

ECOLOGICAL DATA COLLECTION FOR VIRTUAL FENCE PROJECT EAGLE COUNTY

Intern:

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PROJECT INTRODUCTION

Virtual fencing is a new technology which grants ranchers greater control over their livestock by allowing them to create virtual fences. Virtual fencing works similar to an electric fence for dogs, as cattle approach the Virtual fence created by the rancher, an auditory signal is dispatched through a base station to their collar, warning them to not proceed further, if they do proceed, they will then receive an electrical stimulus (shock). This technology is very exciting because it presents benefits to ranchers and the environment. With the greater control that Vence grants, ranchers can implement different grazing strategies such as rotational grazing which prevents overgrazing and improves overall soil structure and rangeland health. Virtual fencing also makes it easier for cattle to be kept out of areas like burn scars or riparian zones which are more sensitive and instead be directed to areas with fuel build up, where grazing can create breaks for fire mitigation. Vence makes implementing these grazing strategies far easier when fences can be made with a few clicks of a mouse instead of the hours of labour and expense that constructing real fences or herding cattle on horse require. Now, physical fencing no longer has to be a limitation that gets in the way of implementing grazing strategies which benefit the land and ranchers.

INTERNSHIP GOALS

The goals of the internship were to collect rangeland data to understand the efficacy, user experience and range management implications of virtual fence in Colorado's rugged, remote terrain.

HOW DOES THIS APPLY TO YOUR EDUCATION

I am majoring in Natural Resources Management here at CSU which looks at how we manage and use our natural resources. This project ties in very closely with that because it is looking at a new technology which could change how we manage our rangelands and the impact that this technology would have on different stakeholders who use the land. The experience I gained through this internship through hands-on learning will help me with future classes I take here at CSU.

WHAT YOU DID

I worked alongside two other field techs collecting ecological rangeland data on plots scattered throughout Eagle County. At each plot we would first set up our transect line which served as a benchmark for the rest of the data we collected. The transect lines ensured that the data we collected would be at the same locations as past years, which allows us to see how an area changes over time. Once we set up our transect lines, we would then begin collecting various forms of data (Coulloudon et 1999; Herrick 2005; Herrick et al. 2009), such as infiltration. Infiltration tests how long it takes water to infiltrate (be absorbed) into the soil which tells us the infiltration capacity under saturated conditions. We also collected LPI data which helps us determine the overall coverage of a plot with plant and other organic material and the height diversity on a plot. This data can then be used to inform the soil and site stability, hydrological function, and biological integrity of a plot. Dung data was also collected on our plots which helps us understand how much each plot is being used by livestock and other animals. Another data point which helps us determine use by livestock on our plots is utilization which we collected by recording the species which were being utilized the most and at what percentage by weight they had been utilized. To help us determine species diversity on our plots, we conducted a plant census, which we completed by walking around the plot and recording every plant species we observed in 10 minutes. On our second visit only, we collected biomass data which helps us approximate aboveground production so we understand the productivity of a site and relative value for grazing livestock. This allows us to interpret change in use in terms of available forage.

Figure 1. Dung quadrat Figure 2. Infiltration test



WHAT YOU LEARNED

I learned that to make decisions about land management you must consider every party who uses the land. A technology like Vence has the potential to change how we manage our rangelands which is why it is so important that projects like this one exist so we know how everyone will be impacted. To have a successful project, every stakeholder must be engaged and considered in the process. I learned how to identify plants and distinguish native plants from non-native plants.

Figure 3. Group of cows wearing Vence collars



NEXT STEPS

This was the last year of data collection for the project, and now the data which was collected over the past three years will be analyzed to conclude the effectiveness of using virtual fencing as a management tool in grazing.

Works Cited

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- Herrick, J. E., Van Zee, J. W., Havstad, K. M., Burkett, L. M., Whitford, W. G., Bestelmeyer, B. T., ... & Unnasch, R. S. (2009). Monitoring Manual.