



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460**

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OFFICE OF THE ADMINISTRATOR
SCIENCE ADVISORY BOARD

EPA-SAB-09-012

The Honorable Lisa P. Jackson
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Subject: Valuing the Protection of Ecological Systems and Services: A Report of the EPA Science Advisory Board

Dear Administrator Jackson:

We are pleased to submit the accompanying SAB report on valuing the protection of ecological systems and services. There is increasing recognition of the numerous and important services that ecosystems provide to human populations, such as flood protection, water purification, and climate control. Protecting ecological systems and services is part of EPA's core mission. To determine the best options for protecting the environment and to demonstrate the full value of its actions to Congress and others, EPA must be able to fully and accurately value the ecological effect of its actions.

Unfortunately, as the accompanying report discusses, past efforts at EPA to value the Agency's protection of ecological systems and services have often suffered from a number of limitations. They have tended to focus on those ecological effects that are easiest to value because of available data or studies, rather than on the full range of ecological values that people care about. Where the Agency has valued ecological benefits, it has sometimes used outdated studies of benefits in one context to estimate the current benefits of protective measures in quite different contexts. In valuing ecological effects, the Agency also has generally drawn on economic methods and has not taken advantage of the full range of valuation methods that could be useful. Finally, valuations have often not adequately addressed uncertainty.

In an effort to strengthen the scientific basis of Agency decisions affecting ecological systems and services, in 2003 the SAB created a committee to examine ecological valuation practices, methodologies, and research needs. To ensure a broad perspective on this inherently interdisciplinary topic, the SAB appointed experts in decision science, ecology, economics, engineering, law, philosophy, political science, and psychology to the committee. The interdisciplinary character of the committee's analysis increased both the complexity of its discussions and the length of time needed to complete its study. Value is not a single, simple concept, and disciplines often have different understandings of what value is and how it should be measured. The resulting report is well worth the additional time and effort, specifically because it brings together these different perspectives. This consensus report represents the first major examination of ecological valuation to consider both economic and non-economic methods of valuation. We believe the report makes a significant contribution to the literature, while providing practical advice for EPA.

The report recommends that EPA take a number of steps to improve ecological valuation at the Agency. First, EPA should focus on valuing all ecological effects that people believe are important, not simply those effects that are easiest to value. To do so, EPA should begin each valuation by developing a conceptual model of the relevant ecosystem and the ecosystem services that it provides and use that model, along with information about relevant public concerns and needs, as a road map to guide the valuation.

Second, EPA should support efforts at the Agency and elsewhere to develop new approaches to measure or predict the ecological effects of EPA's actions in ways that valuation methods can incorporate. In particular, EPA should

focus on the development and use of “ecological production functions” that can estimate how effects on the structure and function of ecosystems will affect the provision of ecosystem services that are directly relevant and useful to the public. Where ecological production functions do not exist, EPA may be able to rely instead on ecological indicators or meta-analysis to provide information about the effects of governmental actions on these services.

Third, the Agency should consider the use of a broader suite of valuation methods than it has historically employed, so long as the methods meet appropriate validity and related criteria. The report considers the possible use of not only economic methods, but also measures of attitudes, preferences, and intentions; civic valuation; decision science approaches; ecosystem benefit indicators; biophysical ranking methods; and cost as a proxy for value. EPA could usefully employ some of these methods in identifying services of importance to the public (as recommended above), providing information about multiple sources and concepts of value, and better capturing the full range of contributions stemming from ecosystem protection. EPA can also improve its ecological valuations by carefully evaluating and overseeing its transfer of value information from one site to another and by more fully characterizing and communicating uncertainty. Because uncertainty will always exist, the mere existence of uncertainty should not be an excuse for delaying action, but the Agency should ensure that uncertainty is carefully analyzed and communicated in any valuation that EPA performs.

EPA should consider making greater use of ecological valuation in a variety of contexts and throughout the Agency. For this reason, the report discusses how the above recommendations can be implemented in three different contexts: national rule making, regional partnerships, and site-specific decisions. To date, the focus of ecological valuations at EPA has been national rule makings. However, as described in the accompanying report, EPA regional offices may also find valuation useful in setting priorities, such as targeting projects for wetland restoration and enhancement, or in identifying critical ecosystems or ecological resources for attention. Valuation may also be useful to EPA in making decisions about the remediation, restoration, and redevelopment of contaminated land or other sites. In addition, EPA may want to use valuations to assist state and local governments, other federal agencies, and non-governmental organizations in deciding how best to protect lands and resources and in communicating the suitability of particular management approaches. Because valuations in these additional settings are generally subject to fewer legal directives or restrictions than valuations conducted for national rule makings, they may be a particularly appropriate setting in which to test and evaluate the use of a wider range of valuation methods.

Finally, the report provides recommendations for how EPA’s research program can help provide the ecological information needed for valuation, develop and test valuation methods, and share data. A number of these recommendations reinforce the research plans already developed by the Office of Research and Development and other Agency groups.

The SAB thanks EPA staff in both program and regional offices for their help in the work of the committee and applauds the efforts that the Agency is already taking to improve its ecological valuations. As part of its work, the committee provided an advisory (EPA-SAB-ADV-05-004) for the drafting of EPA’s Ecological Benefits Assessment Strategic Plan, which previewed many of the recommendations in the accompanying report.

We appreciate the opportunity to provide advice on this very important topic, and we look forward to receiving your response. The SAB would be pleased to assist EPA in implementing the report’s recommendations, if the Agency would find the support valuable.

Sincerely,

/Signed/

Dr. Deborah L. Swackhamer
Chair
Science Advisory Board

/Signed/

Dr. Barton H. Thompson, Jr.
Chair
SAB Committee on Valuing the
Protection of Ecological Systems
and Services

/Signed/

Dr. Kathleen Segerson
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