Grazing Use Checks on The Wichitas

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The basic objective of the Wichita Mountains Wildlife Refuge is to maintain an ecological balance between the animals on the range and the forage resource. A definite effort is being made to upgrade the range toward an optimum condition for wildlife use and to serve as a prime example of range management in the southern Great Plains area.

With this stated range management objective, the Bureau of Sport Fisheries and Wildlife of the U. S. Fish and Wildlife Service has preserved in the Wichita mountains near Lawton in southwestern Oklahoma an outstanding, 59,020-acre example of natural grassland populated with native wild game and longhorn cattle. This important national refuge lies along the eastern edge of the Rolling Red Plains of Oklahoma. It is picturesquely set in the Wichita mountains, a chain of igneous hills surrounded by the permean redbed plain locally impregnated with granite mountain outwash material. Elevations range up to 2,479 feet above sea level. The highest point is on Mount Pinchot in the western part of the area. Over a fifty-year period precipitation at the refuge has averaged 30.42 inches. Only

[1]*The author acknowledges the helpful suggestions provided by Julian A. Howard, Manager, Wichita Mountains Wildlife Refuge, and Arthur F. Halloran, Biologist, who serves this and other refuges of the Bureau of Sport Fisheries and Wildlife.*

7.31 inches of this occurs during the five winter months, November through March. Snowfall is negligible.

Vegetation

The vegetation is varied and representative of the ecotone between the true prairie of central and eastern Oklahoma and the mixed prairie farther west (Clements, 1949). Little bluestem *(Andropogon scoparius)* along with big bluestem *(A. gerardi)* and Indiangrass *(Sorghastrum nutans)* dominate much of the prairie with some of the gramas *(Bouteloua spp.)* and buffalograss *(Buchloe dactyloides)* playing an important role on the more droughty sites. There are many wooded and savannah areas along footslopes, streams, and geological fault lines. Representative woody species are post oak *(Quercus stellata)*, American elm *(Ulmus americana)*, and little walnut *(Juglans microcarpa)*. This mixed woodland and grassland vegetation provides excellent cover and forage for the game population.

Wildlife

Management to keep the grazing game population in balance with the current year's growth of vegetation is not easy. The foraging animals include bison *(Bison bison bison)*, longhorn cattle *(Bos taurus)*, elk *(Cervus canadensis)*, and white-tail deer *(Odocoileus virginianus)*. Species differences in needs for forage and cover require that each important kind of grazing animal be taken into account. Other complexities of management include the need for adequate cover and feed to support excellent wild turkey *(Meleagris gallopavo intermedia)* and bobwhite quail *(Colinus virginiana)* populations as well as other native small game. The heavy concentration of human visitors in some segments of the refuge creates another pressing problem. Refuge records show approximately one million visitors annually. The trend is upward. Visitors cause local game distribution problems.

The present grazing animal population on the refuge includes approximately 900 bison, 300 longhorn cattle, 350 elk, and about 2,000 deer. Pastures with acreages under management are: Mt. Pinchot, 13,286; North Mountain, 8,198; Graham Flat, 10,483; Mt. Scott, 7,581; Quanah-Elk Mt., 16,207; small pastures, 2,622. Area in lakes is 643 acres.

Plans

During 1947 a soil and water conservation plan for the refuge and a cooperative agreement between the Wichita Mountains Wildlife Refuge and the Comanche County Soil Conservation District were developed. The agreement called for a range site and condition class map. This formed the basis for long-range basic soil and water conservation plans for the refuge. Since 1957 annual grazing use checks have been made to provide guidelines for management. These use checks are done cooperatively by representatives of the Fish and Wildlife and Soil Conservation Services.

The Survey

The range use survey is usually made by three, two-man teams. It takes about four days to cover the entire refuge and to summarize findings. The study is made usually the first or second week of April. This is the end of the grazing year and the beginning of "green-up" for the dominant warm season vegetation.

Grazing use is determined through ocular appraisal, supplemented by quantitative data collected at the inception and during progress of the survey. Degree of use is based on percentage of forage removed from key species on each range site and for each condition class. Subdivisions of sites and condition classes are made where significant changes in use occur.

The first day of the survey is the "tooling-up" or training period. Quantitative data are obtained from 36-square-foot exclosures strategically located in each pasture. The cages are moved to new locations each year. The square exclosures are made by fastening together four steel framed and braced panels, each four by six feet and covered with woven wire. These are securely fastened at the corners and anchored (Figure 4). Herbage clippings from plots inside and outside the cages are obtained to appraise total herbage removal. While the cages are not numerous enough for a reliable sample, they do serve as a guide for judgment. In addition, individual key species are clipped and weighed to sharpen judgment on degree of use (Pechanec and Pickford, 1937).

To supplement these quantitative appraisals, each surveyor makes step estimates of use on key forage species along selected transects. Estimates are checked and compared to obtain uniformity. The survey party then maps grazing use on key areas until satisfactory uniformity of judgment is attained. Use is recorded in the field on blue line cartographic reproductions from aerial photo mosaics scaled at two inches per mile. The completed map is colored to reflect areas of light use and overuse. A brief report is developed for the refuge manager. It includes calculated percentages of each use class for all major pastures. This analysis is made only when there is need for a detailed evaluation of progress. Current photographs of selected sites make up an important part of the report. These photographs provide an excellent visual record of vegetation changes.

Percentages of use are divided into four adjective groups; *light use*, less than 25 percent removal

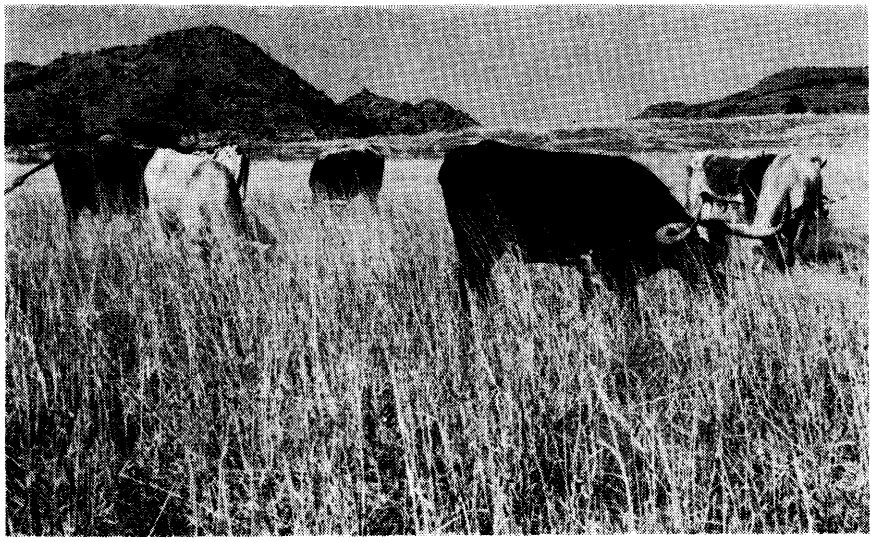

FIGURE 1. Light use, less than 25 percent removal of forage from key species.

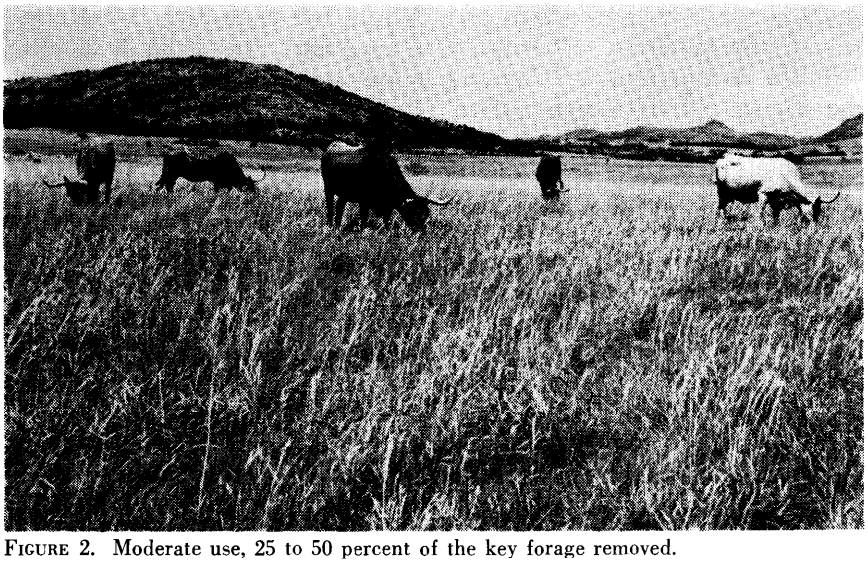

FIGURE 2. Moderate use, 25 to 50 percent of the key forage removed.

of key forage species (Figure 1); *moderate use,* 25 to 50 percent removal (Figure 2); *close use,* 50 to 75 percent removal (Figure 3) and *severe use,* more than 75 percent removal (Figure 4).

Key Species

The most prevalent forage species found is little bluestem. Blue grama *(Bouteloua gracilis)* is the key grass on the hardland sites (Figure 3) and on some other range sites in low condition. Other key forage grasses include switchgrass *(Panicum virgatum)* and big bluestem. Eastern gamagrass *(Tripsacum dactyloides),* while not the major forage producer, is becoming increasingly important on some of the loamy bottomland areas. This highly productive climax grass is particularly relished by bison.

Only grasses are recognized as key forage species but field notes are made on grazing use of forbs, legumes and browse species. The principal browse species are elm, oak, and greenbriar *(Smilax bonanox).*

Results

These annual range use checks have aided in many management decisions. The flourishing deer population has been reduced through trapping. As an example, almost 1,400 deer were live trapped during the 1960-61 and 1961-62 trapping seasons for restocking other areas in Oklahoma. A surplus animal disposal program is used to reduce numbers of bison, elk and longhorns. This is accomplished through donations and sales. The need for reductions is determined from survey results.

The study has also aided decisions on the movement of animals between pastures. Recently, based on study results, the former 30,000-acre Big Game pasture was divided into three units to obtain better distribution of grazing. Water developments and

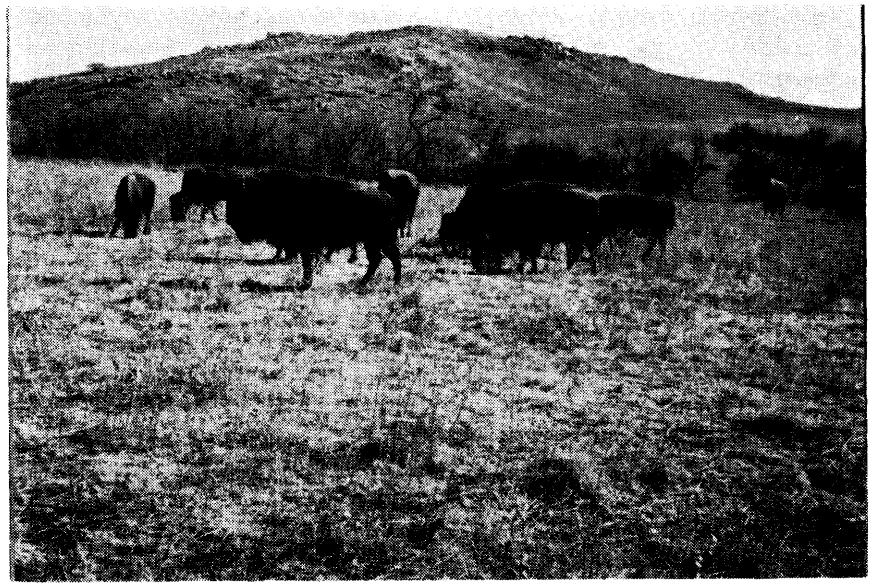

FIGURE 3. Close use, 50 to 75 percent of the key forage removed.

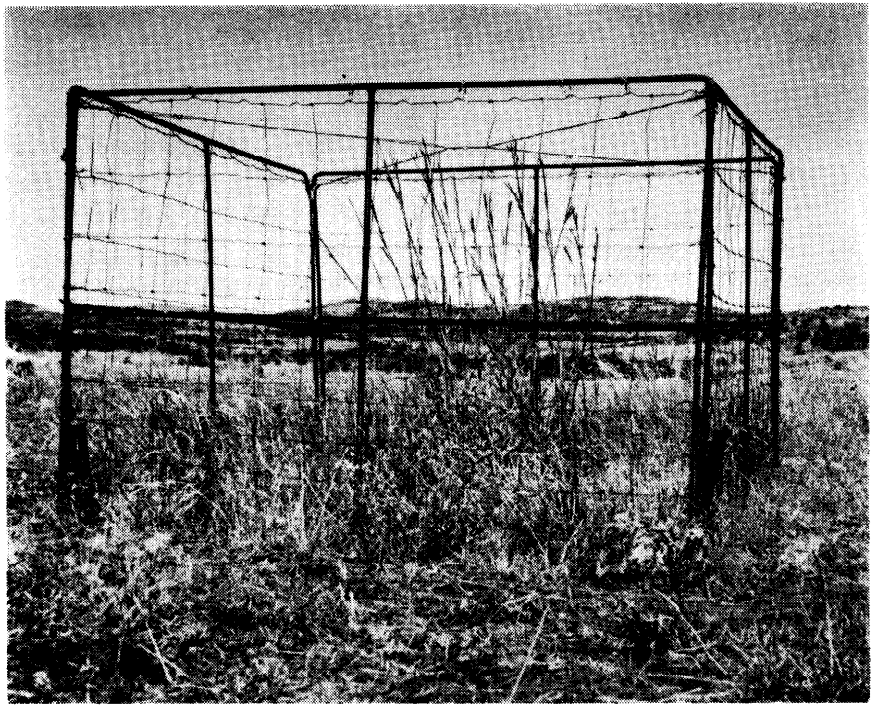

FIGURE 4. Annual exclosure showing growth April, 1958 to April, 1959. Surrounding area represents severe use. Only a minor part of the refuge is used to this degree in any year.

salting have also played an important part in improving the distribution of range grazing.

Summary

Cooperative grazing use checks on the Wichita Mountains Wildlife Refuge are made annually by the U.S. Fish and Wildlife Service and the U.S. Soil Conservation Service. Degree of use is determined by ocular appraisal supplemented by quantitative measurements. Results of these checks are playing an important role in refuge management.

LITERATURE CITED

CLEMENTS, F. E. AND EDITH S. CLEMENTS. 1949. Dynamics of Vegetation. New York, H. W. Wilson Co., 296 pp.

PECHANEC, J. F. AND G. D. PICKFORD. 1937. A Comparison of Some Methods Used in Determining Percentage Utilization of Range Grasses. Jour. Agric. Res. 54:753-765.