

ABSTRACT

Sustainable ranching refers to the practice of evaluating livestock quantities that natural grasses and ecosystems are capable of supporting, with minimal long-term impacts on the environment. Defining optimal and sustainable stocking rates can be a complex problem for land managers striving to implement the practice of sustainable ranching of sheep. I used a combination of Geographic Information Systems (GIS) with Remote Sensing (RS) to analyze environmental variables and track movement patterns of sheep and tested it at the Lava Lake Livestock and Landscape Ranch. A GIS model utilizing remotely sensed imagery was built to identify areas capable for grazing by sheep across the study area. Tracking Analyst and Time Slider, which are GIS based time analysis tools, utilized point data collected from Global Positioning System (GPS) collars to visualize the rate at which sheep are traveling. Results show an estimated 85% of the study area is found capable for grazing with the primary eliminating factors being steeper terrain in the north and lack of water in the south. Results also outline two contrasting sheep patterns: a slower travel rate in autumn within the northern regions; a faster travel rate during spring in the more southern regions of the study area. An improvement in achieving even distribution of grazing, offering more resources such as water, and planning rest breaks of intensely used areas can be incorporated in future management plans. A continuation of the project would benefit from a closer look at vegetation specifically plant species type in the various terrains and a biomass study as well as factors affecting vegetation such as precipitation.