

## Nesting of the Mourning Dove in Northwest Oklahoma

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The present economic and recreational importance of the mourning dove (*Zenaidura macroura*) requires an intensive research program into its biology, habits, and ecology. Knowledge of dove nesting habits provides valuable information which can be used for manipulating the environment for better dove management.

Considerable information has been published on nesting habits, preferences, and densities of the mourning dove in numerous geographical areas and ecological types. The U. S. Fish and Wildlife Service (1962) reviewed the literature on dove investigations through 1961. Notable contributions on dove nesting activities include those of Nice (1922, 1923), Moore (1940), Taylor (1941), McClure (1943), Quay (1951), Cowan (1952), Swank (1952), Hanson and Kossack (1963), and Harris, Morse, and Longley (1963).

Dove nesting in Oklahoma has been studied by three investigators. Nice (1922, 1923) investigated dove nesting at Norman. Dodson (1955) examined numerous shelterbelts for nesting frequency and success. Downing (1959) examined areas in extreme northwestern Oklahoma for the frequency of ground nesting.

In order to determine dove nesting habitat preference in northwest Oklahoma over a relatively large area, a pilot study was initiated to randomly select plots for investigation and then to stratify these into general ecological types and to determine the nesting activity in each type. Systematic examination was also performed to determine further habitat preferences. A more thorough investigation is planned for the 1969 nesting season.

I am grateful to Dr. Robert I. Smith, James C. Lewis, K. Cook, M. Gabbard, and L. Hart for their field assistance, and to the numerous landowners who cooperated in this investigation. The advice and editorial suggestions of Dr. Robert I. Smith, Dr. John A. Morrison, and James C. Lewis are also gratefully acknowledged.

### STUDY AREA

Field studies were conducted around the Canton Public Hunting Area located in northeast Dewey County, Blaine County, and southcentral Major County in northwest Oklahoma. These areas investigated are representative of the land-use patterns over much of this region in Oklahoma.

Sample plots along three transects were randomly selected and examined for nests. Transect I is 3 miles north of the Public Hunting area. It is 12 miles long and includes pastures, blackjack (*Quercus marilandica*)-post oak (*Q. stellata*) woodlots, weed fields, and cleared and cultivated fields. Transect II is a 6-mile route on the Public Hunting Area and consists of blackjack-post oak woodlots, mixed woods, cottonwoods (*Populus deltoides*), sadsage (*Artemisia filifolia*)-grasslands, and extensive crop plantings and habitat improvements for wildlife. The reservoir forms the southern border over most of this route. Transect III is 3 miles south of the management area. It is 8 miles long and contains blackjack-post oak woodlots, wooded creek bottoms, pastures, and large cultivated fields. Sorghum, millet, and cowpeas are the main crops in the Public Hunting

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Area while wheat is the important crop along Transects I and III.

Dominant vegetation types were also examined systematically on the transects as well as on areas 15 miles north of the Public Hunting Area. This northern area is composed largely of wheat fields, mesquite (*Prosopis juliflora*)-pasture areas, and scattered tree rows.

#### METHODS

Sixty-two 4-acre plots were randomly selected from the transects for investigation from 1 to 28 June 1968. Other vegetative types were systematically examined from 16 June to 16 July 1968. Certain areas of high dove nesting densities were re-examined from 23 to 25 August 1968.

Nests were located and the type of tree, number of eggs and/or young, presence of an incubating adult, and general ecological type were recorded. A 2-to 6-man team spaced from  $\frac{1}{2}$  to 1 chain apart, depending on vegetation density and height, systematically searched the area with one man operating as compass man. A mirror at the end of a long cane pole was used to determine the contents of nests that could not otherwise be examined.

A dove banding operation was established in the study area from 1 June to 22 August 1968. Trapping involved portable bait traps (2 ft square by 8 inches high) and mist nets. The captured immature doves were aged by the primary moult sequence (Swank, 1955), and banded with a size 3A Bureau of Sport Fisheries and Wildlife band. Examination of the ages of trapped doves provides information on hatching peaks.

#### RESULTS AND DISCUSSION

Two hundred and forty-eight acres, representing 1.49% of the total 16,640 acres comprising the area enclosed by the transects, were randomly selected for investigation. Of these, 173.5 acres were examined thoroughly (Table I), 30.0 acres were inaccessible due to their location in water or freshly cultivated fields, and 44.5 acres were not examined since they were located in treeless pastures and cultivated fields. Thirteen active nests were found in the area examined. Since no ground nests were located in 53.5 acres of pastures and cultivated fields previously examined, the number of nests in these areas was assumed to be nil for purposes of establishing a nesting density for these 16,640 acres. Nesting density was therefore 0.052 active nests per acre or 865 active nests for this area in late June.

Examination of the random plots (Table I) indicated a preference for shelter belts and homesteads (0.55 and 2.0 nests per acre respectively). Low densities of nesting doves were found in blackjack-post oak woodlots, pastures, weedy fields, and wheat stubble fields. No nests were located in cottonwoods, mixed woods, shrubby edges, or cleared, plowed or cultivated fields.

Examination of dominant vegetation types systematically (Table II) reveals additional preferences for areas of light mesquite, medium-dense mesquite, and orchards (0.32, 0.41 and 2.43 active nests per acre respectively). Salt cedar (*Tamarix gallica*) areas supported a low density of nesting doves (0.15 active nests per acre).

Fourteen species of trees contained active nests. Osage orange (*Maclura pomifera*), elm (*Ulmus americana*), mesquite and orchard trees were the preferred species while blackjack, red cedar (*Juniperus virginiana*), locust (*Robinia pseudoacacia*), mulberry (*Morus rubra*), cottonwood, hackberry (*Celtis reticulata*), and salt cedar supported fewer nesting doves. The majority of nests located in these trees were situated 3 to 6 ft above the ground. Ground nesting is uncommon and where it occurs the nests are frequently destroyed by agricultural activities.

TABLE I. SUMMARY OF DOVE NESTING IN RANDOMLY SELECTED AREAS IN NORTHWEST OKLAHOMA (1-28 JUNE 1968).

Vegetative Type	Acres	Active Nests	Clutches			Nests Per Acre	Nest Site Preference of Mourning Doves																	
			Rare	Young	Nests		Blackjack	Red Cedar	Locust	Elm	Mulberry	Hackberry	Mesquite	Poplar	Orange	Pear	Apple	Peach	Apricot	Salt Cedar	Ground			
Blackjack, Post Oak	38.0	4	8	0	0.11	4																		
Cottonwood	5.0	0	0	0	0.00																			
Mixed Forest	17.5	0	0	0	0.00																			
Shelterbelt (Blackjack, Hackberry, Locust)	11.0	6	6	1	0.55	3	1	1	1	1														
Edge (Shrubs and Weeds)	9.0	0	0	0	0.00																			
Pasture and Weedy Fields	51.5	1	1	0	0.02	1																		
Cleared or Plowed	11.0	0	0	0	0.00																			
Wheat Stubble	28.0	1	1	0	0.04																			1
Cultivated	2.0	0	0	0	0.00																			
Homestead	0.5	1	1	0	2.00	1																		
Total	173.5	13	17	1		8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

\*An active nest is one in which an adult, egg, or young was present at the time of investigation.

TABLE II. SUMMARY OF DOVE NESTING IN SYSTEMATICALLY SELECTED AREAS IN NORTHWEST OKLAHOMA (16 JUNE TO 16 JULY 1968).

Vegetative Type	Nest Site Preference of Mourning Doves																						
	Acres	Active Nests <sup>1</sup>	Eggs	Clutches	Young	Nests Per Acre	Blackjack	Red Cedar	Locust	Elm	Mulberry	Hackberry	Mesquite	Poplar	Osage	Pear	Apple	Peach	Apricot	Salt Cedar	Ground		
Mesquite (sparse)	105.1	9	7	2	0.09								7	1								1	
Mesquite (light)	98.6	32	40	20	0.32								31									1	
Mesquite (medium-dense)	26.7	11	10	9	0.41								11										
Shelterbelt (Osage Orange, Elm, Willow, Mulberry)	6.0	41	45	30	6.83				16	4					21								
Homestead	2.0	2	0	2	1.00			1			1												
Orchard	7.0	17	17	10	2.43												11	3	2	1			
Salt Cedar (sparse-dense)	20.0	3	2	3	0.15																		3
Total	265.4	115	121	76				1	16	5	49	1	21	11	3	2	1	3	2	1	3	2	

<sup>1</sup>An active nest is one in which an adult, egg, or young was present at the time of investigation.

Table III compares nesting between 17 to 26 June and 23 to 25 August at four of the higher nesting density areas. There were 277.4% more active nests, 205.0% more eggs, and 350.0% more young in the first period of the investigation. Additional information obtained by determining the hatch dates of 1205 immature doves captured on the study area indicates that the peak of nesting activity was from 24 May to 29 June (Fig. 1).

One hundred and eighty-six active nests were found throughout the period of investigation (1 June to 25 August). An adult dove was flushed from each of 136 (73.12%) nests at the time of investigation, thereby indicating the location of the nest. Approximately 73% of the total nests were therefore located by the flushing technique. Under similar conditions of relatively low trees and little ground nesting, this technique appears to be a useful tool for studing densities of nesting doves. This more cursory technique would simply involve the investigator disturbing each tree (i.e. moving a few limbs briskly, hitting the trunk of the tree, etc.) as he walked by. Depending on conditions, this technique could probably reduce by 50 to 80% the amount of time required to search for nests.

SUMMARY AND CONCLUSIONS

A pilot study was made of mourning dove nesting activities in north-west Oklahoma from 1 June to 25 August 1968, by a crew of 2 to 6 members. The peak of nesting activity was 24 May to 29 June.

Two hundred and forty-eight acres, representing 1.49% of the total 16,640 acres comprising the area included between three transects, were randomly selected for investigation. Nesting density on this area was 0.052 active nests per acre or 865 active nests for this area in late June. Examination of these plots indicated a preference for shelter belts and homesteads (0.55 and 2.0 nests per acre respectively). Examination of dominant vegetation types systematically reveals additional preferences for areas of light mesquite, medium-dense mesquite, and orchards (0.32, 0.41 and 2.43 active nests per acre respectively).

Fourteen species of trees contained active nests. Osage orange, elm, mesquite, and orchard trees were the preferred species while blackjack, red cedar, locust, mulberry, cottonwood, hackberry, and salt cedar supported fewer nesting doves. Ground nesting is uncommon and where it occurs the nests are frequently destroyed by agricultural activities.

TABLE III. COMPARISON OF NESTING DATA BETWEEN 17-26 JUNE AND 23-25 AUGUST 1968, AT SELECTED AREAS IN NORTHWEST OKLAHOMA.

Area Investigated	Acres	17-26 June			23-25 August		
		Active Nests	Eggs	Young	Active Nests	Eggs	Young
Mesquite (light)	8	7	5	7	2	2	1
Mesquite (medium-dense)	12	11	10	9	2	2	2
Shelterbelts	6	51	50	30	23	29	13
Orchard	7	17	17	10	4	7	0
Total	33	86	82	56	31	40	16

A flushing technique is suggested as a useful tool for studying densities of nesting doves. Depending on conditions, this technique could probably reduce by 50 to 80% the amount of time required to search for nests.

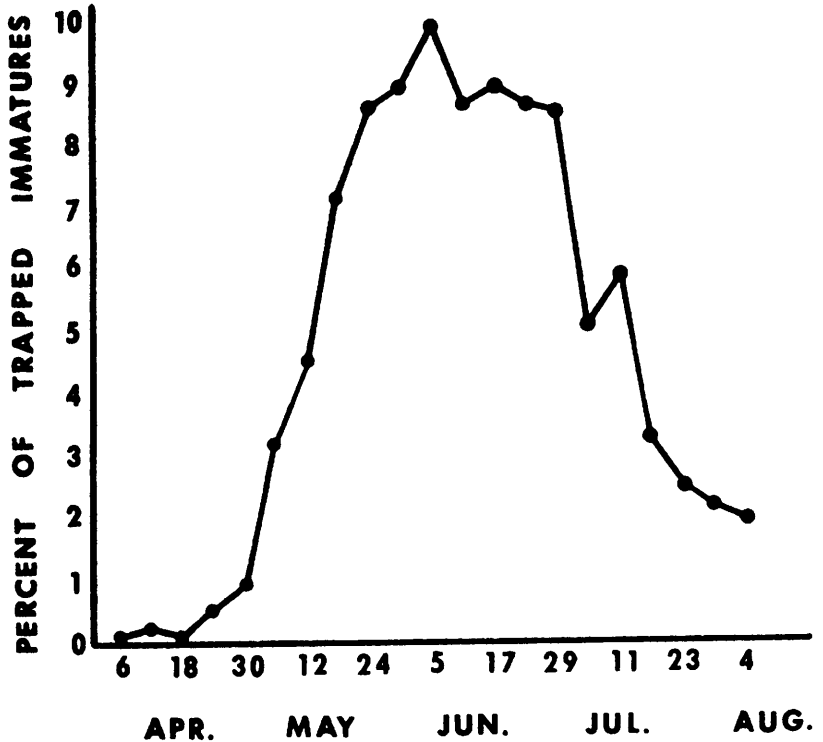


Fig. 1. Frequency distribution of hatch days of 1205 immature mourning doves banded from 1 June to 22 August 1968, in northwest Oklahoma.

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