Ecosystem management: agency liberation from command and control

Richard L. Knight and Gary K. Meffe

"Change is not just a fact of life. It is the very essence of life. To remain relevant and viable, institutions must adapt to the changing environment that is the context of their existence." (Kessler and Salwasser 1995)

Holling and Meffe (1996:330) described a "pathology of natural-resource management," which they defined as "a loss of system resilience when the range of natural variation of the system is reduced." This pathology, resulting in less resilient ecosystems following manipulation and control by humans, was identified as 1 result of a command-and-control approach to managing our natural resources. In attempting to control variation, commodity extraction, and behavior of natural ecosystems, these systems inevitably become less resilient when faced with extreme events such as periodic natural or human-induced disturbances. Holling and Meffe's paper focused primarily on control of nature and the consequences of such control, although there was some discussion of institutional behaviors in this process. Here, we wish to extend their arguments and assess command and control in the context of natural resource agencies, and, in particular, to open a dialogue with respect to ecosystem management and its relationship to agency governance.

Our discussions, over the last several years, with employees of state and federal natural resource management agencies have taught us that the typical organizational structure has been a hierarchical, top-down model. Power typically is concentrated in the upper echelon of agencies and is parceled out sparingly to those lower in the command structure. Power is even more frugally allotted to outside groups interested in natural resources, such as citizens, nonprofit organizations, or other agencies.

Such an institutional design follows the Newtonian model of scientific certainty, precision, prescription, and confidence, which affirmed that with enough effort, systems can be fully understood and therefore controlled. Because the natural world was viewed as ordered, segmented, and mechanistic, with linear, cause-and-effect relationships, it was not surprising that agencies compartmentalized themselves into specialties that employed a command-and-control mentality to manage resources (Nelson 1995). This strategy worked well during an era of utilitarian management of natural resources. Viewing trees as lumber, wildlife as game, and grass as forage allowed agencies to deploy managers with new, industrial age technology to produce more outputs and organize around a machine-model bureaucratic operation. These management efforts were characterized by their singular adherence to maintaining control of the resource and by an absence of cooperation with the resource users, whether they were commodity or amenity groups.

With the advent and adoption of ecosystem management (Grumbine 1994, Interagency Ecosystem Manage. Task Force 1995), agency attitudes and behaviors seem to be changing and evolving. Because ecosystem management encourages partnerships, cooperation, and risk-taking, it contrasts sharply with the linear command-and-control approach of tradi-

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tional resource management that encouraged hierarchical decision-making and risk aversion. With the development of an ecosystem approach, agency resource managers may begin to feel emancipated from this classical top-down, hierarchical model, and embrace a broader, more inclusive perspective toward natural resources (Kennedy and Thomas 1995).

We review several concepts that illustrate differences between the traditional approach and an evolving perspective encouraged by ecosystem management (Table 1). Our purpose is to illuminate how a stewardship approach to managing natural resources mirrors general changes found in today's societal, political, and economic systems, as well as a shift in science away from certainty and positivism, and toward uncertainty and pragmatism (Zukav 1979, Capra 1991). In the process of adopting ecosystem management, we believe that agency personnel have begun to redefine their roles as land stewards rather than land controllers.

One difference between traditional and ecosystem management approaches is that the former emphasizes command from above (top-down) rather than individual initiative and input from all levels. Because of the complexities of managing landscapes for a variety of worthwhile goals (commodities, amenities, biodiversity), and the lack of complete information necessary for hierarchical decision-making, a one-size-fits-all approach issued from the top often clashes with specific needs of individual projects. Inclusion of many minds from many perspectives offers a better probability of sensible decision-making, while also defusing the "power trips" that sometimes motivate individuals to climb the institutional ladder and sing the agency tune rather than care for the resources.

Ecosystem management also acknowledges strengths associated with a decentralized approach to management, rather than the traditional, linear organizational structure. Historically, resource agencies followed a chain-of-command approach to management. Accumulation of power at the top of agencies, and the painfully slow ability for bureaucracies to adapt to change, meant that resource issues were not always addressed in a timely fashion. Employing a decentralized approach with feedback loops acknowledges the intricacies inherent in managing landscapes and allows for greater flexibility and efficiency in meeting the multiple challenges of management.

Table 1. Comparison of management perspectives in natural-resource agencies driven by traditional command-and-control management versus an ecosystem approach to stewardship.

Traditional management	Ecosystem-based approach
Top-down decision making	Input from all levels
Centralized, linear	Decentralized, with feedbacks
Risk-aversive	Risk-taking
Finality of decisions	Willingness to revisit, revise, and admit error
Imposed vision	Shared vision
Within-administrative boundary	Across-administrative boundary
Control	Partnerships

Ecosystem management encourages risk-taking rather than the traditional risk-aversive mentality that traditionally developed among agency personnel. Ecosystem management stresses adaptive management, where learning occurs by designing management actions as experiments rather than prescriptions. When management efforts are viewed in this light, a high degree of certainty disappears, and agencies signal that failures have instructional value and are therefore useful.

Traditional management means making a decision and sticking to it—regardless of the results. Checking goals off a list is highly valued and indicative of good job performance. The ecosystem model instead promotes continual revisitation of decisions, their revision based on a review of initial results and new information, and the confidence in the spirit of continually improving the mission of land stewardship. This approach has much in common with other planning techniques, including Total Quality Management or Quality Improvement Programs (Walton 1986). Institutional learning and improvement, rather than simply meeting a priori goals, then becomes the measure of success and career advancement.

Historically, resource agencies developed their mission statements internally (or accepted them from legislative mandates) and then imposed them upon the resource and its users. Ecosystem management requires the development of shared visions, crafted through dialogue with resource users—those living adjacent to public lands, and sometimes distant stakeholders (Kessler and Salwasser 1995). Agencies can view their mission as facilitating the development of ideas rather than imposing the federal or state viewpoint upon local communities. This cannot help but result in greater buy-in and cooperation from stakeholders.

Landscapes are fragmented by administrative boundaries. Historically, resource agencies behaved as though their boundaries were inviolate, and there was no need to be concerned with cross-boundary fluxes. Ecosystem management dispels this perception and requires agencies to move across boundaries in practicing good stewardship. This necessitates a shift in focus, from exclusive control of events within a political boundary to de-emphasis of the boundary and concentration on the health and land-use practices of greater ecosystems. Because new and emerging issues of biodi-

versity and species survival cut across lands under many ownerships (public and private alike), much is made of the need for collaboration among agencies, owners, and stakeholders. Political leaders, weary of conflict and desiring for consensus, are calling for a shift by resource agencies toward collaborative processes that will affect both public lands and the greater matrix within which these lands are embedded.

At a time when agencies are being asked to do more with less, it is appropriate that ecosystem management stresses partnerships rather than agency control of management actions. Agencies alone no longer have the resources necessary to address the increasingly diverse and complex issues they are being asked to confront. Partnerships, among agencies and all stakeholders, reduce duplication, encourage efficiency and cooperation, and make more collective resources available. When interest groups invest in conservation actions they go from simply being a stakeholder to being a partner, an important difference in productive collaborative relationships.

The traditional approach to natural resource management, captured in the phrase "command-and-control," may have worked well during a simpler, less confrontational era. With the emergence of new and involved, and more, stakeholders on our public lands, and the realization that public and private lands are contiguous and function as holistic ecosystems, agencies can no longer hope to accomplish their missions following the traditional approach. Ecosystem management calls for more open, participatory practices that emphasize partnerships, shared visions of the land, and decentralized agencies; in this model agencies promote risk-taking, shared initiatives, and adaptive management. Because societal, institutional, and ecological approaches have become more complex with an ever-increasing human population, there is no going back to traditional models. Resource-management agencies are acknowledging these changes by adopting an ecosystem approach and liberating their employees from the restraints of a command-and-control approach to management (Yaffee et al. 1996).

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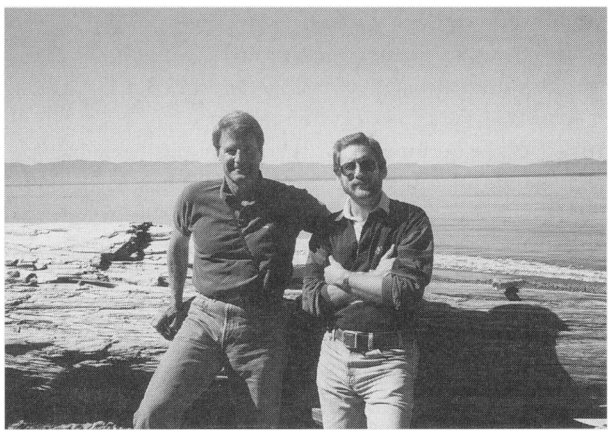

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