I would like to thank Frank A. Pitelka and Ned K. Johnson for their helpful comments, Paul A. Hurd for determining the stomach contents, and Robert T. Orr for use of the facilities at the California Academy of Sciences.—RICHARD B. ROOT, *Museum of Vertebrate Zoology, Berkeley, California, August 9, 1961.*

Variation in the Red-tailed Hawks of Southern México and Central America.—Until recently, populations of the Red-tailed Hawk (*Buteo jamaicensis*) from southern México to Panamá have been referred to the subspecies *costaricensis* (Hellmayr and Conover, Field Mus. Nat. Hist., Zool. Ser., 13, pt. 1, no. 4, 1949; Friedmann, Griscom, and Moore, Pac. Coast Avif. No. 29, 1950; and Friedmann, Bull. U. S. Nat. Mus. 50, pt. 11, 1950). Oberholser's description of *B. j. kemsiesi* from Honduras (Proc. Biol. Soc. Washington, 72, 1959:159) indicated the advisability of re-examining the available material of the species from México and Central America. Some years ago, I examined and measured the excellent series from Guerrero in the Museum of Vertebrate Zoology. In February of 1960, I was able to examine the specimens of this species at the Museum of Comparative Zoology, the American Museum of Natural History, and the United States National Museum. In addition, I have been able to borrow two birds from the type series of *kemsiesi* from the University of Cincinnati Museum and several birds from the Moore Laboratory of Ornithology at Occidental College. Including the small series here at The University of Michigan Museum of Zoology, I have been able to examine over 80 resident birds, approximately one-half of which were in adult plumage. I am grateful to the curators of these collections for permission to use this material.

In southern México and in Central America, Red-tailed Hawks are birds of the mountains, at least during the breeding season. Two major breaks, the Isthmus of Tehuantepec and the lowlands of southern Nicaragua, divide the highlands of this region into two well-defined segments: the highlands of Costa Rica and western Panamá and those from Chiapas to northern Nicaragua. North and west of the Isthmus of Tehuantepec the highlands are essentially continuous with the Rocky Mountain system.

Red-tailed Hawks from the southern part of this mountain system (Jalisco to Oaxaca) resemble

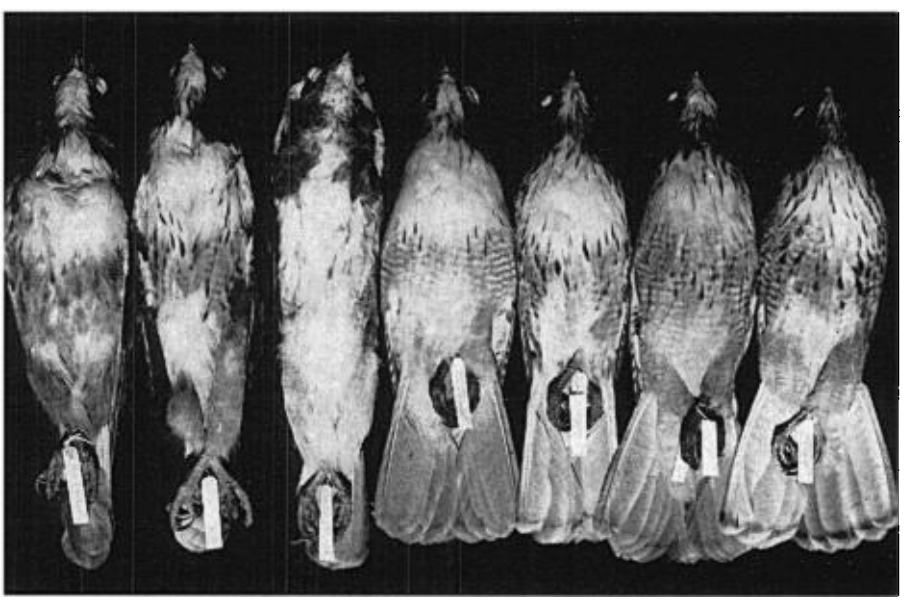

Fig. 1. Adult Red-tailed Hawks from southern México and Central America. Left to right, *Buteo jamaicensis costaricensis,* UMMZ 132072 and 116625 from Costa Rica; *B. j. kemsiesi,* UMMZ 97658 from Chiapas; and *B. j. hadropus,* UMMZ 117225, MVZ 109350 (type), 109365, and 109353, all from Guerrero.

birds from south of the Isthmus of Tehuantepec in size (see table) and some individuals of the larger, more northern race, *B. j. calurus* in color. Adults of the three southern populations, although similar in size, are quite different in color (see fig. 1). Birds from Costa Rica and western Panamá (*B. j. costaricensis*) are darkest dorsally; ventrally, the white breast contrasts with the strong rufous color of the "belly band," which may be marked with sooty streaks varying in width from fine shaft streaks to almost tear-shaped spots. The flags are dark rufous with very little or no transverse barring.

B. j. kemsiesi, occupying the highlands of Chiapas, Guatemala, Honduras, El Salvador, and northern Nicaragua, is somewhat paler above than is *costaricensis* and much paler below than either that race or the more northern population. The "belly band" is ill-defined or absent and the streaks greatly reduced or absent. The flags are faintly barred with pale rufous.

The birds occurring in the area from Jalisco to Oaxaca apparently belong to an undescribed race which may be called

Buteo jamaicensis hadropus new subspecies

Type.—Adult male, no. 109350 Mus. Vert. Zool., taken at Chilpancingo, Guerrero, México, on March 2, 1940, by W. W. Brown; testes "enlarged."

Diagnosis.—Adults differ from those of *Buteo jamaicensis kemsiesi* in having a band of rufous-barred feathers across the abdomen that contrasts with the unbarred white or pale buff breast, in being more heavily streaked below, and in having darker rufous flags, which are usually barred with whitish. They differ from adults of *B. j. costaricensis* in having a lighter back and barred "belly band" and flags. Pale individuals of *B. j. calurus* may resemble specimens of the new race in the color of the underparts, but they can readily be distinguished by their larger size. In addition, light-phase examples of *calurus* have smaller dark tips to the feathers of the back and of the sides of the head so that the light central parts of the feathers are more in evidence, giving the bird a strongly mottled appearance. Measurements of the type of *hadropus* are as follows: wing (arc), 372 mm.; tail, 196; tarsus, 91.5; culmen (from cere), 27.3.

Range.—The highlands of southern México from Oaxaca north and west at least as far as Jalisco. Presumably intergrades with *B. j. calurus* and *B. j. fuertesi* in northwestern México.

WING LENGTHS (IN MILLIMETERS) OF RED-TAILED HAWKS FROM SOUTHERN MEXICO AND CENTRAL AMERICA

	Males			Females		
Subspecies	Number	Range	Mean	Number	Range	Mean
costaricensis	6	352–393	376	8	376–408	395
kemsiesi	8	368–382	375	6	362–402	389
hadropus	20	348–390	379	13	377–420	397

Adults in the dark phase are of infrequent occurrence: I have seen one dark example of *hadropus* (USNM 144148 from Mt. Zempoaltepec, Oaxaca) and two of *kemsiesi* (AMNH 393613 from San Lucas, Guatemala; and AMNH 101089 from San Rafael del Norte, Nicaragua). All three of these birds are black above and below but have concealed light markings on the "tertials" and scapulars. In addition, the two *kemsiesi* have the sooty black on the flags and on the under tail coverts mixed with rufous.

It might be expected that examples of *hadropus* from Oaxaca would approach *kemsiesi* in ventral coloration. However, three adults from that state in the United States National Museum average redder below than examples from Guerrero and Michoacán in that collection.—ROBERT W. STORER, *The University of Michigan Museum of Zoology, Ann Arbor, Michigan, July 21, 1961.*

Horned Lark Captured in Flight by Loggerhead Shrike.—In the evening on March 31, 1961, accompanied by three biologists from the California Academy of Sciences, I camped about 3 miles northwest of Rancho Cantina, on the Vizcaino Desert in central Baja California, México. Several flocks of Horned Larks (*Eremophila alpestris*) had been seen during the afternoon, with from ten to nearly 100 birds in a flock. At dusk about forty birds went to roost in a spiny thicket of *Lycium californicum* about fifty yards from our camp.