Axioms of Ecological Policy

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Abstract

Many current ecological policy problems are contentious and socially wrenching. Each possesses unique features, but there are several generalities that apply to nearly all. I propose nine axioms that are typical of most current ecological policy problems: (1) the policy and political dynamic is a zero-sum game; (2) the distribution of benefits and costs is more important than the ratio of total benefits to total costs; (3) the most politically viable policy choice spreads the benefits to a broad majority with the costs limited to a narrow minority of the population; (4) potential losers are usually more assertive and vocal than potential winners and are, therefore, disproportionately important in decision making; (5) many advocates will cloak their arguments as science to mask their personal policy preferences; (6) even with complete and accurate scientific information, most policy issues remain divisive; (7) demonizing policy advocates supporting competing policy options is often more effective than presenting rigorous analytical arguments; (8) if something can be measured accurately and with confidence, it is probably not particularly relevant in decision making; and (9) the meaning of words matters greatly and arguments over their precise meaning are often surrogates for debates over values.

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Introduction

Many of today's ecological policy issues are politically contentious, socially wrenching, and replete with scientific uncertainty. They are often described as wicked, messy policy problems (*e.g.*, reversing the decline of salmon; deciding on the proper role of wild fire on public lands; what to do, if anything, about climate change; worries about the consequences of declining biological diversity; making sense about the confusing policy choices surrounding notions of sustainability).

Wicked, messy ecological policy problems share several qualities: (1) *complexity* — innumerable options and trade-offs; (2) *polarization* — clashes between competing values; (3) *winners and losers* — for each policy choice, some will clearly benefit, some will be harmed, and the consequences for others is uncertain; (4) *delayed consequences* — no immediate "fix" and the benefits, if any, of painful concessions will often not be evident for decades; (5) *decision distortion* — advocates often appeal to strongly held values and distort or hide the real policy choices and their consequences; (6) *national vs. regional conflict* — national (or international) priorities often differ substantially from those at the local or regional level; and (7) *ambiguous role for science* — science is often not pivotal in evaluating policy options, but science often ends up serving inappropriately as a surrogate for debates over values and preferences.

As if they are not messy enough, ecological policy issues may become further clouded by skepticism about the independence of scientists and scientific information. Much of the available science is tendered by government agencies, companies and corporations, and public and private organizations, as well as myriad public and private interest and advocacy groups. Each arguably has a vested interest in the outcome of the debate and often promulgates "science" that supports its favored position.

All ecological policy problems have unique features, thus there are exceptions to every generality, but are there lessons learned that can be broadly applied? The purpose of this article is to propose a set of such lessons learned. The lessons could be labeled principles, suppositions, empiricisms, doctrines, guidelines, rules, or conventions, but I offer them as axioms. Like all axioms, mine are not universally true, but are applicable in most situations.

Key definitions in ecological policy:

Value: *a core belief which tends to determine or shape personal or group policy preferences*

Policy: *a decision or plan of action for accomplishing a desired outcome*

Policy advocacy: *active support of a particular policy or class of policies*

Policy analysis: *formal assessment of the consequences and implications of the possible options for addressing an ecological policy problem*

Politics: *process of debate, negotiation, and compromise for achieving a desired policy goal*

Science: *information gathered in a rational, systematic, testable, and reproducible manner*

Scientist: *a person who generates or interprets scientific information or "science"*

Ecological Policy Axiom 1 — The policy and political dynamic is a zero-sum game

Probably the most sobering reality for the uninitiated is that selecting any proposed policy choice results in winners and losers. The search for a "win-win" choice, which sounds so tantalizing to decision makers, is hopeless with even superficial policy analysis. There are always winners and losers even though people running for office may try to convince the voters otherwise.

Consider the escalating competition for scarce water resources in many regions of North America. In areas of expanding human populations and/or expanding economic activity, the competition for water can be brutal. Any policy choice results in a set of winners and another set of losers. The winners and losers may be those in this or future generations, obvious or vague elements of society, or in near or distant regions. The benefits and costs may be both monetary and nonmonetary; may be realized immediately or over many years; and may be diffused across many segments of society or concentrated on a few.

As with competition for scarce water, most policy options result in some interest groups getting what they want (or at least most of what they want), others getting little or none of what they want, and still others ending up somewhere in between. In short, the role of the policy analyst is often to *identify* for the policy maker who are the winners and who are the losers. In contrast, the role of the policy maker is to *decide* who wins and who loses.

Searching for the nonexistent but ever politically tantalizing win-win solution often ends up frustrating everyone. Except for the most trivial policy issues, compromise is necessary to craft a proposed policy that is democratically possible. Thus, ecological policy winds up as the classic zero-sum game. Accepting this reality encourages serious discussion about how to best resolve complex ecological policy issues.

Ecological Policy Axiom 2 — The distribution of benefits and costs is more important than the ratio of total benefits to total costs

Benefits are the consequences of a policy option or decision that are categorized as *good* outcomes. Benefits are sometimes measured solely in terms of money, but are more broadly encompassed by *all* the desirable things that are most likely to happen. Conversely, the costs are the *undesirable* outcomes that are likely to happen (often, but not always, measured in monetary terms).

Complicating ecological policy analysis is that, exclusive of money, one person's *benefits* may be another's *costs*. Preserving a wetland, for example, is a benefit for those wishing to preserve such land in its unaltered condition, but such a policy option is a cost to those who wish to ditch and drain the same land to improve agricultural productivity.

To the uninitiated it may seem that the most important factor in decision making is weighing the total benefits against the total costs. Rather, it is usually the case that the most important factor is the perception of who receives the benefits vs. who will bear the costs.

Weighing costs *vs.* benefits is tricky. Because costs and benefits are not simply the things that are measurable, but include loss of personal freedoms, religious or spiritual preferences, individual rights, etc. Benefits and costs can be categorized as either "real" or "perceived." *Real* benefits and costs are the things that analysts are keen to measure, perhaps mostly because they *can* be measured. *Perceived* benefits and costs, however, are the things that people mostly weigh in determining their position on a particular policy issue. They are arguably *impossible* to measure with much confidence.

Ecological Policy Axiom 3 — The most politically viable policy choice spreads the benefits to a broad majority with the costs limited to a narrow minority of the population

Democracies theoretically operate on delegated compromise validated by periodic voting. To gain sufficient political support (votes) for a proposed policy, it is prudent for the decision maker to spread the benefits across a sufficiently large number of people to garner majority support. The corollary is that those (including future generations) who bear the costs should be a minority and the smaller the better.

In political dialog the narrowly-defined minority is often labeled pejoratively as a "special interest" or some other term meant to isolate the group from the majority and weaken the force of its argument.

Consider the question of whether a particular dam should be removed to help restore native aquatic species. Almost assuredly the policy debate will be framed as a conflict between the *general* interests of society (e.g., providing reliable electricity, protecting native species, or maintaining cheap barge transportation) vs. *special* interests (e.g., greedy electric power companies, elite environmentalists, or corporate grain farmers). To market their policy preference, proponents will try to couch their choice as that of the majority (mainstream) and the opponent's position as being that of a small minority (special interest).

None of these policy advocacy tactics necessarily are wrong, immoral, or unethical, but rather reflect the nature of democratic debate. Those involved in policy analysis or providing science to help inform policy debates, however, should be attuned to such tendencies.

Ecological Policy Axiom 4 — Potential losers are usually more assertive and vocal than potential winners and are, therefore, disproportionately important in decision making

With many ecological policy questions, those who bear the costs, the losers, have a disproportionately greater influence on the decision making process. While policy analysis tends to evaluate the rationality of competing policy arguments, the political process tends to weigh breath and vigor in support of each competing policy option. Issues of perceived fairness are important in the political process, but difficult to quantify in policy analysis.

For example, consider the possible listing (under the U.S. Endangered Species Act or the Canadian Species at Risk Act) of a fish species found only in a relatively small geographical area. Except for committed preservationists, most people see the issue as not pivotal although they may philosophically support species preservation in general. In contrast, those whose land and livelihood will be adversely affected are likely to be aggressively hostile to the proposed listing.

Ecological Policy Axiom 5 — Many advocates will cloak their arguments as science to mask their personal policy preferences

Technocrats, as I apply the label, are individuals with scientific training who are responsible for implementing law or ecological policy. There is an understandable impulse by technocrats to insert what they *think* is or *should* be the appropriate public policy goal or option. For example, should ecological restoration be aimed at recreating the ecological condition that existed at the beginning of the Holocene, just prior to 1492, or at the end of last week? The answer requires making a value judgment — a policy choice which is necessarily a political judgment — and it is not a scientifically derived decision. Ecologists and other scientists should assess the feasibility and ecological consequences of achieving each possible restoration target. Selecting from among the choices, however, is a societal enterprise.

Similarly, notions of *degraded* or *damaged* ecosystems, the metaphors of *ecosystem health* or *biotic integrity*, or the relative importance ascribed to *natural* conditions vs. *altered* conditions need to be calibrated by societal values and preferences, not by those offered by scientists and technocrats. For example, one person's "damaged" ecosystem is another person's "improved" ecosystem. A "healthy" ecosystem can be either a malarial swamp or the same land converted to an intensively managed rice paddy. Neither can be seen as objectively "healthy" except through the lens of an individual's values and preferences.

Those of us who work in applied ecology must be constantly on guard against the incursion of normative science into our scientific language and thought. Normative science has built-in, often subtle, policy preferences and biases. Referring to an ecosystem as being "sick" or "healthy" is predicated on a value judgment that one state of that ecosystem is preferable to another. Such a diagnosis may be appropriate as personal or collective policy judgments, but should not be offered under the guise of providing policy neutral science.

Scientists should, as they often do, play an important role in ecological policy deliberations, however their role should be carefully circumscribed even though political institutions rarely provide clear boundaries or guidance. Some of the players in policy deliberations, along with much of the public, remain ignorant to what is scientific information vs. a policy preference that sounds like science.

Ecological Policy Axiom 6 — Even with complete and accurate scientific information, most policy issues remain divisive

The lament that "if we just had some better science, we could resolve this policy question" is common among both scientists and decision makers. Calls for more research are ubiquitous in ecological policy debates.

In most policy cases, even if we had complete scientific knowledge about all aspects of an issue, the same rancorous debate would emerge. Root policy differences are invariably over values and preferences, not science and facts.

Consider, for example, the ongoing debate over the management of U.S. public forests. Nearly every faction supports the policy goal of managing to achieve "forest health" or perhaps "ecosystem health." Many assert that the path to achieving a healthy forest would be pretty clear if we understood the underlying science. Thus there are regular calls for more research, but all the science in the world will not resolve the "healthy" forest debate because it is fundamentally over conflicting values.

Ecological Policy Axiom 7 — Demonizing policy advocates supporting competing policy options is often more effective than presenting rigorous analytical arguments

Scientists and policy analysts become frustrated when they fail to recognize that political debates are partly logical argument and partly image. Negative images are often considered more effective in swaying people than positive ones.

In fractious ecological policy debates, proponents often spend more energy demonizing their opponents than sticking to rational policy analysis. My experience is that such tactics are often effective in policy debates; many people are moved by negative arguments.

Consider salmon recovery in western North America. No one has ever argued that we *ought* to eradicate salmon. The conflict is over which of the myriad competing human priorities is most important — food, electricity, water, transportation, fishing, or a host of others. To label proponents of abundant electricity, efficient farming, cheap transportation, or consumptive fishing as "enemies of salmon" is unfair in policy debates. Rather, each policy choice or priority tends to constrain others.

Ecological Policy Axiom 8 — If something can be measured accurately and with confidence, it is probably not particularly relevant in decision making

In my experience most scientists prefer to talk about things that they can measure with some degree of confidence. Fish population abundance, recruitment rates, optimal habitat, toxicity levels, and field surveys are within our comfort zone. We can put confidence limits on these numbers; we can duplicate the data gathering year after year; we can often forecast future conditions with some degree of confidence.

In contrast, to policy makers the most important factors cannot be quantified or at least not quantified in a credible way. Examples of such unquantifiable but important factors are weighing the relative importance of electricity *vs.* the well-being of threatened species, balancing a prosperous farming sector *vs.* maintaining runs of wild salmon, or sustaining a high degree of personal mobility *vs.* a high level of air quality through emission regulations on automobiles.

The disconnect between what matters most to policy makers and what can be measured by scientists is a reality that scientists should recognize. That reality will not likely change in the foreseeable future. In a pluralistic society, with a wide array of values and preferences competing for dominance, the ecological policy debate is usually centered around whose values and preferences will carry the day rather than over scientific information. Scientific information, as important and visible in policy debates as it often is, remains but one element in policy debates and is often a minor one.

Ecological Policy Axiom 9 — The meaning of words matters greatly and arguments over their precise meaning are often surrogates for debates over values

In my experience, many citizens get frustrated in ecological policy debates because the advocates of various competing choices often seem to argue over semantic nuances rather than getting on with making decisions. The precise meaning ascribed to key words is important and is often the battleground over what policy option is ultimately selected.

The debate over definitions is really a policy debate. How should pivotal words such as "ecosystem health," "sustainability," "degraded," "biological integrity," "endangered," "wild," and "impaired" be defined? Definitions chosen will lead (at least in the mind of the uninformed) to a particular policy option. Thus, the debate over what might appear to be semantic nuances is really a surrogate debate over values and policy preferences.

The term "biological integrity" is a case in point. It is a term included in some environmental statutes although the meaning is ambiguous. Integrity is often defined as the status of a biotic condition relative to a pristine ecological state (unaffected by humans) or as close to a pristine state as can be found. Therefore, ecosystems with higher biotic integrity are closer to the pristine state (unaltered) and those with lower biotic integrity are different (altered). So far, no policy preference has been explicitly stated, but what happens in general discussions when an ecosystem is described as having high biotic integrity? Most listeners undoubtedly *assume* that such a condition must be a good thing and that pristine ecosystems must be inherently more desirable than altered ecosystems. This leap of interpretation cannot be made unless ecosystems closer to the pristine condition are *assumed* to be preferable or more desirable. Nothing in the science or technical analysis says that high or low biotic integrity is inherently preferable.

Because certain definitions tend to help support one particular policy preference, participants in policy debates devote considerable energy to trying to get their definitions adopted.

Conclusion

Many of today's ecological policy issues are contentious, socially divisive, and full of conundrums. They are, however, typical of those that professional natural resource and environmental scientists will confront for the foreseeable future. Those of us who provide information to help inform the participants involved in ecological policy debates need to be cognizant of and appreciate the importance of scientific information, but we also must recognize the reality that scientific information is just one element in complex political deliberations in a democracy.

About the Author:

Dr. Robert T. Lackey, senior fisheries biologist at the U.S. Environmental Protection Agency's research laboratory in Corvallis, Oregon, is also courtesy professor of fisheries science and adjunct professor of political science at Oregon State University. Since his first fisheries job more than four decades ago mucking out raceways in a trout hatchery, he has dealt with a range of natural resource issues from positions in government and academia. His professional work has involved many areas of natural resource management and he has written 100 scientific and technical journal articles. His current professional focus is providing policy-relevant science to help inform ongoing salmon policy discussions. Dr. Lackey also has long been active in natural resources education, having taught at five North American universities. He continues to regularly teach a graduate course in ecological policy at Oregon State University and was a 1999-2000 Fulbright Scholar at the University of Northern British Columbia. A Canadian by birth, Dr. Lackey holds a Doctor of Philosophy degree in Fisheries and Wildlife Science from Colorado State University, where he was selected as the 2001 Honored Alumnus from the College of Natural Resources. He is a Certified Fisheries Scientist and a Fellow in the American Institute of Fishery Research Biologists.

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