services, increased risks of nonlinear changes, and the exacerbation of poverty for some groups of people. These problems, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems.

Meeting at MOBOT

The realization of the gravity of these facts brought together a group of some 40 restoration ecologists and practitioners as well as ecological economists from around the world (Australasia, Europe, Africa, and North America) for a symposium from October 30 through November 2, 2005 at the Missouri Botanical Garden (MOBOT) in St. Louis, Missouri. We were the guests of MOBOT's far-sighted director, Dr. Peter Raven, and Ms. Olga Martha Montiel, head of the Garden's five-year-old Center for Conservation and Sustainable Development. The symposium was a follow-up to an earlier meeting

we organized in September 2004 in Prince Albert, South Africa. Whereas the 2004 meeting brought together participants from developing countries in South America, Africa and Asia, the 2005 meeting focused on designing and refining strategies and tactics for restoring natural capital at local, national, and global scales. What was especially noteworthy was the full engagement and interaction among ecologists and economists, something not often observed and yet absolutely essential for making strides—conceptually and practically—at this critical time in terms of managing and evaluating the world's natural capital.

It is worth noting that the possibility of restoring ecosystems to augment natural capital, and the flow of economic goods and services, was suggested much earlier and independently by the ecologist John Cairns (1993) and the economist Robert Repetto (1993). Their advice was ignored until this prospect was brought to the attention of restoration ecologists in an essay written by Andre Clewell (2000). Thereafter, the topic was explored in special sessions organized by Clewell and James Aronson in 2002 at the first joint conference of the Ecological Society of America and the Society for Ecological Restoration International (SER) in Tucson, Arizona, USA, and at the Third European Conference on Ecological Restoration in Budapest, Hungary. Unfortunately, both these special sessions were notably lacking in economists.

The Program

The first day of the symposium in St. Louis was devoted to papers providing a contextual background of the topic. These included contributions by Andrew Carey of the USDA Forest Service, Pacific Northwest ("Defining and Evaluating the Restoration of Natural Capital"), Joshua Farley from the University of Vermont ("Defining and Measuring Natural Capital Stocks and Flows"), Joan Roughgarden from Stanford University ("Ecosystem Services and Our Relation to Nature"), Michael Rosenzweig from the University of Arizona ("Reflections on Reconciliation Ecology"), and William Jordan III

from the New Academy of Nature and Culture ("Getting Full Value: Ecological Restoration and the Development of a New Economy of Nature").

Each of these talks contributed hugely to the success of the symposium. Joan Roughgarden, for example, showed a three-way mathematical model that simulated human population growth, economic capital growth and natural capital growth, and simultaneously, solved which conditions of the economy, humanity, and natural capital

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(including biodiversity) would be required to achieve equilibrium. Interestingly, ignoring the parameters for equilibrium, especially those that contributed to high human population growth, demonstrated that the model might never reach equilibrium. This implies a continuous imbalance with an endless cycle between over-investment in economic capital with depleted stocks of natural capital leading to depleted economic capital with excess natural capital simultaneously. Hence, restoring natural capital in conjunction with managing economic capital growth, Roughgarden argued, is essential for economic stability and prosperity (for further information, see Brown and Roughgarden 1995).

The rest of the symposium was devoted to four workshop sessions. The focus of these workshop discussions was to seek ways to overcome challenges and barriers that hinder the restoration of natural capital at various scales. Key themes emerging from the workshops were 1) issues of economic valuation and decision-making related to the restoration of natural capital; 2) approaches to overcoming social, economic, and ecological barriers

to restoration at local and landscape levels; 3) tactics and strategies for the management of our ecological "footprint" at a global scale; and 4) financial and non-financial mechanisms, including a focus on policies and institutions, to make restoration "work" across all levels and in all socio-economic and political contexts.

The Upshot

In both Prince Albert, and more so in St. Louis, the "restoring natural capital" vision proved to be common ground for ecological economists and ecosystem restorationists. Both of these "sub-species" of *Homo sapiens* have worked in relative isolation for many years. They have developed different vocabularies, read different material, and understand and interpret ecological problems from different vantage points. Both, however, appreciate the essential function that ecosystem goods and services play in supporting life and fostering human welfare. Both are equally concerned that the rapid rate at which natural capital is transformed into manufactured capital cannot continue indefinitely. Finally, both realize that something has to be done at local, landscape, and global levels to circumvent a major economic, ecological, and anthropological catastrophe. It is this awareness that ties ecological restorationists and ecological economists together under the theme of restoring natural capital. This *consilience* ("jumping together") of various disciplines makes a stimulating configuration. By forming this pact, ecological economists and ecosystem restorationists can start to dismantle the information divide that exists between them and thereby generate creative ways of communicating ecological restoration not as a conservation strategy *per se*, but as a development strategy. Such a strategy could be harnessed together under the umbrella of "economics as if nature mattered and ecology as if people mattered."

The St. Louis Symposium, which was made possible through the generous support of the National Science Foundation, the Winslow Foundation, SER and the Missouri Botanical Garden, has already proved to be a major success. Bridges have

been built, innovative ideas and views have been expressed and existing ones have been sharpened, while new partnerships across disciplinary and continental boundaries have been forged. This has led to various collaborative initiatives among people in the developed and developing countries that might never have happened. In this sense, the symposium was not only a thought-provoking event, but also part of a larger, much more important process toward a better understanding for catalyzing action that has at its heart the search for a more balanced relationship between people and the environment.

The combined outputs of the Prince Albert and the St. Louis symposia will be published in 2007 as part of the SER International-Island Press book series, *Science and Practice of Ecological Restoration*. Some of the contributing authors, in addition to the people already mentioned, will include Gretchen Daily, Peter Raven, Richard Cowling, Richard Norgaard, Bob Scholes, Bill Rees, Dolf de Groot, Karen Holl, David Tongway, Keith Bowers, Steve Whisenant, Andre Clewell, and Mike Young. The book will include case studies

from around the world under the headings "targets for ecological restoration," "approaches towards ecological restoration," and "economic opportunities resulting from ecological restoration."

DISCLAIMER

The views reflected here are those of the authors and do not necessarily reflect that of any institution they might be involved with or the views of any of the other symposium participants.

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James A. Aronson is Head of the Restoration Ecology Group, Centre d'Ecologie Fonctionnelle et Evolutive (CNRS-UM.R. 5175), 1919 Route de Mende, 34293 Montpellier, France; and a research associate at the Missouri Botanical Garden, St. Louis, MO, USA; Telephone: + 33 4 67613284, james.aronson@cefe.cnrs.fr.

Sue Milton is a part-time professor in the Conservation Ecology Department, University of Stellenbosch and the FitzPatrick Institute, University of Cape Town, South Africa.

James Blignaut is a part-time professor in the Department of Economics, University of Pretoria, South Africa.