Management of Livestock to Improve and Maintain Prairie Chicken Habitat on the Sheyenne National Grasslands[1,2]

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Abstract-- Cover requirements of prairie grouse are primarily related to vegetative structure, whereas food needs are species related. Seasonal distribution and intensity of grazing initially alter the structure and ultimately can alter species composition. Initial successful nests were found in areas of more and higher residual cover than unsuccessful nests. Nesting areas were similar in type and height class to areas used by prairie chickens for winter and spring roosting. Success of renesting hens was higher than initial nests which was probably a function of additional cover provided by current year's growth. A key factor influencing prairie grouse numbers lies in the amount and distribution of residual grass cover (15-50 cm, ht) within 1.6 km of a display ground. On the Sheyenne Grasslands, this cover was almost entirely found in the lowlands and midlands. Grazing and haying management of these two communities will have the greatest impact on prairie chickens.

One need only look at published reports of cover requirements for a widely distributed gallinaceous species to see that the common denominator for secure cover lies in structure rather than plant species composition. Hammerstrom et al. (1957) discussed this aspect of cover for prairie chickens in Wisconsin. Jones (1963), in comparing habitats of the greater and lesser prairie chicken (Tympanuchus cupido and T. pallidicinctus), generally found the greater using tall grasses for cover, while the lesser in shortgrass habitat used shrubs. Likewise, Nielsen and Yde (1981) found sharptails (Tymnanuchus phasianellus) using shrubs for cover in the absence of grass of adequate height. Perhaps an extreme in seeking the structural cover requirements, was the heavy use of man-made objects (largely farm machinery) by scaled quail (Calipepla squamata) reported by Schemnitz (1961). In this symposium, Newell et.al.reported on the heavy dependence by prairie chickens on cover height during the reproductive season as did Toepfer and Eng for the winter season. This paper summarizes some of these data and relates them to livestock management on the Sheyenne National Grasslands (SNG).

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Reproductive Season

Seventy-six prairie grouse nests were located, just under 80% of which were located on USFS grasslands (Newell 1987). Only 9% were found on private grasslands and of these 7 nests, only 1 was successful. Just over 80% of the nests located on public lands were located in lowlands (56%) and midlands (25%), while only 3% were located in the most heavily grazed uplands. Structural cover was measurably greater at successful nests than at unsuccessful nests (Newell 1987).

Renesting attempts were more successful (68%) than initial efforts (48%), probably a reflection of the greater amount of cover as a result of current seasons growth. Nesting cover for first nests was invariably provided by residual grasses and sedges, the quality of which was dependent upon the degree of disturbance the previous year. Leopold (1933: 309)) pointed out that waterfowl and gallinaceous birds tend to intitiate nesting efforts prior to new green growth. A decided tendency was shown for nesting chickens to avoid pastures in which cattle were present when 11 of 13 renesting hens which had an option, selected pastures without cattle. The 2 which nested in pastures being grazed, selected the site prior to cattle.being moved in.

Hens with and without broods showed a preference for native stands of vegetation over agriculture and made extensive use of lowland habitats. Also, brood and broodless hens tended to seek areas which had little or no disturbance

(grazing or mowing) during the current year. Roosts by hens during the brood season were primarily found in Class III (26-50 cm) or taller vegetation.

Winter Season

Although prairie chickens on the SNG spent considerable time in disturbed types during the winter while feeding, undisturbed grassland played a key role in their habitat use, with 78% of observed roosts in this type of habitat. From a structural standpoint, 94 % of all roost types were in association with Class 111 or taller vegetation. Height Classes I and II (0-25 cm) which include areas disturbed by agriculture or grazing, were used primarily during the day for feeding (Figs. 1 and 2). Conversely, the undisturbed lowland community found on the SNG provided the taller Class III and IV (26+ cm) cover used extensively for night roosting (Figs. 3 and 4).

Taller height classes of vegetation played a dual role in providing cover for winter roosting prairie chickens. Birds used the vegetation itself in the absence of snow of adequate depth for burrowing. Taller vegetation also acted to accumulate drifting snow providing sufficient depths for snow burrows or depressions (Fig. 5). At no time during the winter of study, did snow accumulate on the level to a minimum depth required for snow burrowing (23+ cm).

Grazing Management Recommendations

The importance of the lowland and midland communities to prairie chickens on the SNG cannot be denied. These two communities recieved most of the winter and spring use by all hens and in summer by brood hens. None of the nests were located in an upland grass community or in a mowed lowland. Renests were more successful than initial nests, indicating a deficit in residual cover prior to current years growth. Thus, modifications in the management of the lowland and midland communities could have the greatest positive impact on prairie chickens.

Mowing of lowland vegetation was carried out primarily to remove rank vegetation and encourage cattle to graze on these areas thereby reducing pressure on the uplands. Mowing was done on a block basis with all the lowlands in a single pasture removed. A major benefit to prairie chickens could be derived from an adjustment in the mowing pattern to provide a wider distribution of unmowed lowlands. Secondly, efforts should be made to increase the total amount of undisturbed lowland and midland for nesting and winter roosting. One possibility to insure both a more even distribution and an increase acreage of residual grasses would be to mow one third of each pasture in a 3-pasture allotment on a three year rotational basis. A second alternative would be to evaluate individural allotments relative to grouse numbers. Using bird numbers as a habitat index, mowing and grazing practices would remain the same within a 1.6 km radius of booming grounds with high numbers of birds while adjustments could be made around booming grounds with low or unstable numbers. The latter alternative would necessitate a reliable monitoring of population numbers and distribution.

Adjustments in the timing of mowing could be advantageous. By delaying mowing of lowlands until 10 August, most nesting activities would be complete and broods mature enough to avoid mowers. Renesting activities were quite significant toward production in this study, with 6 radio-tagged hens bringing off broods after 10 July. Field observations have shown that chicks less than 21 days old sit rather than fly when threatened. A delayed mowing date would make these chicks less vulnerable.

Adjustments in turn-in dates for cattle provides another alternative for a positive impact on prairie chickens. Delaying the introduction of cattle into pastures until June 1 or 15, or distributing the cattle evenly between pastures for the first 2 weeks, would increase the amount of early vegetational cover for early hatching broods.

Recommendations thus far have dealt almost entirely with vegetation structure. Although sharptails used habitat types, height classes and disturbance types on the SNG in a manner comparable to prairie chickens, they used the shrub habitat at a rate 3 times greater. It appears that sharptails are the more aggressive of the 2 species. In this study, while sharing feeding areas, sharptails dominated prairie chickens in 87 of 94 aggression encounters. In 5 of 6 locations in 3 states that we are aware of where both species inhabited the same area, only sharptails remain. Thus, changes in the distribution and relative abundance of shrub species on the SNG could influence the current balance between the two grouse species. Spring inventory should be maintained at a level sufficient to detect changes in the composition and distribution of the two grouse species and shrub control could be implemented if needed and desired to favor prairie chickens.

Although winter food from agricultural crop is usually available, deep and/or crusted snow can eliminate this food source. Recorded shifts in daily ranges clearly indicates the instability of winter food sources, a condition which at times could contribute to reduced survival and production. A more dependable food source could be provided in the form of standing corn or sun flowers, strategically located with respect to known wintering areas booming grounds.

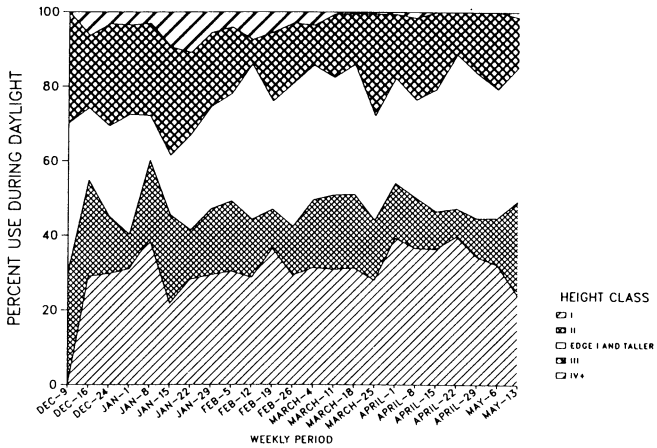

Fig. 1. Weekly use of vegetation height classes (I=0-8 cm, II=9-25 cm, III=26-50 cm, IV=50+ cm) during the daytime by radio-tagged prairie chickens, on the SNG, 1984-85.

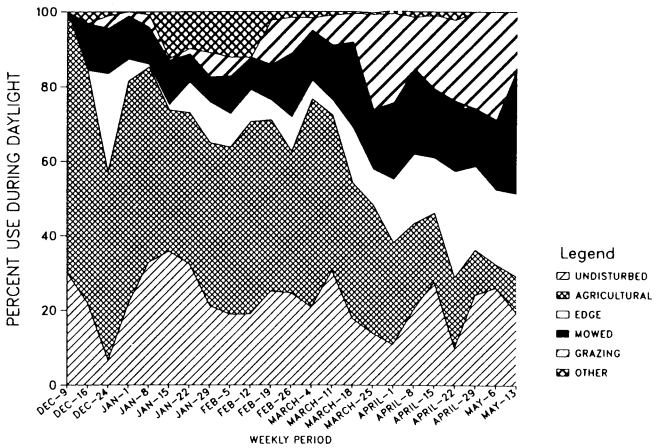

Fig. 2. Weekly use of disturbance types during the daytime for radio-tagged prairie chickens, SNG, 1984-85.

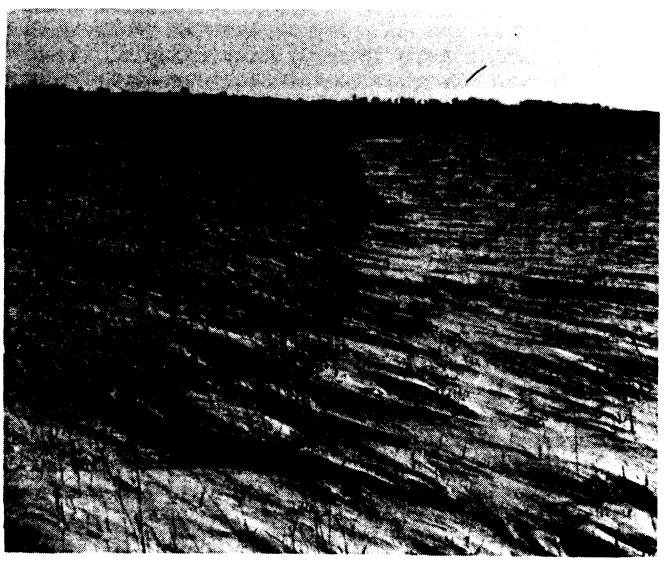

Fig. 5. The accumulation of snow by vegetation, SNG 1984-85.

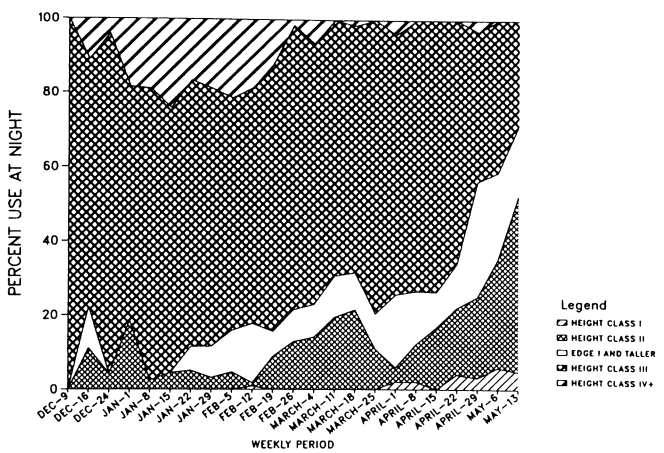

Fig. 3. Weekly use of disturbance types at night for radio-tagged prairie chickens, SNG, 1984-85.

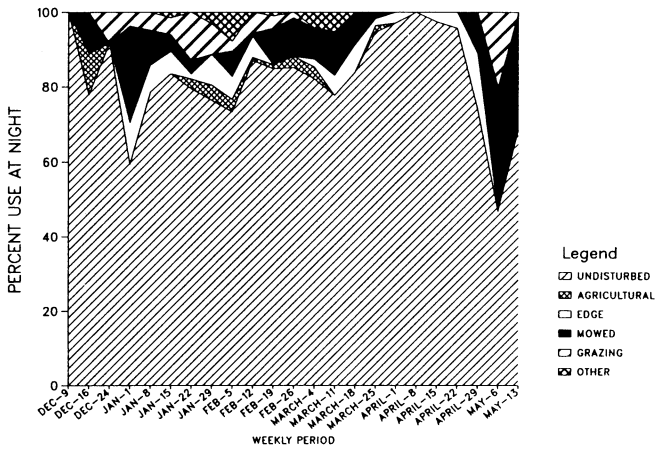

Fig. 4. Weekly use of vegetation height classes (I=0-8 cm, II=9-25 cm, III=26-50 cm, IV=50+ cm) at night by radio-tagged prairie chickens on the SNG, 1984-KD85.

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