

Determining forage production and stocking rates

The first step to deciding how many cows (or sheep, horses, goats, etc.) are appropriate for a piece of ground is to determine how much usable forage it grows and to decide how much of this forage you PLAN to leave. One can obtain this information from either direct measurement through a clipping procedure or from an estimate given in an Ecological Site Description from the Natural Resource Conservation Service.

Clipping

Clipping involves cutting all the forage at almost ground level, weighing the sample, removing the moisture or estimating moisture content to arrive at a dry matter weight. When evaluating forage quantity for the purpose of calculating carrying capacity and stocking rates for livestock grazing it is important to clip plant species the animals will eat. For example, in shrub-steppe ecosystems sagebrush, buckwheat, rabbitbrush, etc., may be a significant percentage of the total biomass, but the animals will not readily eat sagebrush (without training . . . www.behave.net) so you cut grass and forbs that are palatable and likely to be selected by the grazing animal. In locations where grasses have not been grazed in several years there may be an accumulation of previous year's stems. These have negligible nutrient value and will generally be avoided by livestock and should be removed from the clipped sample prior to weighing.

Clip a known area as close as you can and place the contents (minus last year's stems) into a plastic sack. A coated cable hoop with a circumference of 93 inches works well for converting to pounds per acre; be sure to keep the hoop as close to a true circle as possible – the area decreases as a circle becomes more oval.

Weigh the sack first so you know what to subtract from the total weight (which is most useful in grams), then weigh the sample.

Estimate dry matter content using Table 1 (from National Range Handbook at <http://www.glti.nrcs.usda.gov/technical/publications/nrph.html>). Multiply the fresh sample weight by the estimated dry matter or use the oven-dry weight to arrive at grams of dry forage (roughly a hay equivalent). Repeat several times and calculate the average. If using the 93" hoop, multiply the net dry matter weight by 20 to get pounds per acre.

| Table 1. % dry matter of grasses | Before heading (initial growth to boot stage) | Headed out (boot stage to flowering) | Seed ripe (leaf tips drying) | Leaves dry (stems partly dry) | Apparent dormancy |
|---|--|---|---|---|------------------------------|
| Cool-season grasses | 35 | 45 | 60 | 85 | 95 |

Now you must decide how much of this forage will be utilized, which is dependent on the management goal. In cheatgrass-dominated sagebrush steppe a producer may choose close to 100% in an effort to reduce the cheatgrass. (Note that if there are no desirable remnant grasses this will increase sagebrush cover or potentially invite other invasive plants.) A common guideline is to take half and leave half. On bluebunch wheatgrass range there is not a one to one correlation between height and biomass, and something less than 50% may be appropriate, particularly if grazing occurs during the critical growth period of mid-April through mid-June or the first of July. In areas with a history of overgrazing, it may be desirable to use light stocking rates and keep utilization at 10-20%. Whatever the goal, it is important to identify it and plan toward it and fill in this blank.

Estimate from ESD

An ecological site description available from your local Natural Resources Conservation Service office will provide a range of total biomass production for poor to high rainfall years. Keep in mind that these will include all plants on the range site, not just grasses and forbs. Estimate how much of the total is from shrubs before multiplying by the utilization factor. If total production is 1500 pounds and sagebrush is a significant component, it may be wise to assume 1000 pounds of grass (remembering that the entire sagebrush plant is not current year's production). If our goal is 50% utilization, 500 pounds per acre are available. This is also a good way to double-check your clipping estimates, i.e., if the ESD says the maximum possible pounds per acre is 750 and your clipping average indicated 3000, you should probably check to make sure you averaged the results or were being too selective and subjective in selecting a location to clip. You can also do some research yourself now using the NRCS interactive soils website at <http://websoilsurvey.nrcs.usda.gov/app/>.

Calculations

How many cows does 500 pounds support? A lactating cow with a calf will consume between 2.5 and 3% of her body weight every day. At some point, the calf's contribution becomes significant and should be considered as well – this will obviously be different in September than it was in April with a spring-calving cow herd. For safety's sake and to compensate somewhat for the calf's grazing it's best to use 3%. Therefore, a 1200-pound cow will eat 40 pounds of dry matter per day; our 500 pounds available on one acre will be sufficient for 12.x days for one cow. Extrapolating this to your herd size and total acres will be more useful.

Example:

1. Cow herd = 250 cows @ 1200 lbs.
2. Pasture A = 450 *grazable* acres
3. If the clipped samples are representative of the whole pasture, or at least the grazable parts of the pasture, we have 450ac x 500lbs = 225,000 lbs.
4. The daily herd forage demand is 250 x 1200 x .03 = 9000 lbs. per day
5. Pounds per acre / pounds per day = herd days of grazing; so 225,000/9000 = 25 herd days
6. Alternately, we could calculate an AUM (animal unit month) value since many leases are billed on AUMs. To calculate AUMs, divide the total available forage by the monthly requirement of one cow: 225,000 / (1200 x .03 x 30) = 187.5 AUMs. This means there is enough forage to support 187 animals for one month, or 374 animals for 15 days, etc.

--Tip Hudson, WSU Extension – Kittitas County