

Nevada Rangeland Monitoring Handbook
Second Edition

Sherman Swanson, University of Nevada Cooperative Extension State Range Specialist

Most likely, you and your livestock depend on rangelands for your living. Are the rangelands that you depend on meeting objectives that are written down? Is your most valuable agricultural asset, your land and the forage it produces, becoming more productive year by year or less so? If it is changing, are those changes due to livestock management, the growth and reproduction of valuable forage plants, the spread of weeds, the growth of woody trees and/or shrubs, or what? Is this ecosystem becoming more resilient to the disturbance of big events like fire or more at risk? If an agency, your neighbor, an environmental group, or your spouse suggests a change in management, do you have good information about past and present management and its effects to think over their suggestion?

If you have solid answers for all these questions, you may not need the new *Nevada Rangeland Monitoring Handbook* or the new *Ranchers' Monitoring Guide*. Both these Educational Bulletins (06-03 and 06-04) were published by University of Nevada Cooperative Extension and are available on line at <http://www.unce.unr.edu>. Then click "publications" and then "2006." Both are also available at many agency offices because the team that developed them represented a variety of different entities. Authors include: Myself and Ben Bruce from University of Nevada Cooperative Extension, Barry Perryman, University of Nevada College of Agriculture, Biotechnology, and Natural Resources, Bill Dragt, Duane Wilson, and Valerie Metscher, from BLM, Gary Brackley and Gene Fults from NRCS, Diane Weaver from the Humboldt-Toiyabe National Forest, Gary McCuin from Nevada Department of Agriculture, James Linebaugh from Nevada State Grazing Boards, Paul Tueller, a rangeland consultant, and Rex Cleary from the Society for Range Management.

In 2004 the Public Lands Council signed a memorandum of understanding with the BLM and the Forest Service to support **cooperative rangeland monitoring**. The agencies are committed to work with permittees and lessees to develop a monitoring plan. Have you taken advantage of this opportunity?

A year earlier, in June 2003, many ranchers and agency people gathered at the Zaga Ranch south of Elko and Jiggs to discuss rangeland monitoring. We agreed to begin the process of revising the 1984 *Nevada Rangeland Monitoring Handbook*. A lot of progress has been made in rangeland management and monitoring in twenty years and it was time for an update. However, the team that later assembled to accomplish this did not want to start over. **We wanted to keep what was working, primarily an emphasis on both short-term and long-term monitoring.** (Quotations that follow come from the new handbook) "Short term monitoring addresses three topics: 1) Conformance with the plan, 2) Current, annual, or short-term impacts of the implemented management on resources of interest, and 3) Weather and other unplanned events. This information guides day-to-day and year-to-year management by monitoring within-season triggers and end-point indicators. Accumulated short-term monitoring records help interpret trend and other long-term monitoring information."

"Long-term monitoring measures changes in resource attributes such as vegetation, soils, or streams over time and is used to periodically measure progress toward meeting

long-term resource management objectives. It also helps determine the applicability of annual indicators or triggers. Long-term studies are usually done at permanent sampling locations in key areas.”

“The 1984 Handbook emphasized monitoring techniques without emphasizing the reasons for monitoring. Today, management is based on goals and objectives set in a planning process that considers the best science and society’s mix of values.” **“Resource objectives state specific attributes of natural resource conditions that management will strive to accomplish, the area or location where this will occur, and the time frame.** Resource objectives must be site-specific, measurable, and attainable statements of the desired resource attributes.”

Resource objectives are the focus for adaptive management, which is the “continual process of learning from our experiences and managing based on what we have learned. An acceptable plan should include a management program and a monitoring program needed to keep management on track, test assumptions, provide the information needed for future planning, and guide rangeland managers. Adaptive management depends on flexibility. Management plans and monitoring methods flow from objectives”.

“Monitoring in the 1980s focused almost exclusively on livestock grazing management. Today, we recognize that, as important as this is, herbivory is only one aspect of land management, and that some monitoring of vegetation change is needed to track and manage problems such as modified fire regimes and invasive weeds that are not resolved with livestock management alone. Riparian issues were not addressed in the first handbook. Today, we have learned the importance of riparian monitoring for adjusting management.”

Many ranchers will focus on the *Ranchers’ Monitoring Guide* which is aimed at providing the tools ranchers will use most. It presents monitoring methods that can be applied without detailed plant taxonomy and that can be applied with tools that will fit into a saddlebag. While many of the tools are for short-term monitoring (photographs, landscape appearance, key forage plant method, grazing use map, and stubble height), some of the tools provide long-term trend (permanent photos, cover by life form transect, plant density, streamside stability). One tool, the grazing response index, is primarily a tool for interpreting short-term monitoring information, combining **intensity** of use, **frequency** of use (measured by the length of the grazing period), and most importantly, **opportunity** (for plants to grow or regrow when they are not being grazed) into a simple score for each pasture or grazing unit. This *Ranchers’ Monitoring Guide* is the material that Barry Perryman and others have presented at monitoring workshops in recent years.

Many agency personnel and consultants will focus on the *Monitoring Handbook* which aims to provide the broader context for monitoring. While it provides some specific tools (for example nested frequency), it generally does not repeat information that is easily available elsewhere. It includes sections on: a framework for monitoring, objectives, ecological sites, riparian areas, inventory and assessment of base resources, land use planning - large scale, adaptive management, triggers and indicators, statistical considerations, key areas, key species, and the roles of key people.

The section on short-term monitoring includes: grazing use records, photography, project implementation records, weather data, insects, disease, and rodents, use mapping, utilization, residual vegetation / stubble height, woody species use, and streambank alteration. The section on long-term monitoring includes: ground photography, remote

sensing, frequency, production, canopy/foiar cover, ground cover, community-type transects, greenline-to-greenline width, riparian shrubs, streambank stability, stream channel attributes, stream survey, water quality, detecting patterns of vegetation change across a landscape, photos or other remote sensing, weed maps, and vegetation measurement across an edge of a community type.

The handbook goes on to discuss supplemental techniques and information; use differentiation among wildlife, livestock, wild horses, and burros, etc; phenology; fire-related monitoring; exclosures and comparison areas; grazing response index; apparent trend; developing a monitoring plan; and interpretation and use of monitoring data.

Appendices include more information about: cooperative monitoring, ecological sites, drought, establishing good objectives, adaptive management, procedures for selecting key areas and key species, remote sensing to monitor rangelands, use mapping, key species method, and proper use, growing condition indicator checklist, frequency sampling procedures, production and plant community objectives, ground cover and canopy cover measurements, monitoring plan tables, interpretation and use of monitoring information, rangeland management agency offices in Nevada, a glossary, and references.

In spite of these many topics, the **handbook's emphasis on objectives focuses monitoring on the short list** of needed information. The handbook emphasizes the fact that "Monitoring data must be interpreted and used to track progress toward achievement of land use plan and/or activity plan objectives. Monitoring data can help identify linkages among conditions, objectives, and management within the setting. It can be used as evidence supporting decisions to continue or modify existing management. Monitoring data can also be used to validate goals and objectives. To summarize, monitoring data are used to:

1. Determine the effects of management actions on resource production, and economic conditions and values;
2. Determine the effectiveness of management actions in achieving objectives within the planned timeframes;
3. Support management actions and their modification; and
4. Periodically review the validity of resource condition and value objectives.

Monitoring is a key integral component of management, not an end in itself. **If monitoring data are not used for these purposes, rangeland managers are not managing.**" Cooperative monitoring emphasizes sharing the work of monitoring and the data between agencies and ranchers. A documented photographic and quantitative monitoring record over time is one of the most powerful tools that the agency and producers can have if their management actions are challenged or considered for challenge.