



Cattle Producer's Handbook

Range and Pasture Section

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An Introduction to Using Ecological Site Descriptions as a Management Tool

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The concept of “site” has been a fundamental premise in rangeland management and monitoring programs for nearly as long as range science has been recognized as a formal discipline. How many times have you heard a rangeland scientist describe the findings of a study by saying vegetation response to some treatment was “site-specific” or “varied by site”? Or, perhaps when seeking advice from rangeland specialists on range plantings, their recommendations vary depending on site characteristics (i.e., soils, climate, topography, etc.)?

This is because vegetation response to management practices and natural disturbances can vary depending on the soils, topography, and climate. Therefore, dividing landscapes into units (i.e., sites) based on similarities in soils, topography, and climate to predict the response of vegetation and related resources to management actions and disturbances is a particularly valuable tool in rangeland management. The goals of this fact sheet are to better define the concept of ecological sites, demonstrate their usefulness in land management, and describe how to access and use their associated information.

Why should we concern ourselves with dividing landscapes into basic units?

Dividing landscapes into basic units (i.e., sites) for management allows the recognition and communication of meaningful and recurring differences in vegetation, soils, and ecological processes within different parts of a landscape (Brown 2010). Landscapes are not a random collection of soils, plants, and animals that respond in unpredictable ways to management inputs. Rather, there are recurring patterns and organization in their relationships that allow us to form reasonable expectations for productivity and response to management depending on site characteristics. In other words,

thinking about rangeland landscapes as a collection of sites allows recognition that goals and expectations for land should not be the same everywhere, and offers a means to specify with some precision what those different expectations should look like (Bestelmeyer and Brown 2010).

What are ecological sites?

Like many approaches to rangeland management, the concept of site has evolved over time as science has improved our ability to divide rangeland landscapes into units meaningful for management and evaluation. The latest evolution of the concept has been a transition to the use of ecological sites, defined as “a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation, and in its ability to respond to management actions and natural disturbances” (draft Interagency Ecological Site Handbook for Rangelands). In other words, ecological sites are part of a land classification system that allows the division of landscapes into basic units for study, evaluation, and management (USDA-NRCS 2003).

How are ecological sites defined on the landscape?

The process of defining ecological sites on the landscape begins by dividing landscapes into what are referred to as Major Land Resource Areas (MLRA) used within the USDA-NRCS. MLRAs are regional divisions of the U.S. based on major soil patterns, climate, and land use. The U.S. is divided into approximately 300 MLRAs. Ecological sites, heavily tied to soils, are then identified and described within each MLRA.

Fig. 1 shows an example of the spatial relationship between MLRAs, mapped soil series, and ecological