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Book Review: *The Work of Nature: How the Diversity of Life Sustains Us*, Yvonne Baskin, Island Press, 1997, 228 pages.

From Prairie Dogs to Oysters: How Biodiversity Sustains Us

by Mike Hudak, author of
Western Turf Wars: The Politics of Public Lands Ranching

Biodiversity. Ecosystem services. Keystone species. At last we have a book clearly written and for a general audience that explains these and many other environmental concepts and components. Furthermore, the book details their importance to human civilization through fascinating examples from around the world. It explains, for instance, the “value” of such apparently mundane entities as prairie dogs, oysters, hardwood trees and meandering rivers.

Let’s consider a few of the free ecosystem services nature provides.

- Fertilization: “Nitrogen-fixing microbes in the soil supply \$7 billion worth of nitrogen to US agriculture each year. Worldwide, microbes in agricultural soils annually fix an estimated 90 million tons of nitrogen, worth nearly \$50 billion.”
- Pollination: Insect pollinators provide an essential service to more than forty crops in the US worth \$30 billion annually.
- Pest control: by preying on insects that attack sugar cane, bananas and cocoa crops, the Anolis lizards of the Antilles Islands prevents annual crop losses as high as \$455 million. “Even a 1% drop in the lizard population might cost \$670,000 in reduced yields.”

Human tampering with nature has not been without costs. Baskin examines some of those incurred by the accidental or even deliberate introduction of alien species into ecosystems ill-equipped to function with them. For example:

- Gypsy moths brought to the US for study as silk producers annually cause tens of millions of dollars worth of tree damage.

- Eurasian cheatgrass, arriving with livestock feed in the 1880s has converted approximately 100 million acres of diverse sagebrush community in the American Great Basin into a monotonous annual grassland that permits soil erosion, promotes frequent wildfires and is altogether a less productive habitat for wildlife.
- Goats, introduced by early seafarers, have devastated vegetation on many Pacific islands, from the Galapagos north to the Channel Islands. Feral goats and pigs (another introduced species) are major threats to the native flora and fauna of Hawaii—home to more than a third of the officially threatened and endangered species in the United States. These animals trample and devour the islands' plants, denude slopes, increase soil erosion, and spread the seeds of exotic plants in their dung, encouraging further incursions by exotic plants.

Human manipulation of existing ecosystems has also sometimes had unfortunate consequences.

- Forest clearcuts: in the Pacific Northwest the soil fungi (which facilitate nutrient transport to trees) have often been so diminished by the practice that within five years up to 90% of replanted trees have failed to survive.
- “Artificial concentrations of a single species, such as monoculture plantings of crops or timber, can exaggerate natural but quite unpleasant biotic interactions, such as human pollen allergies.” In Japan, where diverse native forests of oak, maple, and evergreen have been replaced by economically valuable plantations of cedar, 10% of the human population has been affected by pollenosis, a level of allergic reactions to cedar pollen unheard of so long as cedars grew amid a variety of other species in natural forests.

What then are the prospects for “ecological restoration”?—the attempt to restore degraded environments to a fully functional and self-sustaining condition. Quoting Baskin, “So far, restoration ecology has yet to produce a clear-cut success, and most projects are still works-in-progress.”

In regard to wetland restoration and mitigation projects in the US Baskin writes, “Thousands of ill-conceived and largely unsupervised mitigation projects have been carried out, often with little monitoring or follow-up. Meanwhile, thriving natural wetlands have been bulldozed, drained and filled to make way for construction.” Citing a 1992 report by the US National Academy of Sciences: “There is no evidence that these restored wetlands can recreate fully functional ecosystems, and they cannot be relied upon to maintain biological diversity.”

Yet another study, by Joy Zedler of San Diego State University, examined coastal mitigation projects throughout southern California. Her conclusion: there was no instance

where ecosystem functioning had been successfully duplicated or where endangered species had been “rescued from the threat of extinction.”

Taking all these factors into account: the value of ecosystem services, the devastating effects caused by human tampering, and our current inability to restore what has been degraded or destroyed, Baskin concludes that until more is known about which species are indispensable to the functioning of ecosystems each species should be treated as an “irreplaceable resource that should be preserved for future generations unless the costs of doing so prove to be intolerably—not just inconveniently—high.” Convincing our elected officials of this is often difficult, especially when they are subject to pressure from industries more concerned with short-term profit than possible long-term threats to the earth’s life support services. Baskin’s book provides facts you can use in making the case to protect endangered species and other components of our environment.