Setting Goals and Objectives in Managing for Healthy Ecosystems

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This section focuses on policy goals and objectives — the explicit policy targets that provide meaning and definition to the generalities that typically dominate much of the political discourse on ecological policy. To move beyond the realm of policy platitudes (e.g., protect our planet, assure sustainable development, embrace smart growth, implement community-based environmental protection, perpetuate our cherished natural legacy, restore degraded ecosystems, achieve ecosystem health) and toward policy evaluation and implementation, requires that society, through its mechanisms of governance, decides which societal values and preferences to adopt. Societal values and preferences are the criteria society uses to select from among opposing policy goals and objectives.

Scientific input is important in selecting policy goals and objectives because many desired goals and objectives are not feasible. Even among the goals and objectives that *are* ecologically feasible, decision-makers, and especially the public, rarely understand the ecological consequences of each option. Ecological policy goals typically conflict, may be mutually exclusive, and the ecological consequences of each are known with varying levels of certainty.

Ecological goals and objectives are often cast in terms of ecosystem *restoration*, but exactly what ecological feature does society wish to restore and to what extent? What makes one ecosystem more important to society than another? For example, if society wishes to receive the benefits of a roadway, should the adverse ecological effects of highway construction be mitigated? If so, how should they be mitigated? As Zedler and Callaway (2002) illustrate in their article, not all ecological restoration efforts replace what was lost, nor can even the trajectory for restoration be predicted in advance.

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Many discussions about goals and objectives end up enmeshing values and preferences within the scientific information essential to evaluate the consequences of policy options. For example, scientists providing technical information in policy discussions are often accused of offering "normative science" by implicitly advocating policy and value judgments under the banner of impartial science. Normative science is "science" based on implicit policy preferences. An example of normative science is use of adjectives such as "degraded" or "healthy" in describing the condition of a particular ecosystem. Such terminology under the guise of "science" conveys the message as to which ecological state is (or should be) desired and which is not. Often scientists are unaware that they have moved from science devoid of a policy preference to science that implies that a particular policy option is preferred. The notion of ecosystem health is often criticized because of its tacitly derived value and preference character. Lackey (2002) reviews the characteristics of normative science and proposes a proper role for scientists to play when providing information in policy deliberations.

Debates over goals and objectives often become the crux of approaches to addressing ecological policy problems. For example, ecosystem management has burst on the land management agencies in North America as the policy approach for this century. What exactly is implied by the term "ecosystem management" and how does it differ from past approaches to implementing ecological policy? Does it only apply to publicly owned lands, or are private lands within its scope? Is ecosystem health sufficiently robust to underlay implementation of ecosystem management? Fitzsimmons (2002) provides a critical review of the concepts of ecosystem health and ecosystem management as bases for managing lands in North America.

Most governmental policy favors, indeed *encourages*, economic development, but how do such policies relate to concepts of ecosystem health? Do healthy ecosystems imply that human populations are prospering? In some sections of the world, it appears that relatively pristine ecosystems support (by western standards) a very unhealthy human population. If an organization (e.g., the World Bank) has alleviating poverty as one of its central policy goals, how is this goal reconciled with "healthy" ecosystems? Anderson (2002) explores the often confusing and contradictory worlds of "ecosystem health" and "economic development."

Food security is of widespread concern and a feature of many governmental goals and objectives, but how does it relate to ecological policy? For many years agriculture operated by reducing biological diversity and channeling photosynthesis through a few plants and animals. Few would argue that biological diversity, at least in a general sense, is important to past and continuing agricultural development, but what should be the relationship given that the amount of "natural" ecosystems being converted to farming continues to increase? Thrupp (2002) evaluates the relationship of biological diversity and agriculture from the perspective of assuring a long term food supply.

Ecological goals and objectives deal with more than producing food and fiber. How does a person's perception of quality of life relate to ecological policy? There does appear to be, at least for some people, a connection between what are often described as "healthy" ecosystems and their perceived quality of life. Is this relationship true only under circumstances where people are relatively affluent? Ewert (2002) explores the connection between perceived quality of life, recreation in "natural" ecosystems, and individual policy preferences.

Traditionally, economic development has usually been predicated on the natural resource development model. Early in the "development" of a country, its economy tends to be extractive. As the economy develops and expands, the economy generally shifts toward manufacturing and possibly toward a "service" economy. Is this the most desirable trajectory? Are concepts of "natural capital" useful in describing more effective approaches to economic sustainability? Collados (2002) provides a critical review of the concepts of natural capital and ecological sustainability, and their implications for developmental policies of nations.

The articles in this section attempt to move beyond the platitudes so typical of ecological policy discourse. Each author critically evaluates the nature and character of potential goals and objectives and, in some cases, how such goals might be achieved. Some of the articles also document what are clearly inappropriate policy goals because they rely on the values and preferences of scientists, rather than reflecting the values and preferences of society.

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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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