Developers of Ecological Site Description Find Benefits in Diverse Collaborations

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On the Ground

- Ecological site descriptions (ESDs) are intended to provide the best available information relevant to a particular type of land and therefore should draw on multiple sources of information and expertise.
- We surveyed participants from 16 interagency ESD projects to understand better the process, benefits, challenges, and keys to success for collaborative ESD development.
- Collaborative ESD development involves federal and state agencies, universities, nongovernmental organizations, private landowners, and consultants and provides perceived benefits that greatly outweigh the challenges.
- The results of this study may improve the transparency and credibility of ESD development by encouraging the inclusion of diverse stakeholders.

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Ecological site description (ESD) development should involve a broad array of experts. Range science is an inherently integrative discipline, drawing from related disciplines, such as soil science, ecology, animal science, and biology, to name just a few. The interdisciplinary nature of rangeland ecology and management is exemplified by the emergence of ESDs as fundamental references for decision making and research. ESDs summarize and compare the relative importance of soils, climate, hydrology, and physiography in determining the potential vegetation, disturbance regimes, and community dynamics of distinctive rangeland types (Abbott, 2014). Not only are ESDs used to distinguish land types based on site potential, but they also include interpretations for wildlife, livestock, hydrology, and various ecosystem products as well as services associated with a specific ecological site (NRCS). The state-and-transition model (STM) included in each ESD, when based on sound information, can be particularly useful for integrating information across disciplines and evaluating the effects of ecological change. ESDs are increasingly considered a common currency for land interpretations among agencies and disciplines (Bestelmeyer and Brown, 2010).

The ESD information system serves as an on-line reference library intended to put the best available information, relevant to a particular type of land, into the hands of end users (Brown and MacLeod, 2011). Indeed, the ESD information system holds great promise to help bridge the gap between science (generation of information) and management (application of information), especially when managers and scientists come together to coproduce the knowledge included in ESDs. Processes of knowledge coproduction are gaining acceptance in ecological and conservation disciplines as the benefits of engaging multiple knowledge holders are recognized (Roux et al., 2006). Yet the process of developing ESDs that effectively capture, organize, and deliver high-quality information from multiple disciplines and stakeholders is not well understood.

Challenges and Questions

The task of integrating information across disciplines is complicated by the diversity of data types and sources, the complexity of natural systems, the involvement of the right people in the right ways, and the sheer scope of describing many thousands of different land types individually. Moreover, the general lack of research and monitoring data in many places necessitates the use of professional and local knowledge in ESD development, which suggests that no individual person, agency, or discipline can adequately develop ESDs without substantial inputs from a diversity of collaborative partners. Further, interviews with STM creators and users (Knapp et al., 2011a), as well as a recent review of STMs in the Ecological Site Information System database (Twidwell et al., 2013), raise concerns about the consistency of STM

development approaches and terminologies and the potential overemphasis on grazing as the dominant process and livestock production as the major service depicted in many current STMs. Involving end users in the ESD development process, as well as scientists and professionals, has been shown to augment scientific understanding with local knowledge, increased awareness, and "buy-in" of ESDs and STMs as valuable management resources and to increase the likelihood of their use to guide assessment, management, and monitoring of rangelands (Knapp et al., 2011b). Bringing diverse disciplines together may also help to broaden the focus of STMs to consider other disturbance regimes, management practices, and ecosystem benefits (Fig. 1).

In an effort to understand better the process of collaborative ESD development, we surveyed individuals currently involved in interagency and interdisciplinary projects that include some aspect of ESD development. The guiding questions of this research are: 1) Who participates in collaborative ESD development and what roles do they play? 2) What tangible outputs do these collaborative groups produce? 3) What are the perceived benefits, challenges, and keys to success of collaborative ESD projects? and 4) How can we increase the occurrence and effectiveness of collaborative ESD development for improved ESD products in the future?

Our Survey

We identified as many interagency and interdisciplinary ESD development projects as possible through e-mail solicitations to known ESD leaders and developers. Some of the projects we identified represent formal interagency agreements, whereas others represent informal collaborative efforts. We sent a short questionnaire containing open-ended (qualitative) and closed-ended (quantitative) questions to participants in 16 different projects and asked the recipients to forward the survey to others involved in collaborative ESD projects (i.e., snowball sample). By January 2013, we had received 23 survey responses representing 16 different collaborative ESD development projects. Quantitative responses were summarized as frequencies, and qualitative responses were coded and synthesized for common themes.

It is important to note that these results do not provide an objective assessment of the quality or credibility of the ESDs that resulted from the collaborative processes included in the survey. However, the results objectively report the participants, roles, and tangible outputs of these processes as well as the respondents' subjective perceptions of the benefits and challenges of collaborative ESD development. Further, because we do not know how many collaborative ESD projects have taken place, we cannot assess how representative our sample is. Although the number of projects and respondents is small, the number of projects may represent a large proportion of collaborative ESD efforts.

Who Is Involved?

Current collaborative ESD development efforts involve federal and state agencies, universities, nongovernmental organizations (NGOs), and private landowners and consultants. The various groups tend to fill different roles in ESD development projects, as summarized in Table 1. The Natural Resources Conservation Service (NRCS), which has historically taken the lead in ESD development, is involved in all 16 of the collaborative ESD projects surveyed. The NRCS is typically involved in most aspects of collaborative ESD projects by fulfilling many of the project roles identified by the survey, with the exception of directly funding the projects. The Agricultural Research Service and researchers from various universities are each involved in 10 of 16 projects and fill similar roles by providing scientific knowledge and

Fig. 1. Interagency field discussion at an ecological site in Montana. Photo courtesy of Eva Muller.