Chronology of a Range Renovation

Ted Hawn

The Marlboro man—to most us—personifies the cowboy riding the western range. The striking scenery sometimes depicted in these commercials is the setting of the George Zieg Ranch in Montana.

Situated in the picturesque foothills of the Little Belt mountains, the Zieg Ranch is approximately 30 miles northwest of White Sulphur Spring, Montana. The ranch complex is part of the foothills and benchlands of the Little Belts, adjoining the Lewis and Clark National Forest. Elevation of the ranch is from 4,800’ to 6,000’, with an average annual precipitation of 16” and a growing season of 70–90 days.

In the early 1980’s, ranch owner George Zieg, Jr., asked the Soil Conservation Service about improving the range condition on his ranch. His chief concern was a five pasture unit containing 1,668 acres. These pastures had been under a deferred rotation grazing system for the previous 20 years with a grazing season use from June 1 thru October 31.

While conducting initial range site and condition inventories, SCS range conservationists determined the range to be in fair condition. Clubmoss was suppressing seedling establishment and basal area development creating an artificial drought condition by impeding moisture infiltration into the soil. The surveys indicated the site had a much greater forage production potential than was currently being obtained. Silt loam and clay loam soils were deep and suitable for treatment by shallow chiseling.

In 1984, a decision was made to conduct a shallow chiseling operation on the pastures. A chisel plow with 18-inch spacing between chisels was used. Two passes were made, with the second pass at the right angles to the first. The objectives were to get at least 4” deep and at least a 60% ground disturbance.

Table 1. Annual and growing season precipitation for two locations near the Zieg Ranch.

<table>
<thead>
<tr>
<th>Year</th>
<th>White Sulphur Springs</th>
<th>Fort Logan</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Annual</td>
<td>Growing season</td>
</tr>
<tr>
<td>1984</td>
<td>11.7</td>
<td>6.6</td>
</tr>
<tr>
<td>1985</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>1986</td>
<td>17.7</td>
<td>12.2</td>
</tr>
<tr>
<td>1987</td>
<td>14.3</td>
<td>11.8</td>
</tr>
<tr>
<td>1988</td>
<td>8.9</td>
<td>5.3</td>
</tr>
</tbody>
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1From: Climatological Data for Montana, NOAA
2Missing data

The author is District Conservationist, USDA-SCS in Lewistown, Montana.
effectiveness of surface modification depended on the site and vegetation characteristics (Wight and Siddoway 1972).

**Raised Eyebrows**

Immediately following the treatment, George expressed concern at the appearance of the fields. From all appearances, it looked like a barley crop could be seeded. John Lacey, Montana State University Extension range specialist, was contacted and gave assurance that the extent of ground disturbance was necessary to provide an optimum response. George's neighbors were also raising eyebrows at the "plowed" condition of the fields. One neighbor even commented that the land was ruined as rangeland and should be planted back to tame grass.

**Patience**

Like a lot of things in life, we must wait awhile for the good things to happen. Typically, the first two years of a rangeland renovation will show an increase in vegetation, with forbs and shallow rooted plants taking advantage of the extra moisture (Baringer et al. 1980). Mechanical disturbance of native sod causes the release of plant nutrients through soil weathering and decomposition of organic matter (Wight and White 1974).

**Drought**

As 1984 progressed, Montana came under the grips of a deepening drought. In August 1984, Montana was the focus of the nation's attention, as the governor proclaimed "Montana is literally on fire." There were more than 250,000 acres burning at that time in the Big Sky State. The drought was also having an effect on the Zieg Ranch renovation. Precipitation for the year was 8.0 inches—and growing season precipitation was 6.6 inches.

Nineteen eighty-five brought a continuation of the drought. In June, the Sandpoint fire burned over 10,000 acres in the Lewis and Clark National Forest, just 30 miles east of the Zieg Ranch. Destocking and reduced stocking was prevalent for cattlemen. Not only did the lack of rain plague the area, but abnormally high temperatures and incessant winds aggravated the already brittle condition of the grass. Even though the response time for the renovation was being slowed due to the drought, the treated area was making better use of the limited moisture. George commented in June 1985 that "the only green pasture in the whole country is the renovated field". The deer and antelope also recognized this and literally camped on the pastures most of the summer.
Favorable Conditions
The years of 1986 and 1987 brought a return to more normal conditions. Precipitation in 1986 was 17.65 and 14.25 in 1987. Again, there was hope, a heartbeat on the land. The improved moisture conditions allowed for significant recovery of the renovated fields.

Raised Eyebrows Again
By the fall of 1987, the renovated fields were again raising some eyebrows, but this time it was the vegetative response that was making an impression. The deeper rooted grass species were contributing to greater productivity. The increased productivity has been attributed to improved soil water availability, greater plant numbers and a significant change in vegetation composition towards midgrasses (Valentine 1977).

The Drought Returns
We will never forget 1988. The year was probably the most serious in a decade of recurring drought in Montana. A scant seven inches to eight inches of moisture fell for the whole year. From May thru August only a sparse 3.5 inches of rain fell—less than an inch in the months of July and August. Conditions were critical for folks making a living from the land. Miles City, a couple of hundred miles east, measured less than two inches of moisture from August 1987 thru August 1988. All of America watched in horror as millions of acres in Yellowstone and the surrounding forest went up in smoke.

By the fall of 1988, some desperately needed rains provided a break. Conditions improved somewhat and a flush of green growth went on display. With marvelous adaptability, the indigenous plants responded to the new moisture, offering a renewed hope to favorable conditions.

Response
Analysis of the plant community provides an indication of what is occurring on the land. Dysterhius (1949) discussed the relationship of indicator plants in the classic "Condition and Management of Rangelands based on Qualitative Ecology."

Vegetative response of the treated pasture was probably slowed due to the drought conditions in 1984, 1985, and 1988. Even so, the forage production has increased significantly. Plant composition, as measured in 1988, shows a marked improvement on the renovated fields.

Management Implications
Through the 1980s, we saw dramatic weather fluctuations. Deciding on proper range improvements has been frustrating. Benefits in reduction of soil erosion, improved watershed conditions and increased numbers of wildlife are observable but somewhat difficult to measure. Responses to rangeland treatments can be measured in many ways. The Zieg renovation has seen a 46% increase in AUM’s since 1984—a significant increase considering more than two years of drought. Range condition classes have gone from fair to good/excellent and still are in an upward improved trend (Personal communication with Eugene Handl).

Rangeland renovation costs vary according to site conditions, equipment, ownership costs, etc. The Zieg renovation was contracted for $10 per acre and a simple economic analysis based on a $10 AUM lease was used. Accounting for a 60% cost share and a drought adjusted 2-year deferment, we used a 12% amortiza-

tion rate and a practice life of 25 years. This shows a cost-benefit ratio of 1.19 to 1 and net-present value of .80/acre. A cow-calf operation would most likely show a higher return.

The improvement in ecological condition will have lasting benefits that can be also be measured by the overall health of the ecosystem. The soil environment—an important measurement of range health, is now much healthier evidenced by the many new seedlings, the improved aeration and water infiltration that now have enhanced plant succession. The future looks bright for these fields and any “on location” commercials in the years ahead will depict a scene the old-timers recall as belly-high grass.

**Literature Cited**


**Water for Wildlife**

**Stephan A. Nelle**

In the rugged, remote and arid Big Bend region of west Texas, permanent water is a precious asset. Because of the scarcity of natural water and the often prohibitive expense of traditional water developments, many hundreds of thousands of acres of desert rangeland are without a reliable water supply for wildlife.

Desert mule deer are the most important game animal in the region, and an asset to ranchers who lease hunting rights to sportsmen. Many landowners would like to increase deer numbers up to the stable carrying capacity of the land. Predation, drought, and poor water distribution are most often cited as reasons for low deer populations. Properly watered areas of good habitat in west Texas support deer densities of 35 to 75 acres per deer, while poorly watered areas with good food and cover may only support a deer to 300 to 500 acres.

Where rangelands produce a good food supply, many ranches could support significant increases in deer numbers utilizing rainfall catchment and storage devices commonly known as guzzlers. In a typical guzzler, an impervious catchment apron intercepts rainfall and directs it to a covered storage tank from which water is supplied to a small ground level drinking basin. In addition to mule deer, javelina, scaled quail, and numerous non-game animals benefit from these guzzlers.

On the nearby Black Gap Wildlife Management Area, owned and operated by the Texas Parks and Wildlife Department, a number of guzzlers have been successfully used for over

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Ground level steel catchment anchored with rock. A gutter and sump divert rainfall to tank using a 4-inch pipe. The 630-square foot catchment will fill the 2,000-gallon tank with 5.1 inches of rain.