

PLUMAGE VARIATION IN THE MASKED BOBWHITE

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Soon after Brewster (1885) described the Masked Bobwhite, *Colinus virginianus ridgwayi*, Allen (1886a) obtained additional material and called attention to a high degree of color variation in the males of this form. The entire head, neck, and throat of the type, from extreme northern Sonora, was black, and Brewster (1885:200) specifically noted the absence of white frontal and superciliary stripes. Most of Allen's birds from Arizona, on the other hand, had more or less well marked white superciliary lines, and he suggested (1886a:275) that the type seemed to be "rather exceptional in certain features." Later, Allen (1886b) commented on additional variation in the shade of cinnamon on the underparts of the Arizona birds and on the touches of white on the throats of most males. Still later, he described the head of another male from Arizona that had even more white on the head and throat than those available earlier (Allen 1887). Apparently not to be outdone, Brewster (1887) described a series of birds from Sonora, noting that "The eight males included in this series show an even greater range of variation than the ten birds . . ." described by Allen, having even more white sprinkled on the head. Brewster suggested that this variation might be related to age. Except for the description of the first plumage of a young male (Allen 1889) and various attempts to use previously recorded information to determine the relationship of *ridgwayi* to other bobwhites, nothing further on the plumage of this form was written until Ridgway and Friedmann (1946) published a detailed description of it.

Several years ago my attention was drawn to this form because of its status as endangered (B.S.F.W. 1966). While examining the small series of *ridgwayi* in the National Museum of Natural History (USNM), I noticed variation in a color character on the head that had not been discussed previously. The USNM specimens were actually of two series, the first a group of birds taken by Lt. Benson at Bacoachi and Cumpas, Sonora, in 1886 and 1887, and the second, of birds recently received from the Patuxent Wildlife Research Center, where birds from the Benjamin Hill, Sonora, area were being reared in captivity to provide stock for attempts at reintroduction of the subspecies in Arizona (Tomlinson 1972b:305). The Benjamin Hill birds, which had been captured in Sonora or were the captive-reared first generation offspring of such birds, all had black ear coverts, whereas all the Bacoachi-Cumpas individuals had reddish-brown ear coverts; this was true in both sexes. Certain other features—paler ventral and browner dorsal coloration in the males—seemed to be associated with the reddish-brown ear coverts. A pair of bobwhites from Las Arenas, in the Valle de Agua Caliente, seemed slightly different from both the Bacoachi-Cumpas specimens and the Benjamin Hill birds, although they also had reddish-brown ear coverts. The detailed description of the plumage of *ridgwayi* given by Ridgway and Friedmann (1946:344) agreed with, and probably was based on, the Bacoachi-Cumpas specimens and did not mention the occurrence of black auriculars in this taxon.

My first reaction to discovery of this variation was that the birds referred to *ridgwayi* actually might

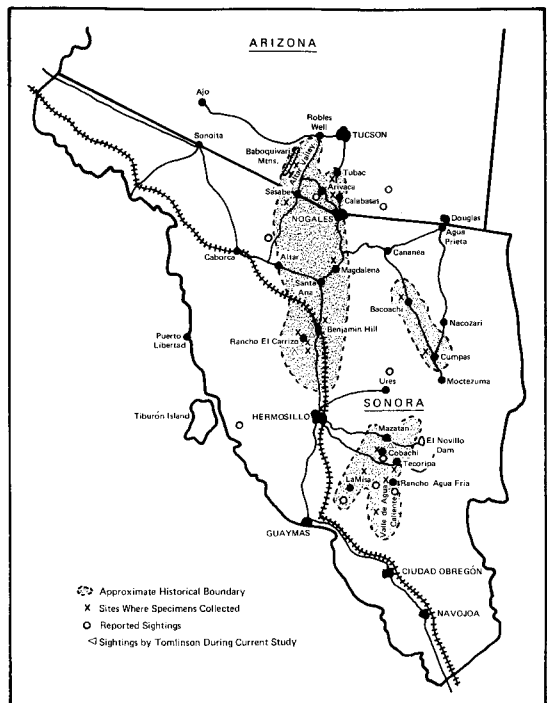


FIGURE 1. Past distribution of the Masked Bobwhite Quail. From Tomlinson 1972b.

represent two separate and distinguishable populations. This impression was reinforced when, in 1970, I had the opportunity to examine the type and several other specimens of *ridgwayi* in the British Museum (Natural History). The type, taken by Frank Stevens 18 miles SW Sasabe, Sonora, had black ear coverts like the Benjamin Hill birds, and five others from elsewhere in Sonora had chestnut ear coverts. Two specimens from Arizona, the first I had seen from that state, were poorly prepared and the color in the critical auricular region could not be determined accurately. A tentative conclusion was that true *ridgwayi*, with black ear coverts, occurred from Benjamin Hill to Sasabe and probably into nearby Arizona, and that another population with reddish brown ear coverts (and presumably correlated dorsal and ventral color characters) occupied the Bacoachi-Cumpas area, farther east in Sonora. If this conclusion were correct it would seem that Ridgway and Friedmann (1946) had unwittingly based their description of *ridgwayi* on birds of the wrong population.

Before I could verify these ideas by the examination of a larger series of specimens, Tomlinson (1972a, 1972b) summarized other aspects of work with the endangered Masked Bobwhite. He published maps showing that the Masked Bobwhite had been known to occupy three separated areas in Sonora, one of which extended slightly into Arizona (fig. 1). One segment of the historic range included southern Arizona, Sasabe and Benjamin Hill; another included Bacoachi and Cumpas; and the third, Las Arenas.

Prior to Tomlinson's (1972a, 1972b) work on the historical range of the Masked Bobwhite, there was no indication in the literature that this form occupied three geographically isolated areas. It is interesting that all who have written about *ridgwayi*, with the exception of those stating the overall range in general terms, have discussed only a single segment of the

tripartite population. A review of the literature gathered by Tomlinson (1972a) suggested that none of the early authors who mentioned variation in head patterns had had material from more than one population available as he wrote. The earliest descriptive papers on *ridgwayi* (Brewster 1885, Allen 1886a, 1886b, 1887, 1889) all related to birds in the western segment, from Arizona to the Benjamin Hill area (fig. 1). Brewster (1887), Ridgway (1887), Beckham (1888), and Bendire (1892) all wrote about the Bacoachi-Cumpas portion of the range. Although W. W. Brown collected a long series of birds in the southern part of the range of *ridgwayi* for the Thayer collection in 1905 and 1906, his specimens and that region were not mentioned until much later (Phillips 1929).

Through the courtesy of the curators of several collections, I was able to assemble, at the Field Museum, a series of more than 60 adult and first-year birds taken during the months of October through February, when the birds were in fresh plumage. All three populations shown in figure 1 were represented.

Examination of this larger and more comprehensive series showed that the geographic correlation of color variation that I anticipated seeing on the basis of the preliminary studies does not exist. Male birds from Calabasas, Tubac, and the Baboquivari Mountains, Arizona, as well as males from 90 miles south of Nogales, Bacoachi, Cumpas, Las Arenas, and Tecoripa, Sonora (fig. 1) had ear coverts ranging from chestnut to light brown or greyish brown, some with black feathers interspersed. Only one male from Tecoripa and the birds from the captive population originating at Benjamin Hill (and the type from Sasabe, not reexamined at this time) had fully black auriculars. Other color characters of the back and underparts that had seemed to be correlated with auricular color vanished in a maze of variability. *Colinus virginianus ridgwayi* must continue to be considered a single, highly variable subspecies.

Lester L. Short (American Museum of Natural History), Robert B. Payne (Museum of Zoology, University of Michigan), and Stephen M. Russell (University of Arizona) sent selected specimens, in response to a request with short notice, to the Field Museum of Natural History where, through the courtesy of Melvin A. Traylor, I was able to study them along with birds from the National Museum of Natural History and the Field Museum's extensive series. J. David Ligon (University of New Mexico) and Curtis S. Adkisson (Virginia Polytechnic Institute and State University) had previously loaned me material. Roy Tomlinson, Bureau of Sport Fisheries

and Wildlife, provided me with much information on the Masked Bobwhite and kindly made available the plate used here as figure 1. I further thank David Snow and colleagues at the British Museum (Natural History) for courtesies extended during my visit to examine specimens in 1970. John W. Aldrich, Marshall Howe, John Weske, and Roy Tomlinson read and commented on an early draft of the manuscript.

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OBSERVATIONS ON ROOF-NESTING KILLDEERS

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Killdeers (*Charadrius vociferus*) have been known to nest on roofs but in researching I could find no mention of the transfer of the chicks from the roof to the ground. Bent (*U. S. Natl. Mus. Bull.* 146:206, 1929) and the Cornell Laboratory of Ornithology Newsletter to Members (Summer 1969)

both noted roof-nesting Killdeers but with no knowledge of the transfer of the chicks.

From 1967 through 1972, I observed Killdeers nesting on the roof of the Superlite Building in Phoenix, Arizona. The building is located on a main street about 6 mi from the Salt River, the nearest other known nesting place of Killdeers. The roof is 22.6 × 48.8 m, essentially flat and covered with pale gravel. Beds of dense vegetation 1.5 m tall surround the building. The only other vegetation is a small grassy area to the north of the building, across from the parking lot.

The Killdeers laid two 4-egg clutches in each of the years 1967 through 1971. Only one clutch was