

FOREST LANDSCAPE ASSESSMENT: THE EFFECTS OF PRE-EXPERIENCE EDUCATION ON PUBLIC PERCEPTION OF SCENIC BEAUTY

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Abstract.—Aldo Leopold argued for a type of “ecological aesthetic,” where perceptions of natural landscape beauty are tied to an understanding of the natural process of forests. The purpose of this study is to examine how education affects perceptions of scenic beauty. Thirty-two students were assigned to four groups, with each group participating in a different educational program (i.e., no pre-educational experience, lecture only, lecture/video, and lecture/video/walk-in-the-woods) related to forest settings. After the educational treatments were administered, the students viewed six video clips taken in a forest setting and asked to evaluate scenic beauty (0=very low scenic beauty to 100=very high scenic beauty) by turning a handheld dial throughout the viewing period. Pre-educational experience was found to significantly influence moment-to-moment scenic beauty ratings ($p<.001$). Students participating in a walk in the woods reported the highest and most varied average scenic beauty ratings, suggesting that sustainable forest ecosystems are better appreciated following first-hand experience. Educational demonstrations may thus help expand perceptions of natural landscape

beauty to include ecological processes and sustainable forest management practices that may otherwise be considered unsightly.

1.0 INTRODUCTION

Natural landscape beauty is important, especially to outdoor recreation enthusiasts. This study investigates the idea that perceptions of natural landscape beauty can shift as recreation users gain experience and appreciation of ecosystem processes that are maintained using sustainable forest management techniques. This shift to look beyond visual, dramatic scenery has been called an “ecological aesthetic” and was first described by Aldo Leopold in his *Sand County Almanac* (1949), where he argued for an expanded perception of landscape beauty based upon a cultivated understanding of the natural processes of forests.

Hammitt (1981) further states that familiarity with a recreational environment can increase visitor preference for and during on-site recreation engagements. Perceptual learning increases the ability of a recreationist to get information from the environment as a result of practice in perceiving properties, patterns, and distinctive features of a landscape. That is, repeat experiences of an environment help develop perceptual skills that allow visitors to better understand and actively engage the forest by detecting more information (Pierskalla & Lee, 1998).

The purpose of this pilot study is to test if perception of scenic beauty is related to pre-experience education, and to identify setting attributes that contribute or detract from scenic beauty. We hypothesize that outdoor recreation students who have undergone educational programs related to forest ecosystems will have a richer and enhanced perception of the forest as displayed in video clips of forest settings. Results

of this project will guide us in developing additional forest-based educational tours that may complement lectures and/or instructional videos.

2.0 LITERATURE REVIEW

2.1 Aesthetics and Ecosystems

Natural landscape preferences have developed over evolutionary time and are thought to be influenced by age, ethnicity, and recreational activity. But contemporary preferences for landscapes are also fundamentally rooted in our dominant culture, including Romantic-era concepts of landscape beauty as visual scenery (Gobster, 1996). Following the ideas of Leopold, ecological aestheticians argue that this “scenic aesthetic” not only has taught us to view landscapes as static compositions rather than dynamic, multi-sensory places, but has led us to design and manage landscapes in ways that could be damaging to ecological sustainability.

Gobster (1996) builds the case that social acceptability in “ecosystem management” forestry programs lies in the way in which people view forest environments and how it relates to them as resource consumers. In most cases, social acceptability is perceived as a scenic aesthetic. Therefore, the concept of appropriateness in education and explanation will conceptually build on an ecological aesthetic. Ultimately, the appropriateness factor will help bridge two other important factors, aesthetics and biodiversity, in land management techniques (Gobster, 1996).

The appropriateness factor can be constructed around perceptual and educational interventions that directly deal with natural resources management. Increased education should lead to a wider range of aesthetic appreciation. Therefore, changing people’s perception of what is considered to have a higher aesthetic quality, reinforcing the importance of ecological systems in the environment (e.g., dynamic systems including disturbances of various spatial and temporal scales), and introducing what can be considered new forms of aesthetically pleasing landscapes such as forest management areas could be valuable to both managers and visitors.

2.2 Preserving Scenic Beauty

In direct contrast to Gobster’s writings on ecological aesthetics and social acceptability, Parsons and Daniel (2002) argue that advocating an ecological aesthetic is premature. They say that managers lack a full scientific understanding about how to implement ecological sustainability, and they reject Gobster’s premise that it is possible to “re-educate” people to new forms of perception of aesthetic quality in hopes of reaching sustainability goals. They suggest that an approach should be taken to better understand the adoption of concerns about environmental resources and how ecological responsibilities are engaged, rather than focusing on perception alone.

Parsons and Daniel (2002) suggest that ideas of landscape aesthetics do not need to be changed, but need better understanding, and that it may be easier or more beneficial *not* to make drastic changes in what is considered to be scenic quality. There is reason to believe that nature experiences, environmental attitudes, and ecological behaviors are influencing the origin of people’s environmental concerns (Parsons and Daniel, 2002). The researchers argue that forming an emotional attachment to a site by experience will trigger a greater appreciation for sustainable goal management as well as cognitive approaches to understanding and adopting a conservation ethics. We do not disagree with the latter argument, but we do propose that education is needed to help the public more fully perceive and enjoy the diverse information provided by nature—contributing to a more informed and meaningful experience.

3.0 METHOD

A set of training sessions was conducted for West Virginia University Recreation, Parks, and Tourism Resources students. Thirty-two students were systematically assigned to one of four groups that had varying levels of “pre-experience” education or different amounts of education related to six video clips of forest settings that they evaluated. Levels of pre-experience education (experimental factors) included:

- Group 1—No pre-experience information
- Group 2—Lecture only
- Group 3—Lecture and video tape (“Managing Your Woodlot” series)
- Group 4—Lecture, video tape (“Managing Your Woodlot” series), and a walk in the woods

After the respective levels of education were delivered to students, they were shown six video clips (ranging from 29 to 65 seconds) taken in a forest setting and asked to evaluate the scenic beauty (0=very low scenic beauty to 100=very high scenic beauty) by turning a handheld dial throughout the viewing period. At the end of each video, respondents were asked to rate the overall scenic beauty using the same scale. The data were collected using MSInteractive’s Perception Analyzer. This Continuous Audience Response Technology (CART) is an experience sampling methodology that eliminates the gap between the actual situation of study and report. This equipment and software merge computer and video technology to record responses every second. The collected responses from each treatment group were displayed as a running timeline over the video for comparison. Data were further analyzed to determine the effect of different levels of pre-experience education on average moment-to-moment and post-video assessments of scenic beauty. After each video clip was shown, students were also asked to write down setting attributes that contributed to or detracted from scenic beauty. The comments were inductively coded into 20 content categories. Each category was reviewed by three researchers for inconsistencies. Coding was revised until all categories were agreed upon.

4.0 RESULTS

Multi- and univariate analysis of variance (and Scheffe post hoc tests) were used to determine the effect of pre-educational experience (Treatment Groups) and video clip on average moment-to-moment and post-video assessments of scenic beauty (Table 1). A boxplot displaying each variables location and dispersion is also provided for comparison (Fig. 1). Both multivariate main effects were significant ($p<.01$); however, the univariate effect of pre-experience was greater for CART derived

moment-to-moment scenic beauty assessments when compared to post-video assessments.

Figure 1 illustrates the average moment-to-moment scenic beauty assessment scores by pre-educational experience and video clip. (Figure 1 note: the box itself contains the middle 50 percent of the data, and the line in the box indicates the median value; the vertical lines or “whiskers” indicate the minimum and maximum non-outlier observations; the points on the ends of the whiskers are outliers or extreme values.) Group 4 (lecture, video tape, and walk in the woods) reported the highest scenic beauty ratings (Scheffe, $p<.05$). Groups 2 through 4 (some pre-experience) reported more variable scores than Group 1 (no pre-experience).

Mean (M) moment-to-moment scenic beauty responses are reported on a timeline for each of the six videos (videos 1 through 6) (see Figs. 2-7) and provide additional support for the proposition that pre-educational experience does positively effect perceptions of scenic beauty. The most common attributes that contribute positively to scenic beauty, as reported by study participants include: trees, tree size, tree form, tree color, bird sounds, landscape, and the presence of roads (Table 2). Lack of tree health and the presence of roads were among the most common attributes detracting from scenic beauty. The presence of roads was among the most frequently and evenly divided setting attribute reported. Although only suggestive, Group 4 appears slightly more likely to comment about the positive effect of landscape extent ($\chi^2=6.0$, $p=.110$) and negative effects associated with dense shrubs ($\chi^2=9.1$, $p<.05$).

5.0 DISCUSSION

The results of this study indicate that educational pre-experience had a significant effect on perception of scenic beauty. Programs that included a walk in the woods had the greatest positive effect on perceptions with one exception: when zooming in on invasive species during video 5, Group 4 reported very low scores. Consistent with descriptions of the characteristics of an ecological aesthetic (e.g.,

Table 1.—Summary for scenic beauty assessments, multi- and univariate analysis of variance

Source of variation	Multivariate F-ratio	Univariate F-ratio	df	P less than	Scheffe ($\alpha=.05$)
Pre-experience treatment group (p)	4.893		6;322	.001	Groups 1-4
Post-video scenic beauty assessment		2.032	3;162	.111	N.S.
Moment-to-moment scenic beauty assessment		4.378	3;162	.005	4>1,3
Video clip (v)	13.274		10;322	.001	Videos 1-6
Post-video scenic beauty assessment		25.428	5;162	.001	1>2,3
Moment-to-moment scenic beauty assessment		26.730	5;162	.001	2>6 and 3<1,2,4,5,6
Interaction p x v	0.645		30;322	.926	

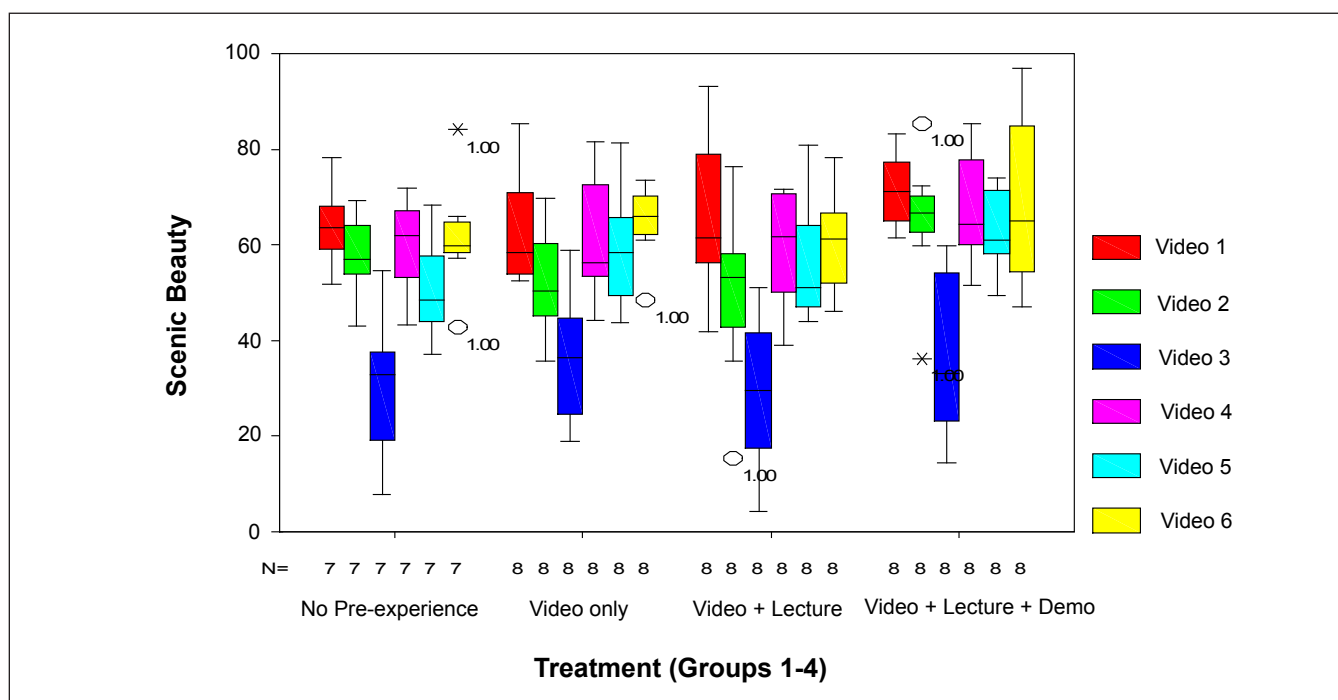


Figure 1.—Box plot of average moment-to-moment scenic beauty ratings by treatment group and video clip.

Gobster, 1996), perhaps sustainable forest ecosystems are better appreciated following on-site exploration and fascination. Self-guided nature walks and other demonstration programs may better involve the public and lead to a richer and enhanced understanding of sustainability.

Generally, video 3 (clearcut) was rated lower in scenic beauty when compared to all other videos (including invasive species on video 5). This finding indicates a need to better educate the public regarding the cost/benefits of clearcuts and invasive plants.

Greater variability in perceptions following pre-educational experience (especially after a walk in the woods) may mean that respondents gained a richer, multidimensional understanding of scenic beauty. Education, especially through demonstrations, can enhance perceptions of scenic beauty to include ecological processes and sustainable forest management practices that may otherwise be considered unsightly.

CART expands the repertoire of methods for examining perception-related phenomenon. It permits

Table 2.—Setting attributes that improved or detracted from scenic beauty

Content category	Improved scenic beauty		Detracted from scenic beauty	
	Selected examples	n	Selected examples	n
1. Tree age	Old tree	8	Not a mature forest	3
2. Tree general	Gnarly tree, spruce	24	Looked at trees	14
3. Tree health	Tree appears healthy	16	Dead trees everywhere	38
4. Tree size	Nice large trees	34	No small trees	13
5. Tree color	Variations in green	20	Not very many colors	4
6. Tree form	Tree canopy	24	Tree branches	8
7. Spatial pattern	Large trees spaced	8	Not uniform growth	7
8. Vines	Less vines	2	Vines	8
9. Shrubs	Color of shrubbery	5	Lots of brush, brush	12
10. Grass general	Grass	4	Small green plant	9
11. Bird sounds	Bird sounds	22	No bird sounds	3
12. Grass invasive	NA	0	Japanese stilt grass	13
13. Sky	You could see sky	4	NA	0
14. Clearcut	Nice clearcut	1	Clearcut	8
15. Road	Old country, dirt road	18	Unsightly logging road	22
16. Slash	Dead trees left	1	Litter, stumps, piled	8
17. MNGT	Small thinning edge	6	Site obviously timbered	14
18. Landscape	Scenic beauty intact	44	Not aesthetic	20
19. Wildlife	Good for wildlife	5	Not much wildlife	9
20. Recreation	Room for camping	2	No space for recreation	1

the analysis of perceptions over time, allowing the researcher to better understand important transitions in visual and audio stimuli. Moment-to-moment measurements revealed the stronger effects of education on perception of scenic beauty when compared to one-time, post-video measurements.

Perhaps post-experience assessments are more prone to memory recall problems. Replication of this study with other populations is needed to extend the generalizability of the results and to better understand the complex relationships between education and perceptions of scenic beauty.

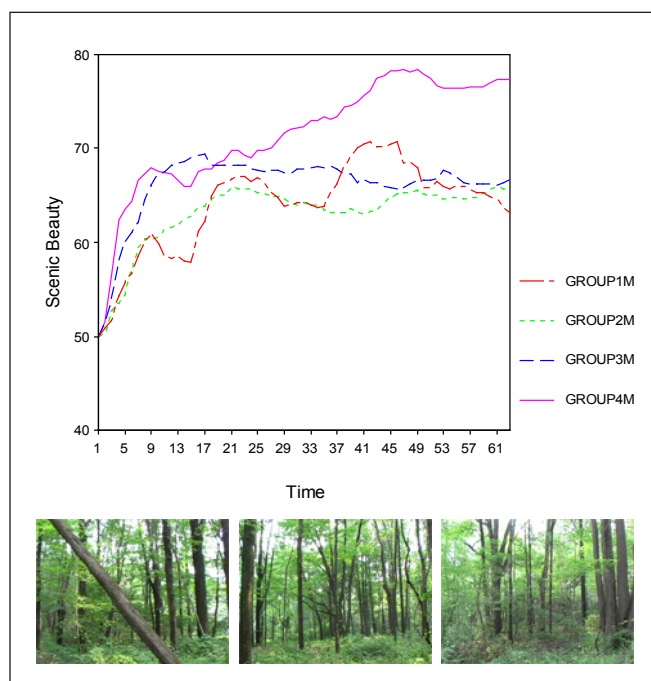


Figure 2.—Video 1: Panning through an unmanaged stand.

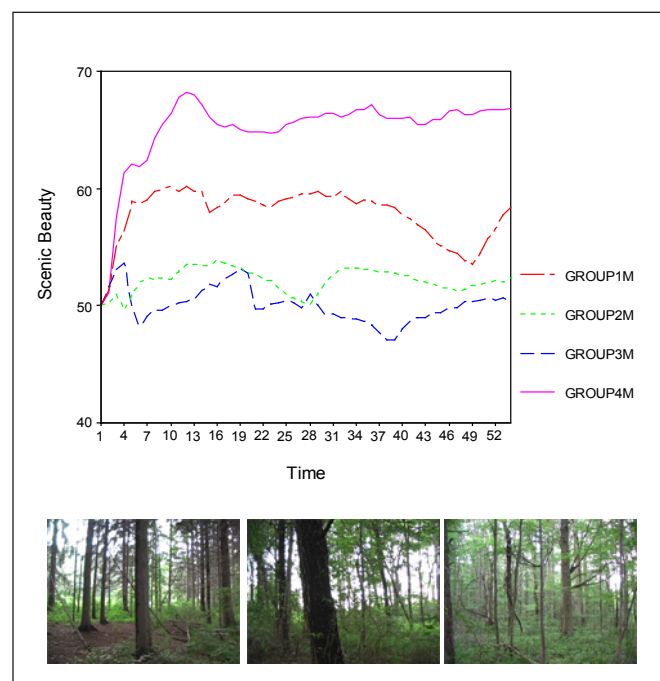


Figure 3.—Video 2: Panning from conifer plantation to natural hardwoods.

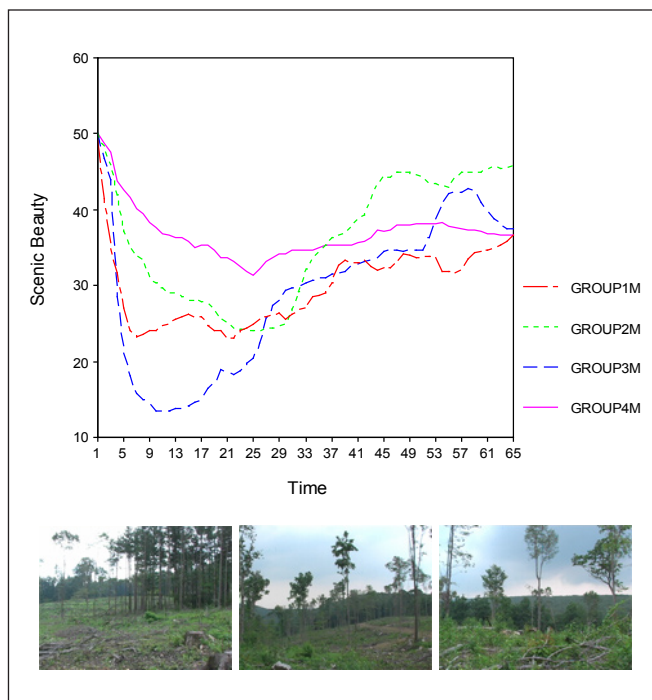


Figure 4.—Video 3: Panning from landing area to clearcut.

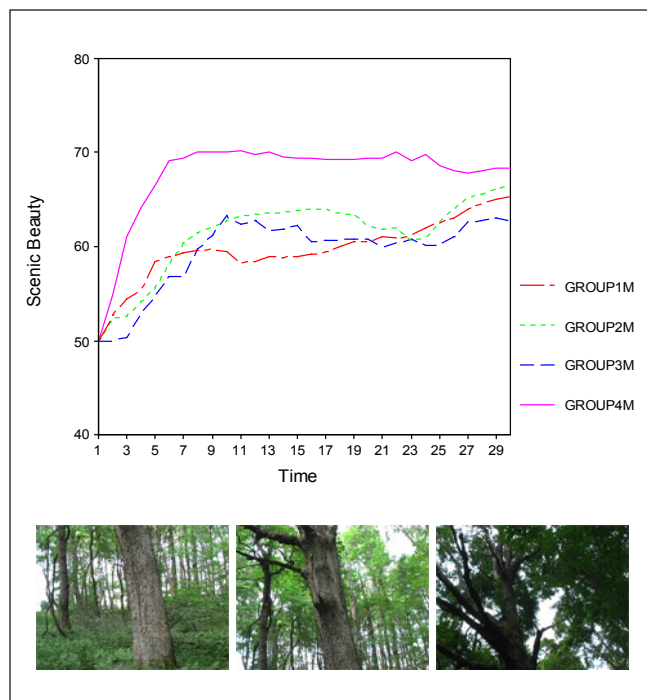


Figure 5.—Video 4: Panning up a large tree.

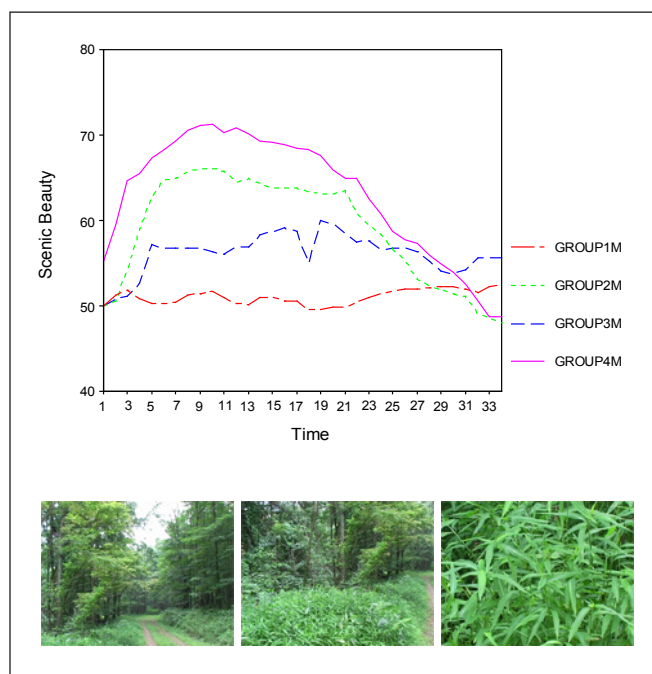


Figure 6.—Video 5: Zooming into Japanese Stilt Grass.

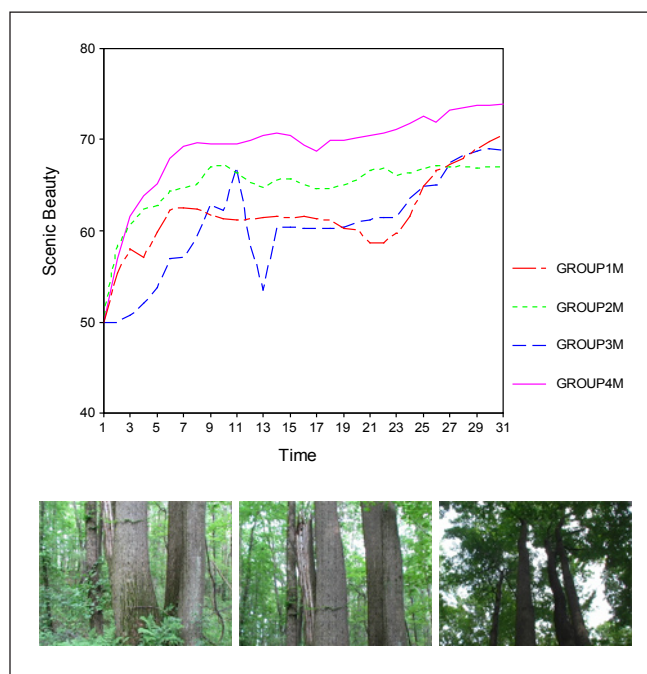


Figure 7.—Video 6: Panning up a uniform shaped tree.

6.0 CITATIONS

- Gobster, P.H. (1996). **Forest aesthetics, biodiversity, and the perceived appropriateness of ecosystem management practices.** In: M.W. Brunson, L.E. Kruger, C.B. Tyler, & S.A. Schroeder, (Eds.), *Defining social acceptability in ecosystem management: A workshop proceedings*. General Technical Report PNW-GTR- 369. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, 77-97.
- Hammit, W.E. (1981). **The familiarity-preference component of on-site recreational experiences.** *Leisure Sciences*, 4, 177-193.
- Leopold, A. (1949). **A Sand County Almanac.** New York: Oxford University Press.
- Parsons, R., & Daniel, T.C. (2002). **Good looking: In defense of scenic landscape aesthetics.** *Landscape and Urban Planning*, 60, 43-56.
- Pierskalla, C.D., & Lee, M.E. (1998). **An ecological perception model of leisure affordances.** *Leisure Sciences*, 20, 67-79.