

USER GROUP ATTITUDES TOWARD FOREST MANAGEMENT TREATMENTS ON THE SHAWNEE NATIONAL FOREST: APPLICATION OF A PHOTO-EVALUATION TECHNIQUE

Jonathan M. Cohen, Jean C. Mangun, Mae A. Davenport, and Andrew D. Carver¹

Abstract.—Diverse public opinions, competing management goals, and polarized interest groups combine with problems of scale to create a complex management arena for managers in the Central Hardwood Forest region. A mixed-methods approach that incorporated quantitative analysis of data from a photo evaluation-attitude scale survey instrument was used to assess attitudes toward forest management practices in southern Illinois. Stakeholder groups that use the Shawnee National Forest (SNF) rated color photographs of forest management treatments. Responses to three targeted management themes—trails, harvesting, and fire—were elicited by photographs paired with a semantic differential attitude measurement scale. Each theme was represented by three photographs depicting a management treatment stage. Follow-up interviews were used to acquire a greater understanding of participant knowledge level of management practices as well as beliefs underlying the photo evaluations. Study findings suggest that this survey method can be a useful tool for measuring attitudes so as to avoid conflict or litigation like that of the SNF management plan process in recent decades.

INTRODUCTION AND OBJECTIVES

Literature related to forestry and natural resources partnership building and conflict resolution seeks to understand how problems originate (McCool and Guthrie 2001, Lachapelle and others 2003, Nie 2003). Drivers of resource-based conflicts can include: resource scarcity, scientific ambiguity, policy design shortcomings, ineffective communication, lack of trust, and different valuations of place. Public land managers must integrate public voices into decision-making processes both to minimize conflict and to be in accordance with public statutes. J. Clarence Davies, Director of the Center for Risk Management in Washington D.C., states that “participatory methods [have been] institutionalized in environmental law (1998, p. 2)”. He goes on to note, however, that participatory methods have not always been effective. In many instances, attempts to foster public involvement in natural resource decisionmaking has not led to true collaboration (Smith and McDonough 2001). New strategies are needed to identify and integrate diverse perspectives about forest management practices earlier in decision-making processes (Reynolds 2002). This paper presents findings from a pilot study of a photo-evaluation technique designed to quantitatively assess and to qualitatively validate different attitudes and values held by stakeholder groups of the Shawnee National Forest (SNF) toward forest management practices.

STUDY AREA

The SNF, situated south of Illinois’ glaciated, agricultural central portion, dominates the rolling landscape of southern part of the state. The 277,506-acre forest encompasses six Illinois Natural Divisions: Coastal Plain, Lower Mississippi River Bottom Lands, Ozarks, Shawnee Hills, Southern Till Plain, and the Wabash Border Division (Illinois Department of Natural Resources 2007). Unlike the remainder of Illinois, this region is characterized by rocky terrain, rolling hills, limestone cliffs, and sandstone bluffs. The climate of

¹Graduate Research Assistant (JMC), Department of Forestry, Southern Illinois University Carbondale, Mailcode 4411, Carbondale, IL 62901; Associate Professors, Department of Forestry, Southern Illinois University Carbondale (JCM and ADC); and Assistant Professor, Department of Forestry, Southern Illinois University Carbondale (MAD); JMC is corresponding author: to contact, call (618)353-3341 or email at jcsaluki06@sbcglobal.net

southernmost Illinois supports ecosystems unique to the state such as an internationally significant wetland system. Federal holdings that comprise the SNF were acquired partially through donations to the USDA Forest Service with the balance purchased through authority granted in the Weeks Act of 1911 (Welch and Evans 2003, USDA Forest Service 2007). Due to this acquisition history, the national forest land is interspersed with private, municipal, state, and other federal lands. Although the SNF now contains some of the largest forest tracts in the state, it is one of the most fragmented units in the National Forest System.

Efforts to involve the public in SNF decisionmaking have tended to focus on local concerns. However, southern Illinois residents represent only one segment of those with a potential stake in forest management. The Shawnee National Forest lies within a half-day's drive of Memphis, TN; Louisville, KY; Indianapolis, IN; Chicago, IL; and St. Louis, MO. This location places the SNF within 350 miles of more than 45 million people, roughly 17 percent of the U.S. population (USDA Forest Service 2007). These urban areas provide a large, diverse population of users that seek out the SNF for its unique cultural and natural heritage and that greatly add to existing use by local communities (Welch and Evans 2003).

Lack of support for timber harvesting on the SNF by local environmental advocacy groups spiraled into a contentious issue in the 1990s and led to these groups seeking legal recourse. Decisions handed down by regional federal courts (*Sierra Club et al. v. USDA et al.* 1996) essentially halted most timber management on federal property in southern Illinois (Welch and Evans 2003). Reynolds (2002, p. 245) suggests that legal gridlocks of this nature could be avoided if the Forest Service substantially improved its traditional decisionmaking practices by incorporating public concerns more effectively. Today, a new SNF management plan has the potential to usher in a new period of communication and collaboration in southern Illinois.

Previous Research on Shawnee National Forest

Recent literature related to the SNF and its associated ecosystems has focused primarily on natural processes, specifically hardwood forest regeneration and application of prescribed fire (Groninger and others 2005, Ozier and others 2006, Ruffner and Groninger 2006). A notable exception was a 2003 Indiana University social assessment of SNF history, local community sociodemographics, and stakeholder viewpoints. This study (Welch and Evans 2003) addressed regional poverty, management conflicts from the 1990s, and public and stakeholder views of forest management. The study attempted to provide an in-depth understanding of the expectations and values of local residents. Many participants held complex views about forest management practices and expressed concerns about potential impacts on forest vegetation and wildlife. Welch and Evans (2003) concluded that producing a forest management plan that stakeholders can accept depends upon clarifying which management issues are most important to stakeholders prior to plan implementation. The photo-evaluation tool under development and presented in this paper is an attempt to quantify and clarify where different attitudes and values exist between managers and other forest stakeholders.

INTEGRATING PUBLIC INPUT

According to Burger (2000), management of ecosystems is a social process. Management of a complex forest ecosystem at the landscape level requires collaboration and open communication between agencies and all relevant stakeholder groups. Maintaining communication can be difficult if individuals and groups cannot find common ground upon which to build a dialogue. Social science tools can be applied to open channels of communication and to help managers and the public identify and articulate areas not only of disagreement but also of agreement. The objective of the present study is to develop a photo-evaluation



Acceptable	___:___:___:___:___:___:___	Unacceptable
Not-sustainable	___:___:___:___:___:___:___	Sustainable
Impacted	___:___:___:___:___:___:___	Pristine
Constructive	___:___:___:___:___:___:___	Destructive
Environmentally	___:___:___:___:___:___:___	Environmentally
Friendly	___:___:___:___:___:___:___	Degrading
Unpleasant	___:___:___:___:___:___:___	Pleasant

Figure 1—Prescribed fire forest treatment photograph paired with semantic differential scale.

survey protocol to measure attitudes toward specific forest management treatments. The goal is to develop a practical tool that is easy to tailor to unique management settings while also being cost effective in production and distribution.

Attitude Measurement

The present study combines two types of attitude measures: rating scales and photographic evaluation. Spector (1992) points out that summated rating scales tend to have strong reliability and validity, are generally easy to develop, and are easy to administer. Most important, their results indicate strength of feeling (Spector 1992). Summated rating scales differ from yes/no questions in that they ask participants to respond to a range of values, generally presented as five to seven choices arranged from “strongly agree” to “strongly disagree”. The semantic differential scale (Henerson and others 1987) combines a summated rating scale with bipolar adjective pairs to elicit attitudes on a given topic or “attitude object” (Fig. 1). Using a semantic differential scale maximizes the benefits of summated rating scales by “summing the summations”, adding to scale reliability. Presenting the subject with multiple adjective pairs also helps to identify which stimulus is eliciting a positive or negative attitude. Our survey instrument presents subjects with color photographs treated as attitude objects that are paired with a semantic differential scale.

Photography as a Research Tool

Recent developments in photography (e.g., disposable cameras and digital photography) have made it a viable research tool. A prominent research topic in recent visual studies is landscape appreciation through photo elicitation (Froment and Domon 2005). Stedman and others (2004) argue that photographs can be used to express meaning in a variety of natural resource settings and refer to an earlier work by Rose (2001), who wrote that photographs offer evidence of historically, culturally, and socially specific ways of seeing the world. Goin (2001) further suggests the need for researchers to move beyond considering photographs merely as support for data, but rather as expressions of ideas themselves.

Reliability and Validity

Netemeyer and others (2003) write that validity cannot be assessed directly, but rather must be determined by assessing results and comparing them against expected outcomes or existing known measures. Our protocol uses follow-up interviews and focus group discussions to assess the validity of attitude rating outcomes. Semi-structured interviews and focus groups will evaluate whether subjects actually responded to the management treatments portrayed in the survey photographs or whether their responses were based on outside influences. Reliability of our photo-evaluation attitude rating scale will be estimated through an internal consistency procedure with the Cronbach's alpha coefficient.

METHODS

Three stakeholder groups were identified through study of past national and local conflicts related to forest management issues: local environmental activists (n=11), national forest trail users (n=10), and U.S. Forest Service staff (n=10). Although any one individual may associate with multiple groups, group membership was determined by organizational rosters and mailing lists. An open-ended survey question asked with which stakeholder group the subject primarily identified.

Phase-one data collection occurred during the 2006-2007 academic year. Surveys were administered in person with the lead author, a graduate research assistant, present. Each subject (n=31) was shown nine photographs depicting three different applications of forest management practices: trails, fire, and harvesting. These applications were chosen because they represented three major management actions on the SNF. Each application was represented by three scenes depicting different stages, or impact levels, of the management treatments. Color-printed photographs were positioned above a semantic differential scale on the survey form. Participants were asked to consider each photograph carefully and then respond to bipolar terms on the attitude scale (Fig. 1).

Follow-up interviews were conducted with four respondents, randomly selected from each of the three stakeholder groups, to discuss feelings and beliefs underlying the attitudes expressed in the context of place attachment. Interview transcripts were coded and analyzed with qualitative research techniques (Strauss and Corbin 2000). In phase two of this ongoing study, these follow-up interviews will be used to assess scale validity.

Quantitative analysis involved calculating a summated attitude rating score for each management treatment photograph-semantic differential combination and then comparing ratings across stakeholder groups using one-way analysis of variance (ANOVA). Our research hypothesis predicts that different SNF stakeholder groups will hold varying attitudes toward management treatments.

Table 1.—Means and range of attitude rating scores for all groups based on treatment photograph theme (n = 31)

Treatment	Mean	Minimum	Maximum
Fire	4.64	-7	16
Harvest	5.78	-8.33	16.67
Trails	0.10	-13.33	13.67

Table 2.—ANOVA results of group differences in attitude rating scores assigned to treatment themes

		df	F	Sig.
Mean Fire Score	Between Groups	2	10.89	0.001
	Within Groups	29		
	Total	31		
Mean Harvest Score	Between Groups	2	3.72	0.036
	Within Groups	29		
	Total	31		
Mean Trails Score	Between Groups	2	1.58	0.223
	Within Groups	29		
	Total	31		

Study limitations can be posed as questions. First, are the photographs accurately eliciting attitudes related to the depicted scenes of forest management; and second, is the scale sensitive to different attitudes held by SNF stakeholder groups? Another limitation of the survey instrument is its length, which presents potential obstacles to larger-scale application. In contrast to large mail-based surveys that often experience low response rates, this pilot study had a response rate greater than 99 percent.

RESULTS

Results indicated a wide range of mean attitude rating scores across the three participating SNF stakeholder groups (Table 1). In addition to the variation in responses to each treatment theme (Table 2), the responses elicited by individual photographs also varied widely (Table 3). The variation in mean attitude rating scores and the variation between photographs and between groups demonstrated that this protocol is a viable method to measure stakeholder attitudes toward forest management. The reliability test yielded an alpha value of 0.78, indicating satisfactory scale reliability. A larger sample size is planned for phase two of this continuing study.

Attitude ratings were analyzed in two ways: first by treating each set of related management treatment photographs as a themed series with a single attitude rating (Table 2); and second, by considering the attitude rating assigned to each individual photograph (Table 3). This process is important because each stage of the pictured management treatments can look very different and attitudes elicited by one treatment may change, based on level of impact or time elapsed since disturbance. Analysis (ANOVA) of management theme data shows SNF stakeholder groups exhibit significant differences in attitudes toward scenes depicting the effects of both fire and harvest. Differences in attitudes toward harvest treatments were expected because harvesting practices on the SNF were the major source of stakeholder conflicts throughout the 1990s.

Table 3.—ANOVA results of group differences in attitude rating scores assigned to individual photographs

Photograph Content		df	Sig.
Harvest 14 years post treatment	Between Groups	2	0.243
Fire at time of treatment	Between Groups	2	0.001
Harvest 100+ years post treatment	Between Groups	2	0.415
New backcountry trail	Between Groups	2	0.352
Harvest 1 year post treatment	Between Groups	2	0.006
Degraded backcountry trail	Between Groups	2	0.077
Fire 5 years post treatment	Between Groups	2	0.022
Hardened trail surface	Between Groups	2	0.037
Fire 1 day post treatment	Between Groups	2	0.030

Variation in responses to photographs grouped as themed management series prompted analysis of each photo separately (Table 3). Of the nine treatment photographs, five elicited significantly different responses between stakeholder groups. In support of the grouped theme analysis, all three individual fire photographs elicited significantly different responses. A photograph depicting a clearcut the same year as the treatment and a photograph of a hardened trail surface, also elicited significant differences in attitudes. Further post-hoc analysis will address between-group differences.

DISCUSSION

Preliminary study findings confirm the potential of photo-evaluation techniques to assess attitudes toward forest management practices. The various SNF user groups surveyed to date were able to distinguish among different management treatments as well as different treatment stages or levels of impact. Interpretation of study findings can clearly indicate where important areas of agreement or disagreement exist between managers and other stakeholder groups. For example, although photos of timber harvest elicited significant differences when treated as a series, the only individual harvest photo to do so was that depicting a recent harvest. All stakeholder groups differed significantly on all photos of prescribed fire, both as a themed series and also when considered individually. These preliminary findings suggest that this survey method can identify socially unacceptable management practices and help managers respond to public concerns earlier in the decision-making process (Reynolds 2002). Future directions for this research project will involve a replication study with a larger sample size, assessment of the effect explanatory photo captions have on attitude ratings, and an exploration of a web-based survey version to facilitate larger-scale survey distribution.

Contemporary natural resource conflicts often revolve around stakeholder values, values that typically differ from those of managers. One solution to such “messy” problems would be adoption of a management style that better incorporates the values of all interested parties—fully—from the beginning. As previously stated, this approach can succeed only if dialogue is encouraged. The attitude measurement tool we are developing is designed to help managers identify value commonalities among stakeholder groups. The tool incorporates a questionnaire form that is relatively quick to modify and easy for participants to complete. Ultimately, creating new methods to solicit and document public input can facilitate an atmosphere of proactive response rather than mere reaction to value-based conflicts on the SNF and elsewhere.

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