EPA Science Advisory Board Committee on Valuing the Protection of Ecological Systems and Services (C-VPESS) Public Teleconference November 20, 2007, 1:00 p.m. – 3:00 p.m. (Eastern Daylight Time)

Committee: The SAB Committee on Valuing the Protection of Ecological Systems and Services (C-VPESS) (See Roster - Attachment A)

Date and Time: November 20, 2007, 1:00 p.m. – 3:00 p.m. (eastern daylight time)

Location: Participation by Telephone Only

Purpose: The purpose of the teleconference is to reach committee consensus on a draft report related to valuing the protection of ecological systems and services. (See Meeting Agenda - Attachment C)

Attendees: Members of the C-VPESS:
Dr. Barton H (Buzz) Thompson (Chair)
Dr. Kathleen Segerson (Vice-Chair)
Dr. William Ascher
Dr. Ann Bostrom
Dr. Terry Daniel
Dr. A. Myrick Freeman
Dr. Dennis Grossman
Dr. Douglas MacLean
Dr. Louis Pitelka
Dr. Mark Sagoff

Consultant to the C-VPESS:
Dr. Joseph Arvai

EPA SAB Staff
Dr. Angela Nugent [Designated Federal Officer, DFO)]

Other Members of the Public (see Attachment D)

Teleconference Summary:

The teleconference began with a discussion of agenda items not covered during the November 19th teleconference (Appendix C and Chapter 5) and then generally followed the meeting agenda (see Meeting Agenda - Attachment C) to continue discussion of the September 2007 C-VPESS draft.

Dr. Buzz Thompson, chair of the committee, noted progress made in addressing written comments on the September draft report, noted that there were no comments received on Appendix C, and asked the DFO to remind members to read Appendix C and provide comments by November 30th. He emphasized his goal that the next draft receive

far fewer comments. He expressed the hope that comments on the next draft will involve fine-tuning and raise no new substantive issues.

Chapter 5, Crosscutting Issues

Dr. Thompson introduced substantive issues raised by external reviewers (Appendix E) and committee members (Appendix F) that merited committee discussion. He noted that one outside reviewer noted the uncertainty section was valuable and deserved additional highlighting. The committee confirmed that the crosscutting issues chapter was the appropriate location for the uncertainty section and agreed that additional references earlier in the report to the uncertainty section would make the text more visible. The committee also agreed that the section on communicating uncertainties in section 5.1 should be merged with the section on the same topic in the communications section (section 5.2.3). They also agreed to the need to "pull out" a section on recommendations relating to uncertainty. Dr. Thompson agreed to make those changes.

Dr. Thompson noted a comment from Dr. Paul Slovic that the uncertainty section emphasized uncertainties associated with statistical issues, which he viewed as less important than issues associated with the assumptions underlying statistical methods. The committee discussed inserting introductory language noting that the section was not designed to address method and associated model uncertainties and assumptions (covered in more detail in Appendix B). Dr. Thompson agreed to talk with Dr. Paul Slovic about this change and to confer with Drs. Freeman and Ascher, authors of this section.

Dr. Thompson noted that a commenter also pointed out that page 100, lines 2-5 referred to different analytic steps in valuation than those discussed in Chapter 3. Dr. Thompson agreed to revise the text. A member noted that the Chapter 5 draft text for the second draft analytical step, "predicting behavioral reactions to these outcomes" was an important and subtle point. Whenever "predicting changes" is discussed in the text, that step should be described in broad enough terms to include behavioral reactions and ecological and human interactions. Dr. Thompson agreed to review text across the report to make this change and agreed to update language regarding the difficulty of expert elicitation to note that "it is difficult but can be done."

The committee then discussed the communications–related text. The group discussed whether to move a paragraph on page 109 about perceptions related to surveys to elicit values to the section on surveys. One member argued that the text properly belonged with the survey discussion; other members argued that the text had broader implications for communications. Dr. Thompson stated that he would revise text to express the general point that in communicating information to decision makers and the public, some types of information can dominate others and note that research supporting this view comes from the survey literature because no evaluation has been done of ecological valuation-related research. The group then discussed how to address Dr. Slovic's concern about whether dollars will dominate results using other metrics related to ecological valuation. In response to a suggestion from Dr. Bostrom, Dr. Thompson noted that he would ask Dr. Slovic for citations and revise text to include that information

and determine whether there is sufficient information for committee agreement on this point, or whether the issue is one for which the committee will report a range of views.

Section 6.1, Valuation for National Rule-making

Dr. Segerson led the discussion and focused on written comments that merited committee discussion. She noted that one set of comments related to the redundancy within section 6.1 and its redundancy with discussions earlier in the report. Dr. Segerson noted that the section should focus on issues unique to the decision context. She suggested that several factors were unique: 1) special legal constraints relating to regulatory requirements and Executive Orders and special time and resource constraints; 2) the requirement for a national-level analysis, while ecological valuation must address variability due to the site-specific nature of ecosystems and variability of social and economic factors across the United States; and 3) the need for benefit transfer that arises because of institutional constraints and variability. The committee agreed that those features were important distinguishing features. Dr. Segerson agreed to highlight those important features in the text.

The committee discussed several other issues relating to consistency and redundancy. Dr. Segerson agreed to clarify that figure 6 in the draft text represented the committee's conceptual model, not the conceptual model EPA developed after work on the RIA was underway. Dr. Segerson also agreed to consider how information currently in the text boxes might be better integrated in the general report text.

The committee discussed the need to revise the text to communicate a clearer message about the role of the public in developing the conceptual model. Committee members spoke of the importance of text on page 120, line 9-20 regarding experimentation in involving the public in the development and validation of the conceptual model. Dr. Segerson agreed to make this point earlier in section 6.1 and review text throughout the section to soften language that may convey the message that constructing the conceptual model should only be conducted by experts.

Dr. Segerson then addressed several other substantive issues. She noted that she would work with Drs. Mooney and Pitelka to determine whether to change or remove text relating to functional groups. She noted that she would consult with Dr. Smith about his concern about the recommendations to document in RIAs decisions about how decisions underlying the conceptual model were made.

Dr. Segerson then noted a comment calling for a clearer summary of conclusions and recommendations from section 6.1. She proposed that important recommendations would include: 1) use of a "bottom-up" approach that would examine how geographically-specific case studies could be used to "aggregate up" to a national analysis; 2) use of meta-analysis, p. 128, line 25 (Dr. Segerson stated that she would contact Dr. Smith to clarify this recommendation); and 3) development of value estimates for recurring rulemakings along with a database for this purpose. Members agreed but emphasized that appropriate caveats must be expressed so that benefit transfers would be

appropriate. They noted that both data and functional relationships derived in one context might not be appropriate for another context. Dr. Segerson agreed to clarify the conclusions and insert the caveat noted.

Section 6.2 (Valuation for Site-specific Decision Making) and Section 6.3 (Valuation for Regional Partnerships)

Dr. Thompson led the discussion of draft text for sections 6.2 and 6.3. He noted the need to discuss the limitations of regional resources within the site-specific section and not to defer those points to section 6.3. He also acknowledged text provided by Dr. Biddinger to clarify the major points in section 6.2 regarding the relationship between ecological risk assessment and valuation.

Dr. Thompson noted the need to revise the text across the entire report so that conclusions were represented in a consistent way (e.g., as formatted bullets or narratives).

Dr. Thompson noted a written comment suggesting that the report characterize how well Chicago Wilderness represents public participation in valuation efforts across EPA regional offices. Committee members noted that Chicago Wilderness is noteworthy for its sophisticated public participation efforts. He also noted that a written comment suggested that the report should provide a better explanation of the link between the Southeast Ecological Framework and valuation. Dr. Thompson noted that he would revise text in the section to address these issues.

Next Steps

Dr. Thompson noted that he would work with Dr. Segerson to revise the report text and would then revise Chapter 7, the Executive Summary, and transmittal letter in light of those revisions. He noted that he would confer with Dr. Segerson to determine whether the planned teleconferences for December 3rd and 10th were needed and would communicate that decision through the DFO.

Summary of Action Items

1. DFO will send an email reminding C-VPESS members to reread Appendix C and provide any written comments by November 30th.
2. Dr. Buzz Thompson will insert references earlier in the report to the uncertainty section to make it more visible
3. Dr. Thompson will merge the texts on communicating uncertainties from the uncertainty section and communications section and will also “pull out” recommendations relating to uncertainty so they are more visible.
4. Dr. Thompson will make the following changes to the uncertainty section:
    a. inserting introductory language noting that the section does not address method and associated model uncertainties and assumptions (which are covered in more detail in Appendix B). Dr. Thompson will talk with Dr.

Paul Slovic about this change and confer with Drs. Freeman and Ascher, authors of this section

b. revising language on page 100, lines 2-5 referring to the second analytic steps in valuation to ensure it is consistent with language in chapters 2, 3, and 5 and is broad enough to include behavioral reactions and ecological and human interactions.

c. revising language about the difficulties of expert elicitation to indicate that it can be done.

5. Dr. Thompson will revise communications text on page 109 to express the general point that in communicating information to decision makers and the public, some types of information can dominate others and note that research supporting this view comes from the survey literature because no evaluation has been done of ecological valuation-related research. He will also ask Dr. Slovic for citations and revise text to include that information and determine whether there is sufficient information for committee agreement on this point, or whether the issue is one for which the committee will report a range of views.
6. Dr. Segerson will highlight the unique distinguishing features of valuation for national rulemaking more clearly in section 6.1.
7. Dr. Segerson will clarify that figure 6 represents the committee's conceptual model, not the conceptual model EPA developed after work on the RIA was underway.
8. Dr. Segerson will consider how information currently in the text boxes might be better integrated in the general report text.
9. Dr. Segerson will make the point about experimentation with involving the public in the development and validation of the conceptual model (page 120) earlier in section 6.1 and review text throughout the section to soften language that may convey the message that constructing the conceptual model should only be the activity of experts.
10. Dr. Segerson will work with Drs. Mooney and Pitelka to determine whether to change or remove text relating to functional groups.
11. Dr. Segerson will consult with Dr. Smith about his comment concerning recommendations to document in RIAs decisions about how decisions underlying the conceptual model were made.
12. Dr. Segerson will revise the conclusions of section 6.1 to communicate recommendations specific for that context. She will check with Dr. Smith regarding his discussion of meta-analysis and ensure that any recommendation relating to benefit transfer will include appropriate caveats.
13. Dr. Thompson will revise section 6.2 to: 1) include discussion of the limitations of regional resources within the site-specific section and not to defer those points to section 6.3 and 2) to insert text provided by Dr. Biddinger to clarify the major points in section 6.2 regarding the relationship between ecological risk assessment and valuation.
14. Drs. Thompson and Segerson will collaborate to make the presentation of recommendations consistent at the end of chapters.
15. Dr. Thompson will revise section 6.2 to characterize how well Chicago Wilderness represents public participation in valuation efforts across EPA

regional offices and to better explain the link between the Southeast Ecological Framework and valuation.

Respectfully Submitted:

/s/

Angela Nugent
Designated Federal Official

Certified as True:

/s/

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

List of Attachments

Attachment A: Roster of the SAB C-VPESS

Attachment B: Federal Register Notice

Attachment C: Meeting Agenda

Attachment D: Attendees from the Public Who Requested or Were Provided Call-in Information

Attachment E: Compilation of Comments Received from Invited "Informal Reviewers" (Drs. James Opaluch, Roger Kasperson, Dr. Duncan Patten) on September 2007 draft

Attachment F: Compilation of Comments received from C-VPESS Members on September 2007 Draft

Attachment G: Draft List of Issues for Discussion at the Teleconference Calls, Drawn from C-VPESS Members and Informal Reviewers' Comments

Attachment A:

Roster of the U.S. Environmental Protection Agency Science Advisory Board Committee on Valuing the Protection of Ecological Systems and Services

CHAIR

Dr. Barton H. (Buzz) Thompson, Jr., Robert E. Paradise Professor of Natural Resources Law, Stanford Law School, and Director, Woods Institute for the Environment, Stanford University, Stanford, CA

VICE-CHAIR

Dr. Kathleen Segerson, Professor, Department of Economics, University of Connecticut, Storrs, CT

MEMBERS

Dr. William Louis Ascher, Donald C. McKenna Professor of Government and Economics, Claremont McKenna College, Claremont, CA

Dr. Gregory Biddinger, Coordinator, Natural Land Management Programs, Toxicology and Environmental Sciences, ExxonMobil Biomedical Sciences, Inc, Houston, TX

Dr. Ann Bostrom, Associate Professor, School of Public Policy, Georgia Institute of Technology, Atlanta, GA

Dr. James Boyd, Senior Fellow, Director, Energy & Natural Resources Division, Resources for the Future, Washington, DC

Dr. Robert Costanza, Professor/Director, Gund Institute for Ecological Economics, School of Natural Resources, University of Vermont, Burlington, VT

Dr. Terry Daniel, Professor of Psychology and Natural Resources, Department of Psychology, Environmental Perception Laboratory, University of Arizona, Tucson, AZ

Dr. A. Myrick Freeman, William D. Shipman Professor of Economics Emeritus, Department of Economics, Bowdoin College, Brunswick, ME

Dr. Dennis Grossman, Director, DGO, Vienna, VA

Dr. Geoffrey Heal, Paul Garrett Professor of Public Policy and Business Responsibility, Columbia Business School, Columbia University, New York, NY

Dr. Robert Huggett, Consultant and Professor Emeritus, College of William and Mary,

Williamsburg, VA

Dr. Douglas E. MacLean, Professor, Department of Philosophy, University of North Carolina, Chapel Hill, NC

Dr. Harold Mooney, Paul S. Achilles Professor of Environmental Biology, Department of Biological Sciences, Stanford University, Stanford, CA

Dr. Louis F. Pitelka, Professor, Appalachian Laboratory, University of Maryland Center for Environmental Science, Frostburg, MD

Dr. Stephen Polasky, Fesler-Lampert Professor of Ecological/Environmental Economics, Department of Applied Economics, University of Minnesota, St. Paul, MN

Dr. Paul G. Risser, Chair, University Research Cabinet, University of Oklahoma, Norman, OK

Dr. Holmes Rolston, University Distinguished Professor, Department of Philosophy, Colorado State University, Fort Collins, CO

Dr. Joan Roughgarden, Professor, Biological Sciences and Evolutionary Biology, Stanford University, Stanford, CA

Dr. Mark Sagoff, Senior Research Scholar, Institute for Philosophy and Public Policy, School of Public Affairs, University of Maryland, College Park, MD

Dr. Paul Slovic, Professor, Department of Psychology, Decision Research, Eugene, OR

Dr. V. Kerry Smith, W.P. Carey Professor of Economics, Department of Economics, W.P. Carey School of Business, Arizona State University, Tempe, AZ

CONSULTANTS TO THE COMMITTEE

Dr. Joseph Arvai, Professor**,** Environmental Science and Policy Program, and Department of Community, Agriculture, Resource and Recreation Studies (CARRS), Michigan State University, East Lansing, MI

Dr. Allyson Holbrook, Assistant Professor of Public Administration and Psychology, Survey Research Laboratory, University of Illinois at Chicago, Chicago, IL

Dr. Jon Krosnick, Frederic O. Glover Professor in Humanities and Social Sciences, Professor of Communication, Director, Methods of Analysis Program in the Social Sciences, Associate Director, Institute for Research in the Social Sciences, Stanford University, Palo Alto, CA

SCIENCE ADVISORY BOARD STAFF

Dr. Angela Nugent, Designated Federal Officer, 1200 Pennsylvania Avenue, NW 1400F, Washington, DC, Phone: 202-343-9981, Fax: 202-233-0643, (nugent.angela@epa.gov)

Attachment B: Federal Register Notice

Science Advisory Board Staff Office; Notification of Four Public Teleconferences of the Science Advisory Board Committee on Valuing the Protection of Ecological Systems and Services
[Federal Register: October 31, 2007 (Volume 72, Number 210)]
[Notices]
[Page 61636]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr31oc07-62]

ENVIRONMENTAL PROTECTION AGENCY
[FRL-8489-3]

Science Advisory Board Staff Office; Notification of Four Public Teleconferences of the Science Advisory Board Committee on Valuing the Protection of Ecological Systems and Services

AGENCY: Environmental Protection Agency (EPA).
ACTION: Notice.

SUMMARY: The EPA Science Advisory Board (SAB) Staff Office announces four public teleconferences of the SAB Committee on Valuing the Protection of Ecological Systems and Services (C-VPESS) to discuss components of a draft report related to valuing the protection of ecological systems and services.

DATES: The SAB will conduct four public teleconferences. The public teleconferences will occur on November 19, 2007, November 20, 2007, December 3, 2007, and December 10, 2007. All calls will begin at 1 p.m. and end at 3 p.m. (eastern daylight time).

FOR FURTHER INFORMATION CONTACT: Any member of the public wishing to obtain general information concerning the public teleconferences may contact Dr. Angela Nugent, Designated Federal Officer (DFO), via telephone at: (202) 343-9981 or e-mail at: nugent.angela@epa.gov. General information concerning the EPA Science Advisory Board can be found on the EPA Web Site at: http://www.epa.gov/sab.

SUPPLEMENTARY INFORMATION: The SAB was established by 42 U.S.C. 4365 to provide independent scientific and technical advice, consultation, and recommendations to the EPA Administrator on the technical basis for Agency positions and regulations. The SAB is a Federal Advisory Committee chartered under the Federal Advisory Committee Act (FACA), as

amended, 5 U.S.C., App. The SAB will comply with the provisions of FACA and all appropriate SAB Staff Office procedural policies.

Background: Background on the SAB C-VPESS and its charge was provided in 68 FR 11082 (March 7, 2003). The purpose of the teleconferences is for the SAB C-VPESS to discuss components of a draft advisory report calling for expanded and integrated approach for valuing the protection of ecological systems and services. These activities are related to the Committee's overall charge: To assess Agency needs and the state of the art and science of valuing protection of ecological systems and services and to identify key areas for improving knowledge, methodologies, practice, and research.

Availability of Meeting Materials: Agendas and materials in support of the teleconferences will be placed on the SAB Web Site at: http://www.epa.gov/sab/ in advance of each teleconference.

Procedures for Providing Public Input: Interested members of the public may submit relevant written or oral information for the SAB to consider during the public teleconferences. Oral Statements: In general, individuals or groups requesting an oral presentation at a public SAB teleconference will be limited to three minutes per speaker, with no more than a total of one-half hour for all speakers. To be placed on the public speaker list, interested parties should contact Dr. Angela Nugent, DFO, in writing (preferably via e-mail) 5 business days in advance of each teleconference. Written Statements: Written statements should be received in the SAB Staff Office 5 business days in advance of each teleconference above so that the information may be made available to the SAB for their consideration prior to each teleconference. Written statements should be supplied to the DFO in the following formats: One hard copy with original signature, and one electronic copy via e-mail (acceptable file format: Adobe Acrobat PDF, WordPerfect, MS Word, MS PowerPoint, or Rich Text files in IBM-PC/ Windows 98/2000/XP format).

Accessibility: For information on access or services for individuals with disabilities, please contact Dr. Angela Nugent at (202) 343-9981 or nugent.angela@epa.gov. To request accommodation of a disability, please contact Dr. Nugent preferably at least ten days prior to the teleconferences to give EPA as much time as possible to process your request.

Dated: October 22, 2007.

Anthony Maciorowski,

Deputy Director, EPA Science Advisory Board Staff Office.

[FR Doc. E7-21450 Filed 10-30-07; 8:45 am]

BILLING CODE 6560-50-P

Attachment C: Meeting Agenda

EPA Science Advisory Board
Committee on Valuing the Protection of Ecological Systems and Services (C-VPESS)
Public Teleconference
November 20, 2007, 1:00 a.m. - 3:00 p.m. (Eastern Time)

Agenda

Purpose: The purpose of the teleconference is to reach committee consensus on a draft report related to valuing the protection of ecological systems and services.

1:00 – 1:05	Opening of Teleconference	Dr. Angela Nugent, Designated Federal Officer
1:05 – 1:10	Review of Agenda	Dr. Buzz Thompson, Chair Dr. Kathleen Segerson, Vice-Chair
1:10 – 1:15	Public Comments	TBA
1:15 – 2:00	Chapter 6 Section 6.1	Dr. Kathleen Segerson Committee
2:00 – 2:40	Chapter 6 Sections 6.2 and 6.3	Dr. Buzz Thompson Committee
2:40 – 2:55	Planning for December Teleconferences	Dr. Buzz Thompson Committee
2:55 – 3:00	Summary and Next Steps	Dr. Buzz Thompson Committee
3:00	Adjourn	

Attachment D: Attendees from the Public Who Requested Call-in Information

Ashraf Abdul-Mohsen, Ph.D.
U.S. Environmental Protection Agency
OW/OST/EAD
Economics and Environmental Assessment Branch

Adam Ayers
General Electric
Corporate Environmental Programs

Patricia Kablach Casano
Counsel, Environmental Legislative and Regulatory Affairs
General Electric Company

Sharon Hayes
EPA, Gulf of Mexico Program Office

Maureen F. Kaplan
ERG

Suzanne Marcy
Office of Research and Development

William J. Mates, MS
Research Scientist/Economics
New Jersey Department of Environmental Protection

Kristy Mathews
Veritas Economics

Wayne Munns
Office of Research and Development

Steve Newbold
Office of Policy, Economics, and Innovation

Attachment F:**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
WASHINGTON D.C. 20460

OFFICE OF THE ADMINISTRATOR
SCIENCE ADVISORY BOARD

October 12, 2007

Note to Members of the SAC Committee on Valuing the Protection of Ecological Systems and Services

From: Angela Nugent, Designated Federal Officer

Please find attached three sets of "informal review comments" requested by the SAB Staff Office, in consultation with the C-VPESS Chair and Vice-Chair, to aid the committee in determining revisions to be made to the September 18, 2007 C-VPESS report. I requested review comments from three experts who either have served or are currently serving with SAB committees or panels: Dr. Roger Kasperson (Clark University), Dr. Duncan Patten (Montana State University), and Dr. James Opaluch (University of Rhode Island).

The SAB Staff Office requested that they focus their comments on: 1) the reasonableness of the advice and general approach recommended in the report; 2) whether descriptions of valuation methods and their applications contain any technical errors; and 3) whether descriptions of ecological science and its use in valuation contain any technical errors.

There will be a more formal technical review when the chartered SAB conducts a Quality Review of the C-VPESS draft, but I hope these comments will provide the committee now with fresh perspectives and insights on the current draft. I am grateful to the reviewers for their willingness to review the draft within the tights time constraints necessitated by the upcoming teleconference and I hope their comments will be useful to you.

Attachments (3)

"Roger Kasperson" <rkasperson@clarku.edu>
10/10/2007 02:03 PM To
Angela Nugent/DC/USEPA/US@EPA
cc

bcc

Subject
C=VRESS Report

Angela, I have done a fast review of this very substantial report which merits a closer review than I have been able to do in the limited time. But here are some big picture comments to begin.

Some Major Positives.

1. Overall. This is a very high quality study which should be very valuable to the Agency. In particular, I appreciate very much

a. the broad scope of treatment. The narrow scope given in the past to the very range of issues has been perhaps the major deficiency

b. the call for a well-developed conceptual model to ground the Agency's work. It is hard for me to see significant high-quality work on the valuation issues without such a conceptual model. That said, it would be helpful if the Committee could provide more guidance on how such a model could be designed.

c. the discussion of uncertainty is very important and thoughtful. But is also seems somewhat buried in this report. Should it be a separate chapter, or, shortof that, given more visibility? You cannot find it in the Table of Contents, for example.

d. the discussion of methods, supported by the lengthy Appendix, is probably the best treatment currently available anywhere.

e. I also appreciate the Committee's structuring around 3 major domains of EPA work.

2. It may seem strange coming from me, an academic, but I worry a bit about the abstract nature of the report. Despite the Committee's good intentions, I do think the report comes across as quite abstract, and not as pragmatic or applied as it might be. So I wonder how much it will be used. More examples throughout would be helpful and in particular one well worked-out example of a case with the implementation steps recommended on page 39 would be very helpful. A model case showing how the Committee's recommended procedure could be done in one separate chapter would be invaluable. This should include a conceptual model.

3. The big problem in the report, in my view, is Chapter 7, Recommendations and Conclusions. It does not do justice to a fine report. I see it as currently a mish-mash of findings, conclusions, observations, and recommendations. I count 24 bolded items in this chapter and I have no idea whether they are findings, conclusions, or recommendations, or Committee

perceptions. Suggest a substantial rewriteand tightening of this chapter, with clear linkages between any conclusions or recommendations and where the supporting evidence can be found in the preceding chapters. I like a format sometimes used in NAS reports where a numbered conclusion is set forth, a paragraph of justification follows, and then a numbered, related recommendation is stated. Ideally, the numbers of such prinicipal conclusions and recommendations should be perhaps 8-10, not 24. Statements that the Committee "believes" this or that are ambiguous. This chapter needs a major reworking so that it is worthy of a very good report.

Roger

SAB C-VPESS Report
"Valuing the Protection of Ecological Systems and Services"

Draft Comments from Dr. James Opaluch, URI

The committee is to be congratulated for a extensive effort to address a very difficult problem, and for the obvious time, energy and careful deliberation it committed to this task. The report could contribute to a more complete consideration of values by EPA. In particular, while suggesting a new "approach", the report identified a method that could improve decision making within the traditional EPA framework of monetizing values when feasible, quantifying values when monetizing is not possible, and qualitative discussion of values that are not quantifiable. In practice, implementation of this approach at EPA often seems to have been reduced to monetizing values when possible (and necessarily not doing a very good job at that), and perhaps listing some values that cannot be monetized. But the approach has not typically led to having those non-monetized values taken very seriously. So the outcome of such an analysis has traditionally been only to focus seriously on monetized values.

Not that this is the fault of EPA. Incorporating a range of values with different degrees of quantification is a very difficult task, and EPA virtually always expected to carry out analyses in far too little time with inadequate funding. Implementing an approach such as that suggested by the panel could be fairly time consuming and expensive. But if decision making were improved, it could be time and money well spent for major actions considered by EPA. In particular, more rigorous grounding for, and acceptance of methods for quantifying non-monetary values and summarizing qualitative values could result in those values being taken more serious in the policy debate, thereby making the valuation process more inclusive. In my comments below I attempt to identify some concerns that struck me during my all-too-brief opportunity to review the report, and to suggest some ways in which I think the report could be improved.

(1) Structural Framework For Ecosystem Valuation

It seems to me that it would have been useful for the committee to formalize their discussion of ecosystem function and services into a set of stages in quantification of ecosystem values, and to link the methods described later to this framework. For example, when faced with policy questions regarding ecosystem valuation, EPA will typically face multiple stages of analysis. One possible way of laying this out is to consider (1) a set of actions or events that (2) drive changes in ecosystems, thereby (3) affecting the flow of ecosystem functions over time, (4) affecting ecosystem services, (5) which are valued. This framework can be depicted as follows:

(1)	(2)	(3)	(4)	(5)
Actions or events =>	Ecosystem Effects =>	Biological Functions =>	Service Flows =>	Values

An action or event might be something like a new regulation being considered by EPA, or it might be a hazardous substance that leaks from a facility, and whose damages need to be assessed to quantify liability. The event has immediate effects on ecosystems (e.g., a fish kill), which in turn affect the natural functions provided by ecosystems (e.g., food webs), and the services enjoyed by society (e.g., subsistence fishing). Finally, these services provide values to

society (e.g., changes in catch and perhaps lifestyle), where the values are defined as in Appendix A of the report.

It might then be useful to use this in organizing and clarifying the potential contribution of various methods discussed in the report. For example, pure bio-physical methods might quantify ecosystem effects and the resultant changes in ecosystem functions, but are unlikely to quantify fully the losses in services to society, and almost certainly are not capable of providing comprehensive measures of losses in social values. Thus, bio-physical methods are essential contributors to analyses of changes in ecosystem values that are the subject of EPA analyses, but are not themselves valuation methods. Thus, bio-physical methods focus on stages (2), (3), and possibly part of stage (4) of the problem as laid out above.

Conversely, social valuation methods are unlikely to be able to resolve complex ecosystem effects, or the resultant changes in biological functions. Rather, these methods focus on stages (4) and (5). Thus, valuation studies clearly require supporting analyses from natural scientists. As is pointed out in the report, the general public often has a poor understanding of the natural systems, and their judgment of the functioning of these systems should not serve as the basis for EPA decisions. I liken this to air travel. I would never fly on a plane that is designed according to a survey of the general public. Rather, I hold greater trust in the expertise of trained engineers.

As an aside, I applaud the statement to that effect on page 19, line 22. It is very important for the Agency to keep mind that, while natural scientists have much to contribute to helping us understand the functioning of ecological systems, the preferences of natural scientists should not dictate social values.

Within this framework, I would argue that public opinions and attitudes elicited from approaches like focus groups are most useful in scoping studies that might identify service flows that are socially important, but are probably less useful quantifying values. For example, Table 7 on page 230 shows a series of questions and importance ratings. While this provides some generic information on public issues of concern, it is unclear how this information could be used to support a specific decision. Should total expenditure of the US Forest Service budget be proportional to these importance ratings? Should the importance rating be used to determine whether or not to develop a particular road? If so, this means that no new roads would be developed in forest and grasslands, since it only has an importance rating of 2.62, while conserving forests and grasslands have an importance rating of 4.73. Thus, while this kind of attitude survey might provide some useful information about general public concerns, the results are not specific enough to answer particular policy questions. So I would argue that the approach might help identify important service flows, but not for quantifying values in a manner appropriate to answer particular policy questions.

I would argue that “values” cannot be expressed on biophysical units, rather ecosystem functions or perhaps service flows might be expressed in bio-physical units (e.g., Page 20, line 8 and lines 11-12). This means that the “valuation” and the ecology must be carried out separately, and both are needed to value ecosystem changes.

A framework of this sort might also allow the committee to place a strengthen the foundation for their recommendation that multiple techniques are complementary, not only because some techniques are more useful that others in identifying particular values, but also because multiple techniques are required to fully quantify many of the individual values.

(2) Explicit Recognition of Decisions Faced by EPA

I think the report might also have benefited by a more explicit recognition that ecosystem valuation analyses are targeted to answer specific questions faced by EPA. This implies that, at least in some cases, analyses don't necessarily have to be complete to provide the information needed to answer a particular question. To continue the example of Table 7 in the Report, if a policy question is faced on whether to allow logging, and one could show that the lost recreational values alone exceed the net value of logging, one could conclude that logging is not justified without determining all the remaining ecosystem effects. It is important to note, of course, that the converse is not true. But at least in some cases, incomplete information is sufficient to resolve a policy question faced by EPA. It would be inappropriate to expend a large effort to analyze the full suite of values, when the correct decision becomes clear with only a subset of values.

(3) Report Does Not Give Balanced Criticisms of Methods

The committee has, in some places, taken a very narrow view of the contributions of economics to valuation, and indeed in some cases the report reads like some panel members have a chip on their shoulder regarding economic methods. I believe that the report could be more balanced in its discussion of the strengths and weaknesses of different methods. The report discusses at some length, and in many different places, the perceived shortcomings of economic methods, while by-and-large providing a much less critical eye towards other methods that are presented. For example, throughout the report, it indicates that economic analysis assumes perfect rationality (P16 L27), well-formed preferences (P17 L1), is based solely on anthropocentric values (P79 L13), ignores civic values (P16 L2), reflect only self-interest (P16, L25), values are expressed in monetary terms (P15 L33), require individuals to express values in monetary terms that might be considered offensive (P22 L16), are restricted to monetary values to individuals in their roles as consumers (P194, L21), etc.

Yet, other methods are presented almost uncritically, or at least any criticisms are much more muted and far more difficult to find. This makes the report appear unbalanced—aside from the fact that I don't agree with some of these points (I include more discussion on this later). Although the report mentions some shortcomings of these approaches, it does so in far less obvious and critical terms than it does economic methods. For example, the report discusses methods like citizen juries. Citizen juries have the advantage that participants spend a considerable amount of time studying an issue, thereby potentially educating participants regarding some of the complexities being faced. However, juries have the well-known limitation of being subject to manipulation by eloquent and skillful participants. We are all aware of horror stories of outlandish jury awards. I don't mean to imply that the citizen jury approach should be rejected. Simply that the report does not have a balanced discussion of the strengths and weaknesses of the approach.

Another example is the energy-based methods of valuation, which are presented far more uncritically. The report could have observed that emergy analysis is based on the assumption that all forms of (excess) energy are equally valued, independent of their form. So, for example, per unit values of energy used to support microbes or the smallpox virus are same as per unit value of energy that supports humans, blue whales and tigers. Emergy analysis would imply, for example, that there is great value to be obtained by dumping untreated sewage into Lake Tahoe, thereby greatly increase emergy content of that highly oligatrophic lake. Yet, the town of South Lake Tahoe was required by EPA to install very expensive secondary and tertiary treatment methods specifically to avoid increasing biological productivity of Lake Tahoe. Emergy analysis would seem to imply that rapid global warming is of great benefit to the earth, since it will increase the energy content of the global system from which organisms can draw. Thus, global warming could potentially greatly increase emergy content of the global system. Yet, even if this were true, one would not argue EPA policy should encourage increased emissions of greenhouse gases in order to increase global emergy. It would be a great error for EPA policy to be based on emergy analysis. Indeed, emergy analysis would seem to violate everyone one of the Report's key recommendations for valuation, as expressed on pages 57-58. Nevertheless, there have been advocates for emergy analysis within EPA.

Yet criticism of Emergy analysis is difficult to find within the report, and rather muted (albeit fairly damning). Indeed, to the contrary, the report states on Page 18, line 20 that valuation based on energy flows are based indirectly on public preferences. I don't understand the reasoning behind this claim, unless the committee sees energy flows as contributing one part of the problem, such as stage (2) in the framework above.

Although I believe that the analysis of flows of energy and materials through a system can provide useful information, these approaches cannot be viewed as measuring values, as values are defined by the report in Appendix A. A framework such as that discussed in my item (1) above would provide a basis for inclusion of these types of values. Although an accounting of energy and materials flows through ecosystems might provide some useful information about ecosystem functioning, it does not provide a measure of values.

Judgment and attitude based methods are similarly based on assumptions of perfect knowledge, otherwise judgment and attitudes could be equally misleading as economic methods. Although social deliberative process are the basis of democratic society, they are subject to manipulation by a vocal and highly motivated minority, who seek their own personal benefit.

All methods have shortcomings, but the discussion in the first Chapter only points out shortcomings of economic techniques, and not other methods. This does not indicate a balanced review of valuation methods. Citizen-juries have potential, but judgments of juries have well known problems.

(4) The Report Adopts a Very Narrow View of Economic Methods

Throughout the report, a very narrow view of economic methods is adopted, assuming economic approaches only use monetary valuation methods. In fact, the foundation of economic approaches to valuation is *preference oriented*, not money, and there is a considerable and rapidly growing body of economic studies that focus on non-monetary means of valuation.

Admittedly, EPA may not have widely adopted the techniques to date, but the report criticizes not EPA's choice of methods (often driven by regulations), but economic methods.

For example, conjoint analysis and other choice-based approaches have been employed by economists for over two decades, and is a rapidly growing area of research. Indeed, choice-based approaches to economic valuation has arguably been the most heavily researched area of economic valuation over the past decade. Choice-based methods are based on the same concept of relative preference over alternative commodities described for attitude and judgment based approaches indicated on Page 17 Line 26. But choice-based economic methods are also consistent with, but do not require, valuation in monetary terms. Similarly, habitat equivalency analysis can also be formulated in a manner that is entirely consistent with economic theory, and use of HEA methods was first suggested by economists, and have been embodied into regulations under the service-to-service equivalency. See, for example, Mazzotta, Opaluch, and Grigalunas, 1993; 1994, Unsworth and Bishop 1994; Matthews et al, 1995.

(5) Benefit Transfer

The committee correctly places great attention to benefit transfer methods, given that most valuation analyses carried out by EPA are not based on new primary studies. Given its importance, should the report place greater emphasis on the need for EPA to improve benefit transfer methods. Given that most valuation studies are based on benefit transfer due to limitations in time and cost, how can EPA employ the far more extensive method suggested by the panel? Either we need to think about how non-economic methods can be transferred, or the panel should say strongly that more resources should be allocated to valuation, or most likely, both.

Given its practical importance, I would amply the recommendation that EPA should support research to improve benefit transfer. Should EPA be advised to fund a research program to test transferability of values (economic or otherwise), to design values estimates that are specifically designed to be more reliably transferred, and to estimate values systematically to cover the range of services that EPA must regularly value. This would provide a "catalog" of values that could be transferred. It is also important that these values be regularly updated to stay current and to insure that studies are based on state-of-the-art methods.

Page 91, line 6. I'm not sure I would agree that little attention had been paid to the challenges and limitations of benefits transfer prior to 2000. For example, in 1992 there were three key events focused on benefits transfer. First, NOAA hosted a workshop directed towards developing databases to support benefits transfer, and EPA complied a bibliography of the NOAA environmental benefits studies. Water Resources Research published a special section that was dedicated to papers addressing key issues related to benefits transfer, and AERE held a workshop entitled "Benefits Transfer: Procedures Problems and Research Needs" funded by US EPA, NOAA and USDA.

(6) Defining Non-Anthropocentric Values

I fear it is misguided to base the definition of anthropocentric values on whether something effects human well-being, if "well-being" is broadly defined to include such thing as economic

nonuse values (Page 13, Line 1-2). I fear that this definition makes the distinction between anthropocentric and non-anthropocentric values purely semantic. For example, suppose I hold value for endangered species, and I believe that they should be protected for their own sake. Is my psychic "well-being" affected if a new law is passed which strengthens protection provided to endangered species? According to the report, this is an anthropocentric value if it based on the economic concept of nonuse values since it affects my well-being, but is otherwise nonanthropocentric. In economic theory, if I think something is important, and I am willing to sacrifice for it, then it is modeled as affecting my well-being (utility). It is not possible to determine whether something effects "well-being", unless well being is defined narrowly to include only direct effects, such as recreation or health effects. If I voluntarily give money to the poor or if I vote for a provision to increase my taxes to support the homeless, am I making myself "worse off", or am I doing it to improve my psychic well-being because I care about the poor and homeless? I would argue the distinction is purely semantic.

I believe that one could equally well define these actions as increasing one's own well-being, simply by saying that my well-being includes concern for others. In this case, the distinction between whether or not a voluntary action increases one's own well being is purely semantic. So the concept of nonuse value could equally well be defined as "anthropocentric" or "non-antropocentric" depending on whether one accounts for an individual's concern for other species.

An alternative way of thinking about anthropocentric values is to distinguish between "weakly" non-antropocentric and "strongly" non-antropocentric. A weakly non-antropocentic value is a value that is ascribed to an entity by humans, but that does not relate directly to human use of a natural entity. For example, many people feel strongly that conservation of blue whales, endangered species, unique natural features (e.g., Grand Canyon), free flowing rivers, healthy ecosystems and pristine wilderness, above and beyond any present or future use by the individual or by people in general. This value is non-antropocentric, in that it does not depend upon the effect of the resource on people, but is weakly non-anthropocentric since the value is ascribed by humans. Thus, the value exists because and only because it is held by people.

A strongly non-anthropocentric value is a value that exists as a Universal Truth, and is beyond determination by people, but rather is imposed on people by some greater Truth. This is underlies the notion of true "intrinsic" values, which are values that an entity holds irrespective of how it related to others, or what is believed by others.

People cannot gain insights into strongly non-anthropocentric values except by seeing "into the mind of the Creator". This is a form of religion. Of course, it is always possible that individuals believe that non-human species have value endowed by a Creator, which serves as their basis for ascribing value. But the value lies in the beliefs by the members of society, and is not imposed on a society that does not share that belief. Many animal rights extremists would conform to this latter view, that the intrinsic value of all species is a right that should be imposed on society irrespective of the beliefs of the members of society. I would argue that "strongly" non-anthropocentric values are based on religious faith, and should not guide EPA policy.

I think this distinction is important, because I believe that many with a biocentric viewpoint hold to the strong non-anthropocentric value that is a form of religion. Furthermore, this distinction helps to separate out "values" that are based on expert judgment (including preferences of

scientists), rather than social values. Furthermore, with this distinction, nonuse values as defined by economists are weakly non-anthropocentric, and specifically not anthropocentric. I firmly believe that the notion of whether nonuse values contribute to human well-being is not a meaningful one.

Many of the approaches described are just as "anthropocentric" as are economic methods, but this is only pointed out when discussing economic methods. For example, Section 4.1.3 describes "Methods of Attitudes Preferences and Intentions" which are anthropocentric.

I think the term "intrinsic values" is misplaced. An intrinsic value is a value of something in and of itself, without consideration of how others are affected. Humans can hold values for existence of something, but this is not "intrinsic", but rather the value ascribed to an held by another. In my view, insights into intrinsic values are either purely speculative or obtained by seeing into the mind of a Supreme Being, which is a religious value. EPA should not be driven by religious values. (Top of page 13). (Bottom of page 13). (Bottom of page 14).

Review of Draft SAB C-VPESS Report "Valuing the Protection of Ecological Systems and Services" Provided by Duncan Patten, Montana State University

General Comments: This is a comprehensive report that obviously has been written by a team. This results in some wordy sections but perhaps wordiness is appropriate for a difficult topic. The approach taken by the committee seems appropriate, that is, an overview, a general approach with a more specific expansion of steps, overview of existing methods, addressing uncertainties, case studies, and general recommendations. This reviewer could not find what one might consider any fatal flaws in the report, although there are many smaller issues that might be addressed in revision.

The more specific review comments below expand on many marginal notes made during reading of the report. Some of the review comments may seem repetitive but if so, then concern for that particular issue may be greater than others. The comments are based on Chapters and Sections of the Report.

Chapter 1. Introduction.

Brief and to the point and leads the reader into the body of the report.

Chapter 2. Conceptual Framework.

A good but somewhat tedious background to ecosystem services and valuation with some good examples and suggestions as to application to EPA.

Some text has suggestions as to valuation of "benefits" but not much mention of costs (e.g., page 7, lines 15-22).

Recognition of boarder aspects of ecosystem services is good as many people only think of direct benefits to humans, not indirect benefits such as ecosystem processes that may result in human benefits. It is also good to bring into the valuation picture intrinsic values versus instrumental values. It is also important to recognize that different individuals and disciplines think of the concept of value differently. Throughout the text, this idea is developed but perhaps might be more emphasized earlier in the text.

Constraints on EPA are recognized (page 25, lines 16-26) but how important are these to overall valuation guidelines if EPA constraints change?

In the Integrated and Expanded Approach, the report focused on EPA where there is an environmental protection decision to be made. Like many other places in this report where decisions are addressed, the process often emphasizes protection but this implies the system is "not broken". Many other comments on using valuation in the text talk about ecosystem "change". The committee needs to address the use of the word "change" because in many places (to be pointed out later), what is really being addressed is ecosystem "response" to some action. The response may be "no change".

Figure 1 (page 32) shows a model that directly ties values to decision making and problem formulation. There should be an additional circle in the model between “values” and “decision making” which would be “analysis of values”. This then leads to final decision making or side tracks to more “problem formulation”.

The “Approach” presented in pages 32-33 does not obviously fit with the conceptual model in Figure 1. The committee should consider another more detailed diagram that depicts the steps used in the “approach”. These are not obvious in Model Figure 1 unless they somehow are combined in “problem formulation”…. This needs to be made clear.

Page 35 the report mentions that ecological models have been developed for purposes other than EPA policy and regulation, usually research. It would be useful here to mention the need to adapt these models or create appropriate models. This is mentioned and recommended later in the chapter.

Page 37 line 10 is a good example of the use of value of “ecological change”. If one uses EISs as examples, there is a “no action” component. This might create no change, or the action itself might create no change, thus using the concept of “ecological response” or “ecosystem response” might be more accurate. In some places the use of “change” is appropriate but the use of this term must be used cautiously.

Figure 2, page 40 shows just one feedback to problem formulation. The committee should consider other feedback loops such as from (4) Projection of Changes in Ecosystem Services to (1) Problem formulation or at any step that might generate new information or concepts. The feedback from (5) Measurement of changes to Problem Formulation is appropriate.

In summary, the approach is designed for integration but the models and discussion appears more linear than it might be.

Chapter 3: Building a Foundation for Ecological Valuation

This chapter discusses use of conceptual models, operationalizing the models and development of ecological production functions, this latter considered the “best” approach to valuation of ecosystem services. One note prior to reading this was that the reviewer was to look for addressing actions that had positive, negative and no-changes. This was to address the reviewers concern that all EPA action leads to “change” which is not necessarily true.

Page 47, line 28. The point made here for “iteration and possible model changes and refinement over time” is major and needs to be reemphasized whenever appropriate.

The discussion of model development and selection is well done but more examples might help the user of this report. Many people have no idea what really constitutes a "conceptual model" whether it is a diagram, complex set of interactive thoughts, etc.

Page 53, line 16. What does "that model will need to be parameterized for the specific valuation context of interest" mean? Perhaps for the non-bureaucrat a definition of "parameterization" needs to be given with examples.

Two important recommendations are hidden in the text. Page 53, line 31 use of models, and Page 54, line 13, selection of model criteria. These are repeated in summary but it seems they need to be highlighted in the text as they are important.

This chapter uses change over and over. The implication to the reader is that valuation requires some change, that one can only put values on things or processes that change. Is this true???? This is implied in lines 9-16 page 55 in the discussion of identifying relevant outputs.

Page 56, line 4. Who or what are stakeholders? They may be public, decision makers, land owners, etc. For the good of this report, they "players" might be better defined.

Page 58-59. A good discussion of possible differences between indicators, endpoints and ecosystem services. Might this be more emphasized?

Page 60, line 20. 3.3.3. The reviewer suggests a change in heading based on concern for use of "change"…. Mapping Changes in Ecological Inputs to Sustainability of Ecological Services….. this recognizes the concept of ecological integrity.

Page 61, line 22. This definition of indicator is a very limited definition. It could also be "a state that tells something about a process" and there are more definitions of indicators. This should be recognized here.

Page 62, line 17. An indicator is not a metric. A metric is what is measured to quantify an indicator.

Page 64, line 16. The report needs to recognize the potential subjectivity of "report cards".

Page 65, line 19. Meta-analysis discussion implies index or indices (e.g., IBI…Karr is referenced). Should this be recognized?

Page 67. The reviewer seriously questions the applicability of NEON to EPA valuation procedures for ecosystem services. Does the committee really believe this?

Chapter conclusions and recommendations are good, but here again, the committee should consider not using "change" as the only outcome of some action.

Chapter 4. Methods for Assessing Value

The reviewer is not familiar with all the methods presented and discussed and assumes several committee members are well versed in these methods thus the reviewer will make few comments here.

One is that the discussion of “benefits transfer” is well done and addresses many concerns about the method. The committee in its recommendations also appropriately cautions EPA in the use of this method.

Chapter 5. Cross-Cutting Issues

This chapter addresses “uncertainty” and “communication”. These two points are probably two of the most important components of this report.

The discussion of uncertainties in ecological valuation is probably so important that this concept should be addressed at several earlier steps in this report. Even development of conceptual models in Chapter 2 is laced with uncertainties and steps in the integrated approach also.

Many points made in discussing uncertainties at times need to be emphasized. One that comes to mind is one dealing with use of experts and that they all might agree but all be wrong. This is important because use of “expert opinion” is such a useful tool when other quantitative data are not readily available.

Section 5.2.3 seems repetitive but perhaps that is useful as a way of emphasizing both communication and uncertainty.

The recommendations at the end of this chapter should have some statements about “uncertainties” not just “communicating ecological valuation information”.

Chapter 6. Applying the Approach in Three EPA Decision Contexts.

This chapter elaborates on three key features of the approach applied to three different “cases”. The features are (1) early identification of impacts important to people, (2) predicting ecological change (should this be “ecological response”?), and (3) use of multiple methods. The three cases are national, local and regional.

One general issue with the recommendations is that only for the regional approach does the committee recommend in detail what EPA needs to do about staffing, etc. On a national basis shouldn’t there also be some expansion of an office that would be able to follow through on the approach to valuation, while on the local level, EPA needs to better be able to aid the community or local constituents which means having some kind of

SWAT team available for such actions. If these are addressed in the text, it is not obvious.

National Valuation…The CAFO case. The reviewer found himself constantly circling the word “change” in this section where “response” or “output”, or “consequences” might be better words.

Page 120, lines 11 and 12. How is use of experts and the public different from “mediated modeling”?

Page 121, line 25. Good point about links between stressors and ecosystem services not being fully understood.

Page 124, lines 4-9. How does EPA select a model that applies nationally and yet has sufficient detail to help the process? It can be done but might be explained. As pointed out in line 26, the site specific nature of many ecological impacts makes a national assessment difficult.

Page 125, line 8. Is the conceptual model of a system as Figure 6 useful or is the problem too general for a national model?

This case study of CAFO discusses water quality but should also address air quality and perhaps quality of localities near cattle feed lots. This is brought into the conceptual model discussion on page 133, lines 6-11 but should be mentioned earlier such as at page 129, line 9.

Site-Specific Valuation (Superfund sites, Mines, etc.)

This section presents a model of approach but does not mention or present a model of the system (or typical system). Both models are necessary for adequate understanding. Another place a model would be useful is to “align risk endpoints with ecosystem services” (page 147 line 21.)

Finally in section 6.2.3.3 there is a recommendation to construct models. The points made here need to be made in steps 6.2.1 and Figure 7.

The use of the bulleted list of recommendations on page 166 is a good list and this approach might be used throughout and perhaps in an Executive Summary, remembering that there is a discussion of recommendations at the end of the report.

Valuation in Regional Partnerships

There may be a need to have a better distinction between local or site specific examples that might have broader impacts, for example on water quality, and regional examples

such as a watershed which also relates to water. Can this be explained at the beginning of this section or beginning of chapter?

How representative is the Chicago Wilderness study of regional problems throughout the country or was it one that EPA worked with? Explain.

How representative is the SE Ecological Framework Project if it does not attempt to combine economic and ecologic analyses (page 186, line 6)? This project has a deep scientific foundation in conservation but did not do valuation. One is not certain of its applicability here unless this is better explained.

The primary recommendations for the regional case studies is for more staffing and funds for EPA regions. Is this appropriate guidance as to how EPS should organize itself? This seems out of balance for recommendations offered in the national and site specific studies.

Chapter 7. Summary of Major Recommendations and Conclusions.

This is well done.

One more time I need to point out the use of "changes"… page 191, line 6 for example. There are not always changes but there are always "ecological process responses".

Most of the recommendations stand by themselves but some may be more important than others (one person's perspective). One such recommendation (page 196, line 15) points out issues in transferability of ecological information. This is a critical recommendation as it is simple to transfer information in making conceptual models or identifying ecosystem components for valuation.

Attachment F

Comments on Draft Report from the SAB Committee on Valuing the Protection of Ecological Systems and Services (C-VPESS) "Valuing the Protection of Ecological Systems and Services" (Draft Report 09/24/07) – Comments from Committee Members (Alphabetical Order)

Comments Included

Comments from Dr. Ann Bostrom 1
Comments from Dr. Terry Daniel 2
Comments from Dr. A. Myrick Freeman 6
Comments from Dr. Dennis Grossman 11
Comments from Dr. Harold Mooney 12
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Comments from Dr. Kerry Smith 23

Comments from Dr. Ann Bostrom

Dear Angela,

Here are just a few written comments, as I am running up against thedeadline for submitting these to you. In general, my reaction is that thereport does an admirable job of synthesizing and presenting the committee's thoughts (thanks especially to you, Kathy and Buzz).
There are various small typos that came to my attention - will send notes on some of those separately. There are also several places where there are missing references and one place at least where there is missing text, as you are undoubtedly aware (decision analysis).

Best,
Ann

Page 16 line 37 - change "researchers have argued" to "researchers have demonstrated"

Page 22 - lines 5-6 and later in the paragraph - this suggests that those with experience are not subject to manipulation or bias, which I am not sure there is evidence to support in the strong form presented here. Is there? Might add references to support this if so.

Page 23 and elsewhere - need some sensitivity still to becoming captive to the idea that scientists just need to educate the public. Maybe switch the order of involvement an public education on line 4. On page 44, line 8 - edit "educating the public" to read "increasing and augmenting public discourse about"

Page 55 line 3-4 and elsewhere (e.g., page 190 lines 23-26) there is a little lack of clarity regarding EPA providing value information versus eliciting values. Need to be careful

with this wording to clarify this.

Page 78 line 4 and the rest of this paragraph - preferences for ecological states and changes, not just changes?

Page 79 line 5 delete "specially selected" (nothing about the methods requires or presupposes this - mental models studies have been carried out with random samples as well as convenience samples)

Page 191 line 6 - add to this sentence (...of the ecological changes)"from the policy in question."

Comments from Dr. Terry Daniel

I ran across a number of small typos etc in my reading, but I will pass these along later. Also, I saw things in my own writing here and there that either were poorly crafted in the first place, or lost their intended meaning when lifted and dropped into their current locations in the text. I hope there will be an opportunity to "tune-up" this text before it goes much further. As requested, the following is limited to more "substantive" issues or to places where the intended meaning of a text seems to be unclear.

P 45
23 These include challenges associated with
24 understanding and modeling the relevant ecology, clearly identifying the relevant ecosystem
25 services, and mapping ecological changes into changes in the ecosystem services ~~of interest~~ likely to be affected by targeted stressors and Agency actions.
[Just trying to take advantage of an opportunity to get the "stressor" idea in, and to further define "of interest."]

50-1 Figure 4
[We should add "aesthetics" or "sense of place" to the examples in this figure of services to better represent the range of "cultural services."]

P 64
16 EPA actions. The report card approach is a possible method for characterizing contributions
17 to human well-being for the purposes of Circular A-4 when economic benefits ~~or~~ of ecological
18 services cannot be ~~readily~~ adequately monetized.
[A fine point, perhaps, but such values are almost never "readily" available.]

P 71
25 information. The intent is not to provide an exhaustive treatise on any given method, nor are these descriptions intended to be a cook-book for applying the methods.

P 80
5 economic benefits. This is viewed by many as a drawback of this approach to defining value in the context of determining public policies.

P 86, Table 3, Conservation Value Method, row 1 column 3
• Use as a means of quantifying biophysical impacts when they cannot be ~~quantified~~ monetized (as required by the OMB Circular A-4)

P 118 figure 6
[I do not recall this model being presented in the CAFO documents that we reviewed and critiqued. My understanding was that a "conceptual model" at this level of detail was not developed until after the CAFO benefits assessment was essentially concluded. My concern is that if this figure is taken by the reader to be from the CAFO analysis (especially if it was developed and used early in the process), it may call into question some of the criticisms and recommendations that we present earlier in our report.]

P 143 -144
[The NEBA process introduction and text box would be better moved to P 160, line 23, or to p 163, line 21. As currently placed, it interrupts the presentation and "flow" of the site-specific case examples. And, it fits better later, where it is called upon more specifically.]

P 148 line 24
[The text boxes for the individual site-specific cases work better when each is presented nearer their introduction into the discussion (exact locations suggested below).]

P 150 text box
21 the environment. The cleanup and restoration plan called for most remaining wastes
22 to be consolidated on site and secured with a protective material where needed, and covered by a
23 thick cap of soil and vegetation ~~known as a cap~~.
24
25 Front Royal is located in close proximity to the Appalachian Trail, the Shenandoah
26 National Park and George Washington National Forest, as well as a number of significant Civil War sites, making it a major tourist
27 center for the Blue Ridge Mountains.
[This first item is just picky texting, but the second change is needed to make sense of a later reference to the possible role of "historians" as part of the interdisciplinary team working on the site assessment.]

P 152, line 33
The Charles George Landfill text box would go well about here.

P 152
37 community, the health and safety concerns were addressed. Although the Record of
38 Decision was published over 20 years ago, the site is still a fenced off no-man's land and the potential for ecosystem services remains

39 untapped.

P 153
1 By contrast, the remediation and redevelopment of the DuPage County landfill site,
~~2 now known as the Blackwell Forest Preserve~~ [text moved below] appears to have been motivated largely by the
3 need to address existence values (e.g., the presence of hawks and other rare birds) and
4 recreational values (e.g., hiking, bird watching, boating, camping, picnicking, sledding). The
5 remediation effort succeeded, and the site is now known as the Blackwell Forest Preserve. Listed as a Superfund site in 1990, "a once dangerous area is
6 now a community treasure, where visitors picnic, hike, camp, and take boat rides on the
7 lake."
[The DuPage Count Landfill text box would fit well about here.]

P 153, line 28
[The Avtex Fibers text box fits well about here.]

P 154
~~3 Defining the ecosystem services that matter to people requires a carefully constructed~~
~~4 and systematically implemented program that integrates the use of multiple methods to fairly~~
~~5 and faithfully reflect the perspectives of multiple stakeholders. There is no simple recipe for~~
~~6 accomplishing this task and no simple algorithm for calculating values and summing them up~~
~~7 to make a decision.~~
[In the current context, this text/platitude (which is close to something I wrote for another time and place) adds little to the discussion.]

P 154, line 15
[The Leviathan Mine text box fits nicely here.]

P 156
10 chosen by the committee. Both the DuPage County Landfill and the Aztex Fibers cases appear to have at least qualitatively considered ecosystem services, with commendable results. These examples ~~did, however, provide~~ illustrate how more formal
11 assessments using ecological models and production functions could influence site-specific remediation and redevelopment efforts
12 ~~results~~ in a positive manner.

p 191
18 **parameterized to the ecosystems. Second, EPA must identify the ecosystem services**
19 **that are of public importance, while still being watchful for services that the public should appreciate but may not be aware of.**

[This may not be the best way—but we need to remind the Agency somewhere in here of the other important edge of the public value sword.]

P 194
24 the role of citizen rather than the role of consumer. Various deliberative and assisted
25 methods assume that many people do not have well formed values (monetary or otherwise) for ecosystem
26 services and that accurate valuation requires experts to actively assist people in constructing
27 and determining their values.

P 223, Column 2, row 1
Quantitative indices of attitudes ,
preference rankings, or
behavioral intentions toward
~~depicted~~ represented environments or
conditions
Column 3, row 2
Public concerns, attitudes, values,
beliefs, and behavioral intentions
related to specific trade-offs among
attributes of policy options

p 283
2 found either way, it seems reasonable to assume that ~~individual narrative interviews~~ focus groups have not been important components of EPA decision
3 making processes. Certainly the qualitative nature of the information provided by ~~both~~ focus groups ~~and individual interviews~~, and the

P 317
11 These differences necessitate the need for trade-offs—the third step in a valuation by decision-aiding process—across the attributes to
[This section starts off by referring to a two-step process. Does the writer mean something like "what might be construed as a third step" (in a 2-step process)?]

In several places in the report we refer to "qualitative assessments" and then illustrate/define that with something like "high, medium, and low" classifications. It is perhaps a fine point (and perhaps not even considered in "hard sciences"), but such classifications would probably be termed "ordinal scale measures" (even if rather imprecise) or as "lexicographic" scales (where "measures" are more roughly ordered and are presented only with words, and not with numbers). This is not worth wholesale editing, but perhaps a short footnote early on could acknowledge the particular variation of the term used in this report.

Also, in several places in the report we use the term "psycho-social" and in other places we use "socio-psychological" to mean the same thing. Either will work fine, but we probably should be consistent.

Comments from Dr. A. Myrick Freeman

C-VPESS Report - Comments by Freeman

Chapter 3

By and large, thias is a good chapter. My only comment is that I think that a little more should be said about how ecosystem dynamics and non-linearity can make prediction of changes in ecosystem services very difficult. There is only one sentence about this now (p. 53, lines 4-5) I suggest a paragraph that describes the problem in a little more detail, provides some examples, and cites Partha Dasgupta and Karl-Goran Maler, eds., The Economics of Non-Convex Ecosystems, Dordrecht: Kluwer Academic Publishers, 2004.

Kathy has a query on p. 65 that I can shed a little light on. The passage at the top of the page (lines 1-4 is clearly based on Barbier (2001). So the cite should be changed from Hoagland and Jin to Barbier. See the last paragraph of his paper. The one change should be in line 3, "non-monetary" rather than "non-market." I have only looked at the abstract of H&J. It might be relevant somewhere. It is about the need for good ecological AND economic modeling in the valuation of the green crab invasion. Perhaps whoever wrote this section can suggest what to say about this paper (if anything) and where it should go (if anywhere).

C-VPESS Report - Comments by Freeman - SECOND INSTALLMENT

Overall Comments:

1. There are two things that struck me while reading this draft of the Report after being"away" from the project for several months:

- We devote a lot of space to the more general topic of how to structure and carry out policy evaluations rather than sticking to the narrower question of how to go about valuing ecosystems and services. This is especially the case in Section 2.2.3 on the CAFO case.

- There is a lot of repetition of points, especially about the need for an "integrated and expanded framework," etc. This is true within Section 6.1 as well as between Section 6.1 and the Conceptual Framework and between Section 6.1 and the discussion of the CAFO analysis.

All of this makes the Report longer than it needs to be. And I am afraid that it will blunt the impact of the Report and obscure the valuable things that it has to say about ecosystem valuation. It is no doubt too late to do anything about this now. But we should anticipate some criticism of the Report on these grounds when it goes to the Charter Board and the wider public.

2. If the Agency accepts our recommendations, especially regarding the "integrated and expanded framework" and greater public involvement, it will need a lot of resources. I think that we need to acknowledge this. If additional resources are not forthcoming, do we believe that the Agency should divert existing resources from other activities? If so, which ones? If not, can we indicate what initial steps might be undertaken within available resource constraints? There is some discussion of this issue on p. 197, lines 5-11. But do we have more to say on this?

Comments on Recommendations/Conclusions:

1. I think that one of our major conclusions should be something like this: Many Agency actions affect not only ecosystems and ecological services but also other things that matter to people (affect human well-being), for example human health, and on the cost side, incomes and the prices of goods and services. In these cases, valuation methods that focus solely on ecological effects will necessarily provide an incomplete picture of the consequences of the action. The Agency should strive to use valuation methods that capture information on the widest possible range of effects of the Agency's actions.

2. p. 192, lines 17-30: We say that one of the critical gaps regarding the third step (how ecosystem services are affected) is difficulty in prediction. But this is also true of the first step- predicting changes in basic ecosystem characteristics.

3. P. 193, lines 9-10: This speaks of "assessing the value of changes ...[emphasis added]" But there are multiple concepts of value. Change this to something like "assessing the various forms of value of changes ..." See also p. 193, line 25. Change this to "values."

4. P. 193, lines 19-21: We speak of "those methods that have already been validated by substantial research ..." But there is very little discussion of the validity of the methods described in Appendix B. The one example is the discussion of validity of stated preference methods on p. 271. So what advice can we give the Agency about which methods have been validated.? By validity, I mean ".... the degree to which [a method] measures the theoretical construct under investigation (Mitchell and Carson, 1989)."

I think that there are two things that need to be done one this. The first is to add discussions of validity tests for each of the major methods discussed in Appendix B with summaries of the results of any such efforts. The second is to recast this recommendation in light of whatever comes out of the discussions of validity in Appendix B.

This same point applies to a statement on p. 36, lines 15-16: " ... only those methods that meet accepted scientific standards of precision and reliability ..." I assume that reliability and validity are refer to essentially the same idea. What are the "accepted scientific standards"? What do we know about which methods meet these standards? Can we agree on the validity of stated preference methods? What about the validity of citizen juries? We know that Constructed Preference Methods and Decision-Science methods can be influenced by the facilitator; so what does that say about the validity of

measures developed using these measures? And so on.

See also the entry for Individual Narratives in Table 3 on p. 87 ("can provide reliable and valid quantitative assessments ...")

5. P. 193, line 30 +: This is a separate idea. This should be the start of a new paragraph.

6. On p. 26, lines 8-16, we speak of the problem that the Information Collection Request poses for getting new value information. I think that this should also be brought up in the Recommendations/Conclusions section.

Comments on Appendix A - Special Terms:

The definition of "benefits" has been removed. I think that it should be put back, especially in light of the discussion on pp. 14-15 and the fact that the term is not always used consistently in the Report (for example, p. 33, line 21). \

Specific Comments - Section by Section:

Section 1:

p. 9, line 7: we say, "The Committee will offer advice on several approaches to characterizing ... values ..." I am hard pressed to say what that advice is, other than be open to a variety of different methods. Can we summarize this advice in the Recommendations/Conclusions section?

Section 2:

1. p. 36, lines 24-26: we say "... the use of multiple methods to characterize the same underlying value can ..." This is technically correct. But the opportunities for doing this are quite limited, for example as between revealed preference and stated preference economic methods, but not as between economic methods and surveys of attitudes, etc.

2. p. 42, lines 6-22: I think that this paragraph oversells deliberative processes. In any case, it is out of place in a section on "Implementation." So cut it.

Section 4:

1. Table 2, p. 74 : Entry for Referenda, Column on "Who Expresses Value? Should be "People who vote on the issue."

2. P. 77, line 26: It says " ... econometric benefit transfer analysis, which is a monetary weighting technique." I am not sure what this is supposed to mean. Couldn't we just say " ... economic valuation methods."?

3. Section 4.1.6: When will we see this material?

4. Table 3, p. 88: I still don't think that Focus Groups is a valuation method. It is a useful tool. And this is how it is described on p. 81. The same comment applies to pp. 281-283.

5. P. 91, line 13: Regarding benefits transfer, I think that "uniformly negative" is too strong. Another reference would be:

"Testing a meta-analysis model for benefit transfer in international outdoor recreation,"
Ram K. Shrestha and John B. Loomis, Ecological Economics, 39(1): 67-83.

Abstract

The economic values of outdoor recreation are estimated using a benefit transfer approach in which one applies existing consumer surplus measures to value the resources at a new site. In this article, a benefit transfer study was conducted based on meta-analysis of existing research in outdoor recreation use values of the United States from 1967 to 1998. The meta-analysis method was used to estimate a meta-regression model, resulting in a benefit transfer function that could be applied to estimate a wide range of recreation activity values in other countries. The estimated meta-model was tested using original out-of-sample studies from countries around the world for international benefit transfer purposes. The tests reveal that there is mixed evidence in using meta-analysis of existing studies in outdoor recreation in the United States to value the recreational resources in other countries that are used by tourists. In the best case, 18 correlation coefficients between meta-predicted and out-of-sample values were positive and significant at the 5% level or greater, but nine of the 18 t-tests indicated a significant difference between the two sets of values at the 10% level. However, the absolute average percentage error of the meta-predictions was 28%, which may be acceptable for many benefit transfer applications.

6. Section 4.2: Somewhere here (perhaps p. 98?), we should mention the Environmental Valuation Reference Inventory (EVRI), a searchable data base of environmental valuation studies. EPA has supported the creation of this data base.

Section 5:

1. P. 109, lines 9-23: This paragraph is out of place. It is more about how to communicate information to respondents in a survey to elicit values.

2. Section 5.2.3: This section should be integrated into section 5.1 on uncertainty.

Section 6:

1. P. 126, lines 20-22: "Few studies provide national level value estimates ..." Is this accurate? Other than the CAFO recreation values based on Mitchell and Carson, none come to mind. So, "few" might be an overstatement.

2. P. 128-129, Re: Kathy's Queries: I think that most of this material came from Kerry Smith. So the questions should be directed to him.

Appendix B - The Conservation Value Method:

1. In the first paragraph (p. 200), there is reference to "environmental, social, and economic values," followed by the statement: "The Conservation Value Method (CVM) is a scientific process to map these values across the landscape ..." By my understanding of the CVM, it is limited to mapping those things that are related to the goal of biodiversity conservation and does not include social and economic values.

2. P. 202, lines 14-15: Regarding the sentence about integrating conservation values with socio-economic and other data: Is this a part of the CVM? Or does it represent a potential extension of framework developed by the CVM to make use of additional data? the outputs

3. P. 203, line 9-10: How could the CVM be used to predict ecological impacts?

4. P. 205, the 3rd item in the list of "The Method's Strengths": It can't be a single benefits number as we have defined benefits. What is the single number that is arrived at by aggregation? And is this done commonly/? How about some examples.

5. P. 205: What is a surrogate dataset"?

Appendix B - Energy and Materials Flows:

p. 212, lines 9-11: The blue crab spawning sanctuary does not seem to me to be an example of the ecological footprint of the blue crab population, especially given the much wider distribution of the blue crab population throughout the Bay during the summer. .

Appendix B - Surveys:

pp. 235-238: Why is Text Box 13 in this section rather than in the economic methods section?

Appendix B - Group Processes:

p. 279, for Referenda, "Issues involved in Implementation": I don't understand this entry.

Appendix B - Deliberative Processes:

1. pp. 305-310: I still don't think that mediated modeling is a valuation method. Mediated modeling is a process for reaching consensus on a wide variety of analytical issues. To the extent that it is used to deal with valuation issues, how does it differ from deliberative processes more generally? In the South African fynbos example (pp. 306-307), where did the values listed in Table 1 of Higgins, et al., (1997) come from? Was there a deliberative process? Was this a form of benefits transfer? The unit value of wildlife harvest might have been simply a market price.

2. P. 309: Please explain the "atelier approach" and "open space techniques. "

3. P. 319, under "Strengths and Limitations": Isn't one limitation the fact that the resulting value is or at least can be influenced by the facilitator?

Comments from Dr. Dennis Grossman

Dennis Grossman
10/11/2007

VPESS Draft Report

Overview Comments:

Chapter 2.

[Page 10] There is a very quick jump from the discussion of ecosystems to that of ecosystem services and then values. I suggest that the **An Overview of Key Concepts** (2.1) section would make more sense if the first sub-section were <u>The Concept of Ecosystems: Their Processes and Functions</u>. Everything that follows is predicated upon this hierarchy of concepts, so we should lay out the information here to provide a strong foundation.

[Page 13, lines 20-23] I would not use the example using the tradeoff between a species and money. It is a volatile subject and could take people away from the point that you are trying to make.

[Page 18, line 31] the use of the term "actually generated" refers to a subset of the values. For example, the ecological systems did not 'actually generate' biodiversity values.

[Page 19, Lines 12-26] I find this paragraph confusing. Valuation is not seeking to measure the value of an impact, nor is valuation providing a comparison of predicted outcomes. These are 3rd and 4th order analyses following our ability to valuate components of the ecosystems and their services. We are too far ahead of our story here, and it will probably confuse other readers.

Chapter 3.

I would suggest that we review the utility and transferability of the 'economic production function' concept for use in 'ecological production functions'. Economic production functions represent human decisions to provide input in different quantities that result in a desired function or service. Ecosystem services are based on 'outputs' from complex ecosystem components and interactions over which humans have a variable ability to control. I know that it resonates with some as it provides a nice parallel structure to economics, but it has never made complete sense to me.

[Page 48, Lines 15, 17; Page 49, Line 8] The word 'stressor' pops up here with no context and setting forth a narrower vision than warranted. Like 'impact', 'stressor' is only looking at one side of the change spectrum, so we should use a broader term that encompasses both positive and negative changes to a system.

[Page 49, Lines 18-24] This part does not work. It may be helpful to first introduce ecological endpoints, which is a difficult concept unto itself and specifically related to EPA practice. Asking the reader to relate ecological endpoints to ecological production functions without definition and context is expecting too much. All of these concepts must be simply explained before asking the reader to understand their application and interrelationships in the context of VPESS.

Chapter 4.

[Page 76, Line 22] The Biophysical Ranking methods are not "based on GIS technology", that clause needs to be deleted. These methods can benefit by the use of GIS, but the methods are independent of the technology and we do not want to confuse or misdirect the reader.

Comments from Dr. Harold Mooney

Chapter 2

Pg 6, line 18 Streams "inhabit" is probably not proper usage

Pg 7, line 18. Is it good form to use a foundational quote and then calling attention to an error (sic)

Pg 11, Lines 14-23. This could be simplified greatly by saying that Boyd and Banzhaf do not include supporting services (indirect) in their definition of ecosystem services but only include direct services, i.e, provisioning, regulation and cultural.

Pg 13. Line 23. This is probably not the best example since the ESA considers the economic value of species loss as infinite (you can't mitigate against or substitute for the loss)

Pg 15. Line 9. Biophysics is normally utilized as a single word, at least in the any university catalog and scientific journals.

Pg 16 as one example, and in general for this introductory chapter. I think this chapter is of course very important but it makes very heavy reading as an introductory chapter particularly since it is so filled with material showing the contradictory, diverse and even contentious nature of the valuation field. I would imagine a practitioner concluding that if the experts don't agree on how to go about this challenge (see pg 20, lines 21-22) there is not much reason for my reading further in the document. It might be hard to get agreement on this from the committee but another way would be to just lead with how the committee has utilized these concepts, or the ones they think are most valuable for EPA's work, and leaving the bulk of the nature of the field and all of the different views to another appendix. It would certainly make for easier reading.

Pg 30. Second paragraph. It might be good to give a little clarity here. We talk elsewhere about the first step is to develop a conceptual model of all of the interactions in order to make sure all of the impacts are included in the analysis, then the second step is to utilize whatever quantitative models are available as discussed in this paragraph.

Chapter 3.

Pg 46. Line 15. This is taken from rather than adapted from unless a graphics person is going to change this.

Pg 50. Line 8, 9, 13. "Kremen" not Kremens

Pg 54, line 8, insert comma after "among"

Pg 57, line 19. After "once" insert "in a particular analysis"

Pg 62. Line 17-18. Redo first two sentences to read, "Figure 5 illustrates metrics that can be utilized at different levels of ecological organization that indicate intermediate contributions to ecological services. One of the ecosystem organization levels contributing to ecosystem services is functional groupings." (It is crucial that the proper figure (which is forever being lost) be used here which shows the arrows going upward from biodiversity to services.). (If the group wants to delete this figure and this concept no problem. It adds a valuable (in my opinion) but not essential point given the earlier text.

Pg. 64. Lines 7-9 show that many indicators of ecosystem services are somewhat qualitative, eg. "quality" "integrity is why I have added Fig 5 which gives a different type of indicators that can be measured objectively, eg. Ecosystem service inputs at different levels.

Pg. 65. Lines 4-6. I don't know this particular study and do not have it available.

Pg 67. Line 6-9. It is a shame that the committee didn't discuss further the suggestion by the OMB staff person of pushing for a Bureau of Ecological Data comparable to the Bureau of Standards. It is frustrating to see the wealth of data available from FAOstat and the Division of Agricultural Statistics where it is so easy to see trends and to realize that nothing comparable is available for economists-ecologists from which to work.

Comments from Dr. Louis Pitelka

Overall the report is well written and accurately reflects my understanding of the information and advice the committee wants to provide to EPA. However, I did find a number of instances where the text was confusing or seemed inconsistent with statements made elsewhere in the report:

Page 13-18. I found this discussion of values difficult to follow and sometimes confusing and wonder how useful the section will be to EPA.

Page 30, lines 3-16. It is not clear here whether the discussion pertains to the conceptual model that was developed to describe the system or the mathematical/computer models that were used to estimate quantitatively the ecological effects of the rule. For instance, on lines 6-7, the sentence is addressing the conceptual model (mentioned in the prior sentence), but later in the paragraph reference is made to "opportunities to quantify effects precisely", which is not what a conceptual model is for. The last sentence of the paragraph starts with "Developing integrated models of relevant ecosystems…" and it is not clear whether this refers to the conceptual or the quantitative models.

Pg. 100, line 2-5. This is potentially confusing because I presume the "three analytic steps" mentioned here are the same as the 3 steps discussed in Chapter 3. However, the second one here, "predicting behavioral reactions to these outcomes" sounds very different from "predicting the effects of these outcomes on ecosystem services valued by people" (my wording).

Pg. 104, line 12. I wondered about this statement because a few years ago I worked with Granger Morgan on an expert elicitation in which we developed subjective probability distributions for all the questions that experts answered. While Granger was responsible for that part, it did not seem "difficult" to me. I am no expert on expert elicitations but wonder why "translation into probabilities is difficult"? I suggest adding to the sentence "but can be done." If a reference is needed one option is the paper from the project I worked on with Granger:

Morgan, J.G., L.F. Pitelka, and E. Shevliakova. 2001. Elicitation of expert judgments of climate change impacts on forest ecosystems. *Climatic Change*, 49:279-307.

Pages116-135. These pages of section 6.1 ostensibly are about national rule making, but the text actually is a general discussion of the committee's advice for all three contexts of EPA decision-making. CAFO and national rule making are mentioned very little in these

pages, and in most cases, where they are mentioned, you could replace them by referring to "all EPA decision-making". Thus, there are 19 pages of text with little analysis or advice specific to the national rule making context. Thus, the entire section, while clear and well-written, seems redundant with earlier sections of the report. In contrast, the two major sections that follow (6.2 and 6.3) on site-specific and regional decision making are quite focused on unique aspects of those two decision-making contexts. It seems odd that pages 28-31 of the report and Text Boxes 2 and 3 represent the actual analysis of the CAFO process (more along the lines of what is done in 6.2 and 6.3) but are either elsewhere in the report or relegated to text boxes. Section 6.1.3 Conclusions (pages 132 to 135) summarizes the prior 16 pages and yet takes three pages to do so. Thus, the summary is redundant with the prior 16 pages, which are redundant with other parts of the report.

Page 117, line 9 – page 120, line 32. This discussion seems to be ambivalent about the active involvement of the public or publics in the development of the conceptual model. For instance, on page 117, lines 9-10 and page 118, lines 18-20, the text seems to state that the conceptual model should be developed by the experts without direct public involvement. This is in contrast to what we say in other places in the report where we strongly recommend direct public involvement. On page 118 the text acknowledges that it is important to consider what ecosystem features are valued by the public but says that "This can be gleaned from a variety of research approaches" rather that stating that the public, or relevant publics, should be involved in the process. On page 119, lines 8-20 the potential involvement of the public is included in two of the three bullets, but even here there is a sense that the experts need to find out what the public cares about but not necessarily involve them in the process of developing the conceptual model. On page 120, lines 11-20 there is finally mention of "a more participatory process", but it is presented as an option, rather than being the clear recommendation of our committee. Is the national rule-making process different enough to make public involvement less critical or more difficult? If so, perhaps that should be stated more clearly so that the approach discussed here does not seem inconsistent with what we say elsewhere.

Page 121, lines 4-5 and 12-13. This discussion of ecological production functions does not reflect the definition that was settled upon in recent discussions and so should be made consistent. The ecological production function is the translation of changes in ecosystem properties and processes into effects on services that people care about, and does not cover all of what is mentioned in these two sentences.

Page 124, lines 11-13. I am not sure what this means. This makes it sound as though there is a methods manual for applying the concept of functional groups. It really is not that straightforward. For one thing, how species are divided into functional groups depends on what criteria are used and so is arbitrary. Plant species A and B could both have wind-dispersed seeds and be grouped in the same functional group with regard to seed dispersal. But A might be a nitrogen-fixing herb and B a conifer tree. They would be in different functional groups with regard to growth form or their roles in nitrogen cycling.

Page 191, lines 16-17. This seems to be putting the cart before the horse. This is calling for the application of ecological models before the conceptual model is developed. For instance, the term "predict" sounds too quantitative. I think the concept here is that the experts should identify and describe in qualitative terms how the EPA action could affect the ecosystem. This can be done without "using ecological models that are scaled and parameterized to the ecosystems." We are simply advocating a box and arrow conceptual model. The application of appropriately scaled and parameterized models would happen later when the time comes to quantify the effect on ecosystems, determine how that affects ecosystem services that matter to people, and value those changes.

Page 191, lines 26-33. The term "biophysical" is used fairly commonly in the report, but this paragraph now makes we wonder if there are different concepts of what it means. How are biophysical properties different from ecological properties? In this paragraph, what is the difference between "experts in both relevant biophysical aspects of the modeling" and "ecologists, who know what biophysical changes can be measured"? This seems to be calling for the involvement of ecologists twice but under different names. Maybe a little rewording would solve this.

Minor Comments, Word Changes, and Typos

Page 22, lines 7-8. Is something missing here? It appears to be an incomplete sentence and an incomplete parenthetical remark – there is no closing parenthesis.

Page 24, line 12. Change "impact" to "benefits", and change "from" to "after" so that it reads: "…could be enhanced by ecological valuation that could demonstrate the potential benefits of ecological services after site redevelopment."

Page 24, line 14. Change to "other governmental and non-governmental organizations where…"

Page 70, lines 19-22. Linked to what?

Page 80, line 8. Insert "and" after "…revealed preference methods)"

Page 80, line 9. Delete "In contrast,".

Pg. 112, line 17. Is "animation" different from "visualization" and "interactivity" discussed a couple of pages earlier? If not, to avoid confusion I would use "visualization".

Page 175, lines 30-32. This does not make sense as stated. In particular, location would be important for any of these recreational activities. I think something like the following might be what is meant: "Ecological models would be necessary to calculate effects of

preserving open space on some recreational activities (e.g., fishing, hiking or bird watching), while others (e.g., walking in the park) could be estimated more simply."

Page 181, line 9. Delete "s" at end of "Applications" and change "are" to "is".

Page 183, line 7. Change "find" to "identify"

Page 183, line 8. Add "practices" after "management", i.e., "more effective watershed management practices".

Page 183, lines 25-29. Need to use semicolons and commas, or parentheses, to distinguish the items in the list of monetized benefits from explanatory phrases about specific benefits.

Page 185, lines 28-29. This statement is unclear. It sounds as though the framework is saying that 43% of the land area of the 8 states should be protected, but that would seem to be a very unrealistic and thus not very useful recommendation. Or does it mean that 43% of some sub-category of land should be "protected and managed for specific contributions to human well-being."?

Page 187, lines 15-27. Use of identical bullet symbols for two different levels of bulleted items is confusing here. The three items in lines 18-27 are "sub-bullets" to the first bulleted item. Use a different symbol here. Normally, MS Word does that automatically, so I don't know how this happened.

Comments from Dr. Mark Sagoff

Dear Angela:

Thank you for sending the materials for the teleconferences October 15 and 16.

Anyone who reads the current draft report must be impressed with the effort that went into it. I am grateful to you, Buzz Thompson, Kathy Segerson, and everyone who has contributed to such a carefully conceived and thoroughly thought-through document.

If I were to hazard a comment other that to express appreciation, it would be this. The Report deals with two quite different ways that ecosystems services may be threatened or diminished. The CAFO example well illustrates the first -- pollution. When manure and other pollutants run off feedlot operations and percolate through the groundwater and into streams, these effluents of course cause damage. The Report ably discusses examples of this kind of economic harm.

The Report also deals ably with a second way ecosystems services may be lost, that is, through development. The standard example, mentioned on page 83, observes that an undeveloped ecosystem may perform filtration services that a developed one may not. Similarly, when wetlands are dredged or filled for farming, their ability to absorb water

during flooding may be lost. The Chicago Wilderness example illustrates the advantages of forgoing development to protect ecosystem or natural values.

I would like to point to what I think is a conceptual and normative distinction that the report draws implicitly -- one that could be made a little more explicit -- between 1) pollution and 2) development as causes of the loss of ecosystem services. The polluter causes damage beyond the limits of his property -- and thus occasions a moral and to an extent legal concern about invasion or trespass -- that is, incursion on the property of others. Development in principle, in contrast, may not spill over beyond its own property lines -- the problem is that the land no longer may provide downstream services it once supplied. So the normative or ethical or legal question is not so clear-cut as in the case of pollution, that is, where there is a clear trespass of property rights. Instead one must ask whether the landowner is required (without compensation) to supply the ecological good in question to his or her neighbors.

In a Coasian economic analysis, of course, none of this matters -- property rights may affect the direction that compensation is paid but not the economic values to be measured or the efficient outcome to which those values would lead. Yet from a legal perspective, one conditioned by common law traditions and practices, the distinction between polluting someone else's land and developing one's own land (even if as a result it ceases to provide certain services to others) is a distinction with a difference. It is worth making explicit, I believe, especially since it runs implicitly through the document.

Congratulations on such an impressive project.

Best wishes,

Mark

Comments from Dr. Paul Slovic

To: C-VPESS Committee
From: Paul Slovic
RE: Comments on Draft Report 9/24/07
Date: October 8, 2007

I am very appreciative of the hard work that underlies this draft and the clear intent to do justice to the vast amount of information that needed to be presented and integrated. I also appreciate and respect the sincere attempt to document and consider the many diverse points of view put forth by the committee members. Thanks to all who did this heavy lifting.

However, despite the many good features of this report, I am not comfortable with it. The introduction and conceptual framework include many statements that I do agree with, regarding the complexity of the valuation task, the need for early involvement of the public, the need to consider and use multiple methods, good discussions of the

weaknesses of certain methods, the need for a fully informed public if public input is used, a strong critique of the CAFO report, and so on. What bothers me is that these important recommendations and qualifications are not consistently applied in the report. The report has an optimistic tone that implies that, despite certain limitations, we do have acceptable methods for valuation that can be taken off the shelf and used, perhaps supported a bit by other less-tested but promising methods.

I am much more pessimistic. This pessimism stems from my many years of studying judgment, preferences, and decision making. Despite lip service to the need for an informed public, and occasional mention of constructed preferences, the report clearly buys into the assumption that the public engaged by EPA will be informed about the complexities of ecosystem functioning, that they will have the well-formed and stable preferences and values required by economic methods, that the methods will be able to reliably uncover these stable values and, finally, that the values that people are discovered to hold are values that *should*, normatively, guide the policies of a regulatory agency.

Pros and cons of various methods are presented but, in my view, the cons are underweighted. Forty years of research on constructed preferences indicates that preferences for complex, unfamiliar outcomes are not well-formed but are often constructed on the spot in the context of elicitation. I am not talking about general values (e.g., biodiversity is important) but rather about the quantitative tradeoffs essential to valuation (see, e.g., p. 79, lines 22 and 23 on substitutability and tradeoffs underlying economic-valuation methods).

The report urges the use of multiple methods in order to allow diverse (valid) components of value to emerge, to round out the picture for decision makers. But the literature on preference construction informs us that the inconsistencies or conflicts that often are revealed when multiple methods are used are not merely due to the methods uncovering different components of value. Rather, these inconsistencies may be due to the fact that the values (tradeoffs) are not strongly held and are *shaped* in different directions by the methods themselves, echoing the Heisenberg uncertainty principle from physics.

Preference construction poses many serious challenges to the methods and conclusions of this report. But there is a bright side. The decision-aiding methods described briefly in the appendix (pp. 314-322) are designed to guide experts and laypersons to an informed, rational, transparent *construction* process, resulting in a defensible expression of value. Because the process is transparent, critics can debate and modify the structure. These constructions can be put before decision makers in the stages where integration, deliberation, and negotiation is addressed in more or less formal interactions with stakeholders and publics (see pg. 227, lines 18-19).

The report incorrectly states that such decision aiding produces multiple dimensions of value that cannot be synthesized into a single quantitative measure (p. 315, lines 1-5). This is incorrect. The correct view, that a single value could be constructed using multi-attribute utility theory, is presented on p. 318, lines 9-15.

A few comments linked to the text

p. 10. Here and throughout the report, ecosystem services are given far more attention than ecosystems. Perhaps the word “ecosystems” should be deleted from the title of the report.

p. 19 lines 10-11. The fact that the public may sometimes appreciate higher-level endpoints or services such as clean water does not mean they have well-formed tradeoffs among these services.

p. 19 lines 28-29. Indicates some methods are well-developed (and ready to use). I think the cupboard is quite empty when it comes to adequate methods for many forms of ecosystem valuation.

p. 20. I believe multiple methods should be required so that inconsistencies, indicative of preference construction, can be identified and dealt with. The report assumes that useful information about value is contained in inconsistent measures. Maybe not.

p. 23 lines 1-5. Urges public education. Will public agencies likely be willing and able to do this?

p. 26 lines 5-16. Given the obstacles to analysis posed by OMB, perhaps proper valuation cannot be done in some circumstances. The formal reliance on benefits transfers is appropriately criticized later in the report.

p. 36. Section 2.3.3. Sets forth criteria for using multiple values, when expanded methods meet accepted scientific standards of precision and reliability, and so on. These criteria should apply to *all* measures used. As noted above, I think few would meet these standards.

p. 55. Notes the need for finding out what is important to people, once they have been informed. Our report should make clear, early on, that every reference to public input assumes an *informed* public.

p. 68. Section 3.5. Very important observation about EPA’s limited and shrinking resources for ecological research. This may seriously constrain efforts to do valuation properly.

Question: How do we recognize valuations that are so uncertain or flawed that they should not be used?

p. 80 line 5. Yes, income effects may be a drawback to economic methods, but issues raised by preference construction are even more serious.

p. 85 line 6. This is one of the few mentions of the cost of using a state-of-the-art valuation method. Cost is an important issue. If resources are limited, will less than state-of-the-art methods be used? Is this acceptable? Might it actually degrade decision making?

p. 90. This long and detailed critique of value transfer is excellent. Should other criticisms of economic-benefit methods be given equivalent coverage?

p. 99 Section 5.1. Most of these uncertainties pertain to statistical issues. These are perhaps less important than the uncertainties coming from the assumptions underlying the methods, which may not be met.

p. 105 Section 5.2. This section makes numerous good points about communication but it seems miscast. Dialogue with the public is not merely to educate them about the valuation analysis but to involve them integrally in the entire assessment process. That was the real message of the 1996 NAS report, *Understanding Risk.*

p. 109 lines 21-23. Says numbers will be dominated by qualitative and visual stimuli. Yes, except when these numbers are dollar values. Dollars carry special meaning that other numbers may not have. Dollars will likely dominate non-monetized dimensions of value.

p. 112 Section 5.2.4. First bullet. Iterative approach needed for elicitation of values, not just for communication.

General comment: Perhaps keep the part of Section 5 dealing with statistical uncertainties. The communication part is really more about interacting with the public in value elicitation. This fits better with the discussion of Robin Gregory's work in the decision-aiding section.

p. 191 lines 1-3. EPA should conduct (not start) any valuation by deciding what it should value . . .

p. 191 lines 18-20. What if experts disagree with the public's priorities for services?

p. 192. Certainly the public input should be respected, but what if the informed public does not wish to place much/any value on systems and services that experts believe important? This wording seems slanted too much in favor of the public's views.

p. 193. See my early criticisms regarding validity of methods and use of multiple methods of value that may disagree.

p. 194 line 6. Decision-aiding methods should be cited here.

p. 194 line 27. Concepts of non-value (or construction) may also be exposed by multiple methods.

196. line 3. Yes, communications about benefits are important but communication issues are secondary to major problems of value elicitation.

197 line 6. What if resources are lacking?

245 line 8. I disagree that the largest barriers to use of survey methods are institutional. I believe they are conceptual (lack of validity).

318. Valuation by Decision Aiding. The name for this method is misleading. The method applies multi-attribute modeling to construct values, in keeping with preference construction. Yes, it aids decisions, but that is the aim of all other methods as well. Perhaps call it Value Construction Methods.

315 line 1. No. The method can provide a specific estimate, as correctly noted on p. 318 lines 9-14.

320 line 5. All methods in this report aim to provide decision support through valuation. Yes, it may not be liked by OMB. This may reflect a deficiency in OMB's guidelines. Yes, the facilitator may influence the results. Nuances of the other methods also may influence their results. That's what preference construction implies.

Final comment: As I have noted before, it is far easier to criticize a report than to draft it. I thank all those who created this clearly written and comprehensive report on this complex topic of valuation. If my criticisms are harsh, it is because I believe the report to be very important.

Paul

to: ANGELA NUGENT

FROM KERRY SMITH

COMMENTS on C-VPESS DRAFT

25 pages including

Cover sheet

to: Buzz Thompson And Kathy Segerson
And Angela Nugent

FROM: Kerry Smith

Subject: Comments on C-VPESS Draft

First of all - let me thank you for all your hard work for the Committee to get this assembled and apologize for a hand written set of comments. I simply cannot type fast enough to get this to you and don't have access to help. So the choice for me was nothing or hand written comments. I chose the latter. I have a large number of comments - some

general and some specific.

Rick mentioned to me questions you added Kathy in the text and I will try to address them.

I have an over arching concern that may dominate all the rest. If we cannot address it squarely in the report and you need consensus on the substance of the report from the Committee I feel it is best if I withdraw from the Committee. I cannot sign on to some of the conclusions and recommendations. Some of this I mentioned

to Kathy concerning the use of the term "benefits" and the report attempts but does not fully address this issue. Others are tone and characterization of economic methods. So if these can't be addressed you can simply ignore what you wish of the other comments and I will resign. I don't have time to prepare a minority opinion.

General and Important Comments/Concerns

(1) For the most part the report seeks to describe economic values as those determinations where values are expressed in monetary

ements. I don't agree that this is essential.

Economic values describe tradeoffs people make to obtain a change in something or to avoid experiencing a change in that thing.

I have referred to the thing as an object of choice following the language that Kreps uses in his graduate micro-text

What is essential is the tradeoff giving up an amount of one thing (or receiving an amount of that thing) that a person accepts (or says they would accept) to experience a specified change in something else.

This is the essence of what Nancy Bockstael and a group of us explained in the paper I

circulated years ago in
Environmental Science and Technology.

There appears to be an overall theme — if it is monetary it is economic. So if you don't like money or you think people don't have dollars values rolling around in their heads -- you should favor other methods of coming up with values and perhaps other concepts of value.

People define all concepts of value. Philosophers, ecologists, psychologists are people. The concepts they define do not trump economic concepts of value simply because they are not defined in monetary terms. They are also not independent of people -- because it is not the ecosystem speaking just because it is an ecologist or a conservation biologist describing a reason why changes in an

ecosystem or ecosystem services are important and these factors underlying this judgment would not be reflected in an economic measure of value.

The fact remains it is a person expressing that value.

Similarly when a person describes reasons from society's perspective why a change is more or less important and abstracts from his or her "personal feelings" about the change -- it remains that person arguing for a concept of value.

We all know this - but it is lost in the report.

All values come from people - experts argue for different concepts of value from different fields

These experts are not designated spokes persons for this ecosystem.

Examples of where this has an effect:

(1) Page 14 lines 13-14, lines 27-30 - give impression a person has not articulated these values; similarly page 15 lines 8-24 are especially confusing on this issue; page 18 lines 3-27

(2) Characterization of economic values - page 16 lines 24-27 - economic values do <u>not</u> assume people are self-interested! <u>They assume people know what is best for themselves.</u> They can gain enhanced well-being by giving to others. This is not "self interested."

Economic values are inferred from actual or stated choices by people.

(3) I don't agree with statement bottom of page 18 lines 30-31 and carrying to page 19 about what the committee believes.

(4) discussion on page 19 lines 12-26 contradict statements before and after e.g.

although valuation should be informed by best available science, it ultimately seeks to reflect the values that would be held by a fully informed general public, not merely the personal values or preferences of scientists" and rest of this paragraph

Compare this to:

Recommendation page 38 lines 17-25

Recommendation page 191 lines 15-22

"Experts characterize the value of changes in ~~[illegible]~~ ecological systems

and services to the extent possible

It is not experts' values!

Experts are trying to measure people's values

P193 line 23-27 — where economic ~~[illegible]~~ methods cannot provide accurate assessment of economic value of a particular change in ecological systems and services

Other methods may provide

Who judges accurate — why are other methods presumed to be more accurate?

(5) The tabular summary of methods is misleading in ~~[illegible]~~ terms of summary of the information and goals Table 2 — pages 72 — 75 — most of non-economic —

experts express value —
but goal is people's
value;

Bottom line — (1) report reads as if
economic values or concepts of
value are narrow, inaccurate.
(because they are narrow or
because people cannot make
these choices) whereas other
methods have experts
who can somehow express
more accurate values for
the people than the people
could.

How do they accomplish this?
Where is the documentation
that it is more accurate
characterizations of people's
non-anthropocentric values.
I'm not sure what this
would be given the
definition.

(2) Report suggests that
ecosystem services and their

valuations are more important than other things EPA takes account of; This is misleading for several reasons.

(A) page 190 lines 8-10 — most efforts focused on human health benefits — aren't we part of the ecosystem — consequently isn't a change in character of human species actually an ecosystem benefit?

We = People

(B) We don't know whether we substantially understate value of actions (line 8) this page.

(C) To the extent economic valuations arise for benefit-cost mandate — The policy is already defined by some other process that is specified by the statute.

Including Ecosystem valuation only has an effect if net benefits of a regulatory action are negative without them.

Certainly if it is a close call then one might argue uncertainties might lead either way.

All of this misses the fundamental point that benefit-cost is not the exclusive basis of any decision.

(3) The report reads as if we don't understand the distinction between a regulatory agency and an autonomous entity. EPA must respond to the statutes governing how it "should" behave. So admonishing the agency to basis decisions on ecosystems is foolish if the legislative mandate sets other objectives

(4) The report contradicts itself in several ways

- economic values can only be defined for changes in something; it appears to accept the Costanza logic for valuing complete ecosystems — the change is all or nothing — which is foolish; in other places it is more clearcut on recognizing plausible changes

- I lost in the specific comments a large number of areas with problems of this sort. No doubt it reflects many writers contributing.

Specific Comments

(1) page 7 - lines 5-8 - too sweeping; conclusion distinguish integrated consideration of ecosystems for some services of ecosystems. The latter has been considered a great deal. Issue is not comprehensive or integrated

(2) Page 9 - lines 3-5; other studies have considered non-economic methods; EU reviewed them and rejected the non-economic as unworkable. This conclusion is overlooked.

(3) page 12 line 9-10 many sources of value (leave out "types") that may be relevant when evaluating NOT valuing.

(4) Page 13 line 14 - instrumental values is ability to make tradeoffs

page 13 line 24-28 - distinction between

a lower bound on value and
value needs to be made

(5) Page 14 lines 9-12
Replace current text
people care about them ( ) is one approach
for evaluating the importance of
ecosystems and therefore offers one
added consideration

6) page 14 lines 13-20 - I don't agree

page 14 lines 23-26 - issues in
different groups values concepts -
not necessarily relevant to
everyone; Every misleading

lines 27-31 misleading
need to be re-worked

P15 lines 9-10 values based on human preferences can be either anthropocentric or non anthropocentric; this is contradicted elsewhere in report; doesn't fit sentence before it.

page 16 - I commentator comparing in lines 24-36

page 18 line 22-27 - recognizing different concepts of value seems to imply ignore standing for EPA mandate - <u>this is not true</u>.

page 18 line 28 - page 19 1-12 - gives impression value can exist for situation without any implicit change; contradicted elsewhere in report see line 18-19

... when measuring value of an ecosystem itself (rather than a change to it) the baseline

SENTENCES MAKES LITTLE SENSE

Page 20 - lines 7-17 -
implies all measures have
equal validity and standing
this is not true

line 28 - estimates of
value play a key role in
policy decisions → NOT TRUE
Most EPA policy does
not allow consideration of
values; based on science
criteria

Page 21 - lines 2-5 - wrong
lines 18 - 21 wrong

Page 22 line 18-21 wrong stated
preference - client
choices; don't force
respondents to <u>construct</u>
preferences

22 line 25 - 27 - effort to
limit relevance of
economic methods; this
is not correct.

Page 29 - Description of objectives of CAFO rule lines 6 - 11 are wrong; conclusion limiting ecosystem benefits distort rationale is wrong

Page 30 - representative and
lines 23-30 non-representative case studies never define what representative is and makes little sense

Page 31 - Executive order does
lines 26-30 not preclude EPA from doing other analysis; but most do benefit cost so other does not substitute and rules are defined by legislation — so this is both naive and incorrect as as description of what EPA can do

Page 33 – lines 18-23 seems to imply other values can be included in true benefits – wrong if this means as it implies adding non-economic benefits to economic benefits;

This is one place where Kathy's commitment to reserve benefits for economics was not upheld.

Page 38 – strongly object to lines 17-25

Page 41 lines 7-11 – issue is concentration / response function not bits to services

Page 72-75 – Note values experts not people

Characterization of Hellborn pricing & existing behavior wrong

Page 79 line 13 – economic values don't require utilitarian; revealed preference and choice give you some out here.

Page 80 lines 2 – 6 WTA

<u>not</u> constrained by income

incorrect

9 – 10 – WTA <u>is</u>

measured with Hicksian wage; AB this is incorrect.

Page 83. HEA is not an economic method; description lines 7 – 17 is not correct.

page 84 lines 15 – 17

Strongly disagree I cannot agree to this

Table 3 – page 87 Preferences and Intentions – example where equate economic values to monetary – don't agree

Page 88 – Hedonic measures

MARGINAL willingness to pay

Page 89 replacement cost

leave out should be used with great care; should not be used!

Page 97 – Description of Disadvantages misleading experts corrected conditions to QWB not values

Page 100 - left out some uncertainty about outcome of policy

Page 101
Monte Carlo reduces transparency; don't agree with characterization of method!

Page 120 why all public comments limited to ecological values
lines ~~120~~ 29-31

lines 23-26 don't agree with recommendation

Page 126 Logic of benefit analysis implies requirement for natural benefits misleading

KS question

Page 128

Robert Johnston's work in water resources research

Kevin Boyle work for EPA IEC report

Boyhay - Smith Journal of Applied Econometrics (in press)

RTI Capo analysis for Smithfield agreement

Richard Carson's Elgar book with bibliography

Page 129 - see Kraemer book

Chapter 7 - I disagree
with all of the
key conclusions

REPORT-WIDE ISSUES FOR INITIAL DISCUSSION AT SEPTEMBER 15, 2007 TELECONFERENCE

1. Optimistic tone of report related to possible use of methods for valuation
2. Need for more context to explain the history of EPA's use of economic valuation and project scope to explore the appropriate role of other types of methods to characterize different types of values associated with ecological protection
3. Should there be a more rigorous rubric for assessing methods (e.g., based on precision, validity, reliability or other criteria)?
4. What are the bottom-line conclusions related to use of different methods now? Related to how EPA can do better valuations now?
5. Is there a lack of balance in evaluating economic methods vs. other kinds of valuation methods?
6. Define economic methods in terms of analysis of trade-offs, not in terms of monetization
7. Question of combining numbers derived through multiple metrics
8. Confirm report's message that all values are defined by people
9. Whose values are valued? Role of experts vs. lay publics.
10. Report message is that there are many types of values and different methods can be appropriate for characterizing different types of value
11. Does valuation only involve valuing the change in an ecosystem or ecosystem properties? Or can it involve valuing the state of an ecosystem?
12. Refer to "ecosystem response" rather than "ecosystem change" (a response could be "no-change")
13. Introduce a clear statement of steps involved in a structural framework for valuation

SELECTED MAJOR ISSUES RAISED BY C-VPESS MEMBERS AND EXTERNAL REVIEWERS' COMMENTS FOR TELECONFERENCES – OCTOBER 15 AND 16, 2007

Chapter/section (new report outline)	**Issue**	**No.**
1 Introduction	Freeman – issue passim with message about multiple methods p. 9, line 7: we say, "The Committee will offer advice on several approaches to characterizing ... values ..." I am hard pressed to say what that advice is, other than be open to a variety of different methods. Can we summarize this advice in the Recommendations/Conclusions section?	1.
	Slovic: " The report has an optimistic tone that implies that, despite certain limitations, we do have acceptable methods for valuation that can be taken off the shelf and used, perhaps supported a bit by other less-tested but promising methods." Preferences are volatile	2.
	Slovic: "p. 10. Here and throughout the report, ecosystem services are given far more attention than ecosystems. Perhaps the word "ecosystems" should be deleted from the title of the report."	3.
2 Conceptual framework 2.1. An overview of key concepts 2.2. Some caveats regarding valuation 2.3. Ecological valuation at EPA 2.4. An integrated and expanded approach to ecosystem valuation: key features 2.5. Implementing the integrated and expanded approach 2.6. Conclusions and	Opaluch proposal for different structural framework "a set of stages in quantification of ecosystem values" – and relate concept of value and role of methods to it	4.
	Costanza : should economic methods be more than WTP, and whether we should be able to aggregate across methods.	5.
	Opaluch and Smith: call for economic methods to be described as more than monetary methods, essence involves trade-offs	6.
	Mooney – simplify definition discussions in chapter by moving much of text to an appendix	7.
	Pitelka: Page 13-18. I found this discussion of values difficult to follow and sometimes confusing and wonder how useful the section will be to EPA.	8.
	Opaluch – simplify values discussion by distinguishing between	9.

Chapter/section (new report outline)	Issue	No.
recommendations	strongly non-anthropocentric views and weakly non-anthropocentric views	
	Opaluch – address issue of when analyses may be sufficient to answer EPA's question, even if they are incomplete	10.
	Smith – use of the term benefits not consistent throughout the report	11.
	Freeman – section 2.2.3 goes beyond valuation to policy valuation (no recommendation)	12.
	Freeman – redundancies between Chapters 2 and 6 and within chapter 6 – report too long. Pitelka – same issue (with a twist – see 6.1 comment)	13.
	Smith: report doesn't communicate clearly that all values come from people	14.
	Smith: role of the expert vs. role of the public in defining values not clear (see examples given, p. 7-8 of his comments)	15.
	Pitelka- CAFO discussion Page 30, lines 3-16. It is not clear here whether the discussion pertains to the conceptual model that was developed to describe the system or the mathematical/computer models that were used to estimate quantitatively the ecological effects of the rule. For instance, on lines 6-7, the sentence is addressing the conceptual model (mentioned in the prior sentence), but later in the paragraph reference is made to "opportunities to quantify effects precisely", which is not what a conceptual model is for. The last sentence of the paragraph starts with "Developing integrated models of relevant ecosystems…" and it is not clear whether this refers to the conceptual or the quantitative models.	16.
	Smith – p. 29 text describing CAFO rule and conclusion is wrong	
	Smith – p. 30 – need to define what a representative case study is	
	Smith – p. 33 – concern lines 18-23 about how concept of benefit is used and implication that non-economic benefits can be included in	

Chapter/section (new report outline)	Issue	No.
	a benefit-cost analysis. related concern p. 38, lines 17-25	
	Freeman, Slovic – address the issue of resources needed more directly.	17.
	Slovic: p. 55. Notes the need for finding out what is important to people, once they have been informed. Our report should make clear, early on, that every reference to public input assumes an informed public.	18.
	Slovic: p. 20. I believe multiple methods should be required so that inconsistencies, indicative of preference construction, can be identified and dealt with. The report assumes that useful information about value is contained in inconsistent measures. Maybe not."	19.
	Freeman – p. 35, lines 15-16 refers to "accepted scientific standards of precision and reliability" – questions what are accepted scientific standards – questions language	20.
	Slovic: p. 36. Section 2.3.3. Sets forth criteria for using multiple values, when expanded methods meet accepted scientific standards of precision and reliability, and so on. These criteria should apply to all measures used. As noted above, I think few would meet these standards.	21.
	Freeman. p. 42, lines 6-22: I think that this paragraph oversells deliberative processes. In any case, it is out of place in a section on "Implementation." So cut it.	22.
	Slovic– Emphasize deliberative processes: Preference construction poses many serious challenges to the methods and conclusions of this report. But there is a bright side. The decision-aiding methods described briefly in the appendix (pp. 314-322) are designed to guide experts and laypersons to an informed, rational, transparent construction process, resulting in a defensible expression of value. Because the process is transparent, critics can debate and modify	23.

Chapter/section (new report outline)	Issue	No.
	the structure. These constructions can be put before decision makers in the stages where integration, deliberation, and negotiation is addressed in more or less formal interactions with stakeholders and publics (see pg. 227, lines 18-19).	
	Slovic: The report incorrectly states that such decision aiding produces multiple dimensions of value that cannot be synthesized into a single quantitative measure (p. 315, lines 1-5). This is incorrect. The correct view, that a single value could be constructed using multi-attribute utility theory, is presented on p. 318, lines 9-15.	24.
	Patton – comments to sharpen language (i.e., distinguish between "ecosystem change" and ecosystem "response" to an action which may be "no change"); link C-VPESS approach to Figure 2; more feedback loops in Figure 2 to show process is iterative, not linear	25.
	Bostrom: change language so it doesn't give impression that experts are without bias	26.
	Bostrom: change language Page 55 line 3-4 and elsewhere (e.g., page 190 lines 23-26) there is a little lack of clarity regarding EPA providing value information versus eliciting values	27.
3 Building a foundation for ecological valuation: predicting effects on ecological systems and services	Kasperson's call for more guidance on how a conceptual model should be designed. Duncan Patton made the same point. Pitelka called for consistency on how conceptual modeling is used	28.
	Patton suggested clarification of terms: "parameterization of models" and stakeholders	29.
3.1. The concept of linkages between stressors, ecological effects, and ecosystem services	Patton questions use of term "change" as the only outcome of some action. Suggests instead "Predicting ecological Response".	30.
3.2. Challenges in implementing conceptual models and ecological production functions	Grossman questions recommendations relating to ecological production: "I would suggest that we review the utility and transferability of the 'economic production function' concept for	31.

Chapter/section (new report outline)	**Issue**	**No.**
3.3. Strategies to provide the ecological science to support valuation 3.4. Identifying relevant ecosystem services 3.5. Conclusions/recommendations	use in 'ecological production functions'. Economic production functions represent human decisions to provide input in different quantities that result in a desired function or service. Ecosystem services are based on 'outputs' from complex ecosystem components and interactions over which humans have a variable ability to control. I know that it resonates with some as it provides a nice parallel structure to economics, but it has never made complete sense to me."	
	Grossman calls for more of an introduction to concept of endpoints before discussion of ecol production functions	32.
	Patton: page 61, line 22 calls for acknowledgement of broader definitions of indicators, including "a state that tells something about a process"; p.64 acknowledge report cards are subjective	33.
	Patton-page 65 line 19 discuss indices (e.g., IBI) in discussion of meta-analysis	34.
	Patton questions applicability of NEON to EPA valuation procedures	35.
	Risser suggests text delete, or at least shorten, the discussion of the criteria for identifying ecosystem services	36.
	Freeman comment about inserting more discussion of ecosystem dynamics and non-linearity	37.
	Pitelka question about functional groups – should text remain as is? Mooney comment on same issue	38.
	Mooney – replace figure 5 with veersion with arrows	39.

Chapter/section (new report outline)	Issue	No.
	Freeman Section 3.4.1 – responds to Kathy Segerson's question about Barbier Reference, Hoagland and Jin.	40.
	Mooney: pg 67. Line 6-9. It is a shame that the committee didn't discuss further the suggestion by the OMB staff person of pushing for a Bureau of Ecological Dta comparable to the bureau of standards. It is frustrating to see the wealth of data available from faostat and the Division of Agricultural Satistics where it is so easy to see trends and to realize that nothing comparable is available for economists-ecologists from which to work	41.
4 Methods for assessing value 4.1. An expanded set of methods 4.2. Value transfer	Freeman, Bostrom: What will be new section on decision science ?	42.
	Freeman – Table 3, p. 87 – questions comment on Individual Narratives – "can provide reliable and valid quantitative assessments	43.
	Opaluch and Smith– report does not give balanced treatment of methods (e.g., citizen juries, emergy, energy, socio-psychological).	44.
	Smith: Table 2 misleading in terms of summary of information and goals	45.
	Opaluch: Enlarge discussion of conjoint analyses to broaden discussion of economic methods, include HEA	46.
	Smith – HEA is not an economic concept. p. 83	
	Smith – replacement costs should not be used	
	Slovic: Pros and cons of various methods are presented but, in my view, the cons are underweighted. Forty years of research on constructed preferences indicates that preferences for complex, unfamiliar outcomes are not well-formed but are often constructed on the spot in the context of elicitation. I am not talking about general values (e.g., biodiversity is important) but rather about the	47.

Chapter/section (new report outline)	Issue	No.
	quantitative tradeoffs essential to valuation (see, e.g., p. 79, lines 22 and 23 on substitutability and tradeoffs underlying economic-valuation methods).	
	Freeman:- Table 3, p. 88: "I still don't think that Focus Groups is a valuation method. It is a useful tool. And this is how it is described on p. 81. The same comment applies to pp. 281-283."	48.
	Smith issue: p. 84, lines 14-17 – with text that "no single method, metric or index of value can be used to fully reflect important ecological effects and human concerns for decision-making because value is such a complex concept"	
	Freeman – benefit transfer: P. 91, line 13: Regarding benefits transfer, I think that "uniformly negative" is too strong (gives citation for acceptable transfers0	49.
	Freeman- 6. Section 4.2: Somewhere here (perhaps p. 98?), we should mention the Environmental Valuation Reference Inventory (EVRI), a searchable data base of environmental valuation studies. EPA has supported the creation of this data base.	50.
	Opaluch –acknowledge recent work assessing benefit transfers research	51.
	Segerson: EPA use of benefit transfer in research on Mid-Atlantic region – issue of appropriate criteria for benefit transfer and reference to this example	52.
5 Cross-cutting issues 5.1. Analysis and representation of uncertainties in ecological valuation 5.2. Communication of ecological valuation information	Kasperson's suggestion to find structural way to give uncertainty section more visibility	53.
	Patton notes that uncertainty also relates to conceptual models – discussion of uncertainty might come earlier in report	54.
	Smith: 101- Monte Carlo reduces transparency	
	Patton looking for section summarizing recommendations from uncertainty section, suggests this could be merged with recommendations from communications section	55.

Chapter/section (new report outline)	Issue	No.
	Pitelka: Pg. 100, line 2-5. This is potentially confusing because I presume the "three analytic steps" mentioned here are the same as the 3 steps discussed in Chapter 3. However, the second one here, "predicting behavioral reactions to these outcomes" sounds very different from "predicting the effects of these outcomes on ecosystem services valued by people" (my wording).	56.
	Pitelka Pg. 104, line 12. I wondered about this statement because a few years ago I worked with Granger Morgan on an expert elicitation in which we developed subjective probability distributions for all the questions that experts answered. While Granger was responsible for that part, it did not seem "difficult" to me. I am no expert on expert elicitations but wonder why "translation into probabilities is difficult"? I suggest adding to the sentence "but can be done." If a reference is needed one option is the paper from the project I worked on with Granger: Morgan, J.G., L.F. Pitelka, and E. Shevliakova. 2001. Elicitation of expert judgments of climate change impacts on forest ecosystems. *Climatic Change*, 49:279-307.	57.
	Patton: Section 5.2.3 has a lot of redundancy. Rick: Move to uncertainty section	58.
	Freeman: P. 109, lines 9-23: This paragraph is out of place. It is more about how to communicate information to respondents in a survey to elicit values.	59.
	Slovic: p. 105 Section 5.2. This section makes numerous good points about communication but it seems miscast. Dialogue with the public is not merely to educate them about the valuation analysis but to involve them integrally in the entire assessment process. That was the real message of the 1996 NAS report,	60.

Chapter/section (new report outline)		Issue	No.
		Understanding Risk.	
		Slovic: p. 109 lines 21-23. Says numbers will be dominated by qualitative and visual stimuli. Yes, except when these numbers are dollar values. Dollars carry special meaning that other numbers may not have. Dollars will likely dominate non-monetized dimensions of value.	61.
		Slovic p. 112 Section 5.2.4. First bullet. Iterative approach needed for elicitation of values, not just for communication. General comment: Perhaps keep the part of Section 5 dealing with statistical uncertainties. The communication part is really more about interacting with the public in value elicitation. This fits better with the discussion of Robin Gregory's work in the decision-aiding section.	62.
6 Applying the approach in three EPA decision contexts		Patton: change terminology from "predicting ecological change" to "predicting ecological response"	63.
		Patton: discuss staffing issues more broadly than just in the regional context	64.
		Patton: make format for recommendations more consistent; likes bullet approach	65.

Chapter/section (new report outline)		Issue	No.
	6.1 Valuation for National Rulemaking	Freeman re: Kathy's question: re "Few studies provide national level value estimates for a range of services that could be readily used in a national level benefit assessment." Rick: 1. P. 126, lines 20-22: "Few studies provide national level value estimates ..." Is this accurate? Other than the CAFO recreation values based on Mitchell and Carson, none come to mind. So, "few" might be an overstatement.	66.
		Pitelka: Pages116-135. These pages of section 6.1 ostensibly are about national rule making, but the text actually is a general discussion of the committee's advice for all three contexts of EPA decision-making. CAFO and national rule making are mentioned very little in these pages, and in most cases, where they are mentioned, you could replace them by referring to "all EPA decision-making". Thus, there are 19 pages of text with little analysis or advice specific to the national rule making context. Thus, the entire section, while clear and well-written, seems redundant with earlier sections of the report. In contrast, the two major sections that follow (6.2 and 6.3) on site-specific and regional decision making are quite focused on unique aspects of those two decision-making contexts. It seems odd that pages 28-31 of the report and Text Boxes 2 and 3 represent the actual analysis of the CAFO process (more along the lines of what is done in 6.2 and 6.3) but are either elsewhere in the report or relegated to text boxes. Section 6.1.3 Conclusions (pages 132 to 135) summarizes the prior 16 pages and yet takes three pages to do so. Thus, the summary is redundant with the prior 16 pages, which are redundant with other parts of the report.	67.

Chapter/section (new report outline)		Issue	No.
		Daniel: P 118 figure 6 [I do not recall this model being presented in the CAFO documents that we reviewed and critiqued. My understanding was that a "conceptual model" at this level of detail was not developed until after the CAFO benefits assessment was essentially concluded. My concern is that if this figure is taken by the reader to be from the CAFO analysis (especially if it was developed and used early in the process), it may call into question some of the criticisms and recommendations that we present earlier in our report.]	68. 69.
		Pitelka: Page 117, line 9 – page 120, line 32. This discussion seems to be ambivalent about the active involvement of the public or publics in the development of the conceptual model. For instance, on page 117, lines 9-10 and page 118, lines 18-20, the text seems to state that the conceptual model should be developed by the experts without direct public involvement. This is in contrast to what we say in other places in the report where we strongly recommend direct public involvement. On page 118 the text acknowledges that it is important to consider what ecosystem features are valued by the public but says that "This can be gleaned from a variety of research approaches" rather that stating that the public, or relevant publics, should be involved in the process. On page 119, lines 8-20 the potential involvement of the public is included in two of the three bullets, but even here there is a sense that the experts need to find out what the public cares about but not necessarily involve them in the process of developing the conceptual model. On page 120, lines 11-20 there is finally mention of "a more participatory process", but it is presented as an option, rather than being the clear recommendation of our committee. Is the national rule-making process different enough to make public involvement less critical or more difficult? If so,	70.

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		perhaps that should be stated more clearly so that the approach discussed here does not seem inconsistent with what we say elsewhere.	
		Smith: p.120, lines 23-26 disagrees with recommendation that "in order to increase transparency the Agency should document in its economic benefit assessments and RIAs how the decisions underlying the conceptual model weere made. It should clearly identify the criteria for including effects within the core analysis and how these criteria were applied to those analytical choices."	
		Segerson- "There is precedent in the literature on economic benefits transfer for these types of analyses (see Rosenberger and Loomis 2003 and Navrud (in press), for examples of how this logic might be used in benefits transfer). [I don't understand the idea behind this second approach from the description here. What is the key distinction? I think it would be helpful to have some clarification, but I can't revise this to be clearer without more info. KS] "	71.
		Patton: edit text to see where "response" "output" or consequences" might better substitute for change.	72.
		Pitelka: Page 124, lines 11-13. I am not sure what this ("fully tested techniques are available for evaluating different functional groups") means. This makes it sound as though there is a methods manual for applying the concept of functional groups. It really is not that straightforward. For one thing, how species are divided into functional groups depends on what criteria are used and so is arbitrary. Plant species A and B could both have wind-dispersed seeds and be grouped in the same functional group with regard to seed dispersal. But A might be a nitrogen-fixing herb and B a conifer tree. They would be in different functional groups with	73.

Chapter/section (new report outline)		Issue	No.
		regard to growth form or their roles in nitrogen cycling.	
		Patton: p.124 calls for more discussion of how to select a model "that applies nationally and yet has sufficient detail to help the process"	74.
		Patton – discuss air quality and CAFOs earlier, e.g., p. 129, l.9	75.
	6.2 Valuation for Site-Specific Decisions	Patton: discuss modeling the ecosystem earlier in section	76.
		Daniel: can the story-line in this section be made clearer?	77.
	6.3 Valuation for Regional Partnerships	Patton: explain distinction between local or site specific examples with broader impacts and regional examples	78.
		Patton: discuss how representative Chicago Wilderness is	79.
		Patton: explain relationship of SE Framework to valuation	80.
7 conclusions and recommendations		Kasperson's suggestion to reduce the number of recommendations, structure it along model of conclusion/justification/related recommendation	81.
		Freeman added recommendation: strive to use valuation methods that capture information on the widest range of effects of Agency actions	82.
		Freeman comment about p. 193, l. 19-21 "methods that have been validated by substantial research" – calls for adding discussions of validity tests for Appendix B methods and revising recommendations	83.
		Freeman – include discussion of information collection requests and burden on valuation	84.

Chapter/section (new report outline)	Issue	No.
	Slovic issues: p. 191 lines 18-20. What if experts disagree with the public's priorities for services? p. 192. Certainly the public input should be respected, but what if the informed public does not wish to place much/any value on systems and services that experts believe important? This wording seems slanted too much in favor of the public's views. p. 193. See my early criticisms regarding validity of methods and use of multiple methods of value that may disagree. p. 194 line 6. Decision-aiding methods should be cited here. p. 194 line 27. Concepts of non-value (or construction) may also be exposed by multiple methods. 196. line 3. Yes, communications about benefits are important but communication issues are secondary to major problems of value elicitation. 197 line 6. What if resources are lacking?	85.
	Daniel: Page 191, line 19 add language to sentence that ends **that are of public importance:, while still being watchful for services that the public should appreciate but may not be aware of."** [This may not be the best way—but we need to remind the Agency somewhere in here of the other important edge of the public value sword.]	86.
	Pitelka comments: Page 191, lines 16-17. This seems to be putting the cart before the horse. This is calling for the application of ecological models before the conceptual model is developed. For instance, the term "predict" sounds too quantitative. I think the concept here is that the experts should identify and describe in qualitative terms how the EPA action could affect the ecosystem. This can be done without "using ecological models that are scaled and parameterized	87.

Chapter/section (new report outline)	Issue	No.
	to the ecosystems." We are simply advocating a box and arrow conceptual model. The application of appropriately scaled and parameterized models would happen later when the time comes to quantify the effect on ecosystems, determine how that affects ecosystem services that matter to people, and value those changes. Pitelka Page 191, lines 26-33. The term "biophysical" is used fairly commonly in the report, but this paragraph now makes we wonder if there are different concepts of what it means. How are biophysical properties different from ecological properties? In this paragraph, what is the difference between "experts in both relevant biophysical aspects of the modeling" and "ecologists, who know what biophysical changes can be measured"? This seems to be calling for the involvement of ecologists twice but under different names. Maybe a little rewording would solve this.	
Appendix A: special terms and their use in this report	Freeman - Include definition of benefits	88.
Appendix B: discussion of methods Bio-physical ranking methods Ecosystem benefit indicators Measures of attitudes, preferences, and intentions Economic methods Group expression of values and	Is treatment of decision science approaches appropriate here? (waiting to see Joe's text)	89.
	Freeman questions about Conservation Value Method	90.
	Freeman question about Energy and Material flows: p. 212, lines 9-11: The blue crab spawning sanctuary does not seem to me to be an example of the ecological footprint of the blue crab population, especially given the much wider distribution of the blue crab population throughout the Bay during the summer.	91.

Chapter/section (new report outline)	Issue	No.
social/civic valuation Deliberative processes Methods using cost as a proxy for value	Slovic: 245 line 8. I disagree that the largest barriers to use of survey methods are institutional. I believe they are conceptual (lack of validity).	92.
	Freeman question about conjoint survey Text box 13: pp. 235-238: Why is Text Box 13 in this section rather than in the economic methods section?	93.
	Freeman questions re Mediated Modeling: 1. pp. 305-310: I still don't think that mediated modeling is a valuation method. Mediated modeling is a process for reaching consensus on a wide variety of analytical issues. To the extent that it is used to deal with valuation issues, how does it differ from deliberative processes more generally? In the South African fynbos example (pp. 306-307), where did the values listed in Table 1 of Higgins, et al., (1997) come from? Was there a deliberative process? Was this a form of benefits transfer? The unit value of wildlife harvest might have been simply a market price. Also question of how facilitator influences outcomes	94.
	Slovic: 318. Valuation by Decision Aiding. The name for this method is misleading. The method applies multi-attribute modeling to construct values, in keeping with preference construction. Yes, it aids decisions, but that is the aim of all other methods as well. Perhaps call it Value Construction Methods. 315 line 1. No. The method can provide a specific estimate, as correctly noted on p. 318 lines 9-14. 320 line 5. All methods in this report aim to provide decision support through valuation. Yes, it may not be liked by OMB. This may reflect a deficiency in OMB's guidelines. Yes, the facilitator may influence the results. Nuances of the other methods also may influence their results. That's what preference construction implies.	95.
	Smith: report appears to suggest that ecosystem services and their	96.

Chapter/section (new report outline)	**Issue**	**No.**
	valuation are more important than other things EPA takes account of; this is misleading	
	Smith: report over-emphasizes ecosystem protection and doesn't put it in context of EPA's overall mission; legislative mandates may not require EPA to base decisions on ecosystems	97.
APPENDIX C: SURVEY ISSUES FOR ECOLOGICAL VALUATION: CURRENT BEST PRACTICES AND RECOMMENDATIONS FOR RESEARCH		98.