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## SOME OBSERVATIONS ON MISMANAGEMENT OF GRASSLANDS AND WOODLANDS

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It is the purpose of this paper to point out some of the destructive agents which cause the most damage to the woodlands and grasslands of Northwest Arkansas. The measures for reestablishing economically productive woodlands or grasslands will not be discussed, although it is recognized that the elimination of the destructive agents will go a long way in returning the areas to good productivity. The process of reclamation may be sped up by interplanting and selective cutting in the case of woodlands, and by tillage, reseeding, fertilization, and other cultural practices in the case of grasslands.

The most destructive agents causing untold damage to our grasslands and woodlands are fire and overgrazing. Both are under the control of man, and he too frequently permits them to go uncontrolled. Therefore, we may surmise that man's carelessness causes the destruction of many millions of dollars worth of timber and grasses in our state every year.

Aside from the alleged setting of fires to spite someone or to create a job and get paid for firefighting, man's principal excuses for burning woods are to kill ticks and to burn off the leaves so that more early spring grass will come through. It is ironical to note that in those areas of Northwest Arkansas where burning is practiced every year for the purpose of killing ticks, it is there that are found the worst tick infested areas.

Most ecologists will admit that planned and controlled burning has a place in improving certain types of food and cover for wildlife and in the management of the longleaf pine lands in Southeastern United States and shortleaf pine in New Jersey. There is never a valid excuse for overgrazing. There are times, however, when heavy grazing has been recommended to aid in the control of weeds such as wild onions and sage grass which have been fertilized to increase their palatability, and in the case of ponderosa pine in New Mexico where some grazing is necessary for reproduction.

Experiments conducted by the Soil Conservation Service in Oklahoma have shown that 30 times as much rain and 11 times as much soil runs off a burned forest floor as runs off an adjacent forest floor which has not been burned.

When the white people settled this country there were approximately 800 million acres of forest. Now there are 615 million acres of woodland and woodland pasture, and only three-fourths of it is considered of commercial value. About 40 million acres of state and private lands are still burned over every year in the United States.

In the first three months of this year 43,408 acres in Arkansas were burned over, as compared to 17,373 acres during the same period last year. The areas hardest hit were near El Dorado, Harrison and Eureka Springs.

In Northwest Arkansas where white oak or red oak stands have occurred, frequent burning accompanied by the cutting of all merchantable timber have reduced some of the stands to a scrub growth of post oak, black jack oak, red oak and black oak. A young growth of white oak seldom ever withstands heavy annual burning. These sites then permit the development of one or more of the following: blue stem grasses, bracken fern, and huckleberry. If heavy grazing is added to this punishment, then the blue stems will be eliminated and likely will be replaced by sage grass. Also, further damage to woody species will result from livestock browsing on the young tender growth.

Overgrazing is the agent which most likely limits the growth of the Indian grasses and the desirable species of the bluestems. These have been observed in open woods and railroad rights-of-way where burning has been practiced each year. Also, they may be found in open range land which is grazed lightly or not at all. In woodlands or pastures that are grazed frequently or have been overgrazed these desirable species give way completely to the poor quality grasses as the three awns and sage grass (*Andropogon virginicus*). The latter has infested thousands of acres of grazing lands in this section of the state and will grow on almost any kind of soil or land condition where the competition has been reduced by fire or overgrazing. Burning does it no harm, but actually helps it become better established by reducing the competing grasses and legumes.

Overgrazing seriously restricts the development of a good root system, for without adequate top growth, the roots cannot develop sufficiently to absorb the necessary foods in poor soils or take up sufficient moisture during dry periods. Regulated grazing gives the plant time to develop enough top growth to produce the necessary food to produce good root growth.

As has been indicated above, fire and overgrazing can quickly reduce good grazing land into a waste of weeds and expose the soil to the destructive forces of erosion. A native cover of perennial grasses will withstand some burning, but when heavy grazing is added, the bluestems and Indian grasses are eliminated and sage grass and bitter weed replace them. This may be observed in many places along the Frisco Railroad right-of-way, which is burned off almost every year. A striking example was observed about six miles north of Fayetteville where the protection of the right-of-way against grazing permitted a heavy growth of Indian grass, big bluestem and little bluestem. The pasture across the fence had none of these, but instead had a good growth of sage grass and bitter weed. The pasture also supported some annual grasses and annual lespedeza, but the heavy growth of weeds and sage grass severely limited the amount of palatable forage.

The story of a degraded grassland is described in the March 1950 issue of *The Land News*. In 1854 Bartlett gave this description of Southwest Texas:

"The whole of this district consists of gently undulating plains, without timber, save along the margins of the streams, and is covered with the most luxuriant grass. The prairie grass is tall, coarse, and full of seed at the top, and when young resembles wheat in the spring."

The story is continued by Don J. Newman in *Sheep and Goat Raiser*, August 1949. "When the Texas rancher found that he could make unheard-of profits from cattle, he began producing more cattle. Then when the railroads came, he could market his cattle easier and he thought of more cattle and greater profits. As the numbers of cattle increased, something began to happen to the tall, luxuriant grass of the 'old timers.' These tall, more palatable grasses began to disappear. In their place came the shorter mid-grasses, but they produced less forage. Continued overgrazing killed out the mid-grasses, removed the thick mat of decaying vegetation from the soil surfaces and thereby created a drier soil condition. Only short grasses and annual grasses could live in the drier soil."

"The seeds of noxious weeds and woody plants could finally get into the soil itself where they could germinate. Since there was little grass cover to slow it down, a large portion of the rain was lost as surface runoff. Natural springs began to dry up. The flow of the streams was lowered. The soil itself became less productive because little or none of the plant food was returned to the soil as decaying organic matter."

"Soon rocks began to show up on the surface of the soil, for there was no grass to prevent the washing of the topsoil into the valleys and streams. After a few decades much of the Texas land where once grew beautiful, beef-producing grass was eroded and covered with worthless brush and undergrowth."

The ill effects of burning and overgrazing may be summarized as follows:

1. Fire scars reduce the sale value of logs and open the way for diseases and insects to enter the tree.
2. The seedlings of desirable species are either damaged or killed.
3. Erosion and runoff are increased, causing more floods and shortening the life of springs.
4. Grasses are prevented from developing the deep root systems that they need to hold their own against weeds.
5. Desirable native or introduced species are killed out leaving the areas exposed to erosion and the encroachment of weeds.

The destructive forces which man permits to go uncontrolled may quickly reduce woodlands and grasslands from profitable investments to scrub growths which will not yield enough products to pay taxes on the land but will leave the soil exposed to active erosion.

Simple measures of conservation including the elimination of fire and the control of grazing will go a long way in preserving these natural re-

sources. Improved cultural practices will further increase the profits derived from them and store enormous amounts of water in the soil. This is a job not just for the farmer, but for the business man as well, for where the land is productive business is prosperous. Conservation is everybody's business.