

NOTES ON THE DISTRIBUTION AND TAXONOMY OF MEXICAN GAME BIRDS

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Collections of birds from Mexico recently acquired by the Museum of Vertebrate Zoology have yielded new information on the distribution and taxonomy of a number of species. It is the objective of this paper to place on record noteworthy results of critical study of one of these collections, that accumulated by A. Starker Leopold in the course of a survey of Mexican game birds. The present report is thus confined to members of the tinamiform, anseriform, galliform, gruiform, charadriiform, and columbiform groups. There were also included in this study specimens representing these groups, whether qualifying as "game birds" or not, from two other collections: first, the Milton S. Ray Collection of Guerreran birds obtained by W. W. Brown, and second, a collection from Sinaloa and Sonora obtained in October and November, 1946, by A. S. Leopold, F. A. Pitelka, and W. C. Russell. Field observations supplementing data from specimens are added from the writer's original notes on Sinaloan and Sonoran species. Topics dealt with here are range extensions of species, critical evaluations of racial characters, revisions of racial distributions, and new data on seasonal distribution and breeding season.

Crypturellus cinnamomeus. Mexican Tinamou.—The only record of this species from Campeche known to me is that of Traylor (1941:199), who described *C. c. intermedius* from the southern part of that state. A series of eight specimens taken at San Juan, Campeche (see fig. 28), in the central, coastal part of the state, also represent that race. Comparative material of other races together with an examination of data provided by previous studies of this species (especially Conover, 1933; Brodkorb, 1939; and Hellmayr and Conover, 1942) indicate that *intermedius* represents a valid race.

In describing *C. c. intermedius*, Traylor (1941:200) did not comment on presence or absence of barring on the breast of females (see Hellmayr and Conover, 1942:66-69, footnotes). Five females of that race in the Leopold Collection vary considerably in this character and form as nearly a graded series as could be expected of merely five specimens. One lacks any barring except for a faint suggestion of it on the sides of the breast; at the other extreme is a specimen prominently barred on the upper breast and rather heavily so on the sides of the breast. The other three specimens fall between these. There is some suggestion that this character may vary with age, to a partial degree at least.

Traylor (*loc. cit.*) states that in dimensions *intermedius* "falls in between" the larger races, *sallei* and *soconuscensis*, and the smaller races, *goldmani* and *cinnamomeus*. No data are given except the dimensions of the type of *intermedius*, a female (wing, 166 mm.; culmen, 25.5 mm.). Dimensions from the series of *C. c. intermedius* in the Museum of Vertebrate Zoology are given in table 1. They suggest rather that in size *intermedius* may be similar to or smaller than *cinnamomeus*.

Anser albifrons. White-fronted Goose.—But one record of this species is available from Sonora (van Rossem, 1945:44). Nine individuals were noted on a laguna at Pita-haya (40 km. SE Empalme, 100 ft.), on October 29, 1946; these plus six others were present early on October 30. None was seen again until November 3 when two individuals visited the laguna briefly.

Dendrocygna autumnalis. Black-bellied Tree Duck.—Friedmann (1947:190) has described two races, *D. a. fulgens* from extreme northeastern Mexico and southern Texas, and *D. a. lucida* from Sonora and Veracruz south at least to Costa Rica. These are said to differ in degree of blackness of the abdomen, *lucida* being the darker. I have examined ten specimens (6 ♂♂, 4 ♀♀) from these geographic ranges. Friedmann had

Table 1
Measurements of *Crypturellus cinnamomeus*

	Wing	Culmen	Tarsus
<i>C. c. intermedius</i>			
3 males	154 mm.	27.4 mm.	51.5 mm.
	146	30.2	46.8
	146	27.9	48.3
5 females	148	29.6	48.4
	151	28.5	46.0
	152	28.8	46.2
	147	25.6	45.2
	145	28.5	46.2
<i>C. c. cinnamomeus</i>			
1 male	156	31.1	47.7
1 female	163	30.2	51.2
<i>C. c. goldmani</i>			
1 male? ¹	152	26.3	47.7

¹Unsexed, but plumage characters appear to be those of a male.

only eight specimens of *fulgens* (4 ♂♂, 4 ♀♀) and 11 of *lucida* (sex representation not given). While there is a slight suggestion of difference between them, this is transgressed by the sexual differences evident in our series. Thus, a male and female collected on August 4, 1945, in Tamaulipas, display the very differences used by Friedmann to distinguish *fulgens* from *lucida*. A comparable degree of sexual difference occurs between a male collected on June 29, 1932, in Costa Rica, and a female collected on July 23, 1912, in El Salvador. Friedmann did not comment on sexual differences within the races he described. In view of these facts, the status of *lucida* is probably doubtful until the characters attributed to it are re-appraised with due recognition of sexual differences.

Cairina moschata. Muscovy Duck.—No previous records from Nuevo Leon have been found. Two females were collected on July 22 and one female on July 29, 1945, at La Union (29 km. NE General Teran, 1000 ft.), in that state.

Anas platyrhynchos. Mallard.—A female was collected at Pitahaya, Sonora, on November 3, 1946. Van Rossem (1945:45) cites no Sonoran records of wintering mallards earlier than December 6.

Anas diazi. Mexican Duck.—The characters attributed to *A. d. novimexicana* by Phillips (1923:56) are "an irregular wavy barring of fulvous color on the mantle" presumably not present in *A. d. diazi* and "a tendency to a darker and more mottled breast." In seven specimens of *A. diazi* available to me, neither of these characters appears valid. With respect to the first, the "wavy barring" is produced by subterminal, more or less V-shaped fulvous marks on the mantle feathers, which, when the latter are worn, become more evident than in fresh-plumaged birds and produce the character described. But these subterminal marks are present in *A. d. diazi* as well as *novimexicana*. What is more significant is their presence in two males and their absence in five females. As to the second character, five specimens from the range of *A. d. diazi* are consistently darker on the breast than two of *A. d. novimexicana*, but there is no evidence of difference in mottling. Our material suggests that if any real differences exist, they are, in *A. d. novimexicana*, lighter ventral coloration, in particular on the abdomen, and more extensive subterminal fulvous marks on back, scapular, and flank feathers, and possibly buffier (less gray) coloration on the throat. Because of individual variation, however, the racial distinctions in this species should be reexamined further.

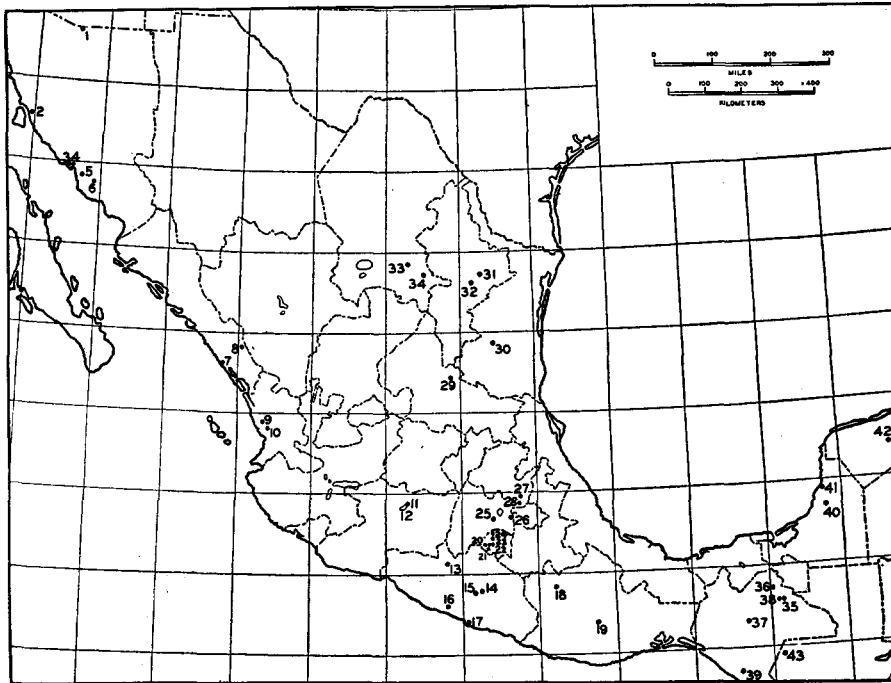


Fig. 28. Map of Mexico showing localities mentioned in the text. Cuapongo, a Guerreran locality near Omilteme and not found on reference maps, is not shown. A key follows.

SONORA

- 1. Nogales
- 2. Sierra Seri
- 3. Guaymas
- 4. Empalme
- 5. Pitahaya
- 6. Bacum

SINALOA

- 7. Mazatlan
- 8. El Batel

NAVARRIT

- 9. Santiago Ixcuintla
- 10. Sauta

MICHOACAN

- 11. Quiroga
- 12. Lake Patzcuaro

GUERRERO

- 13. Poliutla
- 14. Chilpancingo
- 15. Omilteme
- 16. Atoyac
- 17. Acapulco

OAXACA

- 18. Tamazulapam
- 19. Tlacolula

MORELOS

- 20. Tetecala
- 21. Lake Rodeo
- 22. Alpuyecá
- 23. Cuernavaca
- 24. Tres Marias

DISTRITO FEDERAL

- 25. Pedrigal

ESTADO MEXICO

- 26. Rio Frio

HIDALGO

- 27. Lake Tecocomulco
- 28. Apam

SAN LUIS POTOSÍ

- 29. Santo Domingo

TAMAULIPAS

- 30. Ciudad Victoria

NUEVO LEON

- 31. La Union
- 32. General Teran

COAHUILA

- 33. Hipolito
- 34. Saltillo

CHIAPAS

- 35. Monte Libano
- 36. Palenque
- 37. San Cristobal
- 38. El Real
- 39. Escuintla

CAMPECHE

- 40. San Juan
- 41. Campeche

YUCATAN

- 42. Xocempich

GUATEMALA

- 43. Nenton

I find no references to the occurrence of this species in Morelos, and although thought to occur in Hidalgo by Phillips (1923:56), he had no specimens. I have examined two collected at Lake Rodeo, 4000 feet, Morelos, on March 11, 1945, and one collected at Lake Tecocomulco (25 km. N Apam, 8200 ft.), Hidalgo, on November 19, 1944.

Anas discors. Blue-winged Teal.—A male taken by W. C. Russell at Pitahaya, Sonora, on November 2, 1946, appears to represent the second record for Sonora (see van Rossem, 1945:46).

Spatula clypeata. Shoveller.—No records from Michoacan are known to me. One female was collected at Lake Patzcuaro, 6800 ft., on February 22, 1945.

Aythya valisineria. Canvasback.—Van Rossem (1945) does not list this species from Sonora. A female was collected at Pitahaya (40 km. SE Empalme, 100 ft.), on October 28, 1946.

Aythya affinis. Lesser Scaup Duck.—A male was collected by W. C. Russell at Pitahaya, Sonora, on October 30, 1946. Previously the species had not been recorded in that state earlier than November 10 (van Rossem, 1945:50).

Oxyura jamaicensis. Ruddy Duck.—But three authentic records are available from Sonora (van Rossem, 1945:51). One individual was observed at Pitahaya on October 30 and November 1, 1946.

Ortalis wagleri wagleri. Wagler Chachalaca.—Two specimens were collected at El Batel (70 km. NE Mazatlan, 5100 ft.), Sinaloa, on October 20, 1946. Altitudinal occurrence here is above that of most other records.

Dendrortyx macroura striatus. Long-tailed Partridge.—The Ray Collection contains several specimens that provide data on the breeding period of this species in Guerrero. A female collected on August 2, 1945, at Cuapongo, is marked "ovaries greatly enlarged." A half-grown juvenile from the same locality was collected on September 27, 1940. Another juvenile, in an early stage of the postjuvinal molt, was collected at Chilpancingo on August 20, 1937.

Lophortyx gambelii. Gambel Quail.—Eighteen specimens were collected at Pitahaya and one at Bacum, in Sonora, in the period from October 27 to November 2, 1946. The series includes twelve fresh-plumaged males. These display the characters attributed to *L. g. fulvipectus* by Ridgway and Friedmann (1946:296). Hellmayr and Conover (1942:235) did not find *fulvipectus* separable from *gambelii*, but as Ridgway and Friedmann (*loc. cit.*) point out, truly fresh-plumaged specimens are necessary for comparisons.

According to van Rossem (1932:132; 1945:68) intergradation northward between *fulvipectus* and *gambelii* is confined to the regions east and northeast of Guaymas. A series of 15 Sonoran specimens additional to those mentioned above suggests, however, that this area is better assigned to the range of *fulvipectus*, and that intergradation is evident farther north and interiorward, to the Sierra Seri (opposite Tiburon Island) coastwise and to north-central Sonora interiorward. One specimen in this series, an adult male (MVZ 94933), collected approximately 37 miles south of Nogales, October 27, 1941, is indistinguishable in color from *L. g. fulvipectus*, and the remaining specimens—males and females—are intermediate to varying degree in the several characters distinguishing *fulvipectus* from the nominate race.

Nelson (1899:26) originally described *fulvipectus* as a race not only darker, but also larger in size of bill than the nominate race. The latter distinction is weak and therefore not useful in racial segregation, but it nevertheless exists, as shown by the following data on chord of the exposed culmen:

	Range	Mean
22 ♂♂ <i>gambelii</i> (Calif., Ariz., N. M.)	10.1-11.8	11.1 mm.
12 ♂♂ <i>fulvipectus</i> (southern Sonora)	11.1-12.5	11.7 mm.

With reference to Moore's (1947:28) newly described race, *L. g. friedmanni*, from northern Sinaloa, examination of specimens in the Museum of Vertebrate Zoology from Sonora and neighboring parts of Arizona and southern California suggests that most of the characters attributed to *friedmanni* are either the same as in *fulvipectus* or they

are slight accentuations of them. This is not unexpected in a population to the immediate south of the present known range of *fulvipectus* if we recognize the north-south gradient over Sonora in characters separating *fulvipectus* from the nominate race (see above). If characters attributed to *friedmanni* by Moore (*loc. cit.*) in his description are checked against the series examined in this study, only two of six may prove to represent variations not already indicated in *fulvipectus*. These, in themselves variable characters, are streaking of undertail coverts (darker and "definitely" brown in males of *friedmanni*) and color of forehead (almost "solid" brown in females of *friedmanni*). I have not been able to examine any Sinaloan specimens. Moore examined only eight males and two females of "*friedmanni*." All these considerations lead me to suggest that *friedmanni* is merely an end-point in a north-south gradient already evident and recognized in *fulvipectus*.

Colinus virginianus. Bob-white.—A series of sixteen specimens from Morelos, and particularly eleven of these from Lake Rodeo (15 km. E Tetecala), clearly indicate that the locally resident population of *C. v. nigripectus* is mixed to varying degree by transplants from regions outside of the range of this race. The atypical specimens suggest the races *maculatus* or *aridus*, and it is known that birds from the vicinity of Ciudad Victoria in southern Tamaulipas have been released at Lake Rodeo (A. S. Leopold, MS).

Five males and four females collected at El Real, Chiapas, on November 29 and December 7, 1945, apparently represent the race *insignis*. This locality is outside of the known range of *insignis* and within what is generally considered the range of *minor* (see Ridgway and Friedmann, 1946:338). The type locality of the latter form, Palenque, Chiapas, is only about 45 kilometers northwest of El Real. The range of *insignis* (type locality, Nenton, Guatemala) is stated by Brodkorb (1942:3) as the "Comitan-Nenton Valley of eastern Chiapas and western Guatemala," considerably to the south of El Real. The five males from El Real agree with the characterization of *insignis* given by Ridgway and Friedmann (*loc. cit.*). In this series, the throat is consistently black, and the breast and belly are entirely chestnut. On four there is a postocular stripe, with slight touches of white above or in front of the eye, areas that are otherwise black. On the fifth, a superciliary stripe extends almost to the bill. The fifth in addition is spotted white on the malar area from a point beneath the eye posteriorly to the sides of the throat. The neighboring race *minor*, however, is white-throated. Comparative material available to me is inadequate for evaluation of characters displayed by the four females.

These data indicate that the allocation of all of northeastern Chiapas to the range of *minor* is not correct and that, therefore, there is little likelihood that *minor* also occurs in "the neighboring sections of Guatemala" (Ridgway and Friedmann, 1946:338). Continuity in the range of *insignis* between El Real and the Comitan-Nenton Valley yet remains to be established.

Odontophorus guttatus. Spotted Partridge.—Hellmayr and Conover (1942:280) recognize the race *matudae* described by Brodkorb (1941:4) from southern Chiapas, but with some reservations. Racial characters given by them are broader width of white throat stripes and tear shape of breast spots. Brodkorb had but two specimens, Conover has examined but three, and the latter author points out that because of the individual variation displayed in this species, the above characters may not be valid bases for racial distinction. A series of ten first-year and adult specimens from Monte Libano (100 km. NE San Cristobal, 2500 ft.), Chiapas, collected December 1 to 4, 1945, bear out Conover's suspicion. There is such variation in form, size, and degree of black margination of ventral spots and also in width of throat stripes that I regard *matudae* as not

recognizable. This evidence is considered pertinent to the status of *matudae* in spite of the distance between Monte Libano and the geographic range ascribed to *matudae*, the vicinity of Escuintla (Hellmayr and Conover, 1942:281). Ridgway and Friedmann (1946:373) recognize no races in this species.

Cyrtonyx montezumae. Montezuma Quail.—Intergradation between *C. m. montezumae* and *C. m. sallei* in the southern part of the range of the former race is suggested by two specimens I have examined: A first-year male collected at Tres Marias (20 km. N Cuernavaca, 9800 ft.), Morelos, on January 30, 1945, departs from typical members of *montezumae* in the presence of varying amounts of chestnut on the posteriormost flank feathers. Its dorsal coloration is warmer and browner than that of any other specimen of *montezumae* examined, but there is no suggestion of *sallei* in dorsal patterning. Such is clearly present, however, in the second specimen, a first-year male collected 8 kilometers southwest of Rio Frio, 8900 feet, Estado de Mexico, on January 13, 1945. The shaft streaks of back feathers are a warm buff with or without black borders, the ground color is olive-buff, and the transverse, more or less oval spots appear in a row on either side of each shaft streak. In typical *montezumae*, however, the light buff shaft streaks are consistently black bordered and contrast with transverse black bars and lines on a reddish brown or grayish brown ground color. Thus, dorsal patterning of the specimen from Rio Frio is more similar to that of *sallei* than that of *montezumae*; but dorsal coloration is unlike either, although the general impression provided by color is perhaps closer to *montezumae* than to *sallei*.

Late breeding of this species in the highlands of Sinaloa is indicated by the record of a family group of two adults and at least three or four more than half-grown young observed on October 16, 1946, at El Batel (70 km. NE Mazatlan, 5100 ft.). Only the male was collected (left testis, 5 mm.).

Rallus limicola limicola. Virginia Rail.—A specimen of doubtful sex was taken at Alpuyea (25 km. S Cuernavaca, 3000 ft.), Morelos, on January 17, 1946.

Charadrius vociferus vociferus. Killdeer.—This species, lacking from previous lists of Guerreran birds, is represented in the Ray Collection by a female collected on February 20, 1940, at Chilpancingo.

Eupoda montana. Mountain Plover.—No previous records from Coahuila are known to me. One female was collected at Hipolito (50 km. NW Saltillo, 5000 ft.), on February 23, 1946.

Tringa solitaria. Solitary Sandpiper.—A female collected at Cuapongo, Guerrero, on August 15, 1939, represents the race *cinnamomea* on the basis of characters of both color and size (wing, 136.0 mm.). I find no previous report of this species from that state.

Totanus melanoleucus. Greater Yellow-legs.—This species, in Sonora, is considered by van Rossem (1945:81) as "probably a fairly common transient and winter visitant, although records are few and scattered." The earliest fall date given by him from a coastal locality is November 14. Greater Yellow-legs were noted daily and repeatedly, but in small numbers, from October 27 to November 4, 1946, on a laguna at Pitahaya, Sonora.

Actitis macularia. Spotted Sandpiper.—A series of four specimens was obtained at Chilpancingo, Guerrero, between the dates of October 12 (1940) and April 26 (1939). Davis (1944:10) reports three specimens taken in the late summer (August 9-13, 1942) while Griscom (1934:373) lists one taken in January. Evidently this species occurs in Guerrero as both migrant and winter resident.

Capella gallinago delicata. Wilson Snipe.—The Ray Collection contains a female

collected at Chilpancingo, Guerrero, on December 20, 1939. This species is not listed from that state by Griscom (1934) or more recent authors.

Recurvirostra americana. Avocet.—This species, in Sonora, is considered by van Rossem (1945:88) as a "transient and winter visitant of uncertain abundance." At Pitahaya, from October 27 to November 4, 1946, one flock of approximately 25 individuals as well as scattered individuals and small groups were seen daily.

Sterna albifrons. Least Tern.—Another species not previously reported from Guerrero is represented in the Ray Collection by a female collected at Acapulco on September 7, 1944, in a late stage of the postjuvinal molt. Presumably it represents the race *browni*.

Columba flavirostris. Red-billed Pigeon.—A series of 17 specimens from Texas, Mexico, and El Salvador sheds some light on the variation of this species in Mexico. According to van Rossem (1930:197) and Peters (1937:65), two races are found: *C. f. flavirostris* ranges northward through Mexico to southern Texas and southeastern Sonora; *C. f. restricta* occurs in southern Sonora and Sinaloa. *C. f. restricta* is said to be paler than the nominate race, with less red on under parts and more prominent grayish white margins on greater wing coverts. Among specimens examined in this study, only the characters of paler average coloration and ventrally reduced red coloration appear to be usable in distinguishing *restricta*. Individual variation is marked, and the magnitude of difference in average coloration is approximately comparable to that separating eastern and western races of *Zenaidura macroura*. Three adult males examined in this study together suggest a western pale race and are tentatively assigned to *restricta*: one from Sauta (12 km. S Santiago Ixcuintla, 150 ft.), Nayarit, April 18, 1946, and two from Poliutla, Guerrero, December 3, 1944. One of the latter two is ventrally the palest of specimens seen by me. These specimens would seem to bear out Hellmayr and Conover's (1942:452) postulation that the range of this race extends south beyond Nayarit. Summer occurrence of "*Columba flavirostris flavirostris*" in Guerrero has recently been recorded by Davis (1944:10).

It remains doubtful whether or not the character of more prominent white wing-covert margins actually serves in separating *restricta* from *flavirostris*. Again considerable individual variation occurs in this character among specimens seen by me. While the three specimens assigned to *restricta* do show more white wing-covert margining than most specimens of *flavirostris* from northeastern Mexico, they do not show nearly as much white as two from the southern part of the range of the nominate race: an adult female, San Juan, Campeche, November 23, 1945, and an adult male, Xocempich, Yucatan, November 7, 1945. Degree of wear is undoubtedly a factor in the prominence of this character; both of the specimens just cited are incompletely or recently molted, and an immature male collected at La Union, Nuevo Leon, on July 24, 1945, shows newly grown greater wing coverts with striking white margins.

Van Rossem (1930:197) notes that according to Ridgway's (1916:301) figures, birds from Texas average the largest in this species. This fact is borne out by data on wing length of adult males I have examined, as follows:

Texas, Tamaulipas, Nuevo Leon	205, 204, 200 (worn), 200 (worn), 197, 194 mm.
Nayarit, Guerrero, Vera Cruz, Yucatan	196, 196, 194, 193, 192, 192 mm.
El Salvador	187 mm.

Zenaidura macroura. Mourning Dove.—A large series of specimens from Guerrero and Oaxaca clearly indicates that populations occurring in these states do not represent the race *marginella* alone, as maintained by Ridgway (1916:349) and Peters (1937:83), but represent, in the majority of specimens, another race that is smaller and darker.

Occurrence of both breeding and wintering populations of this species in southern Mexico complicates any effort to analyze racial distribution.

Information on the breeding distribution of the Mourning Dove in southern Mexico is scanty. It supposedly breeds in Oaxaca, according to Ridgway (*loc. cit.*), and this is confirmed by four specimens from that state collected by A. S. Leopold, as follows: a male (testis 14 mm.), 6 kilometers east of Tamazulapam (6600 ft.), September 5, 1945; a male (testis 9.5 mm.) and two females (largest ova 1.5 and 4.5 mm., respectively), all from Tlacolula (5000 ft.), September 7, 1945. The dates appear to be too early for migrants from the north, and condition of gonads indicates that these specimens were obtained probably toward the end or just after the nesting season. Nesting of *Zenaidura macroura* in Guerrero, however, is apparently not known. Ridgway (*loc. cit.*) does not include that state in his statement of the breeding range, and Griscom (1934:372) lists four specimens taken at Chilpancingo in the period from October 27 to January 5. The Ray Collection contains 28 specimens from the same state representing all months except May, June, August, and September. Three of these specimens, all from Chilpancingo, were collected in April and July: female ("ovary slightly enlarged"; wing, 134 mm.), April 11, 1943; female ("ovary slightly enlarged"; wing, 140 mm.), April 12, 1944; and female ("ovary minute"; primaries undergoing molt), July 16, 1944. The latter specimens suggest the possibility that the species may breed in Guerrero, presumably at elevations above that of Chilpancingo.

In spite of the present uncertainty concerning the actual breeding range of *Z. macroura* in southern Mexico, it is possible to say that most of the specimens from Oaxaca and Guerrero examined in this study do not belong to the race *marginella*. They are clearly darker, and also smaller (see table 2), than specimens of *marginella* from southwestern United States and northwestern Mexico. The former thus suggest *Z. m. carolinensis*. Among the 36 specimens from Guerrero and Oaxaca, there are but seven actual or possible breeding specimens, already cited. The remaining 29 were obtained at times other than the presumed period of breeding and may represent, in the main, migrants and wintering birds, those from Guerrero perhaps entirely so. The probable occurrence of *Z. m. carolinensis* as a winter resident in Oaxaca and Guerrero is suggested by recently published banding data. Ridgway (1916:346) considered *carolinensis* to be a migrant along only the gulf coast of Mexico, but its presence in the interior of Mexico has been demonstrated by records of McClure (1943:407), who reports recoveries of Iowan doves in Nayarit, Jalisco, and Distrito Federal, and also in El Salvador. Two specimens collected in Michoacan on February 21, 1945, at Quiroga (6800 ft.), resemble the Guerreran and Oaxacan birds in color and thus also suggest *Z. m. carolinensis*. I do not find any breeding records of *Z. macroura* from Michoacan. McClure (letter, March 29, 1948) reports a recovery of an Iowan dove from Curimeo, Michoacan.

The western race, *Z. m. marginella*, however, does occur as a winter resident at least as far south as Guerrero. Two, not included in the total of 36 mentioned above or in table 2, collected at Chilpancingo, are here assigned to *marginella*: a male (wing, 157 mm.) taken on February 17, 1944, and a female (wing, 149 mm.) taken on November 27, 1944. Color characters of these specimens fall within the range of variation of both *carolinensis* and *marginella*.

In summary, it is shown that specimens from Guerrero and Oaxaca, which represent a breeding population in part in the latter of these two states, are distinguishable from *Z. m. marginella* by smaller size and darker coloration and are indistinguishable from *Z. m. carolinensis*. The latter race occurs in the winter in central Mexico and southward; also, most of the specimens were obtained in winter and periods of migration. These

facts suggest that the majority of Guerreran and Oaxacan specimens represent wintering individuals of *carolinensis*. *Z. m. marginella* also occurs in Guerrero as a winter resident. *Z. macroura* is not known to breed in Guerrero, but there is some indication that it may do so. Foregoing data also suggest the possibility of a geographically separated population in southern Mexico that is racially indistinct from *carolinensis*; in this connection, a reexamination of breeding specimens from eastern Mexico is necessary.

Table 2
Wing Length in Three Populations of *Zenaidura macroura*

	Number of specimens	Mean with standard error	Standard deviation
Southern California, Northeastern Baja California, Nevada, Sonora, and Durango (<i>Z. m. marginella</i>)			
Males	20	148.9±0.7 mm.	2.94
Females	15	142.9±0.7	2.59
Guerrero and Oaxaca (<i>Z. m. subspecies?</i>)			
Males	17	143.9±0.7 mm.	2.76
Females	13	139.7±0.8	2.80
Ontario, New York, Michigan, Georgia, South Carolina, Wisconsin, and Missouri (<i>Z. m. carolinensis</i>)			
Males	11	143.3±1.1 mm.	3.44
Females	6	139.2±1.8	3.97

Zenaida asiatica. White-winged Dove.—Thirty-seven specimens from various parts of Mexico and adjoining parts of Texas, New Mexico, and Arizona have been examined in the light of distinctions between the races *Z. a. asiatica* and *Z. a. mearnsi* provided by Ridgway (1916:379, 383). Ridgway included Nuevo Leon and San Luis Potosí in the range of the western race (*mearnsi*), but this is now regarded as erroneous in view of the geographic gap, the northern part of the Mexican plateau, separating northern populations of the two races. Thus, Peters (1937:87) and Hellmayr and Conover (1942:500) restrict *mearnsi* to western Mexico and adjoining parts of the United States.

These authors, however, also extend the range of *mearnsi* southward and eastward to Puebla, and this I regard as open to question. Geographic relations of the two races would lead one to expect intergradation between them to occur to the south of the central plateau. This is corroborated by data from the series examined in this study. Thus, populations in the southern Mexican states east of the gulf-coast lowlands and Oaxaca are more or less intermediate in size between *asiatica* and *mearnsi*. Wing lengths of fifteen specimens from Guerrero are as follows:

Males	166, 165, 162, 161, 159, 158, 155 mm.
Females	164, 163, 160, 157, 156, 154, 153, 148 mm.

The averages, 160.8 and 156.8 mm., respectively, are below those given by Ridgway (*loc. cit.*) for *mearnsi*, but are closer to *mearnsi* than to *asiatica*. Two specimens obtained to the west of Puebla, however, appear to represent *asiatica*: a male (wing, 152 mm.), taken at Lake Rodeo, Morelos, on January 26, 1945, and a male (wing, 150 mm., tip slightly worn), taken at Pedrigal (5 km. S Mexico City, 7900 ft.), Distrito Federal, on July 31, 1943. In both of these specimens wing length is below the average (156.3 mm.) given by Ridgway for the race *asiatica* rather than the reverse, as might be expected from the range statements of Peters and of Hellmayr and Conover. Average color differences between the two races are slight and difficult to appraise; southern Mexican

specimens, however, appear to be more or less intermediate and probably average closer to *asiatica* than to *mearnsi*.

A male taken along the east slopes of the Sierra Madre Oriental at Santa Domingo, 4500 feet, San Luis Potosí, on September 27, 1945, measures 165 mm. in wing length (to the tip of the third developed primary; the second is not fully grown). At present it seems best to regard this specimen as a large variant of *Z. a. asiatica*.

For Sonora (van Rossem, 1945:99), late fall or winter records north of latitude 29° are lacking, although the species is known to winter in southern Arizona in small numbers. A loose flock of approximately 25 individuals was observed in flight over bottom-land timber of poplar and willow just south of Casita (40 km. S Nogales, 3300 ft.), on November 9, 1946.

Leptotila verreauxi. White-fronted Dove.—Guerreran specimens of this species, are assigned by recent authors to *L. v. angelica* [= *brachyptera*], and seven specimens examined in this study are so placed. Characters of these specimens display an approach toward *fulviventris*, however, as vinaceous coloration of the breast and buffness of posterior under parts both average somewhat darker than in typical *angelica* to the north. One specimen, an adult male collected 10 kilometers south of Atoyac, Guerrero, on December 12, 1944, is as richly buffy ventrally as typical *fulviventris* and represents an extreme in the entire series of *angelica* available to me.

Leptotila jamaicensis. Jamaican Dove.—This species, represented by the race *gaumeri*, is known on the Mexican mainland only in the northern part of the Yucatan Peninsula (Hellmayr and Conover, 1942:566). An adult male was obtained at San Juan, Campeche, on November 24, 1945.

Leptotila cassinii. Cassin Dove.—The known occurrence of this species within Mexico is apparently limited to southern Chiapas (Hellmayr and Conover, 1942:567). Four specimens were obtained well to the northeast of this locality, at Monte Libano (100 km. NE San Cristobal, 2500 ft.), Chiapas, December 1-5, 1945. Presumably they represent the race *cerviniventris*. It may be noted that this range extension is similar to that described under *Colinus virginianus insignis*.

Oreopelia albifacies rubida. White-faced Quail-dove.—Among 11 specimens in the Ray Collection from Cuapongo and Omilteme, Guerrero, two provide breeding data: a male collected at the latter locality on July 16, 1945, with "testes fully enlarged" and a well-grown juvenal female from the same locality collected on August 12, 1943.

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