



Scrub cypress.



Salt marsh.

both decreaseers, may produce 4,000 lb/acre.

The salt marshes are located on both the Atlantic and Gulf coasts in north and west Florida. Associated soils are organic, clay loams, or combinations thereof, many with

high sulfur contents. Zonations of vegetation are typical due to interactions of tidal water levels, salinity concentrations, and soils. Common decreaseers are three cordgrasses and production reaches 8,000 lb/acre. Black needlerush is the most common increaseer. ●

A Government Grazing Program That Works— Avon Park Air Force Range

R. Scott Penfield

Editor's Note: The author has been the Range Conservationist at Avon Park Air Force Range since 1977. Avon Park is the largest and most heavily utilized bombing and gunnery range in the eastern United States. Thirty-nine thousand acres of the range consists of two target complexes each containing a conventional range for primary training and a tactical range for advanced training. The remaining area is held as a buffer zone and by law its natural resources are managed under a sustained yield multiple use doctrine. Timber, wildlife, grazing, and recreational opportunities are all managed generally throughout the property. This article highlights the grazing program. Avon Park will be visited on the post tour at the annual SRM meeting in Orlando.

Profits are down, our resources are being depleted, management is not improving production—it's time for a change. Clean house, start over; institute a new program. Is this a board meeting of some large corporation? No, it's in central Florida, approximately 60 miles south of Orlando in the mid 1970's. They weren't discussing a failing corporation but a natural resource—the government's range resource at Avon Park Air Force Range. Years of continuous grazing had severely depleted the resources. The USDA Soil Conservation Service and the University of Florida rated all of the

installations's 106,000 acres in poor condition. Income from grazing leases had failed to keep up with inflation as the lessees were paying the same grazing fees they had 10 years ago. Not only was the grassland resource depleted but fences, cow pens, and stock ponds had all fallen into disrepair.

Avon Park Air Force Range has representative plant communities typical to native central Florida. The flatwoods community with its characteristic flat surface and acidic poorly drained sandy soils dominates the majority of the property. Vegetation consists of bluestem grasses, legumes, shrubs, and pine trees. A sand hill ridge of approximately 11,000 acres runs from the north to the south down the center of the property and is characterized by deep sands that are well drained. Vegetation on the area is mostly scrub oak, sand pine and a variety of shrubs. On the slopes of the ridge exists approximately 2,000 acres of seep which creates a unique community found only in this region of Florida. A seep is an area where water flows to the surface forming shallow pools or very wet soil. This is the only region in the United States where cutthroat grass is found. This sod forming grass is considered a valuable grazing resource. The

most valuable grazing resources on the installation are the marsh land communities. These sites have rich soils and grasses capable of producing as much as 10,000 pounds per acre of biomass material in a single growing season.

The opportunity for range improvement at Avon Park was immense. One wag said there was nowhere else to go. Cows were in poor condition with less than a 40% calf crop. Burning of the grassland was followed with heavy year-round grazing, which created a short-term improvement of livestock condition with a severe depletion of the grassland resource. While fire is an excellent management tool under certain conditions, past burning practices created havoc on the native plant communities at Avon Park. Large 25,000 acre pastures were grazed heavily in the burned areas and poorly utilized on the unburned range. After 20 years of this type of grazing, the Air Force realized that it was not only destroying its range resource but was also losing money on a valuable resource. In 1975 the government made a commitment to restore the grasslands on the range.

The initial goals were to stop the rangeland degradation and increase grazing capacity. An increased carrying capacity would eventually return more revenue to the government. The Air Force decided that for the next ten years (1978-1988) the receipts from the grazing leases (approximately \$150,000 per year or \$1.5 million over the ten-year period) would be applied to build facilities and improve the grazing resource. The program would be directed toward investing in the future rather than exploiting the present.

The first grazing management plan was developed in 1975

by Paul Ebersbach, the Natural Resource Manager at Avon Park, the late Sam Polston, local District Conservationist, Cliff Carter, then State Range Conservationist, both of the Soil Conservation Service, and Dr. Larry D. White then of the University of Florida. This initial plan, implemented in 1978, called for an improvement in the range resource and cattle facilities. To allow better utilization of the range the 25,000-acre pastures were fenced into units of 7,000 acres or less. Five leases were broken up into eight. These eight lease units were broken up into a total of 25 pastures. During the first five years over 150 miles of fence were constructed. New cow pens in each of the leases, stock ponds in each of the pastures, and a brush control program were all planned and implemented.

The brush control program revolved around roller chopping. A big drum with cutter blades mounted parallel with the drum cut up the brush and "kicked" up the soil, putting the plant community in a very low successional stage promoting the preferred grazing plants on sites previously dominated by brush. A prescribed burning program was developed that complemented not only the range resource but timber and wildlife as well. In the past, headfiring (burning that sweeps with the wind) devastated the pine forests, oak hammocks, (*Hammock* is derived from the Indian word for shady place. It is usually an area that is slightly higher than the surrounding land and characterized by hardwood vegetation—usually very large live oak trees), and wildlife thickets.

By applying a backburning policy (making the fire walk into the wind) fire was kept close to the ground, thereby



Round-up in the rain.

allowing young pines along with hammocks and key wildlife habitat to be spared. The use of fire has gradually been refined further by changing from a two-year cycle to a three-year rotation schedule and keying burning to only those pastures that will be rested from cattle the subsequent summer. Fire for grazing reduces the competition of brush plants thereby increasing grass populations, exposing the soil, and allowing this fire adapted plant community to maintain itself. The proper application of fire for the last eight years is showing a dramatic change in the plant communities at the "Park". Now fire benefits not only grasslands but forest and wildlife as well.

In addition to the facility improvements, various grazing systems were evaluated. Because Carter, Polston, and White did not really know the best grazing system for Florida's unique range resource, they recommended relatively simple systems. Six of the leases would follow a three pasture system that allowed grazing for three months followed by rest for six months. On a small lease (5,500 acres) a two pasture switchback system would be tried. One lease even smaller, (700 acres) contained tame and marsh pastures. A rapid rotation system would be implemented with five pastures. Grazing of the three tame pastures would be for seven days followed by 14 days rest in the summer growing season. The two marsh pastures would be grazed some in the summer but primarily in winter.

Stocking rates of approximately 1 cow to 20 acres were kept the same as before the plan was written and recommendations were made in some instances to increase animal numbers. Even though overgrazing dominated in some areas undergrazing prevailed in others. Due to this poor utilization of the resource it was possible to maintain the same stocking rates.

In addition to a lack of range management research in Florida, a commercial large scale application of any type of systematic grazing had never been tried in the State at the level that was being proposed on Avon Park's 106,000 acre tract. All of the research on grazing systems came from the arid west with some work done in Africa. Polston, Carter, and White didn't have time to research and study Florida's unique problems. They were forced to apply the principles of range management and then make adjustments to make the resource respond to the principles. At the inception of the project it wasn't even clear what species of grass were the decreaser types. As it turned out there were grasses in some communities that were not "discovered" until two years after the implementation of the grazing program—grasses that today, eight years after the project began, dominate some plant communities.

The grazing systems were designed to fit in with the plant communities being managed. Systems in the flatwoods were treated differently than systems in the faster growing marsh communities. Grazing during the summer months when the flatwoods grasses would be adversely affected was curtailed to permit desirable forage species to regain vigor and spread. Before the plan was started it was discovered elsewhere in the state that the marsh grasses were summer

grasses and they had to be grazed in the summer rather than stockpiled for the winter. The grazing-rest period for the three pasture system was also determined to be inappropriate and was changed before inception of the program to 60 days grazing followed by 120 days of rest. Later on this grazing schedule was again modified to a sliding schedule that followed 60-day grazing periods during the growing season and 90-day grazing periods during the dormant season. This allowed for a sliding grazing cycle that never allows grazing the same month in the next two subsequent years.

In Florida's subtropical climate with an annual average rainfall of 55 inches the potential forage improvement under some grazing systems was tremendous. For example, on marsh communities, 60-day rest periods during the growing season changed the condition class of the plant community from poor to good within one growing season. Conversely,



Typical Florida native range with planted pines in background.

condition change in the dry sandhill scrub ridges, even after eight years, appears to be minimal. It appears that the amount of water that remains near or on the soil surface for relatively long periods of time affects the potential change in forage condition class. With adequate water, plant communities show a rapid change; without water they do not change as quickly.

Range resources under grazing systems with a high intensity-low frequency utilization improved the fastest, as opposed to the two pasture or switchback system where cattle remained too long in a pasture preventing adequate rest for plant recovery during critical growing periods. The three pasture sliding rotation system demonstrated that improvement in range condition was possible; however, none of the flatwood pastures could maintain cattle condition when cows had calves by their sides. This was in part attributable to the poor quality of forage, irregardless of the grazing method, and partly attributed to the long rest during the growing season.

The small lease (700 acres) configured with 5 pastures, composed of marsh and tame pasture, followed a rapid rotation method. Excellent results were obtained both on the grazing resource and in the cow/calf production. The marsh condition class change from poor to good in just one grow-

ing season. At the same time the producer experienced a 70% calf crop. The previous lessee of this unit had never experienced better than 40%. In examining why this lease operated better than any other it appeared that nutritionally the native marsh and the tame pasture met the cow/calf requirements and that the rapid rotation grazing system prevented forage quality deterioration. The question became how to apply this success to the rest of Avon Park. The grazing rotation period was easily resolved—the nutritional deficiencies have yet to be completely rectified. There are indications that Florida's upland grasses simply do not meet the nutritional requirements of a lactating cow. Fertilizing native grasses is not economically feasible. In the winter, dry cattle (cows without calves by their sides) condition can be maintained with a supplement of molasses. The list of options available to solve the nutritional problems is limited: you could utilize a marsh if you had one, plant tame pasture for summer grazing, or try another grazing system. At Avon Park some leases have rich freshwater marshes and some have limited tame pastureland but some unfortunately have very limited summer pasture for cow-calf pairs. The two biggest leases have large marshes which were just recently divided into two pastures. These pastures are grazed during the summer months to maximize the benefits of tremendous forage quantity and quality. Range condition has improved from poor to good and animal condition and calf crop percentages under these situations have also increased.

Three leases have no marsh and very little tame pasture to accommodate the cow-calf operation. On one lease with this situation a six pasture grazing method started in June 1983. On this lease, much has been learned in the last two years about rapid rotation on Florida's native uplands. First, because of constraints due to research being conducted by

the University of Florida on this lease, grazing periods were set at three-week grazing intervals followed by 15-week rest periods. Before the cattle had been through one grazing cycle it became obvious that a different schedule would be necessary. The schedule was kept until June 1984, when the University finished its research. Then grazing periods were adjusted to the growth of the key plants. Using this method when the cattle have grazed the pasture down to a certain average height, they are moved to the next pasture. If objectives can't be met in a short period of time, then cattle numbers are increased; conversely, if objective heights are met early, stock numbers will be reduced. A comparison of the S.C.S. range inventory conducted in 1983 and again in 1985 reveals a condition class improvement on all transects in every pasture on this lease. The question still remains whether or not this method will improve animal condition and calf crops.

It was found that the managerial ability of the lessee must be recognized. The successes and failures at Avon Park can be traced to the support or lack of interest of the individual producer or lessee. One producer was heard to say that growing grass was great but growing calves was his business and all this grass standing on the ground wasn't growing cattle. These types of producers are still content with a 40% calf crop and begrudgingly move their cattle only to avoid losing their lease.

The grazing program at Avon Park was born out of necessity to improve the range resource and increase the revenues to the Government. The success of the program is visible—where once stood stands of brush and unpalatable plants now a variety of grasses that cattle prefer live as a testament to the potential of all Florida's grassland resources. ●

Remington in Florida

Lewis Yarlett

Frederic Remington is well known as an early American artist and author of the West. At the age of 19 in 1880 he began traveling throughout the West, where he was inspired to record the events of that era.

It is not generally known, however, that Remington visited Florida for a short time following fifteen years in the West. Florida had recovered strongly from the economic ravages of the Civil War and a depleted cattle population. Large ranches were common in the state, and Cuban demand for beef was good. Many reports indicate that individual shipments of cattle were as much as 8,000-12,000 head annually with payment in gold.

It was in that setting in 1895 that Remington visited Florida; the exact reason is uncertain. He described the cattle ranges as:

... flat and sandy with mile on mile of straight pine timber, each tree an exact duplicate of its neighbor tree, and underneath the scrub palmettoes, the twisted brakes, and hammocks, and the gnarled water oaks . . . the land gives only a tough wiregrass, and the poor little cattle, no bigger than a donkey, wander half starved and horribly emaciated in search of it.*

Remington was no doubt describing the present-day flatwoods with occasional cypress communities and hammocks

composed of live oaks or cabbage palms or both. He probably witnessed the poorest of cattle during drought conditions, as there are records of large 1,000-pound steers being sold during that period.



Remington pictured these Florida cowmen fighting for range rights or unmarked cattle. The setting is a typical flat palmetto prairie with a cypress forest in the far distance.