Transactions of the Illinois State Academy of Science
(1991), Volume 84, 1 and 2, pp. 84-91

Longevity of Female White-Tailed Deer on a Refuge in Illinois

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ABSTRACT

Average longevity was estimated for 42 female white-tailed deer (*Odocoileus virginianus*) on a 600-ha refuge located in east-central Illinois. After marking, these females survived an average of 6.6 years and reared an average minimum of 5.7 fawns to 12 months old.

INTRODUCTION

Throughout the range of white-tailed deer, females generally survive longer than males because of reduced hunter selection, decreased risk of predation, and generally better physical condition entering winter (McCullough, 1979; Mech, 1984). In addition, intense competition among males for access to estrous females contributes to a shortened lifespan (Clutton-Brock et al., 1985). Females

also survive longer than males on refuges where firearm hunting is prohibited but where the surrounding areas are open to hunting because, unlike males, females tend to remain within refuge boundaries throughout the year (Gladfelter, 1978; Hawkins et al., 1971). One result of enhanced survival of females has been a rapid increase in deer abundance on many refuges in Illinois and throughout the Midwest in recent years (Nixon et al., 1991).

METHODS

Between 1980 and 1985, we marked 263 deer on Robert Allerton Park, a 600-ha refuge in Piatt County, east-central Illinois. Captured deer were aged by tooth replacement and wear (Severinghaus, 1949) as fawn (≤12 months), yearling (13-24 months), and adult (>24 months). Visual observations and radio tracking enabled us to monitor most of these deer until death. Fawn recruitment during their first year of life was determined from repeated observations of marked does and their fawns beginning shortly after birth.

RESULTS AND DISCUSSION

Minimum survival interval and fawn recruitment were determined for 42 marked females that remained within the boundaries of the refuge throughout our study (Table 1). These females lived to an average minimum of 79.7 months (6.6 yrs) and reared an average minimum of 5.7 fawns to one year old.

A few wild females (unfenced) have achieved longer life than those on the Allerton refuge. Severinghaus and Cheatum (1956:168) reported one female that reached 15 years within the Allegheny State Park refuge in New York. They also report two females, both semi-tame, that reached 18.5 and 19 years respectively when protected from firearm hunting in New York state and an additional protected female in Wisconsin that was 19.5 years old at death. In Minnesota, Erickson et al. (1961) found that nearly 6% of an initial harvest from the Tamarac Refuge were ≥ 6.5 years.

Fawn recruitment rates on the Allerton refuge were very high for Midwest whitetails (Table 1). Fawn losses between birth and weaning at 4-5 months have been reported to vary from 27% to 70% for fawns marked as neonates in Missouri, Iowa, and southern Illinois (Bryan, 1980; Huegel et al., 1985; Nelson and Woolf, 1987; Woolf and Yancy, 1987). Some possible reasons for this high survival were:

(1) Ground vegetation was dense on the Allerton refuge during our study creating excellent hiding cover for fawns and we were often unsuccessful in searching for newborn fawns of radio-marked does. Coyotes (*Canis latrans*), likely the principal predator of fawns in east-central Illinois (Mech, 1984; Nelson and Woolf, 1987), were present on the Allerton refuge. Coyotes are generally considered to be opportunistic predators, searching for prey easiest to capture (Bowen, 1981; Boutin and Cluff, 1989). The dispersed nature of home range occupancy by breeding age females (Ozoga et al., 1982; Nixon et al., 1991) and the dense cover available to shelter fawns on the Allerton refuge would render

prey searches by coyotes often unsuccessful. The few fawns killed by dogs or coyotes probably were the result of happenstance rather than the learned searching behavior typical of coyotes in the more sparsely vegetated arid western deer ranges (Garner et al., 1978).

(2) Fawns were also relatively safe from highway accidents on the Allerton refuge because roads surrounding the refuge were low speed county highways, not conducive to many deer:auto collisions (Nixon et al., 1991).

(3) Our presence on the refuge every day, often late at night, undoubtedly reduced poaching opportunities during the fall and winter when fawns would be vulnerable to poaching activity.

Thus the high fawn survival on the Allerton refuge may be atypical of other refuges, but the increase in deer abundance on the public refuges throughout Illinois in recent years would suggest that fawn survival has also been high on many of these refuges. During 1981-85, the deer population in the Allerton refuge increased 15-16% per year in spite of a 32% total increase in legal firearm and archery harvest on surrounding farms and a 50% dispersal rate of fawns (Nixon et al., 1991). A population model of the Allerton deer herd estimated average successful annual immigration of 8 fawn males, 5 fawn females, and 2 yearling females into an average spring density of 97 deer (3.3 deer per km^2). Fawn recruitment from resident females averaged 81 each year and accounted for 84% of the estimated annual recruitment.

We did not find that older mothers were more successful at fawn rearing than younger females as reported by Mech and Roberts (1990) and Ozoga and Verme (1986) for white-tailed deer and by Clutton-Brock et al. (1982) for red deer (*Cervus elaphus*). The average number of fawns observed traveling with marked does of known age on the Allerton refuge in October ranged from 1.87 for 2-year does (N =30 does) to 2.29 for 6-year old does (N = 7) ($F = 1.57$, 4,106 df, $P>0.10$). We omitted yearling does from this analysis because these primaparous females are known to average fewer fawns per pregnancy (Verme and Ullrey, 1984). Thus, unlike whitetails in more northern ranges subject to rigorous predation and environmental hazards, farmbelt females live in a relatively benign climate with fewer predators and an abundant year-round food supply. Fawn rearing experience that develops as females age may not be as important to fawn survival in these habitats.

The combination of abundant food, relatively benign climate, and protection from firearm hunting offered by the Allerton refuge and other refuges in Illinois have allowed many females to survive and rear fawns. Males, because their home ranges are larger than females, and their fall movements associated with breeding frequently take them away from a refuge, are killed in much higher numbers (Nixon et al., 1991). Food supplies, very abundant on the farms surrounding these refuges, provide deer with nearly unlimited food supplies. Deer usually spent the diurnal hours on a refuge sleeping and loafing in natural cover and nocturnal hours on farm fields. Because deer have a relatively small rumen, they feed often during the day within the refuge and often severely degrade

understory vegetation. However, the abundant food supply available on farm fields maintains deer condition throughout the winter months and the declines in body weight, reproduction, or fawn recruitment associated with inadequate winter diets seldom occur (Nixon et al., 1991; Verme and Ullrey, 1984). Winter densities as high as 1 deer per 2 ha of refuge have been documented for at least two refuges in Illinois (Severson Dells Forest Preserve, Winnebago County, 1987-88, Dr. D. L. Ivacic, Rock Valley College, pers. commun., 1988; Sangchris Lake State Park, Christian County, 1982-83. J. Kube, Illinois Department of Conservation, pers. commun., 1983).

ACKNOWLEDGMENTS

We thank the numerous volunteers who helped capture deer, conduct deer drives, and search for fawns. This report is a contribution (in part) of Federal Aid in Wildlife Restoration Project W-87-R, the Illinois Department of Conservation, the U. S. Fish and Wildlife Service, and the Illinois Natural History Survey cooperating. R. A. Montgomery, Max McGraw Wildlife Foundation as well as S. P. Havera, Dr. G. C. Sanderson, and the editorial office of the Illinois Natural History Survey reviewed the manuscript.

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Table 1. Estimated minimum longevity and fawn production for 42 marked female white-tailed deer resident on a 600-ha refuge in Piatt County, Illinois.

Tag No.	Age When Female Marked (Mo.)	Date Marked	Last Date Known Alive [a]	Minimum Age (Mo.)	Minimum No. Fawns Alive			Fawn Survival to 12 Mo.
					Birth	6 Mo.	12 Mo.	
174	33+	Mar 1983	Oct 1986	75	8	8	8	100.0
178	31+	Jan 1983	Dec 1989	114	14	13	13	92.8
182	8	Feb 1983	Oct 1985	40	5	5	5	100.0
610	7	Jan 1983	Sept 1989	64	5	4	3	60.0
248	21	Mar 1981	Jan 1988	103	10	9	9	90.0
268	13	July 1981	Dec 1989	115	7	6	6	85.7
316	66	Jan 1981	Jan 1984	102		Unknown		
322	27+	Sept 1981	Oct 1984	64	6	6	6	100.0
388	19	Jan 1982	Nov 1985	64		Unknown		
442	31+	Feb 1982	Nov 1986	88	6	6	6	100.0
476	20	Feb 1982	Jan 1989	103	8	8	7	87.5
503	27+	Sept 1983	Dec 1986	65	4	3	2	50.0

526	30	Dec 1983	Dec 1989	102	4	4	3	75.0
529	30+	Dec 1983	Nov 1987	77	4	4	3	75.0
566	34+	Mar 1984	Jun 1986	61	4	4	4	100.0
567	21	Mar 1984	Dec 1989	90	5	5	5	100.0
568	21	Mar 1984	Sept 1988	75	6	6	6	100.0
576	33+	Mar 1984	Oct 1989	100	4	4	4	100.0
598	7	Jan 1985	Oct 1989	64		Unknown		
617	8	Feb 1985	Dec 1988	54	3	3	Unknown	
632	9	Oct 1985	Mar 1987	33	3	3	3	100.0
212	21	Mar 1983	Dec 1989	102	9	9	8	88.9
298	39	Sept 1981	Jan 1989	127	8	8	8	100.0
508	17	Nov 1983	Oct 1989	88	7	5	5	71.4
510	17	Nov 1983	Oct 1989	90	8	8	8	100.0
596	6	Dec 1984	May 1988	66	2	2	2	100.0
336	32+	Feb 1981	Jan 1986	91	4	4	4	100.0
332	8	Feb 1981	Oct 1985	64	10	10	6	60.0
488	8	Feb 1982	Jan 1988	79	7	7	7	100.0
540	7	Jan 1984	Mar 1987	45		Unknown		
490	32	Feb 1982	Nov 1984	65	7	6	5	71.4

342	20	Feb 1981	Oct 1988	112	11	11	10	90.9
192	20	Feb 1981	July 1988	109	5	4	3	60.0
340	8	Feb 1981	Feb 1987	80	10	10	9	90.0
372	30	Dec 1981	Nov 1986	89	12	12	11	91.7
504	4	Oct 1983	Nov 1988	65	4	4	3	75.0
505	4	Oct 1983	Nov 1988	65	5	5	4	80.0
190	9	Mar 1983	Nov 1989	89	5	5	5	100.0
452	8	Feb 1982	Sept 1989	99	6	6	6	100.0
470	11	May 1982	Apr 1986	58	7	7	6	85.7
551	8	Feb 1984	Apr 1986	34	4	3	3	75.0
472	11	May 1982	Feb 1988	80	8	7	6	75.0
			Mean	79.7	6.4	6.1	5.7	89.0
			S.E.	3.6	0.44	0.43	0.42	

[a] Observations terminated December, 1989.