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FAWN MORTALITY IN A CONFINED VIRGINIA DEER HERD

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INTRODUCTION

This paper reports on sex-specific fawn mortality of an expanding herd of 200 to 450 white-tailed deer (*Odocoileus virginianus*) being studied in a 2,322-acre enclosure at Radford Army Ammunition Plant, Dublin, Virginia since 1965.

The habitat is rolling, abandoned pastureland with occasional clumps of mature hardwoods, scattered cedars (*Juniperus virginianus*), and several young shortleaf pine (*Pinus echinata*) plantations. An extensive road system provides good visibility of nearly 90% of the area. Although the 8-foot high fence does not confine all deer, there appears to be little movement of animals out of the enclosure. The study site permits daily observations of large numbers of deer and the easy capture of fawns.

Thanks are due to J. W. Sevaried and D. G. Weeks of the Radford Army Ammunition Plant for cooperation in this study. Observations were made by graduate students J. F. Kreitzer, R. L. Petcher, and J. L. Sandt.

FAWN CAPTURE TECHNIQUES

Experience of 5 years in marking 258 fawns resulted in development of a successful technique for capturing fawns. Behavior patterns vary between individuals, making it difficult to establish firm procedural guidelines. Our success in capturing nearly half of the fawn population each year of the study can be attributed to our having followed three practices: (1) in the interest of efficiency, ignore groups of deer and concentrate on single does, (2) do not leave the vehicle until a fawn is sighted, and (3) make a noisy, fast approach. Fawns older than 1 week are too fast for a man on foot to capture, but fawns up to 3 weeks of age have been captured by a trained dog. Details of this method for capture and marking of fawns have already been described by Downing and McGinnes, 1969.

FAWN MORTALITY

Hundreds of hours of observations following capture and release of fawns have yielded recovery of the carcasses of only 8 marked animals

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(Table 1); 1 was sacrificed, 1 was killed by dogs, 1 suffered a fall, and the remaining 5 died of unknown causes. Six unmarked fawns were also found dead; causes of their deaths are shown in Table 1. Four of the 6 were observed stillborn, and 2 suffered falls. Finding dead fawns is very difficult, and the number found is probably only a small portion of those that die.

The only data available on the 21 other marked fawns never recovered after release are sex, age, abnormalities, and whether they were twin births. We shall examine these factors to determine which, if any, might relate to non-recovery.

TABLE 1. Causes of mortality for eight marked and six unmarked fawns, Radford Army Ammunition Plant 1965-1969

Year	Marked	Sex	Cause of death
1965	(unmarked)	female	stillborn
1965	(unmarked)	?	fell 10 ft. onto concrete
1966	(marked)	male	deformed—fell 10 ft. onto concrete
1966	(marked)	female	unknown, 20 days of age
1966	(marked)	male	badly deformed feet—sacrificed
1967	(marked)	male	unknown, 60 days of age (piebald)
1967	(marked)	male	unknown, 10 days of age
1967	(marked)	male	unknown, 7 days of age
1967	(marked)	female	unknown, 7 days of age
1967	(unmarked)	male	stillborn
1967	(unmarked)	male	stillborn
1968	(unmarked)	male	stillborn (deformed mandible)
1969	(unmarked)	male	fell 10 ft. onto concrete
1969	(marked)	male	killed by dog

Table 2 shows fawns captured during the 5 year period, the number of fawns not observed during at least the first observation period 2 months after release, and the percentage of mortality and survival. Fawn mortality was highest in 1967 and 1969. We believe that the relatively high loss of marked fawns in 1967 may not have been entirely due to mortality, but to the inability of the observers to identify these fawns because of tag losses. There was more observation time in 1969 and retention of tags appeared to be more satisfactory than in any previous year; yet during this year the second highest losses occurred. Reasons for these differences in fawn losses are difficult to define; however, the number of animals involved is not great.

Although fawns were not aged in 1965, estimates of ages were obtained the following 4 years. We wished to determine whether the handling of very young fawns increased mortality among the 131 fawns tagged at 1 to 4 days of age; of these, 20 (15.3%) were not seen at 2 months of age. Of the 104 fawns tagged at 5 or more days of age, 8 (7.7%) were not seen beyond the 2-month period. The differences were tested by chi-square analysis and found not to be significant at the 90% confidence level, ($X^2 = 2.66$, 1 d.f.). Examining these age data by sex, we see that male fawns had virtually the same mortality rate regardless of age, with an overall survival of 88.3%. Female fawns tagged at 1 to 4 days of age had a significantly higher mortality than those tagged at 5 or more days. ($X^2 = 3.48$, 1 d.f.) The overall survival of females was 89.4%.

Does usually hide twin fawns separately after the first 2 days following birth. Because of this, it is extremely difficult to identify sets of twins and often impossible to know at the time of tagging whether a single fawn is a twin or a single birth. Of 24 fawns known to be a

TABLE 2. Fawns captured, marked and released, and percentages of marked fawns known to have survived two months release, Radford Army Ammunition Plant, 1965-1969

Year	No. marked	No. lost	% Mortality	% Surviving
1965	23	1	4.3	95.7
1966	60	4	6.7	93.3
1967	51	12	23.5	76.5
1968	43	3	7.0	93.0
1969	81	9	11.1	88.9
Totals	258	29	11.2	88.8

twin when marked within 2 days of birth, all but 3 survived; one twin was stillborn, and the other 2 were a set of piebald or partial albino twins. This survival rate for known twins is little different from that of the rest of the fawn population made up of both single and twin fawns. However, if we disregard the piebald twins and the one stillborn fawn, our data indicate that the remaining sets of normal twins born alive had a 0% mortality.

Deformities and color aberrations in fawns were not recorded in 1965. Of the 235 captured since 1965, 3 had morphological abnormalities, 2 were nearly white in color, and 10 had markedly white feet. Of the 3 fawns with structural deformities, 1 survived; this fawn had a twisted spine and a Roman nose. The fawn with deformed feet (and some white on the body) was sacrificed; the third fawn had a severely deformed maxillary and died from a fall. The twin piebald fawns mentioned earlier both died. Of the 10 fawns displaying white hair on the feet, 4 died. Of the 258 marked animals, only 11.2% of the fawn population, or 29 animals were lost. Nine of these 29 fawns were either deformed or atypical in color; this amounted to 56% mortality among abnormal fawns. The other 20 represented only 8.3% mortality (91.7% survival) among normal fawns.

There is little evidence that handling of normal fawns or contact with the dog induced abandonment. Fawn mortality due to abandonment may be reduced in the wild by other does adopting these fawns. One such case of adoption was observed. An abandoned marked fawn born to a marked doe was accepted by an unmarked doe with a fawn of her own; the three members of this group were frequently seen and readily identified. At least one other case of adoption is strongly suspected but cannot be proved.

SUMMARY AND CONCLUSIONS

High survival (91.7%) of normal fawns was observed in spite of handling, marking with ear tags, and ear tattooing. Mortality could not be related to the sex of fawns. Age at the time of capture appeared to affect survival of females but not males. Mortality to known sets of normal twins was low. The mortality observed for normal fawns was not great enough to alter seriously the population structure of the confined deer herd under study. Deer herd managers should be watchful to weed out deformed or atypically colored individuals. Although their survival seems quite low, those that live can contribute undesirable traits to the population.

LITERATURE REVIEW

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ABSTRACT

A 2,322-acre enclosure which contains an estimated deer per 5 acres, is used for deer ecology studies. During the past 5 years, 258 fawns have been captured, marked, and released; 229 are known to have survived to 2 months of age. Observations have revealed data on fawn mortality by age at time of capture, by sex, by year, by multiple birth, and abnormalities. Methods used are described for capture of fawns. Causes of fawn mortality cannot always be identified, but survival of marked individuals is known.

PROGRESS REPORT ON CAROLINA SANDHILLS MOURNING DOVE STUDIES ¹

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ABSTRACT

The objectives, methods, and study areas of the Carolina Sandhills mourning dove investigation are described as they apply to present and future research. Indexes to mourning dove nesting densities are gained by means of 25 call-count routes in a 10-county intensive study area and 45 call-count routes in a 33-county extensive study area. These indexes will be correlated with habitat characteristics to determine specific qualities of desirable dove nesting habitat and to gain insight into possible effects of widespread changes in land-use and agricultural practices on dove nesting populations.

The 25 intensive-study-area routes were each run three times per year. In addition, several were covered weekly throughout each summer. Extensive-study-area routes were run only once per year. The average number of doves heard calling per intensive-study-area route was 47.39 in 1968 and 48.14 in 1969. Averages for the extensive study area were 38.80 in 1968 and 37.49 in 1969. Other call-count survey results are presented and discussed, including doves heard, rates of calling, and doves seen.

Opening-day dove kill and hunter success on two managed hunts within the intensive study area were sampled. For these two hunts, average bag sizes were 6.15 and 5.61; limit bags (12) were obtained by 18.5 percent and 9.2 percent of the hunters; and age ratios in the kill were 4.9 and 6.6 immatures per adult.

Project dove trapping and banding accomplishments are discussed.

INTRODUCTION

The mourning dove is the most important game bird species in North America from the standpoint of hunter harvest. The most recent estimate of nationwide mourning dove harvest is 41.9 million birds for 1965 (Bureau of Sport Fisheries and Wildlife, 1967). Previous estimates were 11 million in 1942, 15 million in 1949, and 19 million in 1955. These figures indicate a great increase in harvest in recent years, but since no sampling frame exists with which to reliably sample mourning dove hunters, the exact magnitude of the increase is somewhat uncertain. It is unfortunate that we do not have more reliable harvest estimates; the species has not received management attention commensurate with its popularity as a game bird. Mourning dove research has not kept pace with the demand for utilization of the dove resource.

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