

# What Do We Mean When We Talk About Ecological Restoration?

by Stuart K. Allison

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Is restoration really a form of ecological gardening?

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What do we mean to be doing when we talk about, plan for, and carry out ecological restorations? Restorationists usually reply that our goal in restoration is to return an ecosystem to some previously existing condition that no longer is present at that site. We almost always make the assumption that the site's current condition is somehow degraded or less desirable than the previous condition and needs improvement. The Society for Ecological Restoration's recent definition of ecological restoration seems to capture the standard for our work: "Ecological restoration is an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity, and sustainability. Frequently, the ecosystem that requires restoration has been degraded, damaged, transformed or entirely destroyed as the direct or indirect result of human activities.... Restoration attempts to return an ecosystem to its historic trajectory" (SER Primer 2002).

Yet that definition and our usual goal in restoration raise several important questions, not the least of which is: What do we mean by health, integrity, and sustainability? Furthermore, how do we decide when an ecosystem is so degraded or damaged that it is in need of restoration? What do we mean by historic trajectory? (A historian colleague of mine [Mark Spence personal communication] points out that it is logically impossible for any ecosystem not to be on a historic tra-

jectory.) What sort of values are we bringing to the process when we talk about restoration? What are we really doing when we restore an ecosystem?

These questions have plagued me ever since I got into the business of restoring ecosystems and managing existing restorations. Some of my questions arise from my educational background. In graduate school, I was trained in classical community ecology and, like most community ecologists, I was taught that it was best to study communities and ecosystems that were as little disturbed by human activity as possible. In fact, we purposefully avoided any ecosystem with obvious damage from human activities. Yet, the more I looked at the world around me, the more it became apparent that there were very few ecosystems that were in fact undisturbed by humans.

I do my restoration work in western Illinois where the typical restoration is to take agricultural land and restore it to tallgrass prairie. What makes a tallgrass prairie more valuable than agricultural land? As a society, we would cease to exist without a large amount of agricultural land. Moreover, if I were to simply abandon an agriculture field in western Illinois, it would not turn into a tallgrass prairie on its own. Instead it would eventually become an oak-hickory woodlot. Why is a tallgrass prairie more valuable than an oak-hickory woodlot? The fact that producing the tallgrass prairie requires considerable human effort has led

some philosophers to label restorations as artificial (Katz 1992). But is the input of human effort really a problem when deciding whether a restoration is valuable or not? In this essay, I will concentrate on how we decide the goal of our restoration efforts, what it means when we describe restorations using terms such as "natural" and "artificial," and discuss the potential of using the term "gardening" to describe our work.

## Setting the Goal for a Restoration

In ecological restoration, our feeling is that the current, degraded condition of the site is less natural than a previously existing state and that a more natural condition is better for the site, and usually better for the environment as a whole. We progress towards a more natural condition with the notion that such a condition will ensure better ecosystem health, integrity, and sustainability. But how do we decide what is more natural than the current condition?

In North America, we almost always decide that the conditions that existed prior to European-American settlement were more natural than the conditions that developed afterwards. For example, in western Illinois, we typically decide to plant tallgrass prairie that is similar to the prairies that existed there prior to European-American settlement. Thus, we are setting as our goal the recreation of a tallgrass prairie as it would have existed prior to the 1830s. We hope to restore the site in such a way that the tallgrass prairie will develop along a trajectory of dynamic changes that would mirror what would have happened to tallgrass prairies if European-Americans had never arrived in the area.

Our goal of restoring an agricultural site to something similar to the tallgrass prairies that existed prior to the 1830s immediately presents us with many practical problems, however. First, what do we know about the tallgrass prairies that existed prior to European-American arrival? The answer is—not as much as we would like to know. We have some species lists that date back to the 1830s. For western Illinois, the best plant list by far was com-

plied by pioneer physician and botanical enthusiast, Dr. Samuel Mead (Mead 1846). But Dr. Mead's list only provides us with the names and locations of plants he collected

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and notations of whether the plants were common or rare. We have almost no information about the relative proportions of the plants in the tallgrass prairies he sampled or how the different species were associated with each other. To supplement this limited information, we often use existing remnants of the original tallgrass prairies as models (Schramm 1992). Remnants are problematic, however, because they are small, isolated pieces of prairie that were usually preserved because they were in places not well suited for agriculture and thus were dissimilar to most of the tallgrass prairie that once surrounded them. These remnants have almost certainly changed since the 1830s because they are isolated and suffered changes in fire regime and a loss of many animal species associated with them (Curtis and Greene 1949, Leach and Givnish 1996).

The lack of animals associated with the original prairies is a particularly vexing problem. Almost all tallgrass prairie restorations are too small to support the larger animal species typical of original

tallgrass prairie. Only at the very largest prairie restorations (for example, Neil Smith National Wildlife Refuge and Midewin National Tallgrass Prairie) are there any plans to introduce large herbivores, such as bison or elk. There is no plan to reintroduce the large carnivores typical of tallgrass prairies. Animals like the grey wolf require such a large home range that even our largest prairie restorations could not support them. How natural is a prairie that lacks its typical animals?

A further complication is that the tallgrass prairies that existed in Illinois in the 1830s were almost certainly maintained by Native American-set fires (Anderson 1990). Is a prairie that was maintained by human use of fire really natural? And if it is, why do we feel that a human-maintained prairie is more natural than a human-maintained soybean field? Certainly there are many reasons for this feeling, not the least of which is the presence in the prairie of a diverse group of plant species adapted to the local environment compared to an agricultural monoculture of a non-native, domesticated species. In addition, a soybean field requires a much greater investment of human energy than a tallgrass prairie. But there is clearly a continuum of human involvement in these ecosystems and it becomes increasingly difficult to figure out where the natural and unnatural ends of the continuum become separate from each other. As I mention later, this, of course, is the difficulty we have if the word "gardening" is applied to ecological restoration. Where does gardening as we typically define it begin and end, and where does gardening as restoration begin and end?

The problem of a continuum of human activities with varying degrees of naturalness is even worse in other parts of the world, such as Europe, much of Asia and Africa, where the presence of humans and their activities are so extensive and long-standing that it is difficult to even begin to understand what the environment would look like without them. How can we identify natural in the face of so much human activity occurring over such large areas over hundreds of thousands to even millions of years?

## The Problem of the Natural

One solution to this problem of identifying natural in the face of human activity is to simply define natural as that which occurs without or beyond human activity. Conservation biologist Malcolm Hunter has defined natural in the context of management in just this manner: "In summary, using the word 'natural' to mean 'without human influence' in the context of conservation would help to define clear benchmarks for managing ecosystems both inside and outside ecological reserves. These benchmarks would not be colored by arbitrary value judgments that praise activities by one group of people as natural and condemn activities by other people as unnatural. If we consider all human activities to be unnatural, we can focus on the primary issue: designing management practices that will move ecosystems closer to their natural structure and function" (Hunter 1996). Hunter's definition is very similar to that of environmental philosopher Eric Katz who claimed that "The processes of the natural world that are free of human interference are the most natural" (Katz 1992). Hunter, in particular, worried that identifying something such as the use of fire by hunter-gatherers as natural and the use of bulldozers by industrialized peoples as unnatural was illogical, and felt that any human activity must be viewed as occurring outside of nature, thus preserving the natural environment in some kind of pristine state removed from the taint of human contact.

The definition of natural as "without human influence" causes us, both as humans and practicing restorationists, many problems, however. First, it reinforces the nature-human division that sees us as somehow separate from nature. Once we see ourselves as separate from the environment, we seem to have the mental freedom to think about and treat the environment in any way we see fit without considering the consequences. Reinforcing the human-nature division also flies in the face of much modern philosophical and environmental thinking. Many environmental philosophers have developed the idea that humans are

intimately a part of nature and that we lose our true humanness when we separate ourselves from nature—an idea most elegantly stated by Aldo Leopold in his "Land Ethic" (Leopold 1949).

Nonetheless, many environmentalists remain wary of identifying all human activities as natural. There is a tendency to label some activities or peoples as more natural than others, largely based on things like degree of industrialization or

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the amount of non-renewable resources necessary to produce a piece of technology. Yet from the point of view of an individual plant, fire and hand axes are forms of technology that are just as devastating as bulldozers and herbicides.

The human-nature division is exacerbated by confusion about how we define natural. The confusion is best seen by examining the opposites to different definitions of natural (Vogel 2002). If the opposite of natural is "supernatural," then we see natural as something produced by, or existing in, a condition that developed by way of physical and biological processes that typically operate in our universe—processes that can be deduced by following the scientific method and that we sometimes refer to as "the laws of nature." If the opposite of natural is "artificial," then we see natural as the result of processes that are not human, as it is humans who produce artifacts, the artificial. If we follow the former definition, that natural is not supernatural, then humans are inherently natural. We arose by the biological process of evolution and our creations are the result of the use of our minds and bodies—also the products of evolution. Thus, the human construc-

tion of something like a building or bulldozer is as natural as a beaver constructing a dam on a stream.

Another problem in defining natural as "without human influence" is determining where on earth we could possibly find any "natural" ecosystem today. Many Americans have grown up with the notion that national parks, such as Yellowstone and Yosemite, have always existed as some kind of pristine natural temple, removed from human activity since time immemorial. We visit those parks and look at the environment and think that what we see today has always existed in its current state and that humans had nothing to do with the genesis of the park's environment. The truth is, before the arrival of European-Americans, Native Americans lived in, and made extensive use of, the lands that would become our national parks. The parks as we know them today would not exist in their current condition without the activities of first Native Americans and later the National Park Service (Spence 1999; see also ER 21(4):245-246.).

It is, in fact, difficult to find many places on the Earth that have not been inhabited and modified by humans (Vogel 2002). When I first read *The End of Nature* (McKibben 1989), I, like many people, thought Bill McKibben overstated his case that human influence had become so extensive that no place on earth could escape our actions. But as we learn more and more about global climate change, the seasonal growth of the ozone hole over Antarctica, and the transport of pollutants to the deep ocean, it has become obvious that McKibben was basically right. The main problem with McKibben is that he also viewed the environment through the lens of the human-nature divide and did not completely acknowledge the long-term human influence on the environment. On the other hand, environmental philosopher Steven Vogel has argued that nature as "without human influence" has not existed since the beginnings of human evolutionary history. He claims that we have always lived in intimate contact with the environment and that our actions have always modified the environment as surely as the evolutionary

pressure of the environment modified us. He states that "the world we inhabit is always one transformed by human practices" and thus it is impossible to parse out a nature separate from us (Vogel 2002).

It appears to me that, given the current trajectories of human population growth and ongoing environmental change, all areas that will remain in a condition that has any resemblance to what we might call natural will continue to exist in that state only because of human choice. Moreover, once humans have chosen to set aside an area as a nature preserve or wilderness area, the work does not stop. At that point, ongoing human management—with all its decisions and controversies—becomes a necessity to prevent non-natural influences (such as pollutants, poaching, and the activities of domesticated and introduced species) from overwhelming the ecology of the area (Janzen 1986).

I think it is noteworthy that while the *SER Primer* mentions cultural processes and the necessity of preserving "cultural landscapes" in many parts of the world, its authors still reflect the idea of nature without human interference when they claim that an ecosystem is finally restored when it can "continue its development without further assistance or subsidy." The concept of no further human assistance would seem to preclude the possibility of an ultimately successful restoration of cultural landscapes that depend upon human activities to maintain them.

## What Do We Mean by Restoration?

So, we come back to our initial question: What do we mean when we say that we would like our ecological restorations to result in a "more natural" ecosystem? Given that "natural" is a difficult term to define, that nature defined as "without human interference" is hard to imagine in our post-industrial world and because restorations require continuous human involvement, I would argue that we are left with an unobtainable goal if our desire is to restore a "natural" ecosystem.

It may seem that by making this argument I am supporting Katz's contention

that restorations are simply artifacts, whereas natural ecosystems are natural because there is no human intention in their creation (Katz 1992, 2000). Instead, I agree with Vogel, who argues that because artifacts are produced by humans and because humans are the product of the natural process of evolution, therefore "all artifacts are natural" (Vogel 2003).

The Oxford English Dictionary (2003) defines restoration as: "1. The action of restoring to a former state or position; the fact of being restored or reinstated. a. Of persons. b. Of territory, conditions, or things." Ultimately, I would argue, all we

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mean by ecological restoration is returning "conditions" to a former state. If we leave out value-laden terms like "natural" or "pristine," we allow ourselves a much larger range of possible former states to which we can restore ecosystems. This an important option, especially in North America, where so often the focus on restoration has been to return areas to unobtainable levels of naturalness or pristine condition. Any restoration will necessarily be done with the goal of achieving some state chosen by us, and the goal or final state we attempt to achieve, is only one of many possible states.

In the Midwest, for example, we choose prairie largely because it is the ecosystem encountered by the first European-American settlers and thus it figures into our regional mythos of what we are and

where we came from (Calkins 1989). We also choose tallgrass prairie because we find it aesthetically pleasing, but we have to acknowledge that we have chosen one possible former state from others that existed here post-human arrival and could reasonably be supported by our current climate. Acknowledging our choice in the matter allows us a broader range of possible restoration options and suggests that we need to more seriously consider other historical ecosystems that existed at any one site.

## "The Gardenification of Nature"

Noted ecologist and conservationist Dan Janzen wrote a paper about ecological restoration in the tropics that he subtitled, "The Gardenification of Nature" (Janzen 2001). In many ways Janzen's variation on the word "garden" was a curious choice. Restorationists often take pains to differentiate restoration from gardening and imply that our work is more natural and, perhaps, even more noble than gardening (Jordan 2000). There are several reasons why restorationists make this distinction, chief among them is that gardening is seen as too controlling—too much a process of human domination and domestication of the landscape. Many North American restorationists also view gardening as an artificial process that produces highly simplified plantings. We often think of a row of petunias along the sidewalk or a few vegetables in a plot in the backyard as a garden and forget about the much larger landscape gardens that at least attempt to recreate some version of a more species-rich and less-controlled landscape (Moore and others 1988).

The choice of words we use to describe what we are doing is important because different words imply different values (Hull and Robertson 2000), and this is not merely "antics with semantics" as the title of the old *Reader's Digest* feature might suggest. The words we use often color how we perceive our actions and even the way in which we go about achieving our goals. Furthermore, Strunk and White (1979) taught us to never use a big word when a small word would do. To

my way of thinking, calling our work "restoration" was the use of a bigger word to set our work apart from gardening. Such a division was unnecessary because it only serves to drive people away.

I think that the word "restoration" has a somewhat mechanical feel to it. People restore buildings, artwork and automobiles, and such restorations are often fairly complex processes that only the very skilled can accomplish. In contrast, anyone can plant a seed or pull a weed. Herbert Schroeder (2000) noted that many volunteer groups working on the restoration of savanna ecosystems in the Chicago area took pains to tell potential volunteers that no advanced degree or training was necessary in order to help with the restorations. Perhaps a word like gardening, or at least using the term when describing the process, would be more inviting to potential volunteers.

In a similar vein, while some practicing restorationists have pointed out the art necessary for successful restorations (Schramm 1992) and some have even claimed restoration is an art (Turner 1987), many have focused on the more technical aspects of restoration. Technical information is clearly critical for the success of restoration projects. We need to know the density and mixture of seeds to plant, and how to nurture plants after germination, but, as Eric Higgs (2003) points out, when we focus on the technical we lose the personal connection with the environment. Aldo Leopold wrote that he had more faith that the restoration of a proper human connection to the environment would occur when the average farm boy took an interest in tinkering with the pines on the farm, than he did if care for the environment became the sole province of the academy and trained professionals (Leopold 1939).

Finally, it seems to me that restoration often lacks the cultural dimension—the dimension that produces meaning. For example, the Norwegian geographer, Kenneth Olwig (1995), criticized a restoration of stream meanders in Denmark claiming that without the restoration of the agricultural system that maintained the original stream-meadow ecosystem, the restoration was not very

meaningful. Likewise, in England, national parks have landscapes that are maintained as cultural ecosystems where the traditional pastoral use of the land is seen as vital to maintaining the landscape. Olwig (1995) argues that without continued human use of the environment, the landscape would cease to exist in the form that led to its preservation and the human meaning for the landscape would also be lost. Restoration must result in a deep personal and cultural engagement with the environment or it will not achieve much beyond a temporary patch for the landscape. The ideal human relationship to the environment should result in something akin to love, as in love for other people (Olwig 1995).

Speaking of cultural landscapes and ecosystems, there is a sad irony when we talk about restoring North American ecosystems to conditions maintained by Native Americans without consulting or including Native Americans in the restoration process. These culturally derived ecosystems lack meaning when the original purpose for their creation is ignored. Native Americans burned prairies for many reasons, but it is unlikely they burned them just for the heck of it. If we do not restore the Native American uses to these ecosystems then we need to develop other uses to give the restorations deeper meanings (see *ER* 21(4):245-310).

I think that "gardening" is the perfect word to describe what restorationists are doing because it emphasizes the personal relationship between individual humans and the land (Moore and others 1988). Correspondingly, as William Jordan (1994) and Andrew Light (2000) have pointed out, ecological restoration is not just about restoring a piece of the landscape, it is also about restoring the human relationship to the environment. We can choose a site, pick a historical ecosystem state as our goal, plant native species, remove weeds, and, in some cases, even reintroduce extirpated animals, but we will not have accomplished much if we continue to think of humans as separate from the environment. In many ways the most important end product of restoration is not only a healthy ecosystem, but a healthy relationship between humans and that ecosystem.

Today it is probably impossible to have healthy ecosystems without a healthy human-ecosystem relationship.

To restore the human connection to the land, we need to move back into the environment in a small, personal way, just like a gardener on hands and knees planting bulbs in the cool, autumn earth. The ancient simple act of putting something in the ground and "having faith in a seed" (Thoreau 1993) to germinate and grow is perhaps the defining image of a positive relationship between humans and the earth. In the garden we can actually achieve the "middle ground in which sustained use and non-use might attain some kind of balanced, sustainable relationship" (Cronon 1995).

Of course gardens and gardening are a bit contradictory when thinking of restoring a balanced and healthy relationship to the environment. Gardens are often walled to keep the rest of the environment out. But even in the most tightly controlled, walled gardens of Renaissance Italy, there was a small spot near the center (known as a bosco) that was left unmanaged to incorporate the wild, non-human influences within the domesticated land (Mitchell 2001). Our goal in restoration should be to reverse the plan and process of those Italian gardens. We need to remove the walls and make the domesticated the small central part, and, as much as possible, make the rest of the garden the uncontrolled ecosystem, growing on its own.

## Coda

Do I really think that my call to use the word "gardening" (or variations thereof, such as "ecological gardening") when we talk about ecological restoration will change the name we have for restoration projects? No, the cat is already out of the bag with respect to the term "ecological restoration." The journals devoted to the subject, *Ecological Restoration* and *Restoration Ecology*, already use the word "restoration," as does the main organization associated with restoration, the Society for Ecological Restoration International. As a name, ecological restoration has a history and is well understood by restorationists

(Jordan 1995). But it is important that we are explicit about the relationship between gardening and ecological restoration. It is important that we recognize that ecological restoration is a very highly evolved form of gardening, perhaps the ultimate form of gardening in terms of understanding the human relationship to the environment. Thus, use of the word "gardening" is not a negative or something we need to be ashamed of, rather it is something we need to be proud of and embrace. Because as restorationists we are really trying to restore ourselves to the garden of the environment, to put ourselves back in a position where we see ourselves as just one part of the ecological web. The more we can do to simplify and personalize the human-environment connection, the better. The hang-up some environmental philosophers express about whether restorations are natural or not, or even whether the natural still exists, misses the point. The connection between humans and the environment is real and cannot be denied. The fact that the relationship is not working well cannot be denied, either. There are many items on the plate for restorationists, but the most important item must be the restoration of that human-environment relationship. Without that restoration, none of our other efforts will matter.

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