



WATCHING THE

Rangeland monitoring is critical for long-term management success.

ONE OF THE GREAT BEAUTIES of the beef-cattle production system is that cattle, as grazing animals, are good for the land.

Naturally, grazing too many cattle, grazing for too long or grazing at the wrong time can deplete pastures and rangelands. But properly managed grazing sustains grasslands, supporting healthy, diverse and productive plant communities while producing food for the world.

The key to long-term rangeland health and sustainability, though, is proper grazing management.

And the only way to make informed and objective management decisions is to know the condition of the range, and its response to management, through monitoring.

Colorado State University range scientist Paul Meiman defines monitoring as an evaluation process used by animal and natural-resource managers to help determine how rangeland or pasture systems respond to management. Management objectives, he says, allow relevant and useful analysis and interpretation of monitoring data.



GRASS GROW

BY JOHN MADAY

DECIDE WHY TO MONITOR

Before addressing the what, when and how of monitoring grazing lands, Meiman says it is important to establish why you would implement a monitoring program. He lists four common reasons identified by people involved in monitoring:

1. Improve credibility.
2. Increase the value of the ranching operation.
3. Ability to maintain or increase permitted grazing use.
4. Ability to improve management.

Charlie Orchard, founder of Land EKG, a range monitoring, training and management consulting company based in Bozeman, Mont., also lists those reasons and adds one more — carbon sequestration. As trading in carbon credits becomes more common, he says, ranchers potentially can earn income for storing carbon in rangeland plants and soil. But, he says, they will need monitoring data to show that their management systems succeed in preserving the resource.

Meiman says producers sometimes object to

Standardized measurements of plant cover in a pasture can identify trends from season to season. An increase in bare ground suggests a need for lower stocking rates or longer rest periods.

APPLYING DATA TO DECISIONS

Charlie Orchard offers the following guidelines for adjusting grazing management based on observations in your monitoring program.

■ An increase in bare ground with less basal cover suggests moving to shorter grazing periods and longer rest in the pasture.

■ Decreased litter cover indicates stocking rates are too heavy.

■ An abundance of standing residual forage but not much plant litter in contact with the ground suggests a need for higher stocking density. Grazing activity will break the plants down, providing better soil cover, water retention, seed germination and growth.

■ If the plant community is declining, with less species diversity, change the season of use or use longer rest/recovery periods.

■ If overall forage production is decreasing, reduce stocking rates and increase opportunity for plant growth.

■ Use grazing impact to manage broadleaf weeds or undesirable annual grasses such as cheat grass. Orchard notes that some of these plants make good forage if used at the proper time. In pasture infested with cheat grass or other weeds, stock heavily early in the season. Then use a long rest period to allow cool-season perennials to take hold.

implementing a monitoring program, fearing the process could reveal problems or raise red flags with land managers or landlords. But, he says, if there are significant problems, they probably are not secrets. Monitoring gives you a chance to address problems before others even become aware of them.

Other common objections include lack of time, help or knowledge of monitoring methods. To solve those problems, he says, producers just need to set their priorities. "In many cases," he says, "the best time to start monitoring was 10 years ago, but the second-best time is right now."

BEGIN THE PROCESS

Once you have decided to start a monitoring program, Meiman says, determine who should be involved. On private land, the landowner might be the only one to make decisions regarding monitoring and the program's objectives. On leased land, the landowner and lessee need to work together and agree on objectives. Likewise on public land, the permittee needs to work with representatives of the appropriate government agency. In either case, there can be some benefit to bringing in an independent third party to help design the program and evaluate results.

The next and perhaps most important step toward a successful program is to set objectives for both management and monitoring, Meiman says. These objectives should describe the desired condition of the land resource over time. Monitoring helps verify that management objectives are met or that management decisions result in progress toward meeting those objectives.

Only after objectives are defined can you effectively determine the types of information to collect — what, when and where to monitor. Meiman says monitoring provides information that can support both short- and long-term management decisions, and thus should include short- and long-term methods.

Short-term monitoring tracks conditions that can change from year to year, such as growing conditions for plants, animal numbers, and timing and duration of grazing.

Long-term monitoring focuses on trends and ways the land resource responds to management and natural inputs. Changes in plant communities, either desirable or undesirable, can take place over many years, so a monitoring system needs to allow for comparisons over periods of 10 years or more.

WHAT TO LOOK FOR

Orchard says that while different environments necessitate some differences in how to monitor and interpret results, there are some key indicators producers should watch for.

Bare ground, he says, is arch-enemy No. 1 in pastures and rangeland. It erodes, sheds water, might grow weeds and contributes nothing to the land's productivity. Your No. 1 ally, he says, is plant

basal cover. Plants capture sunlight, hold the soil, cycle nutrients, accept water and repel weeds

Aftermath, or grass residual, is what remains following grazing. Standing residual forage is good, but too much could indicate under-utilization. Also, Orchard says, residual forage is most helpful when it contacts the soil. Litter on the ground shades and cools the soil, allows water to infiltrate and provides sites for seeds to germinate and emerge.

Plant diversity is beneficial on rangeland, reducing maintenance, production variations and risk. Finally, he says, managers need to know how to measure forage production to manage the range.

WAS IT YOU OR MOTHER NATURE?

A challenge in applying monitoring data to management is to separate the effects of management versus the environment. If a pasture improves or declines over time, is the trend the result of management such as stocking rates, or of environmental factors such as the amount and timing of precipitation?

This, Orchard says, is a reason for long-term and repeatable monitoring. Producers should monitor and record environmental conditions, along with their observations of range conditions, and relate these back to their management decisions.

Year-round measurement and recording of precipitation, Orchard says, provides vital information to apply back to management. He uses specially designed precipitation gauges that withstand freezing and thawing and also prevent evaporation of water. By measuring precipitation in a location for the entire year, a producer can track long-term trends and relate them back to range conditions. He says he has tracked some locations in the West for as long as 14 years and recorded a decline in average annual growing season precipitation of 4.5 to 5 inches at some sites. Watching these patterns can allow a producer to plan stocking rates, scaling back when the trend suggests drought and rebuilding when annual data show sustained improvement.

A long-term enclosure that prevents any grazing in a small area can provide a good comparison for tracking the impact of grazing, rest and environmental factors over a period of years. Typically, Orchard says, producers who install an enclosure will notice a short-term improvement in forage health and production inside the enclosure. Over time, though, plant diversity and reproduction tend to decline inside the enclosure, and invasive weeds or other undesirable plants sometimes take over. The long-term enclosure, he says, can serve as an effective tool for demonstrating the benefits of grazing and the degradation of rangeland that eventually occurs in the absence of animal impact.

For shorter-term measurements, a small "grazing cage," Orchard says, can provide excellent annual information on forage production in a pasture. He uses a durable, easy to move pyramid-shaped cage of his own design, which prevents animals from

NEGOTIATING FOR MUTUAL BENEFIT

Whether it is a Forest Service range manager, a landlord or a neighbor, chances are there is someone outside your operation with an interest in how you manage your cattle and the land they graze.

Eric Peterson, a natural resource education specialist with the Wyoming Cooperative Extension service, works with ranchers to help them build win-win relationships with federal agencies and other resource-management entities.

In forging these relationships, he stresses four basic principles. First, he says, everyone likes success. But in a relationship between a rancher and, say, a BLM range specialist, each individual has a different definition or perception of success. For the rancher, access to public grazing lands can relate to financial success. The agency employee's motivation, however, is different, relating more to professional responsibilities, meeting program objectives and, particularly, meeting his or her supervisor's expectations.

The second principle is that for a relationship to be durable, it must serve the interests of both parties involved. If the rancher can help build a program that meets the agency's goals and keeps the employee's supervisor happy, Peterson calls it a win-win situation.

The third principle he stresses is to focus on interests rather than positions. There are, he says, two basic types of negotiation — positional negotiation and principled negotiation.

In positional negotiating, one or more parties begin with pre-determined positions and are prepared to sell or fight for their own agendas. This typically leads to mistrust and a win-lose situation.

Principled or interest-based negotiation begins with each party communicating his underlying interests — the principles that need to be satisfied for a successful resolution of the problem. This process can identify common ground upon which to build a constructive discussion. A rancher and the Forest Service, for example, might share a common interest in sustainability of the resource. Using that shared interest as a starting point, both parties can work toward win-win solutions.

Peterson outlines four important elements of principled negotiation.

- Separate people from the problem. Focus on attacking the problem rather than each other.
- Focus on interests, not positions.
- Consider a variety of possibilities before deciding what to do.
- Insist that the result be based on some objective standard.

grazing in a measured area. Placing the cage in a pasture through a growing season, then clipping and weighing the forage inside the cage, provides an estimate of the total forage production per acre in the pasture. Comparing that figure with the residual forage outside the cage following grazing allows a calculation of forage utilization.

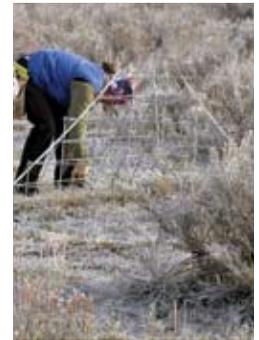
As a general rule, residual forage should be about half of total production, and less than that might indicate the pasture was stocked too heavily or for too long. The goal, he says, is to find the optimal balance of grazing impact and rest for sustainable forage production. Too little grazing can be as bad as too much.

Another issue for many producers, he says, is organizing and storing the information such that you can actually use it in the long term. This might be pages of records and pictures in a three-ring binder or files on a computer, but you need an easy way to compare information from one year to the next. His business offers "EKG Data Store" on its Web site, www.landekg.com, that provides online storage, organization and analysis of monitoring data. Members have access and can add information to their records as they collect it. The program sorts the information, including photographs and measurements, into standardized forms, tables and graphs the producer can view or print. This also provides a secure backup in case hard-copy records are lost or destroyed.

DECIDE WHERE TO MONITOR

Decisions regarding locations of monitoring should again depend on the program's objectives. Typically managers will identify representative areas, which are sample sites selected to represent a larger land unit. Depending on objectives, you might choose to monitor key areas, which differ from the larger surrounding area but can indicate effectiveness of management. You might also need to monitor critical locations such as a riparian area, where the information you collect applies specifically to the management of that area.

Repeatability, simplicity and efficiency are the most important characteristics of a good monitoring program, Orchard says. Monitor the same things in the same places and in the same ways each year to obtain useful data. ✓



A permanent enclosure (top) provides a long-term comparison between grazed and non-grazed land, while temporary enclosures can measure seasonal forage production. Below: Charlie Orchard sets up a location for standardized, repeatable monitoring.

