

Setting Stocking Rates – Note Guide

Rangeland Principles (REM 151)

Grazing Principles

- Which animal(s)?
- How many animals?
- When to graze or not graze?
- How long to graze or rest?
- Where animals graze on landscape?

Calculating stocking: Balance forage _____ with forage demand _____

Carrying Capacity

- The number of animals that a piece of land can support on a long-term basis without causing damage to the ecosystem.
- Expressed as animals/area/year.... usually expressed as _____.

Stocking Rate

- The number of animals a land manager places on a piece of land for a specified period of time.

Animal Units (AU) = 1AU = 1,000 pounds of grazing animals (ruminant)

- Cow = 1
- Horse = 0.56
- Yearling Steer = 1.3
- Sheep = 5
- Jackrabbit = 50

Animal Unit Equivalent (AUE) = a conversion factor reflecting the # of AU in an average animal.

- Cow = 1
- Horse = 1.8
- Yearling Steer = 0.75
- Sheep = 0.2
- Jackrabbit = 0.02

Forage Demand of Animals:

Ruminants: eat _____% of body weight/day in dry matter forage

Hind-Gut Fermenters: eat _____% of body weight/day dry matter forage

Animal Unit Month (AUM)

- Amount of forage an animal will eat in a month.
- How many pounds is an AUM?
 - Each AU = _____ lbs × 2.5% = _____ lbs/day
 - AUM = _____ lbs × 30 days = _____ lbs

Stocking Rate 4-step Method: Forage-Demand Method

1. Calculate usable forage
2. Adjust for terrain, water, or other constraints
3. Calculate forage demand of animals
4. Calculate stocking rate

Step 1: Calculate Usable Forage

- Determine biomass supply.

$$Wt\ of\ biomass/acre \times total\ acres = total\ biomass\ supply$$

- Convert total biomass to total forage.

$$Total\ biomass/acre \times Proper\ use\ (\%) \times area = total\ forage\ supply$$

Proper stocking rates are based on maintaining sufficient plant residue for:

- Plant health/regrowth
- Wildlife forage
- Erosion prevention

- Example:** You manage a 1,200 acre ranch and the average production is 500 lbs/acre. The ranch is located in a sagebrush steppe plant community and has a proper use factor of up to 30% of the annual forage. *What is your forage supply/year?*

$$\underline{\hspace{2cm}}\ \text{acre ranch} \times \underline{\hspace{2cm}}\ \text{lbs/ac} = \underline{\hspace{2cm}}\ \text{lbs of biomass}$$

$$\times \underline{\hspace{2cm}}\ \text{Proper Use Factor} = \underline{\hspace{2cm}}\ \text{lbs of forage.}$$

Step 2: Adjust for Accessibility

Not all forage is available for grazing.

- How far from water?

Miles	KM	REDUCTION IN GRAZING CAPACITY
0 - 1	0 - 1.6	None
1 - 2	1.6 - 3.2	50%
> 2	Over 3.2	100% (consider this area ungrazable)

- How steep?

PERCENT SLOPE	PERCENT REDUCTION IN GRAZING CAPACITY
0-10	None
11-30	30
31-60	60
Over 60	100 (consider the slopes ungrazable)

Step 3: Calculate Forage Demand

$$\text{Body weight} \times \underline{\hspace{2cm}}\% \text{ eaten/day} = \text{amount eaten/day} \times \text{days on range} = \text{total amount eaten}$$

Example: On average cows in your herd weigh 1,000 lbs and graze on the ranch for 3 months
How much forage would you expect each cow to eat?

$$\underline{\hspace{2cm}}\ \text{lb cow} \times \underline{\hspace{2cm}}\ \% \text{ of body wt/day} = \underline{\hspace{2cm}}\ \text{lbs forage/day}$$

$$25\ \text{lbs} \times \underline{\hspace{2cm}}\ \text{days} = \underline{\hspace{2cm}}\ \text{lbs/cow/season.}$$

OR... How many AUMS is this?

$$\underline{\hspace{2cm}}\ \text{lbs/cow/season} \div \underline{\hspace{2cm}}\ \text{lbs /AUM} = \underline{\hspace{2cm}}\ \text{AUMs}$$

Step 4: Calculate Stocking Rate = Number of animals/area of land/season

Example: How many cows should you have in your base herd if your usable forage is _____ lbs/pasture and the forage demand of each cow is _____ lbs?

$$\underline{\hspace{2cm}}\ \text{lbs supply} \div \underline{\hspace{2cm}}\ \text{lbs demand} = \underline{\hspace{2cm}}\ \text{cows}$$

$$\underline{\hspace{2cm}}\ \text{AUMs supply} \div \underline{\hspace{2cm}}\ \text{AUMs demand} = \underline{\hspace{2cm}}\ \text{cow}$$

Overgrazing: repeated heavy grazing that yields damage to the plant community

Overstocking: heavy grazing during a specific season such that high levels of utilization are observable.

Over-resting: excessive resting (no grazing) periods that results in damage to the plant community.

Set a stocking rate and then MONITOR!

