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OUR NATIONAL ELK HERDS

A PROGRAM FOR CONSERVING THE ELK ON NATIONAL FORESTS ABOUT THE YELLOWSTONE NATIONAL PARK

HENRY S. GRAVES
Forester, and

E. W. NELSON
Biologist



Elk in snow, Yellowstone National Park

HAYNES PHOTO, ST. PAUL

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HENRY S. GRAVES, Forester

and the

Bureau of Biological Survey

E. W. NELSON, Chief

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THE EXISTING ELK HERDS in and about the Yellowstone National Park are the greatest aggregate of large game now in existence in such a limited area within the United States. The danger of destruction of these herds, however, through gradual occupation of their winter range, has become imminent and has excited the interest of conservationists throughout the country. The program outlined in this circular, which is the result of studies made by the Bureau of Biological Survey and the Forest Service, will, it is believed, result in effectively safeguarding the future welfare of these magnificent game animals.

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INTRODUCTION.

FOR a number of years the elk within the Yellowstone National Park and surrounding national forests have been the subject of much thought and study in an effort to develop a policy that would preserve them from extinction. Definite investigations concerning the elk situation on the national forests about the Yellowstone National Park were begun by representatives of the Bureau of Biological Survey and the Forest Service as early as 1911. In the count of elk and in many other matters the National Park Service has participated; and assistance has also been rendered by representatives of the Boone and Crockett Club, the American Game Protective Association, and many individual sportsmen interested in game conservation.

As a result of these investigations and conferences the following facts are presented with a proposed program for the future care and management of our elk herds.

THE REMAINING ELK.

Formerly widely distributed, the elk have been progressively exterminated or crowded back into limited areas until the fear that they are going the way of the buffalo has a very real basis. If the right steps are taken, however, it is not too late to save and perpetuate them in goodly numbers. Unless these steps are taken, the

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remaining large herds will dwindle to insignificant numbers, and eventually disappear. This would mean an opportunity lost to conserve a unique and exceedingly valuable national asset.

There are probably about 70,000 elk in the United States. The largest herds are in the Yellowstone National Park and the surrounding national forests. Other important herds are the Sun River herds of some 2,500 elk in the Lewis and Clark National Forest of Montana; the Olympic herds of Roosevelt elk, comprising some 7,000 head in the Olympic National Forest of Washington; 1,750 in the White River, 800 in the Battlement, and 500 in the Gunnison National Forests, Colorado; 200 in the Boise National Forest, Idaho; and the small herds of the Selway and Clearwater National Forests, Idaho, aggregating a total of about 13,500 animals. In addition, small native herds, or herds built up by restocking and aggregating each from 25 to 500 animals, are found in many other national forests and parks, as the Colorado, Pike, Durango, Leadville, Sopris, Rio Grande, Cochetopa, Routt, and Arapaho, in Colorado; the Black Hills, in South Dakota; the Big Horn, Shoshone, Bridger, Washakie, Medicine Bow, and Wyoming, in Wyoming; the Mount Pisgah, in North Carolina; the Cache, Caribou, Challis, Idaho, Minidoka, Payette, Salmon, Sawtooth, Targhee, and Weiser, in Idaho; the Fish Lake, in Utah; the Wallowa and Rainier, in Washington; the Oregon, Siskiyou, and Suislaw, in Oregon; the Sitgreaves, in Arizona; the Wichita, in Oklahoma; and elsewhere. In addition there are a number of small private herds on large estates, including several in the East.

THE YELLOWSTONE HERDS.

Of greatest importance are the elk herds of the Yellowstone National Park region. Here we have the largest number of animals and the largest remaining area of public land suited to the perpetuation of elk in large numbers in their natural haunts. The mountains at the headwaters of the Yellowstone and Snake Rivers have long been the resort of a great number of elk.

In the region now comprising the Yellowstone National Park and the surrounding national forests the elk early found an ideal summer home. In fall they drifted out of the mountains ahead of the storms and snow, scattering over the bordering open valleys and plains where the snowfall was light and where nourishing dry grasses were plentiful. At this season they often worked their way from 100 to more than 200 miles from their summer feeding grounds. In spring they followed the melting snow back to the high mountains, above the zone of the annoying flies, where the climate was cool and refreshing, the forest offering grateful cover, and where fresh and succulent feed abounded.

Then came the settlers with the activities of civilization in many ways so disturbing to wild life. Their fields occupied lands formerly the winter home of the elk; their fences obstructed free movement, especially in the fall and spring migrations; and their introduction of domestic stock consumed the winter feed. In addition, thousands of animals were killed each year. Elk were never so wantonly slaughtered as the buffalo, but their meat and hides were used by the settlers, they were sought by sportsmen from near and far, and hundreds of thousands were sacrificed by irresponsible market and tooth hunters. With the increase of live stock on the ranges a growing conflict resulted between the interests of the elk and those of the stockmen. As a result the elk were steadily reduced in numbers and the winter home of the survivors more and more narrowly restricted.

The diminishing herds were crowded farther back into the mountains. Instead of descending to the plains in winter they remained in the remote valleys and on the lower snow-swept ridges. They were thus restricted to what was naturally their spring and fall range and in some cases even what formerly would have been largely a summer range. Farther and farther the settlement advanced into the mountain regions. More and more restricted became the area on which the elk could spend the winter months, until now there is scarcely enough winter range to take care of the remaining limited numbers during the average winter season, and in severe winters the loss by starvation is extensive. In such seasons these losses would be much greater were it not for the efforts of the Federal Government, the State of Wyoming, and some of the ranchers to furnish field pasturage and hay to the needy herds.

The elk situation has reached a crisis. The steps already taken to provide for the remaining elk in the Yellowstone region are not adequate. A definite program is needed, including certain radical actions, if the size of the existing herds is to be maintained. Substantial additional areas must be obtained to insure adequate winter feeding grounds, and proper safeguards instituted to reduce the losses from overshooting, predatory animals, and starvation. This is entirely practicable with the cooperation and support of the public.

ATTITUDE OF THE PUBLIC.

The public is already deeply interested. There is an increasing sentiment throughout the country for the perpetuation of our big game and other wild life. The passing of the American wilderness, the diminution in the number of game animals, the entire disappearance of certain kinds of game and other forms of wild life from large sections of the country, and the recognized inadequacy of some of the customary methods of wild-life conservation as applied to

game, have deeply impressed the public mind. People are beginning to demand better legislation and more intelligent and efficient administration for the conservation of game. It is probable that we are at the turning point and that in the near future constructive up-building and intelligent utilization of wild life will replace the present imperfect methods.

Wild-life conservation is not a mere fad. The value of wild life is hard to measure in definite terms, but it is none the less real and tangible. While those most active in urging measures of conservation generally do so on the ground either of the sentimental or the



FIG. 1.—Elk calves in Yellowstone Valley near northern border of Yellowstone National Park.

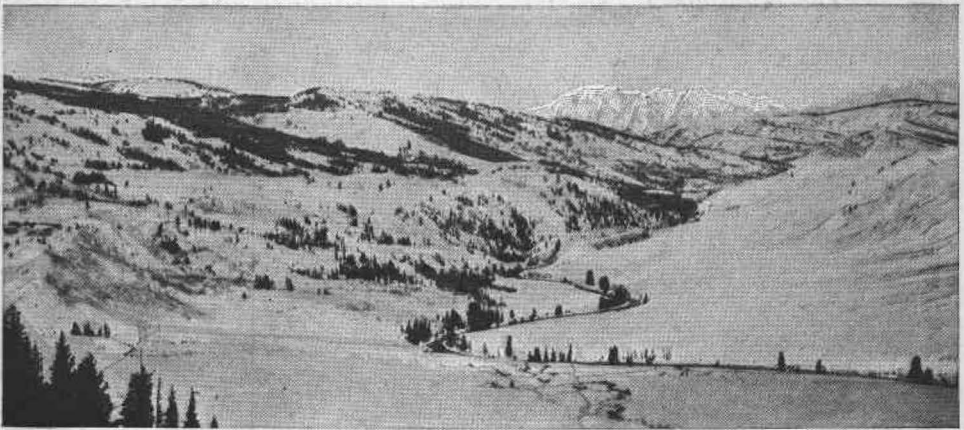
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sporting interest in wild life, a much wider range of interest is involved. A region in which wild life is abundant is the richer by reason of it. The recreational values of the region are vastly enhanced. Oftentimes the indirect economic value of big game, through the expenditures of those brought into a locality by its presence, make it a resource of prime importance. Interest in game conservation in such localities can be counted on, and some pecuniary sacrifices incident to game administration will be cheerfully and gladly accepted. With the right leadership and a really intelligent and carefully devised policy of game administration, hearty public

approval will soon follow. These considerations apply with special force to elk conservation.

THE PLACE OF THE ELK.

The perpetuation of elk under natural conditions means that the use of elk ranges by domestic stock must be in certain parts prohibited and in other parts allowed only under careful restrictions. This definite conflict in the use of the public property as between wild herds and domestic stock has given rise to extensive controversies. Once for all, a settled public policy must now be established as to the place of the elk in the development of the Yellowstone National Park and neighboring national forests. As a part of the elk summering in the park pass the winter in the near-by national forests,



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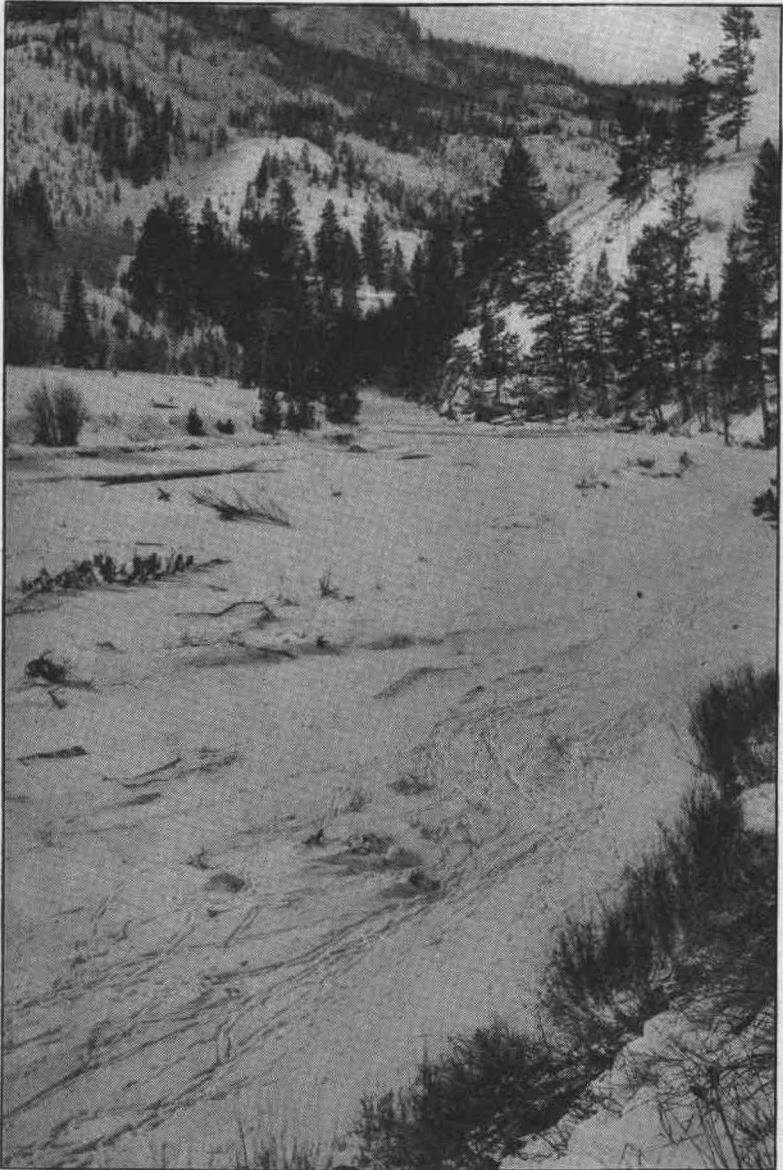
FIG. 2.—Winter view down Gros Ventre Valley from high butte near Turpin Ranch. The Teton Mountains appear in the distance. This is a part of the area in which the grazing of live stock is restricted to hold winter forage for the elk.

the policy for the herds occupying both classes of public reservation must be considered as a single problem.

Naturally, the original conditions, with the immense herds of elk roaming freely over a vast unoccupied area, can never be restored. Even the most earnest friend of wild life would not desire to restore the wilderness to the extent of wiping out thriving agricultural industries and the homes now occupying the former winter feeding grounds of the elk. On the other hand, an equally extreme view held by some is that in case of conflict between wild life and industrial development, the former must be destroyed.

The elk herds of the Yellowstone region, at least up to their present numbers, have a very definite place there. They supply one of the most picturesque and valued assets of that marvelous national wonderland and their disappearance would be a deplorable loss to

the Nation. To demonstrate their importance would require a discussion not only of their value from the standpoint of sentiment, but



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FIG. 3.—Gross Ventre River canyon in the winter of 1918-19, showing tracks made by elk when feeding.

of their direct value to the local public as a game supply, as well as of the influence they exert in the attraction to this region of persons seeking sport, health, and recreation. Outside of Alaska and except-

ing the deer in certain localities, the Yellowstone elk constitute in the United States almost the last stand of big game in large numbers.



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FIG. 4.—Upper Gros Ventre Valley, winter of 1918-19; in the bottom are willows, which furnish winter feed for elk; and on the bordering south and west exposures of the mountains are many ridges and slopes, which, bared of snow by sun and wind, afford grazing.

Certainly the country can well afford to take the necessary steps to conserve them. They will be increasingly appreciated by the Nation as one of the most valued assets of these great public recreation

grounds. They will serve increasingly as a substantial asset to the States and communities within and near which they are located.

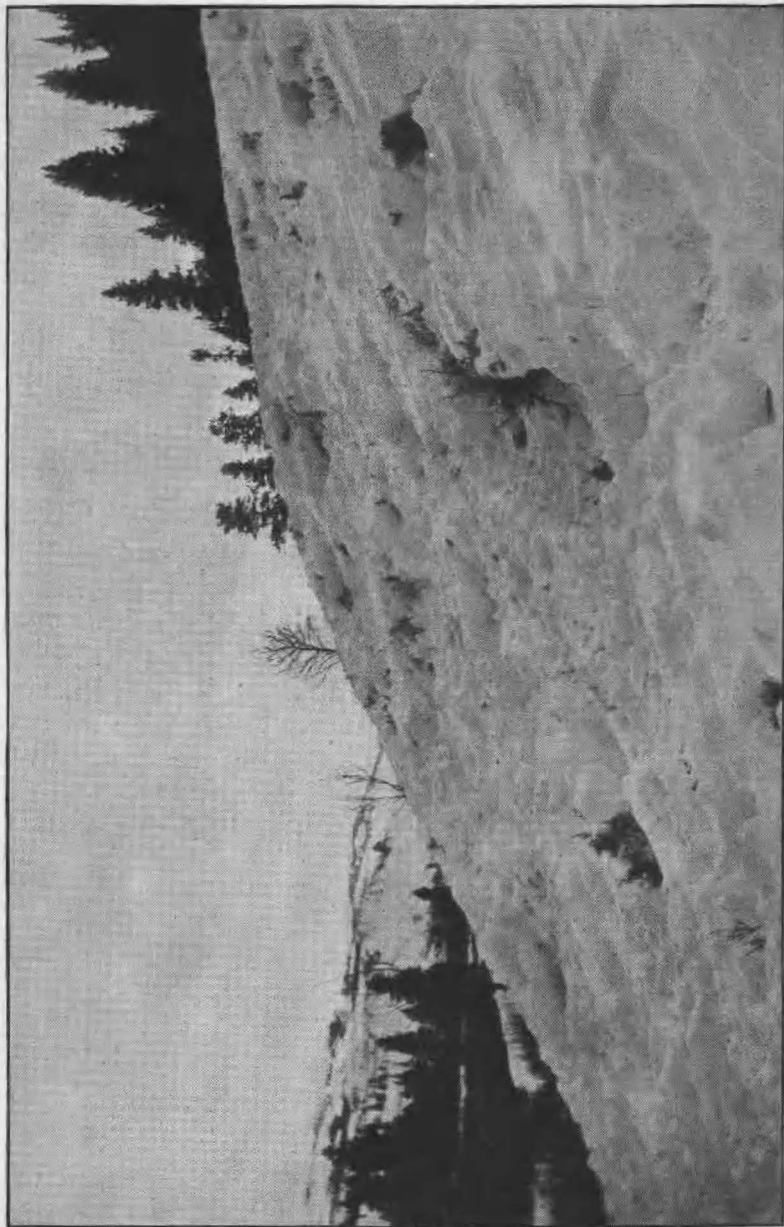


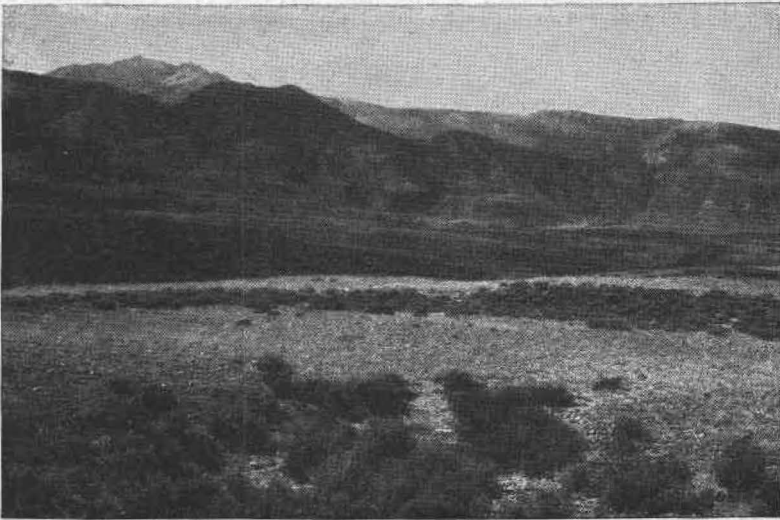
FIG. 5.—Slope bordering the upper Gros Ventre Valley, winter of 1918-19, showing where elk have dug down in 18 inches of snow to feed on grass and shrubs.

From an industrial standpoint the actual loss to the domestic stock industry from the elk in the Yellowstone region is relatively small. The total production of meat, wool, and hides that could be secured

from the range devoted to elk can readily be made up elsewhere. A few individuals would, to be sure, be benefited by grazing their stock on areas which are restricted to the use of elk. Local communities, as a whole, will, however, be benefited by the existence of the elk herds. In short, the elk have a definite place among the natural resources of the region where they are located, a place that should be clearly recognized and utilized in the development of the region.

LAND AND ELK.

The elk problem is a land problem. Because an elk is a grazing animal it must have grass and herbage to support it. It is a gregarious animal, running in bunches and herds, particularly in spring,



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FIG. 6.—Summer view down Yellowstone Valley north of Yellowstone National Park and west of Gardiner, Mont. Sagebrush and other forage plants in the foreground.

fall, and winter. It therefore requires feed in considerable quantities. Owing to its wandering and migratory habits the elk moves over a wide territory during the year, with special needs for forage during each of the four seasons. The elk is not like the mountain sheep, moose, and white-tailed deer, able to find feed in the mountains and forest to maintain it during the winter. It needs during much of the year the same kind of feeding grounds as domestic stock. We have, therefore, the problem of furnishing to the elk herds of the Yellowstone region enough land on which they can find adequate forage during the different seasons.

The key to the situation in this region is the Yellowstone National Park and the surrounding national forests. Here are lands owned and controlled by the public. Here exists a vast mountain region

which so far as summer range for elk is concerned is adequate to support many more of the animals than now live there. Unfortunately, when these reservations were established, and during the early years of their existence, the needs of winter range for the elk were not given consideration. The plan was to conserve land chiefly valuable for its scenic interest and for forest and water conservation. Considerable winter elk range still remains in the public domain, but certain areas which are essential to the maintenance of the elk herds were not withheld from entry under the general land laws, and parts of them have become private holdings.

From the foregoing it must be clear that primarily the elk problem is one of land control; first, to safeguard for elk the use of certain of the public reserve lands, and secondly, to secure for their use such additional lands now privately owned as are essential to the life of the wild herds.

PERTINENT FACTS REGARDING ELK.

In addition to the general requirements of the elk described in the foregoing paragraph, there are certain other facts essential to the development of any comprehensive plan for their management. A detailed discussion of the habits of the elk, such as their feeding and their daily movements, is not pertinent to this paper. Some special features of their natural tendencies, however, vitally affect the problem at hand.

MIGRATION.

Among the more important questions is the general drift or migration of the elk in spring and fall and the factors affecting it. It is necessary to determine the route traversed between summer and winter feeding grounds in order to locate the areas where winter forage must be provided. The most important factor influencing drift is the weather. The storms and cold of approaching winter on the summer ranges on the high mountains start the movement of the elk in the fall. The variation of the weather conditions from year to year explains the differences in seasonal movements of the herds. In mild open winters with normal temperatures and light snowfall most of the elk may remain well within the mountains, grazing on wind-swept ridges and areas where they can reach the grass by pawing through the snow. A heavy snowfall drives the elk to the lower levels, only the stronger animals, chiefly the older bulls, remaining on the intermediate high slopes and ridges where wind blows off the snow. A crusting of the snow due to winter rains may be as effective as a heavy snowfall in forcing the elk down to the lower country.

Elk, like most wild animals, are creatures of habit. In ordinary winters the migration is normal, a large proportion of the individuals

in the herds following a general course year after year over the same ridges, plateaus, and valleys. Unusual storms, unusual depth of snow, or hardness of crust at certain places may cause a deviation of the drift. These variations are of little practical consequence during ordinary seasons, as there is usually enough feed everywhere available to support the animals. When, however, very severe conditions force the elk to lower levels, they may be crowded upon areas of limited feed and cut off from other areas having an abundance. These facts point to the necessity for providing as much lower winter range as possible for use during the harder seasons, with provision for feeding hay where pasturage is inadequate.

HUNTING.

Hunting is the second most important factor in the movement of elk. Elk have an unerring ability to find and occupy areas closed



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FIG. 7.—Yellowstone Valley north of Yellowstone Park looking south from the J. H. Jones Ranch to Sepulcher Mountain. This view and that in figure 6 show favorite winter range for elk and cover parts of the area it is desired to secure for the exclusive benefit of the northern elk herd.

to hunting. Unquestionably the migration of elk may be modified by the establishment of refuge areas, since these animals seek the places where they know they will not be molested. The opening to hunting of formerly closed areas is known to have diverted at least a part of the migrating animals to more secure grounds. In the same way, shooting along the boundary of a refuge tends to keep them within its limits. If the shooting is done in the line of normal drift it may force the elk back upon fall or summer range when the best

interests of the herds require that they be allowed to descend to the winter ranges. It follows that the location of game refuges and the administration of hunting should be planned with reference to their influence on the migration and winter distribution of game.

GRAZING DOMESTIC STOCK.

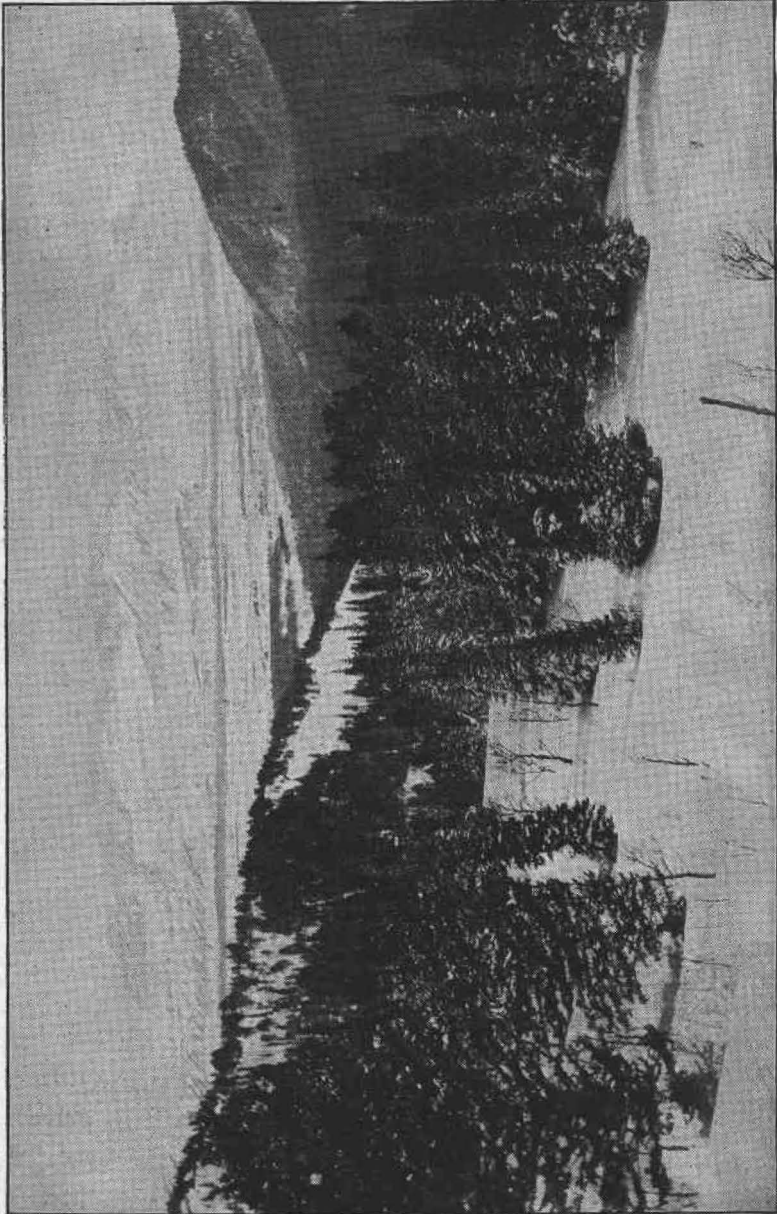
A stock fence may block the natural drift when the animals are in a weakened state and deviate the herds to an unfavorable winter locality, causing heavy losses. Thus, in 1917, in the Gallatin Valley the herd was blocked by a certain ranch. Weakened by the lack of food, they were unable to advance, and 150 of them died near the fence. Eventually it may become necessary to acquire certain privately held lands in order to maintain an open passage between summer and winter feeding areas.

The effect of grazing domestic stock on elk ranges is largely a question of the amount of available forage. Naturally, if domestic stock consume most of the feed the elk suffer. In this manner too heavy grazing by domestic stock may affect the drift of the elk, and on a limited range may result directly or indirectly in heavy winter losses. Exhaustion of feed at certain points may cause a congestion of the elk during some critical winter period in localities where sufficient feed is not available, with consequent loss of many of the weaker animals.

Joint use of summer range by elk and sheep, where occupation of the range by the latter was light, has actually occurred at various points. But elk naturally seek areas where they may be least disturbed by human activities. The very presence of bands of sheep, their herders, and dogs, tends to force the elk away to more quiet areas. Thus may the summer distribution of elk be influenced even by a light stocking of the range with sheep; heavy stocking would, of course, very quickly drive away the elk.

Cattle grazing has ordinarily little effect on elk, because the summer feeding grounds of the elk are usually above and remote from where the cattle naturally range. The conflict between cattle and elk is almost entirely on the winter ranges. In some cases this conflict is very limited. For example, the elk seek in winter the wind-swept ridges and high slopes. Many of these are beyond the range of cattle, which prefer the bottoms and lower flats and slopes which in winter are covered with deep snow. There is, however, an overlapping of the elk and cattle areas even under such conditions. The cattle work up on to many areas used by the elk, and in spring and fall the elk graze over areas naturally liked by the cattle. The extent of actual conflict depends on the relation of the number of cattle to the carrying capacity of the range. Where necessary, true winter elk range should be reserved exclusively for elk. If within the boundaries of

elk winter range there are areas which on account of deep snow could not be used at that season by the elk, the grazing of cattle on



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FIG. 8.—Jackson Hole, winter of 1918-19, looking east from Teton Pass.

such areas in spring or summer should by herding be closely confined to them. In most cases such common use is impracticable, and the cattle should be located outside the winter elk range.

DATES OF OPEN SEASONS.

The date of the hunting season is a factor in the winter losses of elk. Too early a season means that many cows are killed before the calves are weaned or have acquired the necessary strength to carry them through a hard winter. In addition, it leads to waste, since the meat from the animals killed during the warm weather of September often spoils, even when every effort is made to save it. In those areas where the animals are plentiful, there is a distinct inclination upon the part of hunters to be careless, and to assume that they are entitled to meat, so if that obtained should spoil, other animals are killed to replace it. Shortening of the season, and legislation requiring that the meat of all animals killed shall be saved and utilized, would reach this source of loss.



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FIG. 9.—Hay meadows on the Winter Elk Refuge in Jackson Hole. Hay is grown here for feeding the elk during severe winters. Headquarters of Government ranch in background.

The disturbance of the elk when in a weakened condition during or at the end of a severe winter may cause many unavoidable losses. Thus, in Jackson Hole, after severe late winter storms the elk sweep down on the ranches, crowding into the fields, and struggling to get at the haystacks. Naturally, as the value of the pasturage and of hay increases, the ranchers tend more and more to drive the elk away. When conditions are critical this very hazing of the elk causes many to die. This fact is mentioned as showing the necessity for additional land in that region, where the animals may winter undisturbed on public pastures.

Directly in line with the present cause of losses mentioned above is the loss due to spring hunting. A certain class of men start for the mountains in spring under the pretense of hunting coyotes. They follow and drive an elk in the snow until the animal, weakened by

the winter, succumbs and the hunter accomplishes his purpose without firing a shot. In like manner, unscrupulous persons apply to the State for trapping licenses and enter the game fields, where they not only trap indiscriminately, but practice the illegal killing of elk. The licensing of trappers as provided for in the Wyoming law is admirable and should be extended to other States. Abuse of the license privilege can be prevented by careful administration. In this matter the Forest Service can greatly aid the State authorities.

NATURAL ENEMIES.

The predatory animal is a large factor in the annual loss of elk, particularly of the year's increase of calves. Such substantial progress is being made in the destruction of wolves and mountain lions



FIG. 10.—Summer view of a part of the Gros Ventre River Valley. The mountain slopes and exposed ridges in this area afford good winter elk range and lie within the area where the grazing of cattle has been restricted.

that it is hoped in a short time these may be practically eliminated as a serious source of injury to the elk herds. Headway also is being made against the coyotes, but they are still a serious factor in elk loss. They follow the migrating herds in numbers, pulling down the calves, especially those weakened from any cause. Still more vigorous measures against them are needed.

The points brought out above are all covered by the measures proposed in the plan projected in the subsequent part of this paper. Many other facts of interest and importance must be borne in mind in the actual handling of the elk administration, but they are not pertinent to the present discussion.

SPECIFIC PROBLEMS.

There are three groups of elk in the Yellowstone region which may for convenience be called the northern, the eastern, and the southern groups. The northern group comprises slightly more than 19,000 animals, the number having been determined by actual count conducted in the spring of 1917, by representatives of the U. S. Departments of Agriculture and of the Interior, and the State of Montana, working cooperatively. This herd summers in the Yellowstone Park at the headwaters of the Yellowstone, Gallatin, and Madison Rivers, and drifts northward to the northern part of the park and near-by national forests for the winter.



FIG. 11.—Summer view on the mountain slopes bordering the Gros Ventre Valley. Skeleton of a fine old bull elk which appeared to have been killed for his tusks.

The eastern group of about 3,000 head, as determined by actual count and close observations, finds its summer home on the eastern side of the park on the headwaters of the Shoshone River, and drifts out into the Shoshone National Forest to winter.

The southern group summers in the southern part of the Yellowstone Park and the high mountains of the Teton, Wyoming, and Bridger National Forests, and passes the winter in the lower portion of the Teton Forest on Snake River and its tributaries. This herd comprises from 16,000 to 18,000 animals. The number is based on an actual count made by representatives of the Government in the spring of 1916, and after making additions and deductions for the natural increase and loss since the count was made, conservative figures place this herd at slightly less than 18,000 head.

There is some question whether these various groups intermingle at any point. That question has a bearing on the ultimate development of the elk herds, but is not important in connection with the present inquiry.

For immediate consideration the particular problems of the three groups are clearly separate.

THE NORTHERN GROUP.

Approximately 85 per cent of the more than 19,000 animals in the northern group range during the summer on the mountains and slopes of the main upper Yellowstone River within the Yellowstone National Park. A limited number, possibly 5 per cent, summer on the Absaroka National Forest immediately north of the park. The re-

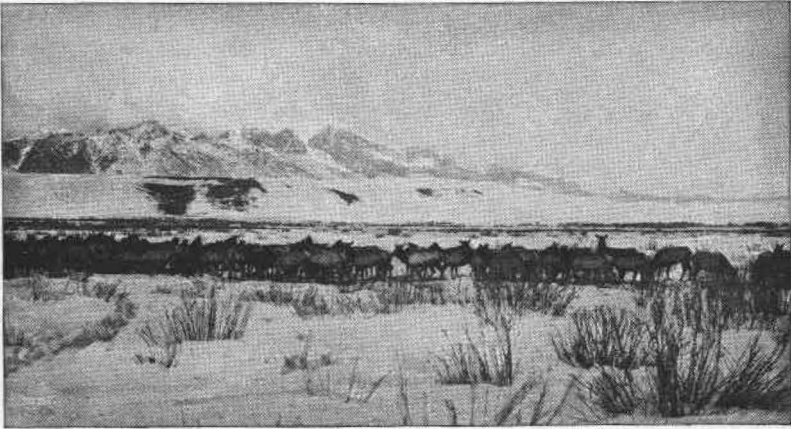


FIG. 12.—The feeding ground for elk near the Government Winter Elk Refuge in Jackson Hole in March. An example of the type of land which it is desired to add to the present area. During the early months of 1918 about 13,000 elk visited this part of the Snake River valley.

mainder of the northern group range during the summer months in the northwestern portion of the park and on the Madison and Gallatin National Forests. As soon as the early winter storms come in the high mountains the Yellowstone River herds drift downward and find an admirable fall and early winter range on the lower Lamar River, lower Hellroaring and Slough Creeks, and the so-called Black Tail region. In mild winters many animals remain in those sections, while some of the stronger animals remain well back on the higher and more open slopes. If the snow is heavy the herds move down the valley and many of them cross the park boundary and spread out over the Yellowstone Valley below Gardiner and on the neighboring slopes, a part of which are in the Absaroka and Gallatin National Forests; between these forests part of the area is public land and part

privately owned. During severe winters the larger portion of the herd may drift to these lands outside the park.

The drift of the other portions of the northern group is, in winter, northward and chiefly down the Gallatin Valley. In normal winters they pass down the valley to below Porcupine Creek in the Gallatin National Forest.

The first problem of the northern group of elk is to provide more winter range. Summer range is abundant, and spring and fall range is also plentiful. During mild winters the animals fare well because they winter on what is naturally a spring and fall range, or even on portions of their summer range. Heavy snows or crust may crowd

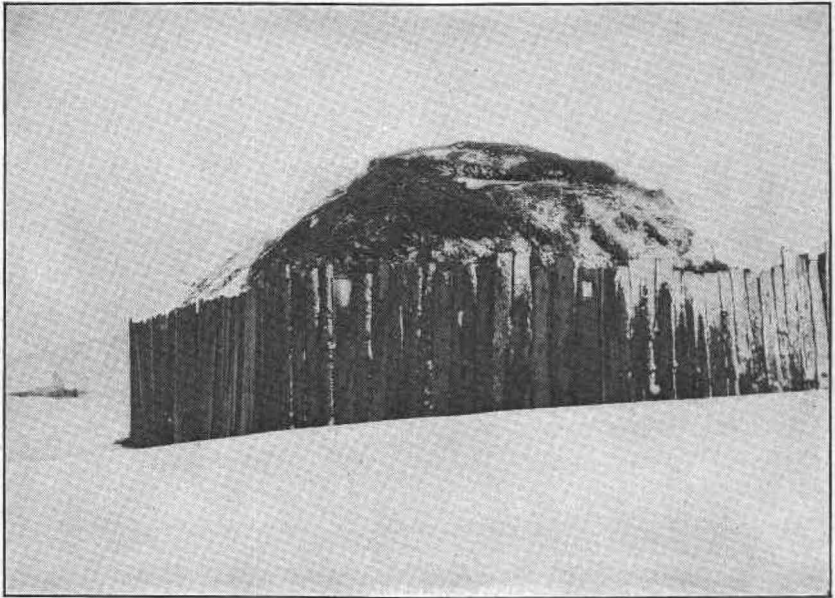


FIG. 13.—A high palisade fence used to protect haystacks from elk in the Jackson Hole region. F40187A

them off these areas, and the park authorities are then forced to feed them, but the facilities for feeding are not adequate to take care of all the elk. Nor is there now enough winter range within the national forests along the northern boundary of the Yellowstone Park to take care of all the elk that crowd down out of the park. The result is loss by starvation.

The key to this situation is the area comprising about 130,000 acres lying north of the Yellowstone National Park, 40,000 acres of which lie between the boundaries of the Absaroka and Gallatin Forests, extending north 15 miles along the Yellowstone River from the town of Gardiner to Yankee Jim Canyon. This latter area is partly

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public and partly private land. It was withdrawn from further settlement on April 16, 1917, by presidential order, pending legislation to secure the land as a game preserve. Careful investigation

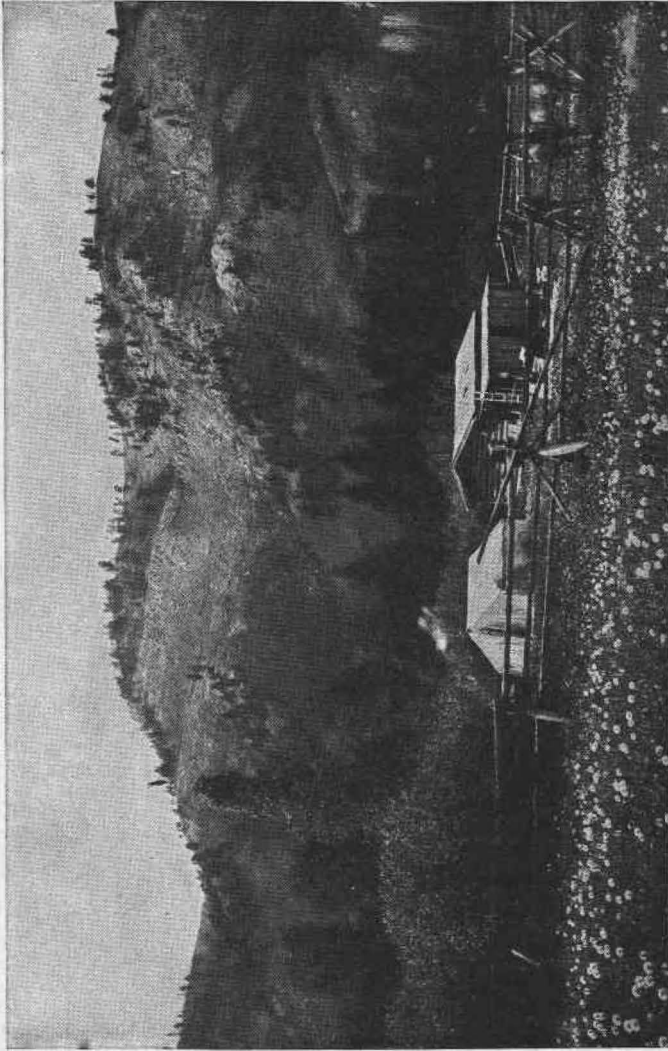


Fig. 14.—Bierer Ranch in the Gros Ventre Valley. This view gives a good idea of summer conditions in this fine winter elk range.

has demonstrated that the ownership and control of this area by the public is essential to the future maintenance of the northern elk herd. Not only should it be added to the national forests, but the bulk of the private lands should be acquired. Within this area between the two national forests are some 21,000 acres of private land, 1,350 acres of school land belonging to the State of Montana, and over 4,000 acres of Northern Pacific Railroad land. It is probable

that an exchange could be effected with the railroad company of their holdings for other national forest land not so important to the public. The more important portions of the remaining private lands within the area would have to be purchased. Also on the winter elk range areas within the Absaroka and Gallatin Forests there are certain areas of patented land which it would be desirable to secure by purchase or exchange.

In order to acquire the necessary private lands located along the Yellowstone River and important private holdings within the elk range on the Absaroka and Gallatin National Forests, and construct the necessary fencing for the proper use of the lands and the protection of the herd, the expenditure of approximately \$500,000 would, it is believed, be required. This would assure the future welfare of the northern herd.

THE GALLATIN ELK.

During 1917, 1,600 elk came down the Gallatin River. This number is much less than formerly used this region as a winter range. The reduction is partly due to the slaughter in the fall of 1915, when a portion of the State game preserve was thrown open. The effect of opening that portion of the preserve and the methods of hunting practiced tend to prevent the restoration of the former numbers of elk. At present the winter feed in the Gallatin is more than adequate to support the present herd. Further restrictions of the already very light cattle grazing, coupled with acquisition by exchange of needed railroad lands, will readily provide enough winter feed for from 3,000 to 5,000 elk.

THE MADISON ELK.

The elk on the drainage of the Madison River comprise small herds aggregating some 250 animals, about equally divided between the Madison National Forest and the Yellowstone National Park. These small bands are no larger than necessary to restock the area. Grazing has been restricted on more than 70,000 acres of the Madison Forest with the view of attracting a larger number of elk to summer there. It is believed that this restricted area should be established as a State game refuge, that the hunting season should be shortened, and that the number of licenses granted for this locality should be materially reduced. There is winter range on this forest for an increased number of elk, and steps should be taken before it is too late to allow these herds to build up more nearly to their former numbers.

It has been asserted by a number of persons that the grazing of sheep at the headwaters of Hellroaring, Buffalo, and Slough Creeks

on the Absaroka National Forest deprives the elk of winter range. All forms of grazing are prohibited there on a strip of about 50,000 acres along the northern boundary of the Yellowstone Park. None of this is good winter elk range, and only a small portion is actually used by elk even during mild winters. The areas on which sheep are grazed are purely summer range. The presence of sheep on the present allotments has therefore no effect on the problem of the existence of the elk, simply because the sheep do not use the winter range. The only possible effect of these sheep is on the distribution of the elk at other seasons. A considerable number of elk now summer on the area within the sheep range. It is entirely possible that more elk would



FIG. 15.—Lower Hoback Valley in March.

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use this area as a summer range if all stock were excluded. From the broad standpoint of game administration such a result is desirable. The area is peculiarly adapted to game of all kinds and already contains in addition to the elk many deer, moose, and beavers, as well as bears and lynxes. It is so located as to make a splendid hunting ground, such an area as in the long run will be required in Montana to meet the demands of legitimate hunting.

GAME-LAW ADMINISTRATION.

The above represents the land problems connected with the northern herds. Such provisions as can be made with regard to forage for the elk go for naught unless the hunting is strictly regulated. It is unnecessary to reiterate the losses to the elk by hunting in violation of the laws. Law enforcement is fundamental. It has not been well enforced in the past. The tooth hunter, the pot hunter, and every

game violator must go. A new regulation which has been promulgated by the Secretary of Agriculture will enable the Forest Service to bring certain cases of violation of the State game laws into the Federal courts, thus supplementing the present procedure of action in the State courts. By vigorous cooperative measures by the State and Federal authorities, it should be possible to put a stop to the lawlessness that has long been a source of substantial loss to the elk herds.

Of great importance to the perpetuation of the elk and their intelligent administration is the correlation of the number of hunting licenses with the natural increase of the herds. The elk herds should be maintained at approximately their present numbers. The increase should be utilized for legitimate hunting, the maintenance of present herds, and distribution to build up herds elsewhere. At present the State law provides restrictions on the individual bag and prescribes a certain open season. There is no limit to the number of licenses issued. A more certain control of the use of the increase should be provided.

There should be a limit on the number of elk that may be killed in certain localities. Thus the Gallatin-Madison herds should be increased and the number of licenses for hunting in that locality should be based on the increase of these herds. Otherwise, even if the total number of licenses of elk in Montana were limited, the Gallatin-Madison herds might be progressively decreased and finally wiped out.

To this end it is recommended that there be legislation to authorize and instruct the State game commission (*a*) to limit the number of licenses issued for hunting elk; (*b*) to issue licenses limited to certain prescribed areas; (*c*) to base the foregoing limitations on the natural increase of elk in each area, these limitations to be determined jointly by the State game commission and officials of the United States Department of Agriculture; and that this limitation should be determined each year, after due verification of the situation, so as to maintain the elk herds at not less than their present numbers.

In the case of the Gallatin herd there is recognized interference by hunting with the natural fall drift out of the park. The hunters line up along the park boundary and thus tend to force the elk back upon unsuitable winter range. It is very desirable that the State of Montana consider a revision of the boundaries of the Gallatin Game Preserve. At the same time the matter of shortening the hunting season should be considered.

THE SOUTHERN GROUP.

A careful count made in 1916 indicated that there were then in the southern group about 20,000 elk. In view of considerable losses occurring since that time, conservatism would indicate the use of

16,000 to 18,000 as a safe estimate of the present number. The bulk of these herds summer in the Teton Forest just south of the Yellowstone National Park. The remainder pass the summer months in the park and in the high mountains of the other portions of the Teton Forest, some doubtless crossing over the divides into the Wyoming and Bridger Forests. Summer range is plentiful and constitutes no serious problem. In fall, as storms come on, the larger herds drift down from the north across the Buffalo River to and across the Gros Ventre, spreading out over the bare ridges and slopes and swinging around over a large territory east of Jackson Valley, and finally large numbers descend into the valley itself. The remainder of the elk, which during summer are well scattered over most of the high mountains of the Teton Forest, come down in winter to the lower areas, and can not, with present information, be distinguished from those drifting down from the north.

The Teton Forest below the high mountains is characterized by many bare ridges and slopes, portions of which in winter are swept clear of snow. It is upon these areas that the elk chiefly remain during fall, and many remain there during winter. Even during the most severe winters the stronger animals maintain themselves successfully on these ridges. During hard winters, however, most of the cows, calves, and younger bulls work their way down to lower levels and into Jackson Valley. During the past winter about two-thirds of the entire herds were driven to the valley and the near-by hills by a rain and freeze causing the snow to crust early in the season, but later they returned to the hills.

Just as with the northern group, the critical problem of the southern herds concerns the winter range. In the early days the elk passed down through Jackson Valley to the plains beyond. Now these areas are all occupied and the valley itself is practically all divided into ranches. For years, in winter, the elk have come out on the open fields of the valley. The Federal Government maintains here its "Winter Elk Refuge," a ranch of about 1,200 acres, where a certain amount of hay is produced for emergency feeding. The State of Wyoming buys hay for the elk from one or two of the private ranches, and the ranchers themselves have been liberal in allowing the elk to pasture in their hay meadows and have often given them hay from their stacks. But conditions are becoming increasingly difficult, the value of hay has increased as the ranchers have had to do more winter feeding of stock, and, further, the effort to raise winter wheat has complicated the field pasturage problem. Consequently for several years there has been a tendency on the part of the ranchmen to undertake to keep the elk away from their fields and stacks. The result of this hazing of the elk from place to place in their weakened condition is an increasing loss. The present situation

in Jackson Valley has become intolerable. The ranchers are suffering, and as they undertake in self-defense to protect their interests, the elk suffer. The ranchmen for years have really been contributing largely to the support of the elk. Now they frankly say that they can not afford to continue to do so.

Two points stand out clearly in this situation. First, there must be provided in Jackson Valley more public feeding grounds where the elk can find winter pasturage undisturbed by people. Secondly, every effort should be made to preserve for the elk the feed on available range back of the valley so that the number wintering in the valley may be kept as low as possible.

The main drift into Jackson Valley tends to center in an area extending from about the Government ranch to and beyond Flat Creek. It is here that, curiously, the snowfall is apt to be less than in any other part of the valley. This area is in direct line with the drift of elk from the Gros Ventre River and is backed by open slopes and ridges that are also used by the elk. It is in this area that additional lands should be required for winter feeding grounds. About 10,000 acres are needed, which could be secured at an approximate cost of \$250,000 to \$300,000. In addition it would be necessary to construct adequate fences and keep the lands in a productive condition to furnish good pasturage and hay for emergencies. The elk would largely congregate on this extended public feeding ground. They would be undisturbed by hazing and guarded from illegal killing, and the neighboring private ranches would be protected from the present destruction of fields and crops. If handled rightly the existence of such feeding grounds need not result in domestication and weakening of the elk. On the contrary, the area is large enough and supplies sufficient grazing, coupled with the winter range reserved on the ridges, to require the elk to rustle, and feeding would be the last resort in very unusual winters. Coming through the winter strong, the condition of the entire herd would improve rather than progressively become weakened. The separation of calves and weak elk from the main herd, to be fed in small fields, has been proved to be successful and can be done on a large scale, thus saving large numbers of animals that would otherwise perish. The sum of \$300,000 to purchase the land and build the necessary fences and make other improvements is a small outlay to perpetuate the great elk herds of the southern group.

WINTER RANGE IN THE HILLS.

But this measure alone is not sufficient. The existing winter range in the adjacent national forest supplements that of Jackson Valley, furnishing forage to animals that do not go down to the valley. There three important centers of winter range exist in the hills. The

first comprises the ridges directly adjacent to the valley on the east. This includes the area added to the Teton Forest by the act of Congress of August 16, 1916, as well as some of the lands included within the former forest boundary. Upon these lands no grazing permits are granted, thus reserving for the elk in winter about 25,000 acres.

A second important center of winter grazing land is in the Gros Ventre River basin, extending from the Red Hills up the river for a distance of 25 miles and including approximately 48,000 acres. This area is characterized by a series of bare slopes and ridges separated by ravines, low basins, and flats. In winter portions of the ridges



FIG. 16.—Mountain slope near the mouth of Hoback River in March. Both this view and that in figure 15 are of country included in the Hoback restricted grazing area which is a great resort for elk in winter and should be included in a game refuge.

are wind-swept and bare, while the lower lands are under heavy snow. This area has been withdrawn from further alienation, and a long step has already been taken in favor of the elk by the restriction of cattle grazing. During the past season all cattle were off the area by July 7. The early grazing was on the lower levels that are not much used by the elk in winter. The late grazing was limited to small numbers of stock owned by settlers living within the area. The condition of winter feed on the slopes and ridges here constituting the winter range is excellent and should improve from year to year.

The program calls for such further restrictions of stock grazing in this area as may be found necessary. The winter range is now safeguarded, but there is still some conflict concerning use of the spring range, though this is small. The final readjustment to clear up completely all conflict can not be accomplished at a single stroke, without unnecessary hardship on those who have been using the range. Fortunately conditions are so favorable as to permit a progressive solution of this problem.

In connection with this Gros Ventre area there should ultimately be an emergency public elk ranch. There are over 7,000 acres of agricultural land withheld from entry in the area and several admirable locations for the proposed development. Such a ranch should be developed on the Gros Ventre to be administered in connection with the present and proposed Government ranches in Jackson Valley. It would hold many animals away from the valley by supplying hay in emergencies, just as is done below.

The third area of winter range is in the valley of the Hoback River, extending from Bryan Flats down to and adjoining the reserved area adjacent to Jackson Valley; this comprises about 60,000 acres. The remaining public lands there are withheld from any further alienation, but contain a much larger acreage of private lands and claims than either of the other areas. The grazing problems are also much more difficult to work out, as the land has been used for many years by the settlers of South Park, and any sudden ending of the grazing privileges would seriously injure them. Fortunately, on the other hand, the productiveness of this range is very good, better than that in the other two areas, and it has been so lightly stocked that there is good feed even where the cattle have been grazing. On the bulk of the area there is no conflict between cattle and elk—that is, the higher ridges used by the elk in winter are above the cattle area. Within an intermediate zone there is an overlapping.

Within this area the restrictions upon the number of cattle permitted should ultimately remove any conflict that will affect the forage available for the elk, at least so far as the public lands are concerned. The readjustment can be brought about in a way to prevent injustice and unnecessary hardship on the settlers. Just as in the Gros Ventre area, it would be desirable in the Hoback area to develop a hay ranch in order to provide forage for the elk in hard winters. This would, as in the case of the hay ranch on the Gros Ventre, tend to keep the elk in winter widely distributed and relieve the great loss arising from too great congestion on a limited area in Jackson Valley.

The general program of elk protection would be greatly benefited if the restricted areas described in the foregoing should be made

State game refuges. As already mentioned, elk habitually go where they are least disturbed, especially by shooting. If, in addition, the restricted areas are made refuges from hunting, another factor is introduced to control and maintain the herds. Just as with the northern herds, the land control is only one part of the problem of maintaining the southern herds. Once in effect, the proposals made above will go far to prevent the present great losses due to hard winters and short forage. The prevention of the great loss due to illegal hunting is a problem which must be solved. The Federal Government can help cure the trouble on the public lands and



FIG. 17.—The elk in this herd, numbering 837, were photographed in February, 1914, on the ranch of S. N. Leek, in Jackson Hole. This is in a part of the great wintering ground for elk in the Snake River valley, where it is necessary to provide more pasturage if elk herds are to be maintained.

will back the State as far as possible in its efforts outside the national forests.

The same recommendation as regards control of hunting licenses in Montana is made for Wyoming. It may be that legal hunting now does no more than use the natural increase of the elk. Let us stop illegal hunting and other avoidable losses, and encourage, under strict control, the proper utilization of the natural increase.

THE EASTERN GROUP.

The northern herd extends its summer feeding along the east side of the park and into the Thorofare Creek watershed, one of the tributaries of the Yellowstone River southeast of the park. The southern

herd summers south of the park on the Buffalo watershed and in the Two Ocean Pass district. Undoubtedly there is an exchange of animals between the herds in the Two Ocean Pass and those in the Thorofare Creek district. A portion of the elk summering in the last-named area drift to the east and south. Those going east cross the high divide and winter in the Shoshone National Forest on the watershed of the North and South Forks of the Shoshone River, while those going south cross from the Buffalo country into the Wind River district of the Washakie Forest.

The 1916 estimates showed 1,200 animals on the Shoshone River watershed and a certain number in the Clarks Fork and Sunlight Basin districts. These latter summer upon the head of the Lamar



FIG. 18.—Elk cows and calves crossing Gros Ventre River in July. The cows in midstream are trying to coax in the calves which gather timidly on the bank.

River and Clarks Fork River outside the park, and will not be considered in this discussion.

As the result of a careful count in the spring of 1918, 1,600 elk were found in the Shoshone River district. A greater number over the 1916 estimate were reported in the Wind River district of the Washakie Forest for the winter of 1917-18. The increase was undoubtedly caused by the additional drift as a result of closing the Thorofare watershed to hunting and opening a portion of the State game preserve south of the park. While it is true that part of the elk wintering on these watersheds summer there, there is a distinct drift over the high divides from the Buffalo and Thorofare regions. The east line of the Yellowstone Park is west of the Divide, and at one time the hunting along this boundary drove the game back into the park where no winter feed was available. This situation was remedied by the creation of a State game preserve which extends east from the park boundary well down upon the Shoshone slope, thereby

giving the animals unmolested access to the winter ranges. This winter range comprises a series of grass slopes with south and west exposures. The slopes are connected by ridges kept free of snow by incessant winds. The lack of snow upon the ridges makes possible the passage of the elk from one slope to another in the progress of their feeding. Winter observation showed practically all the elk of this area wintering on the North Fork of the Shoshone River and its tributaries. Elk Fork, one of the principal tributaries of the main Shoshone River, provides range for approximately half the elk on the North Fork. There is ample range on the Shoshone River to winter at least 2,500 or 3,000 animals. Provision should be made, in regulating the killing, for increasing the herd to this number. The



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FIG. 19.—An August view on winter range for elk within the restricted grazing area at head of Cottonwood Creek, a tributary of Gros Ventre River.

elk wintering here are always found in excellent condition, and the winter loss is extremely light. As in the case on the Shoshone, some of the elk wintering on Wind River remain there throughout the summer, though there is a distinct drift over the Divide from the Buffalo. Just how extensive this drift is will be determined by further observations.

On Wind River the conditions are excellent for a winter elk range. Large areas are so far from water in summer that they are practically untouched in that season, while in winter the filling of the coulees with snow and the sweeping of the snow from the ridges and exposed mesas provide conditions exceptionally well suited for an elk winter range. The distribution and fine condition of the elk there, as shown by winter observation, together with the known unfavorable topographic and climatic features of the range for domestic stock, make unnecessary the reservation of any areas for winter range other than those already existing under present allotments.

It is quite evident that the present Wind River herd can be taken care of in winter and increased from 1,100 to 2,500 head without conflict with other local interests.

The development of a ranch to produce hay for winter feeding on the Shoshone River near the mouth of Elk Fork will undoubtedly be advisable to provide for emergency feeding, should this herd be increased to the full capacity of the range. Ample areas of cultivable land on the public domain are available here should such action be found necessary. Such a ranch location will also be necessary on Wind River, should this herd be largely increased. Owing to lack of available public lands here for such development, it would be necessary to purchase a location.

Somewhat apart from the Yellowstone herds is the Green River herd on the Bridger Forest. Winter observation in 1916 showed 948 head upon Roaring Fork of Green River, while 100 head were found wintering at the Big Bend of Green River in close proximity to that herd. The swamps and willows at the Big Bend and the near-by open ridges provide excellent winter range for a limited number of elk, and these swamps and ridges are unaffected by domestic stock. Should this herd materially increase there is suitable cultivable public land within this area that can be used for the raising of hay for severe winters.

In addition to the number at the head of Green River, elk are found throughout the forest south upon those streams flowing into this river from the east. Elk found here bring the total number for the Bridger Forest up to about 2,000, which it is estimated is all this range will support. A State game preserve closes a portion of the forest to hunting, and a proposed drift fence on the Roaring Fork winter range will isolate the area from domestic stock.

THE PROGRAM.

Summing up the situation the following is the proposed program:

1. The maintenance of herds in the Yellowstone National Park region to at least their present numbers, estimated to be from 40,000 to 45,000 elk. This includes those wholly within the park, those entirely within the surrounding national forests, and those occupying the park a part of the time and the national forests the remainder. The present herds should not be increased in size except at certain points where there is now available surplus winter range.
2. The use of the annual increase or surplus for legitimate hunting and distribution to build up other herds.
3. State legislation to authorize limitation of hunting licenses, in number and by regions, the limits and seasons to be determined from year to year jointly by the State and Federal officers.

4. Under existing regulations of the Secretary of Agriculture recourse to the Federal courts is authorized in cases of violation of the State game laws on the national forests. The Federal courts should be used to supplement and strengthen the administration of State game laws.

5. The closest cooperation should exist between the States and the Federal Government, and most vigorous efforts should be made to stop all illegal practices affecting the welfare of the elk.

6. The addition to the Absaroka and Gallatin National Forests of the area north of Gardiner, Mont., withdrawn under date of April 16, 1917.

7. The acquisition by purchase or exchange of the necessary portions of the private land within this area.

8. State legislation establishing certain needed portions of these and adjoining areas as a game refuge.

9. The progressive readjustment of grazing permits on certain portions of the Gallatin and Absaroka National Forests to meet the present or future requirements of the northern elk herds for winter range.

10. The consideration of legislation establishing a game refuge in the Madison National Forest, and making certain extensions of the existing State game preserve in the Gallatin National Forest.

11. The progressive extinguishment of sheep-grazing privileges in the area of the Absaroka National Forest north of the park to the Boulder Divide in order to prevent any possible conflict within this area between wild life and domestic stock.

12. The extension of the Yellowstone National Park southward to include the areas in which the greater part of the southern group of elk find their summer range.

13. The acquisition in Jackson Valley, Wyo., of about 10,000 acres of private lands adjacent to the present winter elk refuge which are essential to provide needed additional winter forage.

14. The continuation, and at certain points the enlargement, of three so-called restricted areas of winter range: the first adjacent to Jackson Valley Elk Refuge, the second situated on the Gros Ventre River, and the third in the valley of the Hoback; and progressively working out the grazing problem to meet the full requirements of the elk which winter in this section or which may be induced to do so. The restrictions already put into effect on the number of domestic stock permitted there constitute a long step in this direction.

15. State legislation to establish these restricted areas as game refuges.

16. Enlarging the present Government ranch under administration of the Bureau of Biological Survey in Jackson Valley; and establishing an auxiliary hay farm within the Gros Ventre restricted area and another within the Hoback area in order to provide forage during severe seasons for animals wintering in these sections and thereby constitute an added inducement for more elk to remain in those areas instead of drifting into Jackson Valley.

17. Extinguishing progressively the few sheep grazing preferences at the head of Willow Creek in the Teton National Forest. This will eliminate all sheep grazing from the area now within the Teton Forest.

18. The most vigorous campaign possible against predatory animals that destroy elk.

19. Certain readjustments of grazing privileges in the Roaring Fork region of the Bridger National Forest to meet the needs of winter range for the elk.

20. Consideration of State legislation needed to require hunters to report the number and kind of game animals killed, and to preserve and make economic use of the meat.

21. Further study of the grazing situation southwest of the park to determine whether there should be any further readjustment or restriction of the allotments to domestic stock. The data at hand are not complete enough to determine this question.

22. A special study of the migratory drift, and winter and summer habits of the elk, to supply certain facts now in doubt. This should be in addition to regular observations by local officers to secure information bearing on the condition of the herds, annual increases, losses, and other questions.