Home on a Transitioning Range: A Ranch Simulation Game Demonstrating STMs

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State-and-transitions models (STMs) are becoming a preferred method for monitoring rangeland ecosystems and a key input in adaptive management strategies. Yet, land managers do not readily adopt these tools. In this article, we suggest a creative means for increasing awareness of STMs through active participation in a ranch management game accompanying an STM workshop. Recent evaluations indicate successful transmission of key concepts, but adoption of STMs will take time to measure. We review the impetus for developing the STM game, describe the workshop/simulation game structure, and conclude with notable limitations and next steps.

The New Approach: STMs and Economic Outcomes

Have you ever wished that you had a road map to monitor and adaptively manage changes to your rangelands? STMs are conceptual models or “road maps” of ecosystem change based on site-specific information. The utility of STMs is widely recognized among natural resource agencies. In 2010, the USDA Natural Resource Conservation Service, US Forest Service, and Bureau of Land Management signed a memorandum of understanding agreeing that STMs would be the standard basis for rangeland evaluation and monitoring.

Knowledge of ecosystem dynamics is never complete, so STMs represent working hypotheses that are revised as new knowledge is gained through adaptive management. In fact, STMs are an important adaptive management tool—they clearly represent how a given ecosystem responds to different management and environmental factors. As new knowledge is gained through management and monitoring, this information can be used to update STMs. STMs are being coupled with ranch economics to evaluate stocking decisions, forage purchases, and managing lands for wildlife.

As with any rangeland management innovation, a significant gap exists between awareness and application of STMs. In a recent survey of 411 ranchers in several Colorado and Wyoming counties, Kelley found that a majority of ranchers had never heard of (69%) or used (98%) STMs. Although most of the 312 natural resource professionals surveyed had heard of STMs (76%), most had never used them (69%). To the adult learner, STMs can represent new knowledge and a paradigm shift in rangeland monitoring and adaptive management. The challenge is to transfer this knowledge—both site-specific ecological site descriptions (ESDs) and the broader STM framework—to land managers in a manner that is both engaging and contextually relevant. Our approach is asking adult learners in an extension workshop to “play” at managing a ranch with STMs.

An Innovative Game and STM Workshop

We create a cooperative learning environment with the S&T Ranch game, which is a ranch simulation game executed in an Excel workbook. The game is the centerpiece of an STM extension workshop connecting ecological monitoring, economic outcomes, and adaptive management.

Workshop Design

Workshops are open to the public and advertised via targeted e-mailing. Delivery is best with smaller groups (20 to 30 adults), organized with local direction and input of an extension agent, and comprised of mixed clientele: ranchers, educators, agency personnel, and researchers. Workshop duration is between 3 and 4 hours but can be shortened. The physical location is a standard meeting room, but sufficient space is needed for laptop computers with two to three participants stationed at each computer. These participants are grouped together as a management team. The workshop experience has four distinct phases: i) welcome/introductions; ii) introduction to ESDs and STMs, iii) playing the ranch simulation game and repeating the simulation as time permits, and iv) debriefing the game experience and linking it to the workshop objectives. The introduction, game playing, and debriefing create an experiential learning opportunity.