
Why People Matter in Ecological Restoration

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Ecological restoration is a practice of hope; hope because restorationists envision a better future as a result of their efforts. Ecological restoration is a practice of faith; faith because restorationists work in a world of uncertainty. Finally, ecological restoration is a practice of love; love because restorationists care about, and give their lives to, efforts that protect and enhance the lives of humans and other-than-human beings alike. Ecological restoration is a human practice, and because it is, people matter.

In this book we endorse the idea that humans are an integral part of nature and that they play a key role in determining, either consciously or otherwise, the condition of the environment in which they live. We also support the idea that the practice of ecological restoration is one of the more positive ways that humans can interact with the rest of the natural world. Moreover, we seek to show why recognizing and understanding the human dimensions of ecological restoration are critical to the success and longevity of all ecological restoration efforts, especially those undertaken at large scales, on public lands, and/or within urban/suburban settings. These are situations where restoration activities move beyond the vision and control of an individual landowner or small group of like-minded people; these activities are community-based efforts that involve the ideas and concerns of many people.

A fundamental assumption underlying the concept of ecological restoration is that humans are responsible for degrading the natural environment and, therefore, humans have a responsibility to repair it. At the heart of ecological restoration is a vision of a better relationship between humans and the rest of the world. Unfortunately, there is no unified vision of who we are as people, how the world around us operates, and what this better relationship should look like. We believe, however, that ecological restoration provides a forum within which we can study the dialogue between humans and nature, and between various human stakeholders. In this book, we do so by studying the human aspects of collaboration and community-based ecological restoration, restoration economics, volunteerism, environmental education, eco-cultural practices, and politics, governance, and planning.

One of the first things we observe when studying ecological restoration is that, because humans are intimately involved, the practice is inherently (1) value laden, (2)

context driven, (3) prone to be immersed in disagreement and compromise, and (4) experiential.

Numerous studies have shown that determining restoration goals and best practices are value-laden activities because they involve human perceptions, beliefs, emotions, knowledge, and, ultimately, behaviors (Gobster and Hull 2000; Bright, Barro, and Burtz 2002; Morford and James 2002; Shindler, Wilton, and Wright 2002). This is problematic when one practices ecological restoration from a strictly scientific perspective, because ecological science alone fails to capture the full extent of the issues we are trying to solve or that must be bridged in order to reach a science-based solution. As historian and ecologist Robert McIntosh points out, “The conflict between the image of science as objective and value-free and that of ecology as intrinsically value-laden and a guide to ethics for humans, animals, and even trees is difficult to reconcile. Segregation of strictly scientific concerns from matters of public policy is not easy, as atomic scientists had found” (McIntosh 1986, 308). Furthermore, ecological restoration activities take place in cultural, political, and economic contexts that produce different “strains” and definitions of ecological restoration. This is especially true as one looks at projects across various regions and at international scales. In addition, these contexts are dynamic and can change with the addition or removal of even one influential person from an oversight group, management team, legislative body, or field crew. Influxes of funding, passage of key legislation or mandates, perceived crisis conditions, and increased public awareness and support can also play key roles in advancing restoration activities. Likewise, bad press, poor relationships with clients and stakeholders, and other negative associations tend to doom the best plans and override the findings of sound scientific research.

As we have seen in numerous situations (e.g., Cook County Forest Preserves, the Everglades, San Francisco nature parks, southwestern ponderosa pine forests), these two factors—value ladenness and context—can and do produce situations where disagreements have halted or canceled restoration efforts. Moreover, these two aspects of the human condition often compromise the historical authenticity (Egan 2006) or historical fidelity (Higgs 2003) of ecological restoration projects and move them closer to some other kind of conservation effort (i.e., reclamation, revegetation).

To move forward under conditions characterized by uncertainty, disagreement, and complexity, our experience tells us that, instead of seeking greater control we must use pertinent strategies, such as the democratic process, inclusiveness, and respecting local values and knowledge. We must also recognize competing land-use views, differing visions of human–nature relationships, and opposing values related to job creation and financing. Working through these strategies can help develop solutions amenable to both nature and humans.

Finally, human involvement in restoration practices is experiential in both the physical and the psychological sense, making it open for educational possibilities, artistic interpretations, and spiritual and physical renewal. These efforts can, likewise, aid in resolving situations blinded by mistrust and ignorance. Ultimately, people are innately part of restoration projects as experts, learned amateurs, or volunteers, or as the general public affected by the results of restoration projects. To leave them unrec-

ognized because they do not fit neatly into our scientific myth of “objectivity” or because our preservationist myth of “wilderness” holds that they are to be neither seen nor heard is nothing short of absurd and certainly counterproductive to work that needs to be done to protect and restore the environment and humankind’s role as steward of it.

Humans: Apart from Nature or Part of Nature?

As in most endeavors, we stand on the shoulders of those who preceded us. We inherit from them ideas, skills, practices, and theories that inform our present situation and, to the extent that they remain relevant, help us plan for the future. The practice of ecological restoration is not without these traditions. In terms of practical application, it owes much to the practices of agriculture, horticulture, gardening, landscape architecture, forestry, and other applied fields. From a more scientific perspective, ideas from ecology and the other physical sciences serve as an obvious and important foundation (Palmer, Falk, and Zeder 2006). The humanities and social sciences have, until recently, played a lesser role in ecological restoration, despite their importance to the overall success of restoration projects, and, in the case of sociology, a long relationship with ecology under the banners of human ecology (Adams 1935; Hollingshead 1940; Gross 2003) and, more recently, environmental sociology (Dunlap 1980a; Dunlap and Catton 1994; Gross 2003).

In this section, we provide an overview of some of the people, institutions, and events that have changed the Western worldview to include the idea that humans are an integral part of the biophysical world—a concept that is essential for the discussions that take place between the covers of this book.

Whereas indigenous cultures and other non-Western religions and schools of thought typically do not make a distinction between humans and nature (or culture and nature), this dualism is pervasive in Western thought (Glacken 1967; White 1967). Modern science, which has at its foundation this subject–object/us–other metaphysical position, brought this dualism forward when it externalized nature as an object of knowledge (Haila 2000).

Working within this context of modern science, early ecologists in North America and Europe (e.g., Josias Braun-Blanquet, Henry Cowles, Frederic Clements, Victor Shelford, Arthur Tansley) strove to understand plants or animals and how those species associated with one another (communities, assemblages), how various plant communities interacted with one another across the land (plant succession), and how animals interacted with the land (habitat, food webs). Despite their use of terms associated with human-related social units, these ecologists had little interest in the role humans played in the ecological settings they studied, preferring to imagine their study sites as “natural.”

One of the first to allude to the problem created by separating humans from nature was the animal ecologist Charles C. Adams, who, in 1913, wrote: “With a grounding in the general principles of organic response to the total environment, the disturbances due to man are a problem in the adjustment of the highest type of animal, as a

member of an animal association, to its complete environment.” However, this quote is more typical of the belief that humans and human action should be ruled by the laws of nature—a popular idea during the 1910s and 1920s, and even today—than of desire to end the human–nature dualism.

The English ecologist Arthur Tansley, in a 1935 paper that not only challenged the Clementsian model of plant succession and Clements’s concept of the complex organism but offered a new ecological paradigm—the ecosystem—as an alternative (Tansley 1935), provided an extremely important step in dissolving the human–nature dualism concept within ecology. Tansley not only argued for including human-caused vegetation types into the study of ecology (“We cannot confine ourselves to the so-called “natural” entities and ignore the processes and expressions of vegetation now so abundantly provided us by the activities of man” [p. 304]), he also placed humans within the natural world as an “exceptionally powerful biotic factor”:

It is obvious that modern civilized man upsets the “natural” ecosystems or “biotic communities” on a very large scale. But it would be difficult, not to say impossible, to draw a natural line between the activities of the human tribes which presumably fitted into and formed parts of “biotic communities” and the destructive activities of the modern world. Is man part of “nature” or not? Can his existence be harmonized with the conception of the “complex organism”? Regarded as an exceptionally powerful biotic factor which increasingly upsets the equilibrium of preexisting ecosystems and eventually destroys them, at the same time forming new ones of very different nature, human activity finds its proper place in ecology. (303)

Responding to Tansley’s critique, Clements and Shelford, in their 1939 treatise *Bio-Ecology*, did recognize humans as the “outstanding dominant of a new order,” but they deemed it premature to include the study of human ecology in any detail in their book.

Nevertheless, human ecologists (e.g., Robert E. Parks, etc.) proceeded on, using the concepts of ecology to study humans, although most plant/animal ecologists paid relatively little heed to their activities. Still, there were some connections. Indeed, the Ecological Society of America held a symposium on human ecology in 1940 (McIntosh 1986, 307). The idea of interdisciplinary work between plant/animal ecologists and human ecologists continued to hang on by the barest of threads during and after World War II, and through the early 1960s. The Ecological Society of America, for example, made attempts during the mid-1950s to elevate the discussion of human ecology and, in 1955, the National Science Foundation/Wenner-Gren Foundation for Anthropological Research coproduced “Man’s Role in Changing the Face of the Earth,” a conference that brought together ecologists, anthropologists, geographers, and other thinkers to discuss the past, present, and future relation between humans and nature (Thomas Jr. 1956). However, these and other smaller efforts produced little lasting effect.

So little, in fact, that by 1967 the ecologist and philosopher Paul Shepard was asking: “Whatever happened to human ecology?” (Shepard 1967). McIntosh, reflecting

on the situation, concluded: “Geography, sociology, and other disciplines concerned with humans, their cultures, and their relations to the environment sometimes adopted the name but rarely the substance of ecology. . . . The several efforts to bring together ecologists and social scientists failed to integrate them or to produce really significant moves toward interdisciplinary approaches” (McIntosh 1986, 308).

But the postwar era did produce, often for military purposes, a strong interest in the study of systems and the quantification of energy flows and functions within them. In ecology, this effort was led by Eugene Odum and his brother, Howard, as they took Tansley’s concept of ecosystem and Raymond Lindeman’s landmark work (Lindeman 1942), and put their own stamp on holistic-type studies under the banner of ecosystem ecology or systems ecology. As important as their ecological studies and the systems studies of others (e.g., Liken and Bormann at the Hubbard Experimental Forest), was Eugene Odum’s insistence on interdisciplinary studies that placed humans within the ecosystem. He indicated this viewpoint in the following:

Until recently mankind has more or less taken for granted the gas-exchange, water purification, nutrient-cycling, and other productive functions of self-maintaining ecosystems, chiefly because neither his number nor his environmental manipulations have been great enough to affect regional and global balances. Now, however, it is painfully evident that such balances are being affected, often detrimentally. The “one problem, one solution approach” is no longer adequate and must be replaced by some form of ecosystem analysis that considers man as part of, not apart from, the environment. (Odum 1969, 266–67)

Reflecting back on the emergence and growth of ecosystem ecology, Eugene Odum wrote: “[D]uring the environmental awareness decade, 1968 to 1981, a school of ecosystem ecology emerged that considers ecology to be not just a subdivision of biology, but a new discipline that integrates biological, physical, and social science aspects of man-in-nature interdependence” (E. P. Odum 1986, cited in McIntosh 1986, 202). In the minds of many ecologists, Odum’s perspective was a radical departure from traditional ecological science (de Laplante 2005), even if the reality of Odum’s work did little to push the actual study of humans within ecosystems.

On the international stage, UNESCO initiated the Man and the Biosphere (MAB) Program in 1971. The program was viewed as an upgrade from the International Biological Program (IBP), which Eugene Odum chaired in the United States, in that it was less academically oriented and more pragmatic. It also placed a greater emphasis on developing countries and their ecosystems (e.g., tropical forests received a very high priority) than did the IBP. Ecosystem ecologist Frank Golley (1993), in his history of the ecosystem concept, writes: “MAB studied systems in which humans were an integral part, including cities, agricultural systems, and nature reserves (162). . . . The MAB extended ecosystem studies from natural landscapes to the human-built environment, leading to the revitalization of the subject of human ecology on ecosystem principles” (164). The 1972 United Nations Conference on the Human Environment (also known as the Stockholm Conference) endorsed the MAB Program.

Furthermore, it promoted a new, international focus on the relationship between humans and the environment that has proven, in retrospect, to be the springboard for future international environmental efforts (including an interest in climate change and sustainable development) and has been a solid foundation of European environmental efforts.

This same period saw a revival of interest in human ecology/environmental sociology with several new publications (Kormondy 1974; Sargent II 1974; Dunlap 1980a, 1980b). Like earlier efforts, this interest in ecology and humans was short-lived, disappearing as Dunlap and Catton (1994) suggest in the early 1980s as public interest in environmental issues waned during the Reagan administration. It rebounded in the late 1980s and early 1990s as the global nature of environmental issues and the human role in them became better known and more widely publicized (Dunlap and Catton 1994).

A groundbreaking work appeared in the early 1990s—*Humans as Components of Ecosystems: The Ecology of Subtle Effects and Populated Areas* (McDonnell and Pickett 1993). This book not only placed humans squarely within the context of the ecosystem, it complemented new efforts within the Chesapeake Bay area by ecologist Stewart Pickett and others that ultimately resulted in Baltimore being named and funded as an National Science Foundation Long Term Ecological Research (LTER) Network site—the first in the United States to incorporate both ecological and social sciences.

In 1996, the International Council for Science (ICSU) and the International Social Science Council (ISSC) of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) created the International Human Dimensions Programme on Global Environmental Change (IHDP) as an international, interdisciplinary science program dedicated to promoting, catalyzing, and coordinating research, capacity development, and networking on the human dimensions of global environmental change. The IHDP takes a social science perspective about global change and works at the interface between science and practice.

The 1990s and early 2000s also saw the emergence of two other large-scale, human-related environmental issues—the acknowledgment of the human role in climate change and the recognition of ecological economics and ecosystem services. The work that has been done scientifically and in terms of public education about the subject of climate change has been staggering. The Intergovernmental Panel on Climate Change (IPCC) was formed in 1988 and released its first report in 1990. Its subsequent work has made very clear the strong connection between human action and the sustainability of the global environment. Similarly, but at a much smaller scale, ecological economists have made strides toward identifying the true costs of human activities that deplete or damage the existing natural capital of water, soils, vegetation, air, and the like.

As ecologists began grappling with ways to integrate economics into their discipline, other disciplines traditionally steeped in the natural sciences began coming to terms with the overwhelming importance of the social realm. Forestry, wildlife management, and rangeland management are just a few of the fields that have made the leap from a traditional narrow focus on natural sciences and technical expertise to an

increasing engagement with sociology, anthropology, and conflict management. In the mid-1990s, James Kennedy and then U.S. Forest Service chief Jack Ward Thomas stressed the need to prepare young natural resource specialists to deal with people as well as natural areas (Kennedy and Thomas 1995). They argued that natural resource management should be viewed as “social value management” or, alternatively, “social conflict management” (Kennedy and Thomas 1995, 317) and that managers be explicitly trained to understand and deal with complex social-political-economic environments. The U.S. Forest Service and some other federal agencies (e.g., the National Oceanic and Atmospheric Administration) now have integrated social science and human dimensions work into their overall planning.

Finally, although ecosystem ecology as a unified discipline did not last, the human-oriented concept of the Odums continued as many systems ecologists turned their attention to applied and hybrid practices and disciplines, including conservation biology/ecology, ecosystem health and management, sustainability theory, and ecological economics (de Laplante 2005, 404–5), and, in situations where landscape- or watershed-level projects were undertaken, ecological restoration.

While this overview is admittedly brief and incomplete, we hope it has provided the reader with a sense of the foundations of the movement in ecology and the humanities away from the nature–culture divide. Moreover, we hope that it begins to demonstrate that the importance of the social sciences and humanities is now recognized in conservation efforts worldwide and has become an integral part of those efforts. The following section focuses more specifically on the pioneering efforts within the realm of ecological restoration to move beyond the human–nature dualism and embrace the reciprocal role humans have with nature.

Humanities-Oriented Work in Ecological Restoration

William (Bill) Jordan was, arguably, the first person to write consistently about interplay of humans and nature within the context of ecological restoration. Yes, there are the writings of Henry David Thoreau, Aldo Leopold, Loren Eiseley, and others (all of whom Jordan drew upon), but during his tenure (1981–2001) as editor of the journal *Restoration & Management Notes* (later *Ecological Restoration*), Jordan routinely examined ideas such as restoration as performance, restoration as a means of connecting humans to nature, restoration and education, and restoration and community. Moreover, he enjoined authors to do the same, thereby producing a journal that covered not only the scientific and managerial aspects of restoration but the philosophical, artistic, and psychological as well. In his 2003 book *The Sunflower Forest: Ecological Restoration and the New Communion with Nature*, Jordan summarized and updated many of the arguments he had made during those two decades:

Restoration is important . . . because it is a way of returning classic ecosystems to the landscape, allowing us to go on the offensive in the struggle to ensure their long-term survival. . . . But it is also important for exactly the reasons that four generations of environmentalists have been skeptical about it: because it is

at every point an encounter with shame. Restoration is shameful because it involves killing and a measure of hegemony over the land; because the restoration effort is never fully successful and never complete; *because it dramatizes not only our troubling dependence on the natural landscape, but—equally troubling—its dependence on us*; and because it dramatizes the restorationist's complicity, not only in the destructive acts he attempts to reverse, but, more fundamentally, in the shameful process of creation itself, in which he presumes to participate. (*Sunflower Forest*, 50, emphasis added)

While Jordan was making his points in the pages of *Restoration & Management Notes/Ecological Restoration* and elsewhere, other writers were producing books about ecological restoration and its connection to humanity and the environment for a general audience or at least that part of the public interested in environmental affairs. The first was John Berger, whose 1985 book *Restoring the Earth: How Americans Are Working to Repair Our Damaged Environment* provided a journalistic survey of people taking on the job of ecological restoration—and their responses to it. Other books of a similar stripe followed, including William K. Stevens's 1995 account of ecological restoration activities in the Chicago area, *Miracle under the Oaks: The Revival of Nature in America*, and Stephanie Mills's book, also published in 1995, *In Service of the Wild: Restoring and Reinhabiting Damaged Land*, which included accounts of her personal experience with restoring land as well as restoration narratives from across America and in India. River restorationist/writer Freeman House's *Totem Salmon: Life Lessons from Another Species* (2000) told the story of ecological restoration along the Mattole River in northern California, emphasizing the integral and mutually beneficial connection between the human community and salmon recovery. Another book that suggested similar human benefits from restoration was *Ecopsychology: Restoring the Earth, Healing the Mind* (1995), edited by Theodore Roszak and his colleagues. More recently, Peter Friederici (2006) has revisited the interaction between people and restored landscapes in his book *Nature's Restoration: People and Places on the Front Lines of Conservation*.

Social Sciences

While there were earlier works that tied the social sciences to natural resource management issues (e.g., in journals such as *Society and Natural Resources*, *Environmental Management*, *Human Ecology*), the breakthrough in terms of examining the social science perspective of ecological restoration came in 2000 with the publication of *Restoring Nature: Perspectives from the Social Sciences and the Humanities*, which was edited by Paul Gobster and Bruce Hull. Like Stevens's book, they focused on ecological restoration efforts in the Chicago area, but with an emphasis on the public and political controversy that had been under way in Chicago since 1996 about restoration activities. The product of a well-attended conference in 1998, the book examined not only the controversy and people's reaction to it, but the much larger issue of the social creation of nature or how people construct nature as part of their larger worldview.

Gobster and Hull end their important contribution by asking and answering probing questions such as, Why restore nature? Which natures are possible and acceptable? Which natures can be maintained and sustained? Which restoration project is more important than other pressing environmental and social problems, and deserves allocation of scarce resources? They conclude that seeking answers to these questions from the biological sciences is not enough. Instead, they argue, “Contributions from the humanities and social sciences are needed to help decide restoration goals, to justify them in a competitive social context, and ultimately to plan, implement, and maintain desired states of nature” (Hull and Robertson 2000, 299).

That same year, two other books appeared that brought the idea of collaboration to the wider natural resource and conservation audience. Both books—*Across the Great Divide: Explorations in Collaborative Conservation and the American West* (Brick, Snow, and Van de Wetering 2000) and *Making Collaboration Work: Lessons from Innovation in Natural Resource Management* (Woddolleck and Yaffee 2000)—stressed the need to move from confrontation to a collaborative approach in order to solve public policy stalemates. We capture a similar argument in our section on collaboration, but with an emphasis on its role in ecological restoration efforts.

In 2003, Matthias Gross, a German sociologist and cofounder of the journal *Nature + Culture*, presented us with *Inventing Nature: Ecological Restoration by Public Experiments*, a treatise about ecological restoration and the creation of nature, the split between the layperson and the expert, the opportunity that ecological restoration presents in repairing that divide through “real world” projects, as well as a review of the history of sociology/human ecology. He has followed the book with various articles; one in particular, “Beyond expertise: Ecological science and the making of socially robust restoration strategies” (Gross 2006), suggests, as we do, two forms of handling knowledge—one the conventional form of controlled, expert knowledge, the other a transdisciplinary knowledge that is evaluated in terms of its general social relevance. Gross calls this second type Mode 2 and describes it as follows: “Learning in this mode of knowledge production is immediate and is part of the discovery process, as is the case in many restoration projects” (Gross 2006). He goes on to suggest that Mode 2 is not meant to supplant the traditional form (Mode 1), but to complement it and expand its peer review process to the interested general public.

Eco-cultural Restoration: Traditional Ecological Knowledge and Cultural Landscapes

As ecological restoration matured and gained popularity during the 1990s, it expanded its reach outside the typical mainstream environmental community, especially and purposely to indigenous peoples because they have a strong interest in restoring the ecology of the areas they inhabit as a means of increasing their resource base and rejuvenating their cultures. In 1995, at the Society for Ecological Restoration (SER) Conference in Seattle, Washington, Dennis Martinez led the effort to organize the Indigenous Peoples Restoration Network as a working group within SER (Stevens 1996). The sessions he organized for that conference were a template for

other similar and larger events at recent SER and Ecological Society of America conferences. Martinez has also published several articles (Martinez 1998, 2003; Senos et al. 2006) and served as the coeditor with Jesse Ford for a special issue about traditional ecological knowledge in *Ecological Applications* (Ford and Martinez 2000). Other leaders in the effort to marry ecological restoration with indigenous interests have come from academia and include M. Kat Anderson (2001, 2006; Anderson and Blackburn 1993; Anderson and Barbour 2003), Robin Kimmerer (1998, 2000, 2002; Kimmerer and Lake 2001), Nancy Turner (1995, 2005; Turner and Deur 2005), and Thom Alcoze (2003; Alcoze and Hurteau 2001). Their work has been especially important in connecting with indigenous peoples in their regions and in inspiring young scholars, including indigenous students, to continue the work they have started. Special journal issues about the topic—the December 2003 issue of *Ecological Restoration* (Egan and Anderson 2003) and a 2004 issue of *Ecology and Society* (Folke 2004)—along with conferences of the Society of Ethnobiology and the International Society of Ethnobiology, have also served to open this topic to positive discussions and action.

These efforts are aimed at restoring cultural landscapes—an approach that can work nearly anywhere, although there are those, especially in Europe, who believe that their cultural landscapes have too much history to ever be restored. As various projects in England, the Netherlands, and Spain demonstrate, that really depends on the people involved. If there is an interest in the “old ways,” then restoration of cultural landscapes, and the cultural activities that support them (e.g., mowing of meadows, restoration of fens), can produce successful restoration projects.

Design Arts

Ecological restoration has strong ties to the design arts, especially landscape architecture (Egan 1990). The foundation of this relationship extends back to the late nineteenth century in the United States: Frederick Law Olmsted’s work to restore Boston’s Back Bay Fens in 1878, and the subsequent use of native plants by landscape architects such as Jens Jensen, Ossian Simonds, Elsa Rehmman, Frank Waugh, and others during the decades prior to World War II (Grese 1992). Various writers have also made the case for even earlier or contemporaneous efforts of the design arts to restore areas in other parts of the world (Matsui 1996; Whited 1996; Hall 1997, 2005; Ignatieva 2005).

In his book *Nature by Design* (2003), Eric Higgs states so clearly, “As restorationists we are involved in the design of ecosystems and places whether we like it or not” (71), and with nods to writings by landscape planners such as Ian McHarg (*Design with Nature*, 1969) and Philip Lewis (*Tomorrow by Design: A Regional Design Process for Sustainability*, 1996), Higgs encourages restorationists to “take design to another level, a more explicit one, in which we acknowledge human agency in restoration. More than this, *we need to acknowledge that restoration is fundamentally a design practice*” (274, emphasis in original). Higgs sees “good” design as striking a balance between historic authenticity and contemporary needs, between science and art:

“Ecological restoration as a design discipline demands attention to tradition and novelty at the same time, searching creatively across the spectrum of the arts and sciences for the best way to respect ecological and cultural integrity (279), . . . Design is a practice that emphasizes intention, and good designs nurture individual and community engagement” (284). In this book, we provide a look at how environmental artists are using their skills to create restored landscapes that provide both functional value to the landscape, meaning to the public, and opportunities for individual and community participation—all ideals of Higgs’s design process.

Certainly the work and writings of present-day ecological restorationists with a landscape architecture background (e.g., Dean Apostol, Keith Bowers, Leslie Sauer) attests to the foundational role landscape architecture continues to play in the practice of ecological restoration.

Ecological Economics and Systems Studies

The relationship between ecological restoration and ecological economics is relatively new but is developing quickly in light of increasing interest in the development of local, regional, and global sustainability. The ability of ecological economists to develop means of holistic accounting and to delineate concepts, such as “natural capital” (e.g., Costanza and Daly 1992) and “ecosystem services” (e.g., Costanza et al. 1997; Daily 1997), have been instrumental in moving the field forward. The value of ecological restoration has recently been conveyed in terms of augmented ecosystem services and investments in natural capital (Clewell and Aronson 2006; Aronson, Milton, and Blignaut 2006; Aronson et al. 2007). By restoring natural structure, function, and process to landscapes, restorationists can return and enhance a suite of ecosystem services that have been previously negatively affected by human disturbance. Clewell and Aronson (2006) suggest that the pragmatic rationale for restoration of ecosystems is primarily derived from these gains in ecosystem services and that this is currently one of the most compelling, yet untapped, motivations for restoration.

In this book, we agree that augmenting ecosystem services and natural capital is, indeed, a justifiable motivation for restoring landscapes, and it is one of the lenses through which we view the human dimensions of ecological restoration. We also acknowledge the transcendent work of C. S. “Buzz” Holling, Lance Gunderson, John Holland, and many others that extended ecological economics to broader systems analysis, focusing on understanding interactions among human and natural systems (e.g., Holland 1995; Gunderson and Holling 2002). These modern examinations of transformation, adaptation, and resilience (Berkes and Folke 1998; Folke 2006) provide fertile frameworks for examining the human dimensions of ecological restoration.

Education

Educational efforts in ecological restoration have occurred at three levels: K–12, college-level programs, and programs/rituals for the general public. In the realm of K–12

programs, some of the leading work has been done by the Earth Partnership for Schools Program at the University of Wisconsin–Madison Arboretum and the Education Department of Environmental Concern (St. Michaels, Maryland). These two programs have helped schools and other facilities throughout the United States by developing curricula, instructing teachers and administrators, and working with schools to restore the schoolyards with prairies and wetlands. Other smaller programs, such as the Summer Orientation About Rivers (Prairie Plains Resource Institute) and the Mighty Acorns (Chicago Wilderness), provide a more regional approach to educating youngsters about environmental stewardship and ecological restoration. The theoretical support for all of these programs can be found in the works of David Orr (1992), Peter Kahn Jr. and Stephen Kellert (2002), Gary Paul Nabhan and Stephen Trimble (1994), and Richard Louv (2005).

College-level programs and course work in ecological restoration can be found on an international scale, but especially in the United States, Canada, England, and Australia. Lavendel (1999) provided an overview of some of the college-level ecological restoration programs available in the United States at that time. The Global Restoration Network provides a more current listing (<http://www.globalrestorationnetwork.org/education/>).

Educational opportunities for the general public range from so-called tailgate sessions during volunteer work parties, to public lectures and other events, to signage and other interpretive devices in areas where restoration activities are taking place. While no one has written a book or even an overview article about this type of work within a restoration context, articles about these sorts of activities have and do appear from time to time in *Ecological Restoration*. For example, the March 2004 issue included an article by Colette Palamar about how to conduct a fire festival to introduce the general public to the safe use of prescribed burns (Palamar 2004).

Other Humanities-Related Areas

Other areas in the humanities that are of interest to ecological restorationists include history (reference conditions, authenticity), philosophy (ethics), and psychology (understanding human behavior). While we have made a conscious choice not to include discussions of all these areas in this book, we fully recognize their importance and include here a brief summary of a few important publications in each of these areas.

In the area of history and historical ecology, look into the publications by David R. Foster and his colleagues (2000, 2004), Eric Higgs (2003), Dave Egan and Evelyn A. Howell (2001), Peter S. White and Joan L. Walker (1997), William Cronon (1983, 1991, 1996), Carole Crumley and William H. Marquardt (1987), and Carole Crumley (1994). There have been several books about philosophical issues related to restoration. These include works by Bill Jordan (2003), William Throop (2000), Andrew Light (2005), Andrew Light and R. Holmes III (2002), and Eric Katz (1996). Additionally, it would be a huge oversight not to mention *Environmental Ethics*, which has been edited by Eugene Hargrove from 1979 to the present (<http://www.cep.unt.edu>)

/enethics.html). In the realm of environmental psychology, there are several books of note, including those by David Abram (1996); Robert Bechtel and Arza Churchman (2002); George Howard (1997); Rachel Kaplan and Stephen Kaplan (1989); Rachel Kaplan, Stephen Kaplan, and S. Ryan (1998); and Theodore Roszak, M. E. Gomes, and A. D. Kanner (1995).

Structure of This Book

Our intention with this volume is to delve into some of the often neglected and, therefore, often misunderstood aspects of ecological restoration; areas of the practice that ultimately make the difference between “good” and “bad” (or just “mediocre”) restoration, between projects that are successfully executed and those that seem unable to advance past the conceptual stage, between informed, engaged participants in restoration and apathetic bystanders. In so doing, we draw on the experiences of the chapter authors in this book—a diverse assortment of restoration practitioners and researchers from around the world. We hope the lessons contained herein will be valuable to restoration veterans and greenhorns alike, scholars and students in a range of environmental and natural resource fields, and individuals who care about restoring their local lands and waters as well as themselves and their communities.

The careful reader will find that the book is divided into three metathemes: participation, power, and perspective. These overarching metathemes emerge naturally from the narratives in this book. Moreover, they represent and illuminate ecological restoration’s intrinsic characteristics of being (1) value-laden, (2) context-driven, (3) prone to be immersed in disagreement and compromise, and (4) experiential.

Participation is the undeniable essence of ecological restoration because ours is an active practice that requires participation in its planning, implementation, and management. Unlike hands-off preservation, restoration depends on an active, reciprocal engagement with the land and with all the beings, including humans, who live there. As restorationists, we are obliged to meaningful, thoughtful participation as part of our practice. Within the metatheme of participation, there are two themed sections, one of which discusses the important roles volunteers play in restoration while the second explores the often tricky and deeper world of participation in a collaborative setting. As is the case throughout the book, each of these themed sections begins with a chapter that introduces the basic theme and explores its general relation to ecological restoration. Subsequent chapters are case studies of projects, programs, and experiences within that thematic area.

Power may seem like an unusual metatheme for ecological restoration, but once ecological restoration is viewed as a practice that is value laden, context driven, prone to disagreements and compromise as well as experiential, then it becomes clear why and how power plays such a central role. Once restoration decision making is seen as involving more than embracing scientific facts, and that someone or some group typically has the power (i.e., authority, money) to support/neglect/deny a restoration effort, and that other individuals or groups also have claims to power through their engagement with the land and their neighbors, then the role of this metatheme in

ecological restoration becomes more obvious. The thematic sections discussed under the metatheme of power include a section about politics, governance, and planning followed by chapters that discuss restoration economics.

The metatheme of perspective speaks to the experiential component of the practice. It is this realm where ecological restoration intersects and interacts with cultural practices that allow us to negotiate between the tension inherent in the metathemes of participation and power. Such practices help us complete the full restoration experiment by helping transform the practitioner, arguably the most important change of all. The themed sections here include eco-cultural restoration, which includes indigenous ideas about eco-cultural restoration as well as a chapter that explores the loss of eco-cultural practices and landscapes in England (i.e., cultural severance), and testimonies from four eco-artists about their work in public restoration projects in the United States and China. The other themed section looks at the role education, at all levels, can play in rounding out the complete restoration experience, both in terms of gaining technical and people skills and as an avenue for personal and community development (i.e., developing a sense of place). The case studies in this section provide a look at education efforts at the following education levels: elementary/high school, college/university, and continuing. These are real-world efforts that have already begun to bear fruit and show promise for so much more.

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While this book is divided into various sections according to specific metathemes and thematic areas, there is sufficient interplay between the chapters to recommend that readers experience the whole menu rather than simply devouring their favorite or most well-known entrée.

Conclusion

Living in the world is becoming increasingly complex with every passing day. Environmental problems affect us all. Moreover, many of these problems do not come with easy or quick solutions; they are “wicked” problems (Rittel and Webber 1973; Conklin 2001). Such circumstances require us to move beyond “normal” science to a “postnormal science” approach (Funtowicz and Ravetz 1993) that can operate successfully and adaptively in the high-risk, high-uncertainty situations we often encounter. Moreover, these situations suggest that the pursuit of solutions to problems must be more interdisciplinary and more democratic, and must employ an “extended peer community” to assure that all aspects of the situation (both human and biophysical) are taken into account.

To deal with the situations presented by many ecological restoration projects, we need to integrate humans and nature and reconcile the boundaries between contemporary science and the society it serves (Bradshaw and Bekoff 2000). We must not only hear Aldo Leopold’s observation that humans are “plain members and citizens” of the biotic community (Leopold 1949, 204), we must believe and adhere to it. In this book, we give voice to people who have studied the issues and implemented their ideas

about how to integrate the human dimension into the practice of ecological restoration. We hope that you will find what they have to say inspiring, provocative, and pragmatic—and that they will give you the knowledge and courage to move forward with your ecological restoration projects.

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