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**Review: The State of the Nation's Ecosystems: Measuring the Lands, Waters, and Living Resources of the United States**

By the H. John Heinz III Center for Science, Economics, and the Environment

Reviewed by [Dan Tufford](#)

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H. John Heinz III Center for Science, Economics, and the Environment. *The State of the Nation's Ecosystems: Measuring the Lands, Waters, and Living Resources of the United States*. New York, NY: Cambridge University Press, 2002. 270 pp. ISBN 521-52572-1 (paperback). US\$25.00

In modern Western culture, ecosystem awareness has evolved from a somewhat obscure scientific concept a few decades ago, to its current state in the vernacular of a large proportion of the population. Today it is increasingly hard to find someone who does not have an idea of what an ecosystem is, however fragmentary or inaccurate the understanding may be. Yet even with increased awareness it is impossible to state with any certainty and credibility the current overall status of most critical ecosystems.

Some of the reason for this can be attributed to the origins of ecology in the reductionist sciences. Ecosystem status indicators are integrative measures. The act of looking at data seems unnatural or even erroneous to many investigators. The National Academy of Sciences and others asserted the need for indicators at various scales several years ago. Federal agencies, especially the Environmental Protection Agency, have been actively funding work to develop ecosystem indicators that are useful for policy development. The federal agencies encourage use of existing data but also facilitate collecting new data as needed to develop indicators that would otherwise be unavailable.

In 1995 the Heinz Center began an alternative approach. They organized a large group of people with expertise in particular ecosystems, developed a list of indicators for each ecosystem, then assembled available data to quantify the indicators. The result is *The State of the Nation's Ecosystems: Measuring the Lands, Waters, and Living Resources of the United States*.

This volume is clear in its stated purpose and never strays. The report aspires to be "an authoritative, comprehensive, and succinct overview" of the natural economy of the United States. It was prepared as a multi-year collaboration among dozens of experts in various fields, who were organized into broad-scale ecosystem work groups. In the composition of the group membership and the methodologies used for data collection and analysis, the organizers sought credibility and objectivity in the final report. This

report is expected to be the first in a continuing series, with a repeating interval of approximately five years. Thus a process is now in place to provide regular and credible reports to decision makers and the public at large.

The overall objective was to use existing data to develop a set of indicators of ecosystem state. Indicators were developed at the national level, then for ecosystem groupings as coasts and oceans, farmlands, forests, fresh waters, grasslands and shrublands, and urban and suburban lands. Within each broad category are indicators for system dimensions, chemical and physical conditions, biological components, and human uses. The number of individual indicators varies from one broad ecosystem grouping to another. There are one hundred three total indicators.

The report is in three parts. Part one introduces the rationale for the work, describes the study design, and provides a summary of the results. Part two is the core report, going through each broad category in detail. Each ecosystem grouping is introduced and described in its own chapter. Within the grouping each indicator is described, the data are presented, and the results are interpreted. An extensive collection of technical notes is provided in part three.

The developers of this report conceived a set of indicators to provide a coherent picture of critical components of the ecosystems of the United States. In many cases it was not possible to actually produce and interpret the indicator. Reasons include data unavailability and that the indicator needs more conceptual development. In that respect the report is as much a blueprint for further work as it is a description of current status.

For those who work with ecosystem state on a daily basis it is easy to understand the enormity of the task undertaken by the Heinz Center. It is also easy to puzzle over some of their decisions. The biggest one for me is their handling of nutrients in aquatic systems. Both nitrogen and phosphorus are treated inconsistently, so it is not possible to get a holistic picture over all systems. Given the importance of nutrient export to the significantly deteriorated state of many coastal areas, this seems a missed opportunity to invoke the integrative and scale-dependent nature of ecosystems in a way that is both useful and instructive for the target audience.

I believe that weaknesses such as this do not undermine the base value of the report. There could easily be hundreds or even thousands of indicators, not just 103, and the magnitude of the ongoing reporting could well be prohibitive. A balance between overall tractability and value at the policy and scientific levels was struck, and the result is truly impressive.

The real value of this effort will manifest itself if the envisioned regular updates take place. One reads the report with a sense that a previously unreported, critical

dimension of the economy of the country is being revealed. Like most economic indicator reports, it will be trends over time that carry the most meaning.

If this work does continue, no doubt there will be refinements to deal with widely perceived shortcomings and new scientific understanding. The data shortcomings noted in the report will hopefully generate needed monitoring and reporting. An extension of this work would be to integrate it with traditional economic reporting. The integration would bring this valuable work into its fullest and broadest application.

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