



# High Stock Density on the Bow & Arrow Ranch

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## INTRODUCTION

The Bow and Arrow Ranch is located in southeastern Colorado near the Apishapa State Wildlife Area. The ranch is owned by the Peeler Land & Livestock and is managed by Michael Lacy, who has experience on multiple ranches in the western United States. The ranch is managed to have a progressive outlook on many different aspects of ranching including rangeland management. The Peeler Land & Livestock mission statement is “committed to providing products based on ranching with Nature in the most financially, ecologically, and socially responsible manner while striving to regenerate land and communities.” In order to reach this goal, the ranch is currently practicing high stock density grazing on native rangeland. High stock density grazing is the practice of grazing large numbers of livestock on a smaller than average paddock and rotating the livestock as often as few times a day. This practice has led to increased forage production and better soil health where it has been applied on the ranch.

## **HOW THE RANCH APPLIES HIGH DENSITY GRAZING**

The Bow and Arrow Ranch grazes 25,000 to 30,000 pounds of beef per acre or roughly twenty-five to thirty cows per acre. They run five hundred head of cows on twenty acre paddocks. Compared to traditional ranches in my area of Colorado that have stock densities of three to five acres per cow! To achieve this density they had to upgrade their water system. The ranch had six new wells drilled with yields ranging from 40 to 150 gallons per minute. The ranch is only allowed to pump 50 gallons of water per minute, so the ranch manager had a 30,000 gallon storage tank installed. The ranch then installed new water lines to pastures around the ranch and put risers in that run up in the middle of pastures. The manager also has a 1500 gallon portable water tank that he moves around for the cows and hooks it up to the risers through a fireman's hose. This water development was necessary to achieve the high stock density with multiple daily movement of the livestock. It is very important to give the rangeland the proper amount of rest. The manager gives the high density pastures about a year of rest depending on how fast the grazed plants recover.

## **HIGH STOCK DENSITY AFFECTS RANGELAND HEALTH**

Rangeland health is one of the most important aspects of a ranch, and one of the major contributors to rangeland health is good soil health. How does high stock density affect soil health? When Michael does this type of grazing, he is striving to increase soil health by having the cows eat half of the natural forage and trample the rest onto the soil surface which will increase the percentage of soil organic matter. The greater amount of organic matter leads to an increase in water holding capacity and nutrients, which will in turn promote plant growth even with the annual average precipitation being ten to eleven inches. According to the manager for every one percent of organic matter increase, the soil can hold roughly 30,000 gallons of water. Litter is also a good thing to have because it helps increase organic matter and hold the soil down. The increased organic matter feeds the fungi and bacteria that break down nutrients for

the plants to use. Because of the high stock density, the manure is more concentrated and is being stepped on and being mixed in with the soil. Additionally, Michael has stopped worming a portion of the cattle to promote dung beetle populations that help to improve soil health.

### **HIGH STOCK DENSITY AFFECTS BIODIVERSITY AND BARE GROUND**

Biodiversity gives the livestock the ability to graze what they need, a much more nutrient rich forage base. Michael went from being predominantly a monoculture of blue grama to starting to grow western wheatgrass and Indian ricegrass. While he has been using high stock density along with prescribed grazing, Lacy has increased the plant coverage on the entire ranch by an average of twenty percent. There was a lot of bare ground when Michael started managing the ranch. Through the management process described earlier, bare ground was decreased even through the recent drought years.

### **PORTABLE ELECTRIC FENCING AND LOW STRESS LIVESTOCK HANDLING**

Michael also uses low stress livestock moving. First he builds paddocks of polywire, a type of electrical fence used to make movable pens. A new paddock is built next to the one the cows are already in. He then just rolls up the polywire between the paddocks, and the cows easily move themselves. Usually when he moves them, they are ready to go and don't need a bunch of pushing. Ranchers should be careful to not overstock and have enough paddocks. According to Michael at least eight paddocks are needed to benefit the rangeland and for optimal livestock performance at least sixteen are needed. More paddocks will increase performance and give the pastures proper rest to grow forage and give the cows proper food to eat. One day per paddock gives the best results for soil and cow health according to Justin Morris on "Enhancing Soil Biology for Greater Soil Health." This short period prevents the cattle from overgrazing and allows adequate recovery opportunities for the plants to recover.

Michael also has little to no winter feeding of his cows. The management is bringing back species that were lost due to poor management. Some of the species coming back are western wheatgrass and Indian ricegrass. Due to the cool growing season these species growing are leading to less winter feeding.

## **CONCLUSION**

Utilizing high stock density on the Bow & Arrow Ranch has improved the quality of the rangeland without negatively impacting the performance of the livestock. While high stock density grazing is applied on only a small part of the ranch, deferred rotational grazing management is used over the remainder of the ranch. The stock being grazed in such a small area causes the animal impact, which in turn has led to great increases in soil health and plant productivity. After the impact has taken place the paddocks need proper rest periods to adequately recover. Due to a higher organic matter in the soil, plants are revived, and some pioneering species such as western wheatgrass are coming back. This leads to putting better feed in front of the cows. In addition, when these plants increase production feed is left for the winter, which means little to no feeding during this time. The bottom line is in using the management tool of high stock density the Bow and Arrow Ranch rangeland is improved, soil health is improved, and the economic goals of the ranch have been achieved.

## **REFERENCES**

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