

ARTICLE: A TRAIN WITHOUT TRACKS: RETHINKING THE PLACE OF LAW AND GOALS IN ENVIRONMENTAL AND NATURAL RESOURCES LAW

Fall, 2008

Reporter: 38 *Envtl. L.* 1239

Length: 32474 words

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LexisNexis Summary

... The two case studies, of blue crab management within the Chesapeake Bay Program and of the elaboration of the terms "ecological character" and "wise use" within the Ramsar Convention on Wetlands, demonstrate that without some tinkering to the ecosystem management and new governance models, they are unlikely to achieve a goal of effective long-term environmental protection. ... As a critical mass of scholars in environmental and natural resources law respond to the work of both scientists and new governance writers, increasing emphasis has been placed on designing institutions that are flexible, capable of adapting in response to new information, and nonhierarchical. ... Indeed, both ecosystem management writers and new governance writers are focused on the idea that it is collaboration and participation that will lead to a determination of the goals. ... The process itself - the mix of collaborative activity with broad stakeholder participation - will itself lead to individual decisions that will ultimately achieve the larger goals of maintaining ecosystem integrity and sustainable development. ... Although we might know that we have to protect species whose only use is to maintain the resilience or redundancy of an ecosystem and thereby its integrity, it will be harder to ensure protection of such species against competing short-term and immediate interests. ... To advance this ecosystem approach, we will broaden our management perspective from single-system to ecosystem functions and will expand our protection efforts by shifting from single-species to multi-species management. ... Ultimately, the day-to-day workings of the Program suggest an operating structure cognizant of the need for multiple scales of focus, for the separation and reconciliation of science and policy, for the recognition of the role of humans, and, above all, for adaptive management and the encouragement and facilitation of new learning. ... Further, the Convention's updated definition of wise use of wetlands now reads "the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development." ... To the extent that more specific goals emerge from collaborative processes in the form of benchmarks, these are flexible benchmarks. ... In the absence of an entrenched and binding rule that states the goal of wetland protection to be tied to more than short-term needs of poverty reduction, there is no guarantee that Ramsar Convention wetlands will be protected for their long-term contributions to ecosystem health.

Highlight

* Assistant Professor of Law, Michael E. Moritz College of Law, The Ohio State University. Sincere thanks to Anne-Marie Slaughter, Todd Rakoff, and Brad Karkkainen for their valuable help with the early stages of this project. Thanks also to Jim Brudney, Fred Cheever, Amy Cohen, Theresa Corless, Bruce Hay, Brad Karkkainen, Debby Merritt, Reinier de Nooij, Peter Shane, Ric Simmons, Anne-Marie Slaughter, and Peter Swire for their helpful comments on this Article, and to Billy Means and Bethany Collins for their excellent research assistance. I am grateful to the Moritz College of Law at The Ohio State University for summer financial support, and to Charles Sabel and Public Innovations for financial support for the initial stages of my Chesapeake Bay Program research. For the section on the Chesapeake Bay Program, I also owe sincere thanks to the many people who took the time and effort to help me understand the Chesapeake Bay Program, with no gain to themselves, in particular Dr. Jack Greer, Assistant Director for Public Affairs, University of Maryland Sea Grant College; Frances Flanigan, former Executive Director, Alliance for the Chesapeake Bay; Tom Simpson, Maryland Department of Agriculture and Chair, Nutrients Subcommittee, Chesapeake Bay Program; Anne Pesiri Swanson, Executive Director, Chesapeake Bay Commission; David Bancroft, Executive Director, Alliance for the Chesapeake Bay; Rebecca Hanmer, Executive Director, Chesapeake Bay Program; and Howard Ernst, Assistant Professor, United States Naval Academy. Numerous unnamed people shared small insights and generally made me feel welcome at meetings. For the section on the Ramsar Convention on Wetlands, I owe thanks to Vaughn Collins, Roy Gardner, Heather Mackay, David Pritchard, Amanda Leiter, and members of the Georgetown Environmental and Land Use Law Workshop of 2006 for comments on an earlier version of this part of the Article.

As a critical mass of scholars in environmental and natural resources law respond to the work of both scientists and new governance writers, increasing emphasis has been placed on designing institutions that are flexible, capable of adapting in response to new information, and nonhierarchical. The institutional models that emerge from this thinking, however, pay limited attention to the role of goals and substantive law, instead relying on process and procedural law to achieve better environmental outcomes. This Article suggests that this is a mistake, arguing that long-term environmental protection can only be achieved by these new models if we can be sure that all of the values that are at stake in environmental protection will be adequately represented by the procedural institutions. The Article challenges whether this is possible under the current implementation of the models. It further argues that the goal of long-term environmental protection can be better achieved by bringing back a role for substantive law in the design of our institutions for environmental protection, supplementing the models.

The Article begins in Part II with a discussion of ecosystem management, the field that has emerged over the past decades from scientists seeking to ensure more effective environmental protection and management of natural resources. It then briefly addresses similarities between this work and the work of writers advocating changes in how we govern even beyond the environmental and natural resources law fields. In Part III, the Article discusses how these two bodies of work address normative goals and the role of law in institutional design, and considers what is missing from the picture that emerges from both of these bodies of literature. To explore this further, the Article also examines two institutions, the Chesapeake Bay Program and the Ramsar Convention on Wetlands, both of which have incorporated elements of new institutional design. The case studies look at the Chesapeake Bay Program's efforts to address declines in blue crab populations and the way in which the Ramsar Convention on Wetlands has attempted to address the relationship between human activity and wetlands protection. They suggest that the institutional models are missing something that will be necessary to achieve effective long-term environmental protection. In short, the models resemble trains without tracks, moving forward without a path. The Article ends with suggestions for how we can rethink the role of law in environmental and natural resources law by imagining a role for substantive law - in the form of sufficiently specific goals - that can provide tracks for our moving train to guide us towards more effective long-term environmental protection.

Text

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I. Introduction

The message in environmental and natural resources law is also the message in administrative law, constitutional law, international law, and legal theory: we live in a complex society where laws designed for particular purposes can have unanticipated consequences,¹ where bureaucracy is too slow and cumbersome to respond quickly and efficiently enough to those consequences,² and where the traditional structure of top-down lawmaking is under siege as too rigid, too hierarchical, and too contentious³ to achieve its goals. The world we live in, as legal writers spanning a range of fields tell us, requires new forms of governance.

Both within and beyond the environmental law field, writers have begun to address the institutional design challenges raised by these insights. Their work commends and proposes, among other things, flexible mechanisms for resolving regulatory problems, responsive and adaptive regulation, enhanced involvement of private actors in the traditionally public sphere of bureaucracy and its implementation, and deeper collaboration with stakeholders.⁴ In the environmental context, this work also advocates a more holistic approach to environmental protection, moving

¹ See, e.g., *Dilemmas of Law in the Welfare State* (Gunther Teubner ed., 1988) [hereinafter *Dilemmas*]; Michael C. Dorf & Charles F. Sabel, *A Constitution of Democratic Experimentalism*, [98 Colum. L. Rev. 267, 270 \(1998\)](#); Jody Freeman & Daniel A. Farber, *Modular Environmental Regulation*, [54 Duke L.J. 795 \(2005\)](#). See generally Orly Lobel, *The Renew Deal: The Fall of Regulation and the Rise of Governance in Contemporary Legal Thought*, [89 Minn. L. Rev. 342, 356-61 \(2004\)](#) (discussing ways the legal system can adapt to the changing political, social, and economic environment of the twenty-first century).

² See Lobel, *supra* note 1, at 388.

³ See, e.g., Bradley C. Karkkainen, *Collaborative Ecosystem Governance: Scale, Complexity, and Dynamism*, [21 Va. Envtl. L.J. 189, 200-04 \(2002\)](#). See generally Lobel, *supra* note 1 (exploring the shift from a top-down governance approach to a more fluid, decentralized model).

⁴ See discussion *infra* Part II.

away from a focus on separate media like air, water, and waste.⁵ And such work recognizes the importance of a multiscale approach to [*1242] environmental protection efforts, abandoning the traditional dichotomy of local versus federal, and embracing instead multiple scales of governance.⁶

There is no shortage of examples of the kind of governance models advocated in response, or examples of apparently successful implementations of the models: democratic experimentalism;⁷ collaborative ecosystem governance and collaborative governance;⁸ ecosystem management and adaptive ecosystem management;⁹ modular regulation;¹⁰ autopoiesis and self-reflexive law;¹¹ eco-pragmatism;¹² and the harnessing of global networks,¹³ to name a few of the most prominent. Not all of these approaches are the same by any means.¹⁴ They differ sometimes in substance, sometimes in underlying theoretical foundation.¹⁵ Some are positivist accounts; some tend towards a more normative bent.¹⁶ Some are dominated by environmental law examples; others draw from a larger pool of [*1243] regulatory issues. Yet, this group of thinkers is linked by a common emphasis on rethinking governance.¹⁷ Each one - sometimes overtly, sometimes covertly - has implications for the role of law within that project.¹⁸

The significance of this new thinking on institutional design and governance for environmental and natural re-

⁵ Karkkainen, *supra* note 3, at 193, 204.

⁶ See *id.* at 212-22; Freeman & Farber, *supra* note 1.

⁷ See Dorf & Sabel, *supra* note 1, at 267-68.

⁸ See Jon Cannon, Choices and Institutions in Watershed Management, [25 Wm. & Mary Envtl. L. & Pol'y Rev. 379 \(2000\)](#) [hereinafter Cannon, Choices]; Jonathan Cannon, Checking in on the Chesapeake: Some Questions of Design, [40 U. Rich. L. Rev. 1131 \(2006\)](#) [hereinafter Cannon, Checking in]; Jody Freeman, Collaborative Governance in the Administrative State, [45 UCLA L. Rev. 1 \(1997\)](#); Karkkainen, *supra* note 3.

⁹ See, e.g., John Copeland Nagle & J.B. Ruhl, *The Law of Biodiversity and Ecosystem Management* (2002); Holly Doremus, Adaptive Management, the Endangered Species Act, and the Institutional Challenges of "New Age" Environmental Protection, [41 Washburn L.J. 50 \(2001\)](#); Bradley C. Karkkainen, Adaptive Ecosystem Management and Regulatory Penalty Defaults: Toward a Bounded Pragmatism, [87 Minn. L. Rev. 943 \(2003\)](#) [hereinafter Karkkainen, Bounded Pragmatism]; Bradley C. Karkkainen, Panarchy and Adaptive Change: Around the Loop and Back Again, [7 Minn. J. L. Sci. & Tech. 59 \(2005\)](#) [hereinafter Karkkainen, Panarchy]; A. Dan Tarlock, The Nonequilibrium Paradigm in Ecology and the Partial Unraveling of Environmental Law, [27 Loy. L.A. L. Rev. 1121 \(1994\)](#).

¹⁰ Freeman & Farber, *supra* note 1.

¹¹ See Autopoietic Law: A New Approach to Law and Society (Gunther Teubner ed., 1988); Gunther Teubner et al., Law as an Autopoietic System (1993); Eric Bregman & Arthur Jacobsen, Environmental Performance Review: Self-Regulation in Environmental Law, [16 Cardozo L. Rev. 465 \(1995\)](#); Eric W. Orts, Reflexive Environmental Law, [89 Nw. U. L. Rev. 1227 \(1995\)](#); Sanford E. Gaines, Reflexive Law as a Legal Paradigm for Sustainable Development, [10 Buff. Envtl. L.J. 1 \(2003\)](#). Although autopoiesis is not a normative approach, it has normative implications for how we regulate. See, e.g., Niklas Luhmann, The Self-Reproduction of Law and its Limits, in *Dilemmas*, *supra* note 1, at 112-13.

¹² See Daniel A. Farber, Eco-Pragmatism: Making Sensible Environmental Decisions in an Uncertain World 9 (1999).

¹³ See Anne-Marie Slaughter, A New World Order 32 (2004).

¹⁴ See Bradley C. Karkkainen, Reply, "New Governance" in Legal Thought and in the World: Some Splitting as Antidote to Overzealous Lumping, [89 Minn. L. Rev. 471, 496 \(2004\)](#).

¹⁵ Some differ so starkly in underlying theoretical foundation that it might appear risky and perhaps even foolhardy to try and link them together into a common school. This is particularly true, for example, of comparing autopoiesis, founded on systems theory, and democratic experimentalism and new governance, founded on John Dewey's pragmatism. *Id.* at 481-85. Nevertheless, I have included autopoiesis and self-reflexive law in the list of writings responding to complexity and the trend towards new forms of governance and regulation because some of the writers share similarities in their emphasis on procedural law over intrusive substantive law. See, e.g., Orts, *supra* note 11, at 1254 (discussing various procedural laws as examples of the application of autopoietic theory); Gunther Teubner, *The Transformation of Law in the Welfare State*, in *Dilemmas*, *supra* note 1, at 3, 7-8.

¹⁶ Many are a mix of normative and positivist, or draw on positive accounts to demonstrate the benefits of this approach and thereby advocate a particular normative view. See, e.g., Slaughter, *supra* note 13, at 27; Dorf & Sabel, *supra* note 1, at 270.

¹⁷ Lobel, *supra* note 1, at 344.

¹⁸ See, e.g., *Law and New Governance in the EU and the US 1* (Grainne de Burca & Joanne Scott eds., 2006) [hereinafter *Law and New Governance*]; Freeman & Farber, *supra* note 1, at 802-03; Karkkainen, *supra* note 3, at 233-37; Orly Lobel, The Paradox of Extralegal Activism: Critical Legal Consciousness and Transformative Politics, [120 Harv. L. Rev. 937, 970 \(2007\)](#). It is the areas of overlap, particularly in their approach to law, that are of interest for this Article.

sources law is striking. Environmental and natural resources lawyers are hearing the call for change from two sides. First, environmental and natural resources lawyers are hearing the call to rethink legal measures for protection from scientists, particularly writers drawing on the ecological approach of ecosystem management.¹⁹ Second, environmental and natural resources lawyers are also hearing the call to rethink legal measures for protection from another side. Writers in a range of legal and nonlegal fields argue that we must rethink our public sphere and traditional approach to administrative law and regulation. As any environmental law student will attest, administrative law and environmental law are heavily intertwined. Any argument about rethinking regulation and governance is necessarily an argument about environmental law. Indeed, many of the writers referred to above draw on examples in the environmental law setting in order to support broader arguments about regulation and governance in other legal contexts.²⁰

Now, several years into this mix of new thinking, a moment has arrived when the critical mass of practitioners and scholars in the environmental law field recognize the need for new approaches and new ideas.²¹ Now is also the time when the ideas of the last decade or two of new institutional thinking have found their way into some institutions for environmental protection. The time has come, then, to explore whether the promise of these new approaches will result in more effective environmental protection, or whether something is missing from the picture. [*1244]

This Article focuses on the relationship between goals and the role of law in these new approaches to governance and protection,²² and considers whether the role of law assumed by these new institutional models is sufficient to achieve a goal of effective long-term environmental protection. It is this Article's hypothesis that long-term environmental protection can only be achieved by these models if we can be sure that all of the values that are at stake in environmental protection will be adequately represented by the procedural mechanisms that these institutions envision.

The Article explores the answer to this question by examining two institutions where new approaches to environmental governance appear to have taken hold, the Chesapeake Bay Program in the United States and the Ramsar Convention on Wetlands of International Importance, an international treaty with over 150 parties.²³ The case studies suggest that the institutional models are missing something that will be necessary if we want to achieve long-term environmental protection. Indeed, even if we strive to achieve goals other than long-term environmental protection, I posit that the new models' emphasis on procedural law over substantive law means that we cannot guarantee the achievement of any one particular goal.

The models, as currently conceived and implemented, resemble trains without tracks, moving forward without a path. To ensure more effective environmental protection, we need to supplement these models with a role for substantive law. This substantive law can provide the tracks for our moving train - in the form of sufficiently specific goals - that can guide us towards more effective long-term environmental protection.

The Article begins, in Part II, with a discussion of ecosystem management, the field that has emerged over the past

¹⁹ See generally Nagle & Ruhl, *supra* note 9, at 302-03; Carl Walters, *Adaptive Management of Renewable Resources* 30 (1986); C.S. Holling, *What Barriers? What Bridges?*, in *Barriers and Bridges to the Renewal of Ecosystems and Institutions* 3 (Lance H. Gunderson, C.S. Holling & Stephen S. Light eds., 1995) [hereinafter *Barriers and Bridges*]; Karkkainen, *supra* note 3, at 235; J.B. Ruhl, *Thinking of Environmental Law as a Complex Adaptive System: How to Clean Up the Environment By Making a Mess of Environmental Law*, *34 Hous. L. Rev.* 933, 999 (1997).

²⁰ Charles Sabel, Archon Fung & Bradley Karkkainen, *Beyond Backyard Environmentalism* 5 (Joshua Cohen & Joel Rogers eds., 2000); Slaughter, *supra* note 13, at 53, 58, 174; Dorf & Sabel, *supra* note 1, at 364-71, 373-88; Joanne Scott & Jane Holder, *Law and the New Environmental Governance in the European Union*, in *Law and New Governance*, *supra* note 18, at 213-24.

²¹ See Freeman & Farber, *supra* note 1, at 804-05 (describing a "moment of maturation in administrative law and environmental law"). "In this moment, traditional forms of action and institutional structures are giving way to a "problem focus" that calls for new arrangements, new strategies, and new capacities." *Id.* at 805.

²² To this end, I focus on the overlap between the theories and approaches, rather than highlighting their differences, although their differences are undoubtedly significant. In particular, the Article focuses on the emphasis these approaches give to law's procedural function over its substantive function in an effort to escape the perceived problems of command-and-control style regulation.

²³ See Chesapeake Bay Program, <http://www.chesapeakebay.net> (last visited Nov. 16, 2008); Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Feb. 2, 1971, T.I.A.S. No. 11,084, 996 U.N.T.S. 245, available at http://untreaty.un.org/English/UNEP/wetlands_english.pdf [hereinafter *Ramsar Convention*]. A list of the Ramsar Convention's member parties is available at <http://www.ramsar.org/key> cp e.htm.

few decades from scientists seeking to ensure more effective environmental protection and management of natural resources. It then briefly addresses the similarities between this work and the work of writers advocating changes in how we govern even beyond the environmental and natural resources law field. Part III discusses the role of goals and law in these two bodies of work, and considers what might be missing from the picture that emerges from both of these bodies of literature. In Part IV, the Article explores two case studies that shed light on this missing piece before proposing, in Part V, how we can move towards filling that gap.

This is the first step in the difficult task of rethinking our institutional models to better respond to ecological complexity. But we still have a long way to go. This Article serves as a warning that not all paths will lead us to more effective environmental protection and that we need to think carefully about the role of law in new institutional design.

Before going further, a few notes on terminology are necessary. Throughout the Article, I refer to environmental law and natural resources law as one field, using the phrase "environmental law." Although the fields of environmental law and natural resources law have been bifurcated for many years and have had a [*1245] different focus and history, the lessons we are to learn from ecologists tell us that we need to rethink this bifurcation.²⁴ Thus, I use the term "environmental law" as shorthand for a body of law that aims to protect all aspects of the environment. Further, the teaching of ecosystem management is, as we shall see, that humans and nature should not be treated as distinct. I recognize the impossibility of complete division between human and nonhuman when viewed from the standpoint of ecologists. For the sake of convenience, however, I use the term "nature" throughout the paper to refer to the nonhuman world.

The work of writers other than those identified with ecosystem management is referred to throughout the Article as the work of the new governance writers. Although some of these writers may not identify themselves as new governance writers, the familiarity of the phrase makes it a useful organizing term to capture a range of writers thinking about institutional design and governance today.

II. New Thinking in Environmental and Natural Resources Law

A. Responding to the Scientists: Ecosystem Management

Writers in the environmental law and natural resources law fields have increasingly highlighted the need to respond to the work of scientists.²⁵ Regardless of whether we think law has historically misunderstood science, or we believe the science itself has changed, most commentators now seem willing to agree with two propositions. First, environmental law must be responsive to ecological insights about the complexity of natural systems. Second, traditional approaches to environmental law appear insufficiently responsive to science, and further, insufficiently flexible even to develop responsiveness to science.

Growing awareness of the work of scientists has increased interest by lawyers in the field of ecosystem management, sometimes also termed adaptive ecosystem management, which was originally the domain of scientists frustrated with policy makers' failure to grasp the complexity of the natural world.²⁶ To understand the basis for the new legal approaches that are being advanced as a result, we need to begin with an understanding of the science that informs both ecosystem management and those legal approaches that follow ecosystem management [*1246] principles. The following section draws on the work of the pioneers of ecosystem management to provide an overview of this scientific basis.²⁷

²⁴ See Richard O. Brooks, Ross Jones & Ross A. Virginia, *Law and Ecology: The Rise of the Ecosystem Regime* 127 (2002).

²⁵ See, e.g., Karkkainen, *supra* note 3. See also Richard J. Lazarus, *The Making of Environmental Law* 18-19 (2004) (noting how important it is that environmental law be sufficiently cognizant of science); J.B. Ruhl, *A Manifesto for the Radical Middle*, 38 *Idaho L. Rev.* 385, 394-98 (2002) (describing ecosystem management's emergence as a guide for environmental policy implementation during the 1990s); Tarlock, *supra* note 9, at 1121, 1123 (arguing that "science, not ethics, is the ultimate source of environmental law's legitimacy given its continuing contingent state and the need to harmonize its objectives with the individualistic Western legal tradition that promoted radically different values from those of environmentalism").

²⁶ R. Edward Grumbine, *What is Ecosystem Management?*, 8 *Conservation Biology* 27, 28-29 (1994); Holling, *supra* note 19, at 6.

²⁷ For the sake of brevity, this section is a simplification of the work of some of the pioneers of ecosystem management.

1. Ecological Foundations of Ecosystem Management

Among the most important things ecosystem management writers emphasized as the field emerged was that any traditional belief that nature was static, harmonious, and balanced was false.²⁸ Rather, ecosystems are far from fixed or static; their boundaries, their substance, and their interrelationships may change over time.²⁹ Even the notion of an ecosystem implies some kind of static boundary that simply does not exist.³⁰

Instead, the natural world is made up of processes and connections in constant flux with no predetermined fixed outcome.³¹ As Holling, one of the founders and leading authorities in the field of ecosystem management, puts it,³² we are dealing with "complex, nonlinear systems where discontinuous behavior and structural change are the norm."³³

Accompanying the insights above is the notion that nature should be viewed as a series of nested systems, moving at different scales of time and space.³⁴ Thus, a meadow will itself be a system, with connections among its inhabitants and physical elements that result in processes occurring within that area and on a short timescale. Meanwhile, systems of global weather patterns may be much larger geographically and temporally slower. Yet, a species living in the meadow may be affected by changes in these global weather patterns, in what amounts to a third system. That species may in turn affect another species within the meadow's system. Within the meadow, there will also be many systems.³⁵ Systems move [*1247] through cycles; systems move at their own scales, "the result is a hierarchy in which each level has its own distinct spatial and temporal attributes."³⁶

This brings us to the third scientific insight with importance for environmental protection, the insight of redundancy and resilience.³⁷ With nature made up of such a complex network of connections, the possibility of disruption by outside elements is clear. The introduction of something new, however small, may have possibly unpredictable, although not necessarily disastrous, effects, which may in turn create other unforeseen effects.³⁸ Such effects may not only be unforeseen, but may also be unforeseeable, simply because of the impossibility of knowing about every con-

²⁸ See generally Daniel Botkin, *Discordant Harmonies: A New Ecology for the Twenty-First Century* 3 (1990); Brooks, Jones & Virginia, *supra* note 24; Walters, *supra* note 19, at 1; Holling, *supra* note 19, at 4; Tarlock, *supra* note 9, at 1122-23.

²⁹ We may also define ecosystems differently at different times, depending on the conservation context. Norman L. Christensen, Jr. & Jerry F. Franklin, *Ecosystem Function and Ecosystem Management*, in *Ecosystem Function and Human Activities: Reconciling Economics and Ecology* 1, 5, 6, 8 (R. David Simpson & Norman L. Christensen, Jr. eds., 1997) [hereinafter *Ecosystem Function and Human Activities*]. "In many ways, it is the lack of hard and fast rules for definition of ecosystems that has made the ecosystem concept useful to ecologists interested in processes such as the movement of water, cycling of carbon, or flux of energy." *Id.* at 5-6.

³⁰ A. Dan Tarlock, *Slouching Toward Eden: The Eco-pragmatic Challenges of Ecosystem Revival*, [87 *Minn. L. Rev.* 1173, 1184-86 \(2003\)](#).

³¹ Holling, *supra* note 19, at 3, 19.

³² Karkkainen, *Panarchy*, *supra* note 9, at 59; Kai N. Lee & Jody Lawrence, *Adaptive Management: Learning from the Columbia River Basin Fish and Wildlife Program*, [16 *Envtl. L.* 431, 442 n.45 \(1986\)](#); J.B. Ruhl, *Regulation by Adaptive Management - Is It Possible?*, [7 *Minn. J. L. Sci. & Tech.* 21, 28 \(2005\)](#).

³³ Holling, *supra* note 19, at 19.

³⁴ *Id.* at 23.

³⁵ Holling describes four different stages through which natural systems move: exploitation, conservation, release, and reorganization. *Id.* at 22. Thus, protection decisions - for example, a decision as to the number of individuals of a species that can be harvested without causing extinction - must be made with reference to the actual context. What may be a sufficient threshold for a species in one area may not be sufficient for the same species in another area that has different threats. Further, the effects of actions may differ depending on the stage a system is in. See generally *Conservation of Exploited Species* (John D. Reynolds et al. eds., 2001) (providing several examples of the kind of factors that can contribute to the viability of a species).

³⁶ Holling, *supra* note 19, at 23.

³⁷ See Christensen & Franklin, *supra* note 29, at 10-11; see Kai N. Lee, *Compass and Gyroscope: Integrating Science and Politics for the Environment* 58, 63, 101-02 (1993).

³⁸ See Christensen & Franklin, *supra* note 29, at 10-11, 14-15.

nection.³⁹ We may know how some things are connected to other things but we cannot know how everything is connected to everything else. Nature, as has been remarked, is "not only more complex than we think. It is more complex than we can think."⁴⁰

Alternatively, however, the introduction of something new to a natural system may produce no effect, due to the redundancy and resilience of that system.⁴¹ Although everything may be connected to something else, not every activity may be crucial to the maintenance of an ecosystem's integrity. These noncrucial activities can be considered redundant.⁴² Natural systems have redundancy of varying degrees, which gives them resilience.⁴³ An ecosystem suffering from a number of declines in species will gradually lose resilience, even if some of the connections those species have are redundant for some purposes.⁴⁴

Such redundancy, however, also makes understanding the relative resilience of an ecosystem very difficult; even if scientists are able to determine that a process will be disrupted by a certain pollutant, for example, they may not know whether the disruption of that process will significantly affect the system's integrity. Which species or process is key is difficult to determine.⁴⁵

[*1248] The causes leading to extinction and general ecosystem degradation are broadly understood. These causes have even been reduced to a handy acronym, HIPPO: habitat destruction, invasive species, pollution, population, and overharvesting.⁴⁶ Yet, although we have a broad understanding of the causes of species decline and extinction, it is difficult to determine how these causes operate in practice on individual species. All of the causes of species loss and ecosystem degradation may operate as direct threats against an individual species or they may operate as more indirect threats by affecting another element in the ecosystem on which a species is dependent. It appears that there are "countless ways that variations of the HIPPO forces join to weaken and extinguish biological diversity."⁴⁷ Each case of species endangerment "is a result of the unique characteristics of the threatened species and the particular corner into which human activity has pushed it."⁴⁸

³⁹ See id. at 14-15.

⁴⁰ Id. at 6-8 (quoting F.E. Egler, Pesticides in our Ecosystem, 52 Am. Scientist 110, 120 (1964)).

⁴¹ See id. at 10-11.

⁴² It is important to recognize that it is not so much an individual species that will be redundant, but a connection or process, in which one or more species may play a part. That same species whose survival appears noncrucial for the survival of one species with which it is connected may also have a crucial connection with another species.

⁴³ For example, humans do not need two kidneys to survive; one of them is redundant. Nevertheless, that redundancy is an important safeguard should one of the kidneys fail. A human with only one kidney has less resilience to an illness affecting that one remaining kidney.

⁴⁴ See Christensen & Franklin, *supra* note 29, at 10-11.

⁴⁵ Of course, the disruption of too many processes is bound ultimately to result in significant change in an ecosystem. See id. at 13; see also Kevin J. Gaston, Extinction, in 1 Encyclopedia of Evolution 345 (Mark Pagel ed., 2002) (describing "extinction cascades," where one extinction can lead to more extinctions, in turn leading to even more extinctions). The role of redundancy and resilience and the importance of connections in this world of nested systems are demonstrated by Holling's explanation of how the hierarchical nature of this complex of systems can be bottom-up as well as top-down. Holling, *supra* note 19, at 24-25. Larger, slower levels of operation more often than not set the constraints within which smaller, faster levels operate. Importantly, it is not just activities external to a system that disrupt or cause shifts in that system. Internal levels, even smaller ones, can sometimes disrupt or cause shifts in other levels. This is most likely to happen at certain critical times in the cycle of the affected system, times when that system is either over-connected, and therefore brittle, or when the system is at a stage of reorganization, and is therefore underconnected. When a system is over-connected and brittle, it will have developed such tight competitive relations that resilience is significantly decreased. The system becomes "an accident waiting to happen." Id. In the second scenario, a system may also be vulnerable when it is at a stage of reorganization and is, as a result, under connected. A system in the process of reorganization will have many openings for previously unconnected species, including exotic species, to become established. Id.

⁴⁶ E.O. Wilson, The Future of Life 50 (2002). Of these the prime mover is human population growth. Id.; see also Species Survival Comm'n, 2004 IUCN Red List of Threatened Species: A Global Species Assessment 46 [hereinafter IUCN Species Survival Comm'n] (Jonathan E.M. Baillie, Craig Hilton-Taylor & Simon N. Stuart eds., 2004) (describing the threats to species as primarily involving alien species, habitat loss and/or degradation, and overexploitation).

⁴⁷ Wilson, *supra* note 46, at 51.

⁴⁸ Id.

Thus, it is not just that one pollutant may kill off a particular species that it poisons. A species may be simultaneously affected by one or more pollutants originating from near or far, habitat loss, and the decline of a species on which it feeds. The connections among threats are myriad and cause-and-effect often untraceable.⁴⁹

2. The Impact of the Science on Institutional Design

If we are to be able to protect this complex world, we have to recognize that complexity as we design the institutions we put in place to achieve that protection. Efforts to protect nature must take account of its multiple scales of activity in time and space and its constant evolutionary flux. Efforts to protect must also recognize that an ecosystem is a complex web of connections. They [*1249] must, therefore, protect both the individual with its role in the ecosystem and the resilience of the whole ecosystem, all somehow without undermining the evolutionary flux that would operate given no interference. The whole must inform decisions about the individual and the individual must inform decisions about the whole.⁵⁰ Given such complexity, we cannot know enough to make a set of one-shot decisions regarding individual species and expect such decisions to ensure the survival of that species.⁵¹

Historically, environmental law has failed these standards.⁵² The traditional belief by lawyers in the balance of nature has led to laws that focused on individual species and setting aside sites of habitat without more.⁵³ Protection activities were seen as one-shot deals, with no sense of a need to revisit a protection decision to determine its effectiveness.⁵⁴ Laws also focused on individual media - air, water, and land - all of which were separate from species conservation with a small exception for habitat.⁵⁵

Yet if we adapt the lessons of ecology described above for the purposes of environmental law, laws that focus on one medium, such as air, water, land, or individual species, will not adequately take account of the multiple connections.⁵⁶ Laws that attempt to determine standards that are uniform across a wide geographic scale will be inadequate because they will fail to take account of local context.⁵⁷ Conversely, laws that are set at the local level, keenly

⁴⁹ See Georgina M. Mace & Russell Lande, *Assessing Extinction Threats: Toward a Reevaluation of IUCN Threatened Species Categories*, 5 *Conservation Biology* 148, 151 (1991). "Extinction factors may also have cumulative or synergistic effects; for example, the hunting of a species may not have been a problem before the population was fragmented by habitat loss. In every case, therefore, all the various extinction factors and their interactions need to be considered." *Id.* In its chart of causes of extinction for birds, the International Union for Conservation of Nature (IUCN) lists a number of between 20 and 30 extinctions of bird species as caused by "unknown" factors. IUCN Species Survival Comm'n, *supra* note 46, at 46 fig.3.3.

⁵⁰ Reed F. Noss, Michael A. O'Connell & Dennis D. Murphy, *The Science of Conservation Planning: Habitat Conservation Under the Endangered Species Act 14-15* (1997) (arguing that ecosystem conservation (i.e., habitat-based conservation) and species conservation are complimentary and must be reconciled); see also Christensen & Franklin, *supra* note 29, at 3-4.

⁵¹ Noss, O'Connell & Murphy, *supra* note 50 at 17, annot. box 1.2 (noting that the problem with species conservation as practiced is not that it considers the needs of a species, but that it "fails to prioritize species sensibly and that it considers each species one by one").

⁵² Commentators often suggest that the lack of understanding lay originally with the ecologists. See, e.g., Botkin, *supra* note 28, at 160-62; Brooks, Jones & Virginia, *supra* note 24, at 133; Tarlock, *supra* note 9, at 1121. However, the picture may be more complex, related not only to what ecologists believed but to the "power of paradigms." Fred P. Bosselman & Dan A. Tarlock, *The Influence of Ecological Science on American Law: An Introduction*, 69 *Chi.-Kent L. Rev.* 847, 861-62 (1994); see Bryan Norton, *Change, Constancy, and Creativity: The New Ecology and Some Old Problems*, 7 *Duke Env'tl. L. & Pol'y F.* 49, 58 (1996) (arguing that Aldo Leopold had identified the problem in the middle of the century, but lawyers simply did not know how to deal with it). See also Julianne Lutz Newton, *Aldo Leopold's Odyssey: Rediscovering the Author of a Sand County Almanac 177-80* (2006); Grumbine, *supra* note 26, at 28 (discussing the historical origins of ecosystem management). Regardless of your view of the scientific history, however, lawyers seem to have treated nature as static.

⁵³ Karkkainen, *supra* note 3, at 204.

⁵⁴ See *id.* at 200-01. See also Bradley C. Karkkainen, *Toward a Smarter NEPA: Monitoring and Managing Government's Environmental Performance*, 102 *Colum. L. Rev.* 903 (2002) [hereinafter Karkkainen, *Smarter NEPA*].

⁵⁵ See Karkkainen, *supra* note 3, at 204.

⁵⁶ This problem is evident in the United States Supreme Court's recent decision, [National Ass'n of Home Builders v. Defenders of Wildlife](#), 127 *S. Ct.* 2518 (2007). The Court upheld a transfer of authority from the Fish and Wildlife Service to state authorities over water discharge permits despite possible indirect harm to fish. See *id.* at 2527, 2534.

⁵⁷ Karkkainen, *supra* note 3, at 206.

attuned to local context, will be insufficiently responsive to broader scales.⁵⁸ Further, because of the lack of [*1250] information available, laws must be capable of being changed quickly in response to new information.⁵⁹ They cannot be made and then forgotten.⁶⁰ And to ensure full information, the sources of information must be expanded, allowing local knowledge to expand our ability to foresee apparently unforeseeable consequences.⁶¹

To respond to ecology, then, our protection measures must be responsive and adaptive, generate information and respond to information, and must be established with multiple scales of focus - nested scales that do not operate hierarchically, but in a complementary fashion.⁶²

Ecosystem management is the discipline that has led the call for change.⁶³ The term "ecosystem management" has no one, fixed definition, and has come to mean many things to many people.⁶⁴ Yet, despite the possibility for multiple definitions and approaches,⁶⁵ some key features appear throughout the ecosystem literature,⁶⁶ described here and listed in Figure 1. These features are critical to institutional design questions.

At the core of ecosystem management approaches is the recognition of complexity, constant change, and lack of knowledge discussed above.⁶⁷ Thus, management of ecosystems and natural resources must be adaptive and allow for experimentation and learning that can then trigger adaptation.⁶⁸ Institutions for protection must be capable of adapting, must provide mechanisms for constant monitoring and evaluation of progress against benchmarks, and they must be able to cope with surprise because of the inevitable uncertainty involved.⁶⁹ Both the benchmarks and the means of achieving them, therefore, must be subject to such re-evaluation and monitoring, since either might warrant change if, for example, new information indicates that one species is more affected by a pollutant than anticipated or has experienced an internal event that affects its viability.

[*1251] With all this comes an emphasis on more science and more information as the foundational element for policy and law.⁷⁰ That science must be adaptive and recognize its limitations.⁷¹ It must also focus on the connections among species rather than on isolated individual species. As Carl Walters, an early writer in the field, said, sci-

⁵⁸ See *id.* at 222.

⁵⁹ *Id.* at 201.

⁶⁰ See *id.* at 201, 204.

⁶¹ See, e.g., Walters, *supra* note 19, at 49-50. Walters describes the process of determining the environmental impacts of a large hydroelectric dam. *Id.* After a comment, the participants included in their studies the effects of camp cooks and tourists who might increase fishing pressure as a result of the dam building. *Id.* "It did not take long to realize that we were talking about fisheries and wildlife 'impacts' that were likely (if uncontrolled) to be at least an order of magnitude larger than total direct impacts in the actual development area, where most of the monitoring and research had been concentrated!" *Id.* at 50.

⁶² See Hari M. Osofsky, *The Geography of Climate Change Litigation Part II: Narratives of Massachusetts v EPA*, 8 *Chi. J. Int'l L.* 573, 608-10 (2008) (describing the different ways in which the multiple scales implicated by climate change and climate change litigation can be viewed as part of a narrative of international law).

⁶³ See Karkkainen, *supra* note 3, at 193.

⁶⁴ See Grumbine, *supra* note 26, at 29; Tomas M. Koontz & Jennifer Bodine, *Implementing Ecosystem Management in Public Agencies: Lessons from the U.S. Bureau of Land Management and the Forest Service*, 22 *Conservation Biology* 60, 61 (2008); Steven L. Yaffee, *Three Faces of Ecosystem Management*, 13 *Conservation Biology* 713, 714 (1999).

⁶⁵ See Yaffee, *supra* note 64, at 714.

⁶⁶ *Id.*; Koontz & Bodine, *supra* note 64, at 61; Grumbine, *supra* note 26, at 29.

⁶⁷ See Karkkainen, *supra* note 3, at 193.

⁶⁸ C.S. Holling et al., *Adaptive Environmental Assessment and Management* 8-9 (C.S. Holling ed., 1978); Christensen & Franklin, *supra* note 29, at 16; Grumbine, *supra* note 26, at 31.

⁶⁹ Christensen & Franklin, *supra* note 29, at 15-17, 21; Karkkainen, *supra* note 3, at 201-03.

⁷⁰ See Noss, O'Connell & Murphy, *supra* note 50; Grumbine, *supra* note 26, at 31 (listing "Data Collection" as the fourth of ten dominant themes of ecosystem management); Karkkainen, *supra* note 3, at 202 ("Ecosystem management requires more research and data collection (i.e., habitat inventory/classification, disturbance regime dynamics, baseline species and population assessment) as well as better management and use of existing data."). See also Int'l Steering Comm., *International Mechanism of Scientific Expertise on Biodiversity*, Statement from the IMoSEB Consultation International Steering Committee (2007), available at

entists seeking to understand and protect nature must work by "looking outward" and consider the way in which a species interacts with its surroundings, living and nonliving, rather than simply studying the life cycle of the species isolated from its surroundings.⁷²

In recognition of the nested systems of nature discussed above, ecosystem management authors stress the need for nested scales of management in terms of both time and space.⁷³ Thus, spatially, instead of looking only at the broad watershed level or only the level of an individual species, managers - like the scientists - must take into account the broad watershed and the individual species and every level in between and beyond.⁷⁴

Temporally, managers must pay attention to both short-term projections, medium-term projections, and long-term projections, so that, for example, events that may occur only every thirty to sixty years⁷⁵ and events that occur every year are all factored into decisions.⁷⁶ This approach to various scales of management is described as a nested scales of management approach in recognition that each level informs the other and feeds into it, even as it has significance alone, and that information flows both from the top to the bottom and from the bottom to the top.⁷⁷

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Figure 1: Central Tenets of Ecosystem Management

Adaptive Management:

- >Monitoring;
- >Operational goals, or benchmarks;
- >Reevaluation of goals and means in response to new learning;
- >Ability to cope with surprise.

Foundations in Good Science:

- >Adaptive Science;
- >Recognition of the limits of science;
- >Focus on connections;
- >Nested scales of management;
- >Spatially: Ecosystem level and individual species level focus and everything in between;

<http://www.imoseb.net/content/download/1416/7158/version/2/file/IMoSEB+ISC+Final+Statement+En.pdf> (proposing a panel to study biodiversity and threats to biodiversity, similar to the Intergovernmental Panel on Climate Change).

⁷¹ See Karkkainen, Panarchy, supra note 9, at 69-71 (describing different ways to approach adaptive management, actively or passively).

⁷² Walters, supra note 19, at 53-54.

⁷³ Christensen & Franklin, supra note 29, at 16-19. See also Grumbine, supra note 26, at 29-31.

⁷⁴ See Brooks, Jones & Virginia, supra note 24; Christensen & Franklin, supra note 29, at 17-18; Grumbine, supra note 26, at 29-30; Karkkainen, supra note 3, at 206, 217-22.

⁷⁵ Gordon L. Baskerville, The Forestry Problem: Adaptive Lurches of Renewal, in Barriers and Bridges, supra note 19, at 46 (describing the frequency of budworm outbreaks).

⁷⁶ Holling et al., supra note 68, at 150-52 (describing the need for both a 100-150 year time horizon and a 1 year time resolution in order to fully study the effect of budworm outbreaks on spruce forests in North America that arise between 30-45 years apart, or 60-100 years apart).

⁷⁷ Karkkainen, supra note 3, at 222-25.

>Temporally: Short-term, medium-term, and long-term focus.

Humans as Part of the Ecosystem "Ecosystem Components:"⁷⁸

>Recognition of human impacts on all parts of the environment;

>Collaborative decision making with multiple stakeholders:

>to allow for broad >participation;

>to facilitate learning about human influences, both known and unforeseen; and

>to provide a forum for determining the best policy and the values society seeks to enhance.

Finally, and importantly, ecosystem management authors stress the absolute need to recognize that humans are part of the ecosystem; they are "ecosystem components."⁷⁹ This is more than a conceptual point. The significance of human influence on nature means that policies to protect that nature must recognize the impact of social and economic forces.⁸⁰ The recognition is key because it allows us to recognize and anticipate the myriad ways in which human activity affects nature indirectly as well as directly. Thus, ecosystem management approaches stress the need for collaborative decision making by multiple stakeholders to allow broad [*1253] participation, facilitate learning about these human factors, and provide a forum for determining the best policy and the values that society seeks to enhance.

Taking our cue from the understanding of ecology referred to briefly above, this institutional model and the attributes that form part of the core of ecosystem management are important if we are to develop institutions that can respond to scientific complexity. Policies for conservation will be ineffective if they are not based on science or if they are based on science that is too limited in its focus or is outdated.⁸¹ Thus, a strong foundation in science and adaptability are key. Further, the need for multiple scales of focus in time and geographical space is necessary to address the multiple scales of activity in the nonhuman world.

In addition, an important aspect of ecosystem management includes the need to look at human activity even when working in areas relatively unaffected by humans. It ensures that policies do not fail due to unanticipated human activity,⁸² and that where human activity can be changed to effect conservation, such changes are made.

We are left with a strong sense of the need for adaptive strategies, nested scales of governance, and the recognition that humans play a significant role in their ecosystems.⁸³ Implementation of these insights now becomes our biggest hurdle.⁸⁴

⁷⁸ Christensen & Franklin, *supra* note 29, at 17 tbl.1-4.

⁷⁹ *Id.*; see also Grumbine, *supra* note 26, at 31; R. Edward Grumbine, Reflections on "What is Ecosystem Management?," 11 *Conservation Biology* 41, 45 (1997) [hereinafter Grumbine, Reflections on "What is Ecosystem Management?"]; Stephen S. Light, Lance H. Gunderson & C.S. Holling, *The Everglades: Evolution of Management in a Turbulent Ecosystem*, in *Barriers and Bridges*, *supra* note 19, at 103, 151-54.

⁸⁰ Holling, *supra* note 19, at 4; Grumbine, *supra* note 26, at 31.

⁸¹ See Lazarus, *supra* note 25.

⁸² See Walters, *supra* note 19, at 49-50.

⁸³ While there is still debate within the scientific community about ecosystem management and its appropriateness, resource managers appear to be moving forward with various forms of ecosystem management approaches in spite of the debate, although they may emphasize those aspects that are easier to implement over those that are harder. See Koontz & Bodine, *supra* note 64, at 61-62.

⁸⁴ Simply acknowledging the complexity of nature and accepting a call for more ecosystem management is not enough. As both Bradley Karkkainen and J.B. Ruhl, leaders in the field, attest, saying we need ecosystem management will only take us so far. See Karkkainen, *Panarchy*, *supra* note 9, at 61 (arguing that while the need for ecosystem management is widely accepted, present efforts are failing to adopt effective reform); see also Ruhl, *supra* note 32, at 57 ("It will be essential ... for advocates of adaptive management to move beyond defining the need for and basic approach of adaptive management and begin working directly and aggressively with the institutional design questions.").

B. Lessons from New Governance Writers

Scientists and environmental lawyers are not the only people who have been working on institutional design to tackle complex problems. In recent years, a body of work has emerged that both advocates and describes shifts in regulatory patterns away from so-called command-and-control, centralized approaches to regulation, to more flexible, less hierarchical approaches, with a strong emphasis on collaboration and a mix of private and public actors.

Although this body of work comes from political scientists and lawyers, rather than from physical scientists, the theme of needing to rethink institutions to manage complexity is pervasive, and many writers draw on examples in the environmental setting to reinforce their perspectives on the kind of regulatory approach that is appropriate in today's modern world.⁸⁵ Indeed, some of the most interesting work emanates from writers drawing on both fields, spanning the divide and identifying [*1254] the synergies between the two.⁸⁶ It is no accident that the institution chosen as one of the case studies for this Article, the Chesapeake Bay Program, has appeared in the work of different writers as both an exemplar for ecosystem management⁸⁷ and as an exemplar for collaborative governance⁸⁸ and a new deliberative form of participatory democracy.⁸⁹

These approaches vary in detail and this Article is not intended as a typology of new approaches to regulation and governance. However, certain similarities emerge between the work of writers who can be broadly classified as part of new governance thinking and ecosystem management. To the extent that this work is influencing the field of environmental law, it is worth highlighting these similarities.

In the pragmatist tradition of John Dewey, Michael Dorf and Charles Sabel have written about the need for a constitution of "Democratic Experimentalism," which would structure regulatory systems that allow for constant feedback and learning, as well as measurement against benchmarks, with an understanding that ends will constantly need to be reevaluated in response to experimentation at the implementation level.⁹⁰ What is envisioned is a constant re-assessment and re-adjustment of ends and means through continual feedback loops.⁹¹

This kind of experimentation obviously has a lot in common with the experimentation that would form part of an adaptive environmental policy. If environmental policy is to be responsive to new information, it must actively seek out new information.

Experimentation and learning are also key features of the new governance model that has arisen out of Dorf and Sabel's seminal article.⁹² There are two aspects to this. First, coming directly from John Dewey's pragmatism is the notion of learning by doing and the view that setting goals in the abstract without any responsiveness to the possibilities and effectiveness of implementation results in irrelevance for the law.⁹³

The second aspect is an important one even beyond the strict confines of "new governance" writers. Here, the notion of learning expands - as it does for the scientists - to the idea that collaboration can and will generate more and

⁸⁵ See Dorf & Sabel, *supra* note 1, at 356; see also Sabel, Fung & Karkkainen, *supra* note 20, at 1; Slaughter, *supra* note 13, at 38-39; Scott & Holder, *supra* note 20, at 211.

⁸⁶ See especially the work of Bradley Karkkainen. Karkkainen, *supra* note 3; Karkkainen, *Panarchy*, *supra* note 9; Karkkainen, *Bounded Pragmatism*, *supra* note 9; Karkkainen, *Smarter NEPA*, *supra* note 54; see also Scott & Holder, *supra* note 20, at 212.

⁸⁷ Robert Costanza & Jack Greer, *The Chesapeake Bay and Its Watershed: A Model for Sustainable Ecosystem Management?*, in *Barriers and Bridges*, *supra* note 19, at 169; see generally *Ecosystem Function and Human Activities*, *supra* note 29.

⁸⁸ Cannon, *Checking in*, *supra* note 8, at 1131; Cannon, *Choices*, *supra* note 8, at 394; Andrea K. Gerlak & Tanya Heikkila, *Comparing Collaborative Mechanisms in Large-Scale Ecosystem Governance*, 46 *Nat. Resources J.* 657, 659 (2006); Karkkainen, *supra* note 3, at 210, 217-18.

⁸⁹ Sabel, Fung & Karkkainen, *supra* note 20, at 8.

⁹⁰ Dorf & Sabel, *supra* note 1, at 284-89.

⁹¹ *Id.* The work of Dorf and Sabel has sparked the term "new governance" and much research and writing adopts and pursues many of the central lessons of Dorf and Sabel's model. See generally *id.* at 267 (introducing Dorf & Sabel's collaborative governance model).

⁹² *Id.*

⁹³ *Id.* at 284-89.

sometimes better information and that participation of multiple stakeholders is key. In addition [*1255] to the participation of stakeholders, though, the idea goes further, giving rise to discussion among many writers of the notion of collaborative governance.⁹⁴

Thus, Anne-Marie Slaughter, in her broad review of a new world order, writes of the multiple benefits that can arise from the collaboration of agencies, judges, and legislators across borders.⁹⁵ In the context of global collaboration and cooperation, Slaughter writes that "government networks that were consciously constituted as mechanisms of global governance could also acknowledge the power of discussion and argument in helping generate high-quality solutions to complex problems."⁹⁶

Scott and Holder commend the learning that results from the cooperation and collaboration process under the European Union's Water Framework Directive.⁹⁷ Tellingly, this kind of collaboration can lead to better information and also lead to avenues for cooperation on outcomes. Similarly, as Freeman and Farber write, in presenting a proposal for a modular approach to environmental regulation, when farmers wanting water for irrigation and those concerned about sufficient water for fish protection actually sat at the table together to discuss resolutions, they determined that "they didn't all need the same amount of water all the time."⁹⁸ Here, learning led to cooperation.⁹⁹ All of this emphasis echoes the emphasis ecosystem management writers place on collaboration in part because of its contribution to the pool of information.¹⁰⁰

This model has implications beyond simply an acknowledgement of the need to generate information for learning. With an emphasis on learning comes also an emphasis on flexibility. For learning to be effective, institutions - whether legal, political, or scientific - must be able to adapt to the new knowledge that learning provides.¹⁰¹ And to be adaptive, institutions must be flexible.

III. The Role of Law and Environmental Protection Goals in New Approaches

As models for more effective governance, these theories seem sensible. When we draw on the recognition of the complexity of nature, in particular, the need for adaptive management and responsiveness to science should be fairly uncontroversial.¹⁰² Yet before we jump fully committed into the water of designing flexible, adaptive institutions, we should reflect for a moment.

[*1256] First, what place does law have in the models described above? To the extent that law has a role, it is almost entirely procedural. Part of the approach of cooperation and collaboration is the notion of a certain degree of flexibility in the substance of goals or laws. To structure collaboration, what are needed are procedural rules rather than substantive rules.¹⁰³ Although some writers recognize the need for a substantive legal framework that will serve as a guide post for the flexible mix of activity below, even these writers argue that the need is as much for politics

⁹⁴ Cannon, *Checking in*, supra note 8, at 1132; Cannon, *Choices*, supra note 8, at 398-99; Freeman, supra note 8, at 27; Karkkainen, supra note 3, at 218-21.

⁹⁵ Slaughter, supra note 13, at 1.

⁹⁶ *Id.* at 27.

⁹⁷ Scott & Holder, supra note 20, at 224.

⁹⁸ Freeman & Farber, supra note 1, at 849 (quoting Mary Nichols, Chairman of California Air Resources Board).

⁹⁹ Dorf and Sabel similarly regard cooperation and collaboration as keys to information gathering and exchange. See Dorf & Sabel, supra note 1, at 304.

¹⁰⁰ See Walters, supra note 19, at 49; see also Grumbine, supra note 26, at 31 (listing "Interagency Cooperation" as one of the ten dominant themes of ecosystem management, defined as "cooperation between federal, state, and local management agencies as well as private parties").

¹⁰¹ See Karkkainen, supra note 3, at 236-37.

¹⁰² J.B. Ruhl, *Taking Adaptive Management Seriously: A Case Study of the Endangered Species Act*, [52 U. Kan. L. Rev. 1249, 1249-50 \(2004\)](#) (describing ecosystem management as having "swept through" natural resources management policy in the 1990s "to become the dominant model of regulatory practice").

¹⁰³ See Karkkainen, supra note 3, at 236-37.

as the law.¹⁰⁴ And to ensure that information will flow in both directions and that learning can result in shifts in goals, what are needed are procedural rules about information exchange, reporting, and a lack of fixed substantive goals. Flexibility is key, for example, to Freeman and Farber's modularity and to the approach of collaborative governance.¹⁰⁵

Under these new models, the role of law, to the extent it is explicitly discussed, is supposed to respond to complexity, not be complex itself.¹⁰⁶ Laws are supposed to allow for the bottom-up surge of ideas and for the people to participate, but not themselves to be a distinct, controlling, top-down imposed set of substantive rules.¹⁰⁷ To the extent that substantive rules are developed, they are supposed to be responsive and changeable when the processes lead to a better understanding of what will be effective, achievable, and appropriate.¹⁰⁸ Thus, from the side of new governance writers, the role of law in environmental protection measures is changing.

With this change in the role of law, the source of the goals is also changing. Although some writers do not resist substantive goals, the role of these goals is very different from the role substantive goals would have played in older regulatory models. Older models of environmental protection proposed standard setting at the highest levels of government, with implementation at the lower levels. This approach is neatly captured in the increasingly pejorative phrase, "command and control."

Our newer models take us away from this idea to a less hierarchical model of goal setting. Indeed, both ecosystem management writers and new governance writers are focused on the idea that it is collaboration and participation that will lead to a determination of the goals. While goals are central to ecosystem [*1257] management, in the sense that goals are now added to what would otherwise be a goal-less discipline within science, they are not to be set by some higher legal authority.¹⁰⁹ For Dorf and Sabel, similarly, the ability to learn by doing will in turn feed into the ability to adjust the ends sought according to what has been learned about the means.¹¹⁰ For ecosystem management writers, a closer alignment of law and policy with science suggests that it is scientists - or resource managers - that

¹⁰⁴ See Freeman & Farber, *supra* note 1, at 802-03. See also J.B. Ruhl, *The Pardy-Ruhl Dialogue on Ecosystem Management, Part IV: Narrowing and Sharpening the Questions*, [24 *Pace Env'tl. L. Rev.* 25, 28 \(2007\)](#) (arguing that ecosystem management is "to be practiced within a set of criteria established through authorizing statutes and regulations"). Despite Ruhl's apparent recognition of the need for statutory criteria, he goes on to observe that many "EM advocates" incorporate "adaptive management" techniques as the "general rules" of policy implementation, because of the complexity of problems and "their resistance to command-and-control rules." *Id.* Thus, Ruhl's position on the role of legal goals is unclear and his general preference appears to be for nonlegal goals, coming from ecosystem management, to dominate. *Id.*

¹⁰⁵ Freeman & Farber, *supra* note 1, at 835.

¹⁰⁶ The procedural rules may be somewhat complex, but the substance of the law should not be on this view.

¹⁰⁷ See Ruhl, *supra* note 104, at 28-29.

¹⁰⁸ See generally Dorf & Sabel, *supra* note 1, at 286-88 (analyzing the adaptable nature of decentralized governing structures).

¹⁰⁹ Grumbine and other ecosystem management writers recognize that the goals are not scientific, but are political and laden with values. See Grumbine, *Reflections on "What is Ecosystem Management?"*, *supra* note 79, at 46. Nevertheless, their focus appears to be on the generation of goals by those working in ecosystem management and through the processes of collaboration and adaptive management that are central to ecosystem management. For example, Grumbine writes:

As managers learn to accept the role of human values explicitly, the success of ecosystem management will become more likely... . There is a large gap in American environmental values between what sustaining ecosystems requires and what people desire. Burch's second "law" suggests that managers have a role in helping the public to understand that resource management is as much about negotiating what people want from nature as it is about how to cut trees and stock fisheries. Managers cannot change the biological basis of sustainability, but they can influence human behavior to some as yet unknown degree. *Id.* See also Nagle & Ruhl, *supra* note 9, at 335-41 (suggesting the role of ecosystem management is to provide the goods that law would implement, but the goal of achieving ecological integrity would be set by better valuing ecosystem services); Christensen & Franklin, *supra* note 29, at 17 ("Because setting operational goals requires reconciling conflicts among segments of society that may have competing interests in the behavior of ecosystems, operational goals will likely not be set based on some overall vision for the optimal function of an ecosystem.").

¹¹⁰ See Dorf & Sabel, *supra* note 1, at 286-88.

will, after experimentation and broad collaboration, determine what the goals will be.¹¹¹

In part, this can be seen as a response to the difficulty of trying to regulate in a pluralistic society. The debate about procedural versus substantive law is not a new one either in environmental law circles or other areas of law.¹¹² Imposing rules from above leads to concerns about antidemocratic imposition of values on groups that may not share those values. Yet these writers are not backing away entirely from goals. Within the work, the assumption is that a better society - or better environmental outcome - will be achieved by these institutional models. The following section discusses the approach each of the bodies of work has to goals, before discussing the problem with this approach.

A. Goals in Ecosystem Management and New Governance Writing

Scientists in the field of ecosystem management certainly do not reject the role of goals to drive their work. Indeed, the existence of explicit goals is what sets [*1258] ecosystem management apart from other scientific management protocols or schemes.¹¹³ Yet the goals that result are interesting.

It all starts with the key to the modern understanding of ecosystems elaborated above: the understanding that humans are part of the ecosystem.¹¹⁴ This recognition is critical in so far as it may allow us to see ourselves as dependent on what has traditionally been perceived as separate and other to us - nature. This better allows us to manage human activity where it threatens ecosystem integrity. This recognition also allows those who work in the field to take account of social and economic factors in determining what will be possible, effective, and even desirable, a key aspect of ecosystem management.

As a result, we cannot set a goal that involves isolating nature from humans: humans are part of nature and sometimes integral to keeping nature the way we imagine it should be.¹¹⁵ Instead, ecosystem management writers generally adopt a goal of "maintaining ecological integrity," or of "sustaining ecological integrity."¹¹⁶ The goal of management becomes "not to keep things as they are, or to constrain ecosystems within historical bounds, but rather to retain the capability of the ecosystem to adapt."¹¹⁷

Some lawyers and policy makers have pointed out the danger that this kind of goal will not allow us to distinguish be-

¹¹¹ See *supra* note 109 and accompanying text. See also Christensen & Franklin, *supra* note 29, at 15-17. This is not because the ecosystem management writers think that the goals are scientific. It is simply because the very foundation of the field is about allowing goals to permeate resource management decisions by resource managers on the ground. Grumbine, *Reflections on "What is Ecosystem Management?"*, *supra* note 79, at 46.

¹¹² See, e.g., Laurence H. Tribe, *The Puzzling Persistence of Process-Based Constitutional Theories*, 89 *Yale L.J.* 1063 (1979-1980).

¹¹³ Nagle & Ruhl, *supra* note 9, at 335; Norman L. Christensen et al., *The Report of the Ecological Society of America Committee on the Scientific Basis for Ecosystem Management*, 6 *Ecological Applications* 665, 668-69 (1996).

¹¹⁴ See *supra* notes 78-80 and accompanying text.

¹¹⁵ See generally Daniel B. Botkin, *Adjusting Law to Nature's Discordant Harmonies*, 7 *Duke Env'tl. L. & Pol'y F.* 25, 29-31 (1996) ("Often what we really admire and appreciate about Nature, and think of as natural, has been heavily influenced by human beings.").

¹¹⁶ Christensen & Franklin, *supra* note 29, at 7 tbl.1-2; Grumbine, *supra* note 26, at 31. Not all ecosystem management writers adopt this goal. See Yaffee, *supra* note 64, at 714-15 (discussing the different ways of approaching ecosystem management). Indeed, some have adopted an approach to goals that is more reminiscent of the approach of the "new governance" writers. *Id.* at 715 (describing the approach of the Keystone Center as defining ecosystem management as "simply a process of collaborative decision making in which goals emerge that are appropriate to the situation at hand"); see also The Keystone Center, *The Keystone National Policy Dialogue on Ecosystem Management: Final Report 6* (1996) (listing the five main goals of ecosystem management).

¹¹⁷ R. David Simpson & Norman L. Christensen, Jr., *Preface to Ecosystem Function and Human Activities*, *supra* note 29, at xiii (discussing Bartell's description of the shift in models of nature from an equilibrium model to a dynamic model (Steven M. Bartell, *Ecological Risk Assessment and Ecosystem Valuation*, in *Ecosystem Function and Human Activities*, *supra* note 29, at 45)) (emphasis added).

tween human activity and nature, and will therefore place no limits on what we do to the natural world.¹¹⁸ The difficulty arises [*1259] because as soon as we see humans as part of the ecosystem, ecosystem integrity and ecological integrity surely include humans. Under this view, all human activity could be seen as part of evolutionary change and as such unobjectionable.

This concern is somewhat overstated. It is clear that some human actions will affect the ability of ecosystems to adapt and survive and that not all change is equal.¹¹⁹ The current rate of extinction, for example, has been estimated to be as much as 1000 to 10,000 times the background rate of extinction "before human beings began to exert a significant pressure on the environment."¹²⁰ Climate change offers another example of the kind of unprecedented, human-induced change with potentially catastrophic consequences.

Thus, the goal of maintaining ecological integrity might mean restricting human action that is "overly harmful." To achieve this, we would have to know what will be "overly harmful." It seems that key to achieving this goal will be better information and more scientific study.¹²¹ This will allow us to better understand the interactions, resilience, and redundancy of any given system. Further, we need to ensure that information is shared and that management activity is adaptive.

Here, the institutional model of ecosystem management becomes relevant. The procedural rules are intended to ensure more information and adaptive management. As such, they allow for science to come to the forefront. It is assumed [*1260] that this scientific activity will in turn result in achieving the goal of maintaining ecological integrity.

This emphasis on science and specific goal setting, monitoring, and learning, with a sense of maintaining ecosystem integrity, all suggests that science will give us the answers: if we say we want to maintain ecosystem integrity, we can find out what connections are being disrupted and work on maintaining them. As such, many of the key writers

¹¹⁸ See, e.g., Walter Kuhlmann, *Making the Law More Ecocentric: Responding to Leopold and Conservation Biology*, 7 *Duke Envtl. L. & Pol'y F.* 133 (1996) (discussing how modern critiques of balance in nature impede an ecocentric view of law); Bruce Pardy, *Changing Nature: The Myth of the Inevitability of Ecosystem Management*, 20 *Pace Envtl. L. Rev.* 675 (2003) (arguing that ecosystem management is a policy choice rather than the logical result of ecological theory); Bruce Pardy, *Ecosystem Management in Question: A Reply to Ruhl*, 23 *Pace Envtl. L. Rev.* 209, 213-14 (2005) [hereinafter Pardy, *Management in Question*] (discussing human values being applied to nature). Criticisms of this goal because of its "humanism" have also come from outside the field of law. See Thomas R. Stanley, Jr., *Ecosystem Management and the Arrogance of Humanism*, 9 *Conservation Biology* 255 (1995) (arguing that ecosystem management is essentially humanistic); cf. Ruhl, *supra* note 104, at 30-31 (arguing that Pardy's dichotomy of natural/unnatural is the functional equivalent of desirable/undesirable); J.B. Ruhl, *The Myth of What is Inevitable under Ecosystem Management: A Response to Pardy*, 21 *Pace Envtl. L. Rev.* 315, 320-21 (2004) (arguing that ecosystem management is inevitable for both preservationist and utilitarian goals).

¹¹⁹ Christensen & Franklin, *supra* note 29, at 13.

If change is constant and inevitable, it does not follow that ecosystems can sustain change of any kind. Extreme fluctuation is unusual in most ecosystems and can seriously alter some ecosystem processes. Over the four billion year history of the earth's biota, the earth's environment has undergone significant change. However, it is likely that ecosystems such as the Chesapeake have never experienced change at the rate at which it is occurring today. Furthermore, many changes such as extremes of land fragmentation and certain kinds of pollution have no precedent in evolutionary history of the biota of such ecosystems. The rapidity of change as well as the novel character of many human impacts present special challenges to our ability to manage ecosystems sustainability [sic]. *Id.* Indeed, ecologists point out that in constant change, a certain stability emerges. See Norton, *supra* note 52, at 70 (discussing the importance of underlying stability in *New Ecology*).

¹²⁰ Wilson, *supra* note 46, at 99. The 2004 IUCN Red List of Threatened Species provides a self-described "very conservative" estimate for birds, mammals, and amphibians of an extinction rate of 48 to 476 times the background rate of extinction. IUCN Species Survival Commission, *supra* note 46, at 41-42. The Red List also notes that studies that go beyond the three groups addressed by the IUCN's estimate have estimated a present extinction rate of 1000 to 11,000 times higher than the background rate of extinction. *Id.* at 42; see generally Wilson, *supra* note 46, at 98-101 (describing the different methodologies for calculating the background rate of extinction, resulting in the range of estimates). We are currently in what has been termed "the Sixth Extinction." See IUCN Species Survival Commission, *supra* note 46, at 41 (noting that the fossil record appears to indicate five major mass extinctions); Richard Leakey & Roger Lewin, *The Sixth Extinction: Patterns of Life and the Future of Humankind* (1995) (arguing that the sixth great extinction is currently underway). For discussion of the five previous mass extinctions, see Anthony Hallam, *Mass Extinctions*, in 2 *Encyclopedia of Evolution* 661 (Mark Pagel ed., 2002).

¹²¹ Grumbine, *supra* note 26, at 31-33.

in ecosystem management argue consistently that what is needed is more science.¹²² With more science, it is assumed, will come the achievement of the goal of maintaining ecological integrity. Institutional models simply need to provide the procedures that will give the scientists the space to do their work.¹²³

For the new governance writers, goals are also important. As with the ecosystem management writers, always implicit and sometimes explicit in these writers' works is the notion that the kind of collaborative and cooperative activity that will be produced by the procedural framework advocated will in itself lead to better outcomes, captured in broadly stated goals. These better outcomes are more than the better solutions to discrete problems described above. They frequently also have a normative element, incorporating an idea that the collaborative and cooperative activity will move us towards a better world. The idea is that this kind of cooperative, flexible approach to regulation will move us towards overall goals that we want to achieve.¹²⁴

The key assumption, and it is key, is that the processes will be working towards goals that, if broad participation can be achieved, will bring us towards better outcomes. What kinds of goals might these be? Sustainable development, for example, is sometimes presented as the likely end result of this kind of activity, and is a goal with which few people would disagree.¹²⁵

The idea is that with the involvement of broad stakeholder participation, the free flow of information, and the acknowledgement of the need for multiple scales of focus, those developing policy will be working towards the common good because they will have a new understanding that that common good fits with their own self-interest. The goal that is pursued will be the goal that best aligns these two sets of interests.

[*1261]

B. Problems with Ecological Integrity and Process-Generated Goals

1. Goals That Are Too Broad

The goals described above may be seen as a consequence of collaboration and better information, rather than a driver of activity. Yet, even if we perceive a loop effect so that goals generated from collaborative effort would in turn direct subsequent activity, these goals are too broad.

As we have seen, an initial difficulty with ecological integrity arises because as soon as we see humans as part of the ecosystem, ecosystem integrity surely includes humans. Although a goal of maintaining ecological integrity can constrain behavior that is overly harmful, it cannot help us make the more discrete value decisions that will help us determine what level of protection is appropriate in any given instance. Science cannot tell us what level of human influence is appropriate when we are in stages before catastrophe. Ecosystem management writers recognize that values imbue protection decisions and the achievement of "ecological integrity," yet rely on resource managers and procedural mechanisms to encourage collaboration in order to ensure protection.¹²⁶ Yet, as we shall see, this reliance is misplaced precisely because the goal of maintaining ecological integrity - the only goal that is fixed in any way - is

¹²² See Noss, O'Connell & Murphy, *supra* note 50, at xi (discussing the role of science in conservation planning).

¹²³ Cf. Ruhl, *supra* note 32, at 37-39 (suggesting that even too many procedural rules would actually be counter to the achievement of adaptive management); Ruhl, *supra* note 104, at 33 (arguing that an ecosystem management approach will rely heavily on administrative exercise of professional judgment).

¹²⁴ As Slaughter writes in reference to a "Just New World Order:"

"World order" is not value-neutral; any actual world order will reflect the values of its architects and members. Most of these values will not be specific to particular structures or institutions operating in different issue areas. Sustainable development, for instance, is a goal or a value that may drive global environmental policy. Whether it is pursued through traditional international organizations or through a combination of horizontal and vertical government networks should not affect the goal itself. Slaughter, *supra* note 13, at 27-28.

¹²⁵ See U.N. World Commission on Environment and Development, *Our Common Future*, 54, U.N. Doc. A/42/427 (Aug. 4, 1987), available at <http://www.worldinbalance.net/pdf/1987-brundtland.pdf>.

¹²⁶ For example, Grumbine observes that five specific goals within the overall goal of sustaining ecological integrity were frequently endorsed by those writing in ecosystem management. Grumbine, *supra* note 26, at 31. These are: 1) "maintain viable popu-

too broad. Thus, while the goal is relatively uncontroversial,¹²⁷ its breadth leaves the means of achieving the goal opaque.

This is not a problem of recognizing the role of humans in the ecosystem. It is a problem of combining the goal's lack of specificity with a reliance on procedures to achieve it.

Similarly, where the new governance writers have goals, these goals are also frequently too vague to give us clear tracks to guide our decision-making train. "Sustainable development," for example, shares much in common with "ecological integrity." We can all agree with the broad notion that we should not destroy so much of the natural world that we cannot provide for future generations, while at the same time we should not deprive our current generations of the ability to advance. However, it is the details of determining where the line is that are so critical and that inform so many of our fights about environmental law. While few [*1262] would disagree with the goal, they will very likely disagree about what it means to achieve it. Value decisions come into play again in these debates.

This is not to suggest that these are the only goals that these writers discuss. This work often relies heavily on another form of goals to drive activity - benchmarks.¹²⁸ Most writers fully embrace the need for benchmarks to measure performance and achievement of goals. These benchmarks will be largely generated from the collaborative activity.¹²⁹

However, the critical factor is that these benchmarks are open to renegotiation; they are the subject of revisiting and re-evaluation. They are generated from below and are unfixed.

2. Can Broad Goals Combined with Flexible Benchmarks Achieve Better Environmental Protection?

Thus, we now have an approach that uses a combination of broad goals and flexible benchmarks, neither embodied in law, and relies on procedural law to reach those goals and benchmarks. For these writers, the fact that a set of broad goals may not give us concrete answers as to how we should decide what to do in particular situations may not prove fatal to their project. The starting premise of this work is that the complexity of the problems we are facing makes it impossible to set *ex ante* the kind of substantive goals that are concrete enough to resolve the disputes.¹³⁰ The very need for learning and collaboration, with adaptive management, is based on the recognition that more information and experience will lead us to re-adjust our ends because of what we have been learning in the process of implementation.¹³¹

Thus, many of the ecosystem management and new governance writers might say that the goal is intended to be vague, and the benchmarks are designed to be flexible so that they can respond to new information.¹³² The concrete decisions of the collaborative activity will lead to the appropriate decision for achievement of the broad goal.

lations of all native species in situ," 2) "represent, within protected areas, all native ecosystem types across their natural range of variation," 3) "maintain evolutionary and ecological processes," 4) "manage over periods of time long enough to maintain the evolutionary potential of species and ecosystems," and 5) "accommodate human use and occupancy within these constraints." *Id.* As Grumbine elaborates, "the first four of these goals are value statements derived from current scientific knowledge aiming to reduce ... the biodiversity crisis." *Id.* The fifth goal "acknowledges the vital (if problematic) role that people have to play in all aspects of the ecosystem management debate." *Id.* Grumbine's five specific principles are telling because even though they embody value judgments, they are also derived from a combination of science and a recognition of social context. They are, therefore, set by the scientists, even as Grumbine recognizes that the goals are value-driven.

¹²⁷ Cf. Stanley, *supra* note 118, at 256; Yaffee, *supra* note 64, at 714-15 (discussing disagreements about the goal of ecosystem management). But cf. *id.* at 715 (noting that "some scientists argue that key concepts such as ecological integrity are undefinable").

¹²⁸ See *supra* note 126 and accompanying text; Grumbine, *supra* note 26, at 34.

¹²⁹ See, e.g., Dorf & Sabel, *supra* note 1, at 286-87; cf. Ruhl, *supra* note 104, at 28-29. Ruhl refers to legislative and regulatory goals towards which the scientists will work, such as to "maintain and enhance wetland functions within a watershed" and "promote recovery of endangered species." *Id.* Yet the place of these goals in the ecosystem management institutional framework is unclear.

¹³⁰ See, e.g., Ruhl, *supra* note 104, at 28; Dorf & Sabel, *supra* note 1, at 407.

¹³¹ See Dorf & Sabel, *supra* note 1, at 287.

¹³² Ruhl, for example, is comfortable with agency discretion, which in turn indicates that he is comfortable with vagueness in the mandate of those agencies - the goals that they must meet. See Ruhl, *supra* note 104, at 31-34; see also Ruhl, *supra* note 32, at 30 (discussing Shapiro and Glicksman's front-end/back-end distinction in the context of adaptive management and preferring

The benchmarks will be set by the activity, not by some higher authority. The process itself - the mix of collaborative activity with broad stakeholder participation - will itself lead to individual decisions that will ultimately achieve the larger goals of maintaining ecosystem integrity and sustainable development. The assumption here is that the procedural role of law [*1263] will generate more information, and will provide for participation.¹³³ This in turn will lead overall to a better society, including better environmental protection.

Let us assume that better environmental protection includes long-term environmental protection. The achievement of this long-term protection under these models can only occur if we believe that the processes supported by the procedural rules will lead to a collective desire for long-term environmental protection. This in turn would require that the alignment of people's self-interest with the common good will take account of long-term protection needs.

It is this Article's hypothesis that long-term environmental protection can only be achieved by this model if we can be sure that all of the values that are at stake in environmental protection will be adequately represented by the procedural institutions. This Article challenges whether this is possible under the current implementation of the models.

The key to this argument is to consider what role values will play in the procedures. Historically, the goals of environmental law and policy have been influenced by values. Value debates in environmental law have most frequently fallen somewhere along the spectrum between ecocentric or biocentric approaches and anthropocentric approaches, the latter frequently focusing on the utilitarian value of environmental goods for humans.¹³⁴ A decision of which value was being protected would affect the type of protection effort put in place or the level of protection proposed. Such value decisions, however, were frequently polarizing.

At first blush, ecosystem management and its underlying ecology can move us away from these value debates, because when we recognize the fact that everything is interconnected and that humans are part of nature, even a utilitarian value should result in protection of everything. The discussion above of resilience and redundancy, combined with our lack of knowledge and our inability to understand nature, reinforces this.

Ecosystem management recognizes that for ecosystem integrity to be maintained, protection efforts must expand beyond the most obviously or immediately useful goods. As a result, a goal of ecosystem integrity appears to do away with polarizing debates about which values should be protected.¹³⁵ Even a utilitarian basis for protection should seek to protect everything, or almost everything, because we know that we are reliant on nature for our survival, but we do not know enough to predict what we will need to survive and how natural processes will change in response to particular interventions.

This is also why better environmental protection includes some reference to long-term environmental protection. Provided the integrity of ecosystems is [*1264] maintained, nature will be able to evolve and humans will not have lost what they need for continued survival in the long-term.

Thus, it seems that even human-centered values will protect everything. Maintaining ecological integrity appears then to be a goal that is less susceptible to different value perspectives on how it should be achieved. Similarly, sustainable development appears to create a magical line where we can determine what is sustainable and only allow the level of development that is sustainable. This would be the magical point where self-interest and environmental protection interests are aligned.

the "institutionalization of monitoring-adjustment frameworks that allow incremental policy and decision adjustments at the "back end," where performance results can be evaluated and the new information can be fed back into the ongoing regulatory process").

¹³³ This is a different idea of law as procedure than in current administrative law, however. See Karkkainen, *Panarchy*, supra note 9, at 73 (observing that Ruhl and Karkkainen share a concern that the procedural rules in contemporary administrative law are "profoundly at odds with the very concept of adaptive management").

¹³⁴ See Andrew Dobson, *Green Political Thought* 51-61 (3d ed. 2000) (discussing this debate); Bryan G. Norton, *Why Preserve Natural Variety?* 6-14 (1987).

¹³⁵ Cf. Pardy, *Management in Question*, supra note 118, at 213-14 (arguing that ecosystem management relies on a "desirable/undesirable" dichotomy that is anthropocentric); Stanley, supra note 118, at 256 (arguing that ecosystem management can be regarded as either ecocentric or anthropocentric, and criticizing the federal land management agencies' reliance on an anthropocentric view).

However, this apparent shift towards a world where the old value distinctions become irrelevant is something of a sleight of hand, even if unintended. There are other value distinctions that are raised by the recognitions of ecology. One of the main lessons to be learned from ecology, as described above, is the emphasis on nested scales of governance, both temporal and spatial. Temporally, this means that protection decisions must be made with regard to the long-term, and scientific study must pay attention to the long-term and not just focus on the short-term. Spatially, we must pay attention to all levels of activity, and when applied to institutions, all levels of governance: global, local, and everything in between.

The recognition of different spatial scales can be largely addressed by the procedural function of law in the models. The procedures are expressly designed to ensure that decisions are informed by as much information as possible. Provisions for multiple stakeholders and information flows across geographical scales can mostly satisfy this need. Yet even here, we might be concerned that people making decisions will do so largely on the basis of their own immediate geographical concerns.

The temporal scales pose a larger problem. With an absence of a guiding goal, the likelihood is that stakeholders will be concerned with short-term interests. While information can satisfy the need to know about the long-term, it cannot ensure that the long-term is actually taken into account. In addition, some species that do not have short-term utilitarian value may suffer. Although we might know that we have to protect species whose only use is to maintain the resilience or redundancy of an ecosystem and thereby its integrity, it will be harder to ensure protection of such species against competing short-term and immediate interests.¹³⁶

One response to this worry is to observe that since the foundation of ecosystem management and conservation biology that informs the institutional models proposed is to add goals to science, the concern about a loss of goals is misplaced. It is not that goals are being abandoned. They are simply being shifted from a position in a hierarchy where abstract laws take precedence to a position where they can be informed by bottom-up information and the stakeholders themselves. The argument, then, would be that the scientists working on maintaining ecosystem integrity will represent the interest of protection, including long-term protection. After all, it is the scientists themselves who have informed us of the need to take long-term scales into account as well as short-term scales, of the need to consider all species and the importance of redundancy and resilience, and of the need to consider all spatial scales if we want more effective protection. Why [*1265] not trust that institutional models that rely on more science will provide us with more effective protection?¹³⁷

The two case studies explored in the next part of this Article address this question and, although they cannot entirely resolve it, they give cause for concern.¹³⁸ The case studies suggest that the overall protection of species and ecosystems, whether motivated by utilitarian goals (even indirect ones) or by notions of intrinsic value, will suffer in these institutional models even if we accept the need for more science to inform our environmental protection efforts.

Part V of this Article will propose a way to respond to the lessons of the case studies without undermining the lessons of ecosystem management and new governance writers, and will address questions of the role of politics in this model.¹³⁹

¹³⁶ See Holly Doremus, *The Rhetoric and Reality of Nature Protection: Toward a New Discourse*, [57 Wash. & Lee L. Rev. 11, 45-49 \(2000\)](#) (questioning reliance on arguments for the protection of nature that focus on the importance of each component of nature).

¹³⁷ I am not addressing here questions about whether science and scientists are truly neutral or work only towards environmental protection goals. This Article takes as a starting assumption the best case scenario that scientists are working for the goal of long-term protection and challenges whether that is enough. If scientists are not working towards that goal, because of either conscious or subconscious biases, that makes it even more problematic for us to rely on scientists to shape the values we are to follow in our legal institutions for protection.

¹³⁸ Without an ability to look into the future and without complicated - and perhaps impossible - empirical work to trace cause and effect, it would be impossible to know completely whether these institutions are achieving long-term environmental protection and whether that is related to the institutions' designs.

¹³⁹ As we consider the case studies and analyze them, I will refer to substantive goals and norms, procedural law, and use the word "law" frequently. I do not try in this Article to provide a definition of law. However, it is important to stress that my understanding of law is a broad one, in keeping with the approaches of the new governance writers described, who see soft law as contributing to the body of law. Thus, something with a normative pull, including resolutions of conferences of the parties, could be in-

IV. Case Studies: The Chesapeake Bay Program and the Ramsar Convention on Wetlands of International Importance

A. Introduction to the Case Studies

As we move through the case studies, three questions should be at the forefront of our examination. First, is the assumption that the model of cooperation and collaboration will lead to better environmental protection a valid assumption?¹⁴⁰ Second, even if we assume that ecosystem management scientists and conservation biologists are all working towards an aim of long-term environmental protection and will represent that aim, does this institutional model adequately protect these goals against competing interests? And third, can law play a role in ensuring that the goal of environmental protection over the long-term is not lost to competing short-term interests? The case studies demonstrate that we [*1266] need to think more carefully about the relationship between law and goals as we design institutions for environmental protection that can also accommodate the need for flexibility and adaptive management.

The first case study, the Chesapeake Bay Program, has been cited as the model of an institution incorporating adaptive ecosystem management.¹⁴¹ Its approach has been used as the template for the National Estuarine Program¹⁴² and several other multijurisdictional efforts aimed at protecting estuaries. It formed a part of the early work in new governance and democratic experimentalism,¹⁴³ and has also been cited as an example of collaborative ecosystem governance.¹⁴⁴ Although no longer unique in attempting to take a broader ecosystem approach to a region, rather than rely on a general body of environmental law, it was one of the earliest to use language that closely tracks the approach advocated by ecosystem management writers. Indeed, the Chesapeake Bay Program has been cited by both writers in ecosystem management, coming from the side of the physical scientists, and by writers looking beyond the field of environmental and natural resources law.¹⁴⁵ The case study discusses what it is that makes the Program so representative of new approaches to environmental protection, before focusing on what the Program has done with regard to the blue crab to explore the questions raised above. The blue crab's economic importance for the Bay, its place in the consciousness of Chesapeake Bay residents, and the concerns it raises about protection of other species make it an interesting study.

The second case study takes us to the international plane.¹⁴⁶ The Ramsar Convention on Wetlands, when viewed as an institution made up of its constitutive agreement, its Secretariat and associated groups, its member state representatives and activities, and its decisions and resolutions, has been a model of innovation.¹⁴⁷ It has, over time, responded to shifts in ecological understanding and relies heavily on procedural mechanisms to achieve its goals. Al-

cluded in my definition of law. I do not distinguish between soft law and hard law. Yet I do draw some distinctions between flexible norms and those with some more certainty and an element of longevity.

¹⁴⁰ See Joseph L. Sax, *The New Age of Environmental Restoration*, 41 *Washburn L.J.* 1, 11-13 (2001); see also Doremus, *supra* note 9, at 51 ("In order to successfully conserve nature over meaningful lengths of time we must develop management institutions suited to the efficient and effective production, identification, and integration of new scientific knowledge into our natural resources management decisions."); Freeman & Farber, *supra* note 1, at 866-68 (noting concerns by Holly Doremus and others about the effectiveness of the program Freeman and Farber commend in terms of achieving environmental protection).

¹⁴¹ Costanza & Greer, *supra* note 87, at 169; Timothy M. Hennessey, *Institutional Design for the Management of Estuarine Ecosystems: The Chesapeake Bay*, in *Ecosystem Function and Human Activities*, *supra* note 29, at 199.

¹⁴² Hennessey, *supra* note 141, at 218-19. See generally U.S. *Envtl. Prot. Agency*, National Estuary Program, <http://www.epa.gov/owow/estuaries/> (last visited Nov. 16, 2008) (describing the "collaborative problem solving" emphasis of EPA's program).

¹⁴³ See Sabel, Fung & Karkkainen, *supra* note 20, at 4.

¹⁴⁴ Cannon, *Choices*, *supra* note 8, at 379-80; see also Cannon, *Checking in*, *supra* note 8, at 1131 (examining the Chesapeake Bay Program to consider whether collaborative management best protects the public interest).

¹⁴⁵ See, e.g., *Ecosystem Function and Human Activities*, *supra* note 29 (containing the papers generated from a workshop that brought together "ecologists, economists, other natural and social scientists, and policy makers").

¹⁴⁶ If we take the message from ecologists seriously about the need to take multiple geographical scales into account, the global perspective is a critical component of protection strategies.

¹⁴⁷ See *infra* Part IV.C (discussing the goals, structure, and implementation of the Ramsar Convention); David Pritchard, *International Treaties Advisor*, BirdLife International, Address at the Ninth International Wildlife Law Conference: Diet, Exercise,

though this reliance cannot be attributed solely to the Convention's adoption of the new models described above, this reliance does make the institution well placed to respond to these models. It has [*1267] done groundbreaking work in trying to determine the limits of human activity in natural areas that are closely tied to human activity and survival. Thus, although the Ramsar Convention presents a different model of how an institution might respond to the lessons of ecology from that of the Chesapeake Bay Program, it raises similar questions of critical concern to this Article about the role of goals in decision making that implicates humans, biodiversity, and ecological, social, and economic concerns.

We cannot directly attribute failures in the institutions described in the case studies to the models discussed above unless we can see that the institutions represent those models.¹⁴⁸ However, this does not mean that the case studies must be perfect implementations of the models. First, the models are not identical in detail. Second, it is enough to show that these case studies represent real world attempts to change environmental protection actions to fit more closely with the lessons of ecology and modern thinking about institutional design. If they do represent such an attempt, there is value in identifying whether they are achieving what they set out to achieve and what these models assume will be achieved: more effective environmental protection.

Both case studies represent a multiscale approach to environmental protection by allowing for both a holistic and a local perspective, with provision for information sharing across scales and encouragement of adaptive management.¹⁴⁹ Further, these institutions were selected as case studies precisely because they have adapted over time to better respond to ecological insights, both in their substantive mandates and in their procedural and institutional mechanisms.¹⁵⁰ What we can learn from them is critical to how we proceed as we work on redesigning institutions for environmental protection.

B. The Chesapeake Bay Program and Protection of the Blue Crab

1. The Chesapeake Bay

The Chesapeake Bay Watershed covers 64,000 square miles of rivers, tributaries, and land area that bring the Bay itself, stretching for 200 miles, both its life force of freshwater and its excesses of pollution.¹⁵¹ The watershed spans six states and the District of Columbia, with a population of over sixteen million people¹⁵²

and more than 3000 species of plants and animals.¹⁵³ It includes highly urbanized areas, suburban developments, and agriculture, as well as the fishing industry for which it is so famous.

The economic benefits of the Bay's resources are significant. Catches of blue crabs netted an annual amount of \$ 50 million throughout the 1990s, even without including the income generated by industries dependent on the fishery.¹⁵⁴ The indirect economic effects of the recreational boating industry in Maryland alone have been estimated at

and Learning - Keeping a Middle-Aged Convention Fit for the 21st Century (Jan. 27, 2007) (detailing the ways in which the Ramsar Convention has been a model of innovation) (address attended by author).

¹⁴⁸ Cf. Alejandro E. Camacho, Can Regulation Evolve? Lessons from a Study in Maladaptive Management, [55 *UCLA L. Rev.* 293 \(2007\)](#) (discussing the failure of the Endangered Species Act's Habitat Conservation Plan process to be truly adaptive).

¹⁴⁹ Karkkainen, Panarchy, *supra* note 9, at 59, 61 (discussing different perspectives on what it means for management to be adaptive).

¹⁵⁰ Although this Article does not definitively respond to the question of whether each institution is achieving the goals it is setting out to achieve, the Article does ask whether each institution is adequately representing the value of long-term protection of species and ecosystems and the value of protecting species and ecosystems that do not have direct and short-term economic value to humans. The underlying assumption is that without representation of these values, it will be hard for us to achieve long-term effective environmental protection.

¹⁵¹ Chesapeake Bay Program, Facts and Figures, <http://www.chesapeakebay.net/factsandfigures.aspx?menuitem=14582> (last visited Nov. 16, 2008).

¹⁵² Chesapeake Bay Program, Population Growth, <http://www.chesapeakebay.net/populationgrowth.aspx?menuitem=14669> (last visited Nov. 16, 2008).

¹⁵³ Chesapeake Bay Program, The State of the Chesapeake Bay (1999), available at <http://www.chesapeakebay.net/pubs/sob/intro.pdf>.

¹⁵⁴ See *infra* notes 209-10 and accompanying text.

around \$ 2 billion and over 34,000 jobs.¹⁵⁵ And these figures do not incorporate the profits of other industries that benefit from the waters of the Bay and the Bay's many rivers and tributaries. Beyond the Bay itself, the surrounding land area is one of the most populated in the country and is expanding by the year.¹⁵⁶

In addition, the importance of agriculture to the Bay's history has led to serious environmental problems.¹⁵⁷ Pollution from agricultural runoff, both chemical in the form of pesticides and fungicides, and more natural in the form of manure, contributes substantially to the problematic nutrient buildup in Chesapeake Bay.^{N158} The loss of forests, particularly riparian forests, has exacerbated this problem by allowing nonpoint source pollution from both urban and rural areas to reach the rivers unchecked.¹⁵⁹ As a result of nutrient buildup and overharvesting, oyster beds, crabs, striped bass, and countless other less prominent and less economically important species have declined to troubling numbers, as have plant species that contribute to the health of the Bay, including the group of species known as submerged aquatic vegetation (SAV).¹⁶⁰

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2. The Chesapeake Bay Program

Since 1983, the Chesapeake Bay Program has been the institutional structure charged with coordinating protection efforts for the Bay across its multiple political jurisdictions.¹⁶¹ While the Program began with a predominant focus on the estuary itself and the states immediately surrounding it, its scope has expanded into the far reaches of the estuary's watershed. Thus, although the waters of the Bay border only two states, Maryland and Virginia, the earliest Chesapeake Bay agreements included Pennsylvania and the District of Columbia.¹⁶² Most recently in 2000, New York, West Virginia, and Delaware entered into partnership agreements with the Program.¹⁶³ In addition, the federal government participates through the United States Environmental Protection Agency (EPA) by providing resources, a home, and staff for the Program.¹⁶⁴ The Chesapeake Bay Commission, a tri-state legislative body, is a signatory to the Chesapeake Bay Agreements and works to coordinate legislative implementation of the Program.¹⁶⁵ The Pro-

¹⁵⁵ Douglas W. Lipton, *Economic Impact of Maryland Boating in 2006* 3 (2007), available at [ftp://ftp.mdsg.umd.edu/Public/MDSG/rec boat06.pdf](ftp://ftp.mdsg.umd.edu/Public/MDSG/rec%20boat06.pdf).

¹⁵⁶ See Kristen M. Crossett et al., *Population Trends Along the Coastal United States: 1980-2008* 14-15 (2004), available at http://www.oceanservice.noaa.gov/programs/mb/pdfs/coastal_pop_trends_complete.pdf.

¹⁵⁷ Costanza & Greer, *supra* note 87, at 189-95; Howard Ernst, *Chesapeake Bay Blues: Science, Politics, and the Struggle to Save the Bay* 71 (2003).

^{N158} As the Program develops, more substances are discovered that contribute to nutrient buildup and more sources of pollution fall within the purview of the Program. See Chesapeake Bay Program Office, *Minutes of the Nutrient Subcommittee Meeting* (Jan. 22, 2003), available at <http://www.chesapeakebay.net/pubs/subcommittee/nsc/min-1-22-03.pdf> [hereinafter *Minutes of the Nutrient Subcommittee Meeting*] (reporting on a project to assess ammonia emissions from agricultural and urban areas, including airborne emissions of poultry farms); Chesapeake Bay Program, *Agriculture*, <http://www.chesapeakebay.net/landuse/agriculture.aspx?menuitem=19551> (last visited Nov. 16, 2008).

¹⁵⁹ See *Minutes of the Nutrient Subcommittee Meeting*, *supra* note 158; Chesapeake Bay Program, *Forest Buffer Restoration*, <http://www.chesapeakebay.net/forestbuffers.aspx?menuitem=14780> (last visited Nov. 16, 2008).

¹⁶⁰ The amount of SAV, a crucial indicator of the Bay's health, has declined precipitously over the years. See Chesapeake Bay Program, *Chesapeake Bay Underwater Grasses 1-2* (2003), available at http://www.chesapeakebay.net/pubs/SAV_Backgrounder_092203.pdf. SAV provides habitat for species that can clean the water, such as oysters, which filter sediments and pollutants from the water, protect shorelines, and produce oxygen. *Id.*

¹⁶¹ The Program initially took the form of a liaison office at the United States Environmental Protection Agency's regional laboratory in Annapolis, Maryland. Costanza & Greer, *supra* note 87, at 199.

¹⁶² Chesapeake Bay Program, *1983 Chesapeake Bay Agreement 1-2* (1983), available at http://www.chesapeakebay.net/content/publications/cbp_12512.pdf [hereinafter *1983 Chesapeake Bay Agreement*].

¹⁶³ See Chesapeake Bay Program, *Chesapeake 2000* 12 (2000), available at http://www.chesapeakebay.net/content/publications/cbp_12081.pdf [hereinafter *Chesapeake 2000*].

¹⁶⁴ *1983 Chesapeake Bay Agreement*, *supra* note 162, at 1-2.

¹⁶⁵ Chesapeake Bay Commission, *Policy for the Bay*, <http://www.chesbay.state.va.us> (last visited Nov. 16, 2008).

gram is voluntary, reliant on the states to implement its recommendations.¹⁶⁶

a. The Chesapeake Bay Program Viewed Through its Constitutive Agreements

The initial 1983 Agreement followed a five-year, \$ 27 million study that created a Chesapeake Executive Council made up of Cabinet designees appointed by the Governors of the three states, Virginia, Maryland, and Pennsylvania, along with the Mayor of the District of Columbia, and the Regional Administrator of the EPA.¹⁶⁷ This Council was nothing more than a coordinating forum for the political leaders of the preexisting jurisdictions. The Chesapeake Executive Council was also charged with establishing an implementation committee of advisory agency representatives and a liaison office for Chesapeake Bay activities at the EPA's Central Regional Laboratory in Annapolis, Maryland.¹⁶⁸

[*1270] The 1983 Agreement was followed by a more comprehensive Chesapeake Bay Agreement in 1987.¹⁶⁹ The 1987 Agreement already contained, on its face, many of the components necessary for ecosystem management. It established targets and commitments - benchmarks - leaving the actual means of achieving them to those charged with implementation and those on the ground.¹⁷⁰ It set particular dates, allowing for review of performance at a given point while still taking a long-term perspective.¹⁷¹ It demonstrated an ecosystem-wide perspective on the issues by addressing not only the environmental problems in isolation but also the broader contributing factors to ecosystem deterioration, such as population growth and development.¹⁷² In addition, it recognized the need for public participation and education as key components for successful ecosystem protection.¹⁷³ This emphasis on education went further than the 1983 Agreement because it was not merely a top-down model. The Agreement envisioned from the outset "a continuing process of public input and participation in policy decisions affecting the Bay," and committed "to provide for public review and comment on all implementation plans developed pursuant to this agreement."¹⁷⁴

Significantly, the Agreement also allowed for a form of adaptive management. The 1987 Agreement committed to develop, adopt, and begin implementation of, by July 1988, "a basin-wide strategy to equitably achieve by the year

¹⁶⁶ Chesapeake 2000, *supra* note 163, at 2, 7-8.

¹⁶⁷ Chesapeake Bay Program, History of the Bay Program, <http://www.chesapeakebay.net/historyofcbp.aspx> (last visited Nov. 16, 2008).

¹⁶⁸ 1983 Chesapeake Bay Agreement, *supra* note 162, at 1-2.

In 1980, the legislatures of Virginia and Maryland had established the Chesapeake Bay Commission to coordinate interstate planning and programs from a legislative perspective. In 1985, Pennsylvania joined the Commission. And in 1983, Virginia, Maryland, Pennsylvania, the District of Columbia, the U.S. Environmental Protection Agency and the Chesapeake Bay Commission formally agreed to a cooperative approach to this undertaking and established specific mechanisms for its coordination. Chesapeake Bay Program, 1987 Chesapeake Bay Agreement 1, 4 (1987), available at http://www.chesapeakebay.net/content/publications/cbp_12510.pdf [hereinafter 1987 Chesapeake Bay Agreement].

¹⁶⁹ The Preamble to the 1987 Agreement is telling:

RECOGNIZING that the Chesapeake Bay's importance transcends regional boundaries, we commit to managing the Chesapeake Bay as an integrated ecosystem and pledge our best efforts to achieve the goals in this Agreement. We propose a series of objectives that will establish a policy and institutional framework for continued cooperative efforts to restore and protect the Chesapeake Bay. We further commit to specific actions to achieve those objectives. The implementation of these commitments will be reviewed annually and additional commitments developed as needed. 1987 Chesapeake Bay Agreement, *supra* note 168, at 1.

¹⁷⁰ *Id.* at 2-6.

¹⁷¹ *Id.*

¹⁷² *Id.* at 5-6.

¹⁷³ *Id.* at 5.

¹⁷⁴ *Id.*

2000 at least a 40 percent reduction of nitrogen and phosphorus entering the main stem of the Chesapeake Bay.”¹⁷⁵ Yet it also provided for reevaluation of this 40 percent reduction target by December 1991, “based on the results of modeling, research, monitoring and other information available at that time.”¹⁷⁶ Over the next thirteen years, the Chesapeake Bay Program re-evaluated its target and expanded its protection to the Bay’s many tributaries.¹⁷⁷

[*1271] By 2000, the Chesapeake Bay Program had demonstrated substantial links between the lessons of ecosystem management, incorporating the need for adaptability in the face of new learning, adopting an ecosystem-wide perspective both in its scope and in its approach to species, and acknowledging the role of both science and public participation in the formulation of protection strategies.¹⁷⁸ In 2000, a new Agreement was adopted, known as C2K, which only enhanced the ecosystem management aspects of the Program, at least on paper.¹⁷⁹

The Preamble of C2K recognizes that increased population and development have created ever-greater challenges, challenges that are further complicated “by the dynamic nature of the Bay and the ever-changing global ecosystem with which it interacts.”¹⁸⁰ The Preamble notes that the parties “must have a vision for [their] desired destiny and put programs into place that will secure it.”¹⁸¹ It posits that the greatest goal in this recommitment is to engage everyone - individuals, businesses, schools and universities, communities, and governments - in the effort. Finally, the Preamble concludes:

In affirming our recommitment through this new Chesapeake 2000, we recognize the importance of viewing this document in its entirety with no single part taken in isolation of the others. This Agreement reflects the Bay’s complexity in that each action we take, like the elements of the Bay itself, is connected to all the others. This Agreement responds to the problems facing this magnificent ecosystem in a comprehensive, multifaceted way.¹⁸²

The significance of the 2000 Agreement does not end with language recognizing the complexity and interconnectedness of the broader ecosystem, although such language is not insignificant and occurs repeatedly throughout the document.¹⁸³ Without citing the entire document, several aspects are of particular interest for our purposes. In the section now termed “Living Resource Protection and Restoration,” the parties follow key tenets of ecosystem management:

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¹⁷⁵ Id. at 3.

¹⁷⁶ Id.

¹⁷⁷ In 1991, in accordance with the requirements of the 1987 Agreement, the Chesapeake Bay Program conducted the required nutrient reduction reevaluation. The parties responded by amending the 1987 agreement with further commitments. For the first time, the parties expanded their efforts to the tributaries of the Chesapeake Bay, in recognition of the fact that most fish spawning grounds and essential habitat are in the tributaries, and specified that tributary-specific strategies should be developed and implementation begun on them by August 1993. Chesapeake Bay Program, Chesapeake Bay Agreement: 1992 Amendments 2 (1992), available at http://www.chesapeakebay.net/content/publications/cbp_12507.pdf. Correspondingly, the signatories agreed to “explore cooperative working relationships with the other three basin states (New York/West Virginia/Delaware) in the development of tributary-specific strategies for nutrient reduction.” Id. The 1992 amendments also recognized that efforts to control non-point sources of pollution would need to be intensified if the 40% nutrient reduction goal were ever to be met. Id. at 1.

¹⁷⁸ The 1987 Agreement and its 1992 Amendments demonstrated something of a commitment and adherence to the basic principles of adaptive ecosystem management in their ecosystem approach and their shifts in the face of changing knowledge. See Hennessy, *supra* note 141, at 217-18.

¹⁷⁹ Chesapeake 2000, *supra* note 163, at 2-10; Md. Dep’t Natural Res., Chesapeake 2000: The Renewed Bay Agreement, http://dnrweb.dnr.state.md.us/bay/res_protect/C2k/index.asp (last visited Nov. 16, 2008) (stating the Chesapeake 2000 Agreement is commonly referred to as C2K).

¹⁸⁰ Chesapeake 2000, *supra* note 163, at 1.

¹⁸¹ Id.

¹⁸² Id. at 1.

¹⁸³ See, e.g., id. at 1-2 (recognizing goals such as providing for a “balanced ecosystem,” and protecting the Bay as an “intricate system of terrestrial and aquatic habitats, linked to the landscapes and the environmental quality of the watershed”).

Our actions ... must be continually monitored, evaluated and revised to adjust to the dynamic nature and complexities of the Chesapeake Bay and changes in global ecosystems. To advance this ecosystem approach, we will broaden our management perspective from single-system to ecosystem functions and will expand our protection efforts by shifting from single-species to multi-species management. We will also undertake efforts to determine how future conditions and changes in the chemical, physical and biological attributes of the Bay will affect living resources over time.¹⁸⁴

Yet, significantly, the proposed shift to multispecies management does not mean that the plight of single species is ignored. While the management approach may be aiming to shift toward a multispecies orientation, the plight of single species is not forgotten. The Agreement relies on single species not only as indicators, but also recognizes their individual importance because of their commercial significance.¹⁸⁵

In keeping with ecosystem management, the Agreement contains many commitments, sets out goals as well as the need to revisit them, and addresses complexity.¹⁸⁶ In addition, the Agreement again advocates the need to strengthen partnerships with New York, West Virginia, and Delaware.¹⁸⁷ Thus, the 2000 Agreement furthers the Program on the path towards adaptive ecosystem management, at least on paper.

b. The Chesapeake Bay Program at Work¹⁸⁸

The Chesapeake Bay Program's institutional structure also fits with the models of ecosystem management and some of the new governance principles discussed above. The Program is renowned for being complex in the sense that the relationship among committees and subcommittees is not always a straightforward hierarchy. Even those who have devoted large portions of their careers to the Bay Program's work and have been involved with it from its inception do not shy away from recognizing that the Program is extremely complex in design and practice. At a meeting of the Implementation Committee in 2003, one of the subcommittee delegates quipped to an observer that any accurate representation of the Program's structure would have to have many dotted lines running between various committees and subcommittees.¹⁸⁹

[*1273] Indeed, over the years, the Program has become more complex as more committees and subcommittees were created to deal with particular issues and as the lines of communication among different groups intensified. In 2007, the EPA announced that it would halve the number of workgroups involved in the Chesapeake Bay Program in response to concerns that it was becoming too complex and lacked a focus on implementation.¹⁹⁰

At the top end of the Program, the Executive Council, consisting of the Governors of Maryland, Pennsylvania, and Virginia, the Mayor of the District of Columbia, the Administrator of the EPA, and the Chair of the Chesapeake Bay Commission, sets policy, marshals public support for the Program's work, and is accountable to the public.¹⁹¹ The Ex-

¹⁸⁴ Id. at 2.

¹⁸⁵ See id. This combination of the whole and the individual also appears in the section on "Vital Habitat Protection and Restoration." Id. at 3. As the Agreement puts it, "in managing the Bay ecosystem as a whole, we recognize the need to focus on the individuality of each river, stream and creek." Id. at 4.

¹⁸⁶ See generally id. This includes a commitment to produce an annual report on the state of the Bay for the citizens of the Bay area. Id. at 13.

¹⁸⁷ Id. at 12.

¹⁸⁸ Unless otherwise noted, the description and analysis of the Chesapeake Bay Program's structure in practice is based largely on the author's observation of two meetings in January 2003 - the Nutrients Subcommittee Meeting (Jan. 22, 2003) and the Implementation Committee Meeting (Jan. 23, 2003) - and the discussions arising out of those meetings.

¹⁸⁹ Notes from Meeting of the Implementation Committee (Jan. 23, 2003) (on file with author). Another delegate asked that if the observer figured it all out, would she please share it with him? Id.

¹⁹⁰ Amana H. Saiyid, EPA to Halve Number of Workgroups Involved in Chesapeake Bay Program, Daily Environment Report (BNA) No. 179, at A-2 (Sept. 17, 2007). Although this question about implementation and effectiveness is an interesting one for the purposes of examining this Article's claim that these institutions may provide important procedural mechanisms while lacking a focus that allows them to achieve effective environmental protection, this is not the focus of this paper.

¹⁹¹ Chesapeake Bay Program, Chesapeake Executive Council, <http://www.chesapeakebay.net/committee/ec/info.aspx?menuitem=16594> (last visited Nov. 16, 2008).

Executive Council and the Principals' Staff Committee are the policy-making committees.¹⁹² The Principals' Staff Committee acts as the policy advisor to the Executive Council and its members provide briefings to their principals, the Agreement signatories.¹⁹³ The Principals' Staff Committee also acts as a facilitator of communication between the Executive Council and the committees responsible for various aspects of the Program's running and implementation of the goals set by the Executive Council.¹⁹⁴

The Implementation Committee is the most significant for the internal operation of the Program, given that it has a relationship with each of the other committees and also acts as the convener - and overseer - of the next level of activity, the subcommittees.¹⁹⁵ The Implementation Committee provides the forum for the Chairs of each subcommittee, as well as the Chairs of the other committees, to get together.¹⁹⁶ These subcommittees cover the substantive issue areas addressed in C2K.¹⁹⁷ In turn, the subcommittees establish their own workgroups, breaking [*1274] down the issues into smaller and more manageable topics.¹⁹⁸ It is the number of these workgroups that EPA intends to cut.¹⁹⁹

The Program operates at multiple scales, although these scales are not geographical, so much as substantive. The multiple scales are nested, so that each level down gets progressively more scientifically technical or politically detailed. The nesting is evident from the structure of the Implementation Committee; it is the forum for the subcommittee chairs to get together.²⁰⁰ Thus, each tier feeds its lead members into the tier above, in theory allowing for both coordination and specialization, apparently the ideal mix. While the idea of a pyramid shaped hierarchy is not in itself a strange phenomenon in institutions, the institutional nesting evident in the Chesapeake Bay Program is different in that it allows for - and encourages - information to flow both ways. The insights of the technical workgroups influence policy setting just as the policy setting influences the research agenda of the technical workgroups. In addition, the Chesapeake Bay Program structure attempts to cover every aspect of an ecosystem to allow for specialization and segmentation. As one proceeds from top - Executive Council - to bottom - the workgroups - the topics become more specialized, going, for example, from an ecosystem level of thinking, to living resources, to fisheries, to crab.²⁰¹ The structure then explicitly calls for coordination among all the segments in order to bring them together for an ecosystem-wide approach. The structure of the Program therefore follows the multiscale, nesting ap-

¹⁹² Chesapeake Bay Program, Principal's Staff Committee, http://www.chesapeakebay.net/committee_psc_info.aspx?menuitem=16612 (last visited Nov. 16, 2008).

¹⁹³ Id.

¹⁹⁴ See id.; Chesapeake Bay Program, Chesapeake Bay Program Organizational Structure, <http://www.chesapeakebay.net/committeeactivities.aspx?menuitem=14890> (last visited Nov. 16, 2008). These committees are the: Implementation Committee, Citizens Advisory Committee, Local Government Advisory Committee, Scientific and Technical Advisory Committee, Federal Agencies Committee, Budget Steering Committee, Water Quality Steering Committee, Principal's Staff Committee, and Reevaluation Technical Workgroup. See id.

¹⁹⁵ See Chesapeake Bay Program, Chesapeake Bay Program Organizational Structure, <http://www.chesapeakebay.net/committeeactivities.aspx?menuitem=14890> (last visited Nov. 15, 2008).

¹⁹⁶ See Chesapeake Bay Program, Implementation Committee, http://www.chesapeakebay.net/committee_ic_info.aspx?menuitem=46436 (last visited Nov. 16, 2008). The Implementation Committee implements the policy decisions and technical studies of the Executive Council, coordinates all of the subcommittees, and is responsible for the annual work plan, budget, and public outreach. Id. In addition, it receives the "advice of the Scientific and Technical Advisory Committee, Local Government Advisory Committee and Citizens Advisory Committee whose Chairs are also members." Id.

¹⁹⁷ These subcommittees are the: Nutrient Subcommittee, Toxics Subcommittee, Monitoring and Analysis Subcommittee, Modeling Subcommittee, Living Resources Subcommittee, Land, Growth and Stewardship Subcommittee, Communication and Education Subcommittee, and Information Management Subcommittee. See Chesapeake Bay Program, Chesapeake Bay Program Organizational Structure, <http://www.chesapeakebay.net/committeeactivities.aspx?menuitem=14890> (last visited Nov. 16, 2008).

¹⁹⁸ Thus, for example, the Nutrients Subcommittee has six workgroups, covering agriculture, forestry, wastewater treatment, sediments, tributary strategy, and urban stormwater. See Chesapeake Bay Program, Nutrient Subcommittee, http://www.chesapeakebay.net/committee_nsc_info.aspx?menuitem=16597 (last visited Nov. 16, 2008).

¹⁹⁹ See Saiyid, *supra* note 190.

²⁰⁰ See Chesapeake Bay Program, Chesapeake Bay Program Organizational Structure, <http://www.chesapeakebay.net/committeeactivities.aspx?menuitem=14890> (last visited Nov. 16, 2008).

²⁰¹ Although there is some concern about "stovepiping" with the sheer number of issues addressed due to the Program's commitment to an ecosystem approach, the system seems to have ability to respond to this concern. See Interview with Dr. Jack Greer, Assistant Director for Public Affairs, University of Maryland Sea Grant College, Annapolis, Md. (Jan. 24, 2003) [hereinaf-

proach advocated by the ecosystem management and new governance literature in many ways.

Further demonstrating the apparent success of the Program's attempt to be adaptive, in addition to the re-evaluation and amendment of the Agreements themselves, several insiders observed that it was accepted and understood that [*1275] scientific knowledge could and should be revisited constantly.²⁰² Not only were scientists permitted to come forward with amendments to previous findings and conclusions, they were expected to.²⁰³ Thus, the system appears to be designed, in the very least, to allow for constant re-evaluation of both the information informing the policy and the application of the science in the implementation.

Ultimately, the day-to-day workings of the Program suggest an operating structure cognizant of the need for multiple scales of focus, for the separation and reconciliation of science and policy, for the recognition of the role of humans, and, above all, for adaptive management and the encouragement and facilitation of new learning.

The fact that the Chesapeake Bay Program follows the model of ecosystem management or can be regarded as an example of flexible, collaborative decision making, however, does not tell us how effective it has been. In one highly influential account, Howard Ernst has documented the failures of the Program,²⁰⁴ yet some commentators are unwilling to reject the need for flexible approaches despite these failures.²⁰⁵ This Article, however, focuses on one particular implication that the ecosystem management writers and the new regulation writers make: that these mechanisms will lead to better outcomes over time. To explore this, I look at one particular issue - the case of the blue crab. Because the blue crab has so many short-term economic interests at stake, as well as ecological value, it is a prime example for considering whether the procedural approaches advocated by the models can adequately allow room for other values to find voice.

3. The Blue Crab - Beautiful Swimmers²⁰⁶

A member of the swimming crab family that is named after the Greek term for "beautiful swimmer" - *Callinectes*²⁰⁷ - the blue crab (*Callinectes sapidus*) is one of the most economically and socially important species in the Chesapeake Bay. The blue crab fishery has the highest value of any commercial fishery, with landings reaching 51.7 million pounds in 2001.²⁰⁸ Throughout the 1990s, the dockside value of the blue crab harvest in the Bay averaged more than \$ 50 million per year.²⁰⁹ Once the multiplier effects of the fishery on processing, retail, and the jobs associated with the seafood industry are added, the economic effect in 1999 of the blue crab fishery on the Chesapeake Bay area was estimated at \$ 156 million a [*1276] year.²¹⁰ In addition, countless residents and visitors to the region take part in traditional recreational crabbing each year in the Bay, giving rise to a significant impact on crab num-

ter Interview with Dr. Jack Greer] (notes on file with author). Only a few years ago, concerns arose that the then-named Modeling Subcommittee and Monitoring and Assessment Subcommittee were not communicating with each other enough. *Id.* While the Modeling Subcommittee was using data from the Monitoring Committee to feed into its models, it was not keeping track of developments in data and assessment, even though such developments would be crucial to ensuring that the model itself remained up to date. *Id.* Such communication is vital in a system intending to work within the constraints of uncertainty, for the constant investigation and experimentation that is advocated to continually update knowledge has little use if it is not fed back into the system to ensure that management can respond to new information and be adaptive. Nevertheless, the fact that the problem appears to have been recognized may in itself demonstrate the effectiveness of the Chesapeake Bay Program's model.

²⁰² *Id.*

²⁰³ *Id.*

²⁰⁴ See Ernst, *supra* note 157.

²⁰⁵ See Cannon, *Checking in*, *supra* note 8.

²⁰⁶ See generally William W. Warner, *Chesapeake Waters, Beautiful Swimmers: Watermen, Crabs, and the Chesapeake Bay* (1976) (detailing the history and ecology of the Atlantic blue crab as well as the threats facing the Chesapeake Bay natural ecosystems).

²⁰⁷ Chesapeake Bay Program, *The State of the Chesapeake Bay: A Report to the Citizens of the Bay Region 10* (2002), available at http://www.chesapeakebay.net/content/publications/cbp_13112.pdf [hereinafter *State of the Chesapeake Bay 2002*].

²⁰⁸ The fact that the blue crab fishery is the highest value commercial fishery may also be because of the severe decline in the other Chesapeake Bay fisheries. See *id.* at 17.

²⁰⁹ Chesapeake Bay Comm'n, *Policy for the Bay: Annual Report 47* (1999) [hereinafter *Policy for the Bay: Annual Report 1999*].

²¹⁰ *Id.*

bers.²¹¹

However, the blue crab fishery has been threatened. No one can agree entirely on the cause of the decline. Some argue that it has been affected by deterioration of water quality and loss of habitat, primarily the loss of submerged aquatic vegetation (SAV), during the 1970s and 1980s.²¹² Others point to overharvesting as an additional exacerbating factor or as a significant cause of decline.²¹³ In 1996, in the face of these declining numbers, the Chesapeake Bay Commission took the initiative to form the Bi-State Blue Crab Advisory Committee (BBCAC) which is composed of Commission members from both Maryland and Virginia, and also includes natural resources experts from each state, and representatives from key stakeholder groups, including crabbers, researchers, and conservationists.²¹⁴ In 1999, the two states responded by assigning the Advisory Committee with the task of "conducting a two-year analysis of crab stocks in the Bay and of current conditions in the fishery,"²¹⁵ a study which culminated in a report published in January 2001 by the Chesapeake Bay Commission and the BBCAC.²¹⁶

The state of the crab fisheries had been fluctuating, with numbers increasing or decreasing depending on a number of factors, some known and some unknown. Efforts to take action were subject to the consequences of years where conditions were better and, as with the Bay, it was only stakeholders, mainly fishermen, began [*1277] to see a continual decline, that action was taken.²¹⁷ While the catch remained steady, evidence that the amount of effort going into catching each crab was increasing was finally accepted as a sign that the state of the crab fishery was suffering more than the fluctuations of a natural cycle.²¹⁸ When the fishermen perceived a problem, finally everyone could agree that the time had come to act.²¹⁹

a. Science First

For our purposes, the institutional process of the BBCAC's work is interesting. First, the organizers arranged for a two-day meeting for the scientists, described as a "charrette."²²⁰ It was the task of the scientists to determine both the

²¹¹ The Chesapeake Bay Commission reported that

in 1999 in Maryland alone, 29,000 recreational crabbers paid for a license that would allow them to run 1,200 feet of trotline or as many as 30 pots to catch crabs for personal use. Many more sport crabbers, who dangle lines with inexpensive baits such as chicken necks ... are not required to have a license, and though their catch per person may be quite small, with a burgeoning population in the Bay region the pressure put on crab stocks by recreational, as well as commercial, crabbers is likely significant and has the potential to grow. Chesapeake Bay Comm'n, Taking Action for the Blue Crab: Managing and Protecting the Stock and its Fisheries 5-6 (2001), available at <http://www.chesbay.state.va.us/Publications/Archive%20Publications/BBCACReportfinal.pdf> [hereinafter Taking Action for the Blue Crab].

²¹² State of the Chesapeake Bay 2002, supra note 207, at 10-11; cf. Taking Action for the Blue Crab, supra note 1, at 19 (discussing the need for additional scientific study on the role of underwater grasses and water quality on crab populations); Interview with Dr. Jack Greer, Assistant Director for Public Affairs, University of Maryland Sea Grant College, Annapolis, Md. (Oct. 18, 2008) (on file with author) (describing scientific studies that cast doubt on the view that the decline in SAV is solely or largely responsible for blue crab population declines).

²¹³ See, e.g., Bi-State Blue Crab Technical Advisory Committee, Blue Crab 2005: Status of the Chesapeake Population and Its Fisheries 6 (2006), available at <http://www.chesbay.state.va.us/Publications/CBC-CRAB-05.pdf>.

²¹⁴ See Policy for the Bay: Annual Report 1999, supra note 209, at 48. See id. at 49 for a breakdown of the members of the Advisory Committee. Pennsylvania plays no role in the blue crab fishery and therefore was not party to the multistate endeavor. In addition, since the blue crab is not classed as a migratory species, the federal Atlantic States Marine Fisheries Commission (ASMFC) has no jurisdiction over the blue crab. "Responsibility for the future of the Blue crab population rests squarely with the Bay states." Id. at 54. A third management jurisdiction, however, does play a role: the Potomac River Fisheries Commission. Id.

²¹⁵ Taking Action for the Blue Crab, supra note 211, at 4.

²¹⁶ Id. at 24.

²¹⁷ Id. at 8.

²¹⁸ Interview with Dr. Jack Greer, supra note 201.

²¹⁹ Id.

²²⁰ Id.

state of the fishery and the range in population levels the crab could sustain and still survive.²²¹ In other words, how many crabs were needed so that any unforeseen events would not wipe out the entire population? This decision then, about the required numbers of crabs, was not considered a management one.

As Dr. Greer, a key facilitator of the charrette, described it, the group of scientists who convened included experts from all the states, the federal agencies, and external research institutions both within the region and elsewhere.²²² The initial discussion worked from the informal guidelines of two studies that differed in their outcome.²²³ The research also included data collected from multiple sources, a key not only in the charrette but also when it came time to open up the discussion to other stakeholders, particularly crabbers.²²⁴ On the second day, the participants had reached sufficient agreement regarding the numbers to allow them to move on to deciding on the recommendations of threshold levels.²²⁵ It had already been decided that any outcome would be based on consensus and consensus was reached; the target adopted was a 15% reduction from current pressure on the crab stock.²²⁶

b. Stakeholders and Information Gathering

Meetings of the full group of the BBCAC with all its stakeholders followed the scientists' charrette.²²⁷ At this point, the group considered a number of nonscientific factors that might influence the means by which the scientists' [*1278] numbers were to be achieved.²²⁸ Repeatedly during the BBCAC's deliberations, "researchers noted the importance of drawing not only on the results of scientific studies, but also on the observations and experiences of watermen and others who work in the fishery, and on historical commercial harvest and other records."²²⁹ In addition, the Bi-state Committee focused its efforts not only on the biology of the blue crab, but also on "the complexity of the fishery itself."²³⁰ As such, the policy decisions clearly took humans into account. Consultations were held with multiple stakeholders around the Bay, explaining the scientists' decisions and setting out the possible means of achieving the numbers.²³¹

c. Post-BBCAC Crab Protections

In the wake of the recommendations of the BBCAC, Virginia and Maryland eventually took action designed to achieve the recommended 15% reduction in harvest pressure over a three-year period.²³² Yet, at least in Maryland, the legislature initially stalled and the commercial crabbers were not happy with the scientists' work.

²²¹ Id.

²²² Id. Although there was, initially, some discussion about breaking off small groups to agree on the data first, it was decided that the group should remain as a whole. Id. This is significant, because it suggests that at least some of the participants believed that the question of the data could be kept separate from the question of threshold requirements for the viability of the species.

²²³ Id.

²²⁴ Id.

²²⁵ Id.

²²⁶ See Taking Action for the Blue Crab, *supra* note 211, at 11-12 (stating that a 15% decrease in harvest may be needed to meet a target that would double blue crab spawning potential).

²²⁷ See *id.* at 7 (describing a "final consensus effort" wherein insights and information were gathered from stakeholders at public meetings).

²²⁸ See *id.* at 8 (discussing the "powerful frustrations and anxieties" raised by citizens at the public meetings, including water quality issues, unintended species impacts, and burdens on commercial fisheries).

²²⁹ Id. at 5.

²³⁰ Id.

²³¹ See *id.* at 8 (discussing a series of public forums held around the Bay to present proposed thresholds, targets, and potential management options to stakeholders and the public).

²³² See Joel McCord, Panel Warns About Danger to Blue Crabs, *Balt. Sun*, May 14, 2001, at 1B, available at 2001 WLNR 1045569 (describing the agreement as "prompted by earlier scientific warnings about declining crab stocks" in order to preserve the industry).

The Administrative, Executive, Legislative Review Committee of the Maryland legislature "rejected proposed emergency regulations that [would] limit commercial crabbers to an eight-hour workday and [would] tighten requirements that they take off one day a week," thereby delaying the implementation of the regulations.²³³ These regulations would have cut the harvest pressure on Maryland crabs by 5.5% in the first year, and were intended to reduce crabbing in the state by 15% over the next three years.²³⁴ The Maryland legislature had imposed limits on recreational crabbers, but was unwilling to impose limits on commercial crabbers.²³⁵

The Maryland Administrative, Executive, Legislative Review Committee's action stalling the new regulations was supported by some Eastern Shore [*1279] watermen, but was inconsistent with what Governor Glendening had wanted.²³⁶ The watermen believed the regulations were based on faulty science and argued that "crab stocks are cyclical," and that "although they reached record lows last season, they could bounce back next season."²³⁷ By contrast, the National Oceanic and Atmospheric Administration (NOAA) did not think that phasing the 15% reduction in over three years would be sufficient, claiming "one significant environmental event, such as a hurricane or a flood, could trigger a collapse of the bay population."²³⁸

Governor Glendening subsequently imposed regulations limiting hours and also closed the crab season a month early.²³⁹ Virginia, which had been imposing restrictions for some years, imposed restrictions in 2001 that would cut Virginia's state harvest by at least 6% during that year.²⁴⁰

What happened in the ensuing years, however, led to a decline in the political rhetoric favoring protection efforts. In 2003, the successor to the BBCAC, the Blue Crab Technical Advisory Committee,²⁴¹ concluded that the blue crab population had stabilized, albeit at a historic low.²⁴² But in 2005 the numbers were high, a trend that continued into 2006.²⁴³ In 2006, no report was issued due to lack of resources and, likely, a faith in the numbers, which were still so promising.²⁴⁴ By 2006, it appeared the blue crab fishery had turned a corner. Until 2007.

In 2007, numbers of blue crab were once again worryingly low; the abundance of juvenile crabs was the second low-

²³³ See Joel McCord, Panel Rejects Proposals to Cut Blue Crab Harvest; Committee's Action will Delay Start of Emergency Regulations, *Balt. Sun*, Apr. 25, 2001, at 2B, available at 2001 WLNR 1044065 (discussing how the regulations, which could have taken effect immediately, could not go into effect until July 23 because of the lack of Administrative, Executive, and Legislative Review Committee approval).

²³⁴ See *id.* (describing possible implementation of stricter regulations to achieve an immediate 5.5% reduction in Maryland's crab harvest, despite the "sharp blow" to Maryland's goal of a 15% reduction over three years).

²³⁵ See McCord, *supra* note 232 (discussing the legislature's adoption of a licensing program and setting of catch limits for recreational crabbers, and its rejection of emergency regulations for commercial crabbers).

²³⁶ See McCord, *supra* note 233 (describing the vote as pleasing Eastern Shore watermen, but angering Governor Glendening). The Governor could impose regulations without approval if they were not emergency regulations. *Id.*

²³⁷ *Id.* (quoting Joseph T. DeAlteris, a University of Rhode Island fisheries professor hired by the watermen). Further, "Terry Conway, a Crisfield seafood packer, said the state should delay implementing the regulations until results from a crab stock survey this year are known. The regulations "are the most severe in the last 35 years and we are discouraged that the watermen, always an easy target, are being asked again to bear the burden." *Id.*

²³⁸ See McCord, *supra* note 232 (quoting NOAA's 2001 report).

²³⁹ Joel McCord, Glendening Sets Limits, Trims Blue Crab Season, *Balt. Sun*, Apr. 28, 2001, at 1A, available at 2001 WLNR 1032311.

²⁴⁰ *Id.* Yet the Maryland watermen were upset that the early end to their season would actually give Virginia watermen the edge. *Id.*

²⁴¹ Interview with Dr. Jack Greer, *supra* note 201. Greer explains that the BBCAC had been followed by a Technical Advisory Committee, maintained to keep in touch with the scientists and to issue annual reports, so that data was not just coming from the states. *Id.*

²⁴² Chesapeake Bay Stock Assessment Comm., Blue Crab Advisory 2003 1 (2003), available at <http://noaa.chesapeakebay.net/docs/2003BCAR.pdf>.

²⁴³ Rona Kobell, Bay's Juvenile Blue Crabs Reach Their Highest Levels Since 1997, *Balt. Sun*, Apr. 2, 2005, at 1B, available at 2005 WLNR 5197267.

²⁴⁴ Interview with Dr. Jack Greer, *supra* note 201.

est on record and the number of females was also at seriously low levels.²⁴⁵ Yet by 2007, the Blue Crab Technical Advisory Committee was inactive.²⁴⁶ In the spring of 2008, the Governors of Maryland and Virginia finally responded to the new numbers, agreeing in April 2008 to join efforts to reduce by one-third the number of female blue crabs [***1280**] harvested from the bay,²⁴⁷ while some watermen questioned the actions and worried about their livelihoods.²⁴⁸ Senators and Governors of both states also sought emergency status for the area and the federal funding that would bring.²⁴⁹ Yet in August 2008, the Virginia legislature's budget cuts seemed likely to force suspension of some of the regulations proposed to meet the Governors' April agreement.²⁵⁰ In July 2008, the Chesapeake Bay Stock Assessment Committee reported numbers for 2008 that were lower than those of 2007.²⁵¹

Thus, at the time of writing, the fate of the blue crab remains uncertain. The work of the scientists and BBCAC was undoubtedly helpful in generating the kind of response the Governors provided. With scientific consensus on the numbers, political support for changes to fishing regulations was easier to find. While the Governors of Virginia and Maryland were willing to step forward to take action and some provisions remain in effect, there remains a real possibility that the regulations will be subject to changes in political momentum as the short-term economic needs of watermen come to the forefront.

Ultimately, with no forum to consider long-term planning and broader issues than the immediate survival of the species, the future of the blue crab now appears destined to be in the hands of short-term reviews and political will, rather than any long-term planning process.²⁵²

4. Goals and Protection of the Blue Crab in the Chesapeake Bay

What is the significance of this? The 2007 and 2008 figures represent two years that may turn out not to be critical. Maryland and Virginia are both taking at least some action in the face of the worrying figures. It is too early to know what will come of the blue crab fishery and the blue crab, yet the process and the reactions to the blue crab trends shed light on a few of the concerns in this Article.

During the process, the scientists were engaged in a collaborative process and subsequent discussions involved broad stakeholder participation. All of these processes led to better information and to some momentum that certainly contributed to the political will for Maryland to take action and Virginia to continue action. These processes and the flexibility and stakeholder participation in them are consistent with the overall model of how the Chesapeake Bay Program works and fit with many of the central tenets of ecosystem management and the new governance writers.

[***1281**] However, these processes were initially sparked by the dire straits of the species. And when those dire straits were no longer evident, the rhetoric of nonregulation quickly returned. The dominance of short-term economic and political interests over long-term protection goals is striking. Only when the numbers fall to critical lows again is the political will to act revived.

The problem for the blue crab is not a lack of goals, per se. Indeed, the overall goal of protecting and restoring liv-

²⁴⁵ Chesapeake Bay Stock Assessment Comm., 2007 Chesapeake Bay Blue Crab Advisory Report 1 (2007), available at <http://chesapeakebay.noaa.gov/docs/2007bluecrabadvisorreport.pdf>.

²⁴⁶ Interview with Dr. Jack Greer, supra note 201.

²⁴⁷ Rona Kobell and Chris Guy, Governors Act to Cut Harvest of Crabs, Balt. Sun, Apr. 16, 2008, at 1A, available at 2008 WLNR 7085048.

²⁴⁸ Chris Guy, Crabbers Reporting a Rich Early Harvest, Watermen Question State Call for Short Season, Balt. Sun, Jun. 19, 2008, at 1A, available at 2008 WLNR 11553331.

²⁴⁹ Associated Press, Disaster Status Sought for Crabs, Daily Press, Jun. 26, 2008, at A2, available at 2008 WLNR 12047391.

²⁵⁰ Sun News Services, State Budget Cuts Force Suspension of Project to Limit Harvests of Female Crabs from the Chesapeake Bay, Balt. Sun, Aug. 28, 2008, at 12A, available at 2008 WLNR 16347203.

²⁵¹ NOAA Chesapeake Bay Stock Assessment Comm., 2008 Chesapeake Bay Blue Crab Advisory Report 1 (2008), available at <http://noaa.chesapeakebay.net/docs/CBSAC2008bluecrabreport.pdf>.

²⁵² See Jack Greer, Taking Stock of Blue Crabs, 5 Chesapeake Q. 4, 10 (2007) (describing the concerns of Tom Miller, a key player in actions for the blue crab, regarding the lack of an effective forum for discussing issues relating to the types of fisheries requiring management).

ing resources and mention of the blue crab is set out in the 2000 Chesapeake Bay Agreement.²⁵³ Yet, that goal is too broad to assist in on-the-ground management. When the numbers became critical enough to generate sufficient political support, the parties established the BBCAC, presumably with the intention of creating specific benchmarks for the blue crab. Yet the discussion of goals for the blue crab by the Chesapeake Bay Program is telling:

Preserving the Chesapeake Bay's valuable blue crab resource, both now and for the future, will require not only our very best science - including knowledge about the crab's biology and behavior provided by the watermen themselves - but also our best social science and our wisest political leadership. Those who care about the blue crab must ask some very difficult questions. For example, what constitutes the over-riding goal of the blue crab management in the Chesapeake Bay? Is the goal the most efficient harvesting regime possible - that is, the taking of the largest harvest of crabs for the least cost in terms of human effort expended, fuel consumed, equipment purchased? Or is the goal the employment of the greatest number of watermen, in order to sustain the Chesapeake's fishing heritage? Or is the goal realizing the greatest return in profits, by harvesting the highest value product, for example, such as soft crabs for export? Should the blue crab industry be subject to the same competition and, for that matter, protections as any other industry? Or because of its nature, is the blue crab fishery in the Chesapeake Bay something different and deserving of special treatment?²⁵⁴

This statement is all about goals. Yet, the BBCAC itself failed to answer these questions directly.²⁵⁵ And to the extent that these questions were relevant to the decisions by the BBCAC, this statement barely addresses a discussion of long-term protection, including long-term protection of the blue crab to ensure ecological integrity.²⁵⁶

To the extent that there is a goal of long-term protection implicit in the scientists' numbers, that might reassure us. The scientists working on the blue crab [*1282] want to support protection; the very target established by the Committee report - a 15% reduction in harvest pressure - suggests an implicit assumption that long-term protection is desired. So the problem is not that the scientists have no desire to ensure long-term protection. Indeed, it seems, as suggested above, that scientists may be the group that is best placed to represent the interest of long-term protection. As we saw, the scientists' compelling evidence can, in turn, help generate political support for protection.

The more concrete goal - the 15% reduction proposal - also does not provide sufficient guarantee of protection. The 15% proposal was precisely that: a proposal. It represents a flexible benchmark that can be changed with new scientific evidence, input from stakeholders, or both.

Thus, the management of the blue crab in the Chesapeake Bay is an example of a situation where we are faced with broad, indefinite goals and an insufficient emphasis on long-term protection needs, combined with flexible science-set benchmarks that are susceptible to the political process once they leave the safe haven of the scientists' charrette.²⁵⁷ The blue crab's primary value in this process is for the commercial fishermen; this, in turn, skews the debate, such that even the most conscientious scientists cannot ensure that long-term management will be the goal. The assumption that the process of the BBCAC, including the involvement of the scientists and other stakeholders, would enunciate and protect all the values at stake has not proven to be a valid one.

²⁵³ Chesapeake 2000, *supra* note 163, at 2-3. The 2000 Agreement has the goal of establishing by 2001 "harvest targets for the blue crab fishery and begin implementing complementary state fisheries management strategies Baywide" and to "manage the blue crab fishery to restore healthy spawning biomass, size, and age structure." *Id.* at 3.

²⁵⁴ Policy for the Bay: Annual Report 1999, *supra* note 209, at 54.

²⁵⁵ The thresholds and target were major accomplishments, says Miller, but he still isn't fully satisfied. The target may be right in terms of general stock dynamics, he says, but he's disappointed that it doesn't do more. "What kind of fishery do we want to manage for?" he asks. "Do we want more hard crabs or more soft crabs? Do we want more protection of females? In certain places? At certain times?" Greer, *supra* note 252.

²⁵⁶ Although the opening sentence of the passage from the Bay's Annual Report of 1999, quoted above, refers to long-term protection, the remainder of the passage focuses on economic needs. See Policy for the Bay: Annual Report 1999, *supra* note 209, at 54.

²⁵⁷ See Ernst, *supra* note 157, at 105-06, 119-20 (discussing how "disjointed management approaches" by the states "reflect political boundaries more than the ecological needs of the crab," and discussing the effect of the "political clout" of commercial fishermen and the seafood industry on regulations in Maryland and Virginia).

So in **2008**, at the time of writing, it is unclear whether the interest in the long-term survival of the blue crab will be able to compete against the short-term economic pressures presented by the watermen.

C. The Ramsar Convention on Wetlands and the Protection of Wetlands

Wetlands are one of the few ecosystems that have been exhaustively analyzed for the value of the multiple benefits they provide humans.²⁵⁸ Wetlands often have economic and cultural significance for humans, as well as providing habitat for numerous species.²⁵⁹ As such, protection and conservation efforts for wetlands are crucial, both to ensure their survival in the face of heavy pressure and to ensure that they can continue to provide the services they do. The Ramsar Convention on Wetlands of International Importance has been, since 1971, the international legal instrument that seeks to ensure that protection on a global scale.²⁶⁰

[*1283] In part, perhaps because of the international law context in which it was negotiated, the Ramsar Convention's institutional design has a lot of similarities with the institutions proposed by ecosystem management writers and new governance writers.²⁶¹ At the same time, the Convention has "entered into a mature stage,"²⁶² changing over the years from a Convention primarily focused on individual species to one that has expanded in scope to address ecosystems and the place of humans within them. Recent decisions by the parties to the Convention demonstrate an interest in reflecting the ecological reality that humans are very much a part of the ecosystem.²⁶³ As such, the Convention is an ideal regime to study for the purposes of this Article. This section begins with an overview of how the Convention works to provide a basis for understanding the activity of its parties.

1. The Convention's Obligations

The Ramsar Convention was originally negotiated as a result of a push by nongovernmental organizations (NGOs) primarily concerned with the protection of individual species of waterfowl.²⁶⁴ Yet even in its earliest days, the Convention's text recognized the need for more than a focus on individual species and called for the protection of wetlands that were of importance as habitat for those waterfowl. To achieve this protection, the Convention's text relies in

²⁵⁸ See, e.g., Robert Costanza et al., *The Value of the World's Ecosystem Services and Natural Capital*, 387 *Nature* 253, 256 (1997). This valuation still does not employ more than utilitarian values.

²⁵⁹ See *id.* at 259.

²⁶⁰ See Ramsar Convention Secretariat, *What is the Ramsar Convention on Wetlands?* 1 (2007), available at <http://ramsar.org/about/info2007-02-e.pdf>. The Convention currently has 158 parties and 1820 listed sites totaling over 168 million hectares. Contracting Parties to the Ramsar Convention on Wetlands, *Key Documents of the Ramsar Convention*, <http://www.ramsar.org/keycp.e.htm> (last visited Nov. 16, 2008).

²⁶¹ The Ramsar Convention was negotiated at a time when the international legal principle of permanent sovereignty over natural resources was at its heyday, as reflected in the Convention's Preamble and text. Ramsar Convention, *supra* note 23, at pmb1. (recognizing that an international treaty is appropriate because "waterfowl in their seasonal migrations may transcend frontiers and so should be regarded as an international resource"); see, e.g., *id.* at art. 2, para. 3 ("The inclusion of a wetland in the List does not prejudice the exclusive sovereign rights of the Contracting Party in whose territory the wetland is situated."); see also *id.* at art. 2 para. 5 (allowing designated sites' boundaries to be deleted or restricted because of urgent national interests). This context may have resulted in fewer substantive obligations and a convention that relies primarily on information exchange and shaming to achieve its goals. The principle of state sovereignty over natural resources in international law was expressed as early as 1952. *Right to Exploit Freely Natural Wealth and Resources*, G.A. Res. 626, para. 1, U.N. GAOR, 7th Sess., Supp. No. 20, U.N. Doc. A/2361 (Dec. 21, 1952).

²⁶² Gonzalo Castro, Kenneth Chomitz & Timothy S. Thomas, *The Ramsar Convention: Measuring its Effectiveness for Conserving Wetlands of International Importance* 2 (2002), available at <http://www.ramsar.org/cop8/cop8doc37.e.pdf>; see also M.J. Bowman, *The Ramsar Convention Comes of Age* § 13 (1995), <http://ramsar.org/keylawbowman.htm> (last visited Nov. 16, 2008) (describing the Convention as having "come of age").

²⁶³ Bowman, *supra* note 262, § 6.

²⁶⁴ The Convention began firmly as a Convention focused on individual species of waterfowl. Through the 1960s, the International Waterfowl Research Bureau (a forerunner to Wetlands International), the IUCN, and the International Council for Bird Preservation (now known as BirdLife International) collaborated to discuss the problem of disappearing habitat for wild birds and to propose a solution, with some help from certain national governments, including the Dutch government. Cyril de Klemm & Isabelle CrEteaux, *The Legal Development of the Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat* (1995), <http://www.ramsar.org/lib/liblegal.e.htm> (last visited Nov. 16, 2008). Their proposed text was presented at the conference in Ramsar in Iran in 1971 and adopted. *Id.*

part on a list - the List of Wetlands of International Importance.²⁶⁵ The grounds for designation on the [*1284] Convention's list - the textual criteria - are set out in Article 2(2).²⁶⁶ The development of these textual criteria over the years demonstrates a shift from a focus on individual species to recognition of the broader role that wetlands play in conservation and the relationship between humans and wetlands. Thus, while the earliest criteria negotiated in 1974 specified numbers of waterfowl as criteria for designation as a Wetlands of International Importance, the more recent criteria refer to evaluating the connection a wetland has to a major river basin or coastal system, as well as referring to waterbirds and fish.²⁶⁷

Article 3 then supplies the substantive obligations for wetlands in a state party's territory. Parties are to formulate and implement their national wetlands planning "so as to promote the conservation of the wetlands included in the List, and as far as possible the wise use of wetlands in their territory."²⁶⁸ All wetlands, it seems, are covered by the Convention, although the implication from the text of the Convention is that unlisted sites may be treated differently from listed sites.²⁶⁹ In addition, Article 3 requires parties to "arrange to be informed at the earliest possible time if the ecological character of any wetland in its territory and included in its List has changed, is changing or is likely to change as the result of technological developments, pollution or other human interference."²⁷⁰ Thus, the [*1285] states are required not only to list sites but also to remain informed if the "ecological character" is changing as a result of human-caused activities.

These obligations are limited and consist of exhortations to plan and stay informed, rather than clear directions to protect. However, the Convention also relies strongly on procedural requirements. The parties commit to encouraging research and the exchange of data and publications regarding wetlands and their flora and fauna, endeavoring "through management to increase waterfowl populations on appropriate wetlands [and] ... promote the training of personnel competent in the fields of wetlands research, management and wardening."²⁷¹ The parties also commit to consulting with each other, particularly where wetlands cross borders, and agree they shall "at the same time endeavor to coordinate and support present and future policies and regulations concerning the conservation of wetlands

²⁶⁵ The Chesapeake Bay Estuary is on the Ramsar Convention's List of Wetlands of International Importance. Secretariat of the Ramsar Convention on Wetlands, *The List of Wetlands of International Importance 39* (2008), available at <http://ramsar.org/sitelist.pdf>.

²⁶⁶ As Article 2, paragraph 2 states: "Wetlands should be selected for the List on account of their international significance in terms of ecology, botany, zoology, limnology or hydrology. In the first instance wetlands of international importance to waterfowl at any season should be included." Ramsar Convention, *supra* note 23. These requirements have required substantial elaboration over the years, and their elaboration has been a key aspect of the Convention's development from a convention focused on individual species of waterfowl to one concerned about ecosystems in general. See Bowman, *supra* note 262, § 7. Continuing the theme of the importance of waterfowl in the convention, Article 2, paragraph 6 adds that "each Contracting Party shall consider its international responsibilities for the conservation, management and wise use of migratory stocks of waterfowl, both when designating entries for the List and when exercising its right to change entries in the List relating to wetlands within its territory." Ramsar Convention, *supra* note 23. Parties must designate at least one site when they sign the Convention or when they deposit its instrument of ratification or succession. *Id.* art. 2 para. 4.

²⁶⁷ Int'l Conference on the Conservation of Wetlands and Waterfowl Heiligenhafen, 2-6 Dec. 1974, Recommendations of the International Conference on the Conservation of Wetlands and Waterfowl, http://www.ramsar.org/rec/key_rec_0_1974.htm (last visited Nov. 15, 2008) (the first 1974 criteria for designation). Cf. Ramsar Convention Secretariat, *Criteria for Adopting Wetlands of International Importance*, http://www.ramsar.org/key_criteria.htm (last visited Nov. 15, 2008) (referring to sites containing representative rare or unique wetland types in addition to criteria based on species and ecological communities); Ramsar Convention Secretariat, *Strategic Framework and Guidelines for the Future Development of the List of Wetlands of International Importance of the Convention on Wetlands (Ramsar, Iran, 1971)*, http://www.ramsar.org/key_guide_list2006_e.htm (last visited Nov. 15, 2008) (including "wetlands that play a substantial ecological or hydrological role in the natural functioning of a major river basin, lake, or coastal system").

²⁶⁸ Ramsar Convention, *supra* note 23, art. 3 para. 1 (emphasis added). States are also required to "promote the conservation of wetlands and waterfowl by establishing nature reserves on wetlands, whether they are included in List or not, and provide adequately for their wardening." *Id.* art. 4 para.1.

²⁶⁹ The phrase "wise use" should be understood differently from the "wise use movement" in the United States, which adopted the concept of wise use by political groups opposed to many environmental protection efforts. Ramsar Convention Secretariat, *The Wise Use Resource Centre*, http://www.ramsar.org/wurc/wurc_index.htm (last visited Nov. 16, 2008). The phrase as used in the Convention, rather, demonstrates an attempt to recognize that humans are part of the ecosystem - in wetlands, fishing and recreation are a part of the system.

²⁷⁰ Ramsar Convention, *supra* note 23, art. 3 para. 2 (emphasis added).

²⁷¹ *Id.* art. 4 paras. 3-5.

and their flora and fauna.”²⁷²

Perhaps unsurprisingly, because this is an international instrument, the Convention contains no explicit enforcement mechanisms in its text. Indeed, the text itself contains no formal requirements for states to report the state of their wetlands. Degradation of listed wetland sites or failure to implement the required national wetlands planning policies are not punished, as such, but monitored. No longer meeting the site criteria for listing is grounds for removal from the list rather than any kind of punishment or otherwise of the country that has allowed this level of degradation.

²⁷³

Nevertheless, the Convention’s means of shaming states into better protection has developed over the years and in some ways resembles a flexible approach in keeping with a modern sense that top-down attempts to enforce obligations that are dependent on complex internal policies will not work. Persuasion is the preferred strategy. In addition, the idea that protection priorities and strategies should be undertaken at the national - and perhaps even local - level is in keeping with the nonhierarchical and multiscale institutions advocated by ecosystem management writers.

To facilitate the procedural mechanisms, at the First Conference of the Parties, the parties decided that reports should be submitted prior to each Conference.²⁷⁴ This has now become a regular practice with parties submitting reports to allow for review of progress, although parties sometimes fail to submit such reports.²⁷⁵ If listing is the heart of the Convention’s substantive obligations, reporting lies at the heart of its procedural obligations. Standardizing reporting formats and guidelines for states to make compliance with these requirements easier has become an urgent [*1286] task for the parties.²⁷⁶ The Secretariat of the Convention also gains information by undertaking fact-finding missions of its own.²⁷⁷

Among the devices of the Convention is the use of Recommendations at the Conferences of the Parties to make statements about the status of various wetlands and recommendations.²⁷⁸ Although such recommendations are not binding in law, unlike the text of the Convention, these recommendations nevertheless have considerable weight. As De Klemm says, “the parties which accepted the recommendation have, at the very least, a moral obligation to comply with its terms.”²⁷⁹

This kind of shaming and the listing process itself can promote protection in two ways. First, listing can buttress attempts at protection by one political entity within a country against another that may be threatening a listed site. An internal political jurisdiction, such as a state, province, or perhaps a government department,²⁸⁰ can draw on in-

²⁷² *Id.* art. 5.

²⁷³ Guidance for Addressing Ramsar Sites or Parts of Sites Which No Longer Meet the Criteria for Designation, Res. IX.6, 9th Meeting of the Conference of the Contracting Parties to the Convention on Wetlands (Ramsar, Iran, 1971) (Nov. 8-15, 2005), available at <http://www.ramsar.org/res/> key res ix 06 e.pdf.

²⁷⁴ See Bowman, *supra* note 262, § 98 (noting that the Groningen Conference called upon all parties to submit reports to the Bureau at least six months prior to the holding of each meeting of the Conference).

²⁷⁵ *Id.*

²⁷⁶ See, e.g., Synergies with Other International Organizations Dealing with Biological Diversity; Including Collaboration on, and Harmonization of, National Reporting Among Biodiversity-related Conventions and Agreements, Res. IX.5, 9th Meeting of the Conference of the Contracting Parties to the Convention on Wetlands (Ramsar, Iran, 1971) (Nov. 8-15, 2005), available at [http://www.ramsar.org/res/key res ix 05 e.pdf](http://www.ramsar.org/res/key/res/key%20ix%2005.pdf) (requesting that work on harmonizing of national reporting requirements be continued).

²⁷⁷ See Ramsar Convention Bureau, The Ramsar Convention’s Swiss Grant for Africa, [http://www.ramsar.org/swiss/key swiss rpt2006.htm](http://www.ramsar.org/swiss/key/swissrpt2006.htm) (last visited Nov. 15, 2008).

²⁷⁸ See, e.g., The Status of Sites in the Ramsar List of Wetlands of International Importance, Res. IX.15, 9th Meeting of the Conference of the Contracting Parties to the Convention on Wetlands (Ramsar, Iran, 1971) (Nov. 8-15, 2005), available at [http://www.ramsar.org/res/key res ix 15 e.pdf](http://www.ramsar.org/res/key/res/key%20ix%2015.pdf). See also de Klemm & CrEteaux, *supra* note 264.

²⁷⁹ de Klemm & CrEteaux, *supra* note 264; see also Royal C. Gardner, Perspectives on Wetlands and Biodiversity: International Law, Iraqi Marshlands, and Incentives for Restoration, *15 Colo. J. Int’l Env’tl. L. & Pol’y* 1, 7 (2003) (discussing the possibility that resolutions adopted by consensus at conferences of the parties may be considered as sources of international obligation).

²⁸⁰ Simon Lyster, *International Wildlife Law* 190 (1985).

ternational listing to advocate protection against competing domestic concerns.²⁸¹

Second, externally, listing can provide a strong impetus for protection efforts by other countries, or perhaps more significantly, nonstate transnational actors.²⁸² The fact that a site is listed as internationally important adds to the power of NGO rhetoric if that site is threatened. While many Ramsar sites may be listed nationally before they are listed internationally, an international listing makes a challenge to state action threatening a site or a challenge to a private transnational actor [*1287] threatening a site more compelling. International listing can also legitimize the authority of transnational public interest actors to call for protection.

In this way, the Convention's procedural mechanisms work with the substantive obligations, leading to the possibility that even a lack of strong substantive obligations and strict enforcement mechanisms will lead to compliance. In addition, in an important function for an international body, the Convention's Secretariat provides guidance to states for determining when sites warrant listing and when there are changes to their ecological character.²⁸³ The website facilitates communication by posting guidance on wetlands planning and by posting the laws of other states, allowing for the sharing of information.²⁸⁴ National Wetlands Policies are, therefore, available for states wishing to undertake this task. As well as facilitating information exchange for more effective protection, this kind of activity can also enhance compliance.²⁸⁵

The Convention facilitates national activities in several manners. Realizing early on that an incentive might be needed to persuade cash-strapped developing countries to sign up to the Convention, the parties passed a resolution to provide financial support, which, along with technical support, has increased over the years.²⁸⁶ In addition, the Convention uses its website as a clearinghouse for information, posting national planning legislation from different countries and providing guidance for a country to develop its legislation.²⁸⁷ Although funding could be greater, the Convention has become a beneficiary of the Global Environmental Facility (GEF) and has been able to fund projects with its help.²⁸⁸

Thus, the Convention's approach follows many of the design requirements proposed by ecosystem management and new governance writers for institutions that are adaptive and responsive to science, and the procedural obligations that facilitate information exchange and allow for adaptability and responsiveness have become as significant for the Convention's operation as the substantive obligations for protection.

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²⁸¹ See generally David Farrier & Linda Tucker, *Wise Use of Wetlands Under the Ramsar Convention: A Challenge for Meaningful Implementation of International Law*, 12 *J. Envtl. L.* 21 (2000). See also STINAPA Bonaire National Parks Foundation, *Annulment of Decisions for Building near Ramsar Site on Bonaire Was Justified*, <http://www.stinapa.org/pdfs/Annulment-of-decisions-for-building-near-Ramsar-site-on-Bonaire.pdf> (last visited Nov. 16, 2008) (describing the efforts of STINAPA Bonaire, a nonprofit environmental group in the Netherlands Antilles, to overturn the decision of the Government of Bonaire to build near a Ramsar site by appealing to the Governor-General of the Netherlands Antilles and Queen Beatrix of the Netherlands).

²⁸² See generally Margaret E. Keck & Kathryn Sikkink, *Activists Beyond Borders: Advocacy Networks in International Politics* (1998) (discussing the impact environmental advocacy networks have had on various environmental conservation issues); Anne-Marie Slaughter, *International Law and International Relations*, 285 *Recueil des Cours* 9, 96-151 (2000) (discussing the increased role of nongovernmental organizations in international law making).

²⁸³ See Ramsar Convention, *supra* note 23, art. 8; Ramsar Convention Secretariat, *Handbook 11, Inventory, Assessment, and Monitoring: An Integrated Framework for Wetland Inventory, Assessment, and Monitoring* (3d ed. 2007), available at <http://www Ramsar.org/lib/lib/handbooks2006/e11.pdf>.

²⁸⁴ See Ramsar Convention Secretariat, *The Wise Use Resource Library*, <http://www Ramsar.org/wurc/wurc/library.htm#nwps> (last visited Nov. 16, 2008); Ramsar Convention Secretariat, *The Handbooks for the Wise Use of Wetlands* (3d ed. 2007), <http://www Ramsar.org/lib/lib/handbooks2006/e.htm> (last visited Nov. 16, 2008); Ramsar Convention Secretariat, *The Guidelines Adopted by the Conference of the Contracting Parties to the Ramsar Convention on Wetlands*, <http://www Ramsar.org/key/guidelines/index.htm> (last visited Nov. 16, 2008).

²⁸⁵ See generally Abram Chayes & Antonia Handler Chayes, *The New Sovereignty: Compliance with International Regulatory Agreements* (1995) (arguing that information leads to a reduction in transaction costs which in turn facilitate compliance).

²⁸⁶ Michael J. Bowman, *International Treaties and the Global Protection of Birds: Part I*, 11 *J. Envtl. L.* 87, 99 (1999).

²⁸⁷ See *supra* note 284.

²⁸⁸ See, e.g., Global Environmental Facility, *Looking Forward: GEF Support for Wilderness Areas 1* (2005), available at [http://www.gefweb.org/Projects/FocalAreas/bio/documents/Looking forward GEF Support for Wilderness Areas.pdf](http://www.gefweb.org/Projects/FocalAreas/bio/documents/Looking%20forward%20GEF%20Support%20for%20Wilderness%20Areas.pdf).

2. The Convention's Substantive Obligations: Wise Use and Conservation

In addition to the structure of the Convention itself, the work of the parties and Secretariat over the years has contributed greatly to the Convention's emergence as an apparent model of flexible and innovative activity.²⁸⁹ As we have seen, the Convention requires the listing and conservation of sites of international significance and the wise use of wetlands in state parties' territories.²⁹⁰ In addition, parties must stay informed about changes to the ecological character of their listed sites that are caused by humans.²⁹¹ To provide adequate guidance to the parties, these terms all needed to be interpreted through the years.

As the Convention has matured, it has increasingly recognized that the limited scope of attention on individual species of waterfowl is too narrow. Taking a broad reading of the text of the Convention, the parties have added criteria for listing that minimize the role of waterfowl populations and recognize aspects of the entire ecosystem, biological diversity, and other species, such as fish.²⁹²

In addition, the parties have increasingly recognized the close relationship between humans and wetlands, and increasingly stress the relationship between poverty reduction and wetlands protection.²⁹³

Accordingly, the parties' delegates to the Conferences of the Parties have addressed the question of how much, if at all, to distinguish human activity from so-called natural processes. While some commentators believe that the Convention has not yet gone far enough in breaking down the distinction between nature and [*1289] humans,²⁹⁴ the work of the Ramsar Convention is significantly more advanced than other international treaties of the same age.²⁹⁵

The 2005 definitions agreed upon at the Ninth Conference of the Parties reflect a culmination of the direction of previous activity at the Conferences of the Parties that lays bare the difficulties addressed in this Article. Although, in the earliest days of the Convention, the "wise use" obligation was treated distinctly from the need to maintain the "ecological character" of listed sites,²⁹⁶ the Ninth Conference of the Parties' definitions essentially merged the two con-

²⁸⁹ See, e.g., John Lanchbery, Long-Term Trends in Systems for Implementation Review in International Agreements on Fauna and Flora, in *The Implementation and Effectiveness of International Environmental Commitments: Theory and Practice* 57-77 (David G. Victor, Kal Raustiala & Eugene B. Skolnikoff eds., 1998) (finding that the Ramsar Convention's system for implementation review "has undoubtedly provided the parties with some of the information that has enabled them to make the agreement more effective").

²⁹⁰ Ramsar Convention, *supra* note 23, art. 2 paras. 1, 6.

²⁹¹ *Id.* art. 3 para. 2.

²⁹² See *id.* art. 2 para. 2.

²⁹³ See generally *Wetlands and Poverty Reduction*, Res. IX.14, 9th Meeting of the Conference of the Contracting Parties to the Convention on Wetlands (Ramsar, Iran, 1971) (Nov. 8-15, 2005), available at <http://www.ramsar.org/res/key> res ix 14 e.pdf; *Taking into Account the Cultural Values of Wetlands*, Res. IX.21, 9th Meeting of the Conference of the Contracting Parties to the Convention on Wetlands (Ramsar, Iran, 1971) (Nov. 8-15, 2005), available at <http://www.ramsar.org/res/key> res ix 21 e.pdf; 9th Meeting of the Conference of the Parties to the Convention on Wetlands (Ramsar, Iran, 1971), Kampala, Uganda, Nov. 8-15, 2005, *Wetlands and Poverty Reduction: Case Study Examples of Where Wetland Wise Use and Management Have Contributed to Poverty Reduction*, Ramsar COP9 Doc. 33, available at <http://www.ramsar.org/cop9/cop9> doc33 e.pdf [hereinafter *Wetlands and Poverty Reduction*]. The Meetings of the Conferences of the Parties were first named at the Seventh Meeting. Since then, every meeting has referred to the relationship of wetlands and people. The Seventh Conference of the Parties was named "People and Wetlands: The Vital Link." See Ramsar Convention Bureau, Conference Report of Ramsar COP7, http://www.ramsar.org/cop7/cop7_conf_rpt_e.htm (last visited Nov. 16, 2008). The Eighth Conference of the Parties was named "Wetlands, Water, Life, and Culture." See Ramsar Convention Bureau, Conference Report of Ramsar COP8, http://www.ramsar.org/cop8/cop8_conf_rpt_e.htm (last visited Nov. 16, 2008). The Ninth Conference of the Parties was named "Wetlands and Water: Supporting Life, Sustaining Livelihoods." Ramsar Convention Secretariat, Resolutions of the 9th Meeting of the Conference of the Parties, <http://www.ramsar.org/res/key> res ix index e.htm (last visited Nov. 16, 2008).

²⁹⁴ See Farrier & Tucker, *supra* note 281, at 32.

²⁹⁵ See Bill Phillips, Ramsar Rebuttal on Importance of the Wise Use Principle, <http://www.ramsar.org/wn/w.n.wise> use article response.htm (last visited Nov. 16, 2008) (reviewing Farrier & Tucker, *supra* note 281, and arguing that the Convention has gone a long way to ensuring that parties are not obligated to manage wetlands for "naturalness," but instead take into account human needs).

²⁹⁶ See Convention on Wetlands (Ramsar, Iran, 1971), 1st Meeting of the Conference of the Contracting Parties, Cagliari,

cepts.²⁹⁷ This merger is significant. In the past, the notion of "ecological character" was kept distinct from human needs, thus providing a limit on the amount that human activity might be able to affect a wetland. Wise use, by contrast, was a concept used for wetlands not quite making it to the list - and was defined to recognize that wetlands provide resources to humans and should be managed to maintain those resources. The 2005 definitions indicate that the wise use notion is gaining ground, although distinctions between human and natural activity have not yet been completely abandoned.

Wise use, according to the Conceptual Framework developed by the Millennium Ecosystem Assessment equates to "the maintenance of ecosystem benefits/services to ensure long term maintenance of biodiversity as well as human well-being and poverty alleviation."²⁹⁸ In turn, the updated definition of ecological character is "the combination of the ecosystem components, processes and benefits/services that characterize the wetland at a given point of time,"²⁹⁹ with "ecosystem benefits" defined as "the benefits that people receive from ecosystems."³⁰⁰ Further, the Convention's updated definition of wise use of [*1290] wetlands now reads "the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development."³⁰¹

When read closely, this means that wise use requiring maintenance of the benefits people receive from ecosystems and ecological character includes those benefits in its definition. Wise use, in turn, requires maintaining ecological character. As such, maintaining the relationship between humans and the ecosystem has now become part of the goal of the Convention both for listed sites and unlisted wetlands.

Ecological character is more than just those human-focused benefits and services. It is also made of up "ecosystem components, and processes."³⁰² Further, the updated definition of ecological character stresses the difference between human-induced change and natural change: "For the purposes of implementation of Article 3.2, change in ecological character is the human-induced adverse alteration of any ecosystem component, process, and/or ecosystem benefit/service."³⁰³

However, further elaboration of this definition leaves a loophole:

The inclusion of specific reference to Article 3.2 of the Convention text within the definition is designed to clarify the maintenance obligation for the ecological character of listed Wetlands of International Importance (Ramsar sites) under Article 3.2, and to note that such change concerns only adverse change caused by the actions of people... . For the purposes under the Convention, this definition therefore excludes the processes of natural evolutionary change oc-

Italy, Nov. 24-29, 1980, Recommendation 1.5: [National Wetland Inventories], para. 2, available at [http://www.ramsar.org/rec/key/rec 1.05e.pdf](http://www.ramsar.org/rec/key/rec%201.05e.pdf) (stating that wise use of wetlands involves the maintenance of ecological character). It was not until the Third Conference of the Parties in 1987, 12 years after the Convention's entry into force, that the parties adopted a definition of the concept of wise use and began the multiyear process of developing guidelines for its implementation. Convention on Wetlands (Ramsar, Iran, 1971), 3rd Meeting of the Conference of the Contracting Parties, Regina, Can., May 27-June 5, 1987, Recommendation 3.3: Wise use of Wetlands, para. 5, available at [http://www.ramsar.org/rec/key/rec 3.03e.pdf](http://www.ramsar.org/rec/key/rec%203.03e.pdf). See also Convention on Wetlands (Ramsar, Iran, 1971), 3rd Meeting of the Conference of the Contracting Parties, Regina, Can., May 27-June 5, 1987, Recommendation 3.1: Criteria for Identifying Wetlands of International Importance and Guidelines for Their Use, para. 4, available at [http://www.ramsar.org/rec/key/rec 3.01e.pdf](http://www.ramsar.org/rec/key/rec%203.01e.pdf) (recommending the establishment of a working group to consider, inter alia, how the wise use provisions should be applied).

²⁹⁷ See A Conceptual Framework for the Wise Use of Wetlands and the Maintenance of Their Ecological Character, Res. IX.1 Annex A, at para. 5, 9th Meeting of the Conference of the Contracting Parties to the Convention on Wetlands (Ramsar, Iran, 1971) (Nov. 8-15, 2005), available at [http://www.ramsar.org/res/key/res ix 01 annexa e.pdf](http://www.ramsar.org/res/key/res%20ix%2001%20annexa%20e.pdf) [hereinafter Framework] (emphasizing an effort to harmonize wetland ecosystem terminologies).

²⁹⁸ Id. para. 9.

²⁹⁹ Id. para. 15 (footnote omitted).

³⁰⁰ Id. para. 15 n.1.

³⁰¹ Id. para. 21 (footnote omitted).

³⁰² Id. para. 15.

³⁰³ Id. para. 19.

curing in wetlands and also excludes the positive human-induced change.³⁰⁴

Thus, despite the recognition of a distinction between nature and humans, positive human-induced change is deemed acceptable. This leads us back to the fears of lawyers concerned that recognizing ecology's insights leaves us with no stopping point for human activity.

The Ramsar Convention obviously relies on those charged with implementing the Convention on the ground to figure out the ecological integrity of the ecosystem. And action taken under the auspices of the Ramsar Convention would have to conform to the general requirement that activity be sustainable. But, again, where sustainability indicators are defined with reference to human activity, the question of what is sustainable itself leads us back to the question of where we should draw the line between human activity and natural processes.

It is unclear what "positive" human-induced change is. If wise use of all wetlands is required and that wise use entails ensuring human well-being and poverty alleviation, then positive human-induced change is arguably change that may not be ultimately beneficial for the wetlands' natural well-being. After all, development can facilitate poverty alleviation without necessarily serving the ecological character of a wetland. Unless, of course, that ecological character is defined to include human benefits - as it is in the definitions of the Ninth [*1291] Conference of the Parties - in which case, development that facilitates poverty alleviation might always be regarded as serving the ecological character of a wetland.³⁰⁵

3. The Ramsar Convention and Goals

As we have seen, the parties to the Ramsar Convention have taken the Convention in new directions over the years, aligning it with ecology and new approaches to institutional design. Yet the result of this activity is a set of obligations that has increasingly highlighted the reality of the relationship between humans and wetlands, without clarifying the interest of long-term protection of the natural aspects of wetlands. As a result, it is now unclear that meeting the obligations of the Ramsar Convention is the same as ensuring the long-term protection of wetlands. While the emphasis on poverty reduction may serve as a way to introduce long-term considerations into economic planning, it does not ensure that where economic planning can give us higher yields through destruction of the wetland that will not happen.

We can view these elaborations of the Ramsar obligations in two ways. First, we can view them simply as an extension of the obligations of the Ramsar Convention's original text; an elaboration of the broad substantive goals contained in that text. Alternatively, we could view these guidelines and interpretations as the result of the kind of collaborative process advocated by ecosystem management and new governance writers. The work of elaboration, primarily undertaken by the Convention's Scientific and Technical Review Panel (STRP) involves scientists and representatives from different regions and different subject areas, with additional participation by representatives of the key nongovernmental organizations that assist the Convention's Secretariat in its work.³⁰⁶ As such, it [*1292] could be seen as an example of stakeholder involvement in the creation of benchmarks to achieve the broad goals

³⁰⁴ *Id.* para. 20 (emphasis added). Information on all types of change is necessary for reporting purposes. Ramsar Convention, *supra* note 23, art. 3 para. 2.

³⁰⁵ The Framework's elaboration of the definition of wise use indicates that development will not always be appropriate, but suggests that human well-being is still the primary goal of the Convention:

The wise use provisions of the Convention apply, as far as possible, to all wetland ecosystems. Societal change is inherent in advancing human well-being and poverty alleviation, which depends on the maintenance of ecosystem benefits/services. Pressures to follow sustainable development precepts, and to maintain environmental, economic and social sustainability in land use decisions, encourage compromises ("trade-offs") between individual and collective interests.

Within the context of ecosystem approaches, planning processes for promising the delivery of wetland ecosystem benefits/services should be formulated and implemented in the context of the maintenance or enhancement, as appropriate, of wetland ecological character at appropriate spatial or temporal scales. *Id.* paras. 23-24.

³⁰⁶ The STRP at the time of writing includes 17 members: a representative for each of the geographical regions (Africa, Asia, Europe, Neotropics, North America, and Oceania); a representative for each of the Panel's priority work areas (wetland inventory and assessment, including indicators; wise use and ecological character; water resource management; Ramsar site designation and management; wetlands and agriculture; and communication, education, and public awareness); and a representative for each of

of the Convention.

Either way we view these guidelines, they are insufficient to allow us to know whether the Convention is moving towards protection. As broad goals, although they are consistent with the recognitions of ecology discussed in Part II of this Article, they are insufficiently precise to guide those who will be responsible for managing individual wetlands or protecting wetlands within a particular geographical region. Alternatively, to the extent that this elaboration of the substantive obligations can be seen as a set of benchmarks against which progress can be measured, it is also insufficiently precise to allow us to measure success.

One response to this is that the work of the scientists on the ground will move us towards protection, provided these scientists are focused on maintaining ecological integrity. The procedural requirements of the Convention will encourage information exchange and the flexibility of the goals and benchmarks will allow for adaptive management. The argument would be that we could rely, then, on the scientists to ensure that the message is not corrupted and that long-term protection remains an interest. In addition, it could be argued that the information that scientists can provide about the close relationship between ecosystem functions and the needs of humans who make their living from those wetlands will promote a desire for long-term protection to maintain those livelihoods. Further, the definitions of the Ramsar STRP can be seen simply as guidance and information to countries and their decision makers to allow them to determine for themselves where the stopping point for human activity should be.

However, there is no guarantee that long-term protection will remain important with this approach. As we saw above, the need for multiscale management efforts is in part to ensure that multiple spatial and temporal scales can be taken into account. It would seem contradictory, then, to rely on the most localized actors - the scientists and managers working within member states - to provide the long-term scales and broader geographical focus that is missing from the enunciation of the goals at the higher levels of the institutional structure.

In addition, even the most environmentally conscious and concerned managers are placed at risk with this approach. For without entrenched goals that give specific indications of when the ecological character of a wetland is being undermined, the procedural mechanisms of the Convention will not aid protection. Management decisions that are consistent with the broad goals would not lead to shame on the part of the managers because they would be in compliance with the Ramsar Convention even if they turned out to be inconsistent with long-term protection of the wetlands. Political actors within a country will, as a result, be under less pressure to ensure protection unless it is in their short-term economic or political interest to do so, making the shaming and listing aspects of the Convention less effective.

Further, if we want to regard these guidelines and decisions of the parties that adopt the work of these committees as the result of bottom-up collaborative [*1293] processes, we should be especially wary. In recent years, the Convention has moved increasingly towards an emphasis on wetlands as a tool of poverty reduction.³⁰⁷ This is not to suggest that the aim of poverty reduction is itself bad, indeed it is certainly true that many poor communities are dependent on the health of wetlands for their livelihood.³⁰⁸ To some extent, then, this trend could be seen as a way to link long-term protection of wetlands to the more immediate and pressing concerns of poverty reduction. However, the emphasis on poverty reduction reflects a shift in rhetoric in international environmental law that stresses the need to ensure development as much as, or more than, the need to stress protection of the environment over the long-term, leaving a strong risk that poverty reduction projects will be seen as synonymous with economic development.

the Convention's International Organization Partners (BirdLife International, Wetlands International, the International Water Management Institute, the World Conservation Union, and the World Wildlife Federation). The Ramsar Convention on Wetlands, About the Ramsar Convention: The Scientific and Technical Review Panel (STRP), Ramsar's Scientific Subsidiary Body, http://www.ramsar.org/about/about_strp.htm (last visited Nov. 16, 2008). The STRP is charged with reviewing "the wise use concept, its applicability, and its consistency with the objectives of sustainable development." Framework, *supra* note 297, para. 1 (quoting 8th Meeting of the Conference of the Contracting Parties to the Convention on Wetlands (Ramsar, Iran, 1971), Valencia, Spain, Nov. 18-26, 2002, The Ramsar Strategic Plan 2003-2008, para. 3.1.1, http://www.ramsar.org/key_strat_plan_2003_e.htm (last visited Nov. 16, 2008) [hereinafter Strategic Plan]).

³⁰⁷ Strategic Plan, *supra* note 306, at para. 19. See also *supra* note 3 and accompanying text.

³⁰⁸ See, e.g., Wetlands and Poverty Reduction, *supra* note 293, paras. 1, 2, 7 (explaining, for example, how perennial swamp and seasonal wetlands in the western highlands of Ethiopia play a pivotal role in helping achieve food security during the "hungry season").

³⁰⁹ As such, the emphasis on poverty reduction as part of the Ramsar Convention's mission - an emphasis that is not directly reflected in the text of the Convention itself - leads to concerns that a focus on short-term economic development is finding its way into the Convention's work.

Tying the need for protection to the more short-term anthropocentric goals involved in economic development may lead us to ignore the possibility of long-term damage that is economically beneficial in the short-term, but ultimately harmful to human welfare in the long-term even to those same communities that appear to benefit initially.

³¹⁰ It may lead us, in short, to ignore the lessons of complexity and uncertainty discussed above.

The emphasis on poverty reduction as a key aspect of wetlands protection suggests, then, that the Convention has itself been influenced by more immediate economic and short-term concerns. Although the recognition of the importance of wetlands for maintaining overall ecological integrity remains, it appears to be more directly linked to the economic benefits that wetlands can provide, in turn suggesting the possibility of short-term interests superseding long-term interests. To the extent that these developments are the result of a collaborative process, this gives us cause for concern. To the extent that they are separate from that [*1294] collaborative process, they indicate the kinds of pressures that protection efforts must withstand.

Thus, this reading of the activities of the Ramsar Convention suggests that we cannot be sure that reliance on procedural rules and a broad set of goals will move us towards better environmental protection. Further, we cannot depend on the activity of scientists to move us in that direction without some kind of framework that can guide their activity, and that can act as a bulwark against counterpressures with more short-term and/or economic force.³¹¹

V. Filling the Gaps

This Article posed three questions before exploring the case studies. First, is the assumption that the model of cooperation and collaboration will lead to better environmental protection a valid assumption? The case studies suggest that it is not clear that procedures that follow ecosystem management and/or new governance approaches will, in and of themselves, result in better long-term environmental protection.

Yet, because we are dealing with outcomes that will take decades or possibly centuries to play themselves out, it could be argued that this assumption has not been disproved either. In order to assess how likely it is that these procedural approaches will result in better environmental protection going forward, we need to move to the second question. Even if we assume that ecosystem management scientists and conservation biologists are all working towards a goal of long-term environmental protection, does this institutional model adequately protect these goals against competing interests? The case studies show that it is unclear that relying on representation by scientists alone is sufficient to withstand the combination of flexibility and short-term political and economic interests that come into play in environmental decision making.

This leads us to our third question: is there a way that law might play a role in ensuring that the goal of environmental protection over the long-term is not lost to competing short-term interests?

A. The Missing Goals

³⁰⁹ See, e.g., Paolo Galizzi, *From Stockholm to New York, via Rio and Johannesburg: Has the Environment Lost its Way on the Global Agenda?*, 29 *Fordham Int'l L.J.* 952, 991-1001 (2006); Marc Pallemarts, *International Environmental Law from Stockholm to Rio: Back to the Future*, in *Greening International Law* 1, 16 (Philippe Sands ed., 1994) (stating that "sustainable development" has become synonymous with "sustainable growth" both in Europe and throughout the world); George (Rock) Pring, *The 2002 Johannesburg World Summit on Sustainable Development: International Environmental Law Collides with Reality, Turning Jo'Burg into "Joke'Burg,"* 30 *Denv. J. Int'l L. & Pol'y* 410, 410-11 (2002); see generally *Global Ecology: A New Arena of Political Conflict* (Wolfgang Sachs ed., 1993) (critiquing "the centrality of 'development' in the international discussion on the environment").

³¹⁰ Environmental degradation as a result of short-term economic development can often have disastrous consequences for the local communities. Wetland destruction, for example, can reduce the natural buffers to flooding, and deforestation can lead to mudslides. Sierra Club, *Protecting Nature Protects People* (2008), available at <http://www.sierraclub.org/getprepared/downloads/protecting-nature.pdf>.

³¹¹ See Amy J. Cohen, *Negotiation, Meet New Governance: Interests, Skills, and Selves*, 33 *Law & Soc. Inquiry* 503 (2008) (arguing that new governance scholars have yet to fully grapple with the political distributional effects of the processes and forms they endorse); Lobel, *supra* note 18, at 938-42 (discussing the problem of cooptation both in legal and extralegal activism).

The goals in the current approach to ecosystem management and the work of the new governance writers are too broad to guide decision makers. To the extent that more specific goals emerge from collaborative processes in the form of benchmarks, these are flexible benchmarks. Without a sufficiently specific goal to guide these processes, these flexible benchmarks are potentially susceptible to pressure from short-term economic interests as they are being developed. Alternatively, because they are flexible, they are potentially susceptible to short-term economic interests after they have been developed.

[*1295] It is arguable that this is a problem of procedure and accountability.³¹² On this view, if we ensure adequate procedures and sufficient oversight, the lower-level benchmarks will generate the kinds of decisions that will serve everyone's interests.

However, what is missing from this picture is some assurance that interests vital to long-term protection of healthy ecosystems will be adequately taken into account. What is missing is a set of goals that will constrain decision makers both at the lower-level scales of governance and at the higher-level scales of governance. This is a problem not only of procedure, this Article argues, but also one of substance.³¹³ To resolve this problem, we need to rethink the relegation of the role of law to procedure and re-imagine a role for law that is substantive.

This does not require a particular definition of law; rather, it draws on certain attributes of law, namely the potential for law to provide a level of certainty and predictability - some kind of entrenchment.³¹⁴

This model is not a rejection of the ecosystem management writers and the work of the new governance writers.³¹⁵ I take it as a given that we need flexibility and adaptability, broad stakeholder participation, and institutions that can take multiple scales of time and space into account, with nested scales of governance. I also take it as a given that our environmental protection techniques will need to take account of humans as part of the natural world.

However, these models need to be supplemented. So much focus has been put onto the flexible and adaptive aspects of these new forms of management that the tracks that would guide them have not yet been fully addressed. This proposal [*1296] is for a supplement: this is, if you like, ecosystem management plus or new governance plus.³¹⁶

B. A Process for Developing the Substantive Law

How might we add the missing piece to the models? The aim is to find a process that can generate goals that are sufficiently specific that they can guide those responsible for implementation, monitoring, and adaptation, yet sufficiently broad that they can be generated a priori in circumstances of incomplete knowledge and information.

³¹² See Dorf & Sabel, *supra* note 1, at 267, 301; Slaughter, *supra* note 13, at 217.

³¹³ See Tribe, *supra* note 112, at 1067 (arguing that procedural issues have substantive roots). Ruhl offers an approach that would attempt to confine discretion within certain parameters, introducing the concepts of "volatility" and "drift." See Ruhl, *supra* note 32, at 55. Cf. Karkkainen, *Panarchy*, *supra* note 9, at 76-77. Although Karkkainen does not reject the notions of drift and volatility outright, he observes that we cannot know the validity of a change in administrative activity simply by noting when it occurred or even how far it deviates from an initial position. *Id.* We must know the substance. These are the kind of standards - the ones based on scientific evidence - that should be adjusted. What I am arguing about is the kind of goal that should not be as easily adjusted, because it is far more political than scientific. Cf. J.B. Ruhl, *Reconstructing the Wall of Virtue: Maxims for the Co-Evolution of Environmental Law and Environmental Science*, [37 *Envtl. L.* 1063 \(2007\)](#) (arguing that science and policy cannot be neatly separated).

³¹⁴ Although this may appear to privilege a conceptualization of law that is hard, rather than allowing conceptualizations of legal norms that are soft, I do not perceive this conceptualization to be necessary to my understanding of the role of law. Following a more pluralist perspective, I believe that norms that have been traditionally considered either as nonlegal or as soft law could provide the substantive element I argue is missing and could be regarded for these purposes as law. See generally Paul Schiff Berman, *A Pluralist Approach to International Law*, [32 *Yale J. Int'l L.* 301-02 \(2007\)](#); cf. Kal Raustiala, *Form and Substance in International Agreements*, [99 *Am. J. Int'l L.* 581, 586-87 \(2005\)](#) (arguing that there is "no such thing as 'soft law'"); Dinah Shelton, *Normative Hierarchy in International Law*, [100 *Am. J. Int'l L.* 291, 319-22 \(2006\)](#) (addressing the interaction of hard and soft law in international agreements). See generally Paul Schiff Berman, *A Pluralist Approach to International Law*, [32 *Yale J. Int'l L.* 301-02 \(2007\)](#).

³¹⁵ I address arguments about the consistency of this Article's approach with the models *infra* in Part V.C.

³¹⁶ Thanks to Anne-Marie Slaughter for this phrasing. But see Dorf & Sabel, *supra* note 1, at 407 (indicating that the approach proposed by Dorf and Sabel is inconsistent with any approach that sets goals *ex ante*).

One possibility would be to take the BBCAC approach as our model and simply push for the enactment of the 15% reduction in harvest pressure into law. However, this alone does not ensure that collaborative processes like BBCAC will take long-term protection interests into account. The 15% figure is also a figure that may need to be changed over time, in response to changing scientific information. It is best viewed, therefore, as a benchmark. For the substantive law to incorporate goals, we need a process that can guide the decision makers to follow certain substantive goals as they work to reach these benchmarks as well as change them in response to new information.

Another possibility would be to set more specific goals at the highest level institutionally and simply mandate compliance with them. However, this approach resembles command-and-control style regulation, disfavored because of its hierarchical nature and its tendency to develop detailed, substantive mandates that may have little or no practical possibility of implementation. This style of regulation is frequently too far removed from on-the-ground application to be useful. Conversely, in an attempt to avoid this kind of irrelevance, these goals might be set at a very high level of generality, too broad to provide direction, giving rise to the problem discussed in this Article.

We are searching, then, for a middle ground. A process that would allow participation and collaboration by multiple stakeholders, in keeping with the mandates of ecosystem management and new governance, while still forcing decision makers to confront interests that are not necessarily directly aligned with their own short-term interests. We are also searching for a process that is adjustable according to the political context. For example, international decision making and domestic decision making might have to take into account different considerations.

The solution may be to develop a process for this kind of goal setting that takes the best of both sides. We could, for example, develop a process for generating specific goals that would include multiple stakeholders in a collaborative process, while requiring them to consider a specific value of long-term protection in their development of these goals.³¹⁷

The outcome of this process might give us a goal of ensuring the blue crab's survival not only for economic reasons, but also to ensure the long-term integrity of [*1297] the Chesapeake Bay and the crab's ecological connections. This goal would then be embodied in substantive law, to guide a decision-making group like BBCAC as it works to determine the harvest levels required to meet that goal. The goal would also stand to hold other decision makers accountable, so that where scientists had agreed on a number that would meet the specific goal - a benchmark - decision makers would be bound to implement that number. However, following an understanding of uncertainty and the need for adaptability, the numbers themselves could be changed where new information required such a change.

To the extent that the goals established no longer reflect the political will of those being governed, they can always be changed through the same process that has generated them. The key is that such change would occur in an open, transparent process allowing for accountability.

In the Ramsar Convention, this approach suggests that either the treaty text or those charged with interpreting the treaty text should specify the particular interests to be taken into account by decision makers and could establish certain principles for protection. To a large extent, the STRP and other committees already spend time doing this. As they do so, it is important that they consider what kinds of goals can be set that will incorporate a goal of long-term protection. These goals can, in turn, guide decision makers on the ground as they work to implement the goals.

These examples all assume that long-term environmental protection should be part of the goal. However, the lessons of this Article and the model proposed here are still relevant for those who are unsure about the need to ensure long-term protection of the environment. The critique here suggests that the processes described in the ecosystem management or new governance models cannot ensure the achievement of any particular goal, particularly if that goal takes into account more than short-term economic self-interest. The process proposed here for setting substantive specific goals that are entrenched in law is a process that can be used outside of the environmental context also, in an effort to bring in other interests that may not be captured in the institutional models proposed by new governance writers.

The key to designing these institutions is to recognize that environmental protection involves interplay between goal setting and implementation. The goals we are seeking to meet with our flexible, adaptive institutions do not need to

³¹⁷ Cf. Slaughter, *supra* note 13, at 244-57 (proposing a set of informal norms that would serve to regulate government networks).

be as flexible as the specific benchmarks that we set to achieve them. Nor do these goals have to be far removed from the reality of implementation. The result is a two-tier structure where substantive law guides decision makers, accompanied by procedures that ensure information flows, collaboration, adaptive management, and flexibility where it is necessary.

The two roles for law - a procedural role and a substantive role - are complementary. Substantive law, without the procedural element that allows for flexibility, would be unsuccessful because an attempt to use top-down decision making to dictate how a standard is to be achieved would not be sufficiently responsive to science and local context. This is the problem with the command-and-control style laws that ecosystem management and new governance writers are challenging. This approach is also politically problematic, leading in turn to problems of implementation.

Similarly, the procedural rules without the substantive legal standards are ineffective because they have no goal to guide and trigger protective responses. [*1298] Protective efforts would simply be taken over by whatever is guiding a decision maker's actions in the first place: the market, political pressure groups, or localized or short-term pressures.³¹⁸

The aim is to create a set of goals that draw on the work of scientists and supplement that work with the goal of long-term protection. Given the requisite moments of political will for that long-term protection, the approach advocated here makes it possible to maintain a focus on the goals established by that political will unless and until political will determines that they should be changed.

C. The Need to Bring Back a Substantive Role for Law

The attempt to bring back a substantive role for law could be considered unreasonably optimistic. To a large extent, the proceduralization of law is likely a response to the dangers of imposing one set of values on those who may not hold the same values. Commentators are wary of embedding substantive provisions into law for fear of the dangers of top-down imposition of commands from above. The solution is to give law a procedural function, leaving the substance to come from the physical sciences and participation by stakeholders within and beyond the sciences.

It is certainly true that a substantive role for law can be problematic. The lessons conveyed by both ecosystem management writers and new governance writers are well taken. Yet, it turns out that where there are success stories, they may frequently be driven by a legal mandate that is specific enough to guide the flexible activity that is being advocated.

For example, in their exposition of modularity, Freeman and Farber acknowledge that the mandates of Federal law and some State law, as well as the powerful political actors involved, may have driven the success of the CalFed Bay-Delta Program in achieving environmental benefits.³¹⁹ Efforts at innovative regulation of nonpoint source water pollution in the Chesapeake Bay Program, cited as examples for collaborative ecosystem governance, may have been driven in part by federal mandates and time lines.³²⁰ Similarly, as Karkkainen argues, penalty default rules may also provide some form of insurance against the possibility that flexible mechanisms may not lead to the desired result.³²¹

By contrast, in the absence of this kind of background driving force, the flexible rules seem to founder. The direction of blue crab efforts is uncertain and is highly dependent not only on scientific information but also on the political winds [*1299] and economic pressures. In the absence of an entrenched and binding rule or norm that has a higher hierarchical position than the states' rules, there is no guarantee that the need for long-term protection efforts

³¹⁸ In autopoietic terms, this is because the system that the procedural law is seeking to regulate would not alter the logic by which it functions. Procedural rules must have some baselines of protection to ensure that they trigger the responses hoped for.

³¹⁹ Freeman & Farber, *supra* note 1, at 872. A change in politics seems to have led to a decline in the body's effectiveness. See *id.*; see also *id.* at 866-68 (discussing concerns by Holly Doremus and others that CalFed did not actually lead to improved environmental protection); Dave Owen, Law, Environmental Dynamism, Reliability: The Rise and Fall of CalFed, [37 Env'tl. L. 1145, 1149 \(2007\)](#) (describing CalFed's efforts to redress the Bay-Delta's resource conflicts as a "fiasco").

³²⁰ See Jacqueline Savitz, *Compensating Citizens*, *Boston Rev.*, Oct.-Nov. 1999, at 17, <http://bostonreview.net/BR24.5/savitz.html> (last visited Nov. 16, 2008) (responding to Charles Sabel, Archon Fung & Bradley Karkkainen, *Beyond Backyard Environmentalism: How Communities are Quietly Refashioning Environmental Regulation*, *Boston Rev.*, Oct.-Nov. 1999, at 4).

³²¹ Karkkainen, *Bounded Pragmatism*, *supra* note 9, at 997.

will be adequately addressed by the flexible institutional structure of the Chesapeake Bay Program and its satellite institutions. In the absence of an entrenched and binding rule that states the goal of wetland protection to be tied to more than short-term needs of poverty reduction, there is no guarantee that Ramsar Convention wetlands will be protected for their long-term contributions to ecosystem health.

Two further possible counterarguments can be raised. First, it could be argued that the approach proposed here is inconsistent with the very notion of an institutional structure intended to generate solutions to problems through deep collaboration and information gathering. Some might fear that setting *ex ante* goals sufficiently specific to guide decision makers would lead to a lack of creativity and limit the possibilities for collaboration, learning, and problem solving, precisely the problem that new approaches are trying to address.

This Article, however, proposes a set of goals that are both sufficiently specific to provide some form of tracks for the moving train of the institution, but also sufficiently broad that they do not overly constrain the work of all those striving to achieve a solution to the problem. It is not going to be easy to know how specific the goals should be. Nevertheless, it is arguable that it is only the combination of goals with collaborative activity that will generate creativity in problem solving.³²² However, in order to ensure that the train does not fall off its tracks, these goals should be entrenched into law with attributes of certainty and predictability.

Second, it could be argued that the problem is really just one caused by a lack of political will. If the Chesapeake Bay Program and Maryland and Virginia are not protecting the blue crab, critics can argue that that is a problem of political will and not of institutional design. Similarly, it can be seen as a problem of political will if the Ramsar Convention's protected wetlands fall to the interests of local or international economic concerns.

This critique may be valid, but only to an extent. These institutions and efforts would not exist without some political will. And in the absence of any political will to follow a particular goal, that goal will not gain any traction. However, the case studies show that some political will does exist. This Article simply points out that where there is political will, we should design institutions with some view towards longevity and with a willingness to entrench substantive goals with law that will not be subject to the vagaries that flexibility will bring. Entrenching those moments into law brings with it a level of certainty and continuity that requires changes to the goals to be visible and articulated, with full discussion.

VI. Conclusion

As ecologists have increasingly stressed that nature is more complex and less static than once thought, lawyers have tried to catch up to these insights by [*1300] designing institutions and developing laws that will allow for more effective conservation. At the same time, environmental and natural resources lawyers have been hearing the call for institutional change from a range of writers working in diverse legal fields. The main focus of this work to date has been institutional design, advocating procedures that will allow institutions to be responsive to science, to be flexible and adaptive to new information, to encourage deep collaboration, and to operate nonhierarchically in a manner cognizant of multiple scales of time and space.

These institutional design proposals have much to recommend them, but need to be supplemented. I argue here that in order to ensure effective conservation, the procedures must have sufficiently specific substantive goals to guide their activity and that these substantive goals be embedded in law. These substantive goals have not received as much attention in the academic literature. Yet without attention to these goals, some of the interests that are critical to ensuring long-term protection will be left out of decision-making processes and the procedures advocated in the new models.

The two case studies, of blue crab management within the Chesapeake Bay Program and of the elaboration of the terms "ecological character" and "wise use" within the Ramsar Convention on Wetlands, demonstrate that without some tinkering to the ecosystem management and new governance models, they are unlikely to achieve a goal of effective long-term environmental protection. Indeed, the evidence of the case studies is that even if the goal is not long-term environmental protection, the models as they currently stand are insufficient to ensure the achievement of any one particular goal.

³²² See, e.g., Betsi Beem, *Planning to Learn: Blue Crab Policymaking in the Chesapeake Bay*, 34 *Coastal Mgmt.* 167, 179 (2006) (suggesting that the reason that BBCAC's Technical Working Group (TWG) appeared more successful at setting targets than previous attempts to deal with the blue crab was that "the TWG meetings were focused on specific issue areas and were results oriented").

This Article proposes that one way to resolve the missing piece of the puzzle is to re-imagine a role for law as providing a substantive element as well as the procedural elements suggested by the new models. Many questions remain. One of the most difficult questions remaining is what level of specificity the substance of those environmental laws should contain. Too broad a level of specificity will leave insufficient direction, thus leaving potential for precisely the problems discussed above. Yet too detailed a level of specificity would likely leave us with laws that bear no relation to the needs of science and could stifle creativity for problem solving.³²³ I have proposed a process for setting the goals that attempts to navigate these tensions, but this is not the end of the discussion.

As both Karkkainen and Ruhl tell us, we have to start thinking carefully about how we design institutions to do what we want them to do, even if we all accept the premises behind the work of ecosystem management writers.³²⁴ This Article is intended as an early contribution to this thinking and serves as a warning that not all approaches will necessarily lead to more effective environmental protection, even when guided by the new models. We need to make sure that our shiny new institutional train has tracks that will take us in the direction of effective long-term protection.

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³²³ See Lazarus, *supra* note 25.

³²⁴ See *supra* notes 9, 19-20.