Knowledge in Practice: Exploring Rancher's Ecological Knowledge in NW Colorado

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Introduction Rangelands comprise nearly 80% of the western United States , yet little is known about local knowledge of these systems or how this knowledge might contribute to understanding and improved management of Western rangelands . Local knowledge is knowledge integrally linked with the lives of people , always produced in dynamic interactions among humans and between humans and nature , and constantly changing" (Agrawal , 1995) . Despite the interest in and research on pastoralist knowledge in indigenous communities and developing countries , there are few studies of rancher knowledge in more developed countries (Belgrave *et al* . , 1990 ; Garden *et al* . , 2000 ; Strang , 2004) . This study focuses on rancher knowledge in a single watershed and its surroundings in northwest Colorado , USA . Our primary objectives in this exploratory , place-based study were to 1) learn how ranchers in this location acquire ecological knowledge , 2) document and analyze the substance and breadth of that knowledge , and 3) analyze the distribution and variation of knowledge among ranchers within a specific watershed .

Materials and methods We completed 26 semi-structured interviews and 11 field interviews with ranchers . All interviews were audio recorded , transcribed and coded using NVIVO qualitative data analysis software . For a quantitative assessment of knowledge claims we tallied both the number of quotes regarding different subjects and the number of ranchers who addressed each subject . In addition , we used qualitative coding to understand the nature and quality of rancher knowledge and the consensus between ranchers .

Results and discussion Ranchers identified experience as the primary way they gained their knowledge , although they also discussed the importance of social interactions and formal education . Interviews with ranchers revealed three primary categories of rancher knowledge : active knowledge gained through management of natural systems for productivity , diffuse knowledge gained through living in a particular place , and knowledge of the connections between human and natural systems . Strengths of local knowledge included the wide range of knowledge , insight into interconnections between human , and natural systems , and knowledge of management actions . Weaknesses included the variation in and disagreement about knowledge within the ranching community , the predominately management focus , and the reluctance to change management practices . We found that community referrals were the best way to locate the most knowledgeable ranchers . We also found that not all ranchers were equally able to put their knowledge into practice : larger ranchers had more flexibility in management , whereas smaller ranchers were more restricted in their management choices .

Conclusions Local knowledge in the western USA has often been dismissed or overlooked in scientific range management , land use planning , and research . This study illustrates the potential for local knowledge to inform extension and technical assistance efforts , provide insight into sustainable land management , and offer rancher perceptions of ecological processes to be tested by researchers . Although ranchers may be a valuable source of knowledge about rangelands , their knowledge must be used with caution due to its heterogeneity , and its focus on productivity and management . Using community referrals offers a potentially effective way to find the most knowledgeable community members . Interviews suggested that rancher knowledge is embedded in their experiences and it is often difficult for ranchers to communicate their knowledge . Ranchers also may feel hesitant to speak about things they know but cannot apply on their landscapes . Research is needed to understand the best way to elicit rancher knowledge and weigh quality of knowledge claims in order that western landscapes can benefit from a more complete understanding of natural systems and management motivations .

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