

## **Stocking Rate Decisions Are Not Related to What You Paid for Your Land or Pickup**

Author(s): W. Marshall Frasier and Tim Steffens

Source: Rangelands, 35(5):14-21. 2013.

Published By: Society for Range Management

DOI: <http://dx.doi.org/10.2111/RANGELANDS-D-13-00027.1>

URL: <http://www.bioone.org/doi/full/10.2111/RANGELANDS-D-13-00027.1>

---

BioOne ([www.bioone.org](http://www.bioone.org)) is a nonprofit, online aggregation of core research in the biological, ecological, and environmental sciences. BioOne provides a sustainable online platform for over 170 journals and books published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Web site, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at [www.bioone.org/page/terms\\_of\\_use](http://www.bioone.org/page/terms_of_use).

Usage of BioOne content is strictly limited to personal, educational, and non-commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

# Stocking Rate Decisions Are Not Related to What You Paid for Your Land or Pickup

By W. Marshall Frasier and Tim Steffens

## On the Ground

- We develop a simple bio-economic model to reflect the stocking rate decision for a profit-seeking land manager and use it to identify factors influencing the optimal stocking rate.
- The optimal stocking rate will be bounded by the rate that maximizes average animal performance and that maximizing total animal production per unit of rangeland.
- The optimal stocking rate tends closer toward the upper bound as the ratio of the value of the animal product increases relative to the variable costs of production.
- Fixed costs or overhead do not influence the optimal stocking rate, but will affect the amount of profit.

**Keywords:** bio-economic modeling, optimal stocking rate, stocking rate, economics, overhead costs, fixed costs, variable costs, value of production, gross margin analysis.

*Rangelands* 35(5):14–21

doi: 10.2111/RANGELANDS-D-13-00027.1

© 2013 The Society for Range Management

A common approach to mitigating the effects of high fixed costs is to increase production activities to “spread” those costs. This strategy is often useful to businesses that are dependent on large amounts of machinery and facilities to add value to raw materials and whose actions to increase production do not limit the supply of those raw materials—that is, they are able to take advantage of slack capacity. However, it is often inappropriate when talking about businesses with a natural resource base of limited carrying capacity, such as grazing operations that depend on biological conversion of forage resources for their income. When animal numbers

are so high that the marginal return doesn’t cover marginal costs, you can find yourself in a hole that you have dug for yourself. And the first law of holes is this: When you find yourself in one, stop digging.

With a fixed land area, the ability to increase stocking rate profitably is limited by the biological relationship between forage availability and interanimal competition for forage of sufficient quality,<sup>1</sup> and when stocking rate is wrong, applying all the other grazing management tools only forestalls the inevitable. The following discussion is a variation of the explanation that Hart provided in 1978.<sup>2</sup> We use information from both Jones and Sandland<sup>1</sup> and Hart,<sup>2</sup> though with a slightly different approach, and encourage those wanting to explore the idea in more depth to consult both of these sources. Our approach mathematically analyzes the biological and financial relationships determining the most profitable stocking rate (animal demand per unit of land for a specified period of time), but differs from that of Hart<sup>2</sup> in that it first uses information from Jones and Sandland<sup>1</sup> to show how to determine the stocking rate at which productivity is maximized and then calculates an adjustment factor based on the ratio of variable costs to the value of production for a given piece of property, which we believe simplifies and clarifies the subject for the reader.

In the context of the analytic results, we discuss how the optimum economic stocking rate changes with different environmental and financial conditions, and why overcapitalization, (high fixed costs or overheads) on a limited land base must be dealt with as a problem that is independent of the stocking rate decision. We then provide a quantitative example similar to a small stocker operation on semiarid rangeland to illustrate how changing environmental and economic conditions change the stocking rate at which returns are maximized. We clearly show how fixed costs have no bearing on that stocking rate, but will affect the amount of profit. Our example should also help resource managers evaluate their own situation to identify the range in stocking rates that may be optimal in their own circumstances.

Download English Version:

<https://daneshyari.com/en/article/4405144>

Download Persian Version:

<https://daneshyari.com/article/4405144>

[Daneshyari.com](https://daneshyari.com)