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SUSTAINABLE WATERSHEDS

Jonathan Z. Cannon^{*†}

INTRODUCTION

“Sustainability” and “sustainable development” are contested terms, often characterized as vague or ambiguous. Nevertheless, they are invoked as core principles of national and international environmental laws, such as those of the European Community, and seem thoroughly entrenched in the global discourse on environmental issues. While less pervasive than in Europe, notions of sustainability also appear in U.S. environmental law, most significantly in the National Environmental Policy Act (NEPA), codified at 42 U.S.C. § 4331(a).

Despite the ambiguities surrounding it, sustainability can provide useful guidance in managing the major natural systems on which we will depend for the indefinite future, such as the climate system, the oceans, and aquatic and associated terrestrial ecosystems, which I will reference together as watersheds. This Commentary argues that, by any interpretation of sustainability, additional public and private investment should be made to protect and restore watersheds and their incorporated landscapes as sources of ecosystem services. This investment may require reducing current consumption but is justified because it will enhance the well being of the present generation and also enable future generations to enjoy a quality of life equal to our own. The Commentary concludes by outlining tools that are available to achieve this goal and steps that the next administration could take to assure their effective use.

I. SUSTAINABILITY INVESTMENTS

The classic articulation of sustainable development appears in the 1987 Report of the World Commission on Environment and Development (commonly referred to as the Brundtland Report): “meeting the needs of the present without compromising the ability of future generations to meet their own needs.” In June 1992, the Rio Declaration articulated twenty-seven principles to advance economic development, environmental protection, and respect for human rights, all under the rubric of sustainable development. One of the core sustainability principles is intergenerational equity, which posits a duty to preserve or enhance resources that may be necessary for

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future generations of humans while adequately providing for those living in the present. Differing interpretations of the intergenerational obligations focus on how many resources (and of what sort) the present generation is entitled to use and how many resources (and of what sort) it is obligated to leave.

These competing interpretations might lead us in quite different directions in cases involving natural resources or environmental quality where the intergenerational tension is substantial—for example, a situation in which there are net gains in current human well being from the degradation of natural assets, but in which the resulting problems will reduce benefits from those assets to future generations. For reasons stated below, however, it will often be the case that the intergenerational tension is small or non-existent—investments to protect natural capital will return net value to the present generation while also enhancing benefits to future generations. These are the targets of opportunity under any interpretation of sustainability, and among them are programs for increased protection and restoration of the nation's watersheds.

II. THE WATERSHED CHALLENGE

Watersheds provide a range of ecosystem services, including provisioning services (e.g., food, water, wood, biomass), regulating services (e.g., water filtration, flood control, aquifer recharge, carbon sequestration), cultural services (e.g., recreation, aesthetic enjoyment, spiritual fulfillment), and supporting services (e.g., soil formation, nutrient cycling, habitat). The Millennium Ecosystem Assessment Synthesis Report, an expert study conducted at the request of the UN Secretary General Kofi Annan, outlined these services in detail. In the United States as elsewhere, watersheds are largely held in private ownership and may not be managed optimally for the ecosystem services they provide because the owners are not generally compensated for their watershed's ecosystem services (except for provisioning services). Maintaining capacity to provide the services amounts to a positive externality for the landowner, as Jules Petty and other authors discussed in *Policy Challenges and Priorities for Internalizing the Externalities of Modern Agriculture*, an article that appeared in 2001 in the *Journal of Environmental Planning and Management*. As noted in the Millennium Assessment, the resulting market failure has led to significant recent declines in ecosystem services worldwide, often to the detriment of both present and future generations.

Plenty of evidence indicates that enhanced watershed management can make cost-effective contributions to the present generation's welfare as well as enhance the diversity of options for future generations. Our experience in water quality management provides some of that evidence. The federal Clean Water Act established national water quality goals in the public interest. Some progress toward meeting these goals has been made, mainly through imposing stringent regulations on point source dischargers (e.g., factories, sewage treatment plants). However, in almost half of the U.S. wa-

ters for which we have data, these goals have not been met. The 2000 Environmental Protection Agency (“EPA”) National Water Quality Inventory states that unregulated nonpoint source runoff from rural and urbanizing lands is the main cause of this failure.

Management measures exist that can produce substantial reductions in the flow of nutrients, sediment, and other pollutants from these lands (e.g., no-till agriculture, vegetative stream buffers, cover crops, storm water swales), and these reductions that can be achieved for a small fraction of the cost of further reductions by point sources. Watershed protection has also been demonstrated to be a cost-effective approach to drinking water quality. In a now famous example, the City of New York undertook \$1.5 billion in expenditures for environmental protection (including land preservation through acquisition and conservation easements) and economic development in the watersheds that supply the city’s drinking water in order to assure a supply of safe water for its residents and avoid a requirement under the federal Safe Drinking Water Act to construct an \$8 billion water filtration plant. As James Salzman and his co-authors noted in 2001 in the *Stanford Environmental Law Journal*, the city’s action “inspired hope” that governments have the capacity to translate the value of ecosystem services into protections for the watersheds providing those services.

Surface water quality and drinking water quality do not exhaust the benefits available at relatively low cost from watershed-protection measures. And multiple benefits often flow from the same protective measure. For example, vegetative stream buffers not only reduce polluted runoff but also regulate water temperature, provide habitat, sequester carbon, and offer recreational or aesthetic experiences. The policy challenge is to create incentives to invest in such measures when merited by the full array of short- and long-term benefits. Meeting this challenge requires comprehensive assessment of watersheds as a source of ecosystem services and an integrated strategy for assuring that appropriate investments are made to sustain these services.

Ultimately watershed protection is primarily the province of state and local governments, but the federal government has significant resources and authorities that can be used to advance sustainable watersheds. The next Part briefly suggests a process designed to marshal those resources and authorities to best effect.

III. THE SUSTAINABLE WATERSHED TASK FORCE: A PROPOSAL

To facilitate this enhanced watershed investment, the next president should issue an Executive Order with two basic components. First, the Order would direct all federal agencies to administer their resources and authorities to advance sustainable practices across the nation’s watersheds. Second, the order would create an interagency Sustainable Watersheds Task Force to coordinate efforts among federal agencies and state and local governments, to develop and implement criteria for federal investments in watershed protection and restoration, and to assemble data relevant to this

effort. The Task Force's objective would be the most effective deployment of tools available under existing legislation and identification of any additional legislative needs.

The membership of the Task Force should not be limited to federal agencies with relevant program responsibilities, such as the EPA, the Departments of Agriculture and the Interior, and the Council on Environmental Quality (with its responsibilities under NEPA). It should also include members from the Office of Management and Budget, the Council of Economic Advisors, and the Office of Science and Technology Policy to help ensure that investments are economically, scientifically, and technically sound. The Task Force should report to the President within eighteen months of its creation to describe its actions to date, its plan for addressing issues that remain, and its recommendations for presidential action, including legislative proposals to Congress.

The federal tools presently available for watershed protection include regulation, market-based approaches, and subsidies. Below I discuss some issues with each and how the Task Force might improve their effectiveness.

Prescriptive regulation is perhaps the most obvious tool to promote watershed protection and restoration. Historically, state and local governments have regulated land use and local waters, but federal regulations do apply. Examples of prescriptive federal regulation include limitations on discharges from concentrated animal feeding operations, urban stormwater systems and other point sources under the Clean Water Act (CWA), dredging or filling of wetlands (considered "waters of the United States"), and destruction or alteration of habitat on which endangered species depend.

Although some have argued for extending the reach of federal regulation in watersheds—for example, to include nonpoint source as well as point source dischargers under the CWA—there is strong political resistance to expansion of the federal regulatory presence. Many see prescriptive federal regulation, as applied at the watershed or landscape level, as violating federalism principles and as inevitably inefficient because of its inability (or unwillingness) to take local conditions and concerns into account. However, opportunities remain to coordinate the application of the existing regulatory tools and to link them with state and local regulatory authorities to create effective watershed management regimes. In California's Natomas Basin, for example, the CWA and Endangered Species Act were applied in coordination with state and local authorities to create a plan, the Natomas Basin Habitat Conservation Plan ("NBHCP"), to protect species and habitat in the watershed while allowing some development and continued agriculture. The University of California-Davis's Information Center for the Environment [commented](#) that "the greatest purpose of the NBHCP is balancing the biological and local needs in the Basin."

Market-based approaches provide credits to landowners who undertake watershed-protection measures and allow them to trade these credits for cash. Given the market failure affecting ecosystems services discussed above, demand for these credits does not come naturally. Rather, it must be generated by government restrictions on activities that degrade natural re-

sources or environmental quality. Markets for these credits have already emerged within existing regulatory regimes, including mitigation banks for wetlands and species protection and trading schemes for water pollution control. National climate change legislation is likely to create an additional, substantial market for carbon sequestration measures, including carbon emission offset projects on agricultural and forest lands (for example, see [Section 2403 of S. 3036 in the 110th Congress, Second Session](#)); this could help strengthen incentives for practices, such as reforestation and no-till agriculture, that are also desirable for enhancing other ecosystem services.

The existing markets tend to be thin, either because they are poorly designed (for example, structural disincentives for nonpoint dischargers to engage in pollution reduction trades under the CWA), or because the local and isolated nature of some ecosystem services places inherent limitations on the usefulness of a market-based approach. The Task Force's agenda should include working towards increased participation in existing markets to the extent possible; overcoming information problems; reducing transaction costs; addressing any basic design problems; planning the integration of these markets with the future carbon market to enhance returns for worthy investments; and improving compatibility with local watershed institutions.

Price instruments, such as subsidies, offer another kind of payment-for-ecosystem service. The EPA and Departments of Agriculture and the Interior administer substantial programs that pay landowners for undertaking measures that maintain or restore ecosystem services. The Farm Bill administered by the Department of Agriculture provides perhaps the largest source of funds, including land reserve programs that pay to take farmland out of production and working lands programs that provide payments for environmentally beneficial practices on actively managed farmland. The Farm Bill and other federal legislation also provide subsidies targeted at particular watersheds deemed of national significance, such as the Chesapeake Bay and the Great Lakes. A concern with these programs, as with any subsidies distributed through central institutions that offer the only or primary sources of such aid, is that they may be ineffectively or inefficiently administered—a concern that Jonathan Baert Weiner raised in his 1999 article in the *Yale Law Journal*, *Global Environmental Regulations*. The Task Force should focus on improving both the cost effectiveness and the environmental performance of these programs, coordinating them with each other and with regulatory and market-based programs, and developing tools to monitor and assess results.

CONCLUSION: MANAGING THE HORIZONTAL AND THE VERTICAL

As this analysis suggests, the work of the proposed Sustainable Watersheds Task Force has two main dimensions: one vertical, coordinating across the federal government, the other horizontal, extending to state and local institutions. Along the first dimension, the goal is to improve the cost-effectiveness and environmental performance of federal watershed-related programs, both individually and in the aggregate. Although arrangements

exist within individual federal agencies and departments to coordinate watershed planning and policy (e.g., EPA's Watershed Management Council), interagency coordination is weak. Along the second dimension, the goal is to better integrate the federal programs with local watershed efforts. This latter goal is particularly important for watersheds that have been identified as having national significance but that still depend substantially on the mobilization of state and local resources and authorities.