

Ensuring the Common for the Goose: Implementing Effective Watershed Policies

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Abstract.—Addressing public and scientific concerns about human impacts on long-term ecological sustainability will require new approaches to resource management. These new approaches, which place considerable emphasis on management on the landscape or watershed scale, stress holistic and integrated science, meaningful public involvement to reflect changing social goals and objectives, collaborative decisionmaking, and flexible and adaptable institutions. New policies that incorporate ecological understanding as well as promote democratic ideals will be required. Five guidelines can assist in designing an effective policy framework in which watershed management makes a significant contribution to the goal of long-term ecological sustainability. They include: integrate the political from the outset, build bridges to citizens, reexamine laws, rights, and responsibilities, strengthen administrative capacity, and look beyond the watershed.

Introduction

The law locks up both man and woman
Who steals the goose from the common
Buts lets the greater felon loose
Who steals the common from the goose

—Anonymous English poem

Public and scientific concerns about human impacts on long-term ecological sustainability have prompted serious scientific and political reconsideration of the requirements for effective natural resource management. It is increasingly recognized that not only must we focus on the potential harm that can be done unintentionally to discrete ecological units, but we must also focus on issues surrounding the integrity and stability of the larger common; the landscape, ecosystem, or watershed. Politically this means designing more effective policies that incorporate ecological understanding as well as promote democratic ideals of equality, liberty, popular sovereignty, and equity.

Many of our traditional approaches to natural resource management are no longer adequate to meet tomorrow's

challenges, and these approaches have come under severe criticism. In the United States, for example, implementation of current regulatory regimes for clean air and water are said to have created a "pathological cycle of regulatory failure, crisis, and controversy" (Lazarus 1991, p. 146). Natural resource policies are said to be characterized by a "pathology of natural resource management" (Holling and Meffe 1996). Many water, timber, grazing, and mining policies have been termed the "lords of yesterday," i.e., policies that while outmoded continue to exert tremendous influence (Wilkinson 1992). These policies have often had quite devastating effects not only upon the landscape, but upon democracy as well (Cortner and Moote 1999; Ingram and Wallace 1997; Klyza 1996). Thus, new approaches to natural resource management are increasingly being formulated and applied.

A central goal of new ecological approaches is usually long-term ecological sustainability, i.e., maintaining ecological attributes and functions into perpetuity, therefore ensuring that future societies enjoy the same ecosystem values that we do today. Unlike traditional resource management, the first priority of ecosystem management is conserving ecological sustainability; long-term maintenance of ecosystem integrity, productivity, and resilience; levels of commodity outputs are adjusted to meet that goal (Christensen 1996; Grumbine 1994; Wood 1994). Commodity production is considered a secondary byproduct, much like interest on capital (Brooks and Grant 1992). Ecosystem management stresses holistic, integrated science, meaningful public involvement to reflect changing social goals and objectives, collaborative decisionmaking, and flexible and adaptable institutions (Cortner and Moote 1999).

Watersheds play an important role in ecosystem management, and the search for new management paradigms has brought a resurgence of interest in watersheds and watershed management, broadly defined. Watersheds, it is argued, are natural, logical organizing units for land use planning and ecosystem analysis. In many areas of the United States watershed-based organizations are experimenting with collaborative and inclusive decisionmaking processes as part of an ecosystem approach (Natural Resources Law Center 1996; Yaffee et al. 1996; Toupal and Johnson 1998; Weber 1999). Watershed-scale management recognizes the interconnections of upstream and downstream areas, not only in terms of hydrology and

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biology, but also in terms of land ownership and resource management institutions. Biophysically and institutionally, watersheds are natural laboratories of experiments for the collaborative and adaptive management emphases of new ecological approaches to resource management.

This paper addresses the central question of designing an effective policy framework premised on the goal of long-term ecological sustainability. While the focus of the discussion is specific to the United States, many challenges to designing policies that incorporate a broad ecosystem perspective are not nation-specific. The paper suggests five guidelines for designing an effective policy framework in which watershed management can make significant contributions to the goal of long-term ecological sustainability. While these guidelines do not represent an inclusive list, they are suggestive of some significant and important first steps. They include: integrate the political from the outset; build bridges to citizens; reexamine laws, rights, and responsibilities; strengthen administrative capacity; and look beyond the watershed.

Integrate the Political

While natural resource management professionals are want to lament that citizens increasingly appear separated from resources, the traditional myths and cultures of the resource management professions have reinforced that separation. Too often we have separated politics and resource management, treating fundamentally political problems, such as forest planning or endangered species protection, as technical problems that can be fixed with technical solutions and science-based optimal decisionmaking. Questions of politics are viewed as discrete issues, reflecting our historical tendency to separate humans from resources, the political from the technical, the social from the physical. All too often institutional and policy issues are left to the end (the end of a bioregional assessment, the end of a planning process) or are ignored altogether. We nod knowingly when reminded that resource management is embedded in a social-political context and that we need to be conversant with that context; then we continue to exhibit behavior in our management and research establishments that demonstrates that we really don't want to accept that in practice. This can no longer be the case.

It is relatively easy to ask how the watershed is functioning, but leave out the people and their preferences. But most problems are not simply technical in nature, they are political. Political and institutional considerations need to be integrated from the outset. Designing effective policies is not something to be relegated to the end-of-the-pipe

process after the watershed science or the hydrology gets figured out. Socially defined goals and objectives frame the expectations for ecosystem management. This means beginning with an understanding of the social and political context, using that information to prioritize problems, and integrating that information into all aspects of assessment and alternative development and evaluation. Implementation considerations, which are heavily people-dependent, need to be factored into the process, not left for policy makers and managers to figure out after most of the scientists go home.

Build Bridges

Involving interested publics in decisions that affect the management of watersheds is necessary for stewardship, for ensuring that policies adequately reflect social and goals and objectives, for carrying out policy directives, and for monitoring landscape and policy responses. Including people in policy decisions is no simple task, however. Effective watershed policies are therefore dependent first upon building and sustaining social capital and active citizen engagement. Citizens' capacity and willingness to engage in governance depend upon a reserve of social capital, which are those features of social life, networks, norms, and trust, which facilitate citizen association and enable participants to act together more effectively to pursue shared objectives (Putnam 1995). Social capital influences citizens' collective ability "to respond to external and internal stresses; to create and take advantage of opportunities; and to meet the needs of residents, diversely defined" (Kusel 1996, p. 369). The collection of characteristics encompassed by the concept of social capital is enhanced by the presence of existing social networks, such as clubs, professional associations, religious organizations, and other groups; the "associations" that the 19th century French political observer Alexis de Tocqueville (1900) defined as critical to American democracy. Through participation in these associations, citizens realize their collective power to change local conditions and influence society (Machlis 1990; Etzioni 1995). Citizen participation in civic organizations is considered important to democracy in part because it is through participation in these voluntary institutions that people develop the trust and skills needed for participation in political groups.

Today, however, some observers are greatly concerned about declining levels of civic engagement. According to one prominent social scientist: "By almost every measure, Americans' direct engagement in politics and government has fallen steadily and sharply over the last generation.... despite the fact that average levels of education —

the best individual-level predictor of political participation—have risen sharply throughout this period. Every year over the last decade or two, millions more have withdrawn from the affairs of their communities” (Putnam 1995).

People are also increasingly separating themselves from the traditional institutions of government. If one hallmark of mass participation in a democracy is the election, we should take no comfort from voting statistics. American voting turnout, if measured by the percentage of voting age population, is one of the lowest of democratic countries. It is lower now than in the latter half of the nineteenth century. Moreover, polls track a significant and continuing decline in citizen trust in government (Nye et al. 1997). Where polls once showed 75 percent of Americans trusted their government, today only 25 percent do so. Like the term “politics” the term “government” is increasingly used in a pejorative sense. Parallel to the decline in public trust and confidence in the federal government has been a sharp decline in public confidence in leaders of many other institutions, including the military, universities and colleges, the press, and medicine. Moreover, similar declines in confidence are found in other developed countries. As economic development takes place people become more secure about basic existence needs and more likely to challenge traditional authoritative institutions (Inglehart 1997).

While Americans have always distrusted government to one degree or another, the question is, when does the separation of citizens from governance in this country cut so deep that it precludes timely political reform? Despite the long history of an adaptive and resilient political system, the danger is that we may reach the point where the system is incapable of recovery and regeneration. Therefore, if a strong reservoir of social capital is indeed a precondition for the effective performance of political institutions, effective policies will depend upon rebuilding social capital. It will also be imperative to either to reinvigorate traditional governance institutions, or alternatively to experiment with new, more participatory forms of governance outside traditional structures (Nye et al. 1997).

Building social capital and a renewed conception of public life will require countering the destructive aspects of individualism, showing the collective benefit, and breaking down barriers to public participation. While significant institutional barriers to more participatory democratic forms still exist, the increasing interest in collaborative processes when local community concerns are at stake is an encouraging sign of grass-roots civic engagement. Useful lessons are being provided by a number of community-based forest organizations and watershed groups. These groups are attempting to make local communities and local people more effective participants in the process of governance, and have embraced the idea of sustainable resources and sustainable communities. Many

environmental groups, however, remain skeptical of the call for more community-level participation in natural resource management, believing it is a ploy to reverse environmental gains won at the national level and shore up the power of traditional consumptive users. In response, many groups in the community movement insist that the issue is not local control, but inclusivity and more explicit recognition of the contributions communities as well as nonlocal citizens can make in the decision making process and toward achieving the goal of effective resource stewardship. The experiences of other nations with community-scale conservation and watershed management are also being looked to as prototypes of more participatory and localized involvement in resource management (Western and Wright 1994).

Watershed scientists, not just managers, have obligations to build bridges to citizens. Watershed science has an obligation to civic action and the creation of “civic science” in which scientists act as part of the community. This is necessary to ensure that the integrated, holistic science, which is a hallmark of the new ecosystem approaches, does not become a rationale for the construction and conduct of “big science” projects dominated by experts. In big science only experts will be able to determine how complex ecosystems function, and devise standards and criteria for meeting the goal of sustainability (Cooperrider 1996; Klyza 1996; Cawley and Freemuth 1997). And while people may be recognized as part of ecosystems, they will still be viewed as objects to studied and managed rather than meaningfully consulted (Cawley and Freemuth 1997).

Civic science, on the other hand, is participatory; policy makers and citizens also have roles in designing, undertaking, and interpreting research. Participatory and discursive research designs promote democratic deliberation about the problems people, not just experts, see as important, give greater status to grassroots knowledge, and foster collaborative learning and deliberation about values (Cooperrider 1996; Schneider and Ingram 1997). Discursive designs democratize expert cultures. They emphasize learning among participants. They are highly collaborative. They seek to supplement, not replace, the standard analysis that focuses on efficient means to given ends with qualitative discussions of the means themselves (Fischer 1990, p. 366). They are a catalyst for adaptive management (Shannon and Antypas 1996; Lee 1993).

“It should be clear that civic science cannot be simply a device through which citizens are enrolled as helpers in a scientific process....civic science is not simply citizens doing the procedures of science with the help of scientists. Rather, *civic science involves scientists as citizens and citizens as lay scientists* in a process in which knowledge production is integrated with and therefore cannot be separated from the enlightenment function of self-discovery and the

moral effects of political deliberation and choice” (Shannon and Antypas 1996, p. 68 emphasis in original).

There is much new ground to cultivate here and challenges for scientists, citizens, as well as for those who teach science and research methodology. In civic science there is no set formula for a collaborative learning approach, and no standard protocols for understanding the needs, interests, and values of participants. While “scientific methodology texts, perhaps unfortunately, can be organized like cookbooks ... an art form is different” (Fischer 1990, p. 372).

Reexamine Laws, Rights, and Responsibilities

Implementing new ecological approaches that are the foundation of ecological conditions challenges us to rethink how human-nature relationships are structured through social and governmental institutions. These approaches will not be successful without significant and substantial institutional change. In addition to building social capital, this will require reexamining laws, aligning market operations with the goal of sustainability; and rethinking property rights and responsibilities, both private and public.

First, the broad array of laws that govern the use, protection, and restoration of natural resources must be evaluated for compatibility with new ecological approaches. Consider the following criticisms about the laws in the United States that affect watershed management. The Multiple-Use/Sustained Yield Act of 1960, which as implemented has tended to favor commodity production over ecosystem protection and restoration, may have outlived its usefulness. The rational-comprehensive planning approaches outlined in laws such as the National Forest Management Act and the Federal Land Policy and Management Act and their implementing regulations may be too rigid, inflexible, expensive, and inimical to adaptive management. Similarly, the Endangered Species Act’s species-by-species approach may be counterproductive to efforts to look at species distribution and mix over larger ecosystems. Laws such as the Clean Water Act and the Clean Air Act may be so complex that it is doubtful if the administrative capacity to implement them can ever be fully developed (Klyza 1996; Wilkinson 1992; Behan 1992; Behan 1990; Gordon 1994; Keiter et al. 1995; Rosenbaum 1998; Rohlf 1994; Franklin 1993). Finally, the framework established by these laws does not include any

explicit mandates for watershed management, land stewardship, or ecosystem management. It may thus be an appropriate time to make a thorough examination of conflicting legal requirements, look for novel ways to address the political and institutional challenges of achieving long-term ecological sustainability, and make recommendations for new and corrective legislation. The Forest Service is in the process of adapting recommendations made by the Committee of Scientist’s Report regarding regulatory implementation.

Second, there is a need to recognize that economics is also a vital part of the solution and to align government laws and policies that affect market operations with the goal of sustainability (President’s Council on Sustainable Development 1996). Markets are a highly controlled political institution. The availability of goods and services and the prices at which those goods and services are bought and sold are heavily influenced by governmental law and policy both here and abroad. Many principles and theories of economic theory, which influence how we use conventions such as the discount rate and how government constructs and uses indicators of economic productivity and health (such as the gross national product), are government sanctioned. In the past, such conventions have often given short shrift to the values of ecological services and the costs of environmental damages.

Consequently, changes in government policy can create an institutional climate in which market forces are allowed to work in a positive manner, promote ecological behavior, and reward the private sector for producing ecosystem benefits and pursuing long-term ecological sustainability. Government can establish market-based incentives through tax and spending policy and other economic incentives, it can privatize certain governmental functions through the creation of marketable rights and permits, and it can revise budgetary and accounting policies to acknowledge the values of natural capital. Clearly traditional economic ideology and modern ecological awareness must find a common ground from which to cobble a transition toward, and shared responsibility for, fully realizable sustainable practices.

Finally, efforts to manage at a landscape or watershed scale will fail unless both public and private lands are part of the management picture. Management plans cannot be divorced from ownership realities and the different objectives of private and public land owners or they will become mired in political conflict (Flick and King 1995; Hargrove 1980; Cribbet 1986). The property rights movement of the last several years, for example, is indicative of the extremely deep feelings that Americans have about private property.

Property is a social construction that is always undergoing continual modification through court rulings, new

philosophical and ethical currents, and changing societal values about labor and capital. In reality, property tenure systems in today's society are dynamic and diverse (Geisler and Kittel 1994). Societal understanding of property rights and the appropriate extent of government regulation should be expected to evolve, just as the definition of good stewardship changes as more is learned about ecosystems (Cribbet 1986; Sax 1993). For example, societal perception of wetlands has shifted considerably in recent years. Not long ago wetlands were considered unproductive wastelands best drained and reclaimed for productive use. Today wetlands are highly valued as wildlife habitat and water purifiers, among other things, and under current law landowners no longer have the right to drain swamps at will. As population has grown and the technological capacity to do significant ecological damage has increased, there are simply a lot more instances where doing what one wants with property hurts someone else (Weeks 1997). In the future, public-private cooperation and new types of property, such as shared land ownership, may well result in further changes in the way society views private and public property.

Property is also a classic example of the responsibilities that attend rights. One does not have the right to use one's land to the point that it becomes a nuisance to others. It is generally accepted, for instance, that pollution spewing uncontrolled from an effluent pipe or a smokestack may be regulated for the greater good. More recently, the legal responsibilities of landowners have been found to include a responsibility to resident endangered species and their habitat. Although arguments are frequently heard that the current legal framework contains "too much regulation," the writings of Aldo Leopold remind us that those who rail against government regulations are often those who are failing in their own obligations to practice stewardship: "Individual landowners and users, especially lumbermen and stockmen, are inclined to wail long and loudly about the extension of government ownership and regulation of land, but (with notable exceptions) they show little disposition to develop the only visible alternative: the voluntary practice of conservation on their own lands" (Leopold 1949, p. 213). The modern reality is that landowner responsibilities are simply greater than they once were, and regulation is often the price paid for failure to attend to the responsibilities attached to property rights. Recognizing the increasing responsibilities of landowners and changing citizens' philosophical orientation to nature to acknowledge responsibilities for stewarding public and private resources can do much to ensure that property rights serve both ecological sustainability and democracy and reduce the need for government regulation.

Strengthen Administrative Capacity

Agency cultures are a substantial barrier to building institutional capacity. Professional norms affect the identification of management goals and the formulation and adoption of the means for achieving those goals. A strong professional ethos can serve an agency well, giving it purpose and making it cohesive. But such insularity can also be damaging when professional beliefs and myths persist in the face of either new scientific evidence or markedly changing social values (Schiff 1962; Clarke and McCool 1996). Agencies become wedded to routine, and deeply resistant to any alteration that doesn't agree with their own professional view of what should be done. Issues become framed as "them versus us," and divisions between the professional expert and the public are sharpened.

Incentives and rewards systems in resource management agencies have traditionally been heavily weighted toward commodity production; efforts toward improving ecological conditions have not been rewarded. Management incentives also exist to control information (Boyle et al. 1994). When faced with conflict, conformity rather than dissent and innovation is rewarded. As a result, agency cultures have yet to foster a spirit of cooperation and a willingness to give up resources and hence power to other agencies and entities. Agencies have been reluctant to shift from linear step-by-step approaches to public participation to those that are flexible, open, and encourage a rich public discourse (Kennedy and Dombeck 1995). Innovation and new forms of leadership have been impeded by hierarchical decision making structures, the risk aversion found in upper levels of decision making, and standards for organizational promotion. There are some evident changes, however. Efforts to diversify the workforce by discipline, gender, ethnicity, and philosophy have brought new attitudes and perceptions that are providing some support for new approaches (Boyle et al. 1994). Moreover, employee loyalty is increasingly not to the organization but to issues such as protection of resources or to the employee's own sense of personal ethics. While such individuals are simultaneously praised as brilliant entrepreneurs and lambasted as deviant insubordinates, they are nonetheless indicative of attempts by lower and mid-level employees to shape organizational change (O'Leary 1994).

Overcoming organizational biases and rigidity, however, is not a trivial task. Proponents of participatory democracy note that opening resource management decisionmaking will require a shift from the current agency/government focus on efficiency. "The criteria for evaluating policy in a democratic process are the accessibility of the process and/or the responsiveness of the policy to those who are affected by it, rather than efficiency or rationality of the decision" (Kweit and Kweit 1987, p. 22). Rather than simple, linear, cause and effect models, organizational cultures will need to move toward more complex and integrated systems thinking (Kennedy and Dombeck 1995; Senge 1990). New, more participatory shared-leadership models will be required (Berry and Gordon 1993; Sirmon et al. 1993).

As long as multiple agencies and levels of government remain protective of their own turf and define their own visions and management objectives apart from each other, it will be difficult to effectively manage at the landscape or watershed scale. Interagency and intergovernmental coordination are needed to meet data and research requirements, reduce repetition, ensure data comparability, and share results. Since water, plants, animals, pollutants, and people are in large part oblivious to administrative boundaries and cross them at will, resource managers will need to acknowledge mutual responsibility for ecosystem components and coordinate processes those transcend those boundaries (Keiter 1994; Keiter 1989).

While there are numerous legal requirements for coordination and many available techniques, bureaucratic efforts to protect agency domains have been long recognized as one of the main impediments to coordination. Turf battles persist among agencies and different levels of government; specialists in one agency don't trust similar specialists in another. Cultural barriers divide managers and scientists (Forest Ecosystem Management Assessment Team 1993). Even within agencies there may be competition among specialists or different parts of the agency. Better external coordination can occur only when there is better internal coordination (Sample et al. 1994).

It is also important to remember that requirements for coordination are not the same thing as opportunities for coordination. Coordination is both a process and a structure of relationships that distributes power, access, and resources. Too often in the past coordination has been treated as a formal procedure to meet requirements that can be satisfied by notice and consultation. Coordination can be strengthened by making it frequent, personal, and ongoing (Coward and Fairfax 1988; Fulk 1990).

Beyond the Watershed

The number of changes to be considered is indeed numerous and expansive. Yet, the net must be cast broadly. Of course, we must focus on those things that are normally within our professional radar scope, such as, for example, understanding climate effects upon watershed processes, improving water quality monitoring, creating new watershed organizations, or developing more effective technical assistance and economic incentives for watershed stewardship. But effective watershed management policies will also depend upon participation in addressing things not normally thought of as "green." Designing effective policies for watersheds is dependent upon a healthy and adaptive political system that has the capacity to address interrelationships among policy arenas. Consider three examples.

First, reviving citizen trust in government and moving away from the politics of interest that pervades all fields of government, not just natural resources, will require attention to campaign finance reform. Campaign contributions have a wealth and income bias that is greater than for any other mode of political participation (Lijphart 1997). Interests that want to protect short-term gains have disproportionate political power over those advocating change for the long-term interest (Rivlin 1993). The current system of campaign financing creates unequal access and power; at its worst public officials are bought and sold. It has bred corruption and public distrust. Figuring out the mess of campaign financing without stifling free debate is one of the most immediate and important challenges to ensuring the health and integrity of the American political system.

Second, how we treat each other as humans inevitably affects how we treat nature. Racism is not just this nation's enduring curse, it is the world's curse. It squanders both national and human resources with devastating effects on the physical and institutional landscapes. Resources become pawns in the game to gain ascendance over other races or ethnic lineages. Similarly, subjugation of women affects their health, education, and employment opportunities which are factors affecting population policies as well as fundamental human rights. If we cannot treat different races, ethnicities and genders with respect, our relationship to nonhuman objects is also likely to be one of mastery.

Third, the growing disparity between the rich and the poor is of concern. In the United States there is a growing gap between the haves and have nots (Reich 1997). While this gap has not yet become significant politically, it is a latent and explosive issue. It is beginning to affect power structures, define who can afford to politically participate, and separate people from one another. It could unravel the social fabric and affect the legitimacy granted governance structures. In addition to generally reshaping the general political environment in which public policy making takes place, it could also affect how resources, such as watersheds, come to be publicly perceived especially if watershed preserves or certain management practices are widely seen as benefitting the haves at the expense of the have nots.

More apparent are the differences between the rich and poor nations. Developing countries aspire to the same kind of productive, consumptive economy that characterizes the U.S. But without significant cuts in consumption by the developed world, the costs of narrowing the income disparities between the rich and poor countries will have horrendous impacts on the world's resources and its watersheds. True, consumption and population are often given lip service as important factors in discussions about effective natural resource policies, but they are just as frequently dropped as either too big to handle within the confined sphere of the problem at hand or potentially too controversial. Very rarely are policies for dealing with population, over-consumption, or wealth inequalities part of our proceedings.

Thinking holistically about natural resources and the environment doesn't just mean expanding the biophysical scope of interest from the stand to the entire watershed or addressing human dimensions by doing more social-economic assessments of watershed communities. It also means broadening our policy and scientific research agendas to include attention to a much broader set of problems and how they relate to the values, goals, and strategies of long-term ecological sustainability. Effective policies in the area of watershed management are dependent upon policies that create vital and well-functioning governance structures.

Conclusion

New approaches to resource management call for integrated, holistic approaches to the management of land and water resources. These new approaches place long-term ecological sustainability as the central goal of re-

source management. They place considerably more emphasis on management at the landscape or watershed scale. Without doubt, the way natural resource management has been approached in the past requires changing. No longer is ecological condition simply a constraint on efforts to produce efficiently and effectively the most goods and services that can be provided; ecological condition is the fundamental goal.

There are significant opportunities for watershed management programs to become prototypes of an interdisciplinary, holistic, participatory approach to long-term ecological sustainability. Such programs can take the lead in the design and implementation of changes that will be needed in our politics, our traditional scientific protocols, and our organizational cultures. Participation in this process will require watershed managers and scientists to integrate the political from the outset, build bridges to citizens, reexamine laws, rights, and responsibilities, strengthen administrative capacity, and look beyond the watershed. These prescriptions for action, however, do entail redistributions and shifts in the current configuration of power and will spawn the conflicts such shifts entail. Resolving those conflicts will necessitate crafting more effective political connections among humans, nature, science, and government, and heightening concern for the intergenerational impacts of actions. It will require attention not only to watershed science, but also to democratic science. Achieving long-term ecological sustainability and ensuring resilient and adaptive watersheds is intimately connected to the health, resilience, and integrity of the larger polity. Our attention must not only be focused within the boundaries of the watershed and discrete functions within that watershed, but to problems and processes within the larger policy. Significant work remains to be done by scientists, managers, and citizens to design an effective policy framework that ensures that, in addition to not stealing the goose from the common, in the long-term the common is also not stolen from the goose.

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