

Proceedings of the Iowa Academy of Science

Volume 75 | Annual Issue

Article 21

1968

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Recommended Citation

Wigal, Dennis D. and Haugen, Arnold O. (1968) "Survival, Reproductive Success, and Spread of Introduced Rio Grande Turkeys in Northeast Iowa," *Proceedings of the Iowa Academy of Science*: Vol. 75: No. 1 , Article 21.
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Survival, Reproductive Success, and Spread of Introduced Rio Grande Turkeys in Northeast Iowa¹

DENNIS D. WIGAL² and ARNOLD O. HAUGEN³

Abstract. Thirty-nine Rio Grande wild turkeys (*Meleagris gallopavo intermedia*) from Texas were introduced in the Yellow River State Forest, Allamakee County, Iowa, in the winter of 1960-61. The population was studied in three northeastern Iowa counties from June, 1966, through September, 1967; concentrated field studies were centered in and near the Paint Creek Unit of the forest. Adult turkeys appeared to tolerate the northeastern Iowa climate well, but poults may not be so tolerant. Although reproduction has occurred each year since the introduction, poult survival seemingly has been sporadic, possibly because of differences in weather conditions during the rearing seasons. Records indicate production was favorable for 1961, 1965, and 1967 compared with 1962, 1963, 1964, and 1966 when it seemed to be less so. The turkey population appeared to be rather stable by the end of the study but probably never has exceeded 100. Nevertheless, each year there has been a progressive extension of the turkeys' known range. Sighting records have shown that the main inhabited turkey range was composed of 71 square miles in 1961, 100 in 1962, 108 in 1963, 139 in 1964, 149 in 1965, 316 in 1966, and 343 in 1966-67. Verified sightings have been made across the Mississippi River in Wisconsin and up to 41 miles from the release area in Iowa.

The eastern wild turkey (*Meleagris gallopavo silvestris*) inhabited the forested regions of early Iowa. By about 1910, it had become extinct in the state. The first attempt to re-establish turkeys with wild-trapped stock was made by the Iowa State Conservation Commission. On November 18, 1960, 20 Rio Grande turkeys (*Meleagris gallopavo intermedia*), which had been trapped near Sonora, Texas, were released in the Paint Creek Unit of the Yellow River State Forest, Allamakee County, Iowa (Figure 1). On March 7, 1961, a second release of 19 Rio Grande turkeys from the same source was made near the first release site. Twenty-nine hens and 10 gobblers were involved.

Intensive field investigations to determine the extent of establishment of wild turkeys in northeastern Iowa were made during the summer of 1966 and winter of 1966-67; they served as the basis of a study analyzed by Wigal (1968). Additional field work was conducted during the spring and fall of 1966 and the spring and summer of 1967. Many of the data collected prior to the initiation of this study were secured from Iowa State Conservation Commission records.

¹Journal Paper No. 5904 of the Iowa Agriculture and Home Economics Experiment Station, Ames, Iowa. Project No. 1665. A contribution of the Iowa Cooperative Wildlife Research Unit, financed jointly by the Iowa State Conservation Commission, Iowa State University, Bureau of Sports Fisheries and Wildlife, and the Wildlife Management Institute.

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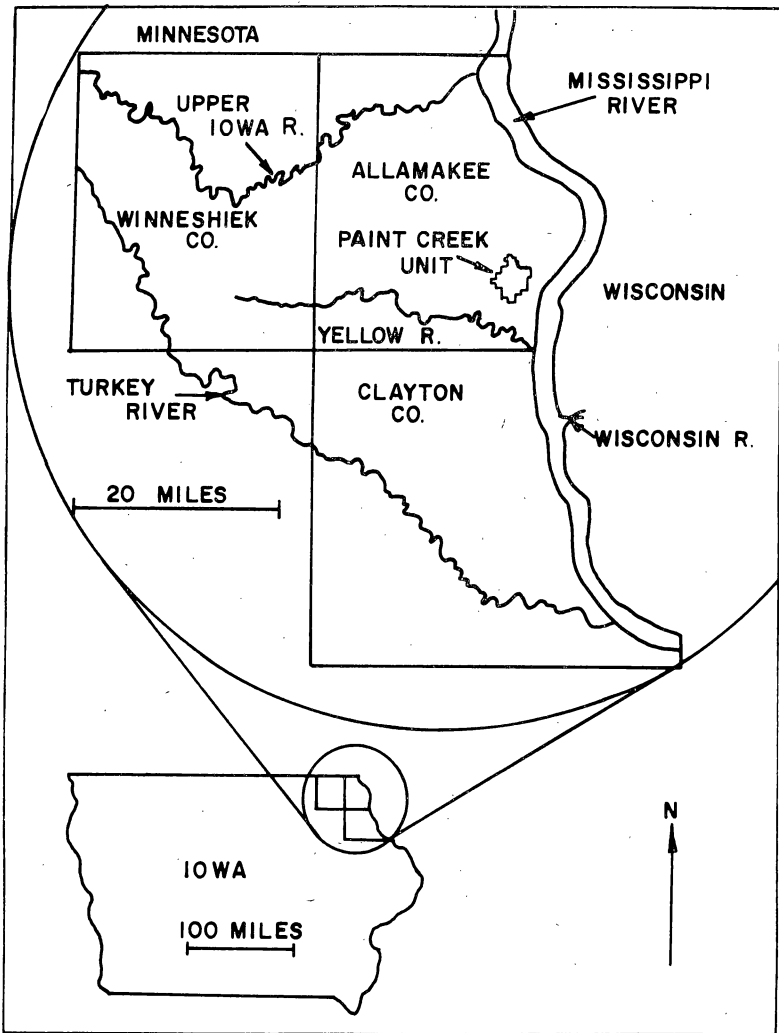


Figure 1. Extensive wild turkey study area in northeastern Iowa.

DESCRIPTION OF STUDY AREA

General investigations in northeastern Iowa were conducted entirely in an extensive study area composed of Clayton, Allamakee, and Winneshiek Counties (Figure 1). Concentrated field studies were centered in a 2,600-acre study area (primary study area) located in the south-eastern portion of the Paint Creek Unit of the Yellow River State Forest and on adjoining private land. The Paint Creek Unit, totaling 3,300 acres, is the largest of the seven units composing the 5,400-acre Yellow River State Forest.

Most of the Yellow River State Forest, and especially the Paint Creek Unit, is managed for timber, wildlife resources, and outdoor recreation. Numerous wildlife ponds have been constructed throughout the forest, and food patches are planted every year to supplement the winter food supply for wildlife and particularly for turkeys. Selective cutting of timber is practiced each winter.

Much of the three-county study area is characterized by a hilly and often rugged terrain created largely by three major drainage systems; i.e., the Upper Iowa, Yellow, and Turkey Rivers. Valley walls may vary from gentle soil-covered slopes to sheer limestone cliffs 400 to 600 feet high (Hoslett, 1965). The widespread limestone formations in the region are permeated with caves, sinkholes, and subterranean streams, the latter evidenced by an abundance of springs.

The dominant forest type in the Paint Creek Unit is mixed hardwood and is considered typical for most of Clayton, Allamakee, and Winneshiek Counties. The lower slopes and outer borders of floodplains of the region are dominated by sugar maple (*Acer saccharum*), black maple (*Acer nigrum*), basswood (*Tilia americana*), butternut (*Juglans cinerea*), and American elm (*Ulmus americana*). White oak (*Quercus alba*), red oak (*Quercus rubra*), bitternut hickory (*Carya cordiformis*), and shagbark hickory (*Carya ovata*) are dominant on the upper slopes and the uplands of Paint Creek Unit.

The majority of the land in northeastern Iowa is either under cultivation or in pasture; the rest is mostly covered by timber. A survey in 1954 indicated that Clayton County was covered by 24 percent timber, Allamakee County by 32 percent, and Winneshiek County by 13 percent (Thornton and Morgan, 1959). In the Yellow River State Forest, several upland plains formerly under cultivation are now planted partly with conifers and partly with forage grasses.

METHODS

More than 300 persons living in Clayton, Allamakee, and Winneshiek Counties and Prairie du Chien, Wisconsin, were questioned to secure information about turkeys. Among those interviewed were farmers, rural mail carriers, county extension agents, and Agricultural Stabilization and Conservation Service (ASCS) office managers for the three counties, state conservation officers, Yellow River State Forest personnel, Effigy Mounds National Monument personnel, Upper Mississippi River Wildlife and Fish Refuge managers, state fisheries biologists, state foresters, fishermen, hunters, hikers, campers, and others. Many of these cooperators acted as intermediaries by "spreading the word" and were contacted periodically.

In addition to interviews, information was also sought through the news media (newspapers and radio programs) and the mails (questionnaires). Every report of a turkey sighting or other pertinent information received second-hand was checked at the source when feasible.

Considerable time was spent searching on foot for turkeys and field evidence of their presence in several locations in Allamakee County (especially the primary study area and the Paint Creek Unit) and, to a lesser extent, in Clayton County. Actual observation of turkeys was sought, but turkey signs (tracks, droppings, shed feathers, scratching, etc.) were noted when found. Searching for turkeys was also done by car during early mornings and evenings.

SURVIVAL AND REPRODUCTIVE SUCCESS

Evidently most of the turkeys survived their first northeastern Iowa winter in 1960-61 and subsequently showed signs of accepting their new environment. From the number and sizes of broods reported during the summer of 1961, it appeared that turkeys had good reproductive success that year. According to Klonglan (1962), seven broods totaling 58 young birds were sighted in and near Paint Creek Unit in the summer of 1961. An average brood size of 8.3 for each of the seven broods appears favorable, although that figure must be accepted with some caution. Dates when broods were sighted were not available. Since mortality is expected throughout the summer, the number of young in broods sighted in the early summer would undoubtedly be fewer by fall. Thus, all 58 poults probably were not alive by the end of the summer.

After 1961 there is a paucity of brood data until 1965. But, there are enough records from each of the seven years since the turkeys were stocked to show that reproduction has occurred each breeding season, although sporadically. Records indicate that production was favorable for 1961, 1965, and 1967 compared to 1962, 1963, 1964, and 1966 when production did not appear as good.

Yellow River State Forest personnel and residents living near the Paint Creek Unit repeatedly mentioned that "broods were seen everywhere" in 1965. In that year, of 10 brood sightings that were reported, at least six contained eight or more poults.

The average size of all broods reported for 1965 is 8.8. This figure compares favorably with average brood sizes determined in other studies (Mosby, 1967). Since dates for the sightings were not given, however, this figure could be considerably reduced if any of the sightings were made in the early summer. Furthermore, not enough information was available to determine if all the sightings were made of separate broods. It is likely that some of the sightings were duplicates. Nevertheless, because of the generally large brood sizes, poult survival was probably higher in 1965 than in the three previous years.

Records in which brood sizes are given frequently reveal the low numbers of poults per brood, especially in years of low over-all production. This is suspected of being a result more of low poult survival than of low hen fecundity. Enough records of broods containing up to

12 young each are available to show that northeastern Iowa turkeys commonly lay normal-sized clutches. In addition, Iowa State Conservation Commission records show that a hatched nest containing 13 egg shells was found in late June, 1962.

The best documented evidence of low production involves the summer of 1966 when this study began. The only reports of turkey nests in the spring of that year were supplied by three farmers whose properties lay adjacent to or near Paint Creek Unit. Two of the farms reportedly had one nesting hen each, and the third was thought to have four nesting hens on it. The first brood sighted in 1966 consisted of seven poults. It was observed in early July in the southern part of the primary study area. A month later a brood of four was observed twice in the same area. It was believed that brood was the remnant of the brood of seven.

Every other brood sighting received for the summer was of either one or two poults, a reflection probably of low poult survival. On August 15, the senior author made the first of three observations of a single poult accompanied by three adult hens. Obviously, two of the hens were non-breeding, sterile, or had lost their broods or clutches. These turkeys were later joined by a fourth adult hen, also without a brood. Since the latter hen did not join the other four turkeys until late summer, the bird probably had produced a brood and lost it. Hens are not known to remain alone in the summer when they have failed to produce or raise young.

On January 22, 1967, the young bird and one of the adult hens from the flock of five were poached. With the death of this bird of the year, the last surviving young turkey produced during 1966 in the Paint Creek Unit area might have been lost.

In 1967, reports on brood sightings were collected through September 8. Cooperators supplied data on 10 sightings, eight of which were made in or within one mile of the Paint Creek Unit. It is believed that several of the Paint Creek Unit sightings were duplicates of the same brood and that from only three to five broods were actually produced. Those broods ranged in size from one (an uncertain count) to 12, the latter a brood with which two hens were associated. Two additional broods, each containing eight poults, were observed south of Paint Creek Unit during the summer of 1967.

SPREAD

Each year since the release of turkeys in the Paint Creek Unit in the winter of 1960-61, there has been a progressive extension of their known range (Figure 2, Table 1). Sightings have been made in all directions from the release area although most of the sightings reported through 1965 were made in southeastern Allamakee and northeastern

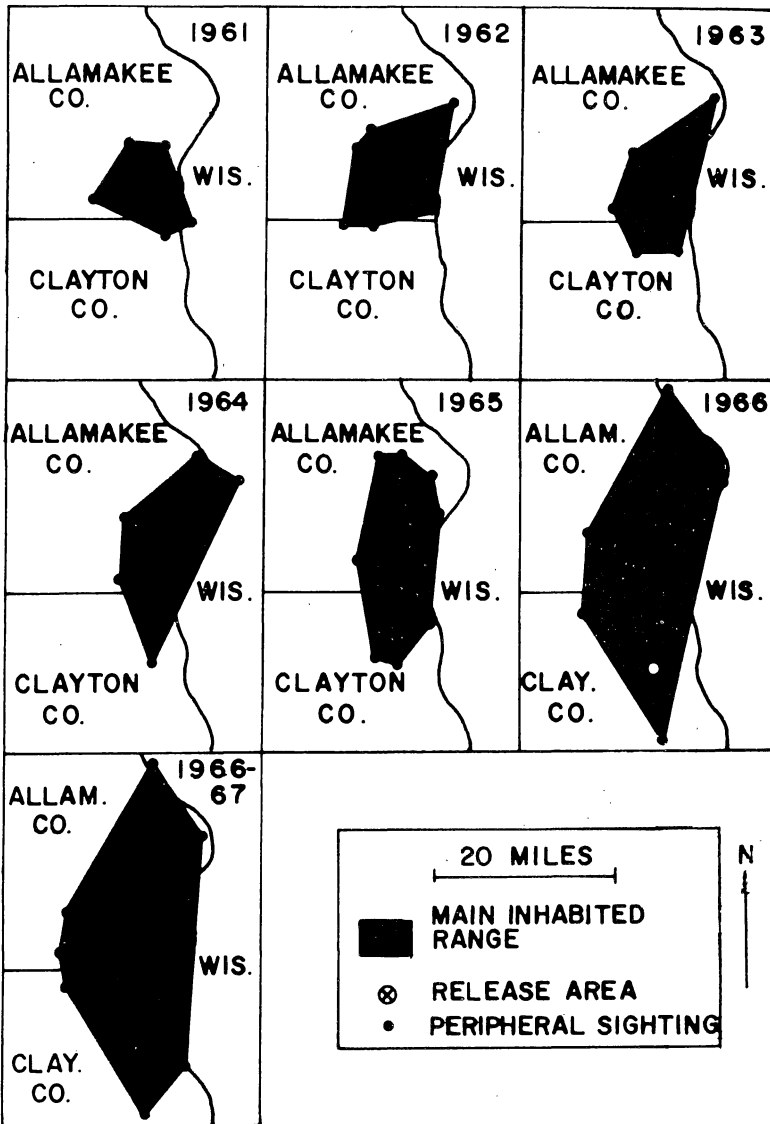


Figure 2. Wild turkey range extension, 1961 to 1966-67, in main inhabited range in northeastern Iowa.

Clayton Counties, particularly the former. All of that land is considered the main inhabited range (Figure 2).

To show the yearly expanding range, all observations (as reported by farmers and other residents) were plotted on a detailed map of the extensive study area according to the year in which they were made. By joining the outermost locations of observations for each year in

Table 1
Known Main Inhabited Turkey Range for Each Year from 1961
through September, 1967, Based on Sight Records

Year	Miles of Farthest Sighting from Release Area	Direction of Farthest Sighting from Release Area	Square Miles of Range	Location (County)
1961	8.5	South	71	Clayton
1962	9.5	Southwest	100	Clayton
1963	10.0	Northeast	108	Allamakee
1964	14.0	South	139	Clayton
1965	14.5	South	149	Clayton
1966	22.5	South	316	Clayton
1966-67	22.5	South	343	Clayton

the area of concentrated sightings (southeastern Allamakee and northeastern Clayton Counties), the main inhabited ranges were determined.

Since 1966, turkeys have been observed to the west and northwest of the release area, mostly in Winneshiek County (Figure 3, Table 2). At least two additional sightings, one in 1963 and one in 1964, have been made in that direction (Figure 3, Table 2). These sightings are not included in the main inhabited range because each is too far removed from the concentrated population of turkeys in southeastern Allamakee and northeastern Clayton Counties. Much of the intervening land is intensively cultivated farmland unsuitable for turkey habitation. Moreover, these observations are too few and spread too greatly over a wide area to accurately reflect inhabited range. At the end of this study, however, there was a small population of turkeys in northeastern Winneshiek County.

Table 2
Verified Turkey Sightings Not Included in the Main Inhabited Range

Year	Location (County)	Direction from Release Area	Miles from Release Area	Number of Turkeys
1963	Winneshiek	Northwest	22	1
1964	Allamakee	Northwest	16	8-10
1965	Winneshiek	Northwest	23	2
	Winneshiek	Northwest	33	2
1966	Allamakee	Northwest	27	"Several"
	Allamakee	Northwest	24	1
	Winneshiek	Northwest	29	?
	Winneshiek	West	21	2, 10, and 12
	Winneshiek	West	36	2
	Winneshiek	Northwest	41	6
	Winneshiek	Northwest	25	8
1967	Winneshiek	Northwest	28	1
	Winneshiek	Northwest	23	12
	Winneshiek	Northwest	26	6

The known main inhabited range occupied each year since the release is listed in Table 1. All the area listed for each year does not support turkeys. This is especially true for the 1966 and 1966-67 ranges

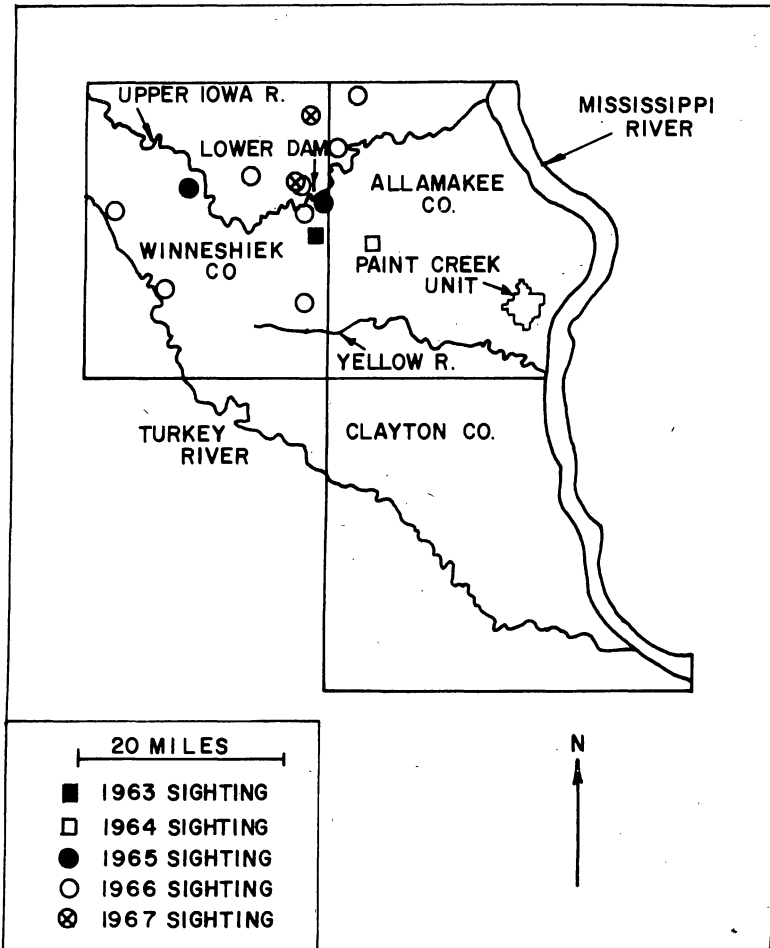


Figure 3. Verified sightings of wild turkeys made from 1963-67 and not included in the main inhabited range in northeastern Iowa.

which encompassed considerable farmland. Range data for these two years were combined because the study ended in September, 1967.

Evidently, most of the turkeys have remained in Iowa. But, sightings of turkeys (mostly unverified) have been made in Wisconsin, indicating that the Mississippi River does not necessarily present a barrier to the turkeys' dispersal eastward. In addition, several unverified and one verified report were received of turkeys on Mississippi River islands.

It appears significant that sightings at the greatest distances from the release area were made in 1966 and 1967. Evidently, the turkeys were continuing to extend their range at the end of this study. The <http://scholarworks.uni.edu/pias/vol75/iss1/21>

greatest distance of dispersal as indicated by one verified sighting amounted to 41 airline miles, the sighting occurring in west-central Winneshiek County (Figure 3, Table 2). Several other sightings have been made more than 25 airline miles from the release area, mostly in Winneshiek County (Figure 3, Table 2).

Reports of several observations have been obtained from areas that appear unsuitable for turkey habitation. The most outstanding example of such sightings is one made in the summer of 1964 in Allamakee County 16 airline miles northwest of the release area (Figure 3, Table 2). It was the only 1964 sighting that is not included in the 1964 main inhabited range. The sighting (8-10 turkeys) was made in a 15-acre woodlot located in the center of a 70-square-mile area that is essentially devoid of timber. Evidently, the turkeys did not remain because no other reports of sightings in the area were received for 1964 or for any subsequent year.

This record indicates that turkeys will move through areas almost devoid of forest cover. In an agricultural region such as northeastern Iowa, however, extensive cornfields and other agricultural crops are probably essential as cover for turkeys to move from one timbered area to another. During the winter when corn and other crops have been harvested, turkeys then restrict their range to wooded areas.

DISCUSSION

The sporadic production of wild turkeys from year to year in northeastern Iowa has not been adequately explained, although temperature and precipitation combinations are suspected of playing a major role in the relative success of production. Young poults are notoriously vulnerable to wetting and chilling. Several consecutive cold, wet days could increase poult mortality, but would not necessarily be evident in weather data averaged on a monthly basis. The spring and early summer of 1966, a year poor for production, seemed to the writers to have been cool and wet. In contrast, cooperators in northeastern Iowa reported that until about June 8, the spring of 1967 was unusually dry. Production in 1967 was considered good.

Excessive poult mortality due to unfavorable weather in some years may possibly occur because of lack of adaptability of Rio Grande turkeys to the northeastern Iowa climate. Observations of adult Rio Grande turkeys in severe winter weather and during all seasons have shown that they seem to tolerate the Iowa climate quite well. But poults may not be so tolerant of inclement weather in early summer.

The most obvious weather difference between the native Rio Grande turkey range and northeastern Iowa is rainfall. The immediate area in which the original Rio Grande turkeys were trapped in Texas (near Sonora) has a mean precipitation of about 22.5 inches per year (United States Weather Bureau, 1960). On the other hand, the release area in

northeastern Iowa, and most of Clayton, Allamakee, and Winneshiek Counties for that matter, has an annual precipitation of 32 to 34 inches (Oschwald et al., 1965).

Perhaps of greater significance is the amount of rainfall occurring during the turkey hatching season of each region. In northeastern Iowa nearly all hatching occurs during May, June, and July, whereas reports compiled by Schorger (1966) indicate that the hatching season for Texas runs from April through June. During these hatching season months, Allamakee County has an average rainfall of 12.61 inches, almost 4.5 inches greater than the 8.13-inch average reported for the Sonora, Texas, area (Reed, 1941).

According to Glazener (1967), rainfall appears the most significant natural factor influencing geographical distribution of the Rio Grande race. The native range of the Rio Grande turkey is bounded by a mean annual precipitation of about 18 inches on the west and approximately 32 inches on the east. Thus, the precipitation averages for northeastern Iowa fall just within the upper limits of rainfall in the Rio Grand turkeys' native range.

Climographs representing temperature-precipitation conditions for reporting weather stations nearest the capture area in Texas and the release area in Iowa show a wide climatic divergence between the two regions (Figure 4). According to Odum (1959), such differences strongly indicate that the climatic factors involved may be sufficiently different to have limiting effects on introduced animals. He adds, however, that the animals might still succeed under both conditions where predation is reduced to a low level.

In spite of the apparent continuing spread of turkeys in northeastern Iowa at the end of this study, the population did not appear to have increased substantially in the seven years since stocked. There are no valid data to indicate that the population has exceeded 100 at any time since the turkeys were released. It is also likely that the population has at no time dropped much below the original stocking level of 39 birds. The paradox between what appears to be a somewhat stable but small population and the increasing dispersal of turkeys has not been explained.

ACKNOWLEDGMENTS

The authors acknowledge the cooperation of Dr. Eugene Klonglan, Assistant Superintendent of Biology, Iowa State Conservation Commission, for supplying state records. Also deserving thanks are many farmers and other northeastern Iowa residents; Iowa State Conservation Commission employees Jack McSweeney (Yellow River Forest manager) and George Kaufman; Conservation Officers John Hoilien, John Horton, and John Hoth; ASCS office managers Oliver Eno, Erick Flaskerud, and Seth Huisman; and Winneshiek County Extension Director E. J. Weigle.

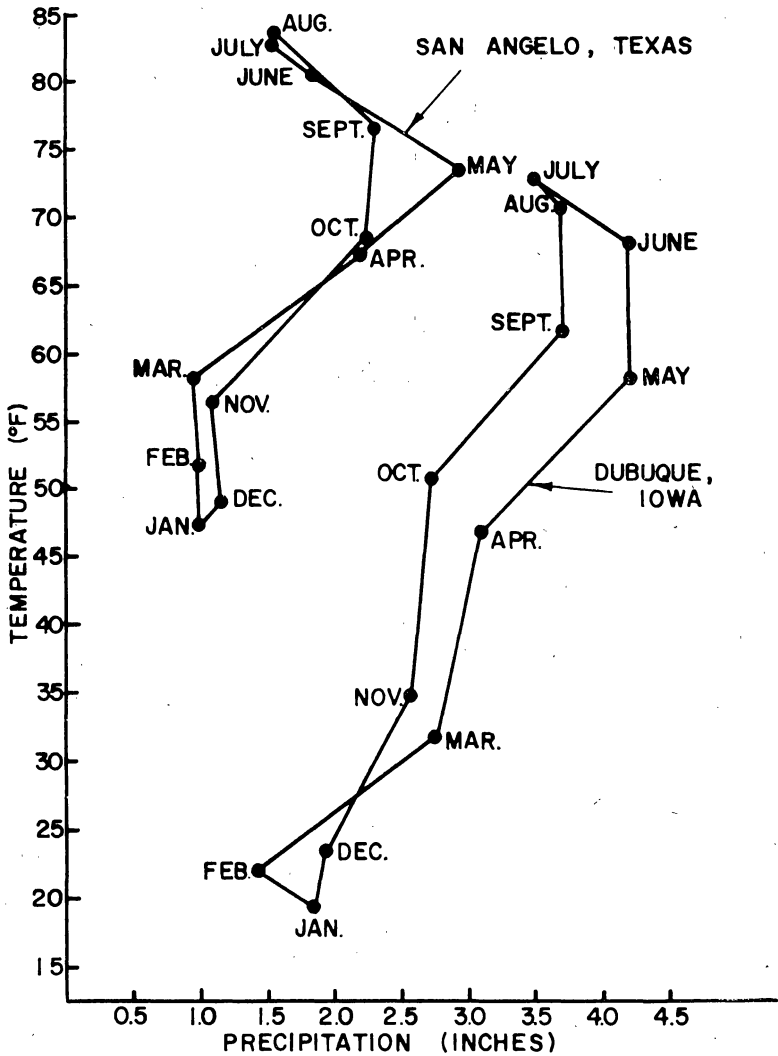


Figure 4. Climographs representing the correlation of monthly temperature and precipitation averages for San Angelo, Texas, and Dubuque, Iowa.

Literature Cited

Glazener, W. C. 1967. Management of the Rio Grande turkey. Pp. 453-492. In Hewitt, Oliver H., editor. The wild turkey and its management. The Wildlife Society, Washington, D. C.

Hoslett, Sherman A. 1965. The mammals of Winneshiek and Allamakee Counties, Iowa. Iowa St. J. Sci. 39:359-386.

Klonglan, Eugene D. 1962. Wintering of wild turkeys in Yellow River Forest area. Iowa St. Conserv. Comm. Quart. Biol. Rpt. 14(1):13-15.

Mosby, Henry S. 1967. Population dynamics. Pp. 113-136. In Hewitt, Oliver H., editor. The wild turkey and its management. The Wildlife Society, Washington, D. C.

- Odum, Eugene P. 1959. *Fundamentals of ecology*. Second edition. W. B. Saunders Co., Philadelphia, Pa.
- Oschwald, W. R., F. F. Riecken, R. I. Dideriksen, W. H. Scholtes, and R. W. Schaller. 1965. *Principal soils of Iowa*. Iowa Sta. Univ. Sci. and Techn., Coop. Ext. Serv. Spec. Rpt. 42.
- Reed, Charles D. 1941. *Climate of Iowa*. U. S. Dept. Agr. Yearbook 1941: 862-872.
- Schorger, A. W. 1966. *The wild turkey*. Univ. Okla. Press, Norman, Okla.
- Thornton, Philip L., and James T. Morgan. 1959. *The forest resources of Iowa*. U. S. Dept. Agr. Forest Surv. Release No. 22.
- United States Weather Bureau. 1960. *Climatography of the United States*. No. 60-41.
- Wigal, Dennis D. 1968. *Status of the wild turkey in northeast Iowa*. Unpublished M.S. thesis. Iowa State Univ., Ames, Iowa.