

## BUGS IN THE RANGE ECOSYSTEM

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We all are aware of the damage that bugs can do to our backyard garden and the economic loss associated with uncontrolled insects in intensive farm vegetable, grain, or horticultural crops. However, neither the rancher nor professional personnel has much feeling for insects in rangelands. Except for black bug infestations in wheatgrass fields and an occasional sagebrush web worm explosion, insect infestations have created little interest. Little is known about what is there, where they are, how many there are, and what they are doing.

In 1974, we surveyed the insect population on the Squaw Butte range at six locations. Two locations were low sagebrush-Idaho fescue and four in the big sagebrush-bluebunch wheatgrass. At each location, samples were taken inside and outside exclosures where there had been no domestic grazing since 1935. Insect sampling was conducted about every two weeks beginning the first of April and continuing until late July. Samples of grass herbage, both old and new growth, were obtained when new growth was in a pre-boot, late boot, and mature development stage. In addition, comparative samples of only bluebunch wheatgrass and of Idaho fescue were checked for bug populations.

In total 39 families and over 100 genera of insects were identified. They can be grouped broadly into phytophagous (plant feeders), saprophagous (decayed matter feeders), and entomophagous (insect feeders). Despite larger amounts of herbage inside the exclosures, phytopagous insects were more numerous outside the exclosures. We believe this to be related to higher nitrogen concentrations of grass herbage in grazed areas (1.77 percent) as compared with concentrations in ungrazed areas (1.18 percent). Insect selection for high nutrient quality also has been shown in other studies. Saprophagous insects were numerous and their numbers fluctuated widely but differences between grazed and non-grazed areas were small. Similarly, differences in numbers of entomophagous insects between grazed and protected areas were small; however, numbers of these kinds of insects were limited but quite stable through the sampling period. All insects in the samples of bluebunch wheatgrass also were in Idaho fescue samples. However, there were differences in the abundance of specific insects between the two grass species.

It is believed that the abundance of insects determined in this survey represents a tolerable level for the sagebrush range. These data, limited to only one year, also suggest that the resting of a range area and the subsequent accumulation of old herbage do not result necessarily in a quick rise in insect populations. The differential abundance of insects between bluebunch wheatgrass and Idaho fescue suggests that these insects have preference. If range manipulations favor one grass species more than others, it is quite likely that such manipulation also will favor the increase of particular insects. The increase of the black grass bug is a good example.

We now know what insects are out there, some information on their numbers, and their distribution. However, essentially we have no information about their benefits or detriments to rangeland productivity. These answers are in limbo. Research plans in the near future do not include any additional studies of range insects at this station. However, this may change if specific insect populations should inflict immediate significant losses or should research elsewhere suggest that insect relations have a greater impact on rangelands than is believed.

People desiring more information about this research can request Squaw Butte publication, No. 189, "Insect Graziers of the Cold Desert Biome."

#### DIETS OF GRAZING ANIMALS USING COMMON RANGE IN EASTERN OREGON

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A growing concern among land agency personnel and ranchers alike is forage allocation. On ranges where several herbivores graze in common, it is important to know the food habits of each so numbers of the various species can be regulated to prevent overuse of the range and to prevent excessive forage use by one species to the detriment of another. The results presented herein discuss the food habits of cattle, sheep, deer, antelope, and free roaming horses in two areas of eastern Oregon and provide a data base for land managers to use in forage allocation decision making.

#### PROCEDURE

The studies were conducted near Burns, Oregon (Sagehen), and west of Vale, Oregon (Westfall). The Sagehen Study was conducted from May 1975 to April 1977; the Westfall Study ran from September 1976 to September 1977. The Sagehen Study encompassed several different pastures and no attempt was made to include grazing systems into the study. At Westfall, particular attention was paid to specific pastures and plant communities. The South Gravel Pasture was not grazed in 1976 so winter deer and horse diets would reflect forage availability not immediately affected by past cattle grazing. The other pastures were grazed by cattle in 1976. The North Gravel Pasture was not grazed by cattle in 1977. The East Miller Creek Pasture was divided into two areas of differing plant communities. The east portion was primarily cheatgrass range. The west portion, made up of bunchgrasses, was topographically more irregular. Diets of grazing animals on the two study areas were determined by analysis of fecal material under a microscope whereby cellular structure of each plant species was identified. Similarity indexes were formulated to evaluate the amount of dietary overlap present.