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April 1969

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LAND USE CHANGES AND SHARP-TAILED
GROUSE BREEDING BEHAVIOR

by

Leonard H. Sisson

The sharp-tailed grouse formerly inhabited much of the area which is now Nebraska. The sharp-tailed, along with its near relative, the greater prairie chicken, disappeared from parts of its former range which were put into intensive cultivation. The 20,000 square mile area of the Sandhills was not suited to such cultivation and consequently is the remaining stronghold of the sharp-tailed in Nebraska. It is one of the more important sharp-tail ranges remaining in the United States.

With continuing decreases in suitable sharp-tail habitat throughout its former range in the United States, it is important to understand land use trends and effects of these trends on the sharp-tail if we are to conserve this resource.

In 1958, the Research Division of the Nebraska Game and Parks Commission initiated a study on ecology and management of prairie grouse on the Sandhills region. Most of the data for this study was collected on the Bessey Division of the Nebraska National Forest near Halsey, Nebraska.

Presented at Meeting of: Nebraska Chapter of the Wildlife Society
Chet Ager Nature Center, Pioneers Park
Lincoln, Nebraska
April 19, 1969

The study was originally intended to include prairie grouse, the sharp-tail and prairie chicken; however, because the Forest area is inhabited almost entirely by sharp-tailed grouse, most data was collected on this species.

One aspect of this research covered the effects of land use on breeding sharp-tailed grouse. During the spring, male sharp-tails gather and display on rather well defined sites referred to as "Dancing Grounds" or "Leks". Females visit these sites and it is felt that most or all mating takes place on the dancing ground. Nesting and brooding are carried out by the female alone.

Although lek behavior of sharp-tailed grouse has been observed and studied by many professional and non-professional ornithologists, little is apparently known about factors influencing selection and use of a particular site for this activity. In general, dancing grounds are described in literature as small hills devoid of rank vegetation which provide a relatively good view of the surrounding area. Two possible reasons advanced for selection of such a site are: (1) males are able to better detect approach of predators, and (2) females are better able to find dancing grounds.

Understanding the effects of land-use on breeding sharp-tails requires knowledge of land use practices and trends, and detailed information on display sites.

Bessey Division, Nebraska National Forest, includes some 90,350 acres (141 square miles) of Sandhills prairie located between the Dismal and Loup Rivers. About 25,000 acres (39 square miles) have been planted to trees,

or 1/8 miles of a windmill. Of 15 transient display sites, 6 or 40% were within 220 yards of a windmill. Of the 9 permanent grounds not near windmills, 4 were near a road, 1 near a corral and 4 were not near any man-made structure. Of 9 transient grounds not near a windmill, none were near a man-made structure. It is also pointed out that dancing grounds and windmills are more or less evenly distributed and usually individual grounds are at least 1/2 to 3/4 mile apart.

In agreement with findings of other investigators, most grounds in this study were on slight to moderate elevations providing a good view of the area. It is also noted that sites vary considerably and other apparently topographically similar sites can easily be found which are not used for dancing grounds. No permanent display grounds were found, however, on choppy sandhill sites such as this.

Vegetation on dancing grounds was studied during spring in 1965 and 1966. Composition of vegetation was determined by 3-step transects which consisted of 100 point readings taken at 6" intervals along a 50' steel tape.

As only plants from the previous growing season are present when dancing grounds are most active, only these plants are treated here.

Six species of plants made up 83% of all hits on vegetations. These were Little bluestem, Prairie Sandreed, Western ragweed, Sand dropseed, lead plant, and Sand bluestem. Of the four grasses two were tall sodforming grasses and two were mid, bunch grasses. Lead plant is a half shrub and all of you are familiar with western ragweed. The plant occurring most frequently on dancing grounds sampled was Prairie

grounds within the study area located between 1963 and 1966. Some 35 dancing sites were located during this period; however, because certain grounds were abandoned or moved, the number of active sites each year varied from 17 to 23 or a little less than one per square mile. In addition to these "permanent dancing grounds" a few individual males were seen each year on other sites which were called "transient grounds". Transient grounds were seldom occupied for more than one year.

There are approximately 26 windmills in this study area or a little more than one per square mile. Of 35 permanent dancing sites found, 26 (or 74%) were within 220 yards or 1/8 mile of a windmill and of 15 transient display sites, 6 (or 40%) were within 220 yards of a windmill. Of the 9 permanent grounds not near windmills, 4 were near a road, 1 near a corral and 4 were not near any man-made structure. Of 9 transient grounds not near a windmill, none were near a man-made structure. Please note that dancing grounds and windmills are more or less evenly distributed and usually individual grounds are at least 1/2 to 3/4 mile apart.

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One way to relate land use in this area to characteristics of dancing grounds is comparison of range condition. Range condition was determined by the Soil Conservation Service method described by Dyksterhuis, 1949. This measurement is based on the principal that climax-prairie vegetation provides a better quality of forage than other types. Thus, a range site is rated on the basis of the percentage (estimated dry weight) of climax-vegetation present on the site.

Range condition (in terms of percent with 100% meaning all climax-vegetation), is broken down into four classes: poor (0-25%), fair (25-50%), good (50-75%), and excellent (75-100%). The average range condition for 20 display grounds sampled in 1965 was 42% and for 26 samples in 1966, 48% or fair both years. Range condition varied from 0 to 95%. Of 83 random samples taken on the study area in 1962, 27% were excellent, and 23% were in poor

range condition. Of 46 samples on display grounds in 1965 and 1966, 11% were excellent and 30% were in poor range condition which suggest that display grounds tend to be in slightly poorer range condition than random samples.

As mentioned previously, display grounds were occasionally abandoned or the location changed during the study. Of 30 groups of displaying males, 5 moved to a new site from 1/4 to 1 mile away during the period 1962 through 1966. Three of 5 groups of males which changed sites moved shortly after the windmill at their original site had been moved. These birds established dancing grounds at the new windmill sites. It should be pointed out that windmills are usually moved when the site becomes badly overgrazed and approaches blowout conditions.

The fourth display ground which apparently moved was not previously located near a windmill. One year after trees were planted on the ground for a shelter belt, the birds moved to a site near the nearest windmill. The fifth ground which moved also moved from a site with no nearby windmill to a site near a windmill.

Many grounds were apparently abandoned during the study. Of 10 grounds located in spring of 1962, 5 were still active at or near the old site in 1966; 4 were abandoned; and one had declined in size to a single bird. Of 30 grounds found during the study, 5 were abandoned the year following their discovery. The latter dancing grounds apparently did not move to new locations as groups.

In a review of land use changes and described sites used by sharp-tailed grouse for spring display on Nebraska National Forest the following were observed:

1. There is tendency for sharp-tailed grouse dancing grounds to be near windmills and to be more or less evenly distributed on the study area.
2. Dancing grounds are usually located on a site affording a good view in all directions.
3. Range condition on grounds varies, usually corresponding to its distance from the associated windmill. Vegetation is usually short or if any plants are tall, they are usually bunch grasses such as Little bluestem.
4. Movement of windmills associated with a dancing ground is frequently followed by subsequent movement of the dancing ground.

From these data it can be concluded that concentration of grazing through use of windmills as a water source, creates favorable sites for establishment of dancing grounds. Although range condition is typically lower on dancing grounds than in the area at large, variation in range condition between grounds is great. Density and height of vegetation on dancing grounds, however, is almost universally low. It seems likely, therefore, that windmill sites have a vegetative cover which is suitable from a structural rather than a taxonomic standpoint. Furthermore, the exact site of the dancing ground, in relation to the windmill, is apparently determined by topography (explaining bare sand sites used).