

# Developing a Range Management Program for a Foothill Ranch in Northern Colorado

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What can range management do to improve foothill and mountain ranges which have been variously abused for nearly three-quarters of a century? The following story relates my personal experience with range management practices on such lands.

This particular place—the Rattlesnake Park Ranch—was appealing to me, as a prospective buyer, for its location. Mountain ranges extended up to 9,500 feet altitude. Sheltered grass bottoms and brushy slopes provided excellent winter range in the foothills at 5,000 to 6,000 feet. A small acreage of bottomland provided a good, unfailing hay yield. Other areas with marginal yields presented some opportunity for further increase in hay production. A desirable climate and a fine modern home with telephone communication suggested ideal living conditions. The steep, two-mile access road somewhat isolated the place from tourists and curiosity seekers. The ten miles to Loveland, the closest shipping point, was on good country roads partly oiled.

## Ranch History

Economic history of the ranch showed the highest cattle selling prices in the area. Still, total operating costs were well below the average due to reasonable balance in seasonal forage, home-grown hay, and a summer grazing permit. It was apparent, however, that ranching here would involve rugged operations characteristic of steep and broken country. Moreover, nearly every patch of open or cut-over land which was plowable had been farmed for grain and potatoes. Some patches were abandoned early, while others were



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still being farmed. About 300 acres of this land had been seeded to grass with variable success. Perhaps 60 acres had a sufficient stand to be excluded from future seeding plans. Additional opportunity to increase forage production was clearly evident from these seedings.

The remainder of the land had been grazed heavily with an inevitable drop in production. These past abuses were evident in rather prominent gully erosion, and sheet erosion ranged from negligible to complete removal of topsoil.

History also indicated that drought years were rather infrequent but that they were often accompanied by cloud bursts and flash floods, which did considerable damage without much benefit. This suggested the possibility of storing or diverting some runoff for beneficial purposes.

In short, with all its drawbacks, here was a ranch which would challenge me to build up productivity, increase the value of the land, and make the land pay for improve-

ments. Like any pipe-dream, the tumblers fell into their places—here was a ranch with real possibilities. So the place was acquired in 1946, and we proceeded to build a ranch.

Gradually additional acres of leased and privately owned lands were acquired to shape up an efficient ranching unit. Present operations extend over nearly 40,000 gross acres. Of this amount 12,400 acres are privately owned. Most of this had been acquired by 1948; the last place, totaling about 2,000 acres, was acquired in 1950. Lease lands total 1,800 acres with 1,200 of these being state lands. My grazing permit on the Roosevelt National Forest includes the Elk Ridge and Lower Elk Ridge allotments totaling about 21,000 acres, only about 4,500 of which are considered usable range.

## Stocking and Herd Management

My original idea in stocking this range was to run a cow-calf type of operation. Part of the operation was devoted to a registered herd which was kept separate from the commercial herd up until the 1954 drought. Mixing of the herds when they were moved has prevented me from keeping the registered herd and papers separate since that time. By 1948 the herd had been built up to peak numbers of around 800 head composed of about 300 cows, 75 replacement heifers, 175 yearlings, and about 250 two-year-old steers to take advantage of the market. Numbers were greatly reduced during 1949 and 1950, while the farmland and depleted areas were being fallowed or chiseled and reseeded. Cows and calves composed a greater proportion of the herd during many of the years until 1956. After three-fourths of the herd had to be moved in 1954, I decided to shift to a cow-calf-yearling operation to introduce more stocking flexibility and weather drought periods better. My present goal is to keep cow numbers down to around 325 which can be maintained even in drought times and to keep a variable number of year-

lings, fluctuating about 300 head, according to range, feed, and water conditions.

The breeding season commences on May 20. Bulls are run with the cows throughout the summer season. Cows are bred to calve as two-year olds and sold as breeding stock at six to seven years of age. Calving commences March 10. All but about 15 percent of the cows calve by April 15. Calves are weaned in late October. Normal weaning weights have ranged from 420 to 480 pounds in late October at river markets.

Shown in carload lots as feeders these calves placed second at the American Royal in 1953 and never lower than sixth.

At the Omaha Feeder Sale feeder calves from the ranch have always sold in the top ten.

Although conception rate is nearly 99 percent, the weaned calf crop averages only about 90 percent. Some losses inevitably occur due to straying, accidents, prolonged blizzards—especially at calving time, and rarely due to poisonous plants, chiefly larkspurs.

### Grazing Management

My grazing plan is to use a different portion of the range during each of the four seasons. Facilities have been built or maintained for handling stock during these seasons and are not easily changed or moved. Cattle are left in the same pasture for short periods and rotated to other pastures. Only on winter pasture are they left as long as 75 days during which time supplements are fed. Bottomland seedings in Chimney Hollow and the Lower Bracket place are used as winter range. Supplements are fed prior to and during calving. Hay is preferred whenever it is available. Ample hay has been produced most years on the ranch and has been hauled up from an irrigated farm near Loveland in recent dry years. Last winter a commercial feed mixture composed of drought-relief grains, cottonseed meal, and phosphate fortified with vitamins A and D, was fed. Hay

is always fed when snow cover warrants.

Originally, I tried grazing the poorer areas, particularly those infested with cheatgrass and weeds, during the spring. This use was up until June 1. My objective was to graze these areas early but to move off in time to permit regrowth and maturity of the desirable grasses. In all years except the extreme drought of 1954 na-

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*Lyman Linger's father, G. W. Linger, was ranching in North Park when Lyman was born. Later the family moved to a ranch in New Mexico, then back to the San Luis Valley, where the family operated a 100,000 acre ranch until 1946, when the operation was sold. In this article Lyman tells of the development and improvement of the ranch that he purchased in northern Colorado in 1947.*

*The Linger ranch placed 9th in the State Soil Conservation Service competition in 1953, and was considered by the judging committee to be the outstanding project of that year. The ranch was also the subject for the Lederle film, "The National Western Stock Show."*

*Of himself Lyman says: "Although I saw the value of education, the ranch came first. I did spend the most of three years at Colorado College and two years at Colorado State University." Lyman is an active cooperator in the Big Thompson Soil Conservation District, a member of the Advisory Council and the Grazing Advisory Board of Roosevelt National Forest, and for several years has been a member of the Executive Committee of the American National Cattlemen's Association.*

*Pictures accompanying this article were taken by Dr. F. E. "Dutch" Richards, Loveland, Colorado.*

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tive grasses made regrowth and headed out when grazed until June 1. Such a grazing system did seem to account for some ecological improvement in cover, particularly

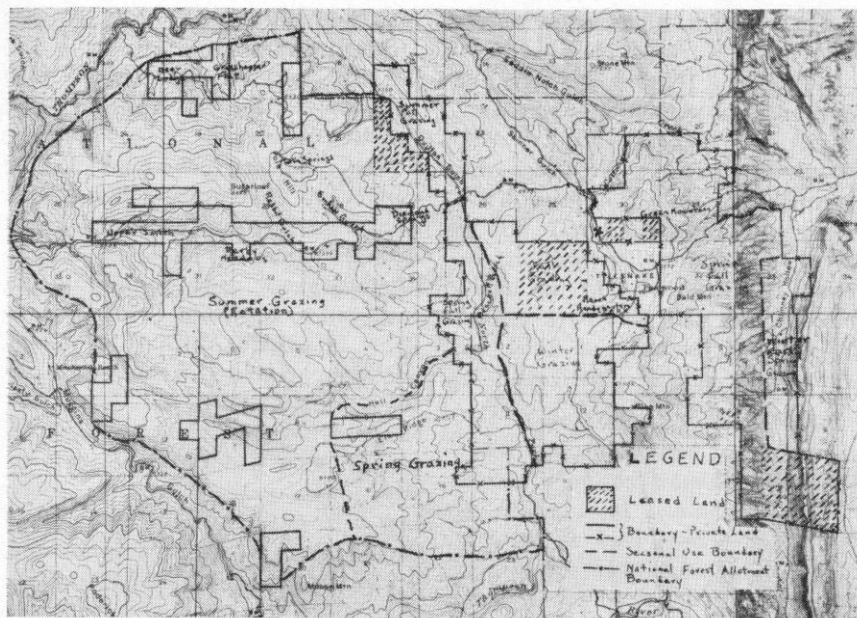
on the Elk Ridge and Upper Bracket places.

Cheatgrass and weeds also seemed to decrease under spring grazing treatment. This spring, however, we again observed heavier stands of cheatgrass when abundant moisture came after several drought years. The worst stands of cheatgrass were found on the east sides of Bald, Green, and Blue Mountains, which were the pastures grazed formerly during the months of April and May. The reappearance of cheatgrass has perplexed us; possibly moisture or sites play a greater role than grazing in its occurrence. The value of cheatgrass may be debatable, but we have observed that it contributes to our having some green feed throughout the year whenever open periods follow moisture, even in December and January. This is certainly of some value from a nutritional standpoint. Moreover, cheatgrass tends to stabilize bare or disturbed areas, such as gulches, until perennials take over.

Summer grazing is on a rotation plan allowing a different area for each of the four months. Since this grazing is on unfenced private and Forest Service lands, all arrangements must be in cooperation with the Service. When this cooperation slows down, which is the present situation, the grazing plan suffers. Specifically, cooperative plans to construct certain fences and water developments for management purposes have failed to materialize.

During the fall the herd is brought down through Quillan Gulch and into Rattlesnake Park. Here cows and calves are intermittently separated until the cows are dried up. Calves are then confined to the meadows, and the cows are shoved out onto the side-hills. Later the cows are moved to the east side of Blue, Green, and Bald Mountains where they do well on fresh pastures.

By 1953 about 85 percent of my ranges had improved one range condition class, as a result of a combination of moderate stocking, improved grazing systems and fa-



Map of the Linger ranch showing ownership, seasonal use, and topography. The contours at the extreme eastern portion of the map are at 20-foot intervals. Elsewhere the contours are at 100-foot intervals.

vorable weather. Such desirable plants as Idaho fescue, mountain muhly, and western wheatgrass had increased, and sideoats grama and little and big bluestems became conspicuous where they were not noticeable in 1946. Old timers in the area have noticed less larkspur, death camas, and other poisonous plants. Not only has the composition improved, but density, vigor, and litter have also shown favorable improvement. This improvement permitted a gradual increase in stocking up until the drought.

While some ranchers in the area kept most of their stock in times of drought, I preferred to move a large proportion of the herd in 1954 to preserve whatever gain had been made in range conditions.

#### Range Renovation and Reseeding

Chimney Hollow had the most good land which was producing little forage when the ranch was acquired. It was tackled as an area in which the biggest improvement could be made per dollar invested. Three miles of fence were con-

structed dividing the bottomland from the side drainages. Complete exclusion from grazing, except for game, was practiced during the growing season. Some vegetation had to develop on the shiny spots of erosion pavement. The raking of trash and weeds into the minor side draws, which originated on the abandoned farmlands, was another objective. These fields developed enough rakeable trash to pack the draws. Dump rakes and finger weeders were used to rake the trash and weeds from the fields and these were backed into the draws. The trash held; the gullies disappeared. Then, these farmlands were summer fallowed to prepare a seedbed for grass seedings. But for some reason cheatgrass came on these bare fields instead of weeds. Following after the first fall moisture might control cheatgrass. This treatment may work in time, but so far my efforts have been unsuccessful. I leave this suggestion: don't make elimination of cheatgrass your life work; it may take longer; probably will! After several seasons of summer fallowing, Chimney Hollow developed the necessary vegetation, through seeding of bottoms and deferred grazing of sidehills, to detain a portion of the rainfall. All of the 300 acres of farmland, except for the 60 acres with previously established stands, were fallowed and seeded to crested wheatgrass, inter-



Range improvement practices put into operation included reseeded and gully control. *Left:* Reseeding in Chimney Hollow with smooth brome and intermediate wheatgrass showing above the alfalfa. *Right:* Gully in Em-Haw drainage which has been packed with trees, limbs, and brush as a means of keeping livestock out of the gully, as well as aiding siltation and stabilization.

mediate wheatgrass, and smooth brome grass in mixture with sweet-clover or alfalfa. As a result of range seedings and grazing management, Chimney Hollow was improved until it would conservatively carry twice as many stock as it would in 1946.

Elsewhere, the drier openings or parks had a fair cover but infiltration rate was low. This was indicated when a good half-inch rain put moisture into the soil only one-half inch deep. Deciding that the worst compaction occurs in the top three inches, chisel points or a renovator were set to run that deep. Chisel points on a Graham-Hoehne plow, pulled by a crawler tractor, were used on larger areas at 14-inch spacings. A drill was trailed behind the chisel, and every other drill run was plugged. Skips of eight feet width were arranged in the chisel operation in anticipation that complete coverage might cause severe erosion. This work extended over two seasons with much of the work being done during late fall and early spring. The results were so variable that they defy analysis.

Basically, the chisel-drill method did not eliminate enough competition, although some seedlings developed in the heaviest native stands, while lighter native stands alongside had no take. In a cheatgrass area the chisel-drill gave a terraced appearance for two years with seedstalk heights doubled on treated areas but without any change in composition. Kentucky bluegrass and needlegrass developed in the chiseled swath in a pussytoes-grama area. Only an occasional seeded plant usually developed, but a perfect stand showed where a bare spot was crossed.

A very thin stand of crested wheatgrass which was given this treatment without the skips showed the best seeding results. This was part of the area which had been seeded before the ranch was acquired. Intermediate wheatgrass and alfalfa were seeded. Here a satisfactory stand of crested wheatgrass and intermediate wheatgrass



Livestock watering pits such as this were developed during the drought years, when springs went dry.

developed in about 50-50 proportions, but alfalfa failed to appear. In the most recently farmed land the resulting stands were fair but somewhat disappointing. A very scattered stand of brome and intermediate wheatgrass was obtained, with some fringe benefits from the increase in desirable native grasses. Some alfalfa showed up early but was apparently eliminated by deer.

The only area that was considered a total loss was a Kentucky bluegrass valley in fair condition. There was no noticeable increase in production, change in cover, stand of seeded grass, or return on investment. Fair to good stands of seedlings were observed but the plants failed to develop, apparently because of competition.

After five to six years the areas receiving the chisel-drill treatment are one range-condition class better, but whether as a result of range management or the treatment it is impossible to say precisely. I have derived great personal satisfaction from observing the results of this treatment, but it is my conclusion that the area to be treated must be in rather bad shape before it pays.

This is a good time to bring in the fact that as soon as the vegetation on one's project increases ecologically, the desirability in terms

of game and adjoining domestic animals increases in greater proportion.

### Runoff Control

My experiences in controlling runoff have been variable. Raking weedy trash into small draws has occasionally worked wonders, as noted in Chimney Hollow. On other occasions, as in the spring of 1957 with prolonged heavy rainfall, trash and debris has moved down to the bottoms where it bunched up, plugged spreaders, and caused washing in new locations.

Brush dams may have their place too, but not without considerable hazards. A series of brush dams in a wash through the upper Smith place did some good, mostly by keeping livestock out of the bottoms while natural healing took place. We are still waiting for them to catch any appreciable amount of silt. One brush dam at Diamond Springs has done about all that one could expect of it. Some draws at Em-haw that were filled with logs, roots, and small stuff may add a few inches to the bottoms as the material rots. Across the draw the Walker washes responded to single trees trimmed to fit in the washes. Although this treatment leaves a draw unsightly, the trees have become covered with



silt and vegetation, and new soil cutting is apparently arrested.

Rock dams are of doubtful value in this area. Two rock dams in Derby Meadows showed no response whatsoever for seven years. Then, suddenly—extreme, continuous high water in 1957 washed out the banks around them. By now I believe that I know what the Army engineers had in mind when they built the Cherry Creek dam, which was considered ridiculously large, east of Denver for flood control purposes. My experience with dams indicates that someday water will be high enough in this mountain country that they will either wash out or cause something else to be washed out. This observation is colored by heavy runoff this spring which resulted in our receiving about half our average annual precipitation of 18 to 20 inches in a week's time when snow-melt was at its peak. I have also experimented with gully plugs and waterspreaders. They have not been too successful, but if employed in the right place, they may aid range management in restoring soil stability and cover on depleted ranges.

Each road, for whatever purpose, is also a dagger poised over any ranch management plan, threatening complete destruction to foothill and mountain ranges. All roads that show signs of erosion are given the ART treatment, which when properly installed are called water bars. Very few service roads developed trouble until the hunters found them. One hunting season in my area is the equivalent traffic of three or four years of ranch use but in a more concen-

trated period. By contrast, my contention is that no one can follow our ranch salting trails.

Trails and Jeeps, with a minimum of road building, did permit the development of many stock-watering tanks. During the dry spell, a change was made from box and tank developments to water pits dug in promising spots. They were successful and developed water after the boxes and tanks went dry. These proved somewhat effective in distributing grazing pressure from heavy to lightly used areas.

Salting cattle for range improvement purposes seems highly overrated. For best results salt is placed reasonably close to water but in the direction that it is desired to draw cattle. The dumb critters will leave salted areas to go where they are used to concentrating, even though they are extremely salt hungry. This makes it necessary to supplement wise salting plans with almost continuous riding to control the movements of stock into desired areas.

### Conclusions

Restoring a ranch and effective range management depend upon the weather. This statement cannot be made strong enough in my opinion. For example, although we moved three-fourths of the cattle to Kansas pastures in the 1954 drought, there was considerable loss in density. Some grasses, particularly big bluestem, and most of the meadow clovers died out completely. Moreover, a pussytoes-fringed sage area in Grasshopper Flat was converted to predominantly grama grass cover follow-

ing a late shower which may have caught the pussytoes in a reduced state of vigor. This happened where grama grass had not been observed previously. Range management seems to improve ranges under conditions which we might consider to be normal weather. Deferred grazing during the growing season does result in additional cover that heals denuded areas in such years. Still the kind and amount of cover seems to depend more upon the time and intensity of rainfall. Spring use, followed by rotation of stock during the time grasses normally head out, also seems to improve the cover. Nevertheless, unpredictable shifts in composition, such as the reappearance of cheatgrass in 1957, may accompany heavy rainfall that may accompany heavy rainfall that occurs after several years of drought. Thus, while good grazing and range improvement practices have been beneficial in improving cover, production, and value of my ranges, no one practice has been uniformly and consistently successful. What happens on the adjoining place is a lead but not necessarily a deciding factor. There is no substitute for experience. Every statement should be tempered by such phrases as "seems to be," "should be," or "perhaps," because of the uncertainty of weather and certain phenomena which may or may not be attributable to the weather.

In conclusion, let me say that someday I hope to meet the person who knows all the answers. When I do, I believe that this person will prove to be none other than Mother Nature!

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### *The Ranchman's Issue*

To all who have contributed to the assembly and preparation of the material included in the *Ranchman's Issue* we extend our special thanks. Without the willing cooperation of ranchers, technicians, and Section representatives the production of this issue would have been impossible.

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