

Determining Grazing Capacity for Native Range ¹

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The question is often asked, "How many cows can I graze on this pasture?" Since cattle are plant eaters and require a given amount of forage to remain alive, healthy, and productive, it is best to answer this question based on the inherent forage production capability of the pasture. More specifically, two sets of information will be needed: one set dealing with certain physical and biological attributes of the pasture, and a second set dealing with how the cattle will be managed.

The Pasture

The size of the pasture must be determined

first. If the vegetation is uniform throughout the entire pasture, then the overall size can be used in all computations. However, in all likelihood, if the pasture is greater than 100 to 200 acres in size, more than one vegetation type (e.g., palmetto flatwoods, live oak hammock, maidencane pond, etc.) will occur within the pasture. If so, the acreage of each vegetation type must be determined.

Use of aerial photographs is the best means to determine the acreage of the pasture or its various vegetation types. Local USDA Soil Conservation Service or county Agricultural Extension Service

offices usually have photographs on hand, or access to photographs, of the property in question. Personnel within these offices are trained and willing to assist land managers in identifying vegetation types and determining their respective acreages.

Secondly, total forage production (pounds of forage) within the pasture must be determined. Different vegetation types have different capabilities of producing forage for cattle consumption; therefore, production must be determined separately for each vegetation type. Forage production capability is best estimated by on-site determination of the dry weight of vegetation samples clipped within a frame of known area. Various frame sizes are commonly used, but a 2ft x 2ft frame would be applicable within most vegetation types. In order to reduce potential bias in frame placement within a vegetation type that may lead to poor estimates, establish a line of sight across the vegetation type and place the frame on the ground at an arbitrarily set number of paces. The total number of frames needed to be clipped in order to obtain an adequate estimate of average forage production will vary depending upon uniformity of plant growth within each vegetation type. In general, the more frames that can be clipped, the better the estimate. Again, county extension agents and SCS

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personnel are available for assistance and are trained in methods of estimating forage production that will reduce the number of frames that need to be clipped and weighed. By multiplying the estimated forage production (lbs/acre) within each vegetation type by its corresponding area (acres) and summing the products, total forage production within the entire pasture can be estimated. *Caution: forage production can be significantly altered year to year by climatic conditions such as drought, wildfire, flooding, etc.*

Grazing Management

Forage Requirements of Animals

Once the land manager knows how much forage there is to work with, the problem of properly harvesting that forage with animals must be addressed. The **Animal Unit Month (AUM)** concept has been developed to standardize the process. An AUM is defined as the amount of forage required by an animal unit (a mature cow weighing 1000lb with unweaned calf) for one month assuming average daily consumption to be 26lb of dry matter. Therefore, by convention, an AUM equals 780lb of dry forage.

Cattle of different weights will consume different amounts of forage in order to maintain metabolic requirements. The term **Animal Unit Equivalent (AUE)** is a numerical value used to express the forage requirements of a particular kind and class of animal relative to the requirements of an animal unit.

The mathematical formula (Equation 1) used to determine an animal's unit equivalent is

$$AUE = \frac{Wt. \text{ Animal lbs.}^{.75}}{1000 \text{ lb}^{.75}}$$

Equation 1 .

Table 1 lists AUE values for a range of cattle body weights. By knowing the average weight of the animals that will be grazing an area, their monthly forage requirements can be estimated.

Forage Utilization and Consumption

It is important to utilize the forage properly. Chronic overuse causes decreased grazing capacity and increased growth of undesirable woody plants.

Under-use allows forage plants to accumulate an abundance of old, rank, unpalatable forage detrimental to the health of the plant. An accepted rule of thumb is to *use half and leave half*. This type of grazing management ensures the plant an opportunity to resupply carbohydrate reserves, needed for sustained growth.

The half of the forage that is utilized is not totally consumed by the grazing animal. Utilization includes forage lost due to trampling, droppage, excrement contamination, insect damage and cattle consumption. A second accepted rule of thumb is that consumption equals one-half of utilization. Since AUMs are based on *consumed* forage only, the actual amount of forage that is available within the pasture for cattle consumption is determined by multiplying the total forage available value by 25% (50% utilization x 50% consumption). By definition an AUM equals 78lbs of dry consumed forage; therefore, the total number of AUMs within the pasture is determined by the following (Equation 2):

$$\text{Total AUMs} = \frac{\text{lbs Consumable Forage}}{780 \text{ lbs/AUM}}$$

Equation 2 .

Example: You have just acquired a 1200ac pasture of native range you wish to graze. Within this pasture you determine that there are 150ac of maidencane marsh, 150ac of oak scrub and 900ac of palmetto flatwoods. Forage clipping information indicated forage production (dry weight) to be 4000lb/ac in the marsh, 600lb/ac in the oak scrub and 1800lb/ac in the flatwoods.

How many AUMs of forage are there to work with?

Solution: See Table 2 : your 1200ac pasture has 740 AUMs of forage to be consumed by your animals.

Duration of Grazing

Native range pastures usually are grazed in conjunction with tame pastures, cleared and planted to improved forage species. A common management scheme involves grazing tame pastures from spring until fall while improved grasses are productive, then wintering the animals on native range that has been

rested throughout the growing season. Depending upon individual ranching operations a particular pasture may be grazed year-round or for some shorter period of time. In order to obtain proper utilization, the number of animal units on a given pasture will have to be adjusted to the planned duration of the grazing period.

For example, if your pasture has 10 AUMs of forage, you could use that forage by placing 10 AUs on it for 1 month, or by placing 1 AU on it for 10 months.

Another important factor that must be considered is the size (body weight) of the animals that will be grazing the pasture. The Animal-Unit-Equivalent (AUE) concept--already explained--applies here. With a given amount of AUMs to be consumed within a set period of time, a greater number of lightweight animals can be stocked than heavier animals.

The following problem using a standardized table as an aid to summarizing the concepts involved with determining grazing capacity.

Let us consider the previous example of the 1200ac pasture having 740 AUMs of forage. You have two options: a) to place mature, pregnant cows on it for 5 months during the winter, or b) to graze replacement heifers on it year-round. Assume the average cow weight is 900lb and the average heifer weight is 600lb.

How many animals under each option will the pasture handle? **Solution:** See Table 3 : Information you have on hand is in parentheses. Perform your arithmetic starting on the right and working to the left.

The same standard table can be used to answer a different type of problem. Suppose you graze 350 brood cows (average weight = 1100lb) on tame pasture during the spring, summer, and early fall (7.5 months). In the past, you have been buying hay for winter feed and have been buying replacement heifers each year. However, now you decide to lease enough native range to winter your brood cows plus maintain 25 heifers year-round (av. wt. = 700lb) for replacement stock. An adjacent tract of native range

is available for lease. Average forage production on the range is 2200lb dry wt/ac.

How many acres will you need to lease?

Solution: Use the standard table to determine the number of AUMs you will need under the given constraints. Known information is again in parentheses. Perform arithmetic, this time, starting on the left and working to the right (Table 4).

Now you can determine the number of acres of range needed to supply this number of AUMs as follows (see Equation 3):

$$\text{Acres needed} = \frac{\text{No. AUMs needed (1916.9)}}{\text{Stocking rate (0.7 AUM/ac)}} = 2,738.4\text{ac}$$

Equation 3 .

Summary

Determining grazing capacity for any pasture requires knowing the amount of consumable forage available during the period of time you wish to graze. Pasture size or of its various vegetation types and the forage production capabilities within the pasture dictate the amount of forage to be used. The actual number of animals that should be placed on the pasture to *properly use* the consumable forage will depend upon: animal size and the intended duration of the grazing period.

Overstocking a pasture is damaging to the productivity of your forages and to the productivity of your cattle. Since most of Florida's range pastures have been overgrazed in the past, often unknowingly by the land manager, proper stocking now will lead to increased forage production capability of these pastures in the future. As forage production capability increases, beef production potential will increase.

Table 1.

Table 1. AUE values and corresponding monthly forage for a range of cattle body weights.			
Animal Body Wt. lbs.	AUE (AU/Animal)	Monthly Forage Reqs. lbs.	
100	0.59	464	
600	0.68	532	
700	0.77	597	
800	0.85	660	
900	0.92	721	
1000	1.00	780	
1100	1.07	838	
1200	1.15	894	
1300	1.22	950	

Table 2.

Table 2. Number of AUMs in this 1200ac pasture.		
Marsh	150ac x 4000 lb/ac =	600,000lb
Oak scrub	150ac x 600 lb/ac =	90,000lb
Flatwoods	900ac x 1800 lb/ac =	1,620,000lb
Total Forage		2,310,000lb
Consumable Forage =	Total Forage x 25% or 2,310,000 lb x 25% =	577,500lb

Table 2.

AUMs =	lbs consumable forage ÷ 780lb/AUM or 577,500lb ÷ 780lb/AUM=	740 AUM
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Table 3.

Table 3. Animal Class grazing options.					
Animal Class	Number Each	AUE	AU	Mos.	AUM
Cows	161	(0.92) Ö	148	(5) Ö	(740)
Heifers	91	(0.68) Ö	61.7	(12) Ö	(740)
Answers: a) 161 pregnant cows or b) 91 heifers					

Table 4.

Table 4. Calculating total AUMs needed.					
Animal Class	Number Each	AUE	AU	Mos.	AUM
Brood Cows	(350)	x (1.07)	= 374.5	(4.5)	=1685.3
Heifers	(25)	x (0.77)	= 19.3	(12)	= 231.6
Result: Total AUMs needed = 1916.9					

Table 5.

Average forage production =		2, 200lb.ac
Consumable forage=	total forage x 25%=	550lb/ac
Stocking rate =	550lb/ac ÷ 780lb/AUM=	0.7AUM.ac