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A site-based approach to delivering rangeland ecosystem services

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The Rangeland Journal 33(2) 99-108 <http://dx.doi.org/10.1071/RJ11006>
Submitted: 8 February 2011 Accepted: 9 April 2011 Published: 22 June 2011

Abstract

Rangeland ecosystems are capable of providing an array of ecosystem services important to the wellbeing of society. Some of these services (e.g. meat, fibre) are transported to markets and their quantity, quality and value are established via a set of widely accepted standards. Other services (e.g. climate mitigation, water quality, wildlife habitat) do not leave the land, but are, in fact, most valuable when they remain *in situ*. Determining their quantity, quality and value presents a challenge that must be met if there is to be a credible, accessible ecosystem services market for rangelands. In this paper we describe some of the ecosystem services that may be extracted from rangelands, discuss their unique ecological nature and relate those unique ecological properties to soil and vegetation attributes that can serve as a basis for measurement, both quality and quantity. We suggest the use of a soil/vegetation-based system in which similar climate, geomorphology and edaphic properties are grouped into ecological sites based on their response to disturbance. Within each ecological site, a unique state and transition model describes the dynamics of vegetation and soil surface properties, provides state indicators (vegetation structure, soil properties), predicts ecosystem services that may be derived at multiple scales, and organises information related to management to achieve ecosystem service objectives, including sustainability.

Additional keywords: ecological site descriptions, state-and-transition models, environmental markets.

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