



INFORMATION BULLETIN

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Elk at Yellowstone National Park

BACKGROUND ON ELK NUMBERS:

...In mid-winter 1988/89, there were approximately 20,000 elk in the herd on the northern range of the Yellowstone area. This herd is the largest of the eight elk herds known to live part of the year in Yellowstone National Park.

...Intensive surveys between January 1 and March 30, 1989, located 719 elk carcasses on the park's northern range, or 3.6 percent of the herd. Based on a sample of radio-collared elk in the herd which died this past winter, it is estimated that winterkill losses were approximately 5,000 animals, or 25 percent of the northern range herd.

BACKGROUND OF ENVIRONMENT, INCLUDING WEATHER AND THE FIRES OF SUMMER 1988:

...Yellowstone National Park is located along the high plateau of the Northern Rocky Mountains where winters often are harsh. All animals that live in the area during winter find it cold, barren, and often leading to death. (The old, diseased, very young, and lame are especially susceptible to death during severe winters. In many wildlife populations, a 10 percent mortality may be the minimum turnover; in a herd of elk, a severe winter may kill 20 percent of the animals.)

...The last several winters in Yellowstone have been mild relative to the average winter there. This mildness permitted the survival of many elk that would have died naturally during a normal or severe winter. In addition, summers during the period of 1983 through 1987 were unusually wet. This situation also aided elk that, otherwise, would have died in attaining longer life spans, by providing ample forage. This succession of seasons very hospitable to elk allowed the northern range herd to grow from a high count of some 12,000 animals in 1979 to the 1988 count of approximately 20,000--a 67 percent increase.



WILDLIFE AND VEGETATION DIVISION

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...The winter of 1988-1989 has been a severe one for the elk and other ungulates. It was preceded by extreme drought during the summer of 1988--a drought that broke the dry winter/wet summer cycle in the Greater Yellowstone Area.

...Summer range forage occurs at higher elevations where the flowering/seeding cycle occurs around mid-August. It thus was significantly affected by the severe summer drought: comparative measurements suggest that 1988 summer forage was reduced by 60-80 percent due to the drought.

... Winter range forage, which grows at lower elevations, was less affected by the drought because it finishes its flowering/seeding cycle about mid-June and was able to benefit from the unusually heavy April and May 1988 rainfalls, which were 155 percent and 181 percent of normal, respectively. Because of this, winter forage estimates were only 22 percent lower than usual. (Actual winter forage reductions may be somewhat greater than this estimate, because measurements of the late season grasses could not be taken. Due to the fire emergency in the park, personnel were not available to take forage measurements.)

...The fires of Yellowstone in the summer of 1988 impacted the habitat of the various elk groups with different degrees of severity. The most affected group was that of about 500 elk that winter in the upper Yellowstone area above Yellowstone Lake, where about 50 percent of the range burned. The second most affected group was the Madison-Firehole-Gibbon herd, where varying amounts of meadowlands burned--from less than 10 percent in the Gibbon area to 50-60 percent of the winter range in the Duck and Cougar Creek area. Altogether, about 32 percent of the northern range burned, but only 9 percent of the grasslands and sage did.

...In the northern range of Yellowstone, there are 66 units of range where an estimated 20,000 elk were found at the beginning of the 1988-1989 winter. A summary of these units and the number of elk known to have wintered on each in 1987-1988, is given below:

- 13 units very severely burned: 2,933 elk wintered there in 1987-88.
- 9 units severely burned: 3,134 wintered there in 1987-88.
- 5 units moderately burned: 2,106 wintered there in 1987-88.
- 7 units lightly burned: 2,025 wintered there in 1987-88.
- 32 units totally unburned: 7,765 wintered there in 1987-88.

(NOTE: "Very severely burned" means 90 percent or more of the unit was burned; "severely burned" indicates that 50-89 percent was burned; "moderately burned" indicates that 26-49 percent was burned; and "lightly burned" means that 1-25 percent of the unit was burned.)

...The fact that, as noted above, summer forage losses from drought are estimated at 60-80 percent and winter forage losses from drought at 22 percent or greater, while only 9 percent of the northern range's grasslands and sage were burned in the fires, has led scientists to conclude that, overall, the drought was a more significant factor in forage reduction and subsequent elk movements and winterkill losses than were the fires.

...The effects of the 1988 fires on elk range will be largely beneficial to elk after the spring of 1989 due to the decomposition of huge quantities of organic matter. It is as if the ecosystem has been given a large nutrient fix, and one result will be a vigorous growth of grasses and herbs.

SUPPLEMENTAL FEEDING OF THE ELK:

...Supplemental feeding of the elk, whether by the National Park Service, some other agency Federal or State, or members of the public, disturbs natural ecosystem processes, and might discourage the animal from seeking natural food. Supplemental feeding is unlikely to be effective on a broad scale and could increase the potential for disease transmission among the elk. In addition, feeding can introduce alien grass species into the natural systems of the park and surrounding area, a serious concern for both the National Park Service and private ranchers in the area.

...Elk congregating at artificial feeding stations also would impact the area around the station by destroying vegetation, removing bark from conifers, etc., and would add to the price of a supplemental feeding program. The total estimated cost for one year for the program would be in excess of \$2 million.

...The State of Montana, which has jurisdiction over the elk outside the park boundary, does not favor the supplemental feeding of elk. Prior to snowmelt, some private citizens in Gardiner, Montana had been feeding a group of about 40-50 elk.

BACKGROUND OF ELK MOVEMENT INTO MONTANA:

...The historical record for the years 1915-1917, when the U.S. Army was the Federal Government's administrator of Yellowstone National Park, discloses estimates of the northern range herd in the range of 14,000-17,000 animals. Over the next several decades in the park's history, before scientists began applying the concepts of long-term ecological processes to wildlife management, the fear grew among park managers that the elk population was growing "too large." Therefore, during the years 1959-69, intensive reductions were undertaken, resulting in a census of only 4,305 elk in 1969 in the northern range herd.

...By 1974--a mere 5 years later--the northern herd was numbered at 10,529. 15 years later, about 20,000 elk were found on the northern range. When there were 5,000 or fewer elk, only a very few of them migrated north to that part of the northern range outside the park, and most of that range remained unoccupied. However, as their number increased, more and more elk ventured northward, not primarily for food, but to occupy less-crowded territory. Between 1979 and 1982, the numbers continued to increase, but the density of elk inside park boundaries did not, strongly suggesting that more and more elk were occupying that part of the northern range outside the park. By January 1982, the elk count was 16,019; this number changed very little by December 1985, when it became 16,286. By the beginning of the 1988-1989 winter, some 20,000 elk were living on the northern range.

STATUS OF ELK HUNTING:

...The total reported from the 1989 late winter elk hunt indicates that 2,356 elk were harvested outside the park in Montana. The final count of the elk taken through hunting in 1988-1989 (including both the earlier general hunt and the late winter hunt) is estimated at about 3,000 animals, or 15 percent of the northern range herd.

SUMMARY PICTURE:

...The combination of the extreme drought and fires of the summer of 1988, and the severe 1988-89 winter weather have had a significant effect on the northern range elk herd. However, as noted above, over the 10-year span preceding 1988, a series of relatively mild winters and wet summers had supported unusual growth in the size of the herd. Based on population trends over the last several decades, it is estimated that the herd was about 25 percent over normal levels at the beginning of the 1988-89 winter. Therefore, while an estimated mortality level of 40 percent (total losses from both winterkill and hunting) is serious, it is not devastating. There are now approximately 12,000 animals in the northern range elk herd, roughly the size that research indicates the herd would have been without the relatively unusual set of circumstances of the past decade.

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