

Ecosystem Services as Assessment Endpoints in Ecological Risk Assessment

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Abstract:

The focus of ecological risk assessment (ERA) is on assessment endpoints, explicit expressions of environmental values to be protected. Traditionally, the ecological entities identified in assessment endpoints have been components of ecosystems deemed by risk assessors to be important to ecosystem structure and function – the benthic community, for example. Yet, there is growing awareness that improved environmental management can be achieved by considering more explicitly how decisions affect the well being of people and society. Ecosystem services, the outputs of ecological functions or processes that contribute to social welfare, can complement traditional assessment endpoints by clarifying to the public the benefits and costs a decision will have to society. Ecosystem service assessment endpoints can improve the transparency of decision making by focusing ERAs on components of nature that nonscientists understand and value. By enabling a more complete evaluation of the tradeoffs involved with the alternative solutions being considered, decision makers can be more fully informed about the intended and possible unintended consequences of their choices. This presentation will describe efforts currently underway by the U.S. EPA's Risk Assessment Forum to establish the technical foundation needed to incorporate ecosystem services in ERA, and to identify generic ecosystem service assessment endpoints that can be considered during problem formulation. Several candidate generic ecosystem service assessment endpoints are considered, including catchable fish, clean water and air, climate regulation, water supply and flood protection, arable land and agricultural productivity, and aesthetic values. General guidance is being developed for selecting ecosystem service assessment endpoints, and for translating risk to traditional assessment endpoints to risk to ecosystem services. Several case studies are being conducted to highlight how use of ecosystem service assessment endpoints can enhance decision making that span several spatial scales and types of decisions. These include case studies covering local issues involving hazardous waste sites and conductivity in Appalachian streams, to broader issues encompassing threatened and endangered species and national scale assessments for setting air quality standards.