

Is Landscape Preservation

an Oxymoron?

"Every act of recognition alters survivals from the past. Simply to appreciate or protect a relic...affects its form or our impressions... Interaction with a heritage continually alters its nature and context, whether by choice or by chance."
(Lowenthal, 1985)

I. Introduction

To a plant ecologist, such as myself, the parts of the landscape of most interest resist preservation naturally. Plants, and the wildlife associated with them, grow, move around, reproduce, die, and generally bring to the landscape a very uncooperative tendency to change. A successful effort at preservation would seem to require its own failure. So what, exactly, is the manager of a landscape trying to preserve?

One element of the problem is the very broad range of entities to be preserved. Called "cultural landscapes," they are defined as "a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historical event, activity, or person or exhibiting other cultural or aesthetic values" (Birnbaum, 1994). Are there any landscapes that this excludes?

In addition, the degree of the problem may differ for the several elements found in cultural landscapes. We can classify the resources of the landscape into four categories. There is, first, the natural terrain—the rocks and soil of the substrate that are configured to form topography. Second, we may find a rich and complicated

diversity of human artifacts representing the surviving relics of the landscape's history. The third resource includes the heterogeneous array of living plants and animals, including humans, that fulfill a transitory existence in the landscape, often in complex biological association with each other.

Finally, there is often a less tangible resource present that reflects the deliberate configuration or alteration of the first three elements into what can be called a design, with its very formal characteristics or its less formal, so-called vernacular qualities. There will also be some set of accidental characteristics that, while not a deliberate component of the design, are often an acknowledged indirect, accepted, and appreciated part of the

landscape's life in time. Often the choice of the design's materials and organisms determines the later proportions of these accidental qualities, forming a kind of landscape patina. Since these four types of resource often express different rates of change relative to each other, it may be appropriate to bring different treatment philosophies to these different resource elements.

A third part of the problem with the idea of landscape preservation depends upon the scale of the landscape. As the cultural property under management increases in geographic size, unambiguously cultural resources become intermingled with "natural" resources in spatially complex mosaics. The historic house with a small lawn bordered by a second growth forest presents a very different set of issues than the remnant mining camps scattered throughout a vast wilderness watershed. In an analogous way, all landscapes can be seen at different scales of time in which a particular "period of significance" overlays and is overlaid by cultural landscapes of other periods, and with modern land uses.

Finally, as noted at the start, there is in landscapes the irrepressible biological vitality of living organisms struggling to survive. No amount of pruning can "preserve" the form or material substance of a tree as it existed at one moment in time.

In the face of these difficulties, the preservation community is seeking to create consensus around a single set

of guidelines to support managers of cultural landscapes (NPS, 1995). These efforts have drawn upon similar standards for historic buildings, structures, and objects for the classification, and often the language, of treatments (NPS, 1992). So, for instance, the **preservation** treatment calls "*for retention of the greatest amount of historic fabric*" and **restoration** allows for "*the depiction of a site...by preserving materials from the period of significance and removing materials from other periods*" (NPS, 1995).

It may, however, be of some value to broaden our perspective to other types of resources. In this heuristic sense, cultural landscapes may be seen as residing on a spectrum that stretches from the purely cultural to the purely natural (Figure 1). At one end might lie the operating system of the average personal computer; at the other end sits the genetic material of an organism such as *E. coli*, the common gut bacteria. Given this bug's happy existence in the human intestine, I will leave it to philosophers to determine just how natural *E. coli* is.

In the remainder of this essay, I will explore this spectrum by examining the form and language of preservation activities as they apply to biodiversity, on the one hand, and painting restoration on the other. I will then briefly return to current directions in historic preservation, and suggest what enlightenment might bring to the challenge of cultural landscape preservation.

II. The Conservation of Biological Diversity

On the natural end of the spectrum, there are two broad activities involved in the preservation of biological diversity that may provide some guidance for cultural landscape managers: ecological restoration of lost landscapes and ecosystem management of existing natural resources. At first glance, the new discipline of ecological restoration would appear to provide hope for such lessons, especially those attempts that go beyond a simple reclamation that installs an erosion-controlling mixture of species quite distinct from the community displaced by disturbance. In practice, however, ecological restoration, if taken literally, promises more than it usually delivers. Even with considerable, continuous management efforts, few such projects are able to truly restore the original plant and animal community in all its historical complexity.

So how authentic are successful restorations? The Henry Greene Prairie at the University of Wisconsin-Madison Arboretum is one of the more successful examples to date (Kline, 1992). This 50 acre cornfield

was first planted with prairie seedlings and transplants nearly half a century ago and today supports over 200 native species of herbaceous plants dominated by big and little bluestem and Indian grass, all classic prairie species. However, the island-like nature of the tract subjects it to continuing invasion by weeds and woody species, requiring frequent intense burns, cutting, and application of herbicides. Missing, of course, are a number of characteristic animal species—green snakes, upland sandpipers, Franklin's ground squirrels, elk and bison—whose presence, along with numerous unidentified arthropods and soil organisms, would create the frequent local disturbances that facilitate soil development and support rare, early successional prairie species. Today such small disturbances are likely to be invaded by alien species such as sweet clover and wild parsnip developing from dormant seed in the soil, a heritage from the cultivation of corn. Managing the invasion of exotic plants is the greatest challenge of the cultured and cultural landscape, thus clearly defining ecological restoration as a highly refined form of gardening

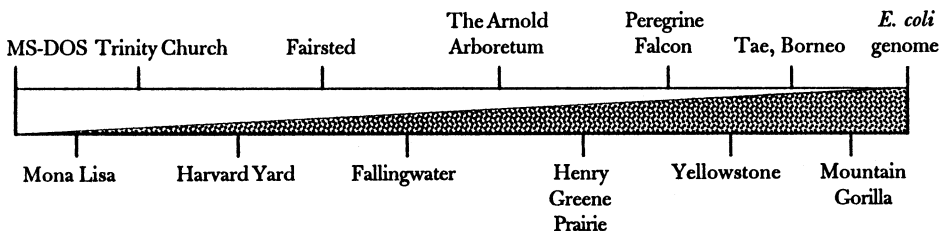


Figure 1. Is Landscape Preservation an Oxymoron?

(Jordan, 1994), albeit one where the intentions of the garden designer (if that is the right word) are greatly constrained by an ideological commitment to a native past.

Beyond questions of authenticity, the art of restoration ecology has become mired in the kind of philosophical and scientific disputes about its practice that remind one of similar rhetoric surrounding the restoration of art (Mendelson et. al., 1992; Packard, 1993; Baldwin et al., 1994). Critics argue about the historical reality of the primeval condition toward which restoration efforts are aimed. They decry the highly intrusive technological assaults (controlled burns, herbicides) mounted by ardent practitioners against aliens, and they mourn the loss of native species judged "foreign" to the presumed original community. They accuse the restoration ecologist of creating an unnatural artifact "analogous to an art forgery" (Elliot, 1982). Restoration ecology is, they say, at best little more than "an expensive self-indulgence for the upper classes, a New Age substitute for psychiatry" (Kirby, 1993) and at worst "*an unrecognized manifestation of the insidious dream of the human domination of nature*" (Katz, 1991).

Perhaps the wisest counsel for the restoration ecologist, and for us, comes from a pair of academic ecologists who call upon restorationists to avoid two intellectual pitfalls (Pickett and Parker, 1994). First, do not assume that there is only a single unique and knowable reference state, the so-

called climax or primeval community, that can guide the process of restoration. Because natural systems exhibit a variety of pathways of change and multiple possible combinations of plant and animal species, an ecological restoration may measure itself against any number of legitimate systems and different results may all be ecologically valid. Second, a restoration is not a single event, but rather an experimentally defined intervention into an ongoing process. Because restoration involves so much trial and error, documentation of this intervention and monitoring its progress are critical to its success.

This emphasis on the ubiquity of change in natural communities, and the variety of pathways it may take, reflects a fundamental shift in our understanding of nature. This shift, in the name of ecosystem management, is beginning to influence the design of natural resource policies on public lands (Loomis, 1993). Called the New Paradigm in ecology (Pickett et al., 1992), the concept is expressed in the metaphor of the "flux of nature," as distinct from the "*balance of nature*" metaphor which has pervaded ecological thinking for most of this century.

Under the older "balance of nature" concept, a plant and animal community undergoes a linear, predictable pattern of change following an external disturbance such as fire. This succession of species ends in a stable, diverse configuration called the climax community that represents the primeval or virgin landscape prior

to human-induced disturbance. The New Paradigm replaces this descriptive "balance of nature" approach with the concept of a continually changing, dynamic configuration of natural elements called an ecosystem. It includes all the plants, animals, and microorganisms that interact with each other, and the inorganic nutrients and energy that create change. The "flux of nature" perspective emphasizes the importance of *processes* within the system that cause the dynamic and unpredictable nature of these changes. Rather than a linear pattern of community development, the New Paradigm sees multiple possible pathways for succession and a number of relatively stable community configurations along the way. The system is open to influence and regulation by outside factors; therefore understanding its dynamics depends on the context in which it is embedded.

The New Paradigm places great importance on the pervasive presence of disturbance as a continuing agent of change within the system. Disturbance can be local (the fall of a tree in the forest) or catastrophic (widespread wildfires), and the evaluation of its effects is therefore very dependent upon the scale of observation. Finally, the "flux of nature" perspective sees human influences as integral to all systems, including the kind of human-induced disturbance, both local and catastrophic, that we sometimes identify as our cultural heritage.

Modern ecology's focus on process and context can also be seen in

the concept of contingency. In this view, the specific dynamics of any one system will be contingent on its history, on the accidents of arrival as species disperse into the site, and on the nature of the system's interactions with the surrounding landscape. The patterns of change in any landscape will be unique, highly variable, and historically contingent.

Because the New Paradigm explicitly includes both natural and human disturbance as important agents of change within systems, it recognizes that cultural influences can often threaten the ecological integrity of ecosystems (Woodley et al., 1993). The evaluation of ecological integrity is not measured in terms of physical materials or organisms, but rather in terms of dynamic processes that maintain the functional interactions among system elements. Integrity is compromised when elements (biodiversity) are lost and functions (energy flow, nutrient cycles) are altered.

The practical application of this paradigm shift can be seen in the struggle to provide Park Service resource managers with a new philosophy of operation (NPS, 1994). On the surface, the draft document *Ecosystem Management in the National Park Service* reflects a need to define properties or landscapes not by political or agency boundaries, but by natural boundaries, called ecosystems. At a deeper level, however, this document encourages a profound shift in the way managers are to think about the resources under their

care. By focusing on the larger system, it encourages managers to move away from a single-resource approach to decision-making. Instead they should adopt an approach that stresses the interconnected nature of all parts of the system, including the past and present effects of humans.

"The bifurcation of the world into human and natural spheres is a false dichotomy under ecosystem management...The National Park Service should reduce the barriers to ecosystem management that result from artificially separating cultural and natural resources and strive to replace them with collaboration planning, research, and resource management efforts that reflect the real-world integration of material, human, and natural features."

In summary, ecosystem management stresses the integrity of system processes, the importance of local context, and the unpredictable and contingent nature of living systems. A systems approach sees natural and cultural resources as integrated aspects of one management system.

III. Painting Restoration and the Preservation of Artifacts

Like ecological restoration, the act of painting restoration is an intervention motivated by a desire to recreate an entity presumed to have existed in the past. An old painting, especially one whose creator is an acknowledged master, represents a highly designed cultural artifact. Because painting restoration has a long history, the discipline has reached some

consensus regarding the philosophical justification and approaches to be taken for its practice.

Prior to the 18th century, works of art (as we judge them today) received little respect as artistic creations; they were often treated as functional artifacts, serving the purposes of decoration, education, or cult objects. Images which became worn, darkened or damaged were renewed by overpainting. If too badly deteriorated, they were destroyed to preserve their sacred dignity. Restoration often involved significant modification of the images to fit the morals or tastes of the age. The profession of restorer flourished in the 18th century when the restoration, including a preference for embellishment, was more important than the original creation.

It was in the 19th century that the work of art was appreciated as an historical document, and only in the last half century have advances in science begun to inform preservation. The word conservation has replaced restoration to reflect an approach that emphasizes protection of the integrity of historic material with minimal intervention. The ethics of modern conservation also stress the importance of documentation for all interventions, and the adoption of technical solutions that are, to the extent possible, reversible.

From the moment a painting is finished, it begins to change, both from the internal effects of age on the chemistry of the materials and from the accumulation of dirt, the accidents of damage, and subsequent at-

tempts at restoration. In addition to the original significance of the painting, an old masterpiece comes to have an acquired significance revealed in its patina that reflects the value we place on age and the importance of survival (Hodkinson, 1990). These dual elements of significance, the original aesthetic value and the acquired historic value, create a natural tension that defines the current integrity of the work and shapes its value for us. Paintings which have been restored to some presumed original condition are frequently greeted with shock at the brilliance of the colors and the loss of a mellowing glow following the removal of grime and yellowed varnishes (Watson, 1992).

Of course, such strong intervention is usually justified in the name of artistic intent. The conservator is merely restoring the work to the condition of its original appearance, as the artist would have wished us to see it. Today, however, such justifications are rather suspect (Carrier, 1992). To quote one famous critic of radical cleaning in the name of artistic intent: "*One should have thought it common ground that Titian is dead and that we cannot ask him what his intention was*" (Gombrich, 1962).

Many ancient works were created not as art, but as functional artifacts serving a particular purpose in a specific setting; once removed from this setting, they become a different object than the painter intended. Similarly a painter may create a work with little thought for its permanence

over time, using fugitive materials, and working under conditions of illumination that instantly change once the work leaves the studio. Even when artistic intentions are thoroughly understood, it is not clear that the conservator has an obligation to honor them above all other considerations of value.

In the end, each act of conservation becomes a statement of interpretation (van de Wetering, 1992). Because a work of art begins to change from the moment of its completion, its acquired historical value may eventually surpass the value of original intentions. Any intervention, even the removal of accumulated grime, will alter these relations and reflect the context and interpretive intentions of the conservator, not the artist. Every era has its own way of seeing the past.

Perhaps there is no better proof of this relativity than the existence today of three equally valid approaches to treating the old varnishes on paintings (Hedley, 1990). One approach ("complete cleaning") removes all varnishes, giving primacy to the value of color and what remains of the original paint. The second approach ("partial cleaning") thins the ancient varnish uniformly to harmonize color and space while retaining the antique character of the surface. The third approach ("selective cleaning") removes varnish in certain locations to achieve a balance by manipulating the relations of colors at their borders, thus restoring the image's pre-

sumed original unity. It is even more striking that the National Gallery in London, the Louvre, and the Metropolitan Museum of Fine Art each employ a different approach.

Because each approach implies a different interpretation by valuing a distinct component of a painting's significance (color, antique harmony, internal relations), each achieves equal validity as a treatment because *"they are parallel ways of constructing a new relationship to the artist's intent and the passage of time,"* thus achieving what Hedley (1990) calls *"new found relativities."* In this sense the process of cleaning fundamentally changes the work as an aesthetic object by re-presenting it to the observer.

"We have lost the old original relations. We did not even want them to stay unchanged, for the passage of time is important. Yet, we need to understand our new found relativities, not as a battleground for right and wrong, but as the varied strands which have come to connect our present view of art with the past."

(Hedley, 1990, p168).

The history of painting conservation, then, seems to yield three observations that may enlighten landscape preservation. First, in contemplating **restoration**, the changes that come with age have added a set of positive, acquired values to a work that must be weighed against its loss of original significance. Second, the intentions of the creator are always seen through the lens of our own times and may therefore be essentially unknowable.

Besides, intent may be largely irrelevant when what was created for one purpose (functional artifact) is made to serve a new purpose (art object). Finally, any treatment is an interpretation that constructs a new relation between the observer and history. Thus there may be multiple, equally valid treatments that give primacy to equally important, but competing, historical values.

IV. A New Paradigm for Historic Preservation

In 1991, the quarter-century anniversary of the National Historic Preservation Act of 1966 brought forth an outpouring of introspection and prognostication in a book of essays called *Past Meets Future* (Lee, 1992). One preservation advocate (Boasberg, 1992) calls for a new paradigm in preservation that would greatly expand its mandate and enlarge the constituencies which it serves. In the future, preservation efforts will need to move beyond saving single objects of historical or aesthetic significance to the broader *context* of urban or rural planning. This will require full immersion in and better management of the political and economic *processes* that shape change in the built environment. To this plant ecologist, this sounds like a systems approach to preservation, a recognition that cultural relics surviving from the past are just one part of a dynamic, living present.

This new paradigm will also need to form new partnerships with constituencies not traditionally involved

in the historic preservation movement. Environmentalists form one logical group for the development of partnerships around common planning goals, and the preservation of cultural landscapes would seem to be an excellent meeting ground for exploring the relevant issues. More importantly, there runs throughout *Past Meets Future* a recognition of the socially narrow origins of preservation in this country and the socially broad impact that preservation has brought, especially to the urban setting. An expanded preservation mandate must embrace and consult minority populations whose cultural interest in the past may be different than traditional architecture.

The thrust of the new paradigm is captured in a quote of Professor Robert E. Stipe that acknowledges the importance of historical integrity but states:

"At the same time, national, state and local preservation programs...will have to display increased sensitivity to changing concepts of significance that have less to do with maintaining the artistic and stylistic integrity of buildings than they do with enhancing the quality of the larger environment for the daily living purposes of people."

This shift in philosophy is also argued for the legal foundation of preservation decisions that are traditionally based on aesthetics (Costonis, 1989). The objects we designate for preservation may be seen as "icons" in our environment that confirm a sense of order and identity in a

world experiencing a frightening rate of change. Aliens, objects that represent the forces propelling innovation and change, threaten icons. While laws to protect icons from aliens may have been erected in the name of aesthetic qualities and "objective" standards, in reality their implementation requires a communal process that weighs and adjudicates the multiple values we bring to our perceptions of the known environment and the new.

"Beauty is off the mark as the force behind aesthetic laws...In its place [should be substituted] our individual and social needs for stability and reassurance in the face of environmental changes that we perceive as threats to these values...legal aesthetics cannot itself make the choice between familiarity and innovation. That is an issue for our culture at large" (Costonis, 1989, p.xv, xviii).

Thus the standards we use to define preservation goals and reach management decisions should also reflect the social values of a broader community, rather than some elusive aesthetic qualities or presumed creative intent.

V. Conclusion

At the end of our journey, what enlightenment can we bring to the challenge of landscape preservation? First, the discipline of cultural landscape preservation, by virtue of its hybrid nature, is presented with an opportunity to mediate two trends: the interest that preservationists have in forming a partnership with envi-

ronmental advocates, and the acknowledgment by natural resource managers that conservation, to be successful, must understand and accommodate the values of a larger society (NTHP, 1994). Perhaps recognizing that ecological restoration is essentially a cultural activity may be a starting point.

We can also want to begin to evaluate cultural landscapes as *systems* more than artifactual properties. This new perspective recognizes that all relics of the past qualify for some level of historic validity. Analysis of integrity and its evolution through the life of the landscape might focus on the cultural function the landscape served and how processes of landscape change due to natural and human factors altered that function in its particular social context. The object of preservation then becomes less the material constituents and more the whole system in its present day operation. Evaluation of preservation options will be very contingent upon location, site history, present social needs, opportunities for creative interpretation, and the scale of the time and land under consideration.

This may also require greater resistance to the comfortable expedient implied by the concepts of "design intent" and "period of significance." Although particular points of time in the past are important, landscapes as systems continually acquire new significance that can inform the present. Especially with highly designed landscapes, the cult of artistic intent ignores the functional significance of

the land through time by idealizing an image of it in the past as entirely the creative expression of a designer.

We may have inherited this preoccupation with original design from the modern movement in architecture which conceived the completion of a building at the end of construction as the moment of maximum expression for the designer. Subsequent changes in the materials—what we call weathering—were a subtraction from this ideal, a loss of design integrity in the face of nature (Mostafavi and Leatherbarrow, 1993). Yet an older architectural tradition envisioned the life of buildings long after construction, and shaped the design to accommodate weathering as an expression of the building's duration through time. The use of rusticated, "unfinished" stone surfaces in Renaissance construction may be seen as an expressive acknowledgment of nature that anticipates weathering.

"The fact of weathering inheres in all construction...and reminds one that the surface of a building is ever-changing. While a potential nuisance, the transformation of a building's surface can also be positive in that it can allow one to recognize the necessity of change, and to resist the desire to overcome fate—an aspiration that dominated much of modernist architectural thought through its resistance to time. The preoccupation with the image or appearance of the building in current practice is symptomatic of this desire" (Mostafavi and Leatherbarrow, 1993, p.116, 119).

Could our impulse to capture a landscape and restore it to a particular moment in the past reflect a similar modernist preoccupation?

Perhaps the best landscape designs, rather than simply creating an abstract idealization of artifacts and organisms, do fully anticipate the life of the land following construction. This would include the inevitable cultural changes that flow from and express the land's functional operation. The "weathering" of the landscape and the accompanying acquisition of socially-mediated significance are not revealed in the documentation that directs construction, or in the photographs that record completion. When landscapes are seen as systems, though, the functional significance that is acquired over time can also be seen as part of the creative intentions of the designer.

Finally, the act of preservation is always an interpretation. In our own day we believe that preservation means material preservation; that is why landscapes, or at least the living elements of landscapes, present such a challenge. Yet material preservation is just one way to conserve a heritage. David Lowenthal, in his book "The Past Is A Foreign Country", notes (1985) that "*the great Ise Shinto temple in Japan is dismantled every twenty years and replaced by a faithful replica built of similar materials*

exactly as before. Physical continuity signifies less to the Japanese than perpetuating the techniques and rituals of re-creation"

If we see preservation as a culturally mediated interpretation of the past, then there may be no unique solution to the challenge presented by our desire to preserve a landscape. Multiple interpretations may be equally valid, each favoring one element of significance over another, and multiple valid solutions may be able to coexist as a mosaic of interpretations. The challenge will be to identify differing modes of interpretation, ranging from radical intervention to benign neglect, that in their application do not try to fix a particular image of the past, but rather permit an understanding of how the landscape's functional, organic nature served a cultural purpose or was transformed through human interaction. In this way a living landscape may both embrace and survive preservation.

"Some preservers believe they save the real past by preventing it from being made over...A fixed past is not what we really need...We require a heritage with which we continually interact, one which fuses past with present...Only by altering and adding to what we save does our heritage remain real, alive, and comprehensible" (Lowenthal, 1985,p.410, 412).

References

- Baldwin, A.D., DeLuce, J., and Pletsch, C. 1994. *Beyond Preservation: Restoring and Inventing Landscapes*. University of Minnesota Press, Minneapolis.
- Birnbaum, C.A. 1994. *Preservation Brief 36: Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes*. NPS: Washington, D.C.

- Boasberg, T. 1992. "A New Paradigm For Preservation." in, *Past Meets Future: Saving America's Historic Environment*. Lee, A.J. (ed). National Trust for Historic Preservation Press: Washington, D.C.
- Carrier, D. 1992. Restoration as Interpretation: A Philosopher's Viewpoint. in *Altered States*.
- Costonis, J.J. 1992. *Icons and Aliens: Law, Aesthetics and Environmental Change*. U.Illinois Press: Chicago.
- Elliot, R. 1982. *Faking Nature*. Inquiry 25:81-93.
- Gombrich, E.H. 1962. "Dark Varnishes: Variations on a Theme of Pliny." *Burlington Magazine* 104:51-55.
- Hedley, G. 1990. "Long Lost Relations and New Found Relativities: Issues in the Cleaning of Paintings." in *Shared Responsibility*.
- Hodkinson, I.S. 1990. "Man's Effect on Paintings." in *Shared Responsibility*.
- Jordan, W.R. 1994. "Sunflower Forest: Ecological Restoration as the Basis for a New Environmental Paradigm." in *Beyond Preservation*.
- Katz, E. 1991. "Restoration and Redesign: the Ethical Intervention in Nature." *Restoration and Management Notes* 9:90-96.
- Kirby, J.T. 1993. "Gardening with J. Crew: The Political Economy of Restoration Ecology." in *Beyond Preservation*.
- Kline, V.M. 1992. "How Well Can We Do? Henry Greene's Remarkable Prairie." *Restoration and Management Notes* 10:36-37.
- Lee, A.J. 1992. *Past Meets Future: Saving America's Historic Environments*. The Preservation Press: Washington, D.C.
- Loomis, J.B. 1993. *Integrated Public Lands Management: Principle and Applications to National Forests, Parks, Wildlife Refuges, and BLM Lands*. Columbia U. Press: NY.
- Lowenthal, D. 1985. *The Past Is a Foreign Country*. Cambridge U. Press: NY.
- McMahon, E.T. and Watson, A.E. 1992. *National Trust Historic Preservation Information Series 71*. In Search of Collaboration: Historic Preservation and the Environment Movement.
- Mendelson, J., Aultz, S.P., and Mendelson, J.D. 1992. Carving Up the Woods. *Restoration and Management Notes* 10:127-131.
- Mostafavi, M. and Leatherbarrow, D. 1993. *On Weathering: The Life of Buildings in Time*. MIT Press: Cambridge.
- National Park Service. 1992. *The Secretary of the Interior's Standards for the Treatment of Historic Properties*.
- National Park Service. 1994. *Ecosystem Management in the National Park Service*: Discussion Draft.
- National Park Service. 1995. *Guidelines for the Treatment of Cultural Landscapes*: Revised Draft.
- Packard, S. 1993. "Restoring Oak Ecosystems." *Restoration and Management Notes* 11:5-16.
- Pickett, S.T.A., Parker, V.T., and Fiedler, P.L. 1992. "The New Paradigm in Ecology: Implications for Conservation Above the Species Level. in Fiedler, P.L. and Jain, S.K. (eds.). *Conservation Biology*. Chapman and Hall: NY
- Pickett, S.T.A., and Parker, V.T. 1994. Avoiding the old pitfalls: opportunities in a new discipline. *Restoration Ecology* 2:75-79.
- Ramsey-Jolicoeur, B.A. and Wainwright, I.N.M. (eds). 1990. *Shared Responsibility*.
- van de Wetering, E. 1992. *The Autonomy of Restoration: Ethical Considerations in Relation to Artistic Concepts*. Annales d'Histoire de l'Art et l'Archeologie, Universite Libre de Bruxelles 14:127-133.
- Watson, W.M. 1992. "Conservation and Historical Consciousness." in *Altered States: Conservation, Analysis and Interpretation of Works of Art*. Watson, W.M. (ed). Mt. Holyoke College Art Museum: South Hadley.
- Woodley, S., Kay, J., and Francis, G. 1993. *Ecological Integrity and the Management of Ecosystems*. St. Lucia Press: Montreal.



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