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Acceptance, Acceptability, and Trust for Sagebrush Restoration Options in the Great Basin: A Longitudinal Perspective

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Abstract

In surveys of residents in three urban and three rural locations in the Great Basin we examined the social acceptability of six management practices showing promise for restoring sagebrush-dominated rangelands. Unlike most studies of range management perceptions that have relied on single measurements, we used longitudinal data from a questionnaire mailed in 2006 to residents that were resurveyed in 2010. Overall, 698 respondents comprised the panel. Respondents' self-reported levels of knowledge about the health and management of Great Basin rangelands *decreased* from 2006 to 2010. In both years, mean acceptance was greater for the use of prescribed fire, grazing, felling, and mowing, but relatively low for chaining and herbicide use. Overall, acceptability ratings were similar in 2006 and 2010 but individually about half of the acceptance responses differed between years. Practices were more acceptable to respondents who expressed greater concern about threats posed by inaction, except that the threat of wildfire was negatively associated with acceptance for prescribed burning. Acceptance was not significantly related to concern about overall health of Great Basin rangelands, or to self-reported knowledge level. Rural/urban residence and general attitudes toward environmental protection were sometimes influential, but more so in 2006 than in 2010. By far the best predictor of acceptance was trust in agencies' ability to implement the practice. In both years respondents were more likely to judge a practice acceptable than to trust agencies to use the practice. Positive or negative change in trust level was the most significant predictor of change in acceptability judgment from 2006 to 2010. Results suggest that efforts to increase acceptance of practices among Great Basin stakeholders should focus on activities designed to build trust rather than simply providing more or better information.

Key Words: fuels reduction, mail survey, public perceptions, wildfire risk

INTRODUCTION

Large fires are historically common in many ecosystems, but more recently their severity and extent, coupled with a growing wildland–urban interface, have driven up costs of suppression, devastation to private property, and rehabilitation, especially in sagebrush and ponderosa pine–dominated ecosystems (Keane et al. 2008). In sagebrush regions of the Great Basin, a number of factors—including the invasion of nonnative grasses and expansion of woody species—have converged to cause landscape-level ecosystem changes (Shinneman and Baker 2009; McIver and Brunson 2014). Some of these changes include altered fire regimes, changes in soil fertility, loss of forage production, and changes in wildlife habitat (Miller and Tausch 2001). At the same time, expanding urban areas have increased pressure on rangelands to accommodate demands for resource and amenity values, while heightening residents' exposure to wildfire and other range management issues. The values and expectations of urban residents are often in conflict with those of traditional resource-based users in range and forest landscapes (Shindler et al. 2011). Thus, land managers face a complex and interrelated set of ecological, economic, and social challenges while working to create land management strategies that are both ecologically sound and socially acceptable (Kaufmann et al. 1994; Loomis 2002; Shindler et al. 2002).

The Great Basin is one of the most sparsely populated regions in the lower 48 United States, with about 5 million people living in an area covering more than 60 million ha (Torregrosa and Devoe 2008). The regional economy has been based largely on federal contracts and employment, mining, livestock, and energy production (Soulard 2006); extractive land uses have been the norm. However, the states of Nevada, Utah, Idaho, and to a lesser extent Oregon, have had some of the nation's fastest-growing populations. Much of that growth has occurred via in-migration to metropolitan areas (Bend, Boise, Reno, and Salt Lake–Ogden–Provo) along the edges of the basin, while the region's interior remains largely in public ownership and is characterized by widely dispersed resource-dependent communities. The sagebrush steppe is said to be among the most imperiled ecosystems in North America (Mac et al. 1998; Davies et al. 2011), with more than half of the original habitat invaded by exotic annual grasses (West 2000) and more than 350 sagebrush-associated plants and animals identified as species of conservation concern (Suring et al.

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2005). Conversion of native sagebrush to exotic annual grasslands also has economic and social consequences due to an increase in catastrophic wildfire and resultant firefighting and restoration costs, as well as the potential loss of land-use opportunities if species such as greater sage-grouse (*Centrocercus urophasianus*) are listed as federally threatened (Garcia 2005). With about 70% of sagebrush habitat in the Great Basin under federal management, the restoration of sagebrush lands is a top priority for the Bureau of Land Management (BLM) and the Forest Service.

Active restoration of at-risk sagebrush communities requires management interventions that promote the success of native shrub and bunchgrass communities while reducing conifer encroachment and cheatgrass invasion (Shindler et al. 2011; McIver and Brunson 2014). Practices such as prescribed burning, mowing, mastication, and herbicide application create visible impacts and potential environmental changes that may be viewed unfavorably by some citizens (Shindler et al. 2002). To gain public support for such activities, land managers with the BLM, Forest Service, and other agencies have sought to persuade citizens of the need for restoration, and that active manipulation of rangelands is the best way to achieve it. However, these agencies have traditionally seen mixed success in garnering public support for management programs (Satyal 2006; Wilmot and Brunson 2008). Effective restoration of rangeland ecosystems will require consideration of citizens in the region and their acceptance of specific management practices, as well as confidence in the agencies to effectively implement them.

This study focuses on social acceptability—the tendency within a particular segment of the public to agree that a management practice is likely to lead to a favorable change in conditions. "Acceptability" is an attribute of a management practice or landscape condition; "acceptance" is a psychological judgment by an individual that can be aggregated to produce a measure of acceptability (Shindler et al. 2002). Social acceptability is multidimensional, depending on factors such as personal experience, relationships with organizations or individuals, values associated with a specific place, perceptions of risk, and even aesthetics (Stankey and Shindler 2006). We measured the social acceptability of six practices that have potential for restoring sagebrush ecosystems in the Great Basin that are threatened by annual grass invasion or conifer encroachment, and explored how acceptability may change over time. We also identified social and psychological factors that can influence individual judgments of acceptance and therefore affect social acceptability.

Few studies examine citizen perspectives on land management or perceptions of management agencies in rangeland ecosystems (Brunson and Tanaka 2011). Furthermore, most studies of this kind rely on a cross-sectional design, taking a snapshot of a single community or limited region at one point in time. The study presented here is longitudinal (2006–2010) in design and uses panel data from a survey of communities across the Great Basin. Longitudinal panel studies resurvey the same group of individuals (the panel) at two or more points in time (Menard 2002), enabling the researcher to more confidently make generalizations about the target population and track changes over time (Frees 2004).

No other study has taken a comprehensive, longitudinal look at communities across the Great Basin. The closest analogue is a recent longitudinal survey of residents in seven US states—including one area of the Great Basin near Salt Lake City—completed by Shindler et al. (2009). They looked at changes in public acceptance of fuel management practices, as well as trust in management agencies (among other factors) between 2002 and 2008. Similarly, Brunson and Evans (2005) used longitudinal data collected from a rural area outside of Salt Lake City to determine the impact of an escaped prescribed fire on the acceptance of fire as a management tool. Shindler and Toman (2003) also conducted a longitudinal study focused on public attitudes toward fire management programs on federal lands in eastern Washington and Oregon between 1996 and 2000.

Research has shown that trust and confidence in rangeland and forest management agencies are key factors in people's acceptance of management practices (e.g., Winter et al. 2004; van Kooten et al. 2006). Research suggests citizens' trust in agencies is influenced by their knowledge of management practices (Shindler et al. 2009), agencies' perceived competence to safely implement practices (Brunson and Evans 2005), transparency in agency communications (Wagner and Fernandez-Gimenez 2008), and the sincerity of agency communications and decision-making processes (Vaske et al. 2007). Siegrist and Cvetkovich (2000) argue that trust in authorities has greater influence on acceptance when an individual lacks knowledge about a potential hazard, but other studies have shown that knowledge, while sometimes influential, may be less important than more subjective or emotional responses (Brunson and Shindler 2004). The latter study found no relationship between acceptability judgments for fuels reduction and general environmental concern, but other researchers have found such a relationship when measuring acceptability of timber harvest practices (Ribe 2002; Ford et al. 2009). Beliefs about natural resource management often differ between urban and rural residents (e.g., Kleiven et al. 2004; Racevskis and Lupi 2006); we have seen such differences in our survey as well (Shindler et al. 2011). However, Brunson and Shindler (2004) concluded that for fuel-hazard reduction, geographic variability in beliefs reflected fire histories, land type, and other factors besides rural/urban differences.

Hypotheses

We tested six hypotheses concerning factors that previous studies have suggested could influence individual acceptance of proposed restoration and/or fuels management practices, and thereby social acceptability of those practices. To evaluate the importance of these factors in engendering *change* in acceptance—a potentially critical goal for land managers seeking to use a particular practice—we also tested whether changes in acceptance were linked to changes in the independent variables in hypotheses 1–3 and 6 below:

- H1: A restoration/fuels treatment is more likely to be judged acceptable if the individual has a higher level of concern about threats posed by inaction, such as wildfire risk, cheatgrass invasion, juniper encroachment, or overly dense sagebrush.
- H2: A restoration/fuels treatment is more likely to be judged acceptable if the individual believes the current condition of the natural environment is unhealthy.