

FORTY YEARS - INSIDE AND OUT

F. A. Sneva, L. R. Rittenhouse, and P. T. Tueller

In the mid-1930s with the drought intensifying poor forage conditions on the eastern Oregon rangelands, the Squaw Butte Experiment Station came into existence. In 1936-37, 13, 5-acre cattle exclosures were constructed inside the larger pasture units that partitioned the 16,000 acre big sagebrush-bunchgrass summer range unit. A cattle management program was initiated at that time. The object was to show how, through management, the rangelands of eastern Oregon could be improved. By the late 1940s, those involved with the program at the station recognized that neither management nor total protection (for the exclosures had not yet become a waving field of grass) was a viable way to improve the sagebrush range.

In the subsequent decade, the manipulation of these sagebrush rangelands either by plowing and seeding or by brush control with 2,4-D resulted in significant increases in production on the treated areas and brought substantial relief in grazing pressures on unimproved ranges. In that same decade the vegetation inside the exclosures did not alter greatly. With more than 20 years of complete protection, there had been no significant reduction in sagebrush nor substantial increase in grass composition.

By the mid-1970s, the areas improved through seeding and brush control in the 1950s were again being overrun by sagebrush despite management efforts to provide optimum competition against brush return. Unimproved sagebrush ranges under grazing continued to produce no better or no worse than in the 1950s. In the exclosures, as much sagebrush was inside as was outside. And the grasses inside the exclosures, except for the presence of old forage, differed little from that growing outside the exclosures which had been subjected to grazing in nearly every year since 1936.

Why, after 40 years of protection from grazing has not greater improvement inside the exclosures occurred? Why, with 40 years of grazing have not unimproved ranges deteriorated? Why, with what we believe to be optimum management practice, does sagebrush increase on improved areas? The data from permanent plots inside and outside the exclosures and measured in 1937, 1960, and 1974, the history of grazing use prior to 1936 and after the station was built, and our increased ecological knowledge of the vegetation and its responses help us to understand why change has not been more dramatic.

Figure 1 shows the mean frequency of occurrence for big sagebrush and grass for 1937, 1960, and 1974. Between 1937 and 1960, there was an increase in perennial grass frequency but it increased alike inside and outside the exclosures. Change in sagebrush frequency was small during this period and also did not differ greatly from inside to outside. We believe the increase in grass frequency was the result of 1) improving

climatic condition, 2) a change of land use from a sheep lambing area to a spring-summer-fall cattle operation, and 3) a considerable reduction in grazing pressure. The combination of the last two probably provided so great a relief to the vegetational system that response to that relief was as great as no grazing at all. The upper limit to which the grass could respond was limited by the sagebrush community and because it had not been influenced by protection nor by grazing a common constraint was in effect both inside and outside the exclosures. There is evidence from other studies at Squaw Butte that the upper limit of response (as measured in 1960) may have and probably did occur in the early 1950s.

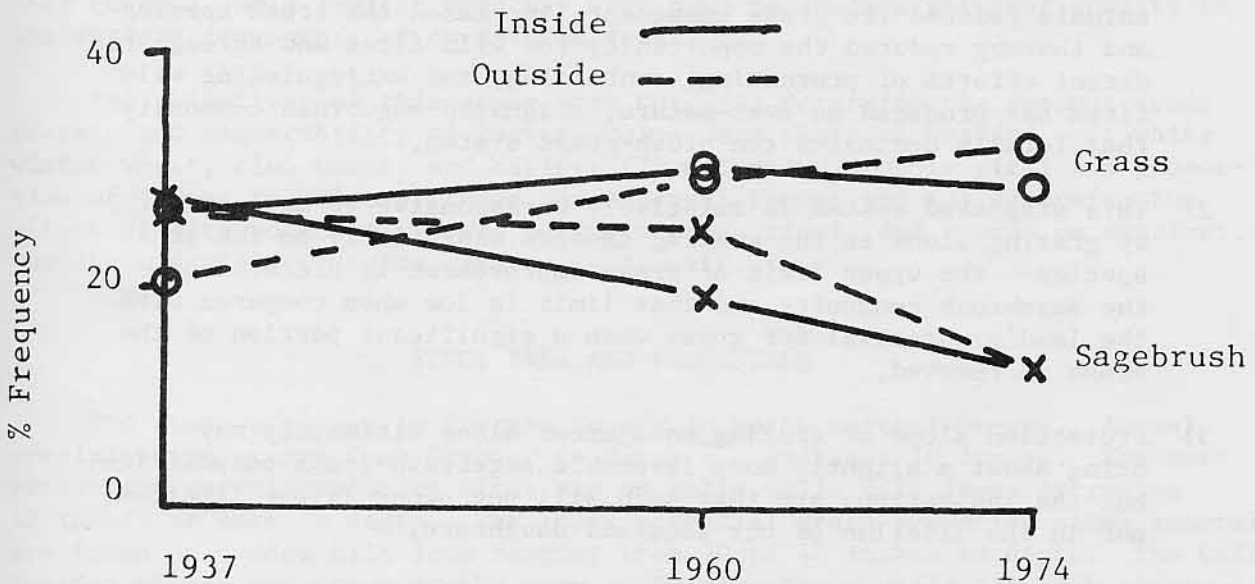


Figure 1. Mean frequency of grass and of sagebrush for nine exclosures at Squaw Butte in the big sagebrush habitat.

Sagebrush declined between 1960 and 1974, both inside and outside the exclosures but somewhat more sharply in the grazed areas. Declines of sagebrush in this period are believed to have resulted from the sagebrush defoliator moth that was prevalent throughout the Great Basin from 1962 to 1965. Total grazing use during this period was nearly double that of the 1937 to 1960 years yet because of increased production remained near 50 percent utilization, and grass response remained quite stable both inside and outside the exclosures. The increased animal use during this period came primarily from the crested wheatgrass seedings, the brush controlled areas, and the management of the total area to provide optimum use of unimproved ranges.

Strong grass increases, despite a reduction in sagebrush frequency during this latter period, did not occur. It is inferred that this sagebrush community is a mature, stagnated stand and totally dominates. Partial reduction of the population numbers may not have resulted in a similar

reduction in competition; thus, the common constraint for further grass increase still remained both inside and outside the exclosures. Grass frequency in grazed areas, despite an increase in animal use during this period, was not altered. This suggests that the grazing pressure exerted in those years was not strongly interacting between the grass and sagebrush competition battle in the natural brush ranges.

The exclosures at Squaw Butte and the vegetation response to grazing outside those exclosures and to total protection inside the exclosures for nearly 40 years lead us to believe that:

- 1) Man's activity on the sagebrush ranges through grazing of domestic animals reduced the grass component, increased the brush species and thereby reduced the opportunity for wild fires and through his direct efforts of preventing, containing, and extinguishing wild fires has produced an over-mature, stagnated sagebrush community that totally dominates the brush-grass system,
- 2) This stagnated system is relatively unresponsive to management by grazing alone as the grazing impacts essentially on the grass species - the upper limit of grass improvement is dictated by the sagebrush community and that limit is low when compared with the land's potential for grass when a significant portion of the brush is removed,
- 3) Protection alone or grazing management alone ultimately may bring about a slightly more favorable sagebrush-grass composition but the indications are that such will not occur in our lifetime, nor in the lifetime of our sons and daughters,
- 4) Man's action in the early history of the sagebrush range caused a degradation of the range from whatever condition then existed (and we are not all in accord as to what that condition actually was),
- 5) Man's actions today and tomorrow can move the present sagebrush-grass conditions towards that which existed more rapidly than can nature if he is allowed to do so.