

Figuring Stocking Rate

Mollie Texan an Example Forage Demand Method

Step 1 - Calculate Total Usable Forage Supply:

Mollie Texan has a ranch in the southern mixed prairie that is 1,000 acres big. 75% of it is covered by a sandy loam range site that produces 1,500 lb/acre/year. The other 25% is a shallow uplands site that produces 800 lb/acre/year. How much total forage does Mollie produce on her ranch?

$$75\% \text{ of } 1,000 \text{ acres} = 750 \text{ acres} \times 1,500 \text{ lbs/ac} = 1,125,000 \text{ lbs}$$

$$25\% \text{ of } 1,000 \text{ acres} = 250 \text{ acres} \times 800 \text{ lbs/ac} = 200,000 \text{ lbs}$$

However Mollie cannot use all of the forage she produces. Why?

$$1,325,000 \text{ lbs}$$

- 1) Not all the vegetation can be eaten - it is not all forage.
- 2) Need to leave some vegetation for soil health
- 3) Want to leave some forage for other animals
- 4) During the growing season, need to make sure some leaves remain after grazing so plants can photosynthesize and recover from the disturbance.

Scientists recommend that Mollie remove only 40-50% of her total forage each year to maintain good range condition. If Mollie decides to use 40% of her total forage, how much usable forage does she have?

$$1,325,000 \text{ lbs} \times 40\% = 530,000 \text{ lbs of usable forage}$$

Step 2 = Adjust for accessibility (terrain or distance to water). No necessary adjustments in this case.

Step 3 = Calculate Forage Demand:

Mollie has several species that she manages on her ranch and all animals graze year-round in the range.

- She has 4 horses that weigh about 1200 lbs each.
- She also wants to allow enough forage for 15 pronghorn antelope that weigh about 110 pounds.
- The rest of her forage she wants to use with sheep that weigh about 180 lbs each.

How much forage will her **horses** need for 1 year?

$$1,200 \text{ lbs} \times 3\% = 36 \text{ lbs/day} \times 365 \text{ days} = 13,140 \text{ lbs/horse} \times 4 \text{ horses} = 52,560 \text{ lbs}$$

How much forage will the 15 **pronghorn** eat on her ranch?

$$110 \text{ lbs} \times 2.5\% = 2.75 \text{ lbs/pronghorn/day} \times 365 = 1,003.75 \text{ lbs/pronghorn} \times 15 = 15,056 \text{ lbs}$$

How much forage will 1 **sheep** eat each year?

$$180 \text{ lbs} \times 2.5\% = 4.5 \text{ lbs/sheep/day} \times 365 = 1,642.5 \text{ lbs}$$

Step 4 - Calculating Stocking Rate:

We need to determine how many sheep Mollie should put on her ranch. From step 1 we calculated that Mollie had 530,000 lbs of forage to use.

- Reduce this amount by the amount need for horses:

$$530,000 - 52,560 = 477,440 \text{ lbs}$$

- Reduce this amount for the pronghorn:

$$477,440 - 15,056 = 462,384 \text{ lbs}$$

How many sheep should she stock year long if each sheep eats 1,642.5 lbs/year?

$$462,384 \text{ lbs forage} \div 1,642.5 \text{ lbs/sheep} = 282 \text{ sheep/year}$$

What if Mollie decides to stock her ranch with stocker steers instead of sheep? Suppose Mollie wants to buy steers weighing 700 lbs April 1st and then sell them June 30 when they weigh about 800 lbs.

- How much will each steer eat a day (average for the whole period)?

$$700 \text{ lbs average wt} \times 2.5\% = 17.5 \text{ lbs/steer/day on average}$$

- How much will each steer need for the 3 month grazing period?

$$17.5 \text{ lbs} \times 90 \text{ days} = 1,575 \text{ lbs/steer/grazing period}$$

- How many steers should Mollie stock?

$$462,384 \text{ usable forage} \div 1,575 = 293 \text{ steers}$$

← amount left after horses + pronghorn