

Dispersal of Restocked Eastern Wild Turkeys in East Texas

Curtis R. Hopkins,¹ *Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX 77843*

Joseph J. Campo, *Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX 77843*

Wendell G. Swank, *Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX 77843*

David J. Martin, *Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX 77843*

Abstract: Dispersal of 54 restocked eastern wild turkeys (*Meleagris gallopavo silvestris*) was studied using radio telemetry on 2 different areas in east Texas from February 1979 through July 1981. Twenty-five turkeys dispersed farther than 5 km from the release site. The maximum distance recorded from the release site for the first year following release varied from 1.3 km to 11.9 km and averaged 4.6 km. Dispersal increased through the spring and summer following release, then did not further increase until the next spring. The mean annual dispersal area was 1,688 ha. For the entire study period, the population dispersal areas were 19,300 ha on 1 study area and 10,545 ha on the other.

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Historically, the eastern wild turkey occupied the river bottom and upland forests of east Texas (Schorger 1966). By 1942 the native population was reduced to less than 100 turkeys which was attributed to overhunting and destruction of ancestral habitat (Anonymous 1945). Wild turkey restoration efforts in east Texas began in the early 1940's with the release of pen-reared eastern turkeys, which soon disappeared. Subsequently, Rio Grande (*M. g. intermedia*), Florida (*M. g. osceolo*), and eastern wild turkeys were released through 1974. Of 13 general release locations; 2 were considered successful, 2 were failures, and success at 9 locations was unknown (Boyd and Oglesby

¹ Present address: Ducks Unlimited, Inc., Rt. 3 Box 81C, Grenada, MS 38901.

1975). Comprehensive data on dispersal and range of restocked eastern turkeys in east Texas at the time this study was initiated were not available. Few studies have been reported on dispersal of eastern turkeys restocked in the southeast (Speake et al. 1969, Eichholz and Marchinton 1975, Bowman et al. 1979, Everett et al. 1979). This report is part of a study of turkey biology to investigate the behavior, movement, habitat use, and reproduction of restocked turkeys. Data presented here are dispersal from the release site of eastern wild turkeys restocked in 1979 and 1980 on 2 different areas in east Texas.

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Methods

The study areas (125 km apart) were located in the east Texas Timber Land Resource Area, which encompasses approximately 6.4 million ha, in the Southern Coastal Plain (Godfrey et al. 1973). Perennial streams provided water throughout the year on the areas. The major land use on both areas was timber production. Both areas were closed to general public access.

The Beef Creek study area was located in Jasper county, approximately 3 km north of Jasper. The major landowner was Temple-Eastex Incorporated. The area was composed of approximately 11,000 ha and included pine plantations 1-10 years old (15%), pine poletimber and sawtimber (70%), bottomland hardwood and pine-hardwood (14%), and openings (1%). Topography of the area was gently rolling to hilly. About 800 ha were clear-cut (average size 70 ha) and regenerated to pine during this study. Approximately 500 ha were control burned during the spring of 1980 and 1981.

During the spring of 1978, 5 subadult hens and 3 subadult Florida wild turkey gobblers were released on the area by the Texas Parks and Wildlife Department. About 14 turkeys were on the area at the beginning of the study.

The Brushy Creek study area was located in Polk and Trinity counties, 5 km south of Groveton. Most of the research was conducted on the 10,100-ha Brushy Creek Wildlife Management and Research Area, owned by St. Regis Paper Company. About 16% of the management area was pine planta-

tions 1 to 10 years old; 5% was openings, 5% was pine-hardwood, and 74% was pine stands. Topography of the area was gently rolling. Six hundred hectares were thinned in 1979, 977 ha in 1980, and 855 ha in 1981. Two-year-old control burned stands (183 ha) were present at the beginning of the study. In the springs of 1980 and 1981, 117 ha and 237 ha were control burned.

Game food plots were maintained on 90 ha of forest openings. Eleven hectares of transmission line right-of-way were planted with chufa flatsedge (*Cyperus esculentus*) in May 1980 and 1981. No wild turkeys occurred on Brushy Creek prior to the 1979 release.

On both areas, pine stands included loblolly pine (*Pinus taeda*) and, to a lesser extent, slash pine (*P. elliottii*), longleaf pine (*P. palustris*), and shortleaf pine (*P. echinata*). Oaks (*Quercus* spp.), beech (*Fagus grandifolia*), magnolias (*Magnolia* spp.), elms (*Ulmus* spp.), hickories (*Carya* spp.), cypress (*Taxodium distichum*), and sweetgum (*Liquidambar styraciflua*) occurred in upland creek drains and bottomland forests on Beef Creek. However, few pine-hardwood forests were on Brushy Creek and hardwoods included mainly upland oaks and sweetgum.

Forty-one eastern wild turkeys were released on Brushy Creek (8 gobblers and 12 hens) and Beef Creek (8 gobblers and 13 hens) in February and early March 1979. Twelve additional hens were released on each area in February 1980. Fifty-eight turkeys were live-trapped in Louisiana by the Louisiana Wildlife and Fisheries Commission. Seven turkeys were donated to Texas by the Mississippi Department of Conservation. The turkeys were monitored between 9 February 1979 and 31 July 1981.

The turkeys were released near the center of each area. All turkeys were released at the same location on Beef Creek. Three release sites within 1 km of each other, and 1 site 4 km from the other sites were used on Brushy Creek. Prior to release, all turkeys were individually marked with patagial tags (Knowlton et al. 1964) and fitted (Williams et al. 1968) with 90-g, solar powered transmitters (150–152 MHz). In the winter 1980–81, a total of 20 hens from both areas was re-captured with rocket-projected netting and released at the capture site with new solar or battery powered transmitters.

Triangulation (Cochran and Lord 1963), using a medium-gain Yagi antenna mounted through the roof of a truck was used to obtain turkey locations (fixes). Fixes were taken during daytime and collected at random intervals. Fixes were plotted on aerial photographs (1:15,840) divided into an X (east-west) and Y (north-south) grid. The average error triangle for fixes was 1 ha.

Maximum dispersal distance (km) was defined as the greatest straight-line distance a turkey moved from the release site. Dispersal area (ha) was determined by a computer algorithm using Mohr's minimum home range method (Silvy et al. 1979). Mean individual dispersal area was based on the

dispersal area for each turkey. Population minimum dispersal area was based on all locations obtained after release of the turkeys.

Results and Discussion

Dispersal Distance From Release Site

Dispersal for the entire study period was determined by 4,273 fixes on 24 turkeys on Brushy Creek and 30 turkeys on Beef Creek. Maximum dispersal from the release site varied from 1.3 km to 11.9 km and averaged 5.4 km. The 11.9 km movement was exhibited by a hen released on Brushy Creek in 1979. The farthest dispersal on Beef Creek was 8 km by a hen released in 1980. The greatest maximum dispersal recorded for restocked turkeys was 4.6 km in Georgia (Eichholz and Marchinton 1975), 13.8 km in North Carolina (Bowman et al. 1979), and 9.2 km in Alabama (Everett et al. 1979). Thirty-seven percent of the turkeys on Beef Creek and 58% on Brushy Creek dispersed farther than 5 km from the release site (Table 1).

Annual dispersal was determined by 1,640 fixes on 16 turkeys on Brushy Creek (5 gobblers and 11 hens) and 20 turkeys on Beef Creek (4 gobblers and 16 hens) that were tracked at least 1 year. The mean maximum dispersal distance (MMD) did not differ between study areas (4.6 km). Hens (4.7 km) dispersed slightly farther than gobblers (4.3 km) during the first year following release. The MMD for 1979 hens increased to 5.4 km in the second year.

Table 1. Cumulative Maximum Dispersal of 54 Restocked Turkeys, Released in 1979 and 1980, within Specified Radial Distances (km) from Release Point on Beef Creek and Brushy Creek, February 1979–July 1981

Km Within	Total				Beef				Brushy			
	Beef		Brushy		1979		1980		1979		1980	
	N	%	N	%	N	%	N	%	N	%	N	%
1	0	0	0	0	0	0	0	0	0	0	0	0
2	2	7	1	4	1	5	1	9	1	7	0	
3	4	13	2	8	3	16	1	9	1	7	1	11
4	14	47	7	29	11	58	3	27	4	27	3	33
5	19	63	10	42	13	68	6	54	5	33	5	56
6	22	73	12	50	15	79	7	64	7	47	5	56
7	25	83	18	75	16	84	9	82	11	73	7	78
8	29	97	20	83	19	100	10	91	13	87	7	78
9	30	100	21	88			11	100	13	87	9	100
10			21	88					13	87		
11			21	88					13	87		
12			24	100					15	100		

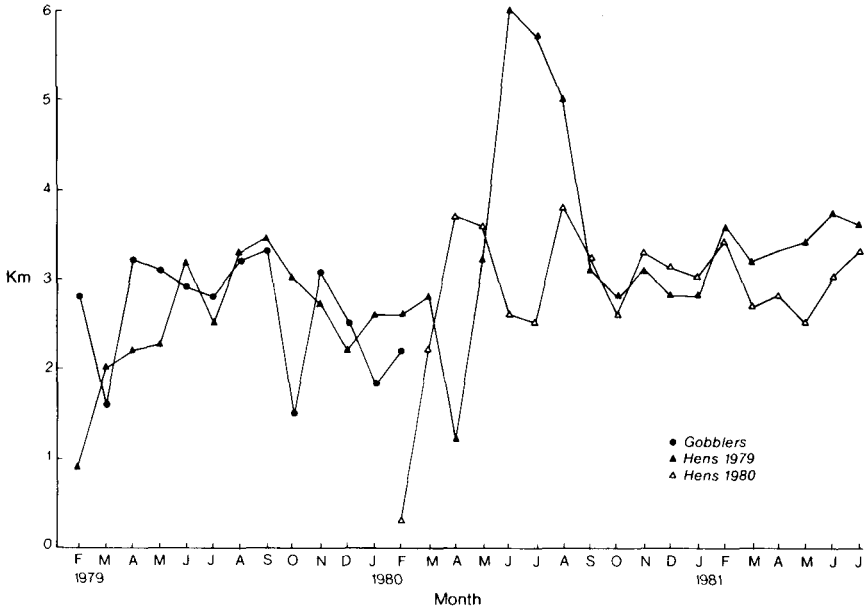


Figure 1. Mean maximum dispersal by month from release site for 20 eastern wild turkeys restocked on Beef Creek study area, east Texas, February 1979 to July 1981.

Although some turkeys travelled considerable distances from the release site in the first year, the majority returned to the release site. The MMD by month in 1979 did not exceed 4 km (Figs. 1, 2). Hens released in 1980 exhibited similar movements to 1979 hens. On Beef Creek, hens released in 1979 had increased movements from the release site during the second summer, but returned to within 3 km by fall (Fig. 1). The increased second summer movement was attributable to brood hen movements. Hens on Brushy Creek made similar movements in the second summer (Fig. 2). Combining data from both areas, the MMD during the summer for hens with broods was 3.9 km and for broodless hens 2.9 km.

Our data indicated that it required 7 to 8 months for the turkeys to become adjusted to their new habitat (Figs. 1, 2). The fluctuations in the MMD after the first year were probably seasonal responses. For the entire study period, only 2 hens on Beef Creek and 1 hen on Brushy Creek had mean X-Y coordinates more than 3 km from the release site. Our data were similar to those of Speake et al. (1969) who reported that restocked turkeys in Alabama selected ranges centering around the more familiar area of the release site.

Dispersal Area

The mean individual dispersal area (MIDA) for the first year following release for 36 turkeys was 1,958 ha on Beef Creek and 1,343 ha on Brushy Creek with an average of 1,688 ha on both areas. The MIDA was slightly larger for gobblers (1,852 ha) than hens (1,710 ha). Everett et al. (1979) found that 4 restocked gobblers had an average annual range (dispersal area) of 1,691 ha and the annual range of 5 restocked hens averaged 1,455 ha. The MIDA for the second year after release for 1979 hens was 1,766 ha.

Fifty-four turkeys provided data for the population minimum dispersal area (MDA). The MDA was almost twice as large on Brushy Creek (19,300 ha) as on Beef Creek (10,545 ha). The greater MDA on Brushy Creek was primarily attributed to the hen that dispersed 11.9 km. Without this movement, the MDA on Brushy Creek was reduced to 14,956 ha. Everett et al. (1979) reported that the total range used by resident and restocked turkeys in Alabama was 14,170 ha for a 3-year period. The larger MDA on Brushy Creek than Beef Creek may be related to the lower quality habitat on Brushy Creek due to a lower hardwood component. Everett et al. (1979) reported that wild turkey ranges are primarily a function of habitat quality.

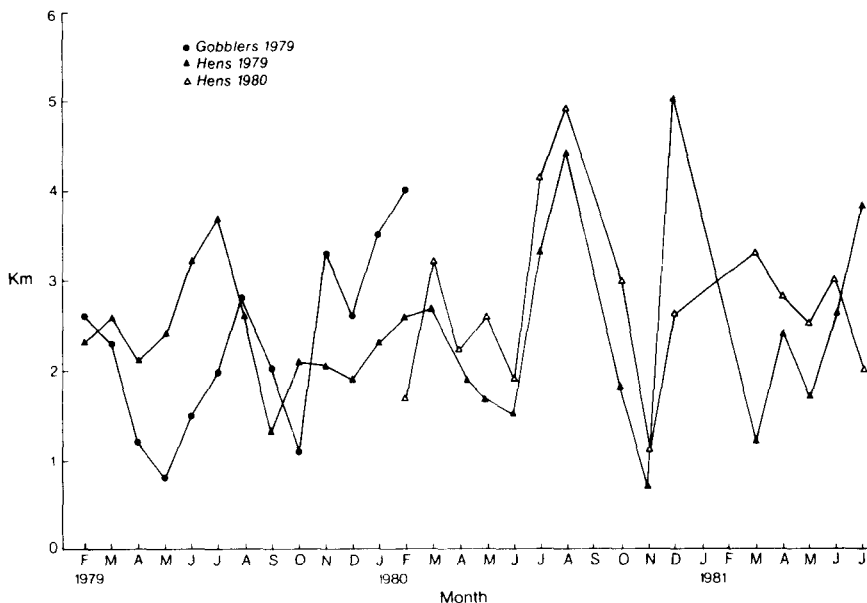


Figure 2. Mean maximum dispersal by month from release site for 16 eastern wild turkeys restocked on Brushy Creek study area, east Texas, February 1979 to July 1981.

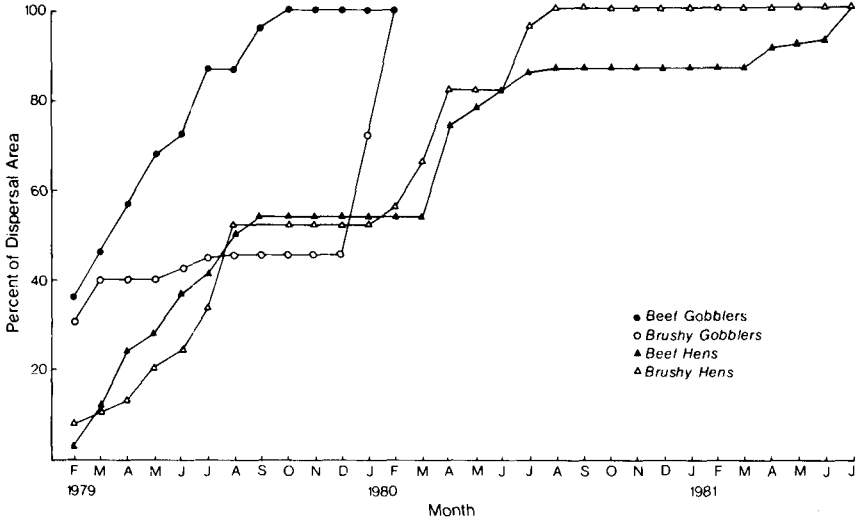


Figure 3. Rate of increase in population dispersal area by month for 54 eastern wild turkeys restocked on Beef Creek and Brushy Creek study areas, east Texas, February 1979 to July 1981.

The rate of increase in MDA for hens was very similar on both areas (Fig. 3). The MDA for hens increased through the spring and summer following release, then did not further increase until the next spring. By the end of the first summer, hens had occupied less than 60% of their MDA. The lack of increase in MDA during the first fall and winter was due to the turkeys returning to the vicinity of the release site. The nearly doubling of MDA in the second year after release was primarily attributed to brood hen movements. About 80% of the MDA for Beef Creek gobblers was reached in the spring and summer. A marked shift in range from fall to winter accounted for nearly half of the MDA for Brushy Creek gobblers.

Conclusions

Almost all of the turkeys centered their activity within 3 km of the release site. Only 3 turkeys did not include the release site in their dispersal area. Turkeys rapidly dispersed into their new habitat through the spring and summer following release, then did not further increase dispersal area until the next spring. The population dispersal area increase in the second summer was primarily due to brood hen movements into previously unoccupied terri-

tory. It appears that brood hens may be the major segment responsible for expansion of occupied habitat.

Our study indicated that over a 2.5-year period, restocked turkeys distributed themselves over a 10,000 to 15,000 ha area. To assure protection, this should be the minimum size area selected for restocking turkeys in east Texas. The probability of turkeys remaining on the area will be increased by making the release in the geographical center of the area.

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