Response of Wild Turkey Hens to Bear Hunting in Western North Carolina

Derik J. Reed,[1] *Department of Forestry, Clemson University, Clemson, SC 29634*

David C. Guynn, Jr., *Department of Forestry, Clemson University, Clemson, SC 29634*

Abstract: Movements of eastern wild turkey hens (*Meleagris gallapavo silvestris*) were monitored using radio telemetry on the Coweeta Hydrologic Laboratory in Western North Carolina during 1985–87. Turkeys (N = 15) responded to the use of dogs for bear hunting by temporarily abandoning portions of their established home ranges and relocating to unhunted areas during the 2-month season. Hens returned to abandoned areas soon after hunting ceased and when dogs were not used for hunting. No mortality of turkeys was detected during bear season. The rapid return of hens to former ranges suggests that unhunted habitats were crowded or that preferred habitats on Coweeta were not available to turkeys during bear hunts.

Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 44:304–309

The eastern wild turkey is more tolerant of human disturbance than was formerly thought. For example, wild turkeys have been successfully established in Midwestern farm woodlots and other areas in close proximity to humans (Wunz 1971, 1985; Little 1980; Clark 1985). Even intensive hunting pressure for big- and small-game species other than turkeys does not appear to adversely affect established populations (Everett et al. 1978*a*, Folk and Marchinton 1980). These studies, however, evaluated short-term hunting seasons, usually without the use of dogs for chase, with frequent periods of no hunting activity. The effect of long seasons involving high hunter densities and dogs has not been evaluated for wild turkeys.

Dogs accompanying hunters may be more disturbing to wild turkeys than the presence of hunters alone. Everett et. al (1978*a*) observed gobblers moving 1.1 to 1.4 km to unhunted areas during short hunts using dogs for white-tailed deer (*Odocoileus virginianus*). Although these movements were within established ranges, they indicated that the sound of barking dogs disrupts the daily activities of

[1]Present Address: Department of Forest Resources, University of Arkansas at Monticello, Monticello AR 71655

turkeys. Hunters and dogs may keep turkeys scattered during fall seasons (Schaffer and Gwynn 1967).

The objective of this study was to determine the effect of bear hunting with dogs on wild turkey movements. This study was supported by B. Hyder, formerly of the North Carolina Wildlife Resources Commission; R. Davis, Clemson University; The National Wild Turkey Federation, particularly the North Carolina State Chapter; and the USDA Forest Service, Coweeta Hydrologic Laboratory, Otto, North Carolina.

Methods

The study area was the Coweeta Hydrologic Laboratory, located in Macon County in the southwest corner of North Carolina. The Laboratory consists of 2,270 ha adjoining the Nantahala National Forest on the north, west, and south; it consists of 2 basins: Coweeta and Dryman Fork. The terrain is steep and rugged, with elevations ranging from 677–1,592 m. Annual precipitation averages 170 cm at the lower elevations to 250 cm in higher coves. Less than 2% of the precipitation is in the form of snow.

Like most National Forest lands in the southern Appalachians, the forest cover is predominantly hardwood, with species composition varying with elevation, aspect, and slope position. Coves are typically dominated by yellow-poplar (*Liriodendron tulipifera*), with northern red oak (*Quercus rubra*), cucumber-tree (*Magnolia acuminata*), red maple (*Acer rubrum*), and black locust (*Robinia pseudoacacia*) present in varying amounts. Xeric ridges consist of pitch pine (*Pinus rigida*), scarlet oak (*Q. coccinea*), hickory (*Carya* spp.), and other upland hardwoods. Northern aspects contain sugar maple (*A. saccharum*), beech (*Fagus grandifolia*), and birch (*Betula* spp.); streams and low moist slopes have white pine (*P. strobus*) and eastern hemlock (*Tsuga canadensis*) in pure or mixed stands (Luckett 1980).

The laboratory was formed in 1933, and except for experimental treatments, there have been no further disturbances. Treatments have included light selection harvesting, clearcutting without roads and no stems removed, commercial clearcutting, woodland grazing, agricultural cropping, conversion of mixed hardwoods to white pine, and conversion of hardwood stands to grass (Swank and Douglass 1977).

North Carolina presently holds a season for black bear (*Ursus americanus*) and wild boar (*Sus scrofa*) in mountainous regions of the state. Dogs are used for chase during the >2-month-long season, which occurs during October–December. On areas with good bear populations, hunter pressure is high and almost constant throughout the season. Other species hunted during this period include deer, grouse (*Bonasa umbellus*), and squirrels (*Sciurus carolinensis* and *Tamiasciurus hudsonicus*). The laboratory, the private land near it, and some adjacent public land is open to bear hunting from mid-October through the end of December. Bear hunting is not allowed during the 3-week deer season which occurs during November and December. Dogs are not allowed during the deer hunting season, and hunter density

also is diminished. Adjoining the laboratory to the west lies the Standing Indian Bear Sanctuary. Also, much of the private land on the north of Coweeta is unavailable for bear hunting. Wild turkeys are harvested legally only during the spring gobbler season.

Wild turkeys present on the study area are descendants of the original strain found there, as no stocking has occurred in that part of Macon County. Hens used in this study were captured with rocket-projected nets and chemically treated baits (Dill and Thornsberry 1950, Evans et al. 1975, Bailey et al. 1980). Hens were weighed, aged, fitted with radio transmitters (Everett et al. 1978b), and leg-banded.

From 1985–87, wild turkey hens were located by triangulation 2–3 times a week from late August until January. Diel locations were made during this period in 1986. To evaluate the effects of disturbance on turkey movements, vehicles and/or visitors encountered during the course of monitoring were counted. Laboratory use by Forest Service and university research personnel remained constant through the entire period; therefore, these users were not recorded.

Telemetry error was estimated by placing transmitters ($N = 11$) in locations frequented by turkeys, and attempts to locate these transmitters were made by a different observer. Three attempts each by 2 observers were made on most transmitters ($N = 60$ attempts), and the locations were plotted on maps in the same manner as turkey locations. Deviations from the actual location of the transmitter were measured, and a mean error of location estimation was computed.

Data were combined in 2×2 tables for Chi-square analysis (Steel and Torrie 1960). Turkey telemetry locations were classified as either being in or out of areas open to hunting and were blocked in rows by bear season status (open or closed to bear hunting). Deer season data were included with pre-bear season data due to the lack of influence such hunting appears to have on turkeys (Folk and Marchinton 1980, Everett et al. 1978*a*).

Results and Discussion

Thirty-two turkeys were trapped during 1985–87, and transmitters were placed on 29 hens. Fifteen of these hens included the laboratory in their summer home ranges. These 15 turkeys were monitored in the fall (5 hens each fall) for disturbance data. Rugged terrain, thick vegetation, and high humidity often resulted in signal bounce and a high degree of error in point location ($\bar{x} = 345$ m, SE = 34 m). However, it was relatively easy to determine when a monitored turkey was located within a particular cove or watershed or when turkeys were located within the Laboratory boundaries.

Hunter effort on Coweeta is related to hunter perceptions of bear numbers. During the 1985 hunt, bears appeared to be common, and hunting pressure was correspondingly high from both local hunters and hunting parties from outside Macon County (as many as 30 vehicles present on the area at 1 time). Frequency of sightings, bear tracks, and hunter interviews indicated that fewer bears were on the area in the following 2 years, and except for early in the 1986 bear season, hunter

density was limited to about 10 local hunters who traditionally hunted this area as a party (Table 1).

During 1985 and 1986, turkeys used areas open for bear hunting significantly more when bear season was closed (Table 2). During the 1987 season, marked turkeys used hunted and unhunted areas similarly ($P = 0.74$). However, all monitored turkeys left Coweeta during a period of intense hunting, which included the harvest of 5 bears prior to deer season. All 5 turkeys subsequently returned to Coweeta within 2 weeks.

Turkey movements followed a general pattern during the fall at Coweeta. Intense hunting activity resulted in turkey movements to adjacent unhunted areas. Cessation of dog activity allowed turkeys to move back to their former ranges, but renewed high hunting pressure caused them to return to unhunted areas.

Bear hunting did not appear to affect the Coweeta wild turkey population to a great extent, as trapping observations indicated an increase in turkey numbers from 1985–1987. However, it is clear that easy access to hunters coupled with intensive hunting with dogs can cause turkeys to temporarily abandon portions of their range. The tendency shown by turkeys on Coweeta to return quickly after disturbances ceased may reflect wild turkey's preference for habitats available on Coweeta, or may be a result of social influences exerted by unmarked turkeys already occupying refuge areas.

If disturbance by hunters is sufficient to cause turkeys to abandon portions of their range, then large parcels of otherwise suitable turkey range may become

Table 1. Mean number of hunter vehicles encountered during monitoring wild turkeys on the Coweeta Hydrologic Laboratory, North Carolina, 1985–87.

Season	1985	1986	1987
Preseason			
Week 1	—	2.3	—
2	0.0	3.1	0.0
Bear season			
Week 1	26.0	7.5	12.5
2	4.0	4.6	3.0
3	0.0	1.6	2.0
4	0.5	3.5	1.0
5	4.5	1.9	1.0
6	3.0	2.3	12.0
Deer season			
Week 1	12.5	—	3.0
2	—	0.8	2.0
3	5.0	0.0	0.0
Second bear season			
Week 7	5.0	0.0	0.0
8	2.0	—	—
9	—	0.5	—

Table 2. Number and percentage of wild turkey hen locations on the Coweeta Hydrologic Laboratory, North Carolina, 1985–87.

Status of bear hunting season	% locations in hunted area[a]	Number of locations (Aug–Jan)
1985[b] (N = 5)		
Open	40.5	121
Closed	79.2	24
1986[c] (N = 5)		
Open	50.6	174
Closed	72.3	47
1987[d] (N = 5)		
Open	60.0	45
Closed	64.0	25

[a]Remainder of locations were in unhunted areas.
[b]χ^2 = 12.0, 1 df, $P < 0.001$.
[c]χ^2 = 7.1, 1 df, $P = 0.008$.
[d]χ^2 = 0.1, 1 df, $P = 0.742$.

unacceptable, resulting in longer movements and reduced range capacity. The increased risk of poaching associated with large numbers of hunters in the woods must also be considered when evaluating the effects of disturbance. Fleming and Speake (1976) believed that illegal kills during hunts for other species resulted in as much as 50% of the total loss of young turkeys from a stable population in the Alabama Piedmont.

No illegally harvested turkeys were found during this study. However, the presence of investigators may have discouraged poachers. Sanctuaries may limit the illegal fall harvest of turkeys by reducing the number of hunters in certain areas. Management practices beneficial to wild turkeys would include providing areas on which vehicle access is limited, while still providing for primitive hunting opportunities. Reducing the length of the bear season or restricting the use of dogs also would allow for greater habitat utilization by wild turkeys on Coweeta during the fall.

Literature Cited

Bailey, R. W., D. Dennett, Jr., H. Gore, J. Pack, R. Simpson, and G. Wright. 1980. Basic considerations and general recommendations for trapping the wild turkey. Proc. Natl. Wild Turkey Symp. 4:10–23.

Clark, L. G. 1985. Adjustment by transplanted wild turkeys to an Ohio farm land area. Proc. Natl. Wild Turkey Symp. 5:33–47.

Dill, H. H. and W. H. Thornsberry. 1950. A cannon projected net-trap for capturing waterfowl. J. Wildl. Manage. 14:123–127.

Evans, R. R., J. W. Goertz, and C. T. Williams. 1975. Capturing wild turkeys with tribromoethanol. J. Wildl. Manage. 39:630–634.

Everett, D. D., D. W. Speake, W. K. Maddox, D. R. Hillestad, and D. N. Nelson. 1978a. Impact of managed public hunting on wild turkeys in Alabama. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 32:116–125.

———, ———, ———, and R. E. Hawkins. 1978b. Multi-purpose radio transmitters for studying mortality, natality and movements of eastern wild turkeys. Biotelemetry 4:155–158.

Fleming, W. J. and D. W. Speake. 1976. Losses of the eastern wild turkey from a stable Alabama population. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 30:377–385.

Folk, R. H., III, and R. L. Marchinton. 1980. Effects of intensive hunting on behavior of wild turkeys. J. Wildl. Manage. 44:398–402.

Little, T. W. 1980. Wild turkey restoration in "marginal" Iowa habitats. Proc. Natl. Wild Turkey Symp. 4:45–60.

Luckett, L. 1980. Management of the wild turkey on National Forest lands in North Carolina. Proc. Natl. Wild Turkey Symp. 4:159–167.

Schaffer, C. H. and J. W. Gwynn. 1967. Management of the eastern turkey in oak-pine forests of Virginia and the southeast. Pages 303–342 *in* O. H. Hewitt, ed. The wild turkey and its management. The Wildl. Soc., Washington, D.C.

Steel, R. G. D. and J. H. Torrie. 1960. Principles and procedures for statistics. McGraw-Hill, Inc., New York. 633pp.

Swank, W. T. and J. E. Douglass. 1977. A comparison of nutrient budgets for undisturbed and manipulated hardwood forest ecosystems in the mountains of North Carolina. Pages 345–364 *in* D. L. Correll, ed. Watershed research in North America. Chesapeake Bay Center for Environ. Studies. Edgewater, Md.

Wunz, G. A. 1971. Wild turkey tolerance of human disturbance and limited range. Trans. Northeast. Fish and Wildl. Conf. 28:159–165.

———. 1985. Wild turkey establishment and survival in small range units in farmland and suburban environments. Proc. Natl. Wild Turkey Symp. 5:49–53.