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DEER MORTALITY FROM GUNSHOT WOUNDS

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INTRODUCTION

Managers of deer herds are frequently confronted with the need for more information regarding the extent of losses sustained by deer through the animals becoming crippled during the hunting season. Information on this subject in the literature is very limited.

Sanders (1939)^{1/} concluded from sample cruises on the Chequamegon National Forest in Wisconsin in 1937 that there were 68 wounded or dead, legal and illegal, bucks, does, and fawns left in the woods for each 100 legal bucks removed from the forest. In 1938 a similar survey gave 60 as the loss through crippling for each 100 bucks removed.

Leopold (1933) said that replies to a questionnaire sent to a list of

^{1/} Publications referred to parenthetically by date are listed in the Literature Cited, p. 8.

New Mexico hunters indicated the serious crippling of 10 bucks for 48 legal bucks brought to bag, or a crippling loss of 21 percent of the legal kill. Leopold further remarked, however, that he believed the loss was at least 30 percent, for not all the replies indicated willingness to admit crippling.

Johnson in 1940 in an unpublished manuscript ^{2/} reported but one dead buck on 3,200 acres during a survey in the Kaibab National Forest (north) after the 1940 deer hunt. At this rate he calculated there would be but 50 dead deer on the west side of the Kaibab (north) from which 582 deer were legally removed. Range loss was consequently calculated as 8 percent of the legal removal. For the entire north Kaibab area he estimated that the range loss would be somewhere between 10 and 15 percent of the legal removal.

After a special hunt in Twelve-Mile Canyon in Utah, Costley, ^{3/} in 1937, found through questioning the game wardens and rangers, who were the only hunters involved in that localized removal program, that there were 13 known wounded deer not recovered for 67 actually brought to bag. The known cripples represented 19 percent of the legal removal. In some additional studies in the Dixie National Forest of Utah, Costley, ^{4/} in 1940, found a loss ratio of 3.3 : 1 between the legal kill and the loss through crippling for areas open to the killing of both bucks and does. The data were obtained by cruisers spaced 50 feet apart on sample areas of the range. They recorded dead deer and paunches or viscera from deer that had been dressed out and removed. The ratio of 3.3 : 1 would represent a crippling loss of 30 percent of the legal removal. Colorado research studies by Hunter (1945) revealed that an additional 15 percent of the deer and elk legally killed died of gunshot wounds or were left in the field.

STUDIES OF LOSSES OF DEER ON THE FISHLAKE NATIONAL FOREST THROUGH CRIPPLING

During the period 1939 to 1946, inclusive, the United States Forest Service carried on investigations on the Fishlake National Forest in central Utah to determine the losses of Rocky Mountain mule deer (Odocoileus hemionus hemionus) through crippling. These studies were conducted under the supervision of the writer while serving as a wildlife technician for the Forest Service.

Methods and Results of the Studies

During the 1939 hunting season the Utah State Fish and Game Commission requested hunters to bring in one ear from each dead deer they found left unclaimed on the range. Only one ear was to be taken from each deer so found. This request resulted in 380 ears being left at checking stations on or adjacent to the Fishlake National Forest. On a subsequent post-hunting-season check Fishlake Forest employees found 27 dead deer, of which 4, or 14.8 percent,

^{2/} Johnson, Harlan G. Hunting report, Kaibab National Forest, North. United States Forest Service report. 1940. [Unpublished.]

^{3/} Costley, R. J. Report of December 21, 1937, to the Regional Forester, Ogden, Utah. United States Forest Service report. 1937. [Unpublished.]

^{4/} Costley, R. J. Report of December 20, 1940, to the Regional Forester, Ogden, Utah. United States Forest Service report. 1937. [Unpublished.]

had one ear removed. Through simple proportion the total range loss was calculated to be 2,568 animals. This mortality was 18 percent of the 1939 legal kill of 13,933, or a ratio of 1:5.5.

In 1940 a 100-percent cruise was attempted after the hunting season on sample areas distributed over the forest. Riders were spaced from 66 to 100 feet apart, depending upon the topography and the vegetative cover, and each rider attempted to discover all dead deer and paunches of eviscerated deer on his assigned strip.

Paunch data were recorded for two reasons. They would serve as an index to the legal kill on each area concerned, and, in addition, the ratio of the number of dead deer to the number of paunches found would give the relationship between the crippling loss to date and the legal kill. The results of the survey showed a total of 60 dead deer and 191 paunches found, a ratio of 1:3.1, or a crippling loss of 31 percent of the legal removal. It was the opinion of several of the checkers, however, that with a spacing of 66 to 100 feet between cruisers many paunches could easily have been missed. Most of the paunches had become blackened and shriveled by the close of the 11-day hunting season and were thus more difficult to discover. If paunches were missed, then the percentage of crippling loss to legal removal would be lowered. Subsequent studies have tended to indicate the probability that many paunches are missed at distances in excess of 20 to 25 feet from the observer.

During the past six hunting seasons (1941 to 1946, inclusive), the Forest Service employees on the Fishlake National Forest have recorded the paunches and dead deer which they found while patrolling the range during and immediately following the hunting seasons. Considerable time was spent on the range and parts of every ranger district were covered, including various elevations, cover types, and areas of varying degrees of accessibility. The distances at which most of the paunches and dead deer were first sighted were also recorded.

The results of this investigation are shown in the following tabulation, which includes some figures from the adjacent Manti National Forest for 1944 and 1945:

Number of paunches reported observed	528
Number of dead deer reported observed.	199
Number of paunch records in which the distance of the paunch from the observer when it was first sighted is given,	477
Average distance of paunch from observer when first sighted. . . .	21.4 ft.
Number of dead deer records in which the distance of the dead deer from the observer when it was first sighted is given	146
Average distance of dead deer from observer when first sighted . .	47.9 ft.

This tabulation shows that the average distance at which dead deer were first sighted was 2.24 times greater than that at which the paunches were first sighted. The average distance at which the paunches were first sighted indicated that many could be missed on a strip of ground 66 to 100 feet wide.

By multiplying the total number of paunches seen on the surveys by the correction factor 2.24, a value was obtained which was the expected number of paunches on the area in which the dead deer were seen. The corrected number of paunches amounted to 1,183, and the resulting ratio of dead deer to paunches, or range loss to legal removal, was 1:5.94. Expressed as a percentage, the range loss was 17 percent of the legal removal. Deer that were crippled but did not die until after the period of the survey were not included in this loss.

Late in November and early in December 1940, or approximately one month after the crippling-loss data were obtained, the writer classified 1,746 live deer according to sex and age and found that 22 of the number were cripples. Similarly in 1942 it was found that 12 out of 1,152 deer were cripples. Thus cripples comprised 1.3 and 1.0 percent, respectively, of the 1940 and 1942 deer herds one month after the close of the hunting season. Deer herein classified as cripples were those that had broken limbs or limped perceptibly. Field observations on the part of the writer have shown that few of such crippled deer survive to the next hunting season. Most of them succumb to predators, malnutrition, or infection during the first winter. Some information supporting the view that most crippled deer die during the first winter following the hunting season in which they were crippled was obtained for the Duck Creek area near Ely, Nev. Officials of the Forest Service and of the Fish and Wildlife Service in classifying deer in that area during the period of January 6 to 8, 1947, found 6 crippled deer out of 479; that is, 1.3 percent of the deer had a broken limb. Two and one-half months later (March 24 to 27, 1947), while taking the annual deer census in the same area, officials saw only 4 cripples out of the 767 deer that were close enough for the observers definitely to determine cripples. Cripples thus made up only 0.5 percent of all deer at that time. Thus during the $2\frac{1}{2}$ months between the two sets of observations approximately 60 percent of the deer with broken limbs had apparently succumbed. These crippled deer might also be considered crippling losses. If so, the number of cripples in the Fishlake herd on December 1, 1940, and December 1, 1942, would amount to 897 and 582, respectively, or 24 and 20 percent of the deer left dead shortly after the respective hunting seasons. The average for the two years is 22 percent. Consequently, if these cripples are considered as hunting mortality even though they ultimately succumb to some other cause, the ratio of range loss to legal removal would be narrowed from 1:5.9 to 1:4.9. This loss would be 21 percent of the legal kill.

Essentially all the crippling-loss data accumulated on the Fishlake Forest were obtained from areas on which both bucks and does were hunted. Does were hunted under the limited license system. A further classification of the dead deer was made to show the number that had been dressed out but left in the field. The result is shown in table 1.

TABLE 1.--Classification of deer found dead following hunting seasons during the years 1939 to 1946.

Condition of deer	Bucks	Does	Fawns	Totals
Dressed	12 (16) <u>1/</u>	46 (63)	15 (21)	73 (25)
Not dressed	52 (24)	107 (50)	55 (26)	214 (75)
Totals and averages <u>1/</u>	64 (22)	153 (53)	70 (25)	287 (100)

1/ Figures in parentheses are percentages.

Altogether, 358 deer which died from gunshot wounds or were left on the range during the hunt have been classified since 1939. Of this number, 79, or 22 percent, were bucks; 190, or 53 percent, were does; and 89, or 25 percent, were fawns.

Analyses of Crippling Loss Factor

During the period 1939 to 1946, inclusive, approximately 141,000 deer were legally removed from the Fishlake National Forest, of which 77,000, or 55 percent, were bucks; 50,000, or 35 percent, does; and 14,000, or 10 percent, fawns. By applying the loss ratio of 1:5.94 (obtained for the period 1941 to 1946, inclusive), there was a calculated range loss of 23,700 deer during and within a few days following the hunt. This loss broken down on the basis of the classification of the 358 dead deer showed a range loss of 5,200 bucks, 12,600 does, and 5,900 fawns. A comparison of the legal kill and the crippling loss of bucks, does, and fawns on the Fishlake National Forest for the period 1939 to 1946 is shown in table 2.

TABLE 2.--Comparison of the legal kill and the crippling loss of bucks, does, and fawns on the Fishlake National Forest, 1939 to 1946.

Deer	Legal kill	Crippling loss	Crippling loss in percentage of legal kill
			Percent
Bucks	77,000	5,200	7
Does	50,000	12,600	25
Fawns	14,000	5,900	42

This indicates rather clearly that the loss of does and fawns through crippling during the hunting season when compared with the legal removal was pronouncedly higher than that of bucks. This can probably be explained by the following reasons:

Hunters place a higher premium on bucks than they do on does and fawns. Consequently they exert a greater effort to recover wounded bucks than they do to recover does and fawns.

Some does and fawns are undoubtedly killed by buck hunters through error and are left because the hunters fear apprehension by wardens.

Because of their poor condition hunters probably leave some does that bore fawns during the year and seek others in better physical condition. The proportion of dressed does to all does left in the woods compared with similar data for bucks tends to corroborate this supposition.

Fawns are probably shot for does by some hunters and left because of their inferior size and condition.

During November and December of 1946 the writer questioned hunters, game wardens, and Forest Service employees concerning the numbers of deer they had legally killed and the numbers they had crippled and were unable to recover. It was felt that by questioning hunters with whom the writer was personally acquainted there would be little if any reluctance on the part of the hunters in admitting the crippling of a deer. The data thus obtained revealed that for 80 bucks killed there were 25 crippled, and for 21 does killed there were 6 crippled. Crippled deer in this instance represented 31 and 29 percent of those killed for bucks and does respectively. Interviews and questionnaires of this type to determine the crippling loss are not satisfactory, however. Hunters, even if perfectly frank in admitting cripples, may sometimes wound deer and be uncounscious of the fact. To offset this factor, deer are sometimes knocked down, momentarily stunned, but get up and bound away relatively unharmed. Yet hunters may class them as wounded deer. Many wounded deer are shot and recovered later by other hunters. There is a limited survival of crippled deer that live through the winter to the following hunting season. Two bucks out of 199 bucks and 87 does checked out of the Salina Canyon checking station during the first part of the 1946 hunting season had survived broken front feet received during some previous hunt. It is thus difficult to appraise the ultimate mortality due to crippling during the hunting season from hunter statements concerning deer killed and wounded.

The statements of hunters indicated a similar ratio between animals killed and those crippled for both bucks and does. Yet, the field surveys showed a wide divergence in such data for bucks and does (7 percent for bucks, 25 percent for does, and 42 percent for fawns), which indicated a rather high recovery of wounded bucks by other hunters but a relatively low recovery of "antlerless" deer.

The reasons why deer are left dead on the range or in the woods during the hunting season are varied, but the more common ones are:

Deer left intentionally

The deer was diseased.

The deer was of inferior size or in poor condition.

The terrain was rough or the place where the deer was killed was a long distance from camp and there were no means of packing it out.

Storms forced the hunters out of the mountains before they had an opportunity to bring the deer into camp.

More deer were killed by the party than the licenses permitted.

The meat had spoiled or the deer was badly shot up.

Deer left unintentionally

The hunter could not find the deer after returning to pack it out.

The deer escaped from the hunter after it was critically wounded.

SUMMARY

Studies of the mortality of Rocky Mountain mule deer (Odocoileus hemionus hemionus) due to their being crippled during the hunting season have been conducted for the past eight seasons on the Fishlake National Forest in central Utah. The estimated legal removals of deer during that period were 141,000, of which 77,000, or 55 percent, were bucks; 50,000, or 35 percent, were does; and 14,000, or 10 percent, were fawns. Determination of the losses through crippling has been attempted primarily through Forest Service employees recording all dead deer and paunches of eviscerated deer which they found during, and immediately following the close of, the hunting season. These data together with the recorded distances between the observer and each deer or paunch at the time each was first sighted have made it possible to arrive at a calculated ratio between the dead deer left on the range and those removed by hunters. The ratio was found to be 1:5.9; or, stated differently, the loss through crippling was 17 percent of the legal removal. If crippled deer that survived one month after the close of the hunting season were considered a part of the crippling loss, the mortality value was raised to 21 percent.

Additional information obtained in the study strongly indicated a rather high recovery by hunters of wounded bucks, but a very low recovery of antlerless deer. Evidently this difference was in direct response to the premium placed upon the two classes of deer by the hunters.

LITERATURE CITED

HUNTER, GILBERT N.

1945. Crippling loss. Big game kill. Colorado State Game and Fish Commission, vol. 2, pp. 10-11.

LEOPOLD, ALDO.

1933. Game management. 481 pp. Chas. Scribners' Sons, New York.

SANDERS, ROY DALE.

1939. Results of a study of the harvesting of white-tail deer in the Chequamegon National Forest. Fourth North American Wildlife Conference Transactions, pp. 549-553.

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