



Breaking the mold: Integrating participatory environmental assessments and underlying narratives to expose differences in traditional stakeholder categories



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ABSTRACT

Evaluation that integrates different stakeholders' assessments of past land management actions is important to improving restoration science and practice. This integration process is often perceived as challenging because stakeholder categories are expected to have different values and assessments. This study explores these assessment differences by comparing land management ratings and underlying narratives among three traditional stakeholder categories: researchers, practitioners and land users. Stakeholders were interviewed during a participatory evaluation of past land management actions in the San Simon watershed in Arizona. Results showed that historical, cultural and science-based narratives explained some assessments, while others were in conflict. Neither assessments nor narratives were necessarily aligned with stakeholder categories. Moreover, new typologies of stakeholder categories emerged from the analysis: optimist, pessimists, pro-management and conflicted. Using common narratives to identify stakeholder typology instead of categorizing them based on traditional labels could give more information and facilitate the integration of stakeholders in environmental assessment and management.

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1. Introduction

Land degradation—or the persistent reduction of land productivity (Safriel et al., 2005)—has been and remains a major challenge in drylands. For centuries, humans have attempted to maintain, recover or increase the productivity of drylands through a combination of soil, water, vegetation and livestock management actions. Examples of these land restoration management programs (land management hereafter) that were implemented over 50 years ago include the *Pinus halepensis* forestations in the Mediterranean in the first decade of the 1900s (Bautista et al., 2010) and the *Eragrostis lehmanniana* seeding in southwestern U.S. in the 1940s (Allen, 1995). Assessment of these older land management projects is essential to improving restoration science and current land

management methods. Unfortunately, efforts to assess the impact of past land management programs over the long term have been limited (Bautista et al., 2009).

Another valuable but uncommon practice in the assessment of past land management projects is the integration of different stakeholders' knowledge and experiences (Bautista and Orr, 2011; Whitfield and Reed, 2012). Restoration literature mentions that successfully restoring and managing landscapes involves not only science but also the values and perceptions people have about their local environments, including the original components, features, and/or functions they perceive their environments should provide (Robertson et al., 2000; Clewell and Rieger 1996; Moreira et al., 2006). However, identifying these qualities in landscapes that have undergone decades or centuries of human use and disturbance is often arbitrary and complicated (Farina, 1998; Jackson and Hobbs, 2009). For example, in the southwestern U.S., due to the limited historical documentation of pre-European ecological conditions and the open range cattle boom of the 1890's, common portrayals of pre-disturbance conditions come from traveler

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descriptions, hagiographic biographies, cowboy tales, etc. that were written at the turn of the 20th century (Sayre, 2006). In such contexts, a combination of local and scientific knowledge is not only important, but crucial to understanding the project under assessment. Furthermore, understanding how through centuries humans have transformed the environment into landscapes for their use is important to comprehend the existence of different local views and contextualize dynamic changes observed in our managed ecosystems (Balée, 1998; Swetnam et al., 1999).

Nevertheless, the participation of stakeholders is perceived as a challenge, in part due to defined differences between local and scientific knowledge (Berkus et al., 2006; Robinson and Wallington, 2012). Local knowledge is understood to be based on firsthand evidence, common sense, casual empiricism, life experience, intuition and oral storytelling (Corburn, 2003). Expert or scientific knowledge is generally reductionist, based on quantitative data, generalizable rules (Failing et al., 2007) and can be replicated and validated through a process of academic peer review of recognized experts (Zermoglio et al., 2005). Uncertainties about local knowledge and its potential integration with expert or scientific knowledge are also perceived as challenges in restoration science and are likely reasons for not having included more diverse types of stakeholders in the implementation and assessment of land restoration and management. The ideal situation is having scientists generating and refining crucial ecological knowledge and the users of ecological restoration (practitioners, land managers, land users) putting that science into practice, exchange insights with the scientists, to test and improve theories (Cabin et al., 2010). Nonetheless, in the practice these producers and users of science are not only are not working together mainly due to misunderstanding of each other's perspectives, lack of communication and lack of value of the importance of one another (Clewell and Rieger, 1997; Cabin, 2011).

Information on the perceptions of degradation and the cultural value held by local people can be captured by the study of environmental narratives (Popper and Popper, 1996; Farina, 1998; Moreira et al., 2006). Environmental narratives are a combination of observations, stories, knowledge and experience people share about both the biophysical and cultural context of a region (Hinchman and Hinchman, 1997). Narratives in the social sciences represent the basic way we humans select, organize and connect events that we later use to communicate, explain preferences, make sense of the world around us and sometimes even change it (Riessman, 2003; Ingram, 2014). The study of narratives has been used in environmental management to understand how problems are understood by different stakeholders and how this may affect management strategies and generate conflicts (e.g. Robbins et al., 2007; Harris, 2009; Bixler, 2013).

The objective of this study is to explore the perceived challenge of integrating different stakeholders in land management assessments by identifying the existence of commonalities among stakeholders from three traditional stakeholder categories (researchers, practitioners and land users). This was done by exploring the relationship between the assessments and the types of narratives provided by members of each category. In the context of this research, assessments are the specific numerical ratings provided by stakeholders while narratives are defined as descriptions based on beliefs, values, perceptions, personal experience (including academic experience), observations and/or oral history used to justify or explain a preference for a specific land management practice. Based on the difference between scientific and local knowledge, there is a general assumption that stakeholders from these pre-defined categories may have commonalities in both how they perceive the landscape and the types of narratives they use to justify their preferences and assess past land management. Because narratives are not only connected to values and perceptions but

also to experience and observation, it would be expected that stakeholders with local knowledge will make more frequent use of locally relevant historic chronicles and culturally shared experiences. In contrast, stakeholders with scientific or academic backgrounds may be more inclined to use other types of narratives or justifications based on scientific documentation and data.

These assessments and narratives were contributed by stakeholders during a participatory evaluation of past land management in the San Simon watershed in Arizona (U.S.) in 2013. Commonalities between members of the same stakeholder category were determined by: 1) comparing the land management assessments (ratings) within and across stakeholder categories; 2) identifying the common narratives used by the different stakeholders; and 3) examining the relationship between stakeholder category, their narratives and their land management assessments. Exploring these assessments and what underlies them helps us understand what stakeholders have in common, on which topics they diverge, and whether new typologies that go beyond traditional stakeholder categories might emerge.

2. Methods

2.1. Study area

The San Simon valley is located in southeastern Arizona and southwestern New Mexico, approximately 50 km from the U.S.–Mexico border (Fig. 1). The valley is marked by the north-flowing San Simon River, which is a major ephemeral tributary of the Gila River that provides irrigation water for an important farming area in Arizona. The San Simon watershed is large (5827 km²) and complex in terms of land tenure and vegetation communities. Approximately 41% of the watershed is managed by the U.S. Bureau of Land Management (BLM), while the rest is comprised of State Trust land (26%), private land (19%) and U.S. Forest Service land (13%). The calcareous loam and clay loam soils found in the watershed are of alluvium origin and are prone to down-cutting and arroyo formation—the conversion of broad valley floors into continuously entrenched stream channels (Bull, 1996; Cook and Reeves, 1976). This study focuses on the northern half of the watershed, which encompasses areas of Chihuahuan–Sonoran Desert shrublands (elevation 800–1200 m; mean annual precipitation 200–300 mm) and Chihuahuan–Sonoran Semidesert grasslands (elevation 975–1525 m; mean annual precipitation 300–400 mm) (USDA & WRRC, 2007).

The history of land use and environmental change in the San Simon watershed is common to many similar landscapes in the Southwestern U.S. Historical descriptions suggest that prior to European settlement, the watershed contained a perennial river and was dominated by grasslands, meadows, marshes and perennial grasses, which were heavily grazed in the 1890s (e.g., Barnes, 1936; Williamson, 1939). Other descriptions from the same period do not account for expansive grasslands or the presence of perennial water and willows in the San Simon River (Emory, 1857: 67; Hodge, 1962). With such scant and often contradicting historical descriptions, it is unclear if these grasslands were mythical, real or observations that were limited to a specific location or time, such as after a large rainfall event. What can be confirmed is that the existence of favorable soil and vegetation conditions attracted settlers, stockmen and farmers in the 1880s who transformed the valley into a production-based landscape (Jordan and Maynard, 1970) that was supported by railroad construction and the channelization of the San Simon River to protect farmland from flooding (Williamson, 1939).

At the turn of the century, a combination of climatic events and anthropogenic factors resulted in a decrease of grasslands, invasion

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