

Range Opportunities in the South

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The potential for range forage production in the South is unexcelled in any other region of comparable size in the United States. The southern range covers about 200 million acres and includes all or portions of a dozen states extending from Virginia into eastern Texas and Oklahoma. Approximately one-fourth of this area is owned by the public and forest industry, while three-fourths belong to nonindustrial private landowners. South-wide more than 28 million acres are in improved pasture, many of which are used to supplement seasonal grazing of native range. In 1970, range forage in the eastern forest was estimated to have potential for increasing livestock production by 147% without deterioration or reduction of environmental quality or other resources; at that time less than half the area was grazed.

The term *range* is defined as lands producing native forage for grazing or browsing animal consumption, or lands that are revegetated to provide forage that is managed like native vegetation. Livestock grazing is usually considered the predominant use of range, but nearly always range is shared or exclusively used by wildlife. Southern range is primarily forested land that produces forage in openings or under the trees.

Several developments in the recent past have heightened the importance of forest range. The Multiple-Use Sustained Yield Act, the Resources Planning Act, and the National Forest Management Act require that federally owned forest lands be managed for the production of multiple forest products, including livestock, wildlife, high-quality water, recreation, and timber. Environmental and social pressures have made forest industry and other private owners more aware of multiple-use practices. Multiple-use of forest range can enhance public relations and provide commodities without large expenditures; however, controversies may arise due to potential interactions. For example, forest grazing aids in meeting local or national red meat demands, which benefits both consumers and cattlemen, but improper grazing practices may damage forest regeneration or wildlife habitat.

This article identifies opportunities and some associated problems in forest-range use in the South and describes range management practices of the region.

History

Domesticated cattle have grazed the southern forest range since the 16th century, when Spanish explorers brought them to Florida. Since that time, cattle have persisted and spread across the South. Numbers have fluctuated from lows during the War between the States to highs near the turn of the present century.

By the early 1930's, most of the old-growth longleaf pine had been harvested and the land virtually abandoned by the lumber companies. As a result, in the lower Coastal Plain millions of acres of prairie-like cutover land became "open range," where annual fires destroyed most attempts at pine regeneration. By the late twenties, however, the southern states had outlawed forest arson and were attempting to reinforce fire prevention. After World War II much of the cutover land was acquired by large timber companies and pine regeneration efforts accelerated. More fences, stock laws, stricter trespass enforcement, intensified fire protection, and prescribed burning increased the successful regeneration of many pine stands. Forage decreased under the fast growing pines and forced a reduction in cattle herds. Today, timber production dominates the management of forested ranges across the South, although vast forage potentials exist.

Forage Potentials

A primary goal in multiple use is to grow high-quality timber and forage for cattle and wildlife on the same acreage. The South has the appropriate climate, soils, water, and light necessary to produce large amounts of both forage and timber. Abundant and uniformly distributed rainfall, desirable for high forage yields, is a characteristic of the South; precipitation varies from 49 to more than 60 inches and is uniformly distributed throughout the year. Most of the area has at least 7 months between killing frosts, while the coastal areas may be frost free for more than 9 months. Cattle forage is mainly grass with some forbs and browse eaten seasonally. Deer are primarily browsers but also eat herbs, mast, and fruits. Quail, turkey, and nongame birds eat seeds, insects, and some herbage.

Three forest-range types make up the most important portions of the southern range livestock environment. These include the longleaf-slash pine, loblolly-shortleaf pine-hardwood, and upland hardwood-bluestem types. Other types include the marsh, prairie, and hardwood bottoms.

The longleaf-slash pine type occupies about 30 million acres along the lower Coastal Plain from South Carolina to East Texas. The area produces more forage per acre than any other forest type in the South. The major forages are bluestem (*Andropogon* spp.), and wiregrass (*Aristida stricta*). Other forage plants are panicums, paspalums, native forbs, and occasional shrubs. Periodic prescribed burning is common in the longleaf-slash pine type. Forage yields commonly exceed a ton per acre on cutover or under sparse tree canopies.

About 55 million acres of the loblolly-shortleaf pine-hardwood type are found on the upper Coastal Plain. This type occurs in a belt, about 150 to 300 miles wide, from eastern Texas to

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northeastern Virginia. Primary plants for livestock are bluestems under open pine stands or in clearcuts, and uniolas where trees are dense. Shrubs and hardwood trees are abundant since fire has been generally restricted. This forest type, which tends to have denser timber stocking than the longleaf-slash pine type, produces less herbage.

The upland hardwood-bluestem type occupies about 46 million acres extending from eastern Oklahoma through parts of Tennessee, Arkansas, Mississippi, and Missouri. Oaks are the primary tree species, with bluestems, Indiangrass (*Sorghastrum* spp.), and switchgrass (*Panicum virgatum*) comprising the most important forage plants. Thousands of acres of low-value hardwoods have been converted from brush to grass, which has increased forage production for livestock by as much as 2 tons per acre.

Multiple Use

Cohabitation of timber, livestock, and wildlife on specific land areas may be compatible, beneficial, or detrimental, depending on several factors. Naturally when adverse interactions among uses occur, controversies arise. Foremost is the controversy regarding the use of Southern forests as range for livestock. Two areas of particular interest are (1) competition for food between cattle and deer and (2) detrimental effects of cattle on pine regeneration. Much of the controversy occurs because management lacks information on the various interrelationships or resource managers do not have access to the available information.

Timber production in the South is and will remain the primary object in forest land management. Consequently, the "burden of proof" for acceptable multiple uses generally lies with the nontimber resource advocates. Some information on multiple uses and their interrelationships already exists. For instance, uncontrolled livestock may concentrate and graze or trample pine regeneration; however, damage can be reduced or eliminated through management techniques such as prescribed rotational burning, fencing, livestock supplementation, and grazing intensities. Damage can also be reduced by balancing animal populations with forage supplies in openings or through deferred grazing until pines are 6 to 8 feet tall. Cattle and deer repellents such as copper carbonate, tetramethylthiuram (TMTD), or zinc dimethyldithiocarbamate cyclohexylamine (ZAC) help, but have not been completely successful. On the other hand, some tree benefits may accrue through a multiple-use management program where grazing reduces competition prior to pine regeneration.

Undesirable competition exists where livestock and/or wildlife (mainly big game) exceed the food supplies. Overuse by livestock for long periods is detrimental to plant composition and yield, and can deteriorate soil and site conditions. Excessive use by big game will also change vegetation conditions, as well as cause damage to nearby agricultural crops.

Livestock and wildlife programs can be mutually beneficial; for instance, livestock grazing can benefit wildlife by stimulating new browse growth or opening trails through dense brush. Range livestock management usually provides water developments and supplemental feed, which are used by wildlife in times of need. Conversely, hunting leases can provide an additional source of revenue for the forest landowner. Recreational use of forests is another one of the multiple uses enjoyed by many Southerners. These multiple uses, when properly managed, also foster good public relations in the local community.

Trees have both beneficial and detrimental impacts on the

range resource. Overstory density, or canopy, is the most influential factor determining forage yields; on the other hand forage nutrients such as protein increase under shade. Trees provide the essential vertical structure and other habitat features for many wildlife species, especially nongame birds. They also provide browse, shade, shelters, and cover for livestock and wildlife.

Forest and Range Management

Forest management is an important factor for reaching range opportunity potentials. Forage supplies generally provide an index to livestock or wildlife capacities; also important is the vegetation which provides cover. Forage yields decrease as tree stocking increases. Thus, to efficiently balance timber and forage needs, land managers must practice methods that benefit both. Some of these practices include timber site preparation, reforestation, timber stand improvement, thinning, clearcutting, fertilization, prescribed burning, and range livestock management. Surface water drainage in the lower Coastal Plain can also improve forage production.

Socio-Economic Considerations

Multiple-use management can provide an additional source of income to rural communities. Many marginal, low-income, livestock operations become economically feasible by using forest range to round out forage supplies or increase the number of livestock managed. Projected demands for red-meat supplies in this country also seem to dictate that Southern range livestock opportunities must be further developed. Energy requirements and point-source pollution from feed-lots can be partially reduced with additional range grazing. Many opportunities for rural community and regional development exist in the South through improved education, technical assistance, and cost sharing. A major impediment to development of forest-range use in the region is the educational system; for decades forest-land management has been geared to timber production, and forestry students are ingrained with prejudices toward resources other than timber. Range science and range management curricula in many educational institutions are very inadequate, even though potentials for forage production and utilization in the South may exceed those of western ranges. Scientists, educators, and managers must develop a coordinated program for fully utilizing the multi-forest resources of the South.

In 1978, a Southern Range Evaluation Project was approved by the Chief of the Forest Service to test and demonstrate practical range, timber and wildlife management levels on an operational scale. Social, economic, and biological aspects are to be monitored where possible, prior to and after prescribed management levels are installed. Field work has been initiated in Texas, Louisiana, Mississippi, and Florida. The results will provide practical guidelines for multiple-use management in a demonstrable manner and provide alternatives for meeting requirements under the National Forest Management Act, Resources Planning Act, Multiple-Use Sustained Yield Act, and Resources Conservation Act.

Projected economics of incorporating livestock grazing into the Southern forests show a possible 17% internal rate of return on investments. Generally, highest returns per cow are obtained from lightly grazed range; greatest returns per acre come from heavily grazed range. A moderately grazed range probably provides the greatest financial benefits with the least conflicts with other resource uses.

The high cost and shortage of energy contribute to changing

the methods for red-meat production in the United States. With inexpensive grain unavailable and increased fertilizer and livestock production costs, low-cost range becomes increasingly important as the key resource for meeting red-meat demands of the future. Consumers indicate little difference in preference between grass-fed and grain-fed beef. The desire to produce leaner red meat for the market place also enhances the demand for grass-fed beef. Furthermore, ruminant animals provide the only efficient manner in which to harvest much of the range forage.

Conclusions

In summary, the opportunities for red-meat production on the Southern forest range are unique; however, judicious multiple-use planning and coordination are necessary to fully realize

these range potentials. Researchers, educators, land managers, and administrators must work diligently and cooperatively to meet local, national, and world demands for food and fiber while providing other amenities from our limited forest land base. The South's "many splendored" forests provide a prime opportunity to assure successful accomplishment of true multi-resource management both now and in the future. To realize our opportunities for improvement of range in the South, several important problems must be solved. These include more information on interactions among resources, better educational programs regarding the multiple uses, and expanded technology transfer systems to implement sound management. Potential success in solving these problems appears high because of our increased awareness, legislation supporting implementation of sound management, and demands for multi-resource outputs.

The Canadian Arctic

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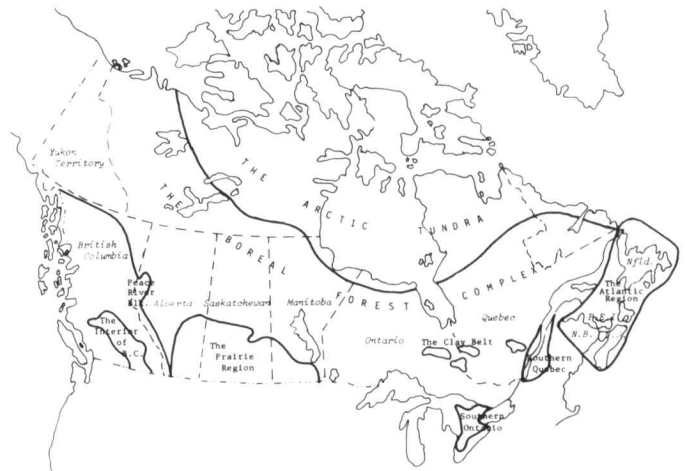
In Canada, we tend to think of the rangelands as consisting of about 50 million acres (20 million ha) of grassy range, mostly in the West, and about 15 million acres (6 million ha) of woodland pastures, mostly in the East.

However, if we accept the definition of range as a kind of land where grazing by wild or domestic animals is a principal use, the Canadian area increases phenomenally because it includes the vast region of the Arctic tundra.

The Canadian Arctic comprises that part of Canada lying north of the tree-line, which is variously defined as the line marking the limit of growth of trees not over 25 feet (7.5 m) tall or a line about 50 miles (80 km) north of the northern limit of more or less continuous coniferous forest.

The tree-line follows the coast of northern Yukon to the delta of the MacKenzie River, where in latitude 68° 40' it reaches almost to the shores of the Arctic Ocean. East of Great Bear Lake, because of the cooling influence of Hudson Bay, the tree-line is deflected sharply southwards and cuts diagonally across eastern MacKenzie and central Keewatin districts and along the coast of Hudson Bay to James Bay. It crosses James Bay in the vicinity of the 52nd parallel and in the interior of Ungava again turns northwards so that only the northernmost part of the Ungavan peninsula is treeless. Along the Labrador coast, the tree-line is again deflected sharply southwards then runs eastwards across the northern third of Newfoundland.

As thus defined, the Canadian Arctic comprises about 1.2 million square miles (3.1 million km²), about 0.45 million square



The geographic regions of Canada.

miles (1.16 million km²) of which make up the northern islands.

Now and in the foreseeable future, the principal use of this vast region is grazing by relatively small numbers of wild and semiwild herbivores—caribou, muskox, and reindeer.

The caribou is a migratory animal that congregates in vast herds during spring and fall migrations. Around 1900, the mainland or Barren Grounds caribou numbered between two and three million head. They moved back and forth across the Barren Grounds, with the southerly herds wintering south of the tree-line; the more northerly herds summered on the Arctic