



**The Goodwin-Niering Center for Conservation Biology and
Environmental Studies, Connecticut College**

**Summary of paper presented at the conference:
Saving Biological Diversity:
Weighing the Protection of Endangered Species vs. Entire Ecosystems
April 6 – 7, 2007**

**Evaluation and Species Preservation
Presented by Bryan Norton**

Summary by Jeff Nemec '09

Bryan Norton, Keynote Speaker of the 2007 Elizabeth Babbott Conant Interdisciplinary Conference on “Saving Biological Diversity,” began by posing the question, “do conservation biologist and policy makers know what they are doing when it comes to evaluating biodiversity?” Although there is wide agreement that biological biodiversity is valuable, Norton feels that there is much less agreement about what that value is, how that value should be described, and how it should be measured. Norton believes that many people are involved in the search for the “holy grail” of biodiversity evaluation—a precise way to place value on units of biodiversity. If we could “determine which units of biodiversity have value, identify and characterize that value, measure the value of individual units, and then represent these values as additive units,” we would have what Norton calls “an Additive Index of the Value of Biodiversity.” He defined this index as one which would allow us “to measure the value of any particular unit of biodiversity, aggregate those values to count the value of composites of these units, assign rankings to systems according to their biodiversity, and measure before-and-after effects of anthropogenic interventions.” The bad news is that there is no “holy grail” which would allow us to place total value on units of biodiversity

Norton feels that biodiversity is not definable in such an quantitative, all encompassing sense. First, he holds that biodiversity “cannot be assigned a metric, cannot be represented as an additive index of biodiversity, and that ecosystems cannot be ranked according to units of diversity which can be expressed as a single measure”; hence, Norton believes the value of biodiversity cannot be represented as an additive quantity. It seems biodiversity would be better understood with a multi-faceted, incommensurable approach, not a quantitative measurement. When we organize nature into two grand “hierarchies.”-- one being taxonomic/phylogenetic (family, genera, species) and the other spatial (habitats, organisms, organs, cells), it is found that biodiversity is strongly represented in both of these hierarchies, but they are not *commensurable* or additive with each other.¹ Further, Norton holds that inventory-style definitions, such as biodiversity being the “sum total of variation in species, genetic variation within species, and in habitats”² only encourages the myths of an inventory of items of biodiversity along with an additive metric of biodiversity that could lead us to a “holy grail.”

Norton then contemplates the notion of biodiversity being “resource” or a “source” of resources. Paul Wood, according to Norton, has argued that biodiversity is not a resource among other biological resources and that it is better thought of as the source of biological resources.³ From this, Norton believes that biodiversity functions in the biological world just as markets function in economics. Because markets generate value/riches, Norton holds that its “generative value cannot be meaningfully aggregated together with the specific values generated by them.” Similarly, Norton believes

¹ Reference from Sahorta Sarkar in Biodiversity and Environmental Philosophy.

² Described by Peter Brussard as the “standard definition” of “Biodiversity” from David Takacs, *The Idea of Biodiversity: Philosophies of Paradise*, (Baltimore: The Johns Hopkins University Press, 1996)

³ Paul Wood, *Biodiversity and Conservation*

biodiversity—by providing many ways to accomplish production under many different circumstances—is a “generator of biological resources of value.” Given Norton’s interpretation, it is best not to think of biodiversity as an “inventory of useful items” but as “the sum total of differences that generate useful items.” Further, this also promotes the view that it is “the source of biological resources, not one resource among others.” So where does this argument leave us? According to Norton, we apparently cannot hope to find a definition of biodiversity “that associates levels or amounts of biodiversity with interchangeable units of biodiversity or an additive/aggregable measure of the value of biodiversity interpreted as units of diversity.”

Is this really bad news? Norton says no in that it doesn’t really matter very much. Given the consensus that biodiversity is valuable and that uncertainty of the perfect valuation of biodiversity is high, the inception of a safe minimum standard (SMS) of conservation is appropriate whereby we would save the resource (species, sub-species, intact ecosystem, etc.) if the social costs are bearable. Further, Norton holds that there is already a “large relatively cohesive community of biodiversity activists who succeed in communicating with each other, seek to initiate a coherent set of policies, and recognize biodiversity when they see it.” In Norton’s words, it seems that “biodiversity-- even if indefinable-- is working as a useful term in public policy discourse as it allows a community of activists and scientists to communicate in pursuit of common goals.”

When we look at actions and proposed actions, experts—in regards to biodiversity—usually agree on what to do. Norton gives the example of activists and scientists agreeing on how to environmentally protect a natural reserve. It seems Norton’s underlying point

is that such a term as “biodiversity” has already been cogent enough to protect biodiversity.

From there, Norton brings in the practice of adaptive management. From this ever-evolving paradoxical “starting point,” Norton believes we can engage in adaptive management and social learning. As we learn by doing, we will incrementally improve our understanding of what we mean by “biodiversity.” Norton argues that we can get on with the work of protecting natural systems from degradation by relying on SMS. While this allows us to begin work on protecting biodiversity, it does not mean we do not need to do evaluations. Norton holds that we still have to “set priorities, state goals, and determine what social costs are too high” in terms of protecting and managing biodiversity.

Norton goes on to discuss what the current state of discourse about environmental/biodiversity policy and he believes it to be in terrible shape. Norton directly states that we continue to live in the Age of Ideology when it comes to environmentalism and “the widespread use of ideology and rhetoric in environmental discourse makes cooperation to protect nature and human environments more difficult.” The prime causes of this rift is the ideology of economism-- the belief that all environmental values can be represented as economic (commodity) values—and the ideology of intrinsic value-- the belief that nature has inherent value, or value that is independent/a priori of humans. These two polarized viewpoints each suggest their own all encompassing theoretical framework. However, Norton contests that since both theoretical positions cannot be submitted to experiential test, they are both epistemologically invalid. Further, Norton believes that these ideological positions only

lead to a lack of communication among people, interest groups, and specifically politicians in many different facets of social life not just limited to the environment.

Norton asserts that this discussion of environmental values has, since the 1970s, been polarized across the disciplinary divide of environmental ethics and environmental economics. To break the ideological gridlock, a new approach is necessary. If developed a certain way, Norton believes that the ideas of adaptive management can provide the means out of the quandary over valuation. Norton sees this great debate as stemming from the different perceived valuations. According to Norton, the environmental ethicists believe that most (or at least many) environmental problems are irreducibly moral problems, a non-anthropocentric valuation that chastises the notion that economic calculations can capture the essential moral aspects of environmental problems. Contrastingly, Norton holds that environmental economists believe all or most environmental values “can be measured in economic terms, can reduce moral values to existence values and consumer preferences measured as “willingness to pay” in order to protect a moral value, and can treat all environmental goods as commodities that can be assigned a price.” This deep schism of valuation epitomizes the history of environmentalism in which those that favor economic analysis as the central methodology of environmental decision making (i.e. Gifford Pinchot) are staunchly pitted against those who believe environmental goals should be set by political means, which includes a public debate about aesthetic and moral values, including non-instrumental value (i.e. John Muir). From this, Norton defines these two approaches as “chunk-and-count” (instrumental) and “chunk-and-sort” (intrinsic) but believes that these two theories surprisingly share related assumptions.

Norton holds that the two ideologies of nature are “chunking” and some of these discrete chunks embody some sort of moral “standing.” Both seem to sort objects differently as economists give standing to only humans and ethicists count other elements of nature (chunks) as having standing as well. Norton calls for an end of this chunking by rejecting their common assumption—that the objects of value in nature and in resources can be chunked in the first place. Norton’s rejection undermines the whole debate since he renders the question, “which things are morally considerable?” moot. Thus, according to Norton’s postulations, it seems we shouldn’t have to answer the valuation question in order to strictly agree upon environmental change.

Norton believes this opens the way for a new approach in evaluating various “developmental paths,” according to a multiple criteria. Norton promotes this sense of value pluralism as the worthy (only) alternative. Norton believes that we should simply accept the observable fact that people value natural objects in many ways, and describe these in “multiple vernaculars.” Following the authors of the Endangered Species Act (ESA), Norton holds that we are provided a list of accepted human values, “without trying to characterize these values of biodiversity according to abstract theory or to force them into some disciplinary jargon.” The “Preamble” of the ESA’s states that the purpose of the act is to protect the aesthetic, ecological, educational, historical, recreational, and scientific values. From this, Norton believes such statements should provide a model construction for the promulgation of value pluralism since it explicitly includes the discussion of metaphors that stimulate deeper social values and meaning. Such discussion must be iterative, experimental, and pragmatically involve learning by doing. In Norton’s

words, the “discourse about the evaluation of ecological change must be embedded in an adaptive management process.”

Norton goes on to discuss the three components that define adaptive management. First, experimentalism through adaptive management “responds to uncertainty by undertaking reversible actions and studying outcomes to reduce uncertainty at the next decision point.” Second, the notion of multi-scalar modeling is consistent with adaptive management because it models environmental problems “within multi-scaled “hierarchical” space-time systems.” Third, the conception of place orientation of adaptive management “addresses environmental problems from a place embedded in local natural and political contexts.” Thus, Norton’s Adaptive Evaluation through a more holistic management is “process oriented, pluralistic in the expression of values, seeks multi scalar indicators, endogenous to place-based, participative management processes, and is iterative.”

Norton feels that if we concentrate on the multiple types of values humans derive from biodiversity, we may be able to avoid ideological and theoretical disagreements across the numerous disciplines. Essentially, Norton hopes for “a continuum of human values.” But Norton feels there continues to be a problem with current environmental terminology. Norton holds that the two competing models—the economist’s view of nature as productive machine and the environmentalist’s view of nature-as-subject—will always clash. In order for an integration of the views, Norton feels that we need more appropriate metaphors which “transcends the perspective of nature as a “collection-of-chunks,” that make ecological processes relevant to members of the public, and that need to be used in a process of choosing appropriate, pluralistic models of evaluating change

in place-based systems.” Norton stresses the crucial role of the metaphor in ecological modeling and in management. Steward Pickett and colleagues, according to Norton, have argued that metaphors are imperative in applying the concepts of ecosystem to local situations to create models of problems.⁴ Further, Pickett’s study of metaphor and the discussion of them will connect ecological science with real world processes. This discussion and endorsement of metaphors should allow environmentally involved individuals to better evoke their sense of values amidst a greater community. Norton sums up the discussion of metaphors by discerning the vast connotation of the term “ecosystem.”

Through his lecture, Norton has held that biodiversity is not a collection of items or an inventory. Further, Norton believes we should discourage the expectation of an “index” of biodiversity. Norton also argues that the term “biodiversity”, has been successfully agreed upon by experts who are more adept at recognizing biodiversity. These experts should also be able to find agreement in regards to what general policies are most effective in protecting biodiversity. But Norton’s issue with “biodiversity” is in the public’s conception and communication of the term which continues to connote it as an “inventory” metaphor. Further, while biodiversity has caught on as a term in conservation biology and some political venues, Norton gave the fact that social scientists tell us that 65% of Americans do not recognize or know the meaning of biodiversity. This poses a problem as Norton hopes for us to move away from an evaluating element of “biodiversity” and toward evaluating processes like development pathways, “back-

⁴ Pickett, Steward T.A. and M.L. Cadenasso. 2002. “The Ecosystem as a Multi-dimensional Concept: Meaning, Model, and Metaphor.” *Ecosystems* 5:1:10.

casting” (futuristic scenarios), and multiple criteria indicators through metaphors that are associated with important meanings and values.

Norton ends by asking, “should we continue to use biodiversity as a central term in biological conservation?” His pros are that it is “widely used, has gained popularity with scientists and policy experts, and has supported significant consensus about what to do to protect biodiversity in practice.” His cons are that the term “seems to encourage us to think of biodiversity as a collection, or inventory, of entities.” In all actuality, Norton stakes that it is “multi-faceted characteristic of the biological world, not susceptible to reduction to an inventory.” But with the continued debate, should we still consider developing an alternative term/concept that fulfills the function of expressing what biologists are trying to describe and communicate? Norton still believes the term “biodiversity” will remain useful as a “bridge” term in that it has both empirical and evaluative content. A promising alternative is that we might consider a pairing of terms, such as consciously referring to “the web of life” which goes along the lines of what biologists call “biodiversity.” According to Norton, this alternative “maintains the scientific momentum behind the term, “biodiversity” and “provides a metaphorical interpretation that is no doubt more appropriate for discussing biodiversity policy than either nature as a productive machine or nature as a subject.”

* I relied heavily on Prof. Norton’s actual slide show in which he sent me via word document. In that, I’m very grateful and I quoted him numerous times verbatim in the summary of the lecture.

<http://www.spp.gatech.edu/faculty/faculty/bnorton.php>

<http://www.press.uchicago.edu/cgi-bin/hfs.cgi/00/155115.ctl>