

**Background Material for Teleconference Call, December 3, 2003
for the EPA Science Advisory Board
Committee on Valuing the Protection of Ecological Systems and Services**

The information below provides background for the Planning Teleconference call tomorrow, December 3, 2004, 1-2:30 p.m. Eastern Time. It includes the following topics:

- A. Draft agenda
- B. Committee's Overall Charge and Desired Outcomes, Outputs and Long Term Objectives
- C. Reports on Six Themes Identified on October 28, 2003 Committee Meeting
 - 1) Purpose/contextual influences
 - 2) Values in a democratic society
 - 3) Alternative approaches/methods
 - 4) Analytical challenges in linking economic and ecological information
 - 5) Express delta value with respect to the nation's ecological assets; national environmental policy and investment.
 - 6) Institutional framework at EPA to facilitate benefits assessment
- D. Update on EPA News and Activities Related to the Committee
- E. Proposed Plan to Follow Up on Theme Group Work and Agency Requests
- F. Attachments
 - 1) EPA Office of Water Project, Workshop To Determine Research Needs To Support Ecological Benefits Assessment
 - 2) EPA Region 4 Project, Environmental Services and Benefits Analysis for a Critical Ecosystem Assessment of the Southeast

**EPA Science Advisory Board
 Committee on Valuing the Protection of Ecological Systems and Services
 Advisory Meeting
 Teleconference, December 3, 2004, 1-2:30 p.m. Eastern Time**

Purpose: To plan the Committee's work. Specifically to (1) raise clarifying questions to better focus themes work and (2) identify cross-cutting issues.

Draft Agenda – December 3, 2003

1:00-1:10	Opening of Teleconference Roll Call Review of Agenda and Materials Sent	Dr. Angela Nugent, Designated Federal Officer, EPA Dr. Domenico Grasso, Chair
1:10-1:40	Clarifying Questions for Each Theme Group leader (5 minutes per group)	Committee Members and Theme Group Leader (identified below) coordinating responses
	1) Purpose/contextual influences	Dr. Gregory Biddinger
	2) Values in a democratic society	Dr. Paul Slovic
	3) Alternative approaches/methods	Dr. James Boyd
	4) Analytical challenges in linking economic and ecological information	Dr. Mark Sagoff
	5) Express delta value with respect to the nation's ecological assets; national environmental policy and investment.	Dr. Dennis Grossman
	6) Institutional framework at EPA to facilitate benefits assessment	Dr. Barton H. Thompson
1:40-2:10	Discussion of Themes in Light of Committee's Overall Charge and Desired Outcomes, Outputs and Long Term Objectives	Committee
2:10-2:25	Proposed Plan to Follow Up on Theme Group Work and Agency Requests	Dr. Domenico Grasso and Committee
2:25-2:30	Summary	Dr. Domenico Grasso
2:30	Adjourn	

Committee's Overall Charge and Desired Outcomes, Outputs and Long Term Objectives

Charge

The SAB initiated this project to assess Agency needs and the state of the art and science of valuing protection of ecological systems and services, and then to identify key areas for improving knowledge, methodologies, practice, and research.

Desired Outputs, Outcomes, and Long Term Objectives

Outputs

- Interim and Final Reports
- Effective communications of Committee activities to interested and affected parties

Outcomes

- Agency values Committee's advice and uses a wider suite of tools to assess ecological values

Long Term Objectives

- Agency invests in key areas identified by the Committee to strengthen research efforts for valuing ecological protection
- Assessments of the value of protecting ecosystems and ecological resources appear increasingly in Agency documents prepared for decision-makers and increasingly affect decision-making
- Departments of Environmental Protection at the state level also act on SAB advice

Theme Group Reports

1:- Contextual Influences

a. Members of the Theme Group -

- Bill Ascher william.ascher@claremontmckenna.edu
- Greg Biddinger gregory.r.bidinger@exxonmobil.com
- Bob Costanza rcostanz@zoo.uvm.edu
- Geoffrey Heal gmh1@columbia.edu
- Klaus Lackner kl2010@columbia.edu
- Kathy Segerson segerson@uconn.edu
- Buzz Thompson, Jr. buzzt@stanford.edu

b. Definitions of Any Major Terms discussed and defined by the Theme Group.

So far the team has recognized that there are at least 3 broad contextual categories that need to be explored further, these include (1) Political, (2) Ecological and (3) Socio-Economic. The team is currently tasked to develop a description of these categories by December 12, 2003.

c. Consideration of the theme as originally defined and a description of the scope as originally proposed or suggested revisions (with supporting arguments).

There really wasn't a definition for this theme just a recognition that the context in which the agency operates may influence the approach taken to assess benefits. It was suggested, methods to test the benefits of a regulation, a policy or a derivative action taken by one of its program or regional offices, might need to rely on different assessment methods.

As discussed in its initial conference call the team members attending agreed with this premise and committed to explore how the contexts may affect methods selection. To that extent the group thought that they would start by trying to assemble a matrix of (1) decision type, (2) Context and (3) assessment design and execution. Their goal is to assemble a first draft of this matrix prior to the January 20/21, 2004 panel meeting.

d. Identification of related major sub-themes.

A number of sub-themes, which cut across the 3 identified contextual categories, were identified. It was suggested that there would be issues of scale in any contextual setting. Temporal, spatial and even social or organizational scales at which the agency and its associated rules and actions are operating should be discussed. As well, the sub-theme of uncertainty was identified for further exploration.

e. Description of how the theme relates to the overall Committee charge and to other themes.

The Charge as initially stated included three major components:

1. Assess the Agency's needs
2. Assess the state of the art and science of valuing protection of ecological systems and services, and
3. Identify key areas for improving knowledge, methodologies, practice, and research.

The focus of the contextual influences theme relates to the overall charge in a number of ways. First, In order to fully assess the agencies needs you have to explore where in the agency's programs and process there is the demand for benefits assessment and/or where there is the potential to add value by it's application. Second, it is essential to understand how leading experts are considering context in the design and execution of benefits assessments to assess the state of the art for benefits assessment. Finally, improving our understanding of the context in which the agency operates and the related scale and uncertainty associated with those operations will be necessary to provide valuable recommendations for improving the agencies practice of benefits assessments.

Regarding other themes we recognized the potential for some overlap. For example we need to coordinate with the theme group focused on influence of scale on methods selection. It is likely that the level of detail will be the basis for differentiation. We will likely discuss generally and they may discuss the particular strength and weaknesses of various methods under specific aspects of scale. It is also possible that our matrix approach to assessing the linkage between context and assessment design could be a general backdrop from which other theme groups might build. This will remain to be seen once we have developed the matrix and gotten broader review by the panel. Our hope is that a partial draft of the matrix will be available for the January panel meeting.

f. Metrics of success for the Committee's work on the theme or a process for establishing those metrics

The group has not discussed this issue to date.

g. Suggestion briefings, consultations, investigations or other activities for the Committee's work related to the themes.

The group has only briefly discussed this issue to date and so far has not identified any briefings, consultations, investigations or other activities. As we proceed this will be considered.

2. Values and Process in a Democratic Society: Lessons Learned from the Risk-Assessment Battlefield

Group: Paul Slovic, Ann Bostrom, Bob Constanza, Terry Daniel, Klaus Lackner, Doug McLean, Dick Norgaard

Quantitative risk assessment came on the scene in the early 1980's amid a wave of optimism about its potential for resolving conflicts and imparting rationality to risk management decision making. The 1983 report "Risk Assessment in the Federal Government: Managing the Process" stands as one of the most widely read and influential documents ever produced by the National Academy of Sciences / National Research Council. The EPA, under William Ruckelshaus' leadership, quickly embraced this methodology as a guide to environmental protection decisions.

Two decades later, risk assessment has proven its value as an important methodology for decision making. But, however useful it has become for some decisions, it has certainly not quelled conflict, controversy, and litigation for the class of decisions where multiple stakeholders hold strong and differing views about what should be done.

In the mid-1990's the Academy revisited the "risk characterization" component of the 1983 report and produced a report "Understanding Risk" Informing Decisions in a Democratic Society" that recognized the need to attend to what might be termed "the sociopolitics of risk" as well as to the science of risk assessment.

In particular, the Understanding Risk report emphasized the need for an iterative process, incorporating both analysis and deliberation, and consulting interested and affected parties right from the beginning. Recognizing that risk assessment is inherently judgmental and dependent upon assumptions and social values, the process of assessment was seen to be as important as the science. Enhanced public participation was deemed necessary to make decision making more democratic, improve the relevance and quality of the technical analysis, and increase the legitimacy and public acceptance of the resulting decisions.

The task of valuing the protection of ecological systems and services seems, in many ways, similar to the task of assessing risk to the environment. To the extent that this is correct, ecological valuation will run into many of the same problems faced by risk assessment during the past two decades. It behooves our committee to examine the lessons learned from risk assessment as a guide to making the valuation process better able to serve the needs of decision makers and society.

Exactly how to distill and apply the lessons from risk assessment remains to be determined. Certainly there are important students and players of "the risk game" who could meet with us; people like Warner North, Tom Burke, Peter Defur, Mark Harwell, Baruch Fischhoff, Sheila Jasanoff, and Kristen Shrader-Frechette come to mind. Values are central to the assessment process and thus, environmental philosophers and nature writers may have important views to offer our committee. Other directions to pursue will likely emerge from discussions of this theme.

3. Alternative approaches/methods for valuing ecological system, services and outcomes? What can be quantified, what can be monetized? Decision-specific approaches. Alternative technological solutions.

Group: Jim Boyd, Bill Ascher; Ann Bostrom; Bob Costanza; Rick Freeman; Klaus Lackner; Hal Mooney; Dick Norgaard; Holmes Rolston; Kerry Smith; Rob Stavins; Valerie Thomas;

Discussion

It was agreed that earlier draft memos would be superseded in all respects by this one.

Following a conference call (Rolston, Ascher, Bostrom, Smith, Stavins, Thomas, Boyd, Nugent) the group makes the following suggestions. (Other members of the theme group are Costanza, Risser, Freeman, Lackner, Norgaard.)

- To address the issues raised by benefit assessment practices (issues both conceptual and methodological) the panel should initially focus on tangible, concrete examples.
- The group also suggests that the examples chosen exclude valuation exercises associated with currently ongoing EPA policy decisions and rulemakings.
- The group would like to hear from practitioners who have completed studies involving benefit assessment.
- As a starting point, we suggest a practitioners' workshop where a variety of practitioners present the methods used in and results of their benefit assessments. Practitioners would be drawn from consulting firms who often conduct the studies, EPA practitioners, and others. The idea is to get a quick crash course on benefit assessment from the people actually doing it.
- The goal of the workshop would be to gain more concrete insight into the methods used; the assumptions made; and the data employed. We also seek frank input from the practitioners regarding the challenges associated with conducting such studies and any limitations of the studies they feel are particularly relevant.
- This workshop will allow the Panel to more explicitly address the following types of questions – among others. What was monetized vs. what was merely quantified? Could things have been monetized or quantified that were not? If so, how? How were economic principles and ecological analysis brought together? How and to what degree is uncertainty captured in the assessment? Are there significant missing elements from the analyses and how might they be addressed? How are the assumptions of the analysis communicated?
- In the meantime, we would like SAB staff to generate a list of potential case studies from which the entire Panel would select. By cases, we mean detailed, directed presentations of and dialogue regarding methods used by the EPA and other agencies. We will make the selection of in-depth cases following the practitioners workshop.
- The following elements of case selection were discussed. Two initial cases in what we could call "Phase I." First, a case that has come fully to closure where monetary estimation of benefits was employed to at least some degree. Second, to address the concern that we not "only go where the easy problems are," we select a case that is likely to be addressed in the future by the EPA, and one that has different – and perhaps particularly challenging – characteristics.

- The cases would involve detailed presentation by agency staff, with the presentations guided by a specific set of questions developed by the Panel.
- Our analysis of cases is not to be limited to these two. But our thought is that we proceed in a phased way, so that the choice of additional cases (Phase II) can be made conditional on what we have learned in the earlier phases.

4. Analytical challenges in linking economic and ecological information”

This is the "Eco-Eco" Theme - the group that examines the problems and prospects of collaboration between economists and ecologists in assessing ecosystems services and related environmental assets. The group will consider reasons, examples, and arguments ecologists and others present for the view that human activities that alter ecosystems can damage economically valuable services these systems provide.

a. Members of the Theme Group

The members of the group include: Terry Daniel, Rick Freeman, Geoffrey Heal, Richard Norgaard, and Mark Sagoff (group leader).

b. Definitions of Any Major Terms Discussed and Defined by the Theme Group

Like the other groups, this team acknowledges that many conceptual difficulties surround the concept of value or valuation. For example, the group acknowledges that people appreciate, care about, or attach value to objects for many different reasons. Some of these reasons are directed to the properties of the objects per se; these are intrinsic values. Other reasons have to do with the effect of objects on welfare or well-being. These are instrumental values. Presumably, we will be considering instrumental values - since the concept of an ecosystem "service" implies that the ecosystem is valued for its outcomes on human welfare not for its intrinsic properties.

There is a background expectation that the values we will be studying are of the sort that cost-benefit analysis can handle. Since cost-benefit analysis allocates goods at market prices, we might be able to finesse disagreements that loom (between ecologists and economists) about valuation in some larger sense. Prices are often observable; methods to infer them when they are not are fairly well understood. Perhaps we do not have to spend too much effort figuring out the philosophical dimensions of valuation if we stick to a notion of "price" as "value in exchange" i.e., a function of supply and demand.

The group, in its initial phone conversation, observed that economists would like ecologists to provide "production function" or its reverse, a "damage function," that relates changes in a given ecosystem to changes that have an economic dimension. Geoffrey Heal mentioned that different ecosystems provide different services and may do so differently; hence the "production function" is likely to proceed case-by-case with each system having idiosyncratic qualities. (Whether there are similarities which permit "benefit transfers" remained an open question.) He and the others on the phone call agreed that some instructive or salient case studies would be most helpful - a conclusion that we understand other groups have reached as well.

One problem may be that the easiest examples are already well-known; e.g., farmers have to buy pollination services from commercial bee keepers if nature does not provide such services free of charge. Accordingly, changes to ecosystems (by pesticides, for example) that harm wild pollinators could require farmers to pay for the commercial system. This is an excellent example of a market-based analysis of the economic value of an ecological service. We would need a variety of these examples to get some traction on the idea of ecosystem services. Only then could we see if these examples lead to general conclusions, concepts, or principles.

Finally, the participants on the phone call recognized the difficulty of saying what is meant by "ecosystem services" other than by giving a list of examples best elaborated in case studies. Perhaps we could start with clear and well-documented examples and go from there. Hunter-and-gatherer goods, such as "capture" fisheries, offer the most obvious examples of ecosystem services, insofar as natural productive processes - as distinct from technology-based agriculture, silviculture, or aquaculture - do the work. Terry Daniel and others on the call discussed the possibility that natural processes are "intrinsically" more desirable than technological ones - e.g., people may spend ten times as much to catch a fish (even to throw back) than to buy one. This is a fascinating point; it should not be lost.

- c. Consideration of the theme as originally defined and a description of the scope as originally proposed or suggested revisions (with supporting arguments).

The participants on the phone call recognized the risk that the various groups would coalesce around a few major problems, such as the need for exemplary case studies and the problem of defining "valuation." There may be some interest, then, in focusing the group on the "eco-eco" divide and figuring out how to bridge it. It may be hard to avoid the larger issues, however, since ecologists and economists may divide precisely because they view them differently. Rick Freeman (by e-mail) made the very helpful suggestion that we start with the writing and thoughts of those ecologists (e.g., Daily et al. in the Science essay cited on our web page) who are most keen on attaching economic values to ecosystem services. What examples do they offer and do these illustrate the kind of "damage" or "production" function economists are familiar with?

- d. Identification of related major sub-themes

Sub-themes include: what are ecosystem services? How to ecologists and economists differ in their conception of value and can they finesse this difference? What is meant by the "production" or "damage" functions economists seek from ecologists? When natural and technological processes can provide the same good, e.g., trees or fish, there is a strong social preference for the natural process. Why is this? What does it suggest?

- e. Description of how the theme relates to the overall Committee charge and

to other themes

There is some concern that the themes addressed by the various committees will all overlap and blur together.

f. Metrics of success for the Committee's work on the theme or a process for establishing those metrics

If we could get a representative group to agree on something substantive - not just bromides and cliches - that would be good.

g. Suggestion briefings, consultations, investigations or other activities for the Committee's work related to the themes.

We need to talk again after the group leader and others who wish to do so circulate materials.

5. Express “delta value” with respect to the nation’s ecological assets; national environmental policy and investment

Theme Report – Conference Call #1
November 20, 2003

Participants

Dennis Grossman
Joan Roughgarden
Lou Pitelka
Valerie Thomas
Steve Polasky
Angela Nugent

Initial Description of “Theme Charter”

Express value of delta due to EPA’s action with respect to nation’s ecological assets.
Need to say something about national environmental policy and investment.

Team Discussion regarding “Theme Charter” (Summary)

- We need to make the results of this team applicable to the agency, to help them do their work better, rather than generate an academic report that does not provide direct guidance to address EPA program objectives.
- This team should address “big-picture” assessment of the national environment, focusing on top-down valuation of ecosystem services at a national level.
 - o Do we have a function/role regarding the EPA Report on the Environment relative to ecosystem status and health?
 - o We should identify a few approaches to the big picture valuation of ecosystems, as we can list ecosystems and their benefits, but do not know how to put a value on these benefits and functions (goods and services). Perhaps these services can be bundled for valuation purposes.
 - o This team should attempt to put value on nature, green accounting, as if nature was treated as a natural industrial sector with capitalized value.
 - o This will necessitate evaluation of what EPA currently does relative to the valuation of ecosystems.
- We should look at the effect of EPA policy change on ecosystem state and function and relate that to change in ecosystem “value”.
 - o The focus is on ecological production function.
 - o This would entail the evaluation of EPA’s current contribution to the nation’s ecological assets, and an assessment of the agency’s contribution to environmental protection.

6. “Institutional Framework” Theme

a. Group Members

- | | |
|-----------------|----------------------------------|
| ○ Ann Bostrom | ann.bostrom@pubpolicy.gatech.edu |
| ○ Bob Huggett | rhuggett@msu.edu |
| ○ Dick Norgaard | norgaard@igc.org |
| ○ Rob Stavins | robert_stavins@harvard.edu |
| ○ Buzz Thompson | buzzt@stanford.edu |

b. Theme Statement & Definitions

The committee did not spend very much time at the October meeting discussing this theme, and the description of the theme in the grid is very sketchy and vague. Our Theme Group has identified two major questions that we plan to address: What institutional factors are likely to influence EPA’s ability to effectively value the protection of ecological systems and services? What institutional steps could and should be taken to facilitate the assessment of such protection?

The “institutional factors” that we believe deserve consideration include the following:

- External limitations or restrictions on EPA, including legal requirements and directives (e.g., separation of laws by environmental media, OMB directives, time limitations in completing assessments)
- Internal EPA policies and rules regarding assessments
- EPA’s organizational structure, including:
 - Division of responsibilities among various program and policy offices
 - Division of responsibilities between HQ and regional offices
 - Differences in spatial responsibilities and outlook
 - Assignment of specific responsibilities for benefit assessments
- EPA staffing, including:
 - Division of economists, ecologists, and other relevant experts among relevant offices
 - Interaction of economists, ecologists, and other relevant experts
- Resource availability, including:
 - Funding
 - Personnel
- Role of outside consultants in preparing or contributing to assessments (reflecting fact that great bulk of RIA assessments are currently prepared by outside consultants)
- Epistemic communities and their influence on EPA experts/work
- Organizational willingness/ability to adopt new approaches
- Agency ability to obtain relevant data
- Cross-agency relationships

c. Identification of Major Sub-Themes

- **Existing Assessments Within EPA:** How are current benefit assessments conducted? What personnel both inside and outside EPA are involved? What resources are used? To what degree and by what institutional factors is the scope of current assessments

constrained? What are the legal and policy restrictions, if any, on what gets valued? Are current assessment approaches “state of the art” and, to the degree they are not, are there institutional explanations?

- **Interdisciplinary Interactions:** What is the current interaction of economists, ecologists, and other relevant experts within EPA, both in conducting assessments and in other related work? What opportunities exist for greater collaborative work and learning? How could interactions among experts be improved?
- **Institutional Factors Affecting Ecosystem Assessments:** To what extent do institutional factors currently impede or facilitate the integrated assessment of ecosystem goods and services? What aspects of ecosystem assessments may lead to additional institutional impediments not present in other assessments (e.g., do they involve a different spatial focus than traditional environmental assessments within EPA, do they require greater time or expert coordination, do they require a longer-term, adaptive approach)? Which of the institutional factors are within EPA’s internal control? Which of the factors are dictated from outside EPA and would require external changes?
- **Potential Mechanisms for Facilitating Ecosystem Assessments:** How could any of the institutional impediments be removed, minimized, or mitigated?
- **Resource Needs:** What additional resources would be needed if EPA wished to value a significant array of ecosystem goods and services? Are there ways of reducing the resource needs? Are the necessary resources available? Are the major constraints on resources internal or external to EPA? (Note that this sub-theme will build on the work of other sub-groups.)

d. Relationship of the Theme to Overall Committee Charge and to Other Themes

Institutional factors can constrain EPA’s ability to value ecosystem goods and services and may be an area in which the committee can provide important and practical advice to EPA. Institutional factors thus are an important element in addressing the committee’s overall charge. Some of the institutional factors may also constitute “contextual influences” and thus be identified and discussed by the first theme group (Biddinger), but the goals of the two theme groups are different. The “Contextual Influences” group will be trying to establish the context for the committee’s work, while the “Institutional Framework” group will be trying to see how institutional arrangements can be improved. The work of the “Institutional Framework” group also is likely to parallel the “Alternative Approaches” theme group, but we are looking at institutional factors while they presumably will be looking at the actual assessment models.

e. Metrics of Success

Our group has not discussed this issue yet.

f. Suggestion Briefings, Consultations, Investigations or other Activities

We see at least five immediate areas for investigation. First, it would be very valuable to have initial briefings from EPA (and perhaps OMB) officials at our next meeting on the sub-themes identified above. Because these issues are also relevant to other groups, we believe that

it makes sense to have the entire committee briefed on these issues. Second, we would like to obtain copies of relevant documents, including any internal policies/guidances regarding assessments (other than those previously provided to us), any external policies/guidances of relevance, organizational charts (with relevant personnel numbers where possible), any relevant funding documents, and the results of the internal interviews/surveys discussed at the October meeting. Third, we would like to work with agency officials to collect additional information on how existing assessments are carried out by EPA (including a review of how a sample of actual, completed assessments were conducted) and to determine the institutional barriers that EPA believes it would confront if asked to approach their assessments in different manners. Fourth, we would like to have briefings from other federal environmental/resource agencies on both (1) the institutional impediments that they encounter in conducting similar assessments and how they try to overcome those impediments, and (2) the institutional issues that they believe exist in inter-agency assessment work. Finally, we believe that the development of several general case studies could be valuable in investigating the sub-issues in this theme, just as they could be valuable in connection with other themes.

Update on EPA News and Activities Related to the Committee

EPA's Workgroup on the "Ecological Benefits Strategic Plan" asks to defer the second consultation with the Committee post January 2004. Expects to have responses to the Committee's questions at the October 2003 meeting in January. A Teleconference in February and a April 2004 Meeting for an Advisory on the Strategic Plan would fit their schedule.

EPA's Office of Water is requesting a consultation with the committee on the design of its planned internal "Workshop To Determine Research Needs To Support Ecological Benefits Assessment," (see Attachment 1) followed by an advisory meeting with the Committee regarding the results of the workshop.

EPA's Region 4 is requesting a consultation with the Committee on the design of an assessment to support its development of an "Environmental Services and Benefits Analysis for a Critical Ecosystem Assessment of the Southeast" (see Attachment 2).

EPA SAB Staff Office has been coordinating with EPA's Office of Air and Radiation. The Staff Office is planning to post shortlist for the new "Ecological Effects Subcommittee" of the Advisory Council on Clean Air Compliance Analysis this week. (This new subcommittee would have ecologists interested in ecological valuation issue and ecologists who specialize in stressor effects caused by air pollutants and would be dedicated to working on the Section 812 Study of the Costs and Benefits of the Clean Air Act) The new EES would hold an initial meeting and/or public teleconference on the issue of characterizing ecological benefits for the Agency's Section 812 Study of the Costs and Benefits of the Clean Air Act. The SAB Staff Office is then planning a liaison meeting session for the EES and the Committee on Valuing the Protection of Ecological Systems and Services on this topic so that OAR would get the benefit of advice from both groups.

The SAB Staff Office Director emphasizes that senior EPA managers support this SAB project as an interactive one. The expectation is that the Agency can turn to the Committee for advice on current issues before their programs.

Proposed Plan to Follow up on Theme Group Work and Agency Requests

Timing	Mechanism	Agenda	Out comes
December 2003- January 2004	Theme Group calls organized through the DFO	Further Development of Theme Group Proposals/Work	
January 20, 2004, 12:30-2:30 p.m. Eastern Time	Public Teleconference Call	Discussions of Themes 1 “Purpose/contextual influences” and 3 “Alternative “approaches/methods” ; “Purpose/contextual influences” and “Values in a democratic society”	Revised contextual matrix Design of April Workshop More Detailed Plan of action for these themes.
January 21, 2004, 12:30-2:30 p.m. Eastern Time	Public Teleconference Call	Discussion of Themes 2 “Values in a Democratic Society,” 4 “Analytical challenges in linking economic and ecological information;” and 5 “Express delta value with respect to the nation’s ecological assets; national environment”	Detailed Plan of action for these themes.
January 22, 2004, 12:30-2:30 p.m. Eastern Time	Public Teleconference Call	Discussion of Theme 6 “Institutional framework at EPA to facilitate benefits assessments” Consultation on design of OW’s Workshop To Determine Research Needs To Support Ecological Benefits Assessment (See Attachment 1)	Detailed Plan of action for their themes. Cogent advice to the Agency
To be Scheduled in February or March. ??, 2004	Public Teleconference Call	Consultation on Ecological Benefits Strategic Plan Liaison teleconference with the new Ecological Effects Subcommittee of the Council on the Section 812 Cost and Benefits of the Clean Air Act Study	Cogent advice to the Agency

April 13, 2004	Committee Workshop	Workshop	To be identified fully. For ideas from Theme Group 1, See footnote ¹
April 14-15, 2004	Advisory Meeting	Advisory on Ecological Benefits Strategic Plan Advisory on OW Workshop Report Review and Discussion of draft Committee White Paper on Contextual Influences	Cogent advice to the Agency
June 14-16, 2004	Advisory Meeting	Consultation on Region 4 Project (See Attachment 2) Other topics to be Identified	Cogent advice to the Agency To be identified.

¹ goal of the workshop would be to gain more concrete insight into the methods used; the assumptions made; and the data employed. We also seek frank input from the practitioners regarding the challenges associated with conducting such studies and any limitations of the studies they feel are particularly relevant.

- This workshop will allow the Panel to more explicitly address the following types of questions – among others. What was monetized vs. what was merely quantified? Could things have been monetized or quantified that were not? If so, how? How were economic principles and ecological analysis brought together? How and to what degree is uncertainty captured in the assessment? Are there significant missing elements from the analyses and how might they be addressed? How are the assumptions of the analysis communicated?

Attachment 1
EPA Office of Water Project
Workshop To Determine Research Needs
To Support Ecological Benefits
Assessment

Background

EPA's program offices, along with the ORD and OPEI, are undertaking the joint development of an Ecological Benefits Strategic Plan (EBSP), and ORD and OPEI are preparing an Environmental Economics Research Strategy. Both strategies emphasize the need to improve the Agency's capability to quantify and economically value the ecological benefits of Agency actions and programs. The complex and interdisciplinary nature of the ecological valuation problem makes it difficult for either research planners or economists to understand the research need in its entirety. This workshop is designed to identify research needs by focusing on specific valuation problems representative of those being faced by Agency programs.

Approach

Because of the importance of ecological benefits assessment to OW programs, this effort will focus on water quality. For a select group of OW rules, including the Combined Animal Feed Operation (CAFO) Effluent Guideline, the Construction and Development Effluent Guideline, the 316(b) (Cooling Water Intake Structures) Effluent Guideline, and the Non-Point Source Program Grants (319), a problem formulation exercise will be carried out. Prior to the workshop, a small technical group will meet to scope out answers to the following issues/questions:

- purpose of the rule and resulting actions,
- sources and stressors,
- ecological endpoints affected,

- ecological relationships among stressors and endpoints,
- translation of ecological effects into economic services (use/nonuse, market/nonmarket)
- how to model biophysical relationships
- economic valuation of ecological effects (monetized/nonmonetized)

With this information, the ecological-economic conceptual models can be developed and the gaps in data, methods and analytic tools can be identified. The workshop participants (EPA decision-makers, managers and technical staff) will review and comment on the conceptual models and develop the prioritized list of knowledge/research gaps.

Time Frame: Workshop to be held in February, 2004

Sample Problem

CAFOs (Combined Animal Feed Operations) (finalized late 2002)

The rule requires NPDES permits, ensures appropriate use of nutrients, allows for innovative technologies and practices, requires nutrient management plans and mandates annual reporting. Key information on cost and benefit estimates include:

- Total compliance and administrative costs estimated at \$125 million (option 1) and \$289 million (option 2)
- Benefits included in estimates: improved surface water quality, reduced incidence of fish kills, improved shell fishing, reduced contamination of private wells, reduced contamination of animal water supplies, reduced eutrophication of estuaries, and reduced water treatment costs
- Benefits not quantified: reduced eutrophication and pathogen contamination

of coastal and estuarine waters, reduced pathogen contamination of underground sources of drinking water, reduced human and ecological risks from antibiotics, hormones, metals, salts, and improved soil quality, etc.

- Total benefits estimated to be \$141 - \$223 million (option 1), and \$204 - \$340 million (option 2)

NOTE: For further information, please see public documents on

<http://cfpub.epa.gov/npdes> and <http://www.epa.gov/owow/nps/guide.html>

Potential Charge to the SAB: (The charge to be developed after discussion with the SAB Staff Office and the Committee Chair) The Agency requests advice as to:

- 1) Whether the workshop conclusions regarding conceptual models for interactions between ecologists and economists and the prioritized list of knowledge/research gaps reflect the committee's understanding of the most valid and useful approaches for strengthening the ecological benefits for the EPA-OW water programs discussed.
- 2) Are there other approaches the Committee would advise the Agency to consider?

**Attachment 2
Region 4 Project
Environmental Services and
Benefits Analysis
for a Critical Ecosystem
Assessment of the Southeast**

ISSUE:

The Southeastern Ecological Framework (SEF) is a geographic-based model that supports planning and decision-making to protect ecosystem function. The identification of important ecosystems facilitates the protection of ecological systems that provide clean water, clean air and protected land through the visualization of critical ecosystems across the southeast landscape. The SEF model uses the best available Geographic Information System (GIS) data to identify ecologically important hub and corridor networks throughout the eight states of the Southeast (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina and Tennessee). The landscape identified in the SEF, when protected from significant fragmentation, provides vital ecological services, habitat protection and support for land, air and water quality for the surrounding communities.

Given the expertise of the Science Advisory Board's Committee on Valuing the Protection of Ecological Systems and Services, it would be of great benefit to Regional efforts in ecosystem protection to identify a mechanism for assessing the economic value of protecting the natural resources identified in the SEF and other critical ecosystem protection efforts. In other words, can you identify a way to help determine the monetary value of the ecological services provided by: wetlands, riparian buffers, wellhead protection areas, drinking water sources, water assimilation and storage (flood protection) areas, carbon sequestration and particulate matter removal, silviculture or agricultural activities, or the natural services that support Total Maximum Daily Loads?

BACKGROUND:

In the Southeast, as in other rapidly developing parts of the country, there is a critical need to understand how human actions impact the ecosystems ability to function and provide needed environmental and economic benefits. Current population growth and economic development is significantly threatening large scale ecosystem function by fragmenting the natural landscape. New road construction, agriculture expansion, and sprawling communities represent the most prevalent changes in our natural landscapes. These types of

activities often cut through existing ecologically significant areas dividing them into isolated parts. This in turn decreases biological diversity, degrades water and air quality, reduces the capacity to assimilate and store water, cuts off or eliminates migratory pathways, and places an increasing economic burden on the human population. It is this last issue that is beginning to draw greater attention from state officials, community leaders, taxpayers, and the public at large.

Fragmentation and development impair the ability of the natural landscape to provide environmental benefits and services. Communities must then become reactive, spending money to replace or provide what the natural systems did for free. In Region 4, a handful of states have recognized the need to proactively protect natural resource areas and are implementing Greenspace Protection Programs. Georgia's Community Greenspace Program, Florida Forever, and North Carolina's Million Acre Initiative are three statewide programs that are currently in place. Unfortunately, very little data is available to help state and local leaders assess and account for the environmental benefits that these greenspaces provide.

The SEF presents a view of an existing base-line ecological framework that can strengthen the environmental and economic benefits of the natural landscape through synergistic natural resource planning. Using the SEF as a tool for focusing and coordinating environmental protection of large-scale ecological systems at a local level will enhance efforts to protect ecosystem integrity. In addition to integrating landscape scale environmental benefits, it also is an integrative tool that allows local, state, federal and non-profit agencies to use the SEF as a tool for strategic decision-making. The SEF upholds EPA's mission and supports all of EPA's Government Performance and Results Act Goals. These goals are met by the SEF's ability to identify key resource areas that significantly contribute to clean air, clean and safe water, better-protected land, healthy communities and ecosystems, and compliance and environmental stewardship.

ECOSYSTEM VALUATION NEEDS:

The SEF provides a "framework" for community leaders to identify key ecological areas and develop wholistic greenspace strategies. But, it is not able to address the number one issue plaguing regional and county governments. How does the local community assess value of the natural resources protected as greenspace or other natural ecosystems in comparison to the developmental value of the land.

Working in partnership with county officials and non-profit organizations in the southeast has directed our attention to a number of economic issues that we cannot

answer. The primary issue for these groups has been how to balance the trade-off between development of the resource (which can more easily be measured in economic terms of dollars gained in tax revenue) and the environmental services provided by protecting the resource. Too often, the economics approach has left the environment damaged and not able to provide the needed functions and services that then must be alleviated through expensive pollution remediation solutions.

For instance, a new strip mall development would be built on adjacent uplands next to some wetlands. The wetlands would be impacted by runoff from a parking lot and mall that will meet the existing zoning code. The developer would also like to reduce the required riparian buffer from 100 feet to 50 feet so that truck deliveries can be made in back of the facility. Since the planning department has no direct valuation of the benefits of maintaining the wetland or the riparian buffer, the zoning variance is granted.

The resulting impact of the decision in environmental terms is the reduction in water quality from stormwater runoff and increased flooding. Rain water can no longer filter through the porous surface of the ground thereby reducing aquifer recharge, increasing stream flow from storm water runoff, causing additional sedimentation, higher water turbidity and making it more difficult for fish to find food. There is loss of particulate matter filtration from the tree canopy, the release of stored carbon and future carbon sequestration capability. The list goes on, but no consideration has been given to these issues because nobody has given the resources a value that the commissioner(s) can use to support holding firm with the current zoning ordinance. Each of the impacts eventually builds up until a solution must be found to solve the problems caused by the development. Result: increased tax burden for the local community.

SAB AREAS FOR REVIEW AND GUIDANCE:

There are a number of areas that we would like the Committee on Valuing the Protection of Ecological Systems and Services to provide guidance. These include valuing the environmental services provided by 1) intact riparian buffers, 2) wetlands, 3)

natural ecosystems, and 4) connectivity that are found in the SEF. These four areas could be evaluated under several environmental characteristics.

The basic need is a fair and consistent methodology that is useful and understandable at the local level for balancing environmental protection and human based development. This should be spatially explicit and able to integrate the various needs of the EPA programs.

<i>Ecological Services</i>	Riparian Buffer	Wetlands	Natural areas	Connectivity	Type
Drinking Water Supply	X	X	X	X	Water
Sedimentation Reduction	X	X		X	Water
Waste Water Treatment	X	X	X		Water
Cloud Formation			X		Water
Aquifer Recharge	X	X	X	X	Water
Water Retention or Storage	X	X	X	X	Water
Flooding/Storm Protection	X	X		X	Water
Urban Heat Island Mitigation			X	X	Air
Particulate Matter Removal			X		Air
Carbon Sequestration	X	X	X		Air
Value of Species		X		X	Biodiversity
Migratory Birds		X	X	X	Biodiversity
Fish Populations	X	X		X	Biodiversity
Game Species		X	X	X	Biodiversity
Disturbance Regime Recovery	X	X		X	Biodiversity
Recreational Value	X	X	X	X	Human
Timber			X		Human
Agricultural Pollination				X	Human
Land Values	X	X	X	X	Human
Hunting/Fishing	X	X	X	X	Human