



YELLOWSTONE NATURE NOTES

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WINTER RANGE IN YELLOWSTONE PARK
by
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The teeming herds of big game animals, in which the elk are represented by the largest numbers, that roam the vast expanses of Yellowstone Park, find an abundance of forage for their consumption during the summer months. At this time these animals are well



distributed over most of the park area and in their well-fed and sleek appearance they provide a picture of health and contentment which few park visitors fail to admire and enjoy.

However, with the approach of winter these conditions undergo a change. Deep snows blanket the southern and interior portions of the park and the animals are forced to migrate to the lower altitudes where a lighter snow-cover still leaves some forage accessible to them. But the fertile valleys and plains in the approaches to the park, where the game animals were accustomed to find shelter from the rigors of the winter, have long ago been preempted by settlers and are therefore no longer available for game utilization. There remains only a comparatively small area in the northern section of Yellowstone Park and the adjoining Absaroka National Forest, consisting of the drainages of the Yellowstone and Lamar

Rivers, where there is sufficient winter food for a limited number of animals. This region is commonly called the Northern Yellowstone Winter Range.

Under the protection of the park the number of animals therein experienced a marked increase and the game population reached its peak in 1915, when 37,192 elk were counted. While there was sufficient forage in the park for these animals during the summer months when all of the park area was accessible to them, the limited area that was available during the winter became heavily overstocked. Excessively large winter losses of elk and other game animals called attention to the crowded condition on the winter range and soon evidence of range deterioration in the form of stunted plants, trees that had the bark and branches removed by hungry animals and partially bare range areas began to appear. Favorable climatic conditions for some time alleviated the effects of this overutilization of the winter range, but the ensuing drouth periods aggravated the damage incurred to the range by animals to an extent that forcibly called for remedial action.

However, before such action could be taken, it was found necessary to more accurately determine the factors responsible for the critical condition of the winter range. The numerical status of the animals within the park had been obtained approximately by annual counts almost since the establishment of this immense game refuge; but little data was available from which could be determined the number of animals that could graze on the winter range without seriously impairing the plants thereon. It was therefore decided to make a systematic study of the winter range over a period of years and from a computation of the resulting data obtain a picture of the average winter. The conditions of such an average winter are to be used as a management basis for the Yellowstone game herds.

The study program was undertaken by the Yellowstone Park ranger personnel and the months of November to April inclusive of each winter were designated as study periods. In order to facilitate these studies the winter range area was divided into 15 range units and assigned to several rangers. Observations on snow conditions and the type and extent of the forage plants utilized as well as the stats of health of the animals on the winter range were made all through the month; but at predetermined times monthly game counts were made and each ranger, on a large scale map of his unit, drew in the outline of the range area where the depth or condition of snow would not preclude the foraging by game animals. These areas, which will henceforth

be referred to as available range, were later plotted on maps and the monthly amount of available range was determined.

In the course of these studies the rangers travelled several thousand miles on skis and snowshoes, often over difficult terrain and during sub-zero temperatures and blinding snowstorms.

A summary of the 1937-1938 winter range studies furnished a graphic picture of the information collected by the various rangers.

Unusual climatic conditions in the fall of 1957, consisting of rains that fell late in November and early December and that were followed by low temperatures, caused the water-saturated snow to form an all but impenetrable crust over much of the winter range through which the animals in quest of forage were unable to paw. This crust remained throughout most of the winter. The immediate consequence of this condition was a large migration of the game animals to the lower regions of the winter range area. There was only a shallow snow cover here and in some instances the rains had taken this off and left sizeable bare patches, but due to the more arid character of these lower range areas the plant growth there was less abundant than on the remainder of the winter range area. The heavy influx of animals to the lower areas made for a crowded condition and in consequence many elk migrated from the park to the adjacent National Forest where 3,536 were killed by hunters during the 1937-1938 season. Though this somewhat lessened the load on the range within the park, the ever-deepening snow cover further restricted the amount of available range as the winter progressed and naturally the animals concentrated in areas where the least amount of snow was found. Thus 34.7% of the elk that were counted within the park were found to be foraging on 14.9% of the available range area.

During the latter half of February the grasses and woods had been utilized to a point approaching exhaustion and the animals were forced to subsist largely on browse plants such as sagebrush, aspen, douglas fir and willows. The plight of the animals, but principally the elk, grew worse during the latter part of the winter and reached its



critical point late in March when large numbers of dead elk were found on the range. Although some of these deaths were probably due to old age and disease, there is little doubt that lack of suitable forage was the major cause that brought about these losses.

Rising temperatures during April melted the snow off large portions of the winter range and uncovered large amounts of forage that had been inaccessible to the animals during the winter. Toward the end of April the animals were recuperating from the hardships of the forage shortage during the winter, but many elk were still in a very weakened condition and it was obvious that some of these would die although forage was now plentiful. Toward the end of the winter, the range had taken on a swept up appearance which caused a visiting game manager to confess his astonishment as to how the large herds of elk could have lived through the winter.

Because of the changing snow conditions in the course of the winter the amount of range available to the game animals varies, but during the winter of 1937-1938 the amount of available range for the average month was found to be 145,437 acres. Studies of the forage habits of elk indicate that eighteen and three quarters acres of the type of range found in Yellowstone Park are required to sustain one elk during the six month winter period. There was then sufficient forage for 7,756 elk during the average winter month of 1937-38.

However, in addition to the elk there were also 786 antelope, 817 deer, 175 bighorn sheep and 245 buffalo using the same winter range. The forage requirements of these animals, after making due allowance for dissimilarities in forage habits among the different animal species, is converted to be equal to that of 697 elk. Therefore, the carrying capacity for elk along the winter range within Yellowstone Park during the winter of 1937-1938 was 7,059 head.

The elk carrying capacities of the winter range for the years from 1934 to 1937 was obtained in a like manner to that of the 1937-1938 winter, and are herewith given in tabular form:

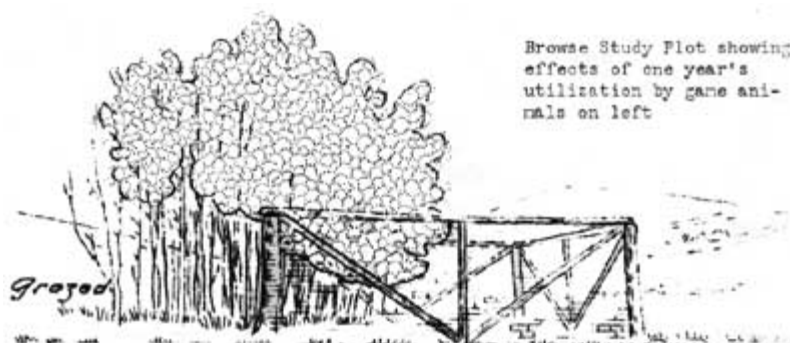
1934-1935	1935-1936	1936-1937	1937-1938
7010	7000	8100	7207

The average of those four years is 7,334 and it is believed that this very closely approximates the true elk carrying capacity

of the Northern Yellowstone winter range in its present condition.

While it is recognized that, due to climatic factors, an appreciable improvement in range plant life has occurred in 1937 and 1938, it was found that this improvement consisted to a large portion of transient plants and that range recovery of a permanent character has as yet not been attained and that a reoccurrence of drouth conditions will rapidly nullify this type of range recovery.

The excessive utilization of the range by game animals was determined by the use of fenced plots. By working these plots it was found that a continuance of the present degree of consumption will result in the practical destruction of such important browse plants as sagebrush and aspen. Overuse of this type clearly indicates that some action had to be taken to remedy this critical range situation, or permanent injury of the range would result.



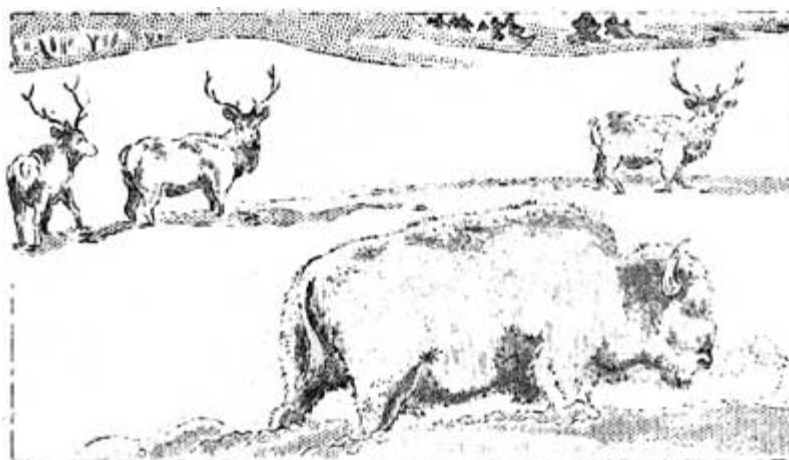
Browse Study Plot showing effects of one year's utilization by game animals on left

The two factors that determine the well-being of the range are climatic conditions and the degree of range utilization. Since no control over the former is possible, any adjustment that appears desirable must necessarily be made in the number of grazing animals.

The number of elk that use the winter range is far greater than the combined total of all the other animals, and reduction to a number comparable with the carrying capacity of the winter range will still leave this herd sufficiently large to assure its perpetuation and to furnish hunting. In the spring of 1938, 10,976 elk were counted on the Northern Yellowstone winter range, of which 448 are known to have died after the count. It is conservatively estimated that the 1938 calf crop amounted to 1500 head. Thus the winter range would be called upon to carry 12,000 head if no reduction was made.

Officials of the National Park Service, the

Montana State Fish and Game Department and the Forest Service have, however, recognized the problem and have cooperatively arranged to reduce the Northern Yellowstone Elk herd during the past five years. During the past winter 2,966 elk were taken by hunters and 296 were shipped alive to zoos and areas in need of stocking in Montana and Idaho. This reduction in the number of elk, amounting to 3,262 animals has helped to reduce the excessive load that the range has been carrying. It is expected that the continued cooperation of the three interested agencies will completely solve the Yellowstone game problem in future years, but most interested parties agree that the final solution will be reached only when additional winter game range is acquired.



A winter scene in the Lamar Valley
sketched from a photograph by Frank R.
Oberhansley

Certain portions of the winter range are utilized by great numbers of elk and bison.

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<http://www.nps.gov/mora/notes/vol16-3-4b.htm>
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