UF IFAS Extension
UNIVERSITY of FLORIDA

SS-AGR-105
https://doi.org/10.32473/edis-ag173-2002

# Managing South Florida Range for Cattle[1]

J. Vendramini, R. S. Kalmbacher, and R. Boughton[2]

The southeastern pine forest region is classified into six range types, according to the forest overstory (Figure 1). Florida is classified as the longleaf/slash-pine/wiregrass range type. This land has been used for cattle production since 1521, when the first cattle were introduced into the state. In 2017, about 3 million acres of range exist statewide, and much of it remains forested, particularly in the northern half of the state, where production of forest products is the primary source of income from range. About two-thirds of the state's cattle are found in South Florida, and range is an important forage resource for many large, extensively managed ranches. Nineteen of 26 counties in the region each contain at least 100,000 acres of range.

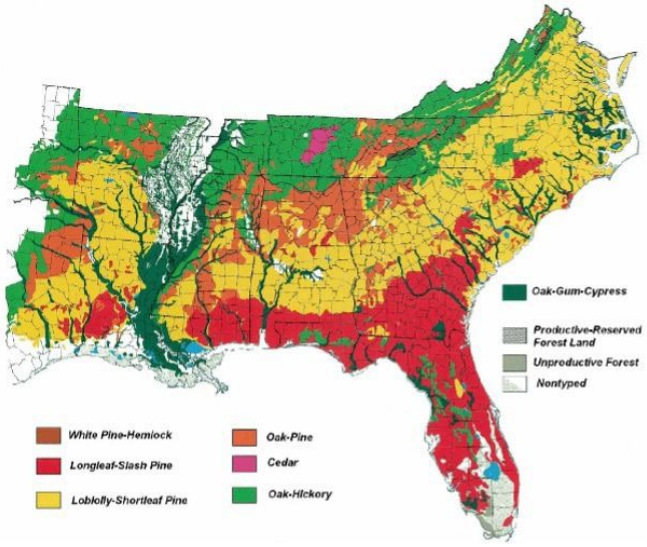


Figure 1. Range types of the Southeastern United States. Credit: Reynolds, J.E. Megadrilogica, v. 16, n. 9-12, p. 186

## Florida Range Sites

Range is land where indigenous or native vegetation predominates. Range may be grazed or ungrazed but is managed to maintain the native vegetation. The natural plant community at a range site is usually adapted to rather broad but distinctive soil and climatic conditions. Thus, different range sites have different distinctive features in terms of kinds and amounts of forage. Range Conservationists of the USDA, Natural Resource Conservation Service (NRCS) recognize 28 range sites in Florida, but for practical purposes, about four sites are important for cattle production in South Florida (Table 1). Approximately 332 native grasses grow in Florida, but only 10–15 produce most of the forage for cattle. These grasses are of economic importance on the site where they grow.

Range scientists divide grasses into two groups. Preferred or desirable grasses are referred to as "decreasers," which are generally those grasses that are more palatable, nutritious, and higher yielding. These may be grasses that are selected first and grazed most often; consequently, they may decrease on range that is overgrazed. Examples of decreaser grasses are creeping and chalky bluestems, lopsided indiangrass, and maidencane. On the other hand, less desirable grasses—in terms of cattle production—are referred to as "increasers." These grasses are less palatable and are grazed less; therefore, they increase on range that is overgrazed. Examples are wiregrass, bottlebrush threeawn, and broomsedge.

Condition class is the "state of health" of range and indicates the current productivity for cattle production relative to the kind and amount of vegetation that the site may produce. There are four condition classes, which are based on the relative contribution of decreasers (Table 2). Condition class is usually determined by measuring the frequency-of-occurrence of species, and less commonly by biomass determination. Condition-class determination and its interpretation require knowledge and experience. It is a service provided to ranchers by NRCS Range Conservationists.

The concept of condition class and increasers/decreasers is a helpful tool, but remember that it is an artificial system to aid in communication about range trends. Not all range has the capability to be excellent-condition range. At best, some range is now, and always will be, "wiregrass range." The first step in a range management program is to determine range condition class and realistically assess its potential for improvement, which is best accomplished with NRCS technical help. To try to manage wiregrass range for creeping bluestem and other such grasses, when there is no potential for them to grow, is to do a real disservice to the rancher. On the other hand, if there is potential for improvement, the rancher can profit by having greater cattle carrying capacity with those grasses referred to as decreasers.



Reviewed: 12/2025

It is pertinent to point out that range condition is no longer the preferred method of assessing range. However, data on rangeland health of Florida ranges are not yet available. In the 1990s, panels from the Society for Range Management and the National Research Council proposed the concept of rangeland health for assessing the status of rangeland ecosystems. The opinion of the panel was that range condition was neither a reliable indicator of rangeland function and productivity nor a good management guide. Thus, current assessment of rangelands is in terms of rangeland health rather than range condition, and the new assessment tool has been incorporated in the USDA's National Range and Pasture Handbook. While range condition assessment was based on descriptions of undisturbed climax plant communities, rangeland health is based on soil and ecological processes, and accommodates changes in the range that are a deviation from climax or natural plant community. The new range health monitoring systems will be easier to measure and enable management decisions to be made for many uses and values of the range.

Rangeland health is defined as "the degree to which the integrity of the soil, vegetation, water and air as well as the ecological processes of the rangeland are balanced and sustained. Integrity is defined as the maintenance of the functional attributes of a locale, including normal variability." Rangeland health measurement procedures, as currently being developed and tested, are for use by experienced, knowledgeable rangeland professionals. A range is rated healthy, if current assessment indicates that the capacity to satisfy values and produce commodities is being sustained; at risk, if current assessment indicates reversible loss in productivity and increased vulnerability to degradation; and unhealthy, if degradation has resulted in loss of capacity to provide values and commodities that cannot be reversed without external inputs.

## Cattle Diets

Cattle grazing range often have over 100 species of plants from which to choose throughout the year. Over 4 years, 98 plant species were encountered in a range at the UF/IFAS Range Cattle Research and Education Center (UF/IFAS Range Cattle REC), Ona. The major preferred grasses were creeping bluestem, chalky bluestem, and maidencane (Table 3). Saw palmetto was the major shrub, while the major less desirable grasses were broomsedge, wiregrass, and *Dichanthelium* spp.; and goldenrods were the major forbs. In a grazed range, the frequency of occurrence of these plants may remain stable over a few years. However, there may be changes in availability and palatability of the plants, and as a consequence, cattle diets change during the year. In such cases, while more shrubs are eaten in winter and more forbs are eaten in summer, grasses such as creeping and chalky bluestems are eaten year-round. Maidencane is palatable from the time it starts to grow in the spring until late October. Old, weathered maidencane is not eaten during winter. Wiregrass is palatable for only about 6 weeks after a burn.

## Available Forage and Nutritive Value

Two criteria for evaluating range are available forage and nutritive value (crude protein and total digestible nutrients [TDN]). Neither criterion alone is useful, and the ultimate evaluation of Florida range is winter weight-loss and calving percentage of cows, which will be discussed later.

Range differs from pasture in the use of these criteria. Like pasture, measurement of available forage should always be on a dry matter (DM) or moisture-free basis. Unlike pasture, ungrazed range forage accumulates over one or more growing seasons and inflates estimates of available forage. To overcome this problem, estimates of available forage should be adjusted to reflect only grazable forage. This estimate can be made by a combination of hand separation and estimation, or by measuring forage in the fall—after a burn in the previous winter or spring. Second, estimates of digestibility by in-vitro organic-matter digestion (IVOMD), as performed by the UF/IFAS forage testing laboratory, tend to underestimate range forage by 5–10 percentage units because range forage is almost always at the low end of the scale for all forages tested. For this reason, it may be more useful to predict and use TDN (TDN=[0.49 X IVOMD + 32.2] X 0.93) rather than IVOMD.

Since much of Florida range is in poor to fair condition (Table 2), typical values of available forage and shrub biomass yields (Table 4 ) are provided for these two condition classes. Decreasers make up about 5% of the herbaceous vegetation in range of poor condition, while wiregrass makes up about 40%. All increasers (wiregrass + other increasers) make up about 76% of the herbaceous vegetation. In the example of fair-condition range, decreasers make up about 43% of herbaceous vegetation and increasers make up about 38%. Occurrence and biomass of shrubs are considered in determination of range condition, as shrubs usually constitute a large portion of the total biomass from range.

Grazable-forage yields on range can be low (Table 4), and as a result, the carrying capacity of range is low. The poor-condition-class range used in the example above has historically supported one cow on 35 acres in an all-range, year-round grazing program. In the fair-condition-range example, one cow has been supported on 13 acres, which are grazed from September through February. Range condition, season, and duration of grazing all affect carrying capacity.

Available forage from fresh marsh sites in good to excellent condition is considerably greater than forage from flatwoods sites, primarily due to maidencane, which

dominates the marsh site. Table 5 shows the comparative yield between creeping bluestem, a major decreaser grass on flatwoods sites, and maidencane, a major decreaser on fresh marsh. Yield data assume pure stands of forages, which is rarely the case with creeping bluestem. Maidencane produces more forage than creeping bluestem or any other grass on a flatwoods site, but maidencane production is limited to the summer, and herbage mass declines in the fall and winter due to senescence.

Nutritive value of diets of cattle-grazing range is relatively low, but it does improve in spring and early summer (April–June) and then declines through fall and winter (Table 6). Nutritive value is the major limiting factor for cattle production on range. Available forage can be increased through management, but there is little that can be done to range forage that will result in lasting improvement to crude protein and TDN. At best, flatwoods range is adequate to meet the nutritional needs for growth of a non-lactating cow in spring and early summer. A lactating cow cannot regain weight lost during winter, provide milk for a nursing calf, and rebreed in spring while grazing range. Forage from fresh marsh, however, could supply the protein and TDN required by a lactating cow in spring and summer. Access to marsh greatly benefits the nutritional input to cows, especially in spring and early summer, when it is important to regain weight lost during winter. However, the nutritional value of forage from marsh declines greatly during winter.

Mineral concentrations in the diets of cattle grazing unburned range depend on season and site grazed (Table 7). Concentrations of P and K are similar in diets obtained on flatwoods or fresh marsh, but concentrations of Ca, Mg, and Mn tend to be lower in diets obtained from marsh than from flatwoods. Concentrations of P, K, Mg, and Mn decline from summer to winter, while Ca and Fe remain about the same. All minerals (except Fe and Mn) at all seasons are below levels needed by a dry-pregnant cow, and they should be supplied in a complete mineral supplement.

## Calf Production

Range forages do not provide adequate nutrition for lactating beef cows. Cows on range year-round lose considerable weight and body condition and generally do not conceive their next calf because of the poor nutrition from range forage (Table 6). With a calving period in late December to mid-February when range forage quality is lowest, cows without a calf gain weight and breed during March to July when there is relatively good-quality forage. Lactating cows continue to lose weight during this period of relatively good forage quality, and may lose as much as 15% of their body weight. These cows do not breed until their calves are weaned and they have a chance to go through another spring/early-summer period as dry, "open" cows. As a result, cows grazing "typical" south Florida flatwoods range year-round usually calve in alternate years, and the result is a 50% calf crop (Figure 2).

Calf weaning weights from an all-range program are about 300–350 lb or about 10–12 lb/A annual live-weight gains—assuming a cow produces a calf every other year.

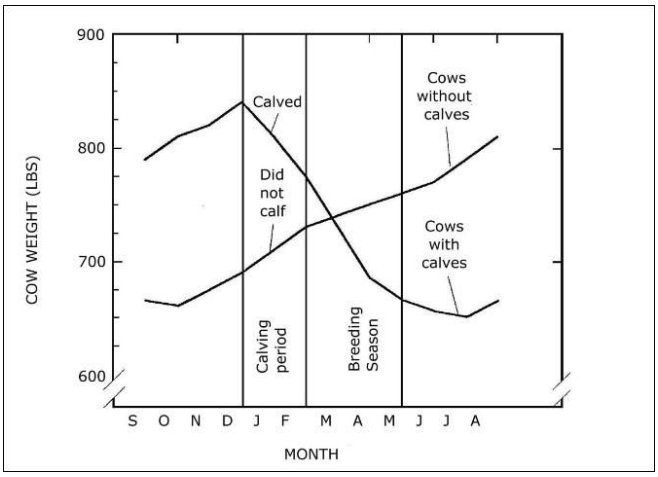


Figure 2. Cow weight changes on range and the consequences for reproduction.
Credit: Hughe. 1974. J. Range Manage. 27:186.

## Increasing Calf Production on Range

Increasing calf production on range simply means improving the level of nutrition available to the cow. This can be accomplished by rotational burning, supplementation by feeding protein and energy, or providing improved pasture at certain times of the year.

Rotational burning is the oldest and perhaps the least expensive method to improve forage quality. The practice consists of burning different portions of the range at different times during the fall and winter and permitting cows to move to new burns. In the early days at the UF/IFAS Range Cattle REC at Ona, one-half of the range was burned each year (one-fourth in November and one-fourth in January). Burning increased weaned calf crop from 53% to 69% and increased calf gain from 9.3 lbs/A on unburned range to 11.7 lb/A on a combination of burned and unburned range. Cows in this study, which were stocked at 1 cow per 20 acres of range, lost an average 105 lbs during winter (12% of body weight) on unburned range compared to 46 lbs (6%) on the combination of burned and unburned range.

However, burning and grazing can lead to range deterioration if not used properly. Forages must be allowed to regrow (no grazing) to restore vigor, and when cattle are allowed to graze regrowth, care must be taken to assure that these burned areas are not overgrazed, especially in May and June.

Supplementation of the cow diet with molasses-based slurries is the most practical method to provide protein and energy to cows on large ranches. Molasses is readily available, favorably priced, easy to mix with protein sources, easy to transport and feed, and molasses is a valuable energy source. Early research at the UF/IFAS Range Cattle REC showed that calf production increased from 11.7 lb/A to 13.5 lb/A on rotationally burned range when cows were fed 6.6 lb/head/day of straight molasses for 135 days.

Today, cane molasses is usually fortified with urea or natural proteins, such as cottonseed meal, feather meal, or dried blood, so that the mixture contains 20%–40% crude protein. Recent research at the UF/IFAS Range Cattle REC has shown that mature brood cows grazing range in winter respond equally well to molasses-based liquid supplements containing either urea or natural protein. The slurries contained 20% crude protein and were fed at 5 lb/head/day for about 165 days beginning in mid-December.

Using improved pasture with range is a practical method of providing nutrition to the cow at critical times during the year. The advantage of interfacing pasture (usually bahiagrass) with range is that cows can recover weight lost in the winter faster on pasture than on range, and they can go into the winter in better condition than when grazing range alone. In the past, with limited use of pasture, which entailed grazing bahiagrass during four months in summer, about 15 acres of native range were needed to support one cow weighing 800–900 pounds. That level of management still resulted in higher weaned calf crop and live-weight production than grazing range alone at the same stocking rate. Subsequently, research at the UF/IFAS Range Cattle REC showed that pasture should substitute for range at a ratio of 1:8 to 1:10. This meant that one acre of pasture replaced 8–10 acres of range. For example, a herd of cows (about 900 lb cows) and heifers was supported on a ratio of one cow per 5 acres of range plus 1.2 acres of pasture (Table 8). Cattle had continuous access to range with no supplemental feeding except access to one of several pastures throughout the year. It was estimated that cattle obtained 30%–40% of their forage from range.

More recently, further research at the UF/IFAS Range Cattle REC included supplementary feeding (cane molasses-urea) on the range during the winter and early spring/summer, in addition to grazing improved bahiagrass pasture. The study also determined the best breeding season for cows grazing winter range and bahiagrass. One set of cows grazed range during October–February and moved to bahiagrass pasture in late February for breeding and calf rearing (spring-bred cows). The other group of cows grazed the range in December–April and was moved onto bahiagrass pasture in May (summer-bred cows).

Coming off the range at the end February, spring-bred cows (955 lb) weighed less than summer-bred cows (1010 lb) that came off the range at end of April. In addition, there was a greater loss of body condition on spring-bred cows (-1.2) than for summer-bred cows (-0.8). However, at the end of the bahiagrass grazing period, both groups of cows had similar weights, body condition scores, and pregnancy rates. These results were explained by conditions of the range and bahiagrass when the cows grazed them. The summer-bred cows were in the range from December until spring, the period when the nutritive values of range forages are at the peak. In contrast, the spring-bred cows were in the range during the winter when the nutritive values of range forages are at their worst. However, the summer-bred cows did not have superior body condition scores and weights when they moved onto bahiagrass in May. By the end of the bahiagrass grazing period, spring-bred cows, which moved onto bahiagrass pasture in February, had similar weights and body condition scores as summer-bred cows. In terms of average calf weaning weight, spring-bred cows (451 lb) had heavier calves than summer-bred cows (398 lb).

Changes in the nutritive value of bahiagrass were responsible for the poorer performance of summer-bred cows. Spring-bred cows benefited from the higher nutritive value of bahiagrass during March–May period, which declined thereafter, and would not provide adequate nutrition of lactating cows. Summer-bred cows also nursed their calves during the August–September period when the combination of heat, insects, and flooded pastures depress livestock performance whereas calves from spring-bred cows were weaned in August. Thus, March–May breeding season was better than a May–July breeding season for cows grazing a combination of range and bahiagrass.

## Range Improvement

Sometimes range can be improved in its condition class by the proper combination of grazing, burning, and mechanical brush control. Ranchers and their consultants must consider very carefully the cost of any management practice because the returns from calf production on range are quite low.

Rotation of cattle on range is important mostly for the maintenance of the range resource. On pasture, rotation of cattle among three, four, or more pastures can increase stocking rate and animal production per acre. However, with Florida range utilized as a winter forage source, nutrition is so limited on range that it is doubtful that any slight increases in calf production as a result of rotation would pay for the additional fencing.

If range is grazed year-round, more complex systems of range rotation may be beneficial, but there is no published Florida research indicating what type of grazing program is beneficial to the range or if it will be economical for the

rancher. It is known that both time and intensity of grazing affect vigor and productivity of Florida range. "Take half, leave half" has been the general rule for determining when to rotate cattle from one unburned range unit to the next.

Fencing, and consequently rotation, is essential to exclude cattle after burning range. Desirable grasses should be protected from grazing for at least 30 days after burning in March–May and at least 60 days for burns between October and February—when regrowth is slower. Range regrowth after burning is about 200–600 lb/A of dry matter at 30–60 days, depending on the month. Cattle can consume such limited quantities of forage quickly, and range needs to be protected from overgrazing. Protection against overgrazing requires on-site judgment, but as a rule, there should be about 30–60 days of grazing on regrowth, with range stocked at one cow per 10–15 acres.

Management of wiregrass range differs from management for desirable grasses. Wiregrass range is "burn-and-graze range." Cattle will not graze wiregrass beyond 6 weeks after a burn, so in this sense, wiregrass is self-protected.

Rotation is essential to exclude cattle after roller chopping for palmetto control, which will be discussed later. When desirable grasses, such as creeping bluestem, are present on range, they are usually found under the protection of the palmetto canopy. Chopping removes this canopy temporarily, and it is during this time that grasses have an opportunity to spread.

Protection from grazing for one growing season is most advantageous for range renovation. However, intensive grazing management does not guarantee consistent responses in terms of increase in the biomass of desirable species, and therefore such management may not justify required inputs.

## Prescribed Fire

The reasons for burning include improvement of forage quality, brush control, improvement of wildlife habitat, and reduction of hazardous fuel to help prevent wildfire.

Improvement of forage quality as a result of fire is short-lived. Early forage workers demonstrated that crude protein in wiregrass could be increased from about 5% before burning to 9% in regrowth following fire. The problem was that there were only a few hundred pounds per acre of this forage, and it declined in quality so fast that there was no improvement after about 6 weeks. Creeping bluestem and other desirable grasses are a little better than wiregrass in this respect (Table 9). Improvement in crude protein lasts about 3 months, while improvement in digestibility lasts about 5 months. If a rancher wishes to take advantage of improvement in forage quality as a result of burning non-wiregrass range, range must be grazed within about 4 months of burn. Care must be taken that the range is not grazed too soon after the burn (30–60 days as indicated earlier) and that the range is not overgrazed.

Shrub control can be obtained by using prescribed fire. Winter burns, particularly head fires that carry the flames up into the canopy of wax myrtle and gallberry, are effective at keeping the shrub canopy in a reduced state. Wax myrtle and gallberry are fire-tolerant plants, and they will regenerate their canopy over 2–3 years. Late-spring and summer burns may be more harmful to these shrubs, but burning at these months may be impractical on most ranches.

Wildlife habitat improvement because of burning results in more herbaceous plants, especially annuals, which are good seed producers. Plant diversity is increased for 1–3 years after fire. Insects, an important food source, are also more abundant following fire.

Reduction in hazardous fuel is an increasingly important factor, especially because of the proximity of urban development to some ranches, but this often presents problems with the control of smoke from a controlled burn. On the other hand, the rancher is also liable to those same people if a wild or prescribed fire on his land spreads or escapes and destroys other property.

When, how often, and the burning technique used depend on the objectives of a controlled burn. For improvement of range for cattle production, burning between September and March is most common. Burn on a day when wind speed is stable, 2–10 mph is best. Fuel moisture should be 7%–20%. Often these requirements will be met with the passage of a cold front that has left about one-half inch of rain.

Most ranchers burn on a 2- to 4-year frequency. On non-forested range, a head fire (burning with the wind) is the fastest method. On forested range, backfires (burning into the wind) are recommended to protect the forest resource, but backfires are slower and more costly in terms of time than a head fire. The time required for a burn is important since night fires are usually not permitted, and all fires must be out by 5 p.m.

## Saw-Palmetto Control

The purpose of saw-palmetto control is to increase forage yield and therefore to increase cattle-carrying capacity. The increase in forage yield is mainly due to a change in botanical composition, namely, more bluestems, indiangrass, etc.

Since saw-palmetto control is a costly range management practice, thought must be given to the need and benefit. Three factors should be considered. First, a grazing plan must be in effect. Ranchers need to exclude cattle from

grazing for one growing season after treatment. Without a grazing plan, saw-palmetto control could result in a further reduction in condition class because uncontrolled grazing could reduce the desirable grasses that were protected by the palmettos. Second, there must be a source of desirable grasses present. Treatment of wiregrass range will reduce saw-palmetto cover, but the result will be more production of wiregrass and other less desirable increaser grasses. Third, palmetto size must warrant control. Saw palmettos greater than 30-inches tall provide sufficient shade to reduce growth of grasses beneath them. A few scattered patches of tall saw palmettos do not warrant control, whereas a uniform stand of 30-inch-tall palmettos does.

There are two types of machinery commonly used on range for saw-palmetto control: roller chopper or brush cutters (Figure 3) and web plow (Figure 4). Chopper size must be matched to palmetto size. Marden Manufacturing sells three sizes (models L, M, and B) in 7- and 10-foot drum lengths. Normally, the model M, which has a 55-inch diameter drum, is adequate for saw-palmetto control on most ranches. For best results, the drums should be filled with water, pulled in tandem (one drum behind the other), and the chopper must have the correct offset (angle between drums). Ideally, it should be pulled at 4–6 mph. Best results are obtained when chopping is done with good-to-excessive soil water as opposed to dry soil conditions. A single pass, if done with these conditions, provides adequate reduction in saw-palmetto cover. Chopping when the soil is too dry results in mortality of grasses, especially bunch grasses. Burning to reduce palmetto cover before chopping is helpful from the standpoint of the operator being able to see holes and stumps, but burning prior to chopping does not result in greater palmetto mortality. Cattle should be excluded from the range for one growing season after chopping.

Figure 3. Roller chopper.

Figure 4. Web plow.

The web plow consists of a 6-foot steel blade that is usually mounted under a road grader (Figure 4). The blades are like the wings of an airplane and run about 4–6 inches below the soil surface, slicing off roots but leaving the aboveground portion of plants largely intact. Some models are built for pulling behind a tractor. Web plows are "homemade" and not commercially available. Considerable skill is required to build them because it is difficult to get the blade to run uniformly under the soil without surfacing. In addition, the blades require frequent maintenance because of rapid wear in sandy soil.

A comparison of various aspects of control of palmettos with roller chopper vs. web plow is given in Table 10. Although the web plow results in better and more long-lasting control than the roller chopper, the roller chopper is much more practical.

## Selected References of Additional Information

NRC (National Research Council). 1994. Rangeland health: New methods to classify, inventory, and monitor rangelands. National Academy Press, Washington, D.C. (http://www.nap.edu/catalog.php?record_id=2212).

Pate, F.M. and R.S. Kalmbacher. 2003. Molasses–Supplements for Mature, Lactating Beef Cows Grazing Range. AN044. Gainesville: University of Florida Institute of Food and Agricultural Sciences. http://ufdc.ufl.edu/IR00004535/00001.

Society for Range Management Task Force Group on Unity in Concepts and Technology Committee. 1995. New concepts for assessment of rangeland condition. J. Range Manage. 48: 271-282. (http://digitalcommons.library.arizona.edu/objectviewer?o=http%3A%2F%2Fjrm.library.arizona.edu%2FVolume48%2FNumber3%2Fazu_jrm_v48_n3_271_282_m.pdf).

USDA (United States Department of Agriculture). 2022. Summary Report: 2017 National Resources Inventory. https://www.nrcs.usda.gov/nri

USDA NRCS (National Resources Conservation Service). 2003. National Range and Pasture Handbook. Grazinglands Technology Institute, Revision 1 December 2003. https://www.nrcs.usda.gov/national-range-and-pasture-handbook

Table 1. Range sites important for cattle production in Central and South Florida.

| Site | Characteristics | Important grasses |
|---|---|---|
| South Florida flatwoods | Nearly level, deep sandy Spodosols, seasonally poorly drained to excessively drained. | Creeping bluestem, Lopsided indiangrass, Blue maidencane, Chalky bluestem, Wiregrass |
| Slough | Level, poorly drained Spodosols that are seasonally wetter than S. Florida Flatwoods. Also called "prairie". | Blue maidencane, Chalky bluestem, S. Florida bluestem, Wiregrass, Bluejoint panicum |
| Freshwater marsh and maidencane ponds | Poorly drained, often Histosols, which occur in shallow depressions or along waterways. | Maidencane, Cutgrass, Blue maidencane |
| Cabbage-palm flatwoods | Deep sandy Spodosols underlaid with shell, resulting in higher pH than S. Florida flatwoods. Seasonally wet/dry. | Creeping bluestem, Chalky bluestem, Switchgrass, Wiregrass |

Table 2. Range condition classes. USDA Natural Resource Conservation Service.

| Condition class | Characteristics |
|---|---|
| Excellent (5%)[1] | 76%–100% of the forage is a mixture of mostly desirable grasses (decreasers). The remainder are undesirable grasses (increasers). Legumes and desirable forbs may be present. |
| Good (10%)[1] | 51%– 75% of the vegetation is a mixture of decreaser grasses. The remainder are increaser grasses. Some legumes and palatable forbs may be present. |
| Fair (30%)[1] | 26%–50% of the vegetation is a mixture of decreaser grasses. The remainder are less desirable grasses. |
| Poor (55%)[1] | Less than 25% of the vegetation is a mixture of decreaser grasses. The majority of forage is a mixture of increaser grasses. |
| [1] Percentage of Florida range in this condition class. NRCS data. 1981. | |

Table 3. Plant species that are relatively abundant on flatwoods range.

| Plant species | Frequency of occurrence (%) |
|---|---|
| **Desirable grasses** | |
| Creeping bluestem | 36 |
| Chalky bluestem | 22 |
| Maidencane | 15 |
| **Less desirable grasses** | |
| Broomsedge | 33 |
| Wiregrass | 25 |
| *Dichanthelium* spp. | 15 |
| **Shrub** | |
| Saw palmetto | 40 |
| Kalmbacher et al. 2000. J. Range Manage. 53: 390-394. | |

Table 4. Available forage by various categories and shrub yield on south Florida flatwoods range in poor and fair condition classes (lb/A, dry matter).

| Shrubs | Wiregrass | Other Increasers | Decreasers | Forbs |
|---|---|---|---|---|
| **Poor condition class**[1] | | | | |
| 1700 | 370 | 330 | 50 | 160 |
| **Fair condition class**[2] | | | | |
| 1180 | | 690 | 780 | 330 |

[1] Kalmbacher et al. 1994. J. Range. Manage. 47:43-47.

[2] Kalmbacher et al. 1995. Anim. Sci. 73:853-860.

Table 5. Comparative yield (lb/A, dry matter) of creeping bluestem and maidencane from small-plot studies. The number in parentheses represents a loss due to senescence.

| Time when creeping bluestem was produced[1] | | | | | |
|---|---|---|---|---|---|
| **Feb–Apr** | **May–June** | **July–Aug** | **Sep–Oct** | **Nov–Dec** | **Total** |
| 250 | 650 | 850 | 550 | 100 | 2400 |
| **Time when maidencane was produced[2]** | | | | | |
| **May** | **June** | **July** | **Aug** | **Total** | **Sep–Dec** |
| 800 | 2130 | 1410 | 810 | 5150 | (-1960) |

[1] Kalmbacher et al. 1981. J. Range Manage. 34:471-474.

[2] Kalmbacher et al. 1988. J. Range Manage. 41:245-248.

Table 6. Crude protein and total digestible nutrients (TDN) of diets of esophageally fistulated steers grazing flatwoods range or fresh-water marsh in summer or winter.

| Site | Summer | | Winter | |
|---|---|---|---|---|
| | CP | TDN | CP | TDN |
| | ----------%---------- | | | |
| Flatwoods | 6.9 | 50.4 | 6.9 | 43.0 |
| Marsh | 10.7 | 52.2 | 6.1 | 45.8 |

Long et al. 1986. J. Range Manage. 39:518-521.

Table 7. Mineral concentrations in range forage averaged over flatwoods and fresh marsh sites compared to concentrations required by a dry-pregnant cow.

| Mineral | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | K | Ca | Mg | Fe | Mn | Zn | Cu |
| | ----------%---------- | | | | ---------- % ---------- | | | |
| Range forage | 0.05 | 0.17 | 0.19 | 0.09 | 90 | 32 | 17 | 3 |
| Requirement | 0.18 | 0.70 | 0.18 | 0.13 | 10 | 10 | * | 4 |

[1] National Research Council requirement for dry-pregnant cows.

* Requirement for Zn not established.

Kalmbacher et al. 1984. J. Range Manage. 37:36-39.

Table 8. Average cow weight changes and calf production data from a herd of cattle supported by a ratio of one cow per 5 acres range plus 1.2 acres of pasture.

| Range Cattle Experiment Station | | |
|---|---|---|
| **Item** | **Month** | **Response** |
| Cow weight (lb) | December | 907 |
| | March | 871 |
| | June | 881 |
| | September | 871 |
| Weaned calf crop (%) | | 80 |
| Calf weight at 205 days (lb) | | 425 |
| Calf production (lb/A) | | 68 |
| Jones et al. 1960. Univ. Florida Bull. 554A. | | |

Table 9. Effect of burning on crude protein and total digestible nutrients (TDN) of creeping bluestem.[1]

| Month after February burn | | | | | |
|---|---|---|---|---|---|
| **Burn** | **March** | **April** | **June** | **August** | **October** |
| **---------- crude protein % ----------** | | | | | |
| Yes | 9.8 | 10.1 | 7.2 | 3.7 | 3.0 |
| No | 3.2* | 3.0* | 4.0* | 2.9 | 3.0 |
| **---------- TDN % ----------** | | | | | |
| Yes | 55 | 54 | 49 | 44 | 43 |
| No | 40* | 38* | 40* | 41* | 43 |

* Difference between burn and no burn significant (P<0.05).

[1] Kalmbacher et al. 1985. J. Range Manage. 38:531-535.

Table 10. Comparison of roller chopper and web plow for various aspects of palmetto control in Florida.

| | Machine | |
|---|---|---|
| **Item** | **Chopper** | **Web plow** |
| Acres/hr[1] | 6 | 2 |
| Cost/A ($)[2] | 6–15 | 10–14 |
| Duration (yrs) | 5–8 | 15+ |
| Palmetto kill (%) | 25–35 | 65–75 |

[1] 10' chopper at 5 mph in 24–30 inch tall palmettos vs. 6' web plow at 3 mph.

[2] Cost depends on ownership, depreciation, etc., and varies widely.

[1] This document is SS-AGR-105, one of a series of the Department of Agronomy, UF/IFAS Extension. Original publication date June 2002. Revised April 2006 and December 2022. Visit the EDIS website at https://edis.ifas.ufl.edu for the currently supported version of this publication. This publication is also a part of the Florida Forage Handbook, an electronic publication of the Agronomy Department.

[2] João Vendramini, center director, Texas A&M AgriLife Stephenville Research and Extension Center, former professor and forage specialist, Department of Agronomy, UF/IFAS Range Cattle Research and Education Center; Raoul Boughton, senior research ecologist, The Mosaic Company, former assistant professor and Extension rangeland wildlife specialist, Department of Wildlife Ecology and Conservation, UF/IFAS Range Cattle Research and Education Center; UF/IFAS Extension, Gainesville, FL 32611.

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions or affiliations. For more information on obtaining other UF/IFAS Extension publications, contact your county's UF/IFAS Extension office. U.S. Department of Agriculture, UF/IFAS Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Andra Johnson, dean for UF/IFAS Extension.