

RADIO-TRACKING A WHITE-TAILED DEER¹

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ABSTRACT

A female deer (*Odocoileus virginianus*), which had been confined all six years of her life, was immobilized with Sernylan, fitted with a collar containing a radio transmitter, and released on a study area in west-central Illinois on March 8, 1963. Her movements and daily activity were monitored, using portable radio tracking equipment, until December, 1963. Early movements and activity were thought to be related to previous confinement, while later movements and activity were considered to be more normal.

INTRODUCTION

A six-year-old captive doe deer was immobilized and fitted with a collar containing a radio transmitter. The doe was allowed to recover from the drug and then released in the wild approximately 42 miles east of where it had been confined. The purpose was to gather movement and activity data, and to observe movement and behavior of the deer after release, by using portable radio tracking equipment.

The 11-square mile study area in which the doe was released is located in Bethel Township, McDonough County, Illinois. This area was selected primarily because it was a large uninhabited area under one ownership. The land was dissected into hills and valleys with forested slopes. Both the uplands and bottomlands were cultivated or in various stages of oldfield succession.

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MATERIALS AND METHODS

The radio transmitter used in this study had a 26 megacycle pulsating signal and a loop antenna, and was powered by 4 Mallory RM3 batteries hooked in parallel. The transmitter was similar to that described by Cochran and Lord (1963). The transmitter was mounted on a natural polyethelene collar and potted in epoxy, a procedure described by Cochran and Hagen (1963).

The receiver was a Model D-11 direction finder, constructed according to specifications described by Cochran and Nelson (1963). The receiver, radio transmitter, and collar were all constructed by Mr. William W. Cochran. The receiver and transmitter had a range of one-half to three-quarters of a mile.

The six-year-old doe used in this study had lived in confinement at the Quincy, Illinois, Soldier's Home since birth. The one-acre enclosure in which she had been confined contained four large trees and a small pond.

For the purpose of moving her, the doe was immobilized with 1 cc of Sernylan (Parke, Davis and Co., Detroit) on March 7, 1963. The dart carrying the Sernylan was fired from a CO₂ Cap-Chur-Gun into a large muscle of the doe's left hind leg. After immobilization and attachment of the collar with the radio, the doe was transported 42 miles east of the area of confinement and released.

The portable receiver was used to determine the doe's approximate position by triangulation. Once her position had been determined by use of the radio tracking equipment, it was possible, on a few occasions, to take advantage of topography and wind and to move in closer to the deer for visual observations. Using this

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method, her position was determined each day for the first month and a half and several times a week thereafter until the transmitter failed on December 2, 1963. She was located and radio tracked at a different time each day or night so that, assuming that her activities were always the same during each part of the day, a complete record of her activities would be known throughout the 24-hour period.

RESULTS

During the immobilization and transport to the release site, the effect of Sernylan on this doe was similar to that described by Harthoorn (1965). Seven hours after immobilization the doe was observed walking eastward from the release site.

The first morning after her release, on March 8, 1963, the doe was found, by triangulation, about one-quarter mile east of the release site. This area is a floodplain community predominantly composed of elm (*Ulmus* spp.), silver maple (*Acer saccharinum*), hackberry (*Celtis occidentalis*), cottonwood (*Populus deltoides*), sycamore (*Platanus occidentalis*), and river birch (*Betula nigra*). Ohio buckeye (*Aesculus glabra*), box elder (*Acer negundo*), and pawpaw (*Asimina triloba*) were important understory trees. The herbaceous plants at this time of year were represented by grasses and sedges.

The doe remained within a 200-square-yard area, bounded by steep hills and a small stream, for 38 days. During this time the deer was approached several times and showed little alarm upon discovering the observer. She was generally observed feeding on grasses and/or sedges and a few buds, or lying down.

On the 39th day, the doe had moved from this spot to a new location one-half mile westward, or one-quarter mile west of the original release site. This was an area well dissected into hills and valleys, and characterized by an oak-hickory community. The bottomland of this site contained winter wheat and a harvested corn field.

During late April and all of May, the doe gradually extended her range westward another one-quarter mile. Her daily activity of feeding and resting continued to be limited to a small area, but not so small an area as at the first site. She did consistently remain, however, in the same area from June 3 through June 18. Her only activity seemed to be moving to and from a nearby creek.

She was observed with a single fawn three times between June 18 and June 23. Judging from Severinghaus and Cheatum's (1956) description of sizes and mobility of fawns, birth had probably occurred during the period from June 3 through June 18 when the doe's movements had been very restricted.

During July and August, the doe gradually extended her range farther to the west. From September through November, she was observed to be using an area in and around a corn field and to have 2 fawns in her company. The second fawn may or may not have belonged to the doe.

Visual contact with the doe during October and November became more limited because of the increased wariness of the deer. During these months her activity seemed to be more pronounced in early morning and evenings, similar to the behavior of wild deer. In fact, on one occasion, she was seen in the company of wild deer.

Hunters, during a three-day deer season in progress in November, failed to kill or report seeing the doe, even though hunters were observed in the area used by the doe. Several other deer were taken from the area.

On December 2, 1963, after an interval of 10 months, the batteries of the radio transmitter expired. The area covered by the doe from the time of release until the radio failed was about two miles long and, at the widest point, one-half mile wide, an area of approximately 600 acres. In any one 24-hour period, however, the doe's movements seldom covered more than one-half mile.

DISCUSSION

In a study of this nature, the presence of the observer can not be discounted as a factor influencing the results. However, it is my opinion that the presence of the observer influenced only the immediate activities of the deer.

During the first 38 days after release, the doe did not cross any major topographic features and her activity was confined to an area approximately 200 yards in diameter. Her daily periods of activity did not fit a consistent and predictable pattern. These observations lead me to believe that her behavior during those 38 days were conditioned by her previous confinement. In the area in which the doe had been confined there were no major topographic restrictions, little opportunity to move any distance, and irregular activity because of human disturbance. The abundance of green herbs, nearby water, and little disturbance may also account for her limited area of activity during the first 38 days of freedom.

A sample of the activities of only one deer is admittedly minimum for any basic conclusions. However, the study of this doe, as well as the later similar studies by Tester, *et al.* (1964) and by Montgomery and Hawkins (1966) all show that deer released in a new environment will stay in a relatively small area and only gradually increase the size of their home range.

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