

PROBLEM OF SURPLUS ELK

IN

YELLOWSTONE NATIONAL PARK

1950

D-458

IN
STORAGE

Early History of Elk in the Park: Earliest observations and historical records indicate that very few elk wintered in the park prior to 1878. By 1881 small bands totalling about 400 wintered in the Lamar region. Ten years later, in 1891, elk wintering in or near the park had increased enormously, their numbers being estimated at 25,000. During each of the severe winters of 1891-92 and 1898-99, it was estimated that 5,000 elk died of starvation. Some 15,000 drifted out of the park to lower country. One of the most disastrous winters of record, 1919-20, brought losses estimated at nearly 60 percent of the entire herd.

In the meantime, more and more intensive settlement of grazing and farm areas outside the park took place. Ranching developments excluded elk from vast tracts of their former winter range. Surviving elk were forced to remain for longer and longer winter periods within the limited range of the park.

Overgrazing of Park Range: As early as 1911 it was recognized that limited available winter range in and adjacent to the park would require reduction and control of elk numbers. During the following years (up until 1934) 3,590 elk were trapped in the park and transplanted throughout Montana and many other states. Additional thousands were taken through legal hunting outside the park boundaries. These removals, however, did not sufficiently reduce the herd. Deterioration of the winter range continued. In 1934 annual reductions were increased by extended hunting season and slaughter within the park.

Meanwhile, investigations and studies had been carried on to determine grazing capacity of the winter range in the northern area of the park. By 1938 it was tentatively determined that available range both inside and immediately outside the park in the northern area could not support more than about 7,000 elk, in addition to the deer, bighorn and buffalo which also subsisted in the same areas. Although substantial periodic reductions have been made, winter elk populations have always greatly exceeded the 7,000 objective. For the past eight years, or since 1942, an annual average of more than 2,000 excess elk have contributed to further excessive deterioration of the winter range lands. The impact of this overload has reduced the carrying capacity of the winter range. Direct effects of serious overgrazing are apparent in the reduction of the most tasty and productive grasses and browse plants. Quaking aspen and willow are making their last stand throughout the winter range. Sagebrush on the lower and more arid range is in a similar condition. Choice grasses have been reduced by heavy use and replaced by grasses which are less productive and generally shorter and less available during the winter. This has occurred extensively over the winter range.

In some areas which have supported the elk through critical periods, the vegetative cover has been broken up so that only woods and cheat grass survive. Such plants provide practically no forage during the winter and are far less effective in preserving the soil than are the better grasses. On some south slopes the vegetation is so sparse that the soil is vulnerable to erosion by water and wind.

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Almost permanent changes take place in the soil if plant retrogression is allowed to continue. Trampling by the wild animals is more severe as they are required to graze constantly over the same areas in search for food. Gradually the humus in the top soil is reduced. The ability to absorb and retain moisture lessens upon exposure. Finally physical removal of the soil occurs through the action of rain, melting snow and wind. Such changes have occurred to varying degrees on the northern Yellowstone winter range. Immediate action to arrest this unnatural movement of soil is needed. Reduction in plant production can often be corrected by proper grazing. However, soil breakdown is difficult to arrest and restoration often would require longer than a lifetime. Objective should be to maintain a vegetative cover which will preserve both the elk and the soil. Present range condition requires that only about 5,000 elk be maintained on the northern Yellowstone winter range.

The serious situation of grass range and soil deterioration described above--due to overgrazing by excessive numbers of elk for many years--applies also to some 10,000 acres of winter elk range in the northwest corner of Yellowstone National Park, known as the Gallatin area. Here an elk herd, which has varied in numbers from 1,500 to 3,000 or more during the past twenty years, winters partially within the park and partially within the adjacent Gallatin National Forest. Studies conducted by the United States Forest Service and the Montana Fish and Game Department indicate that the winter carrying capacity of this entire area is not more than 1,500 elk. This capacity has been greatly exceeded for many years and extremely serious damage to park lands has occurred in a restricted area where the elk first congregate in the fall and spring migrations and where considerable numbers remain all winter. Even if future management is successful in maintaining the Gallatin herd at a maximum of 1,500 head, it is doubtful if desired recovery of damaged park lands can be fully accomplished because of restricting topography which forces excessive use of this migration corridor.

Similar Problems in Other Areas: The surplus elk problem in Yellowstone is not materially different from similar situations in other areas. In the Sun River region of northern Montana serious overgrazing by a large elk herd has occurred. A few years ago the Fish and Game Department of Montana found it necessary to cut the elk numbers by one half. This herd is being maintained on reduced basis by regulated hunting. Such measures have been necessary with respect to several smaller elk herds throughout Montana. Control of elk numbers is a recognized management measure in most of the mountain states where elk herds exist.

Preservation of Natural Conditions Required. The basic Act of Congress creating Yellowstone National Park (1872) stipulates that all features within the area shall be preserved in their natural condition. Thus (among other responsibilities) it is incumbent upon the National Park Service to maintain all species of animals and their environment in original or primitive character. In the northern Yellowstone area preservation of the bighorn, the antelope, the bison, the deer, the moose and the elk requires such management that no one species will be threatened with extinction through excessive competition with the others. The numbers of each cannot be permitted to increase to the point where the natural food supply becomes insufficient to support them.

Yellowstone Elk Management Objective: Present depleted range condition makes it imperative that effort be directed to reduction of the northern Yellowstone elk herd to about 5,000 animals. The Gallatin elk herd should not be permitted to exceed 1,500 animals. It will be necessary to maintain the herds at reduced levels until the range warrants increased forage use.

Through cooperation of all agencies concerned it is believed that the elk herds can be stabilized in balance with a healthy range condition. When this point is reached there will continue to be an annual surplus in the amount of seasonal increase. Under present conditions the elk herds increase at the rate of approximately 20% per year. Thus, with a herd of 5,000 elk, the annual surplus would be 1,000. With 6,000 elk it would be 1,200, with 7,000 elk, 1,400.

Most desirable methods of controlling size of the elk herd are (1) by live shipment of surpluses to other areas or (2) by legal hunting as the animals migrate beyond the park boundaries. If these two methods should fail to remove surpluses, slaughter within the park might become the only alternative.

Live shipments cannot be expected to remove more than a small percentage of the annual surplus. Legalized hunting outside the park on the other hand, has proved an excellent method of substantial reduction, except during mild winters when elk have failed to migrate from the park. It follows that (if hunting is to be relied upon as a principal means of controlling elk numbers) large reductions must be made by hunters outside the park in those irregular periodic winters when strong migrations occur. Averaged with small reductions of light winters, these removals over a period of years should maintain the wintering herds at the desired level.

Estimation of Current Elk Numbers - Northern Yellowstone Herd: Counting of the elk throughout the extensive area of the northern Yellowstone range is a difficult task. In recent years, counting methods have been improved. Changes in the number and boundaries of counting units have been made to facilitate coverage without duplication of counting. Cooperation of various agencies, organizations and individuals has made it possible to give more intensive coverage to counting units.

In the past eight years, four well-organized and intensive elk counts have been held. Complete records have also been maintained on annual reductions.

By taking into account the number of animals removed and the number counted immediately after this reduction, the absolute minimum size of the herd for the previous fall can be mathematically determined.

Thus, each of the four recent elk counts of the Northern herd (1943, 1946, 1948 and 1949) have clearly shown that previous forecasts of fall populations invariably have been low. Actual minimum size of the fall herd has been underestimated by 1,500 to nearly 2,000 animals. These excess animals have created a serious overload upon the winter range. Naturally, the range has shown continuing damage.

Past experience now indicates that each elk count must be carefully evaluated. Estimate must be made for those elk missed, or not seen, by observers.

As everyone who has participated in an elk count knows, some inventories are more complete than others. Weather conditions, snow depths, distribution of the animals and other factors--all have an important bearing on human ability to make a good census, or count.

On the basis of present knowledge, elk counts and estimates for the past eight years have been carefully analyzed. This analysis is graphically shown on the accompanying chart.

Because of extreme snow depths, concentration of elk, favorable weather and good organization, the elk count of the Northern Yellowstone herd conducted in the spring of 1943 is regarded as the most complete inventory ever made. Experienced observers who participated that year estimated that elk present but missed in the count would number an additional 5 per cent. On the same basis, the counts held in 1946 and 1948 can be rated as good (but not "excellent," as in 1943,) with animals present but not seen probably amounting to an additional 10 per cent. Actual count figures were used in the census of 1949.

On the basis of the above census evaluations, fall and later winter populations for the past six years have been computed for the Northern Yellowstone herd as shown on the chart. These recalculated fall estimates not only check rather closely with periodic actual figures obtained by census and reduction, but also approximate the minimum number of animals required in a basic herd to produce the known average annual drain.

Following the above pattern, size of the northern Yellowstone elk herd in the spring of 1950 is estimated at 10,000. Average annual herd increase in this area through birth and survival of calves to the age of 8 or 9 months appears to be about 20%. Thus, it is estimated that the fall population of the Northern Yellowstone elk herd will be 12,000.

Considering that an annual average of more than 2,000 elk in excess of the carrying capacity determined in 1938 has been carried for the past eight years as an overburden on a deteriorating range, it is now imperative that not more than 5,000 elk be carried on the Northern Yellowstone winter range until such time as vegetative recovery and soil stabilization may indicate that this maximum number can safely be increased.

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Record of Elk Reductions For Past 14 Years

Northern Yellowstone Elk Herd

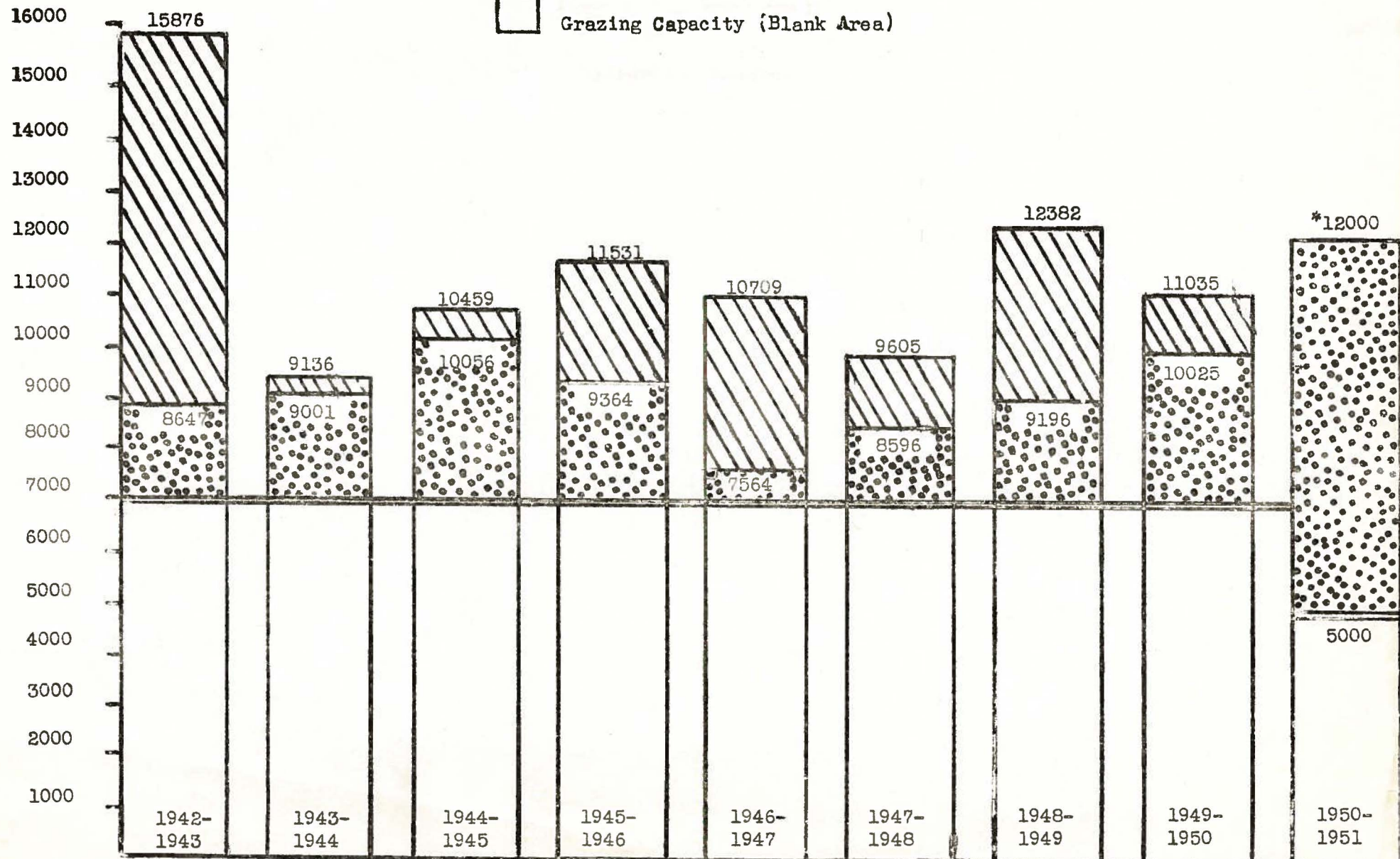
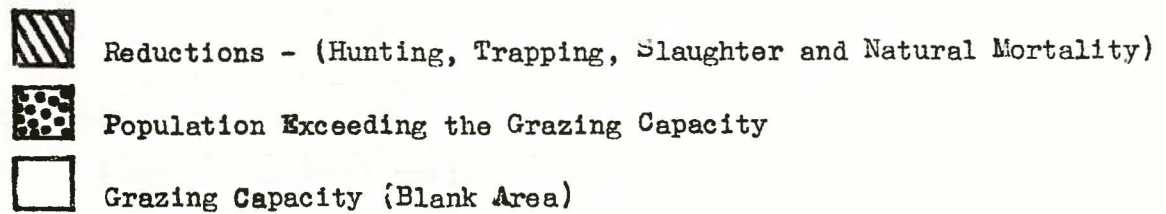
Period:	Actual	REDUCTIONS				
Spring to	Count:					
- Spring -	Spring -	Hunting:	Slaughter:	Trapping:	Winter Kill:	Total
1934-35	10 647 (1934)	2 598	223	444	--	3 265
1935-36	10 112 (1935)	2 287	*6	551	89 (1936)	2 933
1936-37	10 281 (1936)	257	394	180	15 (1937)	846
1937-38	8 794 (1937)	3 587	*11	225	89 (1938)	3 912
1938-39	10 976 (1938)	2 971		307	553 (1939)	3 811
1939-40	NONE (1939)	122		16	68 (1940)	206
1940-41	NONE (1940)	275		12	10 (1941)	297
1941-42	NONE (1941)	2 071		145	108 (1942)	2 324
1942-43	NONE (1942)	6 539	691		872 (1943)	8 102
1943-44	8 235 (1943)	125		10	100 (1944)	235
1944-45	NONE (1944)	403			300 (1945)	703
1945-46	NONE (1945)	2 094		73	250 (1946)	2 417
1946-47	8 513 (1946)	3 069		76	475 (1947)	3 620
1947-48	NONE (1947)	970		39	375 (1948)	1 384
1948-49	7 815 (1948)					
TOTALS		27 368	1 325	2 078	3 304	34 055

*Killed for museum specimens.

Annual Average Drain For Past 14 Years 2 432
 Annual Average Drain For Past 10 Years 2 310
 Annual Average Drain For Past 5 Years 1 671

Minimum Basic
 Herd Required
 13 900
 13 200
 9 550

Northern Yellowstone Elk Herd - Fall and Spring Populations



* Estimated Population Fall 1950.