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# LANDSCAPE JOURNAL

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# LANDSCAPE JOURNAL

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Design, planning and management of the land

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*Landscape Journal* is dedicated to the dissemination of the results of academic research and scholarly investigation of interest to practitioners, academicians, and students of landscape architecture.

Cover: Granite nameplate for *58,175 Daffodils* by Brinsley Tyrrell. Photograph by Jeanine Centuori.

Below: Super Mall entrance, Tacoma, Washington (May 1995). Photograph by Chris Faust. From *Placing Nature: Culture and Landscape Ecology* edited by Joan Iverson Nassauer.

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# An Ecological Aesthetic for Forest Landscape Management

Paul H. Gobster

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**Abstract:** *Although aesthetics and ecological sustainability are two highly regarded values of forest landscapes, practices developed to manage forests for these values can sometimes conflict with one another. In this paper I argue that such conflicts are rooted in our conception of forest aesthetics as scenery, and propose that a normative, "ecological aesthetic" based on the writings of Aldo Leopold and others could help resolve conflicts between aesthetic and sustainability values. I then offer suggestions on how we might advance an ecological aesthetic in policy and planning programs, on-the-ground management, and research and theory development in landscape aesthetics.*

As a social scientist and landscape architect, I am interested in how people perceive and experience forest landscapes, and how we can use this knowledge to help improve the management of forests for people's enjoyment and use.<sup>1</sup> Many who share these interests maintain that aesthetics are a primary aspect of people-landscape interactions (e.g., Kaplan and Kaplan 1989). In forests, as in many other environments, people often form perceptions of a place based on what they see and experience from an aesthetic point of view. This might especially be so for those who visit forests for recreation (Ribe 1994). In some cases, aesthetic considerations have even attained legal status and must be taken into account in planning and managing forests (Smardon 1984). For these reasons, "scenic resource management" has become an important part of managing forests for multiple values.

Many public and environmental professional groups regard aesthetics as one of the "good" resource values included in public forest management (Vining and Ebreo 1991). Aesthetic value implies a kind of purity, an appreciation of the forest for what it is rather than how it might be changed to serve human needs and

desires. While such a conception can be debated, the values associated with other forest resources—timber, range, wildlife, water, and recreation—are more often seen as having a commodity orientation that, if not held in check, can compromise the existence of this "higher" resource value. This lofty position of aesthetics, however, is being challenged by other non-consumptive "goods" that contribute to the sustainability of forest ecosystems (e.g., Xu and Bengston 1997). Forest health, biodiversity, and related sustainability values are gaining increased attention from citizen groups, and ecological management programs are redefining how resource professionals think about forest management (e.g., Norton 1992).

But while managing for such "white hat" resources is increasingly being looked on as the right thing to do, what happens when management prescriptions developed to achieve such "goods" conflict with each other? In the case of aesthetics and sustainability, forest landscape architects and landscape researchers alike are coming to recognize that some ecological management practices for maximizing forest health and bio-

diversity may conflict with practices long advocated for enhancing the scenic quality of landscapes (e.g., Brunson and Reiter 1996, Parsons 1995). Are these conflicts resolvable? In this paper I argue that they are, but maintain that our current cultural emphasis on landscape-aesthetics-as-scenery prevents an easy resolution. I suggest, however, that an alternative, normative aesthetic that incorporates principles of ecology is one way in which aesthetic and sustainability values might be integrated. After explaining and discussing the differences between these two aesthetics, I identify some ways in which we might move toward an ecologically-based aesthetic as it applies to the management of forest ecosystems.

Before I begin, let me define and delimit the major concepts I will deal with in this paper. My basic concern is with forest resource values, which I define as relatively enduring desires or preferences that people hold, individually or collectively, toward the forest landscape or parts of it. Aesthetic values of forests relate to preferences people have for beholding and experiencing forests. Aesthetic preferences might be directed toward particular forest features such as large trees or waterfalls; places

that have special meaning because of their location, history, or symbolism; or landscapes and ecosystems characterized by their particular qualities, processes, or functions (Gobster and Chenoweth 1989). Sustainability values relate to preferences for maintaining and restoring the ecological structure and function of ecosystems and for preserving and enhancing the health and diversity of native species and ecological communities. Examples of management approaches that aim toward this goal include "New Forestry" and "Ecosystem Management" (e.g., Franklin 1989, Kaufmann et al. 1994), where forest and related wildland ecosystems are managed for multiple resource values, including commodity values such as timber; and "ecological restoration" (Jordan et al. 1987), where commodity values usually do not enter the picture<sup>2</sup>. Examples of practices implemented to accomplish sustainable management goals include direct manipulation through seeding, cutting, burning, and other intentional activities; and indirect management that permits or encourages natural processes and disturbances such as fire, timber falls, and diseases.

There are numerous other values in nature (e.g., Rolston 1988) and it is not my intention to ignore these, but rather to limit the discussion to the two values that I see as having a particularly important priority in the context of current forest management issues. By the same token, there are also a number of different aesthetics that have been described by various authors, such as the aesthetic of "function" or "neatness" associated with modern agricultural landscapes (e.g., Carlson 1985, Nassauer 1989, Riley 1985). Again, while there is some merit in discussing and comparing these, I am limiting the discussion to two kinds of aesthetics that I feel are important and timely in the context of forest landscapes.

#### *Nature and Development of the Scenic Aesthetic*

Aesthetic preferences for landscapes are thought to be influenced by a range of factors. At the most basic level, some researchers hypothesize that there is a bioevolutionary preference for certain landscapes

based on our origins on the African savanna and survival needs to "see without being seen" (e.g., Appleton 1975, Kaplan and Kaplan, 1989, Kellert and Wilson 1995). At the other end of the spectrum are specific factors among individuals and groups that sometimes serve to differentiate preferences for landscapes, such as age (Zube et al. 1983), gender (Lyons 1983), ethnicity (Kaplan and Talbot 1988), and recreational activity (Ribe 1994). Among this range of factors, however, our culture and history are most often cited as playing the major roles in shaping our preferences for landscapes that are *natural* in character (Cox 1985, Huth 1972, Nash 1982). In the United States as in many other countries, our natural landscape preferences grew from a tradition of landscape painting and aesthetic theory that began in seventeenth- and eighteenth-century Europe. As our frontier was tamed and remaining wildlands shrank in size, Americans began to appreciate nature rather than fear it. Borrowing from the European tradition, our attraction to natural landscapes in the United States grew during the romantic and transcendentalist movements of the mid-1800s through landscape paintings of artists such as Frederick Church and Thomas Cole of the Hudson River School; through the writings of novelists, poets, and philosophers such as James Fenimore Cooper, William Cullen Bryant, John Muir, and Henry David Thoreau; and through the park and estate designs of Andrew Jackson Downing and Frederick Law Olmsted.

But the landscape portrayed through these media, and preferred by those who increasingly visited it for recreation, was not so much a natural environment as it was a *naturalistic* interpretation of one. Landscape painters often stylized the nature they saw, carefully composing a scene by adapting formal design principles such as balance, proportion, symmetry, order, vividness, unity, and variety in line, form, color, and texture (Clark 1949). Many subjects focused on the dramatic, monumental landscapes of the eastern and western United States; others emphasized the

"softened" wilderness where human activity harmonized with nature.

These compositional techniques were emulated by landscape designers who created parks and garden estates that were stylistic renditions of nature as portrayed in paintings. As if looking at a landscape painting, people regarded these environments for their visual, scenic, and picturesque qualities, and what I will refer to as the "scenic aesthetic" became the dominant mode of landscape appreciation (Crandell 1993, Rees 1975).

#### *The Scenic Aesthetic in Forest Management and Research*

The popularization of a landscape aesthetic based on a preference for idealized, naturalistic scenery went far to help define how city parks were designed and which western parcels of land were preserved for national parks and monuments. This scenic aesthetic also became the basis for addressing aesthetics in forest management (Runte 1991), although aesthetics did not become a major concern in forest landscape planning and management efforts until a century later.

Management of large-scale forest landscapes for aesthetic values began in earnest in the late 1960s and early 1970s in response to public concern over clearcutting in eastern and western national forests and provisions of the National Environmental Policy Act and the National Forest Management Act. The USDA Forest Service's "Visual Management System" (1974) and programs of other public agencies were developed to identify aesthetic values in the landscape, define people's sensitivity to landscape change, and set standards for preserving, enhancing, or retaining aesthetic quality and mitigating the effects of landscape development (Smardon 1986).

Like the landscape painters and designers of earlier times, landscape architects who practice visual management often use formal design concepts such as variety in line, form, color, and texture to describe and deal with change in the forest landscape.

For instance, examples in Forest Service handbooks illustrate how introducing greater variation in corridor edges and in the shape, size, and distribution of clearcuts can help to emulate patterns found in the natural landscape (e.g., Bacon and Twombly 1980). Following the popular scenic aesthetic, management practices often emphasize the visual, stylized design of an ideal nature, rather than one where the dynamics of change are apparent. With considerable effort focused on mitigating the visual effects of undesirable landscape change, vegetative or topographic screens and other techniques are often used to hide or reduce visual impacts (e.g., Rasmussen 1992). The "illusions" sought by these techniques further the idea that a natural forest is one that is mature, tidy, and unchanging (Wood 1988).

Many social science researchers have explored the nature of landscape aesthetics, from both theoretical (e.g., Kaplan and Kaplan 1989) and applied (e.g., Ribe 1989) perspectives. Like the visual management practices just described, researchers have tended to focus their attention on the scenic aesthetic, asking people what they perceive to be the "scenic beauty" or "visual quality" of the landscape under study. The scenic aesthetic is conceptualized as a perceptual, affective reaction to the landscape in that viewers are asked to quickly evaluate how much they like or dislike a landscape (e.g., Daniel and Boster 1976). Many of these studies use simple rating scales and represent landscapes with photographs or slides that allow for the efficient evaluation of many views in a short time (Nassauer 1983). The ratings are often correlated in models with physical, formal design, and psychological landscape attributes to address theoretical and applied problems in landscape aesthetics (Gobster and Chenoweth 1989, Zube, Sell, and Taylor 1982).

#### *Potential Conflicts between Scenic and Sustainability Values*

Visual resource management practice and research have been successful in addressing landscape aesthetics, highlighting an issue few recognized or had the means to deal

with just three decades ago. But the scenic aesthetic we have focused on in our practice and research has helped perpetuate a preference for forest landscapes that some have called superficial (Nassauer 1992). By emphasizing the visual, dramatic, and picturesque attributes of nature; by treating the landscape as a static, formal composition; and by conceptualizing and measuring only the visual, perceptual, and affective aspects of human aesthetic response, we may be limiting the range and depth of aesthetic opportunities we afford our public. This is unfortunate in itself, but the problem is compounded when we attempt to provide for sustainability and aesthetic values.

Although aesthetic and sustainability goals are compatible in many situations, three examples below illustrate how these two goals might conflict with each other in important aspects of forest management. Because most of the research and practical experience dealing with forest-related visual management issues has focused on timber harvesting, my examples tend to draw from that literature. Nevertheless, available research on perceptions of ecological management suggests that people may hold similar responses toward the visual characteristics of landscapes whether they occur as a result of timber harvesting, ecological restoration, sustainable landscape management, or natural forces (Gobster 1997, Nassauer 1995, Schullhof 1989, Thayer, 1989).

*Fire.* Fire is a major natural disturbance process in many forest ecosystems and is increasingly recognized as an essential tool for maintaining and improving forest health and diversity (Pyne 1997). Visual management research, however, has shown that prescribed fire has an immediate and major negative visual effect on forest stands, even though over time stands may actually improve in visual quality (Anderson et al. 1982, Taylor and Daniel 1984). Accepted visual management practices call for minimizing the apparentness of these negative visual effects by leaving unburned islands, limiting the

amount of road frontage that is treated, and restricting burns to periods of low visitor use (Bacon and Dell 1985).

*Dead and Down Wood.* Standing and fallen dead trees and other coarse woody debris are integral components of many mature and old growth forests, and some ecologists maintain that the health and diversity of these forests may have more to do with the dead and dying material they produce than with the large, living trees that remain (Hunter 1990, Maser et al. 1988). Those working to restore old growth conditions thus often try to maintain or increase the number of standing "snag" trees, tree tip mounds, and fallen coarse woody debris (Franklin et al. 1997). However, visual perception research has shown that, whether it occurs naturally or through timber harvesting, dead and down wood has one of the biggest negative impacts on the perceived visual quality of near-view forest scenes (e.g., Schroeder and Daniel 1981, Vodak et al. 1985). Accepted visual management practices call for reducing the appearance of dead and down wood by chipping or lopping slash created from timber fells or by locating snags away from areas of human use (e.g., Bacon and Twombly 1980).

*Forest Fragmentation.* Fragmentation of forest cover is an important problem in many places where flora and fauna rely on interior forest conditions (e.g., Thompson 1995). Openings and edges are more easily invaded by weedy plant species and predators, reducing overall species diversity and the diversity of old-growth species and making forests more susceptible to pathogens, wild-fire, and windthrow (Franklin and Forman 1987). But while forest ecologists have shown that fragmentation due to forest harvesting and other activities can be reduced by making fewer but larger openings and by minimizing edge/area ratios (i.e., round instead of linear), visual preference research shows that people generally prefer smaller openings over large

ones, and openings that are scattered over those that are concentrated (Palmer 1997). Additionally, established visual management practices call for minimizing clearcut size and undulating the edges of openings to make them less noticeable (USDA Forest Service 1974).

### *An Ecological Aesthetic for Forest Landscapes*

These three examples illustrate how visual management practices may work against sustainability goals. Can such conflicts be resolved? I believe so, but forest users, managers, and researchers may need to expand their ways of thinking about the aesthetics of forest landscapes. As a mode of aesthetic appreciation, the scenic aesthetic might function well for some types of landscapes—parks in particular—but for landscapes where ecological values are a primary consideration, we must look beyond their surface qualities (Tuan 1989) to gain a deeper understanding and appreciation of nature. Ideas about this aesthetic—an “ecological aesthetic” as some have called it—stem largely from the writings of Aldo Leopold, culminating in his *Sand County Almanac* (1949). Although Leopold never explicitly outlined his ecological aesthetic, its elements are synthesized by Susan Flader and Baird Callicott in their compilation of Leopold’s writings, *The River of the Mother of God* (1991):

By contrast [to the scenic aesthetic], in Leopold’s revolutionary land aesthetic all the senses, not just vision, are exercised by a refined taste in natural objects, and esthetic experience is as cerebral as it is perceptual. Most important, form follows function for Leopold as for his architectural contemporaries. For him, the esthetic appeal of the country, in other words, has little to do with its adventitious colors and shapes and nothing at all to do with its scenic and picturesque qualities—but everything to do with the integrity of its evolutionary heritage and ecological processes (pp. 9–10).

Using their work and Leopold’s writings as starting points, I have tried to summarize the elements of an ecological aesthetic, and contrast them with

Table 1. Some elements of scenic versus ecological aesthetics.

Scenic	Ecological	Selected references
<b>The Individual</b>		
Perceptual, immediate, Affective/emotional	Cognitive, knowledge based, “a refined taste,” and affective	Carlson 1979, Leopold 1981, Rolston 1995, Thayer 1989, Zajonc 1980
View of world is homocentric	View is biocentric, ethical “ecological humanism”	Leopold 1981, Rosenberg 1986
Study of aesthetic response is descriptive	Study of aesthetic response is normative	Carlson 1993, Sepänmaa 1993
Limited to visual sense	All senses engaged—sight, hearing, smell, touch, taste as well as movement/exploration	Gibson 1979, Hevner 1937, Leopold 1981, Zube et al. 1982
Preference = popular taste, “lowest common denominator”?	Appreciation = elitist?	Carlson 1977, 1995, Ribe 1982
<b>The Landscape</b>		
Visual, focused	Multimodal, ambient	Spirn 1988, Zube et al. 1982
Static, inanimate, fixed	Dynamic, living, changing	Spirn 1988
Formal elements, Picturesque	For follows function, vernacular	Carlson 1979, Hunter 1990, Nassauer 1992
Dramatic	Subtle, unscenic	Callicott 1983, Gussow 1995, Saito 1998
Naturalistic	Natural	Nassauer 1992
Taken at face value	Symbolic, deeper meaning	Howett 1987, Rolston 1998
Bounded, framed, specific places	Unbounded, entire forest	Hepburn 1968
Composed view	Aesthetic “indicator species” in intact ecosystem	Callicott 1983
Tidy, pristine	Messy	Hunter 1990, Nassauer 1995
<b>Human-Landscape Interactions</b>		
Passive, object-oriented, stimulus-response	Active, participatory, experiential	Berleant 1998, Koh 1988, Thayer 1989
Accepted as a given	Invokes a dialogue	Spirn 1988
<b>Outcomes or Benefits</b>		
Pleasure	Understanding and pleasure	Thayer 1989
Observation	Action and involvement	Zube et al. 1982
Short-term, mood changes	Long-lasting, restorative, deep values, unity, sense of place	Hull 1992, Kaplan 1993, Spirn 1988
Maintains status quo	Catalyst for internal and external change	Spirn 1988

the elements of a scenic aesthetic (Table 1). I have added points from others in the fields of design, ecology, psychology, and philosophy, and presented them within a framework adapted from Zube et al. (1982) to describe the “landscape perception process.” This framework, which I have found useful for helping to organize and identify elements of an ecological aesthetic, is divided into sections pertaining to the individual, the landscape, the human-landscape interactions that take place, and the outcomes or benefits that result.

*The Individual.* A cursory comparison of elements in the table shows the fundamental differences between the two aesthetics. For one, an ecological aesthetic requires us to

redefine how we “see” the landscape and our place in it. In the scenic aesthetic, the pursuit of pleasure (affect) is primary and derives directly from viewing the landscape, irrespective of its ecological integrity. In contrast, in an ecological aesthetic, pleasure derives indirectly through knowing about the landscape and knowing it is ecologically “fit” (Eaton 1997). This difference changes the focus of our relationship with the landscape from a homocentric one toward one that is more biocentric. In the context of aesthetics, Rosenberg’s idea of “ecological humanism” may be a more appropriate conceptualization of this relationship, where “the needs of humans and the needs of the environ-

ment converge" (Rosenberg 1986, p. 79). This moves the study of people's aesthetic response to landscape from one that is purely descriptive toward one that is more prescriptive or normative in nature. In so doing, it ties aesthetics together with ecology and with ethics, as expressed in Leopold's land ethic: "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise" (Leopold 1981, pp. 224-5). This change in focus also changes our idea of perception as a process that is visual, immediate, and largely affective toward one that demands engagement of all our senses as well as our intellect to "see," as Leopold writes, "[beyond the pretty] . . . through successive stages of the beautiful to values yet uncaptured by language" (1981, p. 96). In this way, an ecological aesthetic forces us to expand our measurement of aesthetic value beyond simple ratings of visual preference toward more holistic concepts such as aesthetic appreciation (Carlson 1995). With respect to public land management, some might think such an approach to be elitist (Ribe 1982), while others argue that to manage only for popular taste reduces what is deemed of value to the "lowest common denominator" (Carlson 1977).

*The Landscape.* The things we "see" in the landscape also change as we shift focus from a scenic to an ecological aesthetic. The dramatic, visual elements of the picturesque continue to give aesthetic pleasure, but so do the more subtle and ordinary landscapes of forest ecosystems (e.g., Gussow 1995). The beauty of these places, however, often requires deeper exploration of their qualities; and appreciating the landscape's extra-visual properties as well as the dynamics of change often takes precedence over viewing the landscape as if it were a static composition (Rolston 1998). In ecological aesthetics, pleasure is derived from knowing how the parts of the landscape relate to the whole—for example, how rare or sensitive plants and animals are sustained in an intact ecosystem. Callicott (1983) calls these "aesthetic indicator species," and such features

imbue the forest landscape with deep, symbolic meaning, whereas the composed view is often appreciated at face value.

*Interactions and Outcomes.* The last two parts of the table distinguish the interactions between humans and the landscape, and the outcomes that result. Having an ecological aesthetic requires that we experience the landscape as active participants—not watch it passively as if it were a picture or other art object, but relate to it as a living landscape. This takes the idea of aesthetic experience beyond the notion of "disinterestedness" espoused by Kant (1987) and other theorists. Berleant (1994, 1998) maintains we have a definite interest when we appreciate the landscape, and suggests the idea of "engagement" as a more realistic descriptor of aesthetic experience, one I feel might relate better to an ecological aesthetic. Spirn (1988) suggests that through these interactive kinds of relationships we develop "dialogues" with ourselves and with the landscape that help us know ourselves and our place in the world. Although "snapshot" experiences of pretty landscapes may be sufficient to temporarily alter moods in a positive way (Hull 1992), extended dialogues with nature facilitate psychological restoration and allow opportunities for long-term inner change (Kaplan 1993).

#### *Adopting an Ecological Aesthetic for Forest Ecosystem Management*

In the first part of this paper I have argued that our orientation to the scenic aesthetic is strongly grounded in culture and tradition. It is reinforced by the places we designate for recreation and by the methods through which we manage forests for aesthetic enjoyment. Knowledge of people's aesthetic preferences for forests accumulated from research over the past three decades is formidable, but it too is limited in its methods and scope, and tends to aim at "mopping up" (Kuhn 1962) questions about our understanding and application of the scenic aesthetic rather than expanding aesthetic theory through discovery and expression of alternative paradigms.

A cultural shift toward an expanded idea of landscape aesthetics that embraces the structure and function of ecological systems will not be an easy thing to accomplish. But recent experiences show that aesthetic appreciation of landscapes can evolve when guided (or forced) by agents of cultural change. For instance, there has been a fairly rapid rise in the popularity of arid-adaptive landscape design in some parts of the desert Southwest United States as a sustainable alternative to the water-demanding traditional "grassy front lawn" (McPherson and Haip 1989). Many people have also come to recognize the necessity of and appreciate the beauty produced by functioning fire-dependent ecosystems in the wake of the 1988 Yellowstone wildfires; this change in perception has been communicated in many popular magazine articles and books (e.g., Lauber 1991, Wuerthner 1989).

How do such changes in perception and appreciation come about? In the second part of this paper, I wish to flesh out some ideas of how an ecological aesthetic might be realized. Many of these ideas have been stated previously by others, but by bringing them together in the context of ecological management of forests, I hope they might give some insights on how we might incorporate ecological thinking into policy and planning programs, on-the-ground management, and research and theory development in forest aesthetics.

#### *Some Ideas for Policy and Planning Programs*

I begin this section with suggestions for integrating an ecological aesthetic into policy and planning programs. While some suggestions focus on ecosystem management by the USDA Forest Service and other agencies within a multiple use context, others are more widely applicable to policy and planning programs for ecological restoration where managers see aesthetics as an integral element in communicating sustainability values.

*Build aesthetic values into sustainable landscape policies.* Public policies have been instituted in recent years to promote the ecological health and sustainability of landscapes and ecosystems. These range from local sustainable landscape ordinances to international policies on ecosystem management (e.g., USDA Forest Service 1997). Like NEPA, NFMA, and other groundbreaking legislation of the 1960s and 1970s, there is a prime opportunity to integrate aesthetic objectives explicitly into these new policies (Nassauer 1992). As mentioned at the beginning of this paper, aesthetic values often have an immediacy in the public consciousness that other landscape values do not, and thus it might behoove policymakers to use the principles of an ecological aesthetic as both an end and a means to public policy.

*Continue to move "visual management" toward an ecological approach.* The Forest Service's Visual Management System handbook (USDA Forest Service 1974) and related policies and programs have gone far to bring visual quality issues into the forest planning process, not only for National Forests in the United States but throughout the world. Ecosystem management offers new opportunities to help expand public ideas of naturalness, and landscape management programs could incorporate ecological principles explicitly into methods and practices. Elements of such changes are evident in the Forest Service's recent publication, *Landscape Aesthetics: A Handbook for Scenery Management* (USDA Forest Service 1995), which replaces the 1974 handbook and uses ecosystem management concepts and information on public perceptions as bases for defining scenic attractiveness. As the system is applied and as resource-specific handbooks and training programs are updated, these too could reflect a broader, ecological aesthetic (Bedwell et al. 1997).

*Develop the role of forest landscape architect as "environmental critic."* Along with revising planning systems and programs, training and other educational experiences are also needed to increase the knowledge of resource

professionals related to ecological aesthetics. For the National Forests of the United States, these efforts should begin with forest landscape architects, for they have primary responsibility for protecting and enhancing forest aesthetics. Many of these professionals have been trained in the fine arts tradition, though landscape architecture curricula are increasingly incorporating natural resource coursework, including important new areas such as landscape ecology. The challenge as I see it is not to replace one body of knowledge with another, but to integrate ecological knowledge with the landscape architectural tradition of designing places for aesthetic enjoyment and use. Such a synthesis forms the basic qualifications for what Carlson (1977) and Sepänmaa (1993) refer to as the "environmental critic," one who is capable of describing, interpreting, and evaluating the aesthetic quality of environments. Although most forest landscape architects may not approach the level of sensitivity of Aldo Leopold—whom Carlson (1977) holds up as the prototypical environmental critic—they not only hold promise as arbiters of taste in incorporating ideas of ecological aesthetics into practice and communicating them to the public, but they are already in place and accepted in these roles. Interdisciplinary training and collaboration with individuals in the physical, biological, and social sciences and the humanities could further cultivate the role of the landscape architect as environmental critic.

*Incorporate contextual considerations into aesthetic management.* Principles of sustainable ecosystem management are beginning to be incorporated into forests large and small, in urban and wildland settings, and in public and private ownership (e.g., USDA Forest Service 1997). Because the extent of ecological restoration and management activity might vary depending on the context or setting in which change is to occur, so too might the approach for implementing and communicating a sustainable ecological

aesthetic. In an earlier paper (Gobster 1996), I discuss how the management emphasis, degree of change, and the expression of change to the public of sustainable forest activities might vary as a function of the setting. Principles such as the scale and duration of change described by the USDA Forest Service's Recreation Opportunity Spectrum (USDA Forest Service 1986) provide one set of ideas for helping integrate sustainability and aesthetic values across a variety of settings. Tlusty (1992) and Eaton (1997) provide alternative conceptual models for understanding how aesthetic management criteria might be applied to different types of settings. The goal of any approach, however, should be to aim toward promoting an aesthetic appreciation of ecosystem health and diversity no matter what the scale or location of the forest or its uses.

#### *Some Ideas for On-the-Ground Management*

I think the majority of effort in adopting an ecological aesthetic must be directed toward the public, who are the owners of public forests and whose aesthetic concerns and preferences must legally be taken into account. Because the scenic aesthetic is entrenched in our culture, it is difficult to "see" ecological beauty and accept practices that promote a more healthy and diverse but messier looking forest. But values can change, and some ways that we might expand appreciation of ecological beauty include the following:

*Show a "conspicuous experiential quality."* Visual mitigation practices such as screening, edge shaping, or siting are commonly used to reduce the impacts of harvest activities that might not meet people's expectations for a naturally appearing forest environment. Should sustainable ecological management practices that violate this same scenic ideal be similarly mitigated? Thayer says no, and maintains that the "visibility and imageability of the sustainable landscape is critical to its experiential impact and the rate at which it will be adopted and emulated in common use" (Thayer 1989, p. 108). This implies that for an ecological aes-

thetic to become understood and appreciated by the public, it must be seen and experienced. This "conspicuous experiential quality" will help speed the diffusion of change in aesthetic expectations (Thayer 1989).

*Use design to "reveal" ecological beauty.* Nassauer's research (e.g., 1995) suggests that design cues can convey powerful messages that "messy" ecological practices show human care and stewardship rather than neglect or mistreatment. For example, in recreational settings these cues might include picturesque conventions like the use of vegetation to frame and provide transition to areas where sustainable land use practices are taking place. In such areas practices might be small in scale and of limited duration, but would be visible to the recreationist, perhaps along a nature trail. In forest areas away from concentrated recreational use, less stylistic cues might be used such as mowing or low-key fencing that still convey human intent and land stewardship. In backcountry areas cues might be subtle or missing altogether. For these sites, care is exhibited by ecological integrity and largely up to forest users to discover it.

*Provide information to interpret sustainable forest ecosystem management practices.* Leopold and others (e.g., Carlson 1995, Rolston 1995) have stressed the importance of scientific knowledge as an important ingredient in the comprehension and appreciation of ecological beauty. Information can be an important tool in conveying knowledge about the intent and purpose behind sustainable management practices, especially for some activities like prescribed burning where it is difficult to employ design cues to make such activities more acceptable to the public (Brunson and Reiter 1996). On-site signage, interpretive nature trails, volunteer stewardship programs, and the like can aid in communicating information to the public. Newsletters or brochures put out by many forests and restoration groups are useful off-site means of communication, as are local newspapers. It is critical, however, that this

information be expressed with sincerity and objectivity to avoid suspicion that managers are trying to "fool the public" (Wood 1988).

*Involve the public to gain a deeper understanding and experience of "ecological" beauty.* Experience is the essential counterpart to information for attaining knowledge and appreciation of sustainable ecosystems. Experience can be facilitated by designing self-guided nature tours; by encouraging nature-oriented recreation like birding, plant identification, hunting, and nature photography; and by providing other opportunities for unassisted nature experiences. Guided tours are one important way to reach large audiences, and have shown potential in communicating the benefits of "New Forestry" practices (Brunson 1992). Directed activities, such as participation in ecosystem restoration, are particularly valuable ways through which individuals and small groups can gain experience and appreciation of natural systems and processes. People who participate in such activities on a continuing basis often find that what began as an uncommon leisure activity has evolved into a relationship with the land that has deep aesthetic, symbolic, and spiritual implications (Stevens 1995).

#### *Some Ideas for Research and Theory Development*

I conclude this part of the paper with some suggestions for advancing research in landscape aesthetics toward a broader understanding of the aesthetics of sustainable ecosystems.

*Investigate the attributes of sustainable forest ecosystems that relate to aesthetic quality.* Much of the past research on people's perception of landscapes has been directed toward identifying "universal" predictors of landscape quality (e.g., Wohlwill 1976), and looking at the visual impacts of different resource-extractive management practices (e.g., Ribe 1989). With the wider application of New Forestry, ecosystem management, ecological restoration, and other sustainable

ecosystem approaches, more in-depth studies are needed that look specifically at how people perceive practices like prescribed burning, leaving snag trees for wildlife, and cutting patterns that minimize forest fragmentation (Brunson and Reiter 1996). Information is also needed on how people view the functioning of forest ecosystems, especially on how the dynamics of change are perceived and experienced (Rolston 1998). Finally and most importantly, we need to know more about the unique qualities that make different forest types and ecosystems aesthetically significant (Evernden 1983).

*Investigate people's aesthetic experiences of sustainable forest ecosystems.* A second kind of information that is needed is on the nature of aesthetic response itself. Because most empirical landscape studies ask people to rate the "visual quality" or "scenic beauty" of photographs, we know very little about how real places are experienced (Hull and Stewart 1992), or about the broader nature of aesthetic responses. Zube et al.'s (1982) landscape perception framework laid out a rich source of questions for understanding the aesthetic experience of landscapes, and deserves renewed attention in the context of ecological aesthetics.

*Examine the multiplicity of environmental values.* Along with studies focused directly on aesthetic responses to the environment, we also need to look more holistically at how people's aesthetic values are linked with other forest resource values. Analysis of recent opposition to ecological restoration activities in the Chicago area has shown the complexity of functional, economic, recreational, aesthetic, and symbolic values that people hold toward forest environments (Gobster 1997). As Eaton (1989, 1995) and others have pointed out, aesthetic values are often closely linked to other social and environmental values, and artificially separating them could be difficult and possibly counterproductive. Instead, it may be more fruitful to try to

examine the totality of landscape perceptions and experiences as they pertain to sustainable forest ecosystems.

*Expand the repertoire of methods.*

Investigations of some of the ecosystem-and experience-related phenomena mentioned above will require new and innovative methods. "Experiential approaches" to landscape assessment include a wide range of qualitative and quantitative methods (Gobster 1990), and hold significant promise for gaining a better understanding of how sustainable ecosystems are perceived and experienced. Examples of successful approaches include in-depth interviews and focus groups (e.g., Gobster and Westphal 1998), aesthetic experience diaries (Chenoweth and Gobster 1990), a technique from experiential psychotherapy called focusing (Schroeder 1990), first-hand aesthetic description (Berleant 1992), literary analysis (Porteous 1986), narrative-description (Tuan 1991), and observation (Seamon and Nordin 1980).

*Build ecological aesthetics into landscape perception theory.* Finally, theory development in landscape assessment can help support ideas of ecological aesthetics. Philosophical critiques of applied environmental aesthetics by Carlson (1993), Eaton (1989), Sepänmaa (1993), and others provide guidance on how these assessments might benefit from alternative theoretical development. An important part of this development relates to norms and ethics. Carlson's (1993) review concludes that while current theories of landscape assessment help explain which landscapes are preferred, they do little to *justify* why they are preferable. For example, just because removal of slash and downed wood may make forest stands more scenically preferred, it does not justify this preference. As Carlson concludes: "We need not only to be able to explain what is preferred and desired by way of landscapes, but also to establish what is preferable and desirable. Only by references to the preferable and the desirable do we have the ultimate grounding for landscape evaluation and for the more practical matters of landscape planning and design" (p. 55).

Eaton's (1989, 1992) contention that there is a deep connection between aesthetic and ethical values further establishes a need for this type of theory development. She says that: "Failure to connect the aesthetic with other human values results in policies and practices—environmental assessment and planning, for example—that are at best superficial and at worst pernicious" (Eaton 1989, p.178). Within such a theoretical framework, an ecological aesthetic would not only recognize the beauty of such things as dead and down wood, but also might see its complete removal as morally wrong. Sepänmaa (1993) talks even more explicitly about such a link as it applies to sustainable ecosystems and calls ecological aesthetics "a new form of normative aesthetics" in which the basis of the norms are "the necessities of nature." In this sense, he might conclude that actions such as removing dead and down wood would result in an "aesthetically distorted system" (p. 129).

These contemporary thoughts support Leopold's land ethic. By uniting beauty with ecological integrity, Leopold's land ethic provides a normative justification for preferable and desirable landscape management that enhances the sustainability of forest ecosystems for human, biological, and ecological values.

*Conclusion*

Evidence of evolving land management approaches in urban, agricultural, and wildland environments shows that the concept of ecosystem sustainability is becoming accepted at least on some basic level by many professional and lay persons. But for most, this acceptance has been largely because of an intellectual understanding, and not because the products or processes of sustainable landscape management are inherently preferred. Our cultural ties to the scenic aesthetic run deep, and because of the primacy of aesthetics in environmental perception, a greater commitment toward the adoption of innovative methods for maintaining and improving ecological sustainability has not been forthcoming.

An ecological aesthetic offers

guidance for merging biological and ecological concepts of sustainability with aesthetic appreciation. Experience is a key component of this aesthetic, in which both intellectual and affective capacities engage an individual to understand, appreciate, and ultimately act upon the environment in a purposeful way. This last point is a crucial one for greater public adoption and acceptance of sustainable forest ecosystem management. It suggests that approaches that foster experiential contact with natural systems and processes can lead to positive behaviors to protect them (Gobster 1998). The ideas in this paper provide some ways in which we can help to advance this evolution of change, not only among our public groups but also in our institutional cultures of landscape management and research.

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*Notes*

1. An earlier version of this paper was presented at "The Aesthetics of the Forest," the Second International Conference on Environmental Aesthetics, Lusto, Punkaharju, Finland, June 10–13, 1996.
2. Some argue that while new forestry and ecosystem management have ecological sustainability values as principal stated goals, as presently practiced most applications represent "business as usual for industrial forestry" in terms of a primary commodity orientation and a secondary regard for ecosystem processes and functions (James Palmer, personal communication, July 31, 1996; see also Langston 1995). Poor examples notwithstanding, I include these emerging management concepts in the discussion along with those of ecological restoration to illustrate how aesthetic problems might be addressed within the broad context of publicly expressed goals for ecological management.

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