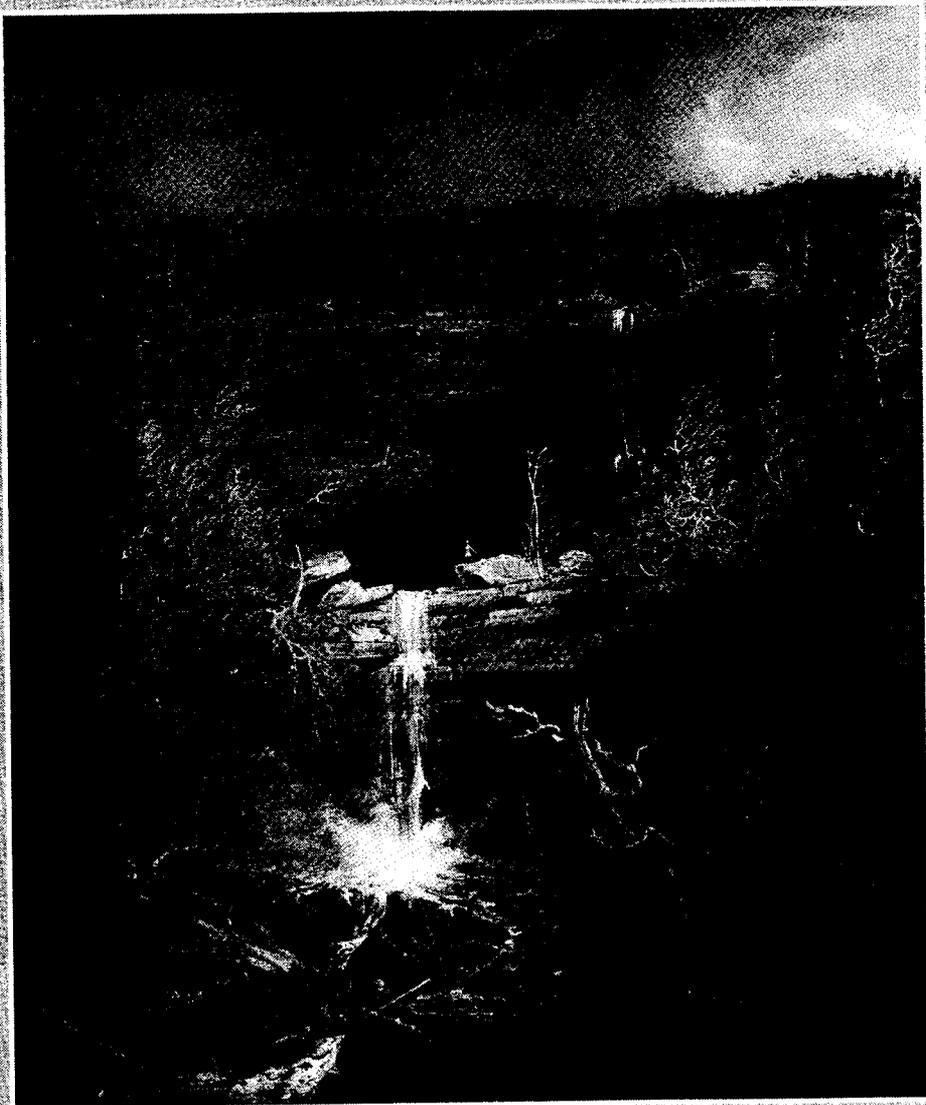


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Ecological restoration involves returning ecosystems to their original (usually read “pre-European settlement”) structure and species composition. The articles in this issue address this vast topic from several angles: Kimmerer explores ways to incorporate the traditional knowledge of Native peoples into restoration plans and invites us to review the nature of our relationship with the land. Covering the issue from a regional perspective Stanturf et al. describe efforts to restore bottomland hardwood forests in the floodplains of the Mississippi River, and Lynch et al. focus on the economic implications of forest restoration in Colorado. Long and Smith present innovative silvicultural approaches to restoring ponderosa pine while managing for wildlife habitat. Finally, Hull and Gobster address the human component as they explore how managers can accommodate social concerns surrounding restoration.

About the cover: *The Falls of Kaaterskill* by Thomas Cole. Courtesy of the Warner Collection of Gulf States Paper Corporation, Tuscaloosa, Alabama.

Restoring Forest Ecosystems

THE HUMAN DIMENSION



Why should society restore forest ecosystems? What kinds of restorations are likely to succeed socially as well as ecologically? How do we maintain the volunteer force needed to implement and maintain restoration projects? Scholars are beginning to address these questions and finding that human dimensions are key to the successful implementation and maintenance of restoration projects. We recommend making clear the range of benefits resulting from restoration, negotiating ecologically sound and socially acceptable alternatives, and creating volunteer communities that sustain projects over the long run.

By R. Bruce Hull and
Paul H. Gobster

In the past two decades, ecological restoration has moved from an obscure and scientifically suspect craft to a widely practiced and respected profession with considerable scientific knowledge and refined on-the-ground practices. Concurrently, forest restoration has become a valued skill of forestry professionals and a popular goal for forest management. Politics and conflicting human values, however, continue to confound and derail even some of the most well-intended efforts to restore forest ecosystems. Restoration projects exist within a social context, and they must therefore produce environmental conditions that are not just ecologically sound, but also economically feasible and socially acceptable.

We have been examining restora-

tion projects for several years with a group of social scientists and humanities scholars and have become convinced that knowledge of the human dimensions is as critical for the success of a restoration as is the knowledge of ecological science (Gobster and Hull 2000). Here we offer a preliminary set of suggestions for making restoration projects more responsive to important social concerns. These suggestions address three issues: making clear the range of benefits of restoration, negotiating ecologically sound and socially acceptable restoration alternatives, and creating communities to sustain restoration projects over the long term.

Above: Field tours are useful ways to communicate the benefits of restoration to the broader public.

Communicating the Benefits

Restoration projects require extensive resources and political support. As such, restoration competes not only with other worthy environmental projects, but also with programs more obviously linked to human health, education, and welfare, like hospitals, schools, and roads. The methods by which a restoration site is selected and the project implemented should explicitly consider the full range of benefits of alternative projects. The choice of where and what to restore will rarely be undisputed, but the debate can be more sophisticated if the consequences are clearly understood and the goals specifically articulated.

Detail the many instrumental benefits of restoration. It can be convincingly argued that human health and welfare are enhanced through restoration of damaged ecosystems. Human societies depend on functioning ecosystem services that, it is estimated, are worth at least \$33 trillion annually—several times the global gross national product (Costanza et al. 1998). Assessments of these utilitarian benefits can be found in the pages of this journal and in the literature of environmental mitigation, ecological economics, public health, and environmental risk assessment.

The choice among alternative restoration projects could consider, for example, the extent to which productivity for commercial harvests will be enhanced, the tons of carbon sequestered, the volume of water saved or stored, or the amount of soil stabilized for future generations. Instrumental benefits are numerous, and which ones are relevant depends on community preferences and environmental conditions.

Respect ethical obligations to the non-human world. Forests are increasingly valued for more than their utilitarian contribution to human health and welfare. Environmental philosophers have been identifying and defending the intrinsic values in forest ecosystems, and opinion polls suggest increasing public support for the rights and integrity of wild forests. Although such values are hard to define and quantify, scientists, managers, and the public are using con-

cepts like biological diversity, ecological integrity, and ecosystem health to integrate these ethical concerns about nature into restoration efforts (Sagoff 1988; Westra and Lemons 1995; Rapport et al. 1998). Certainly, practicing restoration is one way to demonstrate respect and value for the forest.

But does restoration fully represent our ethical obligation to the nonhuman world? Environmental philosopher Eric Katz (1992), for one, sees restoration as a largely human-centered endeavor that imposes human values on the destiny of nonhuman nature. Restoration, he says, encourages people to believe they know what is best for nature and have the technology to repair whatever damage they might cause. Such faith is misplaced, according to Katz, and promotes an arrogance that can lead to further environmental destruction. Managers should be sensitive to these negative interpretations of restoration.

Break the paralysis of the human-nature dichotomy. Katz's argument and others like it stem from a worldview

that sees a firm separation between people and nature. From this extreme end of the human-nature dichotomy, the forest is seen as soulful, living, and distinct from humans, and is "best" when left alone to take its own course. This rationale often justifies policies that remove evidence of humans from the land and minimize active management. From the other end of the dichotomy, the forest is viewed as a stockpile of goods and services and is "best" when managed to provide sustainable flows of economically valuable resources. This rationale often justifies considerable domestication, if not complete development, of a forest ecosystem. Negotiations between these two camps over desired future conditions are quickly polarized and paralyzed (Ingerson 1994; Senecah 1996) (see "Public Participation Paralysis").

Restoration provides an alternative vision of society's relationship with the forest that may help us work around this paralyzing dichotomy. A restoration ethic opens up a broad middle

Public Participation Paralysis

The paralyzing effect of the human-nature dichotomy can be seen in Senecah's (1996) account of efforts to manage development in Adirondack Park in upstate New York. One side of the debate, mostly locals, became characterized as "greedy" developers "taming" the wilderness, "marring" vistas, "maiming" shorelines, "contaminating" water and pristine beauty, and otherwise threatening a "vulnerable" nature. Because they wanted to include or promote human development, they were called environmental "rapists" promoting "unbridled, unwarranted, irresponsible, and massive" development.

The other side, mostly seasonal visitors and people living outside the park boundaries, argued for the "spiritual" retreat, the "timeless" splendor, the green "oasis," the "forever wild" jewel that was a biological "treasure chest." For wanting to exclude or minimize human development, they were construed as "nature nazis," "forest faggots," and "watermelons" (green on the outside, red on the inside) trying to create a "scenic gulag" that did not value the local history and culture.

Throughout the Adirondack controversy, as documented by Senecah, potential for compromise existed all along the vast middle ground of the human-nature continuum. Despite an official planning effort that clearly articulated this area of compromise, public debate remained polarized at the extremes and the planning effort languished.

The language and intent of restoration may help society work around the paralyzing dichotomy and move toward constructive debate about the desired future conditions of our forests.

ground where it is appropriate for humans and nature to coexist and interact, where humans can actively improve nature for nature's sake. Restoration can build into our culture an appreciation and respect not just for wild nature or for marketable resources but for our relationship with nature. The restoration ideal can help people who find themselves holding incompatible values—for example, those who value wood products in their homes but simultaneously oppose timber harvests—to find a middle ground on which to stand. It can provide the rationale to respect and sustain both the ecological integrity and the human culture that exist on a piece of land. In this way, restoration adds a corollary to Leopold's land ethic by enlarging the notion of the community of nature to include people (Jordan 1994).

Address equity and environmental justice. It is not uncommon to find degraded environments (e.g., landfills, stripmines, heavy industry, abandoned lots, and eroded soil) near society's least powerful members. The reasons for the uneven distribution of environmental degradation are many and varied and reflect social priorities and political history (Gottlieb 1993). Restoration projects can be selected to address such inequities and designed to generate a sustainable livelihood for the affected citizens (Gadgil and Guha 1995).

Designing Restoration Plans

Restoration projects can assume many shapes and serve many goals. Finding the alternative that is both ecologically sound and socially acceptable is the challenge.

Promote socially acceptable restoration management practices and outcomes. Public understandings and expectations of the forest are many and varied (Kempton et al. 1995). Clearly there exists widespread concern about clean air and water, but the more specific concerns—such as biodiversity, exotic versus native species, and global warming—are not nearly as widely shared or understood. Conflict and litigation are consequences of these varied understandings and expectations.

For example, well-meaning, environmentally minded people attempting to

restore pre-European-settlement savanna conditions to areas around Chicago became adversaries of equally well-meaning, environmentally minded people who could fathom no reason to destroy trees (exotics or otherwise) that were obviously thriving and providing the community with a valued forest (Gobster 1997).

No matter how ecologically sound and well intentioned the goals of a restoration project may be, they must also be socially acceptable if they are to be implemented. As in the Illinois savanna example cited above, some restoration activities may alter or remove environmental features, such as trees or hedgerows, that have become valued icons to stakeholder groups. Restoration practices must accommodate the social values and expectations people have for existing natural features and incorporate them into restoration plans.

Conflict escalates when the expert is less than tolerant toward citizens' alternative ideas about what is best (Helford 1999). Planning procedures that legitimately include and seriously respond to their concerns can forge consensus on goals and thus give the project a chance of being implemented (i.e., Brunson 1998; Francis 1999).

Mitigate restoration impacts through project implementation. People learn about environmental change and evaluate environmental conditions based on what they see, and there are numerous techniques of site design that can help make restoration more socially acceptable.

For example, the removal of mature exotic trees that currently block an unattractive view could be delayed until strategically planted natives fill in enough to serve the same buffer function. Restoration activities that appear messy, uncared for, and hence unattractive could be framed by visual cues of care, such as fencing or mowed strips. Likewise, uniforms, visible supervision, public relations, and related efforts can be used to signify that the volunteers who are cutting, burning, and removing vegetation in public areas have the approval of responsible authorities. And of course, signs can always be planted, along with the desired vegetation, to explain management in-

tentions and educate stakeholders (Nassauer 1995).

Negotiate ecological constructs. People use the language of ecological science to imagine and negotiate acceptable environmental conditions. Constructs such as health, integrity, naturalness, sustainability, and biodiversity exist at the interface between science and policy. These terms necessarily serve double duty: They are used to describe what is (a scientific function) and to prescribe what ought to be (a political function). These distinctions place additional burdens on the science and practice of restoration. Constructs such as "health" need to be defined as desired qualities of ecological systems that combine concerns about ecological structure with concerns about societal needs (e.g. Norton 1998; Rapport et al. 1998). That is, scientists need to work with other stakeholders to define the terms that are ultimately both the topic of scientific study and the goal of forest management. Science, by itself, should not define these value-laden terms independently of the values held by the broader public.

Engaging the Local Community

A strong community of volunteers has been the key to success in many restoration projects, and managers have come to realize that maintaining this community not only benefits individual restoration projects but also can help them achieve broader natural resource management and societal goals.

Understand what motivates volunteers to participate. A restoration program needs to provide the full range of benefits volunteers seek if it is to sustain their volunteer efforts (Miles et al. 1998). Restoration volunteers want to make a tangible difference in environmental issues they care about, learn technical and leadership skills, and find the social networks, friendships, and sense of community that volunteer communities create. Restoration activities also provide profound experiences for volunteers. Through intimate involvement with nature, restorationists come to appreciate the scientific, historical, cultural, and mythological stories that lie beneath sensuous qualities that appear on the surface of the landscape (Foster 1998).

Increase skill levels and expertise among volunteers. A common complaint lodged by some critics of restoration is that the volunteers who implement the plans lack professional training. Increasing the skills and expertise of volunteer restorationists might therefore be a goal for those who manage volunteer-driven restoration programs (see "The Volunteer Stewardship Network"). Informal peer teaching in the field is a critical component of knowledge and a valued aspect of the volunteer experience (Ross 1994), but formal training and certification programs can also help equip volunteers with the expertise and credentials needed to do the job right. Combined with the appropriate level of professional supervision, this educational mix can create a corps of citizen stewards who remain motivated and are trusted by the broader public (Harris 1997).

Create informed constituencies for natural areas management. Restoration programs that are volunteer-driven add a distinct value to ecological restoration that does not accrue to programs run by in-house staff or outside contractors. By engaging local citizens in long-term, hands-on efforts, managers develop an informed constituency for broader land management concerns. As a form of collaborative management, volunteer-based restoration efforts have virtues that mirror those expressed in the ideals of participatory democracy—in this case, creating a community of citizens who are actively involved in learning about, participating in, and taking responsibility for the consequences of land management decisions. This critical, "value-added" dimension of restoration is natural resource conservation education at its best, and it is missed entirely in restoration programs that operate without volunteers (Light and Higgs 1996).

Conclusion

The humanities and social sciences can make many contributions that will help managers meet the challenges of restoration and realize its opportunities. The social sciences can help identify what is socially acceptable and politically feasible and help explain the social mechanisms and processes by

which restoration occurs. The humanities can help justify the selection among the many ecologically possible and socially acceptable restoration goals by placing that decision in the context of what it says about society. Ultimately, the restoration and man-

agement of nature require collaboration from all fields of formal scholarship and professional management, as well as a real and meaningful sensitivity to existing conditions, local knowledge, and the unique factors that make special, valued, and important each in-

The Volunteer Stewardship Network: Chicago's Model for Community-Based Restoration



Nadine Zelle

Experimental education programs like Mighty Acorns, run by the Nature Conservancy of Illinois, can have a positive impact on youths and other groups who might not otherwise be aware of restoration activities.

Chicago is widely regarded as a center of excellence for ecological restoration of prairie, savanna, and woodland ecosystems. A less well known but equally important part of the story is that the success of restoration efforts in the region is largely due to the efforts of volunteers. Beginning in the late 1970s, individuals from diverse walks of life began small-scale prairie restoration projects on county forest preserves, experimenting with different seeding, cutting, and burning techniques, thus helping build the art and science of ecological restoration (Stevens 1995).

At the same time, these individuals built an exemplary program for mobilizing more volunteers, which was formally organized in 1983 as the Volunteer Stewardship Network and managed as a program by the Nature Conservancy of Illinois (Ross 1994). Today the network includes more than 8,800 members involved in more than 320 sites around the state. They annually log more than 67,000 hours of activity, ranging from on-the-ground restoration of sites to newsletter production, public education, research, and working with youth groups to bring more than 5,000 children a year to restored areas.

Forging a mutually beneficial partnership between public resource managers and volunteer participants, the network has become a model for similar programs across the nation and is regularly studied by officials from other countries. For more information, see the Nature Conservancy of Illinois website at www.tnc.org/infield/state/illinois/illinois.htm.

stance of society's relationship with nature. We have summarized here what we believe are some of the more important issues that limit or enable restoration projects, but we provide considerably more detail elsewhere (Gobster and Hull 2000).

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