Contextualism and Norton's Convergence Hypothesis

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Toward Unity among Environmentalists is Bryan Norton's most developed effort to surmount the frequently intractable debate between anthropocentrists and nonanthropocentrists. Norton argues that the basic axiological differences between the two positions have become irrelevant at the level of policy formation. His thesis is that the two camps converge when dealing with practical goals and aims for environmental management. I argue that Norton's approach falls significantly short of establishing such a convergence because of the overall methodological framework for policy formation that he defends. The key problem with that framework is that it fails to provide for the degree of species protection most suitable to the nonanthropocentrist position.

INTRODUCTION

As a prominent voice in environmental philosophy for over a decade, Bryan Norton has labored to show that the intractable axiological debate between "anthropocentrists" and "nonanthropocentrists"—a debate which has served to frame most discussions of environmental ethics—often distracts attention away from the fact that when it comes to practical principles of environmental management, the two opposing approaches for the most part converge.[1] His position has been that because the nonanthropocentric position involves highly questionable metaphysical and epistemological commitments, and because nothing of normative importance contained in nonanthropocentric theories is lost in dispensing with these commitments, environmentalists would be better served by adopting what he has called a "weak anthropocentric" position. More recently, Norton has also been in the forefront of efforts to develop the conceptual apparatus for an approach to environmental management that is capable of accommodating both socioeconomic and environmental perspectives without requiring extraordinary sacrifices of the supporters of either

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[1] An early attempt at arguing for this convergence can be found in Bryan G. Norton, "Environmental Ethics and Weak Anthropocentrism," *Environmental Ethics* 6 (1984): 131–48. That argument has been developed and refined in his "Conservation and Preservation: A Conceptual Rehabilitation," *Environmental Ethics* 8 (1986): 195–220, and his *Toward Unity among Environmentalists* (New York: Oxford University Press, 1991). Recently, James Sterba has argued for a similar kind of convergence regarding principles of justice. See "Environmental Justice," in James P. Sterba, ed., *Morality in Practice*, 4th ed. (Belmont, Calif.: Wadsworth, 1994), pp. 499–506.

position. In a number of writings, he has worked to articulate and defend an approach to environmental management that adopts as its mandate the maintenance of ecological "health" and that is loosely modeled on the paradigm of medical science. Because social and economic systems can be viewed as being contextually embedded in larger environmental systems, Norton holds that such an approach is capable of integrating socioeconomic concerns with environmental concerns, in that the maintenance of the health of the environmental context in which socioeconomic activity takes place is necessary if such practices are to continue to exist and flourish. These two intellectual activities converge in *Toward Unity among Environmentalists,* where he argues that despite divergences regarding ultimate values and justifications, "a consensus on the broad outlines of an intelligent policy" is possible among "environmentalists of different stripes" once their concerns are placed within a framework of environmental management centered on the maintenance of ecological health.[2]

A prime example of Norton's position can be found in a chapter devoted to interspecific ethics.[3] There he continues his program of reconciliation by arguing that when analyzed in detail, deep ecology, the paradigmatic example of a nonanthropocentric approach to environmental ethics, would not, in general, issue policy positions different from those advanced by "longsighted anthropocentrists." Norton's conclusion is that

> . . . introducing the idea that other species have intrinsic value, that humans should be "fair" to all other species, provides no operationally recognizable constraints on human behavior that are not already implicit in the generalized, cross-temporal obligations to protect a healthy, complex, and autonomously functioning system for the benefit of future generations of humans.[4]

Norton's position is that this policy convergence takes the form of a bilateral commitment to the position that all species should be protected as long as the socioeconomic costs of doing so are bearable, a position that has been labeled the "safe minimum standard" (SMS) criterion.[5] I argue that even if one grants the premise, with regard to practical policy formation, that deep ecologists are committed to or would accept the SMS criterion, the possibility of convergence between deep ecology and longsighted anthropocentrism is minimal, or even

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[2] Norton, *Toward Unity among Environmentalists,* p. 187.

[3] Ibid., chap. 12.

[4] Ibid., pp. 226–27.

[5] Ibid., pp. 225–26. This baseline principle of species preservation was developed by S. V. Ciriacy-Wantrup in his *Resource Conservation: Economics and Politics* (Berkeley and Los Angeles: University of California Division of Agricultural Sciences, 1959), as a way of dealing with the inherent limitations of quantifying resource benefits. Norton also defends the use of the SMS approach in his *Why Preserve Natural Variety?* (Princeton: Princeton University Press, 1987), p. 36.

nonexistent, because the overall methodological framework for policy formation within which Norton places the concerns of longsighted anthropocentrism, a framework which he refers to as "contextualism," is unlikely to generate an overall approach to policy formation that accommodates the axiological intuitions of deep ecologists since it allows for the disappearance of species even when the costs of preserving them are bearable. Although I concede that, in the presence of scientific ignorance about the structure and functioning of ecological systems, the contextualist approach might commit environmental management to something at least as strong as the SMS criterion, I argue that given the directive for ecological science set by contextualism, if ecological science does at some future time develop the required body of knowledge, then the most reasonable decision criterion for environmental management will be one that is considerably weaker than the SMS criterion, and too weak to capture the axiological intuitions of deep ecologists.

THE CONVERGENCE ARGUMENT

The controversial nature of Norton's claim about convergence lies in the fact that the basic value assumptions that underlie anthropocentric approaches on the one hand and the deep ecology movement on the other stand in rather stark contrast to one another. Consequently, proponents of approaches based on ascriptions of intrinsic value to nonhuman species may be hesitant to concede Norton's point regarding policy formation because they perceive it also to be a concession on the more basic axiological commitment. Put another way, their intuition about the inherent value of all nonhuman species, which is expressed as a philosophical claim about intrinsic value, might appear, to them, to be incompatible with anthropocentric-based policies, which, at least prima facie, subordinate the value of nonhuman species to that of humans.

What Norton tries to show in *Toward Unity among Environmentalists* is that in agreeing to the kind of preservationist policy that emerges from the longsighted anthropocentric approach, deep ecologists need not, in effect, abandon their initial intuitions about the value of nonhuman species. Rather, what they are abandoning is a particular philosophical framework for translating those intuitions into axiological claims. As Norton notes, when forced to develop precise policy positions, deep ecologists, as a consequence of their commitment to "unqualified egalitarianism," find themselves in situations of undecidable conflicts when faced with circumstances requiring (some) killing or exploitation.[6] Naess himself was aware of this problem and included in his original articulation of the principle of biospherical egalitarianism the qualification that such a principle was an ideal, and that "any realistic praxis

[6] Ibid., p. 224.

necessitates some killing, exploitation, and suppression."[7] This qualification, however, as Norton points out, creates the possibility that a de facto hierarchy of value will supplant the ideal of biospherical egalitarianism, and, more seriously, that such a hierarchy will in effect "map onto the phylogenetic scale in a predictably anthropocentric pattern" an outcome that is self-defeating for the deep ecologist position.[8] For Norton, this consideration reveals the problem with the deep ecologists' approach to generating principles of policy: its axiological framework is too individualistic. In committing themselves to the nonhierarchical ideal that *all individual* organisms are of *equal* inherent value, deep ecologists find themselves bereft of a methodology that allows them to escape the dilemmas posed by axiological conflicts. Further, the implicit metaphysical atomism contained in this individualistic axiology directly clashes with the professed metaphysics of deep ecologists, namely holism.

According to Norton, when the deep ecologists' intuitions about the value of nonhuman species are placed in a contextualist framework in which individuals are recognized as part of larger systematic wholes, a framework that is consistent with their own holistic commitments, the difficulties that emerge from an individualistic perspective (i.e., irresolvable conflicts) are avoided due to the fact that the continued "health" of larger, ecological wholes—a concern for any "realistic praxis"—may require that some individuals be "killed, exploited, or suppressed." Such ecological necessity does not entail that particular individuals are being treated in an "unfair" or "unjust" way because contextualism embodies an approach to environmental management based on the principle of "interspecific impartiality," by which is meant the view that restraints on species populations and their activities, *humans included*, are to be based on standards of ecological health, not on strictly anthropocentric standards. As Norton notes, this principle of interspecific impartiality requires that "humans are morally justified in culling elk only if the humans are willing, similarly and impartially, to limit their own populations when they exceed their carrying capacity."[9]

Norton's conclusion, understood contextually rather than atomistically, is that the deep ecologists' intuitions about the inherent value of nonhuman species are not threatened by an anthropocentric approach in that "No long-term human values can be protected without protecting the context in which they evolved [a diverse natural environment]."[10] Instead, what one comes to expect is convergence: human interests and nonhuman interests converge. Placed within the proper epistemological-axiological framework, the deep ecologist's call for the preservation of species will be identical to the demands

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[7] Arne Naess, "The Shallow and the Deep, Long-Range Ecology Movement: A Summary," *Inquiry* 16 (1973): 95.

[8] Norton, *Toward Unity among Environmentalists*, p. 224.

[9] Ibid., p. 225.

[10] Ibid., p. 240.

of mainstream environmentalists that species be protected provided that the costs of doing so are bearable. The SMS approach rests on the presumption that all species are of value and that the burden of proof lies with those who would diminish this value to show that the socioeconomic costs of preserving species is prohibitive. As such, the concerns of such avowed nonanthropocentrists as the deep ecologists converge with those of anthropocentric mainstream environmentalists when one arrives at the point of general policy formation.

In this context, I am not interested in exploring the validity of Norton's convergence hypothesis itself, although, of course, such a critical assessment is necessary. Norton grants the hypothesis a dual status. It is both "a very general empirical hypothesis" and "an article of environmentalists' faith."[11] Whether it can stand as an empirical hypothesis and whether it ought to be a committed guide for environmental management are important questions to consider, though not ones I wish to pursue here other than to argue that in the case of species preservation, deep ecologists might be more than a little suspicious about the possibility of convergence. Also, I am not interested in reviewing Norton's argument that deep ecologists would be driven to a decision criterion similar to the SMS criterion. It must be conceded, however, that Norton's claim is at least plausible. Deep ecologists must be able to translate their normative claims into reasonably specific positions regarding action, both individual and collective. One would expect that in order to preserve their belief in the intrinsic value of nonhuman nature, deep ecologists would opt for a decision criterion that minimizes as far as possible the extent to which such value can be allowed to disappear or diminish. The SMS criterion is, prima facie, an appropriate candidate in that it represents an attempt to maximize the preservation of species by requiring that only *prohibitive* costs count as legitimate reasons for engaging in activities which threaten species diversity. An important point of dispute will of course be the question, "What counts as *prohibitive*?" Nonetheless, supposing that this issue could be settled to the satisfaction of deep ecologists and longsighted anthropocentrists (which might prove to be quite a difficult task), it is quite plausible to believe that deep ecologists would be comfortable with the SMS criterion, and convergence would be achieved.

Apart from whether or not the SMS criterion is the most plausible decision criterion for deep ecologists to consent to, the question I wish to explore is whether the SMS criterion is the most reasonable decision criterion for contextually framed, longsighted anthropocentrism to accept. If it is not, then the convergence question has to be restated in terms of the decision criterion that the contextually based environmental manager *would* commit to. Understood this way, I think it becomes clear that no such policy convergence would occur, and in this specific context, that Norton's convergence hypothesis is not

[11] Ibid., p. 240.

supported. Demonstrating this point requires an exploration of what Norton means by *contextualism.*

CONTEXTUALISM

In a number of articles and in *Toward Unity among Environmentalists*, Norton develops the methodological framework for policy formation which he refers to as the contextualist approach.[12] Contextualism is a synthesis of a pared-down version of the traditional organicist metaphor and hierarchy theory, a contemporary approach to systems ecology. As Norton puts it, "Expressed metaphorically, contextualism is organicism—the biota is a living system which has an internal, self-perpetuating organization—but organicism minus teleology."[13] The "minus-teleology" qualification is intended to demystify organicism by stripping it of any connotations of *intentional* activity on the part of ecological systems. What is left is a "methodological/metaphorical" version of organicism which Norton refers to as "minimal holism."[14] This version of organicism focuses on the autopoietic, or autogenic, capacity of ecosystems manifested through the many homeostatic and homeorhetic responses that they exhibit in reaction to internal disturbances and environmental changes. Although not developed in *Why Preserve Natural Variety?* as a part of contextualism, Norton provides in his earlier book a concise explanation of the nature of autopoietic ecological systems.[15] In the course of refining the traditional diversity-stability hypothesis in the light of contemporary ecological thought, Norton notes that the concepts of diversity and stability, in an ecological context, are "multiply ambiguous." Traditionally, diversity has been understood as "within-habitat diversity," and stability has been interpreted either as constancy, an ecosystem's capacity for withstanding structural disturbances, or as resiliency, an ecosystem's ability to "bounce back" from disturbances and resume a predisturbance state. It is the connection between the two concepts so understood that has failed to be empirically supported. To solve this difficulty, Norton offers an alternative way of formulating the hypothesis which involves different interpretations of the two constituent concepts. Instead of within-habitat diversity, Norton suggests that attention be focused on "total diversity," by which he means the variety and relative

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[12] The key articles are Bryan G. Norton, "Context and Hierarchy in Aldo Leopold's Theory of Environmental Management," *Ecological Economics* 2 (1990): 119–27; "Sustainability, Human Welfare, and Ecosystem Health," *Environmental Values* 1 (1992): 97–111; "Should Environmentalists be Organicists?" *Environmental Values* 12 (1993): 21–30; and, coauthored with Robert E. Ulanowicz, "Scale and Biodiversity Policy: A Hierarchical Approach," *Ambio* 21 (1992): 244–49.

[13] Norton, "Sustainability, Human Welfare, and Ecosystem Health," p. 105.

[14] Norton, "Should Environmentalists be Organicists?" p. 28.

[15] Norton, *Natural Variety*, chap. 4.

abundance of species occupying all of the habitats that compose a given geographical region. Because ecosystemic boundaries are not fixed and are permeable, the species makeup of any given ecosystem is subject to natural fluctuations due to species immigration and emigration. By focusing on total diversity, these natural fluctuations—the downturns of which might otherwise be taken as signs of ecosystemic "illness"—can be accommodated without alarm since the entire pool of potential colonizers is accounted for, and a more realistic picture of the dynamic character of ecosystems is generated.

Regarding ecosystemic stability, Norton appropriately points out that it is an agreed upon ecological fact that ecosystems change structurally over time. The idea of ecological succession, that ecosystems develop through stages, captures this inherent ecosystemic dynamism. As he indicates, however, constancy and resiliency are static concepts, applicable to ecosystems only as systems "frozen in time." To equate ecosystemic stability with constancy or resiliency is to deny the dynamic character of ecosystems by implying that a stable ecosystem is one that seeks to maintain some fixed structural state. What ecologists have come to realize is that ecosystems display a number of "normal" states to which they return after disturbances. A disturbance that exceeds a certain threshold causes a system to adjust to a new structural state, whereas disturbances below that threshold are followed by a return to the predisturbance state. This multiplicity of post-disturbance states is typical of both stable and unstable ecosystems. Drawing on Margalef's analysis of ecosystemic maturity, Norton argues that the difference between stable and unstable ecosystems lies in the fact that the future states of the former are largely the result of internal forces and not external environmental inputs, whereas the future states of the latter are due largely to such external forces.[16] *Stability* is defined in terms of a system's autogenic capabilities; so understood, it has a dynamic character, better reflecting the actual development of ecosystems. Ulanowicz has even called this capacity of ecosystems—the ability to "creatively" adjust to changes in circumstances—the defining feature of healthy ecosystems.[17]

Given these interpretations of diversity and stability, Norton recasts the diversity-stability hypothesis as the view that total diversity, because it represents the potential for intense competition for available niche space in regional ecosystems, leads to the development of autogenic ecosystems. As he summarizes it:

[t]he proposed version of the diversity-stability hypothesis claims that, when ecosystems develop under such intense competition [present in an area with a large amount

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[16] Ramon Margalef, "On Certain Unifying Principles in Ecology," *American Naturalist* 97 (1963): 357–74. Norton also cites Eugene P. Odum, "The Strategy of Ecosystem Development," *Science* 164 (1969): 262–70.

[17] Norton cites Ulanowicz on this point in "Scale and Biodiversity Policy," p. 247.

> of total diversity], they will attain, both more quickly and to a greater degree, the characteristics associated with dynamic stability. Systems in which competition for niche space is intense will develop a high degree of complexity, interrelatedness, and niche specialization. These characteristics lead to greater degrees of autogenic determination: alterations of the system become increasingly determined by features internal to it.[18]

To fill out contextualism, Norton overlays this view of ecological systems as autopoietic with a template for understanding the complexity and internal organization of ecological structure drawn from hierarchy theory.[19]

> According to hierarchy theorists, natural systems exhibit complexity because they embody processes that occur at different rates of speed; generally speaking, larger systems (such as a community) change more slowly than the microhabitats and individual organisms that compose them, just as the organism changes more slowly than the cells that compose it. Further, the community survives after individuals die and, while changes in the community affect (constrain) the activities of the individuals that compose it, the individuals themselves are unlikely to affect the larger system because the individual is likely to die before the slow-changing system in which it is embedded will be significantly altered by its activities.[20]

This hierarchical nesting of "subsystems" or "holons"—organ/organism, organism/population, population/microhabitat, microhabitat/ecosystem, ecosystem/bioregion, etc., as they are called—allows one to model intrasystemic complexity by choosing from a range of temporal and spatial scales based on the particular goal of the investigation. Although "higher" holons form the relatively stable environment in which "lower" holons operate, and are relatively immune to the destabilizing activities of lower holons, that is not to say that higher holons are entirely immune to the affects of lower holons. As Norton notes:

> As a part, the holon affects the whole, but scale is very important—the "choices" of one element will not significantly alter the whole—but if that part's activities

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[18] Norton, *Natural Variety,* p. 84. The idea of ecosystemic autogeny advanced by Norton is similar to the Gaia hypothesis, that the biosphere is a self-regulating system, and to the idea that ecosystems are autopoietic entities, as recently suggested by Callicott. See J. E. Lovelock, *Gaia: A New Look at Life on Earth* (Oxford: Oxford University Press, 1979), and J. Baird Callicott, "AIdo Leopold's Metaphor," in Robert Costanza, Bryan G. Norton, and Benjamin D. Haskell, eds., *Ecosystem Health: New Goals for Environmental Management* (Covelo, Calif.: Island Press, 1992), pp. 42–56.

[19] An often cited source for hierarchy theory is R. V. O'Neill, D. L. Angelis, J. B. Waide, and T. F. H. Allen, *A Hierarchical Concept of Ecosystems* (Princeton: Princeton University Press, 1986). Norton relies on an earlier work, T. F. H. Allen and Thomas B. Starr, *Hierarchy: Perspectives for Ecological Complexity* (Chicago: University of Chicago Press, 1982).

[20] Norton, *Toward Unity among Environmentalists,* p. 148.

> represent a trend among its peers, then the larger and slower-changing system will reflect these changes on its larger and slower scale. One cell turning malignant will not affect an organism significantly unless it represents a trend toward malignancy. If such a trend is instituted, then the organism might eventually be destroyed by that trend in its parts.[21]

For Norton, this fusion of autopoietic function and multiscalar hierarchical structure represents the framework within which environmental management is to take place and provides a method by which to construct "an ecologically sound concept of dynamic health for ecological systems."[22] The "distinctive character" of contextual management is a focus "not so much on individual actions as on their collective effects on the larger system and their effects on trends across more distant time,"[23] with a goal of avoiding those activities which disrupt the autopoietic behavior of ecological systems by accelerating the rate of change in the larger holons.

Concerning the preservation of biodiversity, the general implication of contextualist management is that the accelerated rate of human-caused extinctions threatens ecosystemic health because, as a trend, it threatens to accelerate the rate of change in those larger systems which environ species populations (e.g., communities and bioregions). More specifically, relying on Norton's recommendation that the scale of resolution most proper to questions of species preservation is that of total diversity, the concern for contextualist environmental management is that the global trend of reduction in total diversity threatens to disrupt the "normal" rate of ecological change in bioregions. Consequently, the environmental manager will ultimately be concerned with activities that accelerate the "natural" pace of change in the species profile of bioregions. Activities which affect that pace in a fashion that cause it to diverge from its "normal" rate are to be deemed unacceptable because they will have the effect of deleteriously impacting the larger organizational levels of regional ecological systems.

In Norton's opinion, such a contextualist approach to environmental management produces a base-line recommendation that a species be preserved unless the costs of doing so are prohibitive, or, alternatively, that a species be preserved as long as the costs are bearable. Norton describes the merits of the SMS criterion in this way:

> It sets as its goal to save all species, but accepts that efforts to save species must be politically and ecologically viable, and that choices will have to be made as to how preservation dollars will be spent. The SMS criterion states the common sense position: In the extreme case, costs might override the strong presumption

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[21] Ibid., p. 148.
[22] Ibid., p. 151.
[23] Ibid., p. 147.

> in favor of preservation, but the burden of proof always rests on those who would degrade a resource or destroy a species.[24]

Norton acknowledges in *Why Preserve Natural Variety?* that he adopts the SMS criterion because "it embodies the central assumption that all species have value," and he puts the burden of proof on those who would diminish or destroy such value to show that such a loss is unavoidable or necessary to satisfy some other equally stringent moral obligation.[25] It is clear from his later writings that his endorsement of the SMS criterion is also based on his belief that the SMS criterion is the most reasonable approach to protecting large-scale ecosystemic processes, inasmuch as protecting such processes is dependent on the maintenance of total diversity, and that it represents a presumptive commitment to protecting as many species as possible.[26]

CONTEXTUALISM, DECISION CRITERIA, AND CONVERGENCE

As mentioned earlier, setting aside questions about the acceptability of the SMS criterion from the perspective of deep ecology, the other half of the convergence hypothesis can be questioned. Would longsighted or weak anthropocentrism, understood within a contextualist framework, result in the SMS criterion? My position is that it would not. The problem is that contextualism provides inadequate support for the presumption that species can be allowed to diminish in abundance or go extinct (locally, regionally, or globally) only in those cases where the costs of preservation are prohibitive. In other words, there is room within contextualism for the environmental manager to adopt a decision criterion that lowers the acceptability standard for species loss below the "bearability" level; species losses may be acceptable even if the costs of preservation are bearable, or are not prohibitive.

It is clear that the focus of the contextualist approach to environmental management is on systemic issues. Specifically, in terms of biodiversity preservation, the goal is "to protect *total diversity at the landscape level of ecological organization.*"[27] Interpreted in the light of hierarchy theory, the positing of such a goal entails that concern be directed at monitoring phenomena at the level of the lower holons that may accelerate the normal pace of changes in total diversity at the level of the "landscape" holon. In particular, the environmental manager is to be on the alert for developing trends in the decline of species populations which might, if unabated, accelerate changes in total diversity. As such, the contextualist is concerned with declines in the

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[24] Ibid., p. 153.
[25] Norton, *Natural Variety*, p. 36.
[26] For example, see Norton, "Scale and Biodiversity Policy," p. 248.
[27] Ibid., p. 246.

abundance of individual species only if such declines represent or have the capacity to initiate a trend in species loss.

The implication seems to be that the loss or decline of an individual species is not, in and of itself, an issue of concern. As hierarchy theorists admit, the activities of lower-level holons tend not to affect the higher-level processes unless such activities "represent a trend among its peers." If so, then the loss or decline of an individual species ought not to be cause for alarm unless one has good reasons to think that such a loss or decline has the potential to initiate, or in fact is already part of, a regional trend in species decline and loss. Is it plausible to believe that there may in fact be instances in which the loss or substantial decline of an individual species or small set of species does not represent or does not have the potential for initiating "trends in its peers?" Or is such a scenario inherently implausible because every species loss or decline either represents the beginning of such a trend or has the potential to initiate one? I argue that such a scenario is indeed quite plausible.

As mentioned earlier, it is the nature of ecosystems, as autopoietic systems, to display the capacity for "creative" responses to environmental changes and internal disturbances, such as fluctuations in species abundance and demographics. If so, then it makes sense to assume that ecosystems have tolerance levels. Due to their structural and functional complexity, they may, within certain parameters perhaps, withstand the loss or decline of individual species and still maintain their autopoietic capacity at higher levels of organization. That ecosystems persist structurally over very long time periods seems to underscore the fact that as self-organizing systems they have "built-in" tolerances to environmental changes. The concept of ecosystemic threshold, mentioned earlier in the context of the definition of ecosystemic autopoiesis, is indicative of this inherent tolerance. Using the analogy of medicine, which Norton finds to be an appropriate metaphor for the approach of a contextualist environmental manager, the existence of one malignant cell does not seriously impact the health of the organism unless it represents a trend in malignancy. Additionally, the loss of any particular cell, or assemblage of cells, may not be cause for alarm if the organism's ability to maintain itself is not diminished. In either case, what is evidenced is the ability of an organism (a particular type of autopoietic system) to tolerate the loss or diminishment of some particular component. If so, then calls for invasive procedures to remove the malignant cell or avoid the loss of cells are medically unnecessary. Applied to species preservation, if the decline or loss of individual species poses no threat to the "health" of the larger system, then calls for intervention to prevent further decline or to prevent the local (or global) extinction of such species, though not prohibited, are ecologically "unnecessary."

In cases in which the decline or loss of some individual species poses no threat to the autopoietic capacities of the larger systems, the socioeconomic costs required to reverse the decline or save the species from extinction take on

greater significance than they do in cases where one is faced with a developing trend in species impoverishment. Once the ecological necessity of preserving an individual species no longer holds, one can plausibly argue that since society can avoid the socioeconomic costs that would be incurred if attempts were made to save the species, and in doing so create no or little risk to ecosystemic health, then, in accordance with the management goal of balancing environmental and socioeconomic concerns, the most reasonable *management* decision to make is to allow the species to continue to decline or go extinct. Because, as quoted above, Norton defends the view that questions about how to spend resources, financial and otherwise, are essential to decisions about species preservation, it is reasonable to assume that the contextualist manager could, in specific cases, decide to allow certain species to decline or go extinct (locally or globally) even though the costs of preservation are bearable. Notice that this same conclusion is reached if one considers cases in which certain socioeconomic benefits are derived from activities which impact the abundance of certain species, but that such impact does not represent an ecologically dangerous trend. In either case, the existence of certain species becomes a barterable commodity, one which can be exchanged for other benefits or to avoid certain costs. If so, then contextualism entails a much weaker decision criterion than the SMS criterion. Most likely, the actual decision criterion would be to avoid *trends* in species decline or loss unless the costs of doing so are prohibitive, which clearly marks a move away from assigning presumptive protection to species on an individual basis.

Of course, even this weaker decision criterion contains a presumptive commitment to preserving *many* species; a failure to do so would represent a trend in species decline or loss since species are interrelated. Nevertheless, this commitment, given the quantitative vagueness of *many*, is far different from a presumptive commitment to preserve *all* species if possible, and, quite different from a commitment to preserve *as many species as possible*.[28] These differences follow from the fact that it is plausible to believe that ecosystems are so structured as to be capable of "tolerating" significant changes in the composition and amount of total diversity. Norton acknowledges as much when he remarks that "Diversity must be understood dynamically, in terms of healthy processes, rather than merely as maintenance of current elements of the system."[29] If existing species patterns are not the *ultimate* object of concern for the contextualist environmental manager, then the goal of preserving *all* species or *as many as possible* is no longer operative. Noticeable changes in the "current elements" of any particular ecosystem become not only allowable in cases where preventive costs are prohibitive, but also in cases where such costs are bearable.

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[28] Ibid., p. 248.
[29] Ibid., p. 249.

When the implications of contextualist environmental management are spelled out in this way, the possibility that deep ecology and longsighted anthropocentrism would converge at the level of policy formation seems less likely, bordering on the nonexistent. Norton's criticism of deep ecology's axiological individualism turns out to be a double-edged sword. True, unqualified egalitarianism leads to irresolvable policy conflicts; however, thoroughgoing contextualism, despite its apparent ability to achieve consistent policy formation, fails to provide adequate support for the preservation of individual species. It fails to do so because it turns the focus of environmental preservation away from individual species and toward ecosystemic processes. This shift in focus is mirrored by a shift in normative goals. Unlike the deep ecologist, who will be committed to preserving as many species as possible, and will try to define "possible" in such a way as to maximize the amount of species diversity preserved without requiring extraordinary socioeconomic sacrifices, the contextualist environmental manager will be committed to the much weaker normative goal of avoiding trends in species loss. These different normative goals are not easily translatable into equivalent decision criteria. The intractability of the debate at the normative level is not relieved at the level of policy formation. The optimism expressed for the convergence hypothesis seems to wane when the issue of devising a single comprehensive decision criterion by which to develop practical policy is addressed, at least as regards species preservation.

CONCLUSION

There is an obvious and potentially powerful response to my argument that deserves consideration. It could be argued that my criticism of Norton's convergence hypothesis rests on a false assumption, namely, that we are in a position to predict which lower-level phenomena will or will not accelerate processes at higher systemic levels. Such an assumption, it can be argued, is simply false; we do not have at our disposal the requisite knowledge of ecological structures for making such predictions. As ecologists have come to recognize, ecosystems are so complex that simple linear explanations of ecological phenomena and their interrelatedness are grossly unrealistic. The fact that higher-level systemic processes occur over such long periods of time makes it terribly difficult, if not outright impossible, to accumulate the kind of data necessary to generate reasonably comprehensive principles of ecosystemic functioning, and to test theories and models. Because of the short temporal scale of the studies that have been undertaken, the available data is at best "uncertain." Consequently, cases in which species can be "sacrificed" because of their "ecological unimportance" are at best only hypothetical, since the kind of ecological knowledge required in such cases is itself nonexistent. In the presence of ecological ignorance, the contextualist manager must be commit-

ted to the stronger version of the SMS criterion. Because we are not in a position to determine whether any particular species loss will initiate a trend, all species should be protected if the socioeconomic costs of doing so are bearable.

The appropriate response to this objection depends on the strength of the epistemological claim embedded in it. First, it is obviously true that we are far from the kind of ecological enlightenment necessary to make such cases a *real* possibility, and as long as that situation remains unchanged, my argument is at best a theoretical one. As a result, Norton can easily respond that such a theoretical problem is not worrisome because it has no impact on policy formation. At that level, the SMS criterion *will* be the most reasonable such criterion for the contextualist manager to adopt, and if the SMS criterion is also the most reasonable criterion for deep ecologists to adopt, then the convergence hypothesis holds for species preservation. However, one point must be made clear: is our present ecological ignorance simply a contingent phenomenon, or are ecological structures so complex that it is inconceivable that we will ever come to acquire sufficient knowledge to generate causal principles linking phenomena in lower holons with processes in higher ones? Are we suffering from temporary or permanent ecological blindness?

If ecological science continues to develop and ecologists begin to generate a body of principled knowledge capable of grounding predictive hypotheses, then the ability to predict the impact of lower-level phenomena on higher-level systemic processes may become a *real* possibility. If so, however, the appropriateness of the SMS criterion for contextualist environmental management will only be temporary. At some future point, the weaker version of the SMS criterion will become more reasonable. Convergence, if it is realized, will be a simple historical fact, not a principled position.

Furthermore, Norton and others who defend an approach to environmental management based on the metaphor of medical science, operate with an overall framework which *requires* that such ecological knowledge become available.[30] As Norton remarks, "Scientific contextualism places a heavy burden on scientific models to help us determine which activities may have long-delayed, but potentially catastrophic, consequences."[31] With regard to modeling, environmental management on medical science, Norton writes:

> Just as medical research must fulfill both a criterion of methodological rigor *and* a criterion of relevance—usefulness in healing patients—conservation biologists are likewise obligated to characterize ecological systems in ways that are not only accurate, but useful in protection and recovery programs.[32]

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[30] Costanza et al., *Ecosystem Health,* is an outstanding collection of essays by authors supportive of this approach.

[31] Norton, "Sustainability, Human Welfare, and Ecosystem Health," p. 105.

[32] Norton, "Scale and Biodiversity Policy," p. 244.

Norton acknowledges that the application of ecological principles of "diagnosis" and "treatment" to environmental management continues to be difficult because there is no adequate characterization of the "physiology" of ecological systems, which is primarily the result of difficulties in resolving "scale issues"; nevertheless, if environmental management is to be guided by the mandate, "Protect ecosystemic health," then it must have at its disposal a body of knowledge that allows it to engage in diagnostic, curative, and preventive ecological "medicine."[33] With regard to a contextual hierarchical approach to environmental management, Norton holds out the hope that "hierarchy theory, or some other model of complex systems, may someday furnish mathematical ratios of change across systems of differing levels."[34] Without this type of knowledge, managing lower-level holons so as to avoid impacting the rate of change in higher-level holons seems to be little more than guesswork. In the presence of such knowledge, the possibility that we can determine when species decline or loss is ecologically benign becomes quite real.

On the other hand, if a sufficiently detailed and comprehensive body of ecological knowledge is an impossibility, then environmental *management* becomes a practical impossibility in the same way that managing human health would have been impossible without the tremendous advances made by medical science. This kind of "argument from ignorance" is one which Norton uses quite extensively to criticize the traditional economic approach to valuing species. In *Toward Unity among Environmentalists,* he sums up the problem this way:

> Given the magnitude of the problems afflicting aggregative methods of valuing species, it is not surprising that Moralists ridicule the economists' attempts. Economists are very far from having, even for one well-known species, a complete accounting of all its present and future values. Given that many endangered species, especially in the tropics, have neither been named or studied, the Aggregator offers an approach to valuing species that is at best theoretical.[35]

If contextualism is plagued by a similar inherent inability to specify the ecological value of species, then his criticism of the aggregator's approach applies to contextualism as well. Although it may represent a sound theoretical

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[33] Norton discusses these difficulties in "A New Paradigm for Environmental Management," in Costanza, et al., *Ecosystem Health,* pp. 23–41. David J. Rapport has labelled this branch of ecological science clinical ecology." See David J. Rapport, "What is Clinical Ecology?" in Costanza, et al., *Ecosystem Health,* pp. 144–56. Additionally, a growing branch of scientific ecology, restoration ecology, is built on the premise that ecological science is capable of generating the kind of knowledge of ecological systems necessary to restore damaged or "ailing" systems to some healthy state. See, for example, William R. Jordan III, Michael E. Gilpin, and John D. Aber, eds., *Restoration Ecology* (Cambridge: Cambridge University Press, 1987).

[34] Norton, *Toward Unity among Environmentalists,* p. 151.

[35] Ibid., p. 140.

approach to environmental management, without the knowledge and techniques necessary to generate predictive hypotheses about the effects of species loss, contextualism will be an unfeasible approach to policy formation.

Thus, on one hand, if ecological science is capable of developing the kind of clinical knowledge necessary to make contextualism work as a form of environmental management, then it is both conceptually and pragmatically unlikely that Norton's convergence hypothesis will hold with regard to species preservation. On the other hand, if clinical ecology is a conceptual impossibility, then contextualist environmental management will suffer a similar fate as a practical approach to environmental decision making. Because Norton is committed to a defense of contextualism, the latter position on ecological knowledge is not an option for him. Consequently, from the perspective of contextualism, the matter of policy convergence remains problematic. Because forming environmental policy is a matter of unifying diverse environmental perspectives, contextualism may prove to be an inadequate framework within which to attempt to derive environmental management policy which incorporates some of the more demanding normative, environmental claims, like those of deep ecology.