Yellowstone Hotspot

Reflections on Scenic Beauty, Ecology, and the Aesthetic Experience of Landscape

Paul H. Gobster

ABSTRACT Some scholars and practitioners have advocated an "ecological aesthetic" to address issues related to the protection of ecologically significant landscapes. Others see these efforts as an attack on traditional ideas of scenic beauty. Perhaps these two ideas of natural beauty are more complementary than is acknowledged. By examining how scenic landscapes are aesthetically experienced, not only might we better understand their value to people but also discover clues for appreciating ecologically significant landscapes that are "scenically challenged" (Saito 1998, 101). In this essay, a phenomenological approach is applied to examine the scenic beauty of Yellowstone National Park through three popular modes of landscape experience: driving, sitting, and walking. Each experiential mode offers different insights. Together they challenge distinctions between scenic and ecological beauty, which pertain more to how natural landscape beauty has been conceptualized and measured in quantitative studies of landscape preference than in how it is experienced through real-time interactions between people and landscape. Yet there still remains the problem that many ecologically significant landscapes do not exhibit readily perceptible scenic qualities that draw people to experience them aesthetically. Here the geothermal process of a hotspot is used as a metaphor to suggest how unseen aesthetic qualities of landscape can be made perceptible. The hotspot metaphor also suggests ways in which the model of human-environment interactions proposed by Gobster et al. (2007) might be implemented to communicate to public groups about the beauty of scenically challenged landscapes.

KEYWORDS Landscape perception, ecological aesthetic, phenomenological description

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For some time now I have been writing about the prospects of adopting an ecological aesthetic as a way to expand how we think about and manage for beauty in the landscape (Gobster 1992, 1994, 1995, 1996, 1999, 2001). Based on the writings of Aldo Leopold (1981) and contemporary scholars of environmental aesthetic philosophy (for example, Callicott 1983; Eaton 1997; Rolston 1995; Saito 1998) and ecological design (for example, Howett 1987; Mozingo 1997; Nassauer 1995; Thayer 1989), an ecological aesthetic maintains that there is a type of beauty in the landscape that is associated with its ecological health, diversity, and/or sustainability. The characteristics of an ecological aesthetic are thought to differ in important ways from those associated with landscape scenery and, in an earlier paper in *Landscape Journal* (Gobster 1999), I attempted to summarize how these scholars distinguished an ecological aesthetic from the more familiar "scenic aesthetic" that underlies most theories of natural beauty and has dominated landscape research and management.

Although most proponents of an ecological aesthetic view it as a way to expand ideas of beauty in the landscape, some critics have interpreted it as an attack on scenic beauty (Parsons and Daniel 2002). Indeed, in distinguishing between scenic and ecological beauty, I cited derogatory terms such as *superficial, passive, static,* and *lowest common denominator* that others have used to characterize a scenic aesthetic (Table 1). Subsequent efforts to clarify ideas and positions led to a spirited discussion at the "Our Shared Landscape" conference in Ascona, Switzerland in May 2005, where I joined panelists Joan Nassauer and Terry Daniel to debate some of the key relationships between aesthetics and ecology (Gobster, Nassauer, and Daniel 2005). From this interchange, we agreed to collaborate on an essay to resolve or explicate disagreements voiced at the conference and were joined by Gary Fry to help provide a European perspective to our largely North American experiences (Gobster et al. 2007).

Shortly after the conference, I went with my family on a two-week vacation to Yellowstone National Park and vicinity. It was not my intent to turn the holiday into a personal intellectual inquiry into the nature of landscape aesthetics, but the issues we discussed at the conference beckoned my thoughts. Moreover, my experiences at Yellowstone blurred the distinctions between ecological and scenic aesthetics I had studiously identified and categorized. Why was it that Yellowstone, long regarded as one of the foremost icons of scenic beauty, provided me with aesthetic experiences that strayed across the neatly divided columns of my table? Work on our collaborative essay was moving along in fruitful directions, but the beauty of Yellowstone confronted me with a reality that contrasted with our abstract discussions.

My goal in this essay is to take advantage of the

Table 1. Some major distinctions between scenic versus ecological aesthetics. Adapted from Gobster (1999) and Parsons and Daniel (2002).

Scenic Aesthetics	Ecological Aesthetics
Human	
Affective/emotional	Cognitive/knowledge-based
Stimulus-response/snapshot in time	Experiential/temporal-spatial dimensions
Visual	Multisensory/movement
Preference/lowest common denominator?	Appreciation/elitist?
Landscape	
Visual/static/inanimate	Multimodal/dynamic/animate/ephemeral
Picturesque/formal/composed/face value	Vernacular/symbolic/indicator species
Bounded/fixed/framed/specific places	Surrounding/entire landscape/ambient
Naturalistic/dramatic/vivid/scenic	Natural/subtle/unscenic
Tidy/scenery	Messy/ecological processes
Interactions and Outcomes	
Perceptual	Experiential
Pleasure	Understanding and pleasure
Passive/object-oriented	Active/participatory/engaging/involvement
Short-term/mood change	Long lasting/restorative/unity/sense of place
Status quo	Catalyst for internal and external change

juxtaposition of these two events, one intellectual and the other experiential, to more deeply explore the concept of natural landscape beauty and the characteristics of scenic and ecological aesthetics. Using Yellowstone as a subject analysis, I address the following questions: How is the beauty of Yellowstone experienced and how can it be described? What is it about Yellowstone that serves to align scenic and ecological beauty? What implications might the iconic beauty of Yellowstone have for efforts to understand and conduct research in landscape aesthetics? How might such vivid beauty help to communicate ideas about ecological health and sustainability to public groups?

My approach is unconventional. In contrast to most studies of scenic beauty published in journals of landscape research, my analysis of Yellowstone relies upon firsthand phenomenological description of my aesthetic experiences. This qualitative approach involves developing an awareness of the environment and one's interaction with it through primary (for example, walking) and secondary (for example, photography) forms of experience. Reflecting on these more or less direct experiences, I tested the characteristics of scenic and ecological aesthetics summarized in Table 1. While this approach has significant limitations relating to personal subjectivity, it can also provide insights difficult to obtain through more quantitative studies of environmental perception (Berleant 1992, 2005; Seamon 2000).

I begin by describing three modes of interaction in which the scenic beauty of Yellowstone is most often experienced by visitors—driving, sitting, and walking. From the analysis I then discuss how this experiential perspective alters distinctions between scenic and ecological beauty. Finally, I focus more broadly on the relationship between aesthetics and ecology and use the literal geological process of a hotspot as a metaphor to explain how complex environmental phenomena might be made perceptible through aesthetic experience. Implications for landscape aesthetics are drawn with an emphasis on research, management, and communication to public groups.

THE SCENIC BEAUTY OF YELLOWSTONE: THREE MODES OF EXPERIENCE

Designated in 1872 as the first national park in the United States, Yellowstone helped a growing nation establish natural scenery as a key part of its identity (Nash 1973; Runte 1997). Recognition of Yellowstone as a scenic vacation destination followed rapidly. Camping areas and lodges were developed in the park through leases to private concessionaires and a loop road linked the park's main natural attractions such as

Mammoth Hot Springs, Old Faithful, Yellowstone Lake, the Upper and Lower falls, and the Grand Canyon of the Yellowstone River. By 1892, more than 5,000 tourists were visiting Yellowstone annually, most arriving by train, then following this route in stagecoaches as organized groups (Haines 1977). This "Grand Tour" became a defining part of the aesthetic experience of Yellowstone with visitors traveling by day, viewing the scenery along the route and making stops for short walks to scenic attractions, then settling in for the evening at a tent camp or lodge to enjoy food, drink, and social camaraderie surrounded by the beauty of nature (Barringer 2002).

Today the automobile has individualized and somewhat democratized travel to Yellowstone, but people still experience the landscape in much the same way that early tourists did. This programming of experience, along with visits now around 3 million annually (USDI National Park Service 2007), has led many connoisseurs of landscape scenery to eschew Yellowstone as nature's equivalent of Disney World (Cahill 2004). Indeed, crass commercialism and mass consumption of scenery at places like Yellowstone are likely reasons why some feel the scenic aesthetic appeals to the lowest common denominator and why distinctions between scenic and ecological beauty have been amplified. If scenic beauty is experienced only as a snapshot in space and time, if it is regarded as a particular feature or view and the rest of the landscape is ignored, and if it is stripped of other sensorial and experiential context, then the scenic aesthetic may justifiably be called a superficial means of experiencing landscape beauty.

For me, the act of photographing the scenery of Yellowstone sometimes reduced it to these dimensions or at least brought them to my awareness. But for the most part, my experience of Yellowstone's beauty did not conform to the list of scenic characteristics in Table 1. In this section, I examine these characteristics relative to three modes in which most people experience the Yellowstone landscape. Characteristics from the table are highlighted in the text in italics.

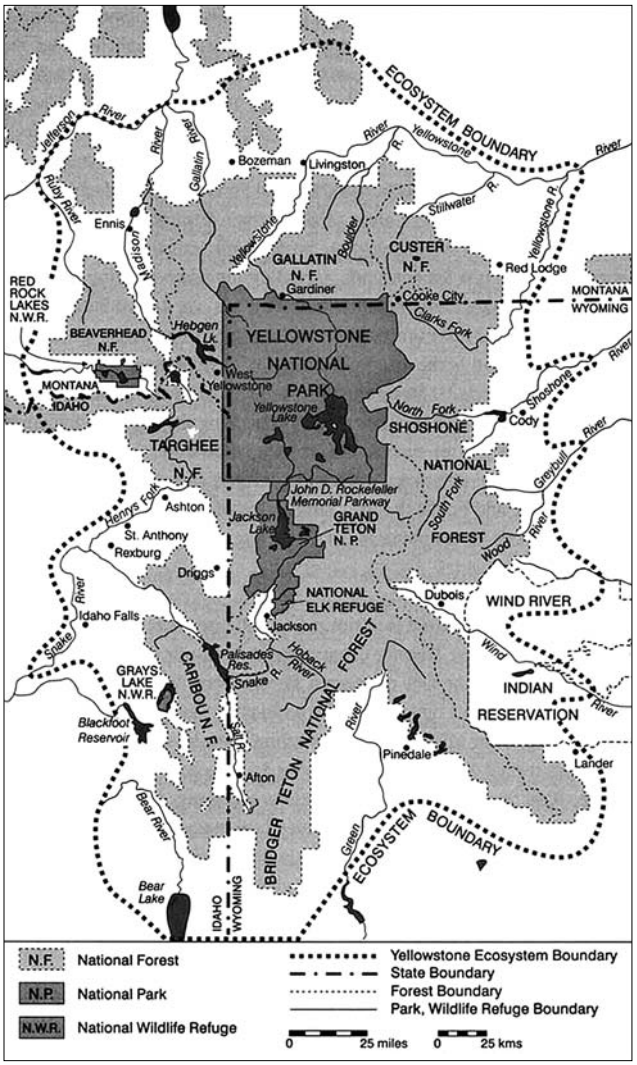

Figure 1. Map of the Greater Yellowstone Ecosystem. (Courtesy of the National Park Service)

Driving

Our family pilgrimage to Yellowstone began in Chicago, our two children being the fourth generation on my spouse's side to make the trip from the flat, green, and urbanized Midwest. Replacing the train and stagecoach of earlier travelers with a plane flight and a compact Kia rental car, we drove out from Cody, Wyoming, 50 miles from Yellowstone's East Entrance. Like most tourists, a map and guidebook provided essential *cognitive* information for finding our way to the park as well as sating our curiosities about places and features along the route—the North Fork Shoshone River, the first Forest Service ranger station in the United States at Wapiti, the heights of the various peaks along the Absaroka Range that signaled our imminent arrival into the park (Fig-

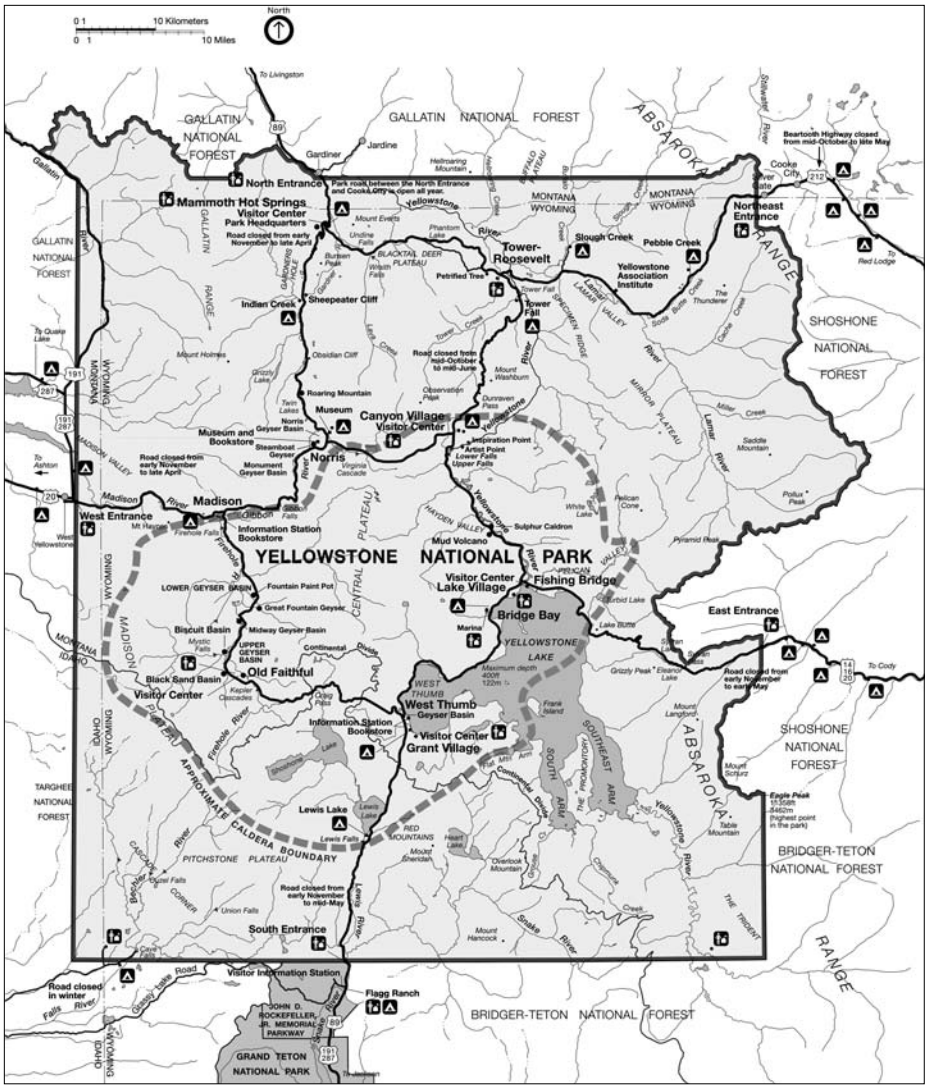

Figure 2. Visitor map of Yellowstone National Park. (Courtesy of the National Park Service)

ure 1). Stops in Cody at the Buffalo Bill Historical Center and other tourist attractions the previous day thickened our real-time experience with added layers of natural and cultural history (Foster 2000). Knowledge is a chief feature of the ecological aesthetic (for example, Carlson 1995; Rolston 1995), and while critics stress the primacy of emotion over cognition in aesthetic perception (Parsons and Daniel 2002), this intellectual activity seemed a natural extension of the sensory process leading to the experience of beauty. After all, the pleasure derived from "scenic driving" would be much diminished if one was lost, and as information-seeking beings such knowledge is essential to how we perceive and act in the modern world.

Once inside the park and on our way along the Grand Tour (Figure 2), I was soon aware of the aesthetic constraints and opportunities defining the driving experience. Strapped within a steel and plastic shell and separated from the landscape by a surround of glass, the scenic aesthetic via driving is about as restricted as one can get to a *passive, visual* experience. It is also difficult to escape the *framing* of the view, and throughout our travels in the Yellowstone region I found myself crouching to look up through the windshield at mountain tops or stealing glances out the driver's side window at rivers and other scenic treasures down beyond the guardrail. These impediments to our scenery watching were compounded when vehicles in front of us partially blocked the view; our low-slung sedan disadvantaged us among the SUVs and motor homes that made up much of the park traffic, and it took considerable effort to mentally 'Photoshop' them out of the scene.

Despite these limitations, driving has some unique characteristics that add to the scenic aesthetic experience. First is the aspect of *movement*. Because Yellowstone is a park and scenic driving is a major activity,

Figure 3. Hayden Valley, Yellowstone National Park. Driving affords the Yellowstone visitor perhaps one of the best opportunities to view charismatic megafauna, prime contributors to the aesthetic experience of the landscape. (Photograph by author, 2005)

the roads tend to be narrow, curving, and attractively designed. Speed limits are set relatively low but many drive even slower, as the act of traveling is as much a part of the experience as is one's destination. This roadway experience is overshadowed by even greater scenic enjoyment derived from the *surrounding* landscape. Throughout many parts of the Yellowstone region the sequence of scenery afforded a *dynamic,* cumulative effect greater than the sum of its separate views. Once-distant scenes become close-ups; places viewed from above are later experienced from below or at ground level. Some memorable examples included the views of Yellowstone Lake as we drove over the crest of the Yellowstone caldera and into Lake Village, the infinite moods of the Teton peaks approaching Jackson Lake Lodge, and the spectacular geological displays along the Wind River from red-rock badlands near Dubois to the Wind River Canyon south of Thermopolis. These experiences reflect the goals of early park road designers (McClelland 1998) and parallel the findings of those who have studied how people move though landscape (Appleyard, Lynch, and Myer 1964; Conan 2003; Litton 1968).

Second, while the physical landscape was the chief scenic attraction drawing us to Yellowstone, it was the wildlife we saw that produced some of our most memorable aesthetic experiences. It seems ironic that these encounters with *animate* nature tended to occur while in a most unnatural mode of conveyance, yet driving affords the Yellowstone visitor one of the best opportunities to view "charismatic megafauna" (Figure 3). Motoring across the landscape, we encountered herds of bison crossing the road; saw groups of elk both close and distant; and surprised lone antelopes, coyotes, and deer at various points along our tour. Few landscape perception researchers have studied how wildlife affects aesthetic experiences, perhaps because these *dynamic* and *ephemeral* elements of the landscape are not easily controlled by managers. But researchers who have done so have found that wildlife plays an important role in scenic quality evaluations (Hull and McCarthy 1988).

Driving out from Yellowstone Lake through Hayden Valley on our first full day in the park, we experienced what city traffic reporters often refer to as "gapers' delays," slowdowns caused by motorists gawking at an accident. But out here in nature we quickly found these delays to be a reliable indicator that wildlife was near. Parking to check things out, we followed fellow wildlife enthusiasts down a footpath to the Yellowstone River, where in the broad valley flats two grizzly bears were feeding on the carcass of a bison lying (safely for our sake) on the far stream bank. The park ranger present told us that two bison had sparred with each other, leaving one gored and available for a multiday feeding orgy by any number of carrion-loving species. As undisputed pinnacles of the food chain, the grizzlies had laid claim to the carcass. As we watched the two confidently swagger up the hill after feeding, I could not help but feel awed by this *symbolic* icon and how the grizzly served as an aesthetic *indicator species* for the intactness of the Yellowstone ecosystem. In our discussion at

the "Our Shared Landscape" conference, Terry Daniel (2005) questioned the idea of an ecological aesthetic by making light of environmental philosopher Holmes Rolston's (1988) example of a rotting elk carcass as an aesthetic object. But for us (and at this distance), the *unscenic* carcass made for a deeply moving aesthetic experience.

The above example shows how scenic driving can provide an entrée into the aesthetics of wildlife, but it also illustrates a third advantage of driving as a mode of experience: to provide a broader context for the aesthetic *appreciation* of *ecological processes*. The carcass was a small but critical element in our main aesthetic experience of watching the grizzlies. But the overall context of driving through the *entire landscape* of the Hayden Valley made the experience whole. One might not feel the same way watching bears beg for picnic goodies thrown by tourists from their car windows, a once-popular Yellowstone pastime. Now long discouraged by park managers, such practices not only exemplify how aesthetic enjoyment of wildlife can occur in ways that are removed from a broader ecological context, but also how aesthetic and ecological relationships can grow to be dysfunctional (Biel 2006; Gobster et al. 2007).

At an even larger scale, driving through Yellowstone helped me understand and appreciate the scenic and ecological beauty of the great fires that swept through the park during the summer of 1988, burning more than a third of the park's 2.2 million acres (USDI National Park Service 2005). At times, driving through large areas of dead trees was a somber and unsettling experience, though in most cases these stands are now dominated by the greenness of a young and healthy lodgepole pine forest. These dead stands are often referred to as "ghost forests," a term that to me has high aesthetic-descriptive value in reference to the translucent beauty of the silvery, barkless tree trunks set off against the living forest. The term also has a *symbolic,* metaphorical value as it recalls the devastation of the past and the renewal evident as the cycling of nutrients leads to vigorous under and overstory growth. By providing this overall context, driving can aid the observer "reading the landscape" (Watts 1999) to accumulate knowledge and weigh perspectives *experientially,* in contrast to gaining knowledge through reading books and other nonexperiential sources.

As a final note on driving and aesthetic experience, although being sealed off from all but the visual stimulus of nature can be restrictive, the quiet comfort of the car allows its passengers to play music and create a *multimodal* aesthetic experience that integrates the works of nature with those of human creation. Music provides an important form of aesthetic experience in its own right and often plays an integral role in movies; one might conceivably extend this logic to consider music as an additional aesthetic component to scenic driving. Anticipating that our rental car would have a CD player, I brought along a selection of discs from our collection that I thought might complement our travels. In the park proper we felt satisfied driving without musical accompaniment, but in coming to and leaving the park we played a number of our CDs. Upon approaching Yellowstone there was Mannheim Steamroller's *Yellowstone: The Music of Nature*. Heading through the Wind River Indian Reservation we played Robbie Robertson and the Red Road Ensemble's soundtrack for the public television documentary *The Native Americans*. And driving on the broad, brown plateau back to Cody I put in the slightly off-location but appropriately cowboy-themed soundtrack from the movie *Pat Garrett and Billy the Kid* by Bob Dylan. The latter two worked best for me, while the *Yellowstone* disc seemed contrived. I suspect that in terms of a constructed aesthetic experience like this, the integration of music and scenery is a highly individualistic, taste- and context-specific endeavor. Nevertheless I find it curious that the two discs that fit best for me were soundtracks, and I wonder if anyone has developed a soundtrack to a landscape in the context of a scenic driving experience.

Sitting

Some time ago I served as a task force member on a community-driven master planning effort for Chicago's

Lincoln Park that included an observational study of park users. The investigator found that after walking, the most common activities were standing and sitting in one place (People, Places, and Design Research, Inc. 1991). Upon reviewing these results at a task force meeting, I vividly remember one community leader express with no small degree of dismay something to the effect that: "What are all these people doing just standing or sitting around? They've got to be doing something other than just standing or sitting there!"

There are, of course, many reasons for adopting such stationary positions in park settings, but a common one at Yellowstone (as well as Lincoln Park) must surely be for watching the scenery. With skillful regard to long-established scenic aesthetic principles (McClelland 1998), there are benches, buildings, roadside turnouts, and other observation points sited throughout the Yellowstone area to maximize the *composed, framed* view of *picturesque* scenery from a proper distance and perspective. Artist Point above the Lower Falls of the Yellowstone River is an iconic example that compelled us to sit and watch the *dramatic* scenery. Other stopping places on our trip included a roadside picnic area overlooking the expansive Hayden Valley, the semicircle of benches around the Old Faithful geyser, and the rock perch at Inspiration Point above Jenny Lake in Grand Teton National Park.

At first consideration, sitting as a mode of experience is an ideal way to appreciate these iconic landscapes with the *passive, static,* and *visual* attributes that epitomize a scenic aesthetic. Artist Point is perhaps the best example. Aptly named for its *formal* qualities as captured by many landscape painters and photographers, Artist Point and the image of its falls dropping through yellow canyon walls is frozen in our mind's eye. From benches at the site, the landscape is presented to us as a *fixed,* aesthetic composition, like viewing a painting in an art gallery. As amateurs, we attempt to replicate the images with our own snapshots, or embellish them with a portrait of our loved ones in the immediate foreground, bearing witness that we were there.

But then something happens. Unlike driving, where the passenger experiences *movement* with changes in perspective, while sitting, the landscape itself moves. Water falls and flows. A rainbow shimmers in the mist above the river. A hawk circles overhead. Each movement fractures the static scene, breaking the picturesque from its frame. The passage of time increases perceptual information. Sounds enter your awareness, emanating from the landscape or from people admiring it. A cloud moves away from the sun and a wave of light sweeps across the canyon walls like a floodlight in a theater performance, producing an enjoyable *ephemeral* effect. These and other qualities increase the *dimensionality* beyond the landscape-as-picture.

Sitting as a mode of aesthetic experience is often limited to minutes or tens of minutes at stops along a road or trail, but longer stays invite opportunities for increasing the *temporal* potentials of aesthetic experiences. During our visit to Yellowstone and Grand Teton national parks we stayed in lodges and cabins, usually for two nights at a stretch. Being new to the lodge experience, I soon took to porch and lobby sitting as one of my favored leisure activities. While my penchant for this activity was sometimes supplemented with a good book or conversation, I spent many hours alone or with family "just sitting" and watching the scenery.

Each of the four places we stayed in at the two parks showed us a different face of the Yellowstone area, together giving us a more complete *understanding* of the region's beauty. At Lake Yellowstone there was the open expanse of the lake itself, made sublime by an afternoon storm that drove us indoors to marvel at its beauty from overstuffed chairs in the warm comfort of the hotel lobby. The rain and cold continued as we moved on to Roosevelt Lodge. Here the view was of valley and mountain scenery, and despite the less than ideal weather, I often returned to the lodge's front porch to sit and rock on the rustic chairs while taking in the wildness of this remote corner of the park. Our views of Old Faithful and the Upper Geyser Basin from the upstairs porch of the Old Faithful Inn were obscured by an ongoing renovation of the 100-year-old hotel, but the grand porch and lobby still delivered a rich *ambience*

Figure 4. Jackson Lake Lodge, Grand Teton National Park. The ability to gaze upon a landscape over an extended period can make one critically aware of the importance of the temporal dimension of scenic beauty. (Photograph by author, 2005)

of the history and *symbolism* of this remarkable edifice. Finally, the porch of our second floor "mountain view cottage" at Jackson Lake Lodge offered a spectacular view of the Teton Range, underscoring the findings of studies quantifying the value of a room with a view (for example, Lange and Shaeffer 2001).

The advantage of multiple experiences from these fixed viewpoints became clearest to me in our room at Jackson Lake Lodge (Figure 4). As if our view of one of the world's most scenic mountain ranges was not enough, the privilege of seeing it over the course of morning, noon, and night from this private vantage point showed me the importance of the temporal dimension of natural beauty. We arrived at the lodge in midafternoon and although being awestruck by the view upon opening the curtain, the sun silhouetted the range and blasted our porch with nearly unbearable heat, forcing a retreat to the bland but refreshing outdoor pool. Returning to the room after dinner, we took to the porch to watch the sun set behind the mountains in more comfortable and serene surroundings. As night drew in, sonic beauty grew as scenic beauty faded, and insects chirped and coyotes called to each other in stereo from the meadow below. Waking up too early the next morning, the one-room cottage forced me back out on the porch to avoid disturbing the others. Here I shivered and marveled as the nearly full moon overhead and the dim predawn light cast sky and mountain in deep shades of blue and purple. As the sun came up, the mountains changed color from rose to orange and yellow, their mysterious forms in the night sky made sharp and naked in the cold morning light. Later that evening a storm moved through and cast the mountains in dark clouds as rain, wind, thunder, and lightning showed us the violent beauty of the Tetons. Then, as night approached, we used our binoculars to spy a group of 13 elk make their way across the meadow that lay between us and the distant mountains.

Although my attempts to capture the beauty of Yellowstone scenery photographically rarely did it justice, my picture-taking behavior at places such as the Tetons where we stayed for a longer time seemed a revealing indicator of the value of temporal experiences. Different times of day, varied atmospheric effects, and different focal points of interest each warranted their own photograph. My desire to take the "perfect" photograph no doubt was an underlying motivation, but after a while, each mood of the landscape seemed an equally worthy representation of its scenic beauty.

Finally, the act of sitting and watching scenery over an extended period seemed to have a powerful effect on my inner self. I grew more contemplative, not only of the landscape, but of my place in it and even my purpose in life. I felt a deep relaxation, a goal of vacations that often gets subverted by tight schedules, unforeseen complications, or crabby children. And I began to feel at home in a landscape about as different from Chicago as a place can be. These effects, in turn, could be described by the ecological aesthetic elements *catalyst for internal change, restoration,* and *unity* or *sense of*

place. That they can be achieved through "just sitting" is a marvelous testament to the power and potential of scenic beauty.

Walking

Walking is in some ways similar to driving as a mode of landscape experience. *Movement* remains a primary dimension, although it is dramatically slowed down; the distance covered in an hour by car could take days on foot. Speed changes our selection of landscape for viewing, and for many walking experiences we first drive through an extensive landscape to reach one more intensively packed with scenery for more detailed exploration. So while vistas can play important roles, with the walking experience the foreground landscape often takes center stage. Some of this is out of necessity; to avoid accidents one must watch the ground, overhanging branches, and other potential hazards. But details not noticed at high speed now come into aesthetic awareness, and walking allows their exploration through *multiple senses*—hearing the birds chirp overhead, touching the rough bark of a tree, smelling the sulfurous odors of a geyser, and tasting the sweet-tartness of a wild berry. These sensations happen within an experience that also provides many *ambient* qualities less apparent while sitting or driving, especially the *surrounding* nature of landform, vegetation, and sky. There is also a fuller *interaction* between body and environment in our skin's reaction to sunlight, temperature, and wind or in muscle response to topographic gradient and surface texture.

We took two kinds of walks while visiting Yellowstone: short walks at popular scenic destinations and longer day hikes through scenic areas. Of the first kind, guidebooks and road signs provide the walker with a wide array of options, but within the time frame that most allot to their visit the actual selection is often reduced to a much smaller set of must-see places. For us, these included the Grand Canyon of the Yellowstone River, Mammoth Hot Springs, several of the geyser basins, and the Artist Paint Pots. At each venue, the walker can choose among trails of varying lengths, and most venues provide a satisfying consumption of scenery with an easy one-mile, one-hour stroll along a paved trail or boardwalk. In casual observation, visitor movement within and between spots seemed highly predictable, and after a while I started noticing some of the same people at the different spots we chose in our tour, running into them time and again even over the course of several days.

Many aesthetic experiences in nature tend to occur while alone or with close companions, and if others are present we mentally tune them out of the scene (Chenoweth and Gobster 1990). In contrast, the festive, social atmosphere of Yellowstone's most popular scenic destinations seemed to add to our experience. We were like fans at an outdoor concert; these places were our literal rock (and water and plant) stars and we came to see them and hear their greatest hits. It was not uncommon to hear "oohs" and "ahhs" watching water crash at the base of a falls, laughter at the sounds of air being forced to the surface of the paint pots, and even applause upon the eruption of a geyser. Contrary to the idea of scenery as consisting of static objects, the greatest hits of Yellowstone were true performance pieces and we were the audience sharing in the experience.

But while our encounters with the scenic beauty of these popular destinations were engaging, like being in a theater, we were always conscious of the separation between performer and audience. The fragility of the park's natural scenery and its potential hazards to humans, combined with huge visitation rates, necessitate that people keep their distance. This is accomplished in several ways, including boardwalks, guardrails, and signage. This forced separation tends to *objectify* the landscape and limit most active or participatory interactions. As adults we are acculturated to this kind of aesthetic appreciation and its attendant rules of behavior, but while I was reveling in my own experiences of scenic beauty, I was also aware that our children were not always responding the same way.

While we were driving and sitting it didn't take long

Figure 5. Yellowstone River Picnic Area Trail, Yellowstone National Park. For children, opportunities for interactive play with the landscape—climbing, collecting, stone throwing—can play important roles in aesthetic experiences. (Photograph by author, 2005)

before our children grew bored looking at the scenery and sought other diversions—playing games with each other, drawing, reading, or complaining to stop or move on. This happened less often on our short walks at popular destinations, but was often a problem on our day hikes. Like many children, ours are very active with sports and free play in their daily lives, but hiking to look at the scenery was usually viewed by them as a chore. Once on the trail, they usually ended up having a good time, though it wasn't always for the same reasons as we adults. For the adults, our day hikes combined physical activity with the roving qualities of scenic landscape appreciation described above. The kids' focus was much more oriented toward *action* and *involvement*—what they could do in and with the landscape as active *participants* (Figure 5).

Climbing was a favored activity, and challenging rocks and trees became nature's substitutes for the jungle gyms of city playgrounds. A stop at Sheepeater Cliff for a hike soon turned into an impromptu free climb up the easily scaled rock wall, and the short legs and small feet that earlier trudged along scenic stretches of trail now bounded with the lightness and agility of the bighorns that once resided here. Hands-on activity was our seven-year-old's favored way of landscape interaction; whether pocketing stones along the trail up to Inspiration Point or harvesting sage leaves off the bushes on the trail along the east rim of the Yellowstone, she was often intent on collecting, digging, building, or otherwise manipulating her environment. Our eleven-year-old daughter, a self-proclaimed baseball nut, sought out every chance to exercise her pitching arm by throwing stones into water bodies ranging in size from the smallest trail puddles to Lake Yellowstone. Both girls begged for a chance to climb down off the designated path and frolic in the waters below Mystic

Falls, and after a hot and vigorous hike we adults joined them in what was one of our few direct interactions with the scenic Yellowstone landscape.

As adults and environmental professionals, my spouse and I had ambivalent feelings in allowing what could be construed as inappropriate behavior in a national park. Yet when conditions seemed right, we acquiesced to these deviations from the "look but don't touch" norms. For children, unstructured play is regarded by some aesthetic theorists and child psychologists as an important and advanced form of aesthetic activity: it has affective, cognitive, and imaginative components that can create new meanings and understandings in how children perceive the environment (Armstrong 2000; Lindqvist 1995). For adults, activities such as gardening and ecological restoration that involve active manipulation of the environment are also regarded as forms of play and aesthetic expression (Francis and Hester 1992; Lonsdorf 1993). While the scenic beauty of Yellowstone can provide *passive* reflection and be deeply *engaging*, without greater hands-on interaction, its ability to fulfill these active aesthetic functions is likely limited. This constraint to interaction can also operate in landscapes of ecological rather than scenic beauty. While those engaged in restoring such landscapes may reap experiential value and creative expression from active participation, the restored landscape is then considered precious and often roped off to the broader public seeking more interactive experiences (Gobster 2007).

FROM SCENIC BEAUTY TO AESTHETIC EXPERIENCE

In examining the beauty of Yellowstone through these three different modes of experience, I found that the characteristics associated with the ecological aesthetic (as listed in Table 1) applied to this most scenic of landscapes as much or more often as did those associated with the scenic aesthetic. Why is this so? Certainly part of it may be that for the Yellowstone landscape scenic and ecological beauty are closely aligned. But on another level, there may be fundamental differences in how scenic beauty is conceived of, designed for, and measured by landscape managers and landscape perception researchers compared to how ecological beauty is talked about and studied by aesthetic philosophers. In the former case, the landscape focus is on the visual, static, and picturesque qualities, while more experiential dimensions are largely ignored. Similarly, the focus on the individual usually considers only the person's visual perception of landscape, measured by unidimensional preference ratings for discrete scenes presented off-site through the use of photographs (Gobster 1999). Now take away the scenery and what do you study and design for? In the case of ecologically significant landscapes that may appear messy or drab, aesthetic philosophers have had to dig deeper to understand landscape beauty, instead focusing on the aesthetic experience of landscapes and how people come to appreciate them though real-time, on-the-ground interactions.

Many of the attributes associated with the ecological aesthetic included in Table 1 derive from philosophical writings about aesthetic experience (for example, Carlson and Berleant 2004). Aesthetic philosophers such as Baird Callicott (2004), Allen Carlson (1999), and Holmes Rolston (1998) have written about ecological beauty at least in part from an experiential perspective, often drawing on places they and others have experienced. My analysis of Yellowstone turns this strategy on its head—instead of arguing for the appreciation of scenically challenged landscapes of ecological quality by highlighting aesthetic experience, I have explored how aesthetic experience can better capture the full dimensionality of scenic beauty.

Table 2 is a revision of my earlier table, reflecting this focus on aesthetic experience. Drawing on the same domains that Zube, Sell, and Taylor (1982) used to describe the landscape perception-interaction process, I see that aesthetic experiences come about from transactions between the landscape and people and result in outcomes that affect change in both of these realms. Factors affecting the individual include things people bring to their experience: emotion and cognitive

Table 2. Some factors influencing the aesthetic experience of landscape.

Domains	Salient categories and dimensions
Human	
Affective	Pleasure, fear, biophilia preferences
Cognitive	Thought, acquired knowledge and experience
Socio-demographic	Age, gender, culture, lifestyle
Situational receptivity	Distracted/occupied—open/focused
Landscape	
Perceptible dimensions	Non-perceptible—visual—multi-sensory
Change	Movement, weather, time of day effects, wildlife, succession, disturbance
Types	Region, ecotype, place
Scale	Detail/site/whole landscape
Ambience	Focal/fixed/framed—open/surrounding/unbounded
Naturalness	Wild-human dominated, designed, vernacular
Interaction	
Mode of experience	Activity type (e.g. walking, sitting, driving)
Activity intensity	Conceptual, observational, mediated, immersed
Meaning	Historical, vernacular, symbolic, iconic
Spatial relationships	Fixed-moving, above-below, near-far, point-area
Temporal relationships	Duration, number, interval
Social factors	Alone-with others, compatibility-conflict
Outcomes	
Human	Preference—appreciation, health/restoration, future behavior, fear/aversion
Landscape	Protection, preservation, restoration, negative impact
Change mechanisms	Involvement/participation, policies and management; design, information, programs

capabilities, some of which may be hardwired through evolution and others that are acquired through knowledge and experience. These factors exist in a larger context of identity as defined by self and culture and situational factors such as how preoccupied or focused the individual is at the time of interaction with landscape. Factors affecting the landscape are numerous and have been well documented by Zube, Sell, and Taylor (1982) and others.

In contrast to my earlier table where I tried to distinguish between scenic and ecological aesthetic attributes of landscapes, here I make no inference to the superiority of one category or pole of a dimension over the other. In the context of interaction factors, my Yellowstone analysis shows that while some landscape attributes commonly associated with the scenic aesthetic apply in some modes of experience (for example, *framing* and *visual* for driving), there was often considerable overlap with attributes of the ecological aesthetic across different modes of experience. As a result, I found my aesthetic experiences at Yellowstone occurring under widely varying spatial, temporal, and social conditions, and at a range of intensities. These different types of aesthetic experiences result in different outcomes for the individual and in turn have different implications for what happens to the landscape. Foremost among these is the potential for change, a key component in the model my colleagues and I have proposed in our collaborative essay on the relationships between landscape aesthetics and ecology (Gobster et al. 2007).

In this way, aesthetic experience should be an important focus of study for landscape perception researchers. However, little such work has occurred outside of the philosophical literature. In two earlier studies, colleague Rick Chenoweth and I empirically examined people's aesthetic experiences in the landscape and the value they had to people (Chenoweth and Gobster 1990; Gobster and Chenoweth 1990). Drawing largely on philosophical studies of aesthetic experience to formulate our rating scales and open-ended questions, we

found that people considered aesthetic experiences to be a valued part of their lives with important psychologically restorative benefits. Presumably, one reason why certain landscapes are preferred for their scenic or ecological beauty is because they provide aesthetic experiences—some small and fleeting and others that can be "peak" and even life-changing. Because of this important link between preference and experience, it would seem critical that more attention be given to the study as well as design and management of landscapes that facilitate aesthetic experiences.

There are many ways in which experiential perspectives might be built into landscape perception research, from personal, phenomenological descriptions such as my analysis, to more structured techniques using numerical quantification and representative samples. Information gleaned about aesthetic experience from this range of work is needed to help us understand the full dimensionality and value of scenic beauty for research and management.

But this still leaves unresolved one of the vexing issues in ecological aesthetics. If ecologically significant landscapes appear messy, drab, or otherwise unappealing, how can people be drawn to explore the qualities of these landscapes that lead to valued aesthetic experiences? Unlike Yellowstone and other scenic landscapes, there is no obvious scenic "hook" in landscapes such as wetlands and prairies, and most people have neither the time nor the inclination of aesthetic philosophers or ecologists to make this intellectual leap. To address this question, in the next section I suggest how the vivid scenery of Yellowstone offers clues for how to better communicate ideas about the beauty of scenically challenged yet ecologically significant landscapes to public groups.

YELLOWSTONE HOTSPOT

Until now I have said little about the geothermal features of Yellowstone, but soon after our arrival in the park I discovered that they are really what Yellowstone is about and, in large part, shape the experience of the park's scenic *and* ecological beauty. Steam seeping from fumaroles; water boiling from hot springs and shooting from geyser holes; multicolor mudpots cutting loose sulfurous farts; and bizarre formations of travertine ejecting streamlets carpeted with thermophilic organisms in colors of unimaginable brilliance are just a few of the wondrous features that visitors past and present experience as manifestations of the "Yellowstone Hotspot" (Figure 6).

Figure 6. Old Faithful geyser, Yellowstone National Park. The Yellowstone hotspot vividly reveals the beauty of environmental phenomena that may otherwise lie hidden outside the realm of human perception, and may offer clues for appreciating ecologically significant landscapes that are "scenically challenged." (Photograph by author, 2005)

A hotspot is a place on the earth where a plume of molten magma rises from the earth's mantle to near its crust. A building dome of magma causes the crust to rise, stretch, and eventually explode as a huge volcano. Such events have occurred in the Yellowstone region over the past 2 million years, most recently resulting in the Yellowstone caldera, a collapsed area 45 by 30 miles in extent that occupies a large part of the park's center (USDI National Park Service 2005). Continued activity of the hotspot along with other hydrological, chemical,

and biological processes has helped to create the spectacular scenery that is Yellowstone—its mountains, lakes, waterfalls, and more than 10,000 hydrothermal features, including two thirds of all the world's geysers (Wallace 2001). In part due to Yellowstone's protection as a park, these features have influenced the ecology of the system—one of the most intact in North America (Keiter and Boyce 1991).

The sheer uniqueness of the Yellowstone Hotspot is one reason why the park is so revered as a scenic icon. Of the 40 to 100 hotspots that exist in the world, the Yellowstone Hotspot is one of only a few that occurs under a landmass (Kious and Tilling 1996). In most of the rest of the world, geological activity of the earth's core and mantle remains deep below the surface, invisible to all and known only through geological study. A hotspot reveals this activity to our senses and in the case of the Yellowstone Hotspot does so in a very vivid way.

I found hotspots to be a fascinating phenomenon, but even more rewarding was recognizing their value as a metaphor for understanding the relationships between aesthetics and ecology. In our model of human-environment interactions (Gobster et al. 2007), aesthetic experience is restricted to the perceptible realm of landscape patterns. In most landscapes, these perceptible manifestations have only indirect connections to more fundamental biogeochemical processes. These more abstract environmental phenomena lie outside the perceptible realm and are unknowable without the aid of what is often a sophisticated level of knowledge. But just as a geological hotspot brings magma up its plume to the surface, so does a metaphorical hotspot reveal information about the environment hidden beyond our awareness.

How might this hotspot metaphor be applied to help communicate the importance and beauty of ecological processes to public groups? In our collaborative essay (Gobster et al. 2007), we discussed interventions as ways to resolve conflicts between landscape aesthetics and ecological health, and in this context the hotspot metaphor might be fruitfully applied. With respect to environmental phenomena, design can reveal how underlying ecological processes might be brought to the perceptible surface of landscape patterns. Similar to Yellowstone but often in a much less vivid way, the surface structure of ecosystems is an expression of underlying functions and processes. Design can help strengthen this connection by bringing essential functions and processes to sensory awareness. "Ecorelevatory design" (Brown, Harkness, and Johnston 1998) refers to a variety of ideas and principles for helping to reveal or make perceptible ecological functions and processes. For example, buffer plantings of native vegetation that hug the contours along agricultural stream courses can raise people's awareness about the connection between visibly clean water and unseen soil erosion and chemical runoff (Sullivan, Anderson, and Lovell 2004). Nassauer's (1997) concept of "vivid care" is particularly applicable because it relies on longstanding scenic principles that are commonly recognized as having aesthetic value. For example, showy plantings of butterfly-attracting forbs at gateway entrances to a prairie or wetland can help draw visitors' aesthetic attention to the beauty of detail present in landscapes that may from a distance appear flat, monotonous, or otherwise scenically challenged.

With respect to human phenomena, we discussed knowledge in our collaborative essay as a second type of intervention that can help make ecological functions and processes perceptible. This is one that has often been written about in the context of the ecological aesthetic and one for which many cautions have been raised because it may not change perceptions and may impose the value bias of ecological experts (Parsons and Daniel 2002). But people do seek information to make sense of their environment and, to the extent that it can be offered in appropriate ways, it too can help make perceptible what might otherwise be invisible. My own information seeking about Yellowstone was satisfied by a range of available materials, from on-site signs, brochures, and tours, to books and off-

site museums. Nor does information need be text only; the museums around Yellowstone did an excellent job revealing the ecology, history, and culture of the area through a diverse range of multimedia exhibits.

Information in this context might correctly be termed interpretation, which has a long history of development in art and environmental education as well as in the context of tourism. Along with the typical range of informational materials mentioned above, programming can often be an important part of interpretation as it aims more squarely at the experiential dimension of learning. At Yellowstone, living history presentations, hikes themed around particular topics, and volunteer opportunities are among the many programs offered to enhance visitor knowledge and appreciation. For example, volunteer restoration opportunities such as those offered through Tauck World Discovery (2007) and "lodging and learning" programs through the Yellowstone Association (2007) cater to a variety of skills and interests.

Finally, design need not just be concerned with revealing ecological process. By facilitating use of places through physically accessible design and by understanding other social and psychological concerns that people have, good design can increase use and enjoyment and provide an entrée to appreciation of ecological beauty for a wider range of people.

CONCLUSION

With respect to scenic beauty, this phenomenological analysis of Yellowstone suggests how researchers and landscape managers might productively expand current ideas and practices to incorporate dimensions revealed through aesthetic experiences—experiences that have great value to people and can lead to more positive human-landscape interactions. A key challenge here is how we can make a more substantive shift beyond studies where preference ratings of static landscape representations are the accepted norm. This challenge may even be more critical to the increasing number of studies aimed at understanding aesthetic-ecological relationships (for example, Hill and Daniel 2008; and Junker and Buchecker 2008), especially work on scenically challenged landscapes where an experiential approach could help reveal less obvious characteristics of ecological beauty.

Some of this is beginning to happen with advances in visualization techniques, and studies are now more often incorporating perceptual information such as sound and motion into landscape representation (Bishop and Lange 2005). But in other cases we may need to go backward before we move forward, and low-tech, intensive studies of how people experience real places can provide important knowledge that *au courant* methods such as web-based surveys and digital landscape simulations cannot. Part of this going backward should entail revisiting the theoretical framework for an adequate study of landscape perception outlined by Zube, Sell, and Taylor (1982). Initially developed in a more general context by Ittelson (1973), the framework is now 35 years old but still offers one of the best roadmaps for future work in this area (Gobster, Palmer, and Crystal 2003). I include it here with some adaptations based on my own work:

- **Landscape perception has multisensory qualities.** Landscapes provide information that is received through multiple senses and that is processed simultaneously.
- **Landscape perception has spatial and temporal qualities.** Perceptions of landscapes can be shaped by cumulative experience over space and time and can change as landscapes change.
- **Perceptual response to landscapes can be multidimensional.** People respond to landscapes aesthetically but also respond in terms of perceptions of ecological health, safety, cleanness, and other dimensions. These dimensions are interdependent and can interact in complex ways.
- **Landscape perception is cognitive as well as affective.** Landscapes are perceived not only in terms of preference but also through symbolic meanings and motivational messages.

- **Landscape perception has social, cultural, philosophical, and ethical aspects to it as well as psychological ones.** Perception of landscape is colored by the immediate perceptual social context and by our acquired experiences as individuals and through our society and culture.
- **The outcomes of landscape perception are varied.** Landscape perception can result in preferences, choices, uses, and experiences that can have deep aesthetic or restorative value. Perception calls forth action that can lead to behavioral and environmental change.
- **Landscape perception research methods should accommodate the variety inherent in landscape perception.** Researchers should use the full range of qualitative and quantitative approaches appropriate to the research questions at hand in order to advance theory, practice, and policy.

Beyond these concerns about perception, a key challenge with respect to an ecological aesthetic lies in forging a better understanding of the ecological aspects of landscapes that relate to aesthetic experience. Few of us have the knowledge and sensitivity of an Aldo Leopold to uncover the properties of a prairie or wetland that are salient to its aesthetic experience. Thus in many cases it is critical that landscape researchers, designers, and managers work with ecologists, geologists, historians, and others who know what "hotspots" are important to a given landscape. In doing so, we can better interpret the meaning of ecological processes and functions of landscapes in ways that will contribute to their appreciation and protection.

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AUTHOR PAUL GOBSTER is Research Social Scientist with the US Forest Service Northern Research Station in Chicago. He holds MSLA and PhD (Land Resources) degrees from the University of Wisconsin–Madison. His current research focuses on people's perceptions of natural areas restoration and management; the phenomenology of nature experience; and human health, access, and equity issues in urban parks.