

## THE THREE-BIRD CHASE IN MOURNING DOVES

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OUR preliminary observations indicated some similarities between the multiple-bird flights of Mourning Doves (*Zenaidura macroura*) and those of waterfowl, but many differences seemed apparent. This paper attempts to analyze the function of this activity in Mourning Doves.

Multiple-bird chases in various waterfowl species, particularly the dabbling ducks, have been analyzed by workers interested in breeding behavior. Barclay (1970) reported on several types of multiple-bird flights that have been descriptively named. Hochbaum (1944) described these flights for several species of dabbling ducks, and indicated a relationship to territory establishment or, broadly interpreted, spacing or isolation of pairs. He indicated that chasing may result in spreading the ducks widely throughout available habitat. The Pintail (*Dafila acuta*) has been found to be an exception to the general pattern in that sexually active birds do not become isolated but rather seek out females to chase or other sexually active males to associate with (Smith, 1968). McKinney (1965) agreed that the primary function of three-bird flights was the dispersion of pairs, possibly serving to reduce the opportunity for predation at the nest site. Hori (1963) pointed out the need for care in differentiating pairing-display flights from sexual pursuits of mated females. It is the pursuit of mated females that most workers have dealt with in analyses of multiple-bird chases.

### METHODS

Studies were conducted primarily at three sites of intense breeding activity: one site in southeastern Iowa, and two others in central Missouri. All sites contain shelterbelts of mixed evergreen and deciduous tree species, located in prairie-forest transition areas.

We recorded observations for any three-bird chase that could be sighted and followed for a minimum of 30-40 yards. Various means were used to identify the sex of individual birds participating in the chases. For some flights the sexes could be discerned by the behavioral or morphological characteristics observed before or after the actual flight. Behaviors useful in identifying sex included Perch-cooing by males and displays by males to females. On three occasions the role of the birds in nest-building activities was used to distinguish sex. Size differences were used to distinguish the sexes of birds that were paired and seen resting or feeding together. Occasionally, male coloration could be distinguished. On the Iowa area and one of the Missouri areas, many doves were marked for sexual identification by the use of a back tag modified from the type described by Blank and Ash (1956).

In cases where there was any doubt as to sex, the bird was recorded as "sex unknown."

TABLE 1  
SEXES AND POSITIONS OF DOVES IN 135 CHASES

Number of chases	Last position	Middle	Lead
Sexes of All 3 Birds Known			
10	Male	Male	Female
14	Male	Female	Male
3	Female	Male	Male
1	Male	Male	Male
Sexes of 2 Birds Known			
9	Unknown	Male	Female
5	Male	Unknown	Female
15	Unknown	Female	Male
1	Male	Female	Unknown
2	Female	Male	Unknown
8	Male	Male	Unknown
6	Male	Unknown	Male
Sex of 1 Bird Known			
14	Unknown	Unknown	Female
12	Unknown	Female	Unknown
2	Female	Unknown	Unknown
16	Male	Unknown	Unknown
9	Unknown	Male	Unknown
8	Unknown	Unknown	Male

#### RESULTS

Three hundred and twenty-one chases were recorded. Of these, all three doves were identified as to sex in 28 chases, two were of known sex in 46 chases, and one was of known sex in 61 chases. In the remaining 186 chases, none of the doves were identified as to sex.

*Frequency and position of males and females in chases.*—In all chases in which the sexes of two or all three of the birds were known, at least one male was involved (Table 1). In 42 of 75 chases with sexes of either two or three birds known, at least two males were involved.

Only one female was known to participate in any one chase, and in 15 chases in which the sex of two or more birds was known, no female was identified.

Birds of both sexes were identified in all positions in chases—lead, middle, and last. Males were tallied in the lead position 47 times vs. 38 times for

females; in the middle position males and females were tallied 42 times each; and in the last position, males were seen 61 times vs. 7 times for females (Table 1).

*Origin and termination of chases.*—In the seven chases in which the female was identified as the last bird, the origin of the chase was seen. In these chases a pair of doves was observed (presumably in an established nesting territory) when another dove flew close by. In all cases the male of the pair chased the intruder and the female flew after her mate. Three of these chases were observed to termination and all three were short (less than 150 yards). These three chases terminated when the chasing male and his mate suddenly veered and returned to the starting area, while the intruding dove continued its flight. In another case the pair was seen to return to the area of origin of the chase within 3 minutes after the chase was initiated.

The origins of five chases with the female in the lead position were observed. In all of these chases, a female followed by a male flew close to the cooing perch of another male and the second male gave chase. In the only one of these cases in which the entire chase was observed the pair turned sharply and lit in a tree only a few seconds after the third dove left his perch to fly after them. The third dove then lit in the tree near them.

The origins of nine chases with the female in the middle position were observed. In eight of these chases, the origin was as described for those with the female in the lead position: a pair was pursued by a male near whose cooing perch they flew. In the one exception, two males and one female were picking up grit on a gravel site; when they all flew off, the female was in the middle position. In none of these nine cases was the termination of the chase observed.

Forty-one terminations of chases were observed, in addition to those described above. In three of these terminations, the two lead doves lit, and the last dove in the line (in two cases a known male) flew on. In these three cases, it was possible to identify the two doves that alighted as a leading male and a following female. One chase terminated when the three birds dispersed in three different directions. In this case the sex of none of the birds could be determined.

In 33 other cases where terminations were observed, the three birds alighted very near each other either in a field or in trees. The spacing of the three doves with respect to each other after alighting varied considerably.

The duration of chases could not be analyzed because entire chases were seen infrequently. It was common, however, for chases over a prairie area and a lake area to last for one minute or more. Many of these longer chases followed a criss-cross pattern over the same area.

TABLE 2  
POSITION OF FEMALE RELATED TO FREQUENCY OF FLIGHT PATTERN

Known position of female (87 chases)	Flight pattern	
	Twisting	Straight
Lead	35	3
Middle	40	2
Last	0	6
Assumed position of female (14 chases where position of two males was known)		
Lead	7	1
Middle	6	0
Last	0	0

*Flight patterns of three-bird chases.*—There are two basic flight patterns for three-bird chases. I term one of these patterns “straight” and the other “twisting.” In “straight” patterns, the birds fly with one directly behind the other, and with rather consistent spacing. The middle bird is commonly 1 or 2 feet behind the lead bird and the last bird is often 3 or 4 feet behind the middle bird. Occasionally the middle bird is spaced evenly between the other two. The flight paths are of varying altitude but are relatively level with few or no sharp turns to either side.

The “twisting” flight form is highly irregular with rapid changes in altitude and many sharp turns to the side. In this pattern, the spacing of the three birds is more irregular than in “straight” chases. Often the three birds are tightly grouped at one instant and spread wide the next. The birds continue to be aligned behind each other for the most part, but one may occasionally be offset from the direct line. Two of the three birds were seen flying side-by-side for a few seconds on only six different occasions. Of the 321 observed chases, 46 were classified as the “straight” form and 244 as “twisting.” The remaining 31 chases could not be classified in this respect. Table 2 presents the frequency of flight form for those chases where the position of the female was known or could be reasonably assumed.

#### DISCUSSION

Of the several types of multiple-bird chases in ducks listed by Barclay (1970), the pursuit of transgressing pairs by a territorial male seems to be the type most comparable to the three-bird chases in Mourning Doves. However, Barclay’s “territorial drake” is a drake of a mated pair. In doves the most common chases originate when an unmated male gives chase to a pair

that flies close to him. This appears to be the defense of a territory by an unmated male. The term "three-bird-flight" is used to describe a flight pattern in ducks that includes a territorial drake in pursuit of the hen of a mated pair, with the hen's mate usually positioned last in the chase. In doves the female is always positioned next to her mate, either in front of or behind him.

The attempted rape flight in ducks was described by Barclay as being erratic in pattern and including several males following a hen. Many of the chases in doves are erratic (twisting), but in no case was attempted copulation observed.

The fact that the flight pattern is twisting when the female is in the lead or middle position suggests an effort on the part of the unmated male to gain the attention of the female participating in the chase. This common type of chase, i.e., a male chasing a pair that flew close to his cooing perch, could have the effect of preventing a pair from selecting a nest area close to an area already "claimed" by another male. This behavior, therefore, could cause nest dispersion, as has been suggested for ducks.

The straight flight pattern exhibited when the female occupies the last position may indicate a different function for this type of chase, with the unmated male simply fleeing from the pair.

#### SUMMARY

Observations were made of 321 three-bird chases of Mourning Doves. In 28 chases, the sexes of all birds were known; in 46 chases, the sexes of two birds were known; and in 61 chases, the sex of one bird was known. No more than one female was identified in any chase, and in one chase, all birds were known to be males. When a known pair was involved, the female was always positioned next to her mate in the chase, sometimes in front of him and sometimes behind him.

The most frequent cause of chase origin was when an unmated male pursued a pair that flew close to his perch.

Flight patterns were straight when the female was last in line of chase, and twisting when she was in the middle or lead position.

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#### PROCEEDINGS OF THE FIFTY-SECOND ANNUAL MEETING ERRATA

In the list of persons attending the Annual Meeting at Dauphin Island, Alabama (Wilson Bull., 83:339, 1971) the following names were inadvertently omitted:

From MINNESOTA: 10—*Duluth*, Joel K. Bronoel, Pershing B. Hofslund, Henry B. Roberts; *La Moille*, Violet Nagle, Pauline Wershofen; *Minneapolis*, Dorothy Breckenridge, W. J. Breckenridge, Isabel Daniels; *South St. Paul*, Mr. and Mrs. Thomas C. Savage.

The total registered attendance at the meeting was 255 rather than the 197 given.