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Leonard H. Sisson

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DISTRIBUTION AND SELECTION OF SHARP-TAILED GROUSE
DANCING GROUNDS IN THE NEBRASKA SAND HILLS

by

Leonard H. Sisson

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DISTRIBUTION AND SELECTION OF
SHARP-TAILED GROUSE DANCING GROUNDS
IN THE NEBRASKA SAND HILLS

The purpose of this paper is to report progress of certain aspects of research on sharp-tailed grouse in Nebraska. Specifically, I will discuss distribution and selection of display grounds by sharp-tailed grouse in the Nebraska Sand Hills.

The Nebraska Sand Hills covers a 20,000 square mile area in the central part of the state. Early attempts to raise crops were unsuccessful and the most economical use of this area was found to be cattle raising. For this reason, the Sand Hills have remained in a similar vegetative cover since man's settlement and represents one of the more important sharp-tail ranges in the United States. However, recent changes in grazing practices have been introduced which could bring about important changes in vegetation structure. As recently as last month this article appeared in an Omaha paper entitled "Sand Hills Sod Now Nurtures Fine Cornfield." Need for understanding ecology of grouse in this area is self-evident.

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

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

to trees, a large number of which burned in 1965. The remainder of the area (100 square miles) is grassland on which approximately 5,000 cattle are grazed, mainly from mid-May to mid-November. The area is divided into allotments of varying size which are leased to private ranchers. The main difference in land use of this area and surrounding private lands is that grazing pressure is more carefully regulated on the Forest, resulting in maintenance of better than average range condition.

Other land use practices of interest include construction of windmills and roads, mowing of roadsides for hay, and tree planting.

This map illustrates the distribution of dancing grounds and windmills on the Forest. During this research the area of about 25 square miles bounded by these roads was most intensively studied. Study of dancing grounds on the Forest was initiated in 1962 and was continued through 1966 by Larry Blus who preceded me on this study. It was felt that most of the dancing grounds within the study area were located 1963 through 1966. Some 35 dancing sites were located during this period. However, because certain grounds were abandoned or moved each year, 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 more than one year.

There are approximately 26 windmills in this study area or a little more than one per square mile. I would like to point out the relation between the distribution of dancing grounds and windmills. Of 35 permanent dancing sites found, 26 or 74% were within 200 yards

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

sandreed, a tall grass spreading by rhizomes. Although these plants are capable of fairly high growth, dancing grounds are typically heavily grazed and plants seldom attain even average height.

Vegetation was also described on the basis of range condition according to the Soil Conservation Service method. Range condition 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 sampled 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 changed location 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 grounds which apparently moved was previously located at a location not 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 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.

From our studies of sharp-tailed grouse dancing grounds the following observations were made:

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.

As is often the case, this research raised more questions than answers. In 1968, a more detailed continuation of this study was initiated in an effort to determine factors influencing selection and use of display sites by sharp-tails. This study is scheduled for completion in 1970. Research is being conducted by Curtis Twedt, a Ph.D. candidate at the University of Nebraska. Most of the data for this study were collected during this summer on the same study area as previous work. Although this research is not complete, I will briefly describe some of the methods and preliminary results.

Eight display grounds located within a nine square mile study area were selected for study. Selection was based on accessibility and proximity of one ground to another. Eight additional sites were selected randomly within the study area for comparison to display grounds. Location and approximately boundaries of each dancing ground were determined by observation using natural features for reference points. Vegetation and topography were studied on display grounds and random sites.

Line transects were established through the long axis and approximately perpendicular to the long axis of each ground. Line transects were established on north-south and east-west lines at random sites. Measurements of vegetation and topography were made with reference to these transects.