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Dr. Kris Havstad (left) explains new rangeland monitoring processes at a workshop sponsored by the Quivira Coalition, on a ranch near Quemado, N.M.

–Courtney White photo

Reseachers at the Jornada Experimental Range found Corriollo cattle from Mexico are best at rustling up forage on arid lands

By Courtney White
for Headwaters News

Editor's Note: *This is the second of a two-part series on the work done at the U.S. Department of Agricluture's Jornada Experimental Range in Las Cruces, N.M.*

What role might livestock play in this emerging concern for sustainability?

At the Jornada Experimental Range, this question is very much on the mind of Dr. Ed Frederickson.

For starters, he wants to know how beef cattle use landscapes and what their impacts are over time.

"It's an interesting question, in part, because there really aren't any specific answers," said Frederickson. "Like most ecological questions, every component of the system being studied is changing at various rates. The situation is never the same at any two points in time.

Animals are learning, their social interactions constantly shifting, and physiological needs are adjusting to varying internal and external conditions every moment. Likewise, their environment is even more dynamic."

Why research a question to which there are no answers?

Frederickson cites Simon Levin's book "Fragile Dominion" in which the first commandment of environmental management is to "reduce uncertainty."

"In a world of increasing energy costs, and human competition for grains, an animal that can rustle up its own grub might be just what the industry needs."
– Dr. Ed Frederickson, USDA Jornada Experimental Range

Courtney White writes a monthly column for Headwaters News that focuses on people who embrace a sustainable approach to western resources.

White is executive director of the Quivira Coalition, a Santa Fe-based group devoted to collaboration as the approach to an ecologically healthy region.

Much of Quivira's emphasis is on ranching, but its principles of education, cooperation and innovation apply to many of the region's biggest issues.

comment on this column

It's the same reason we watch the weather forecast on TV – for peek at the future. Increased certainty allows land managers of all stripes to make decisions that will have more reliable outcomes, which increases our ability to achieve sustainability.

However, as Frederickson notes, we should be aware of Levine's second law of environmental management: "expect surprise."

The uncertainty Frederickson is trying to reduce specifically is how livestock alter landscape soil nutrients and seed distribution.

This is important, according to Frederickson, because research has demonstrated that livestock hastened the conversion of 94 million acres of desert grassland in the United States into mesquite shrubland not simply through overgrazing, but also through seed dispersal.

"This research permits modelers like Deb Peters and Sandy Tartowski in our group to use modeling to detect emergent ecological patterns or properties and predict future landscape directions given a range of potential scenarios," said Frederickson, "which will allow us to determine how grazing animals shape plant communities."

There's another question on Frederickson's mind: what is the best cow for arid ecosystems?

He suspects that Criollo cattle – a lighter animal adapted to arid lands and brought to the Southwest over 450 years ago by the Spanish – may be the answer.

"My interest in these animals began while reading a ranching magazine published early in the last century," said Frederickson. "In this publication, a rancher was concerned about bringing Hereford cattle into New Mexico since the little Spanish cattle could "rustle up grub" better than any other cow he'd seen.

In a world of increasing energy costs, and human competition for grains, an animal that can rustle up its own grub might be just what the industry needs."

To find out, Frederickson and Mexican researchers selected semi-wild Criollo cattle from the Copper Canyon country of northern Mexico and brought them to the JER.

The goal is to understand what behavioral and physiological traits allow Criollo to persist in arid environments. For instance, does their relative 'wildness' give them an adaptive advantage when it comes to disease?

He also wonders what role Criollo cattle might play in the development of alternative livestock production systems that fit desert environments.

Could they be good "'grassfed' animals that might become a part of the burgeoning health food market?

All of this leads Frederickson to a philosophical thought:

"I believe my primary role is to discover and organize knowledge, then to share this knowledge with others."

Frederickson's goal is to help entrepreneurs with new knowledge – though he'll leave the entrepreneurship to the experts.

"Prescriptive, or rigid, production systems lead to greater dependency on others and ultimately fragile systems," he said.

"Knowledge-based systems lead to creativity and a greater ability to adapt to change. This is important.

While the beef cattle industry in the United States is highly efficient, it also has become increasingly centralized and rigid. This leads to a system that is vulnerable to collapse in response to catastrophic events.

By promoting increased entrepreneurship, the system will become more diverse and increasingly modular with time; thus, it will be more resilient."

In a sense, the circle is closed: resiliency is also the key to ecological integrity, which is the foundation for economic sustainability.

Landscape Scale

Being useful means not sitting still for very long. In the case of the JER, this means tackling new, and pressing, frontiers, including how ecological processes work at landscape scales, how to effectively conduct restoration, understanding the ecological effects of land fragmentation, and continuing to explore how to mesh ecological flexibility with economic flexibility.

To accomplish these goals the scientists at the JER are taking an increasingly collaborative approach.

Under Havstad's direction, for example, all the scientists convene regularly in order to share their latest research as it pertains to overarching issues, such as developing land health indicators that work at landscape scales.

"You work for the good of the group," said Jeff Herrick. "To the extent possible, egos are jettisoned. Collaboration is the new paradigm."

All the researchers at the JER understand, of course, that collaboration is also the key to getting anything done on the ground at landscape scales in the West.

"Fifteen years ago the question to us was: tell me how rangelands work," said Havstad. "Today, the question we get asked is: how do we restore and maintain these systems?"

That means people. Which means collaboration. And economics.

"What we've learned is that the trouble has not been with the tools," continued Havstad, "but how we have used them without a landscape ecological perspective.

But that's changing. There's a movement now – it's not just scientists. Politicians are talking about it, so are business leaders. It's going global too.

"To be truly sustainable, we must be educated and practiced observers of our environment."

– Dr. Kris Havstad

Range health manuals are being translated into Mandarin and Mongolian as we speak."

Naiveté isn't an issue: everyone knows it will be difficult to accomplish landscape scale restoration, if, for no other reason, the challenge we all face from the long tradition of managing the West by "fractions" as Havstad puts

it – meaning the fragmentation of lands among various private, state, tribal and federal owners.

But this too is changing as tools such as grassbanks, for example, allow management to be coordinated over larger landscapes. And there is little doubt that the JER will be right in the thick of this change as well, being useful.

Since indicators are such an important part of the JER's effectiveness, here is an indicator that I like to use when contemplating their success: when I first met Kris, Jeff, and Ed they worked out of trailers in a parking lot on the New Mexico State University campus. And there were only eighteen people involved.

Today, the JER resides in a large spiffy building and has over 80 people employed or associated with it.

This type of growth doesn't happen by accident, or simply by effective lobbying. It happened because people are beginning to understand, thanks to the work of the JER scientists and others, that land health is the foundation to social and economic health.

It might start with soil, grass, and water, but it includes us as well.

Or as Kris Havstad put it: "To be truly sustainable, we must be educated and practiced observers of our environment."

Read the first part of the Jornada Range Experiment series.

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back to top | to page 1
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