Building Healthy Rangeland Soils

Adaptive grazing minimizes disturbance, increases plant diversity

Eastern Oregon rancher Dick Fleming wants to make the most of every precious drop of rain on his rangeland. His 3,305-acre ranch in Baker County gets only seven inches of rain a year on average, and has a limited growing season of six weeks. It’s most definitely a challenge for Fleming—and other Eastern Oregon ranchers—to maintain moisture for forage production.

But Fleming is turning to the soil for help. And so far, the results are looking good.

“I’ve seen a two-week lag in the dry-out between our property and the neighbor,” Fleming said. “My land is holding on to more moisture longer, and that is just after a couple of rest rotation cycles.”

By allowing his ranch to have regular, rotating rest periods, Fleming has minimized disturbance on the soil and promoted more plant cover and plant diversity. NRCS photos by Aaron Roth.

Those rest rotation cycles are the secret to healthy rangeland—and healthy soil. By adapting his grazing plans and investing in the health of his soil, Fleming is minimizing disturbance and increasing plant diversity—which translates to better soil infiltration and more forage production.
profiles in soil health

“If you have just bare dirt, the window of opportunity for new plant establishment and growth is narrow,” Fleming said. “We typically have only six weeks between the last frost and when it’s too dry in a good year. Allowing the grass to store energy in its roots allows you to take better advantage of the sun; the reserves get something green up quickly.”

Minimizing Disturbance

Fleming’s first priority was protecting riparian or streamside areas. He enrolled in the USDA Farm Service Agency’s Conservation Reserve Enhancement Program (CREP) in 2005, which assisted him with fencing off the streams and reducing disturbance in these critical areas. Minimizing disturbance is one of the four principles of soil health that is important for rangeland health.

The CREP project wasn’t completed when it was time to bring animals on in 2006, so Fleming only grazed half of the ranch, further reducing disturbance. Only half the ranch has been grazed annually ever since.

“You don’t lose much by not grazing this year, because what you grew last year is still there and the dry stuff with the green is a good nutritional mix for the animals,” he said.

By allowing the ranch to have regular, rotating rest periods, Fleming has achieved another soil health principle: increasing cover. By strategically adjusting his grazing management, his rangeland has developed bigger, more productive plants with an increase in plant structure and complexity. Also, he has seen a return and rebounding of important shrubs and forbs on his land, with more resistance to weed pressure and reduced erosion.

“If the water runs off site by overland flow, what good is it doing? Now we have very little runoff – all the runoff we see is along the roads,” Fleming said.

The goal in rangeland health is to capture, store and safely release all available moisture that comes to the water-limited rangelands. Without healthy soils, this can be very difficult to achieve.

Adaptive Grazing and Monitoring

Over the years, Fleming has moved further away from traditional management, which uses an annual calendar and scheduled stocking rates, and he started letting the grass tell him when to move the animals. He works with the USDA Natural Resources Conservation Service to employ adaptive grazing management principles across his ranch. NRCS staff provide technical assistance to help Fleming track key species in the pasture to manage his ranch for healthier soil. NRCS provides financial assistance to implement these practices under its Wildlife Habitat Incentives Program.

Fleming established photo monitoring points to gage changes in his ranch year to year. He’s seen that resting the ground every other year has accumulated carbon, protected top soil, and provided energy to the roots—which has increased the size, health, and

Fleming has seen that by resting the ground every other year, his soil is accumulating more carbon, which has increased the size, health, vigor and diversity of plants. Pictured: mariposa lilies. NRCS photos by Aaron Roth.
vigor of the plants. Over time, he’s seen increased diversity of plants, with more forb species coming in such as yarrow, mariposa lily, and phlox. Plant diversity is another soil health principle that is coming to fruition on his rangeland.

Fleming notes there have been several challenges along the way, such as managing stock water and moving the animals regularly. Also, he said it requires more time to pay close attention to what’s going on across the ranch and to monitor soil conditions. However, Fleming believes the benefits far outweigh the challenges.

### Sage Grouse Habitat and Other Wildlife Benefits

Fleming is also starting to see the benefits of adaptive grazing management practices and how they complement wildlife. The ranch is on the northern boundary of the habitat range for threatened sage grouse. Rest cycles and adaptive management allow range plants to achieve their full size, providing the kind of habitat structure that juvenile sage grouse require.

Last year, Fleming saw sage grouse juveniles on the ranch for the first time in his memory.

Taking advantage of the NRCS’s Conservation Stewardship Program (CSP) allows Fleming to take wildlife habitat enhancement even further, including installing and maintaining wildlife friendly fencing, and rotating supplements to distribute cattle grazing to different parts of the pasture. He’s also using CSP to implement non-chemical techniques to control undesirable weed species and manage livestock access to water to help protect and restore these critical areas.

“Fleming continues to look for way to improve the ranch utilizing a holistic approach to improve the pasture for livestock as well as habitat for the numerous wildlife species that use the land,” said Aaron Roth, NRCS range management specialist. “Working with producers that question the standard and try innovative approaches are the only way that positive changes can be discovered and hopefully adopted across broader landscapes.”

### A Sustainable Future

Looking ahead, Fleming hopes to continue to not only improve productivity on the ranch, but also the value of what the ranch produces. He measures wealth in the carbon he is storing in the soil and knows that every drop of water that travels off his place is wasted.

“People talk sustainability, but it goes beyond that to restorative agriculture,” Fleming said. “That’s what I want – to restore the capacity that the ranch had when Lewis and Clark came through.”

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