

TRACKING LIVESTOCK MOVEMENT FOLLOWING THE EAST TROUBLESOME FIRE

GRAND COUNTY, COLORADO

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PROJECT INTRODUCTION

During the summer of 2020, Grand County was severely affected by the East Troublesome Fire. Among the affected was the Fitch family and their ranch that lost approximately 26 linear miles of barbed-wire fencing in the burn scar.

In June of 2021, the Fitch family began using a virtual fencing technology known as Vence on their ranch to sustainably graze their Black Angus cattle herd. The system consists of base stations that provide signal coverage and collars that are equipped with a battery that powers a GPS tracking unit and electrodes for sound and electrical stimulus. These collars are then fitted to the adult cows of the herd (approximately 100 individuals).

Vence allows users to control cattle movement and grazing through the creation of virtual paddocks, which can be made from the farmer's smartphone or computer. When the cattle get too close to the boundary of a virtual paddock, they are warned with a sound stimulus through their collar. If they continue to move toward the virtual paddock boundary, their collar will eventually give them a shock stimulus.

Fitch Ranch will be utilizing Vence on their own property as well as on their public land allotments that are assigned to them through the BLM and National Forest Service.

INTERNSHIP GOALS

The goal of this study aimed to determine how quickly, if at all, the cows learned to obey the sound and shock stimuli produced by the Vence collars.

By examining the learning behavior of the cows, the study was able to better understand how well the Vence technology worked in keeping the cattle within the virtual paddocks to facilitate a sustainable rotational grazing operation where the native ecology of the land and safety of the people and animals of Fitch Ranch were top priorities.

HOW DOES THIS APPLY TO YOUR EDUCATION

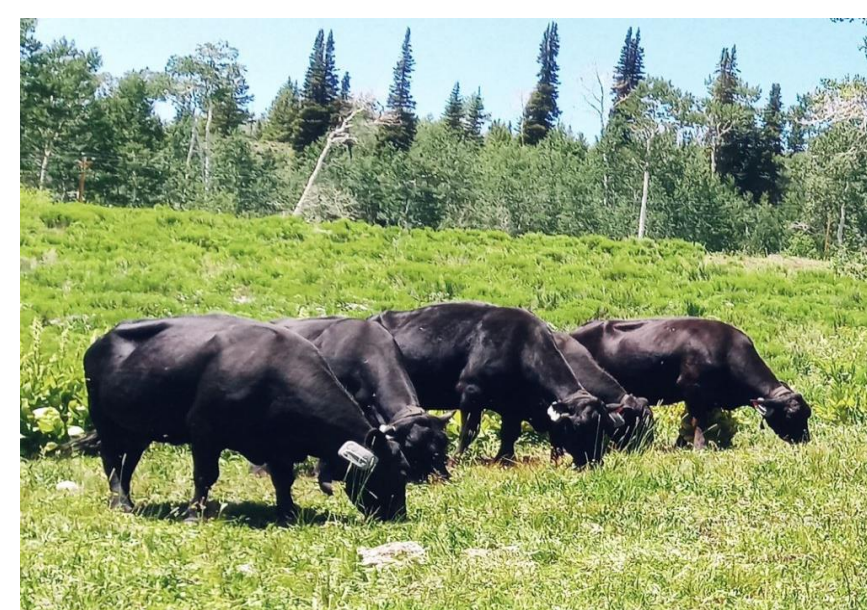
I am a graduate student in the Colorado School of Public Health. My concentration is in animals, people, and the environment where I am pursuing an MPH in one health. This internship applied to my education in so many ways as I was able to participate in a variety of environmental monitoring practices while getting an incredible hands-on experience in land management and the overall upkeep of a ranching operation.

These activities, combined with my background in public health have further shown me how incredibly interconnected our world is when discussing environmental, human, and animal health.

WHAT YOU DID

During the first week of the project, from June 14 to June 21, all of the Fitch's cows were brought down from the open range where collar fittings and general health checks were done for the adults, and vaccinations, ear tagging, and brandings were preformed for the new calves.

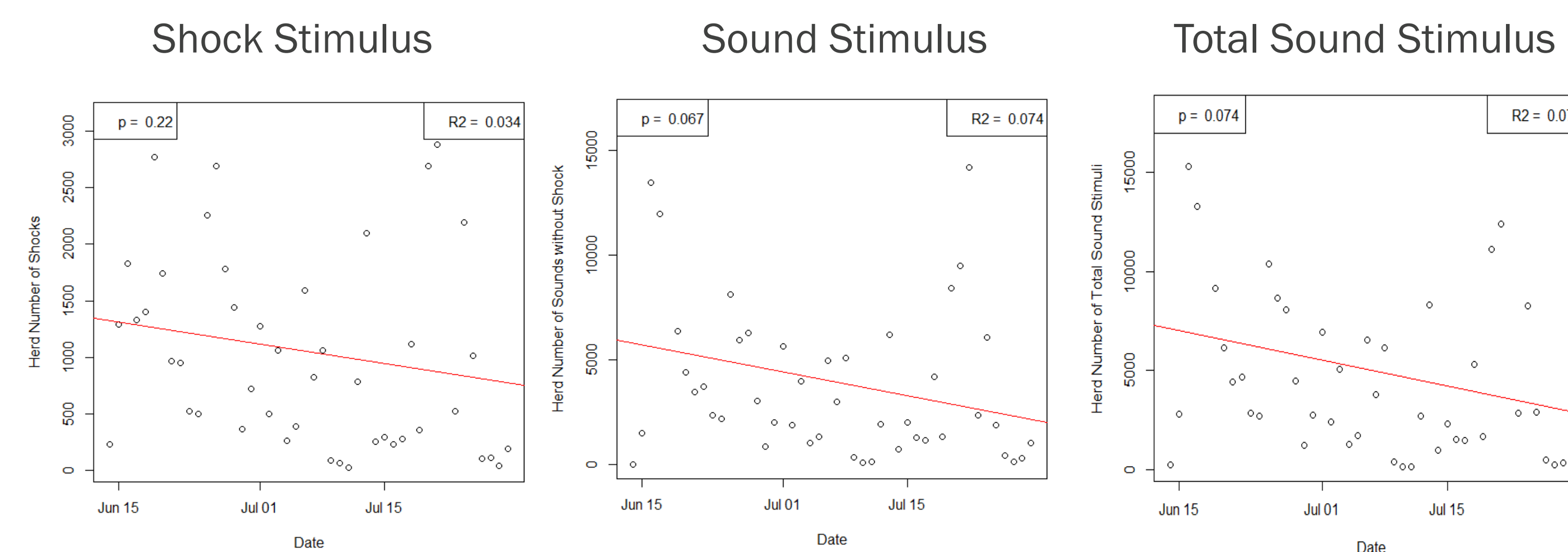
This was a collective effort that involved myself, several of the Fitch's friends, family, neighbors, and employees. Once this was completed, regular life at the ranch resumed and the cows were released back out to the home pasture where they would begin to learn how the Vence technology worked in keeping them enclosed within certain areas.



For the rest of the summer, mornings at the ranch were dedicated to completing daily chores and assisting in the upkeep of the ranch. During the dry months of summer, the pastures required consistent irrigation. The daily herd check would be done in the morning as well where we would go out and examine the cows from afar for any possible injuries or if any new calves had been born the night before. Occasional maintenance of ranch facilities and equipment was also completed.

Later, in the afternoon and evening my time was spent working on various aspects of the research project. This spanned from data analysis, to land surveying, map-making, and the construction of one of the Base Stations (that we converted into a mobile unit).

FIGURES



WHAT YOU LEARNED

Constructing the graphs with the shock and sound count data collected from the summer, it is understood that the cows were learning to abide by the commands of the Vence collars. As time progressed, the number of shock and sound stimuli decreased.

In terms of ranching, I gained so many new skills that I would have never gained otherwise. From large animal stewardship and care, to electrical engineering and construction, the list of things I learned at the Fitch Ranch would go on forever.

Viewing this experience through a lens that concentrates more on my scholastic background of one health and ecology, the list of new skills learned through this internship is quite vast as well. The most useful having been the ability to make maps through the collection of GPS coordinates that were later imported into Arc GIS and additionally, the very important practice of water conservation and water rights policy.

I also had the pleasure of working alongside many people with backgrounds and views that differed from my own. This diverse work environment taught me a great deal about the importance of collaboration within diverse groups and why it is beneficial to collaborate with others that have different ideas and opinions to your own.



NEXT STEPS

Over the course of the summer many ideas were brought forth that dealt with improving the Vence collars and their tracking abilities. The main facet to this issue is combining some form of calf ear tag to a mother cow's collar to better track the movements of her calf.

Predator-prey interactions could also be mitigated by collars being fitted onto large carnivores such as mountain lions, bears and wolves, that would deter their predation on livestock who were also fitted with Vence collars. This was a popular topic of discussion that was brought up several times between myself and the ranching community of Grand County.

Looking at the regeneration of burnt forests, the US Forest Service and the BLM were both interested in the utilization of Vence's technology to facilitate better grazing practices that would stimulate faster plant growth and reduce burn severity.