

The following information was taken from a thesis that was completed by Carol Evans in 1986, titled, The Relationship of Cattle Grazing to Sage Grouse Use of Meadow Habitat on the Sheldon National Wildlife Refuge.

Pages one and two are the cover page and approval page of the thesis. Pages three, four, five and six contain excerpts of some of Ms. Evens's more important findings. The content therein speaks for itself.

UNIVERSITY OF NEVADA

RENO

The Relationship of Cattle Grazing to
Sage Grouse Use of Meadow Habitat
on the Sheldon National Wildlife Refuge

A thesis submitted in partial fulfillment of the requirements
for the degree of Master of Science in Renewable Natural
Resources.

by

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ON PAGE 10

Klebenow (1982) found that birds tended to avoid meadow areas of dense rank vegetation but would use these areas once they were "opened up" by grazing. Oakleaf (1971) reported that heavily grazed meadows containing a mixture of forbs and grass-like species were utilized by sage grouse, while succulent areas of ungrazed meadows dominated by heavy stands of sedge (*Carex* sp.) and rush (*Juncus* sp.) were not used as feeding areas. After cattle grazed and left a meadow, sage grouse were observed to concentrate there in greater numbers than before the grazing treatment (DeRocher 1980).

ON PAGE 31

RESULTS

Food Habits

Juvenile sage grouse crops contained over 22 plant and animal food items, but less than half of these formed substantial components of the diet (Table 3). Species which comprised almost 94 percent of the diet by weight included; in order, low sagebrush, big sagebrush, little green rabbitbrush (*Chrysothamnus viscidiflorus*), yarrow, common dandelion, western aster, and Louisiana sagebrush. Food items which occurred most frequently in the diet included; in order, yarrow, common dandelion, ants (Formicidae), little

green rabbitbrush, big sagebrush, western aster, and low sagebrush. Other food items which were also important in terms of frequency or composition but were used in lesser amounts included clover, milkvetch species, and false dandelion. Most of the plant species were consumed as young growing leaves, although developing flowerheads and even seeds of slender false phlox and common dandelion, were sometimes used.

ON PAGE 38

A chi-square test showed statistically significant selection for grazed meadows as the summer progressed (Table 8). Sage grouse used grazed and ungrazed meadows in proportion to their availability during the mid-July survey, but not during the late July-early August, mid-August, and late August surveys. During the last 3 surveys, observed use of grazed meadows was significantly higher than expected.

Use patterns of individual meadows over the 4 time periods showed variability and fluctuation, but in general, sage grouse per hectare values were higher for most grazed than ungrazed meadows from late July to the end of August

ON PAGE 44

Sage grouse use of areas within meadows was influenced by the distribution of common dandelion. Of the 3 food forbs, it was the most important. Sage grouse were flushed more often from meadow types where dandelion was rated as common or abundant than would be expected if no selection for those areas were occurring

ON PAGE 46

The amount or thickness of vegetative cover present on certain areas may have influenced sage grouse distribution on meadows. The difference between the number of sage grouse flushes expected and the number observed within a range of cover ratings for meadow types was significant ($X^2=12.79$, $P < 0.05$, Table 12). While sage grouse did not appear to select or avoid areas of open to moderately dense cover, significantly fewer ($P < 0.10$) sage grouse flushes were observed in very dense areas (with ratings of 0.0 - 1.5), than would be expected if no avoidance of those areas was occurring.

ON PAGE 52

Average phenology indices for the 3 food forbs decreased on all meadows over time, but indices for forbs on grazed meadows were generally higher and declined at a slower rate than indices for forbs on ungrazed meadows

The effects of time on phenology were highly significant for yarrow and western aster ($F=10.913$, $F=8.257$, respectively), but not for dandelion. Common dandelion, unlike many other forbs, retained its succulence long after maturation.

PAGES 104 & 105

Grazing by cattle prior to the cessation of plant growth on mountain meadows increases the quality of the food forb resource for sage grouse. Grazing increases succulence of forbs by interrupting and delaying maturation. New leaf tissue is higher in crude protein and lower in crude fiber than mature tissue. Sage grouse appeared to seek sources of succulent forbs by selecting for meadows grazed by cattle.

The distribution of dandelion is closely tied to grazing, it increases with grazing and is noticeably less abundant in communities protected for long periods such as West Rock Springs Enclosure. Perhaps most significant is that common dandelion is an exotic and not native to sage grouse habitat. Under pristine conditions, it would be interesting to consider what first occupied the prominent place that dandelion now holds in sage grouse diets and mountain meadow ecosystems. A study on the ecology of this unique forb might yield important insights into how the environment for sage grouse has changed and how sage grouse have responded to those changes.