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Leonard Sisson

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Leonard Sisson
April 25, 1968

STUDIES IN THE ECOLOGY AND
MANAGEMENT OF PRAIRIE GROUSE

The purpose of this paper is (1) to present the scope of research being conducted by the Nebraska Game and Parks Commission on prairie grouse, the sharp-tailed grouse and greater prairie chicken, and (2) to discuss preliminary findings of one aspect of this research - characteristics of nesting and brooding habitat of sharp-tailed grouse.

In 1958, our Research Division initiated a ten-year study on the ecology and management of prairie grouse in the Nebraska Sandhills.

Researchers on this project have included biologists, Marvin Schwilling and Lawrence Blus, and a graduate student, Mr. Jerry Walker. As I took over the study in August, 1967, most of the information I am presenting was collected by these individuals.

This study was financed by hunters through the federal excise tax on sporting firearms and ammunition.

The location of this study is the extensive Nebraska Sandhills. Most of the data has been collected on Nebraska National Forest near

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Halsey, Nebraska. The Forest consists of some 100 square miles of prairie and 40 square miles of coniferous tree plantations.

Most emphasis of the study has been on the sharp-tailed grouse which is the more abundant of the two species of prairie grouse on the Forest.

The scope of this study may be termed broad in that it consists of several aspects including:

1. Spring inventories of grouse on display grounds,
2. Trapping, marking, and studies of movements,
3. Analysis of habitat associated with various activities of grouse,
4. Manipulation of habitat by planting trees, shrubs, and food plots,
5. Studies of food habits, and
6. Collection of harvest data from hunters to determine extent and composition of the kill.

While annual progress in each of these aspects has been reported, complete analysis of data is still in progress.

This afternoon, I would like to present some preliminary findings on one aspect of the study, which is characteristic of nesting and brooding habitat of sharp-tailed grouse.

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During the summers of 1963 through 1966, characteristics of several nesting and brooding sites of sharp-tailed grouse were studied.

Factors considered included:

1. Frequency and percentage composition of plant species,
2. Percent canopy,
3. Height of vegetation,
4. Range condition,
5. Topography, and
6. Soil type

Analysis of vegetation was accomplished by the Three-Step and Soil Conservation Service (quantitative ecology) methods. The Three-Step Method consists of recording species and height of plants at each of 100 points along a 50-foot steel tape. In the case of sampling at a nesting or brooding site, the center of the steel tape was placed at the location of the nest or brood. Incident light was measured with a photographic exposure meter every five feet along the tape giving ten readings per transect. Light was measured above the vegetation and at four inches above ground, the percent of light intercepted by the vegetation was considered percent canopy. Range condition class was determined according to the Soil

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Conservation Service method in immediate area of the nest or brood site. In addition to sampling of grouse activity sites, a series of random samples have been taken.

Findings, I am presenting, consist of comparisons of some characteristics of 21 nesting and 19 brooding sites.

This figure represents the percent frequency of nest sites and brood sites on the different soil types present on the Forest. The majority of nests were on choppy sands sites typical of steeper dunes, while the majority of broods were located on sands and sandy sites representing gentle dunes and dry valley sites respectively.

Difference can also be seen with respect to percent slope of nest and brood sites, with most nests located at more than 10 percent slope and most broods at less than 10 percent slope.

Exposure also varied between nest and brood sites with most nests on north facing slopes and most broods on level sites.

This figure illustrates difference between nest and brood sites with respect to range condition, nests being predominantly in excellent condition range and broods in good condition range.

Other differences between nesting and brooding sites included

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the number of plant species present and the percent composition of invader plant species. On 21 nest sites, 11 species of invaders were found; on 19 brood sites, 16 species of invaders were recorded.

Invaders accounted for 7.9 percent of the total plant composition in nesting areas, and 22.2 percent, or nearly three times more, in brooding areas.

Average percent canopy, as measured by light intercepted, was 32 percent at brooding sites, and 12 percent at nesting sites. Height of vegetation was also slightly greater at brooding sites than at nesting sites.

The following slide is of a sharp-tail nest site
The next three slides are of brood sites.

With respect to differences in vegetation on nesting and brooding sites, it should be pointed out that sampling was done during two different periods - i.e. the nesting season and the brooding season. It is felt that part of the differences in characteristics of vegetation at nest and brood sites may be due to this seasonal difference in sampling. For this reason, final description of vegetation of such sites will be in the form of

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comparison to random sampling done at the same time. We are also investigating more meaningful methods of measuring vegetation as well as other aspects of environment.

I have presented preliminary findings of one aspect of our research on prairie grouse. Work in the immediate future will consist of completion of analysis of data already collected, as well as continued field work on certain areas. This summer Mr. Curtis Twedt, a PhD candidate here at the University, will initiate a study on the reproductive ecology of prairie grouse in the Nebraska Sandhills. Of primary concern in his research will be characteristics of prairie grouse display grounds.

LS/rs