

# Wild Turkey Survival in Southeastern Oklahoma

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**Cause-specific mortality and survival of eastern wild turkey hens were investigated in southeastern Oklahoma on commercial forestland during 1983 and 1984. Nine (20%) of 45 radio-instrumented turkeys were killed by predators. Turkeys were also lost due to transmitter loss or failure and capture stress. Poaching or hunting did not appear to be a major cause of mortality. Monthly survival rates varied from 36 to 100%.**

## INTRODUCTION

Only limited information exists on effects of predation on adult eastern wild turkeys at the southwestern periphery of their range. Our objectives were to determine the monthly loss rates and causes of turkey mortality.

## MATERIALS AND METHODS

Our study area was located on the 19,000-ha Weyerhaeuser Company Mountain Fork Wildlife Management Area in McCurtain County, Oklahoma. The region is characterized by oak (*Quercus* spp.)-pine (*Pinus* spp.) forest, rolling topography with steep rugged hills, and streams with many spring-fed tributaries (1). Approximate site indices for pine on flat to rolling terrain and those on steeper slopes were 18 and 11 m (age 50 years), respectively.

Turkeys were captured with rocket-projected nets from November through March 1983-1984 and fitted with 164-MH radio transmitters (Wildlife Materials, Inc., 19 solar and 26 battery-powered). Turkeys were monitored from March 1983 through August 1984. Battery-powered transmitters were equipped with motion switches that activated them after remaining motionless for about 2 h. Instrumented birds were monitored 3 days/week during 3 activity periods/day (0800-1200, 1201-1600, 1601-2100 hrs). When the non-motion mode of a transmitter was detected, or location fixes remained the same for > 2 activity periods, a visual sighting was made. Recovered transmitters were attached to newly captured birds when possible. Cause of loss or death was determined by direct observation or by locating predator sign on and around dead turkeys. The following criteria were used to categorize predator kills: turkeys killed by bobcats (*Felis rufus*) typically had a partially eaten breast and neck and the entire carcass was covered with forest litter, and those killed by owls (probably great horned, *Bubo virginianus*) had the head severed from the body; feathers plucked, sheared, and strewn around the carcass; and tissue cleanly removed from the bones (2-4). Monthly survival rates were calculated as the number of known deaths during a period of time divided by the number known to have been alive initially in each month subtracted from 1 (5). Cause-specific mortality rates in telemetry studies can be evaluated by this method and expressed as simple percentages provided that all animals are radiomarked at the same time for the given period of interest (i.e. month) (6).

## RESULTS AND DISCUSSION

A total of 45 turkeys (38 female, 7 male) was captured and instrumented (9 in 1983, 36 in 1984). Nine (20%) were killed by predators during the 19-month study. Two females and 1 male were killed by bobcats, 3 females by owls, 3 females by unidentified predators, and 10 were lost to unknown causes. In addition, 6 transmitters fell off, and 11 transmitters failed due to weak batteries or other mechanical problems. The remaining 9 turkeys survived with no appar-

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ent problems. Shaffer and Gwynn (7) and Speake (8) reported that predation on hens during brood rearing and nesting was common, although this was not the case in our study. None of our 14 nesting turkeys was killed by predators; instead, predation of females occurred only during February and March, prior to nesting and brood rearing.

Some studies have suggested that attached radio transmitters exacerbate mortality (G.A. Hurst, pers. comm., 9-11). However, several other studies have shown that transmitter-induced problems are unusual and should not affect behavior or mortality (12-15). Our sample population for which predation and survival rates were calculated had been instrumented for at least 1 week prior to being included in the sample in order to exclude capture-related bias.

The annual survival rate (Table 1) with predation as the only source of loss from the sample population was 80%, which is higher than reported in most other studies (16-18). However, during most of 1983, our instrumented population was small ( $N \leq 4$  Apr. - Dec.) and therefore does not provide a reliable estimate of survival the first year. During 1984, the sample population was  $> 20$  and subsequently provided better information.

Our data suggest that survival was lowest during the late winter months. A study in northern Missouri (19) concluded that poaching and predation were the major causes of hen turkey mortality, with poaching being especially prevalent on hens during the spring "gobblers only" season. Our findings do not support the conclusion by Powell (20), Wright and Speake (21), and Kurzejeski et al. (19) that poaching losses are a major cause of wild turkey mortality.

TABLE 1. Monthly survival rate of an instrumented wild turkey population for all sources of loss in south-eastern Oklahoma, 1983-84.

| 1983  |          |                  |                    |                                    |               |                  |
|-------|----------|------------------|--------------------|------------------------------------|---------------|------------------|
| Month | <i>N</i> | Transmitter lost | Transmitter failed | Predator kill                      | Unknown cause | Survival rate(%) |
| Mar   | 11       | 1                | 4                  | 1, owl                             | 1             | 36               |
| Apr   | 4        | -                | -                  | -                                  | -             | 100              |
| May   | 4        | -                | -                  | -                                  | -             | 100              |
| Jun   | 4        | -                | -                  | -                                  | 2             | 50               |
| Jul   | 2        | -                | -                  | -                                  | -             | 100              |
| Aug   | 2        | 1                | -                  | -                                  | -             | 50               |
| Sep   | 1        | -                | -                  | -                                  | -             | 100              |
| Oct   | 1        | -                | -                  | 1, bobcat                          | -             | 0                |
| Nov   | 4        | -                | -                  | -                                  | -             | 100              |
| Dec   | 4        | -                | -                  | -                                  | -             | 100              |
| 1984  |          |                  |                    |                                    |               |                  |
| Jan   | 24       | -                | 1                  | -                                  | -             | 96               |
| Feb   | 27       | -                | 2                  | 2, bobcat<br>1, owl                | -             | 78               |
| Mar   | 27       | 3                | 1                  | 1, no I.D.<br>2, no I.D.<br>1, owl | -             | 74               |
| Apr   | 27       | -                | -                  | -                                  | -             | 100              |
| May   | 27       | -                | 2                  | -                                  | 1             | 89               |
| Jun   | 24       | -                | 1                  | -                                  | 1             | 92               |
| Jul   | 22       | -                | 4                  | -                                  | -             | 82               |
| Aug   | 18       | 1                | -                  | -                                  | -             | 94               |

Further studies will be required to evaluate predation on turkeys in southeastern Oklahoma and to ascertain if predation is a major turkey management problem.

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