

D I A L O G U E

Ten Myths of Ecosystem Management

by Bruce Pardy

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The philosophy of ecosystem management (EM) has come to dominate the field of environmental law. Even in the absence of explicit adoption of EM processes in legislation, agency practices tend to reflect its premises: that the best approach to environmental governance is to understand, measure, control, and change ecosystems to produce the highest and best environment in human terms.

The desirability of EM is so well established as to be considered almost self-evident. It is an ideal process for massaging the clash between commercial and social needs of growing communities and the political imperative of “being green.” EM’s legitimacy is difficult to challenge, in part because the term creates the perception of an either/or choice¹: the only alternative to ecosystem management must be ecosystem *mis*management. But that is not correct. EM is one of several possible approaches to environmental governance. Its superiority has yet to be established, and it rests on premises that are of questionable validity. Below are 10 myths of ecosystem management.

Myth 1: The purpose of ecosystem management is to preserve native ecological processes and features.

The methodology of EM allows ecosystems to be controlled, used, planned, and changed to suit human preferences. Sometimes those preferences are consistent with preserving native species or natural conditions, but more often they are not. EM accommodates the pressing expectations of civilized society by minimizing their impacts upon ecological processes, and fashions an environment that reflects community aspirations. In the words of Daniel Botkin, an early advocate of EM, the task is “to live within the discordant harmonies of our biological surroundings, so that they function not only to promote the continuation of life but also to benefit ourselves: our aesthetics, morality, philosophies, and material needs.”² This utilitarian perspective may not reflect a universal conception of EM’s purpose, but because EM is a largely discretionary process (see Myth 6 below), there is

no binding consensus, and the goals to be pursued can vary widely from situation to situation.

Myth 2: Ecosystems can be managed.

An ecosystem is a collection of organisms and their physical environment, and the multitude of interactions and relationships that exist among them. The systems are complex and the intricacies so vast as to defy documentation. In the face of this complexity, EM proceeds on the premise that it is possible to manage ecosystems while equipped with only a partial comprehension of the dynamics operating between their constituent parts. EM is the environmental equivalent of a chemistry experiment in which the chemist knows the identity of only some of the chemicals to be mixed together and without the knowledge required to predict the synergistic effects of the combination. EM is an ongoing real-world experiment with unknown variables and no control set.

Myth 3: Ecosystem management is based upon scientific theories that are correct.

EM claims to be based upon correct scientific theories about how ecosystems behave. The application of these theories can change ecosystems permanently. Once altered, an ecosystem is unlikely to return to a previous state. The history of science shows that scientific theories are continually being altered or replaced by new ideas thought to be more correct than the old ones. At one time, ecology was based upon the notion of equilibrium in ecosystems: the idea that ecosystems reached a mature or developed state in homeostasis that would be stable unless affected by outside forces. Equilibrium has proved to be an erroneous or incomplete explanation of the behaviour of ecosystems, and has been superseded by the idea that ecosystems exist in a state of nonequilibrium, in which there is continual evolution and change. If the pattern of scientific development is anything to go by, the postulate of nonequilibrium will itself eventually be shown to be an incomplete or inadequate description of the behaviour of ecosystems.

Myth 4: EM decisions are scientific decisions.

EM is premised on the idea that only certain kinds of scientists are qualified to make decisions about ecosystems.

1. J.B. Ruhl, *Ecosystem Management, the ESA, and the Seven Degrees of Relevance*, 14 NAT. RES. & ENV'T 156, 157 (2000); Bruce Pardy, *Ecosystem Management in Question: A Reply to Ruhl*, 23 PACE ENVTL. L. REV. 209, 209 (2005-2006).
2. DANIEL BOTKIN, *DISCORDANT HARMONIES: A NEW ECOLOGY FOR THE TWENTY-FIRST CENTURY* 191 (1990).

Because ecosystems are highly complex, the argument goes, their affairs are not properly the domain of amateurs. The reality is that EM decisions are rarely scientific. Instead, they involve trade offs—between human use and ecosystem function, between short-term and long-term goals, between economic and ecological needs, and between political interests with conflicting aspirations. These trade offs require value judgments. Weighing social costs and benefits is not a scientific inquiry. Instead, EM decisions reflect economics, politics, social welfare, and ideology. Ecosystem managers have no particular expertise to perform this function, but EM gives them the power to establish and promote their own priorities.

Myth 5: EM is complex-adaptive problem solving.

EM claims to apply “complex-adaptive” problem-solving techniques, “methodology that relies on building models of ecosystem dynamics and then us[es] rigorous testing, monitoring, and evaluation of policy implementations to provide the feedback necessary to promote long-term ecosystem integrity.”³ But these are not the most important characteristics of complex-adaptive governance. Complex-adaptive problem solving promotes local, diverse, innovative, creative solutions. Authentic complex-adaptive systems are resilient because they do not rely on a single source of authority, but instead accommodate multiple kinds and sources of independent and diverse problem solving. EM does not do this. Instead, EM is a coercive process. It resembles conventional decisionmaking that is top-down, expert-driven, and controlled by the state. EM is merely another form of central planning, in which scientific and government elites dictate the environmental steps that are to be taken. Although EM contains some elements of complex-adaptive problem solving, its main features are those of traditional, prescriptive, hierarchical control from which it claims to differ.

Myth 6: EM is consistent with the rule of law.

Under a classical liberal conception of the rule of law, legal decisionmakers are not able to innovate as they see fit, but have limited discretion, constrained by abstract, generally applicable rules in statutes and regulations. Government officials are limited to their specific statutory powers, and courts are bound by precedent, the need to provide reasons, the rules of evidence, and appeal rights. EM does not include these kinds of limitations. Instead, it is predominantly based upon discretion. Typically there are no binding rules or principles to apply, no mandatory goals to achieve, and little democratic accountability. There is no notion of precedent; indeed, EM aims not to be consistent from case to case, but to adjust and “adapt” as it goes along. Thus, managers have fewer institutional checks than judges and significantly more

latitude to define their own mandate.⁴ The public has little control over the approach to be taken or the value judgments that are pursued. Broad discretion means that there is ample opportunity for political considerations to be reflected in any particular decision.

Myth 7: Ecosystems are too variable to be protected using abstract legal rules and principles.

Environmental managers maintain that environmental decisions cannot be made with abstract, generally applicable legal rules and principles. They take the position that ecosystems are too variable, the science too uncertain, and the human factors too unpredictable to govern ecosystems by general rules. Instead, they say that EM decisions must be ad hoc, one ecosystem at a time, in isolation, and according to that system’s peculiarities. These objections reflect misconceptions about law and about ecosystems. Abstract rules and principles are the heart of common-law systems. Legal decisions of all kinds are frequently made in the face of scientific and evidential uncertainty by applying such rules and principles. Indeed, such variability is a reason to have abstraction, not a reason for abandoning it. There may be an astronomical number of interactions taking place in a multitude of unique ecosystems, but all of them have common characteristics that, after all, allow them to belong to the category called “ecosystems.”⁵ They all contain living and non-living elements; they have some degree of diversity of species, genes, chemicals, and so on; they have some degree of resilience; energy flows from outside to inside, fueling the reorganization of materials from one form to another; they have carrying capacities for certain kinds of organisms; they exist in a nonequilibrium state; their evolution is unidirectional; and so on. Making decisions on a case-by-case basis without generally applicable rules is arbitrary law and lazy science. It avoids having to articulate the rationale for a decision in abstract terms, and for having to apply the same rationale in the next case.

Myth 8: Ecosystems should be managed.

One of the most important characteristics of ecosystems is that they are unplanned. They operate as complex-adaptive systems with their own inherent rules and dynamics. To manage an ecosystem is to manipulate it, making it something other than what it was and what it would have been. Managing ecosystems in order to protect or preserve them is a contradiction because the act of management creates the influence that changes the system. As I have written elsewhere, “the pursuit of specific environmental and social objectives means that different preferences will be expressed

3. J.B. Ruhl, *The Pardy-Ruhl Dialogue on Ecosystem Management, Part IV: Narrowing and Sharpening the Questions*, 24 PACE ENVTL. L. REV. 25, 28-29 (2007) (footnote omitted).

4. Bruce Pardy, *The Pardy-Ruhl Dialogue on Ecosystem Management Part V: Discretion, Complex-Adaptive Problem Solving, and the Rule of Law*, 25 PACE ENVTL. L. REV. 341 (2008).

5. Bruce Pardy, *In Search of the Holy Grail of Environmental Law: A Rule to Solve the Problem*, 1 MCGILL INTL. J. SUSTAINABLE DEV. L. & POL’Y 29 (2005).

in different situations. Isolated decisions disregard total load, or the cumulative ecosystem impact produced by all human activity—past, present, and future. The attempt to dictate results means that elements within the system are not autonomous nor engaged in a truly competitive pursuit of self-interest, the information normally produced through system interactions is not accurate, the system's self-governing mechanisms are thrown off, the system's evolutionary destiny is altered, and the ability of the system to function as a system is compromised.”⁶

Myth 9: EM is working.

One can find examples of particular settings in which management decisions have preserved or restored native species or ecosystem functions, and these are positive results. But “The Environmental Problem” is that human impact is gradually and incrementally transforming ecosystems into systems made by humans. EM has not stemmed this tide. Instead, it is designed to accommodate continued ecosystem transformation. Indeed, in the eyes of some EM advocates, changing ecosystems is the objective: to alter ecosystems deliberately, rather than inadvertently. Again, the words of Daniel Botkin are telling: “Nature in the twenty-first century will be a nature that we make; the question is the degree to which this molding will be intentional or unintentional, desirable or undesirable.”⁷ EM represents a capitulation and endorsement of human impact upon ecosystems, rather than resistance to it.

Myth 10: EM is inevitable.

Managers insist that there is no policy option now available other than EM. It is difficult to find concrete rationales for this conclusion, but one of the themes appears to be that it is too late to attempt to protect or preserve native ecosystem characteristics.⁸ Advocates of EM may believe that human effects upon ecosystems are now so widespread that systems will be radically altered from now on, and the only question is how they will be changed. This approach throws in the towel. It is true that human activity has probably affected all ecosystems on the planet to some degree, but “natural” features of ecosystems still remain. Other governance options exist that have not yet been explored.

Conclusion

EM is not the benign practice that it appears to be. Its widespread adoption is legally and environmentally problematic. Its legitimacy rests upon premises and assumptions that are of questionable validity. If the objective is to preserve and protect natural characteristics of ecosystems, environmental law requires a new approach.

6. Bruce Pardy, *The Hand Is Invisible, Nature Knows Best, and Justice Is Blind: Markets, Ecosystems, Legal Instrumentalism, and the Natural Law of Systems*, 44 TULSA L. REV. 67, 87 (2009).

7. BOTKIN, *supra* note 2, 193.

8. Bruce Pardy, *Changing Nature: The Myth of the Inevitability of Ecosystem Management*, 20 PACE ENVTL. L. REV. 675 (2003); J.B. Ruhl, *The Myth of What Is Inevitable Under Ecosystem Management: A Response to Pardy*, 21 PACE ENVTL. L. REV. 315 (2004).