

## NESTING OF MEARNS QUAIL IN SOUTHEASTERN ARIZONA

By O. C. WALLMO

Accounts of nests of the Mearns or Montezuma Quail (*Cyrtonyx montezumae mearnsi*) are so few that the discovery of several nests and the observations related to them seem to be worthy of record. These observations were made in the Huachuca Mountains, Cochise County, Arizona, in 1950. This mountain range rises from desert grassland pediments of about 5000 feet elevation to a maximum height of 9445 feet. The vegetative cover is largely oak woodland and chaparral, with lesser areas of pine-oak woodland and pine-fir forest. The data were collected incidental to activities under Pittman-Robertson project 46-R, Arizona Game and Fish Commission.

Mearns Quail are considered to be quite rare where they occur in Texas, New Mexico, and Arizona, but they were found to be fairly common in the Huachuca Mountains in the period from 1948 to 1951. In 1949 and 1950 there seemed to be a decided population increase, judging from intensive personal observations and the universal testimony of local residents. Most residents said that "fool quail" were more numerous than they had seen them for many years. This apparent population increase applied at least to all of the area between the San Pedro and Santa Cruz rivers, including Mearns Quail range in the Huachuca and Patagonia mountains and the Canelo Hills (Cochise and Santa Cruz counties).

In 1949 paired birds were first observed on April 15 in the Mule Mountains, 20 miles east of the Huachucas. That year, when little work was done in Mearns Quail range during the breeding season, 3 broods were seen as follows: August 4, 1 adult, 5 young; August 5, 1 adult, 5 young; September 7, pair with 7 young.

In 1950, paired birds were first observed on April 11. Between April 11 and September 18, 32 pairs without young were observed, none of which observations could reasonably be called duplications. The first juveniles that year were seen on July 16. The following broods were seen that season: July 16, pair with 2 young (2 inches long); August 3, pair with 10 young ("larger than sparrows"); August 12, pair with 2 half-grown young; September 13, pair with 7 young; September 26, pair with 9 young; September 28, pair with 11 young of 2 age classes; October 6, 2 pairs, each with 7 young; October 9, pair with 4 young; October 30, 11 young; October 31, pair with 1 young. After that date young birds were not distinguishable in the field. These brood counts may not in all instances represent the entire brood.

In 1951, paired birds were not observed until May 25. Work in Mearns Quail range was discontinued in June and no more observations were obtained.

In a cursory review of the literature, several dates were found which pertained to the period of reproduction, all being observations in Arizona. They were: June 14—young birds seen (Sutton and Phillips, 1942); June 18—eggs, August 10—young a week old (Bent, 1932); August 17—newly hatched chicks, August 22—fresh eggs, September 5—late nest (Willard, 1913); October—young two-thirds grown (Scott, 1886).

Our observations of nests and more abundant observations of young broods, in addition to the published dates, show that nesting in southern Arizona is principally in the summer rainy season which usually occurs between late June and late September. This late season of breeding has also been reported by Campbell (1934), Brandt (1951), Miller (Robertson, 1932) and Swarth (1909). The dampness in this season, according to O. C. Poling (Bent, *op. cit.*), is often responsible for staining the normally white eggs. We found such stained eggs in an active nest discovered on July 12, 1950. At that time light to heavy rains fell daily and the grass in the nest was damp.

Nests found by Poling, Todd, Owen and Willard were described by Bent (*op. cit.*). Apparently Willard had seen a large number of nests but we found reference to only three (from the Huachuca Mountains) which he reported. Descriptions of seven nests found in the summer of 1950 are given below. One of these nests (number 2) was found by the author. The other six were found and shown to me by residents of the area. Nest number 7 was in the Canelo Hills just west of the north end of the Huachuca Mountains. The others were in the Huachuca Mountains proper.



Fig. 1. Nest no. 3, a depression in maple and sycamore leaves.



Fig. 2. Nest no. 6, a chamber in curly mesquite and hairy grama; egg fragment on top of nest.

*Nest 1.*—July 8, found by Mr. Tom St. John; female at nest; eleven eggs. July 23, female walked away with 11 chicks; no shell fragments left in nest (some found 2 feet from nest); during incubation the hen was gone most of the morning; on leaving she would pull leaves over the entrance; no male was seen at the nest during this 15-day period (information from Mr. St. John). The nest was situated in the bottom of Ramsay Canyon, 5700 feet elevation, under a dense canopy of Rocky Mountain maple (*Acer glabrum*) and Arizona oak (*Quercus arizonica*) in deep shade. It was fifty feet from the base of a water storage tank, 100 feet from a running stream, and 200 yards from a residence. The site was cool and moist. The nest was placed against the base of a small Arizona oak and consisted of a chamber sparsely roofed with bedstraw (*Galium* sp.) and bullgrass (*Muhlenbergia emersleyi*). The floor was lined with dry leaves of Arizona oak. Interiorly it was about 5 inches wide and 4 inches high.

*Nest 2.*—July 12, female flushed from nest; ten eggs. July 13, female present; eleven eggs. The nest was deserted some time between July 13 and 28. The site was in the bottom of McClure Canyon, 6300 feet, in a small meadow of pinyon ricegrass (*Piptochaetium fimbriatum*), under a woodland of Rocky Mountain maple and silverleaf oak (*Quercus hypoleucoides*). A stream was about 100 yards away and the area was cool and moist. The nest was a roofed chamber of pinyon ricegrass, the interior being about 6 inches wide and 4 inches high; it was lined with dry grass, some Emory oak (*Quercus emoryi*) leaves, and very little down. The eggs averaged  $1.19 \times 0.98$  inches and were clear white but stained.

*Nest 3.*—July (no date), found by Mr. Clint Post. Reportedly, 8 or 9 chicks hatched about July 20. The site was in the bottom of Ramsay Canyon, 5800 feet, under a dense woodland of maple and sycamore (*Platanus wrightii*). There was a sparse ground cover of grape (*Vitis arizonica*), brome-grass (*Bromus* sp.) and *Equisetum*. It was situated about 250 yards from nest 1, 4 feet from the edge of a travelled road, and 20 feet from a stream—a cool, moist site. The nest was in a barely perceptible hollow in dead maple and sycamore leaves, with no canopy and was among the trunks of a dense thicket of small maples (fig. 1).

*Nest 4.*—July 30, found by Mrs. Ila Healy; female flushed from nest; thirteen eggs “well incubated.” August 13, fragments of 2 eggs lay 4 feet in front of the nest; fragments of 11 eggs in the nest; a male was calling 200 yards below the nest and several other quail were heard “talking.” The site was hot and arid on a limestone ridge above Blacktail Canyon, 6000 feet. The nest was on an east-facing slope with chaparral cover (fig. 3) of mountain mahogany (*Cercocarpus breviflorus*), sotol (*Dasylirion wheeleri*) and agave (*Agave palmeri*), and a dense lower-story of sideoats grama (*Bouteloua curtipendula*), plains lovegrass (*Eragrostis intermedia*) and *Brickellia* sp. There was a temporary water seep 200 yards below. The nest was hollowed out of a dead clump of plains lovegrass, almost under a limestone boulder. It was shaded by tall clumps of sideoats grama and plains



Fig. 3. Site of nest no. 4; slope grown to mountain mahogany-sotol chaparral.



Fig. 4. Nest no. 4, chambered in plains lovegrass.

lovegrass. The interior was 6 inches wide and 4 inches high, and the floor was lined with dry grass fragments and down (fig. 4).

*Nest 5.*—August (no date), found by Messrs. Little, Worthen and Yorger (date not recalled) while cutting weeds; female present; deserted nest with one egg. The site was an open woodland of Arizona oak and juniper (*Juniperus pachyphloea*), 5900 feet, about 100 yards from buildings of Jack Wakefield mining camp. No water was present except that around the buildings. The area was hot and arid. The nest was in a clump of bulb panicgrass (*Panicum bulbosum*), well concealed by sprouts of Arizona oak and was chambered about as in nest 4.

*Nest 6.*—September (no date), found by Mr. Carl Yorger (date not recalled); reported “15 or 20 eggs, all hatched,” prior to September 18. The site was on a hot and arid grassland mesa (Campini Mesa) at 5500 feet. There was a draw with Arizona and Emory oak about 100 feet away. The principal grasses were plains lovegrass, blue and hairy grama (*Bouteloua gracilis*, *B. hirsuta*), and curly mesquite (*Hilaria belangeri*). The nearest water was one-half mile away. The nest was hollowed out of a dense, mixed clump of curly mesquite and hairy grama, with constructed elements of stems of those grasses. The floor was lined with grass.

*Nest 7.*—September 20, accidentally stepped on by Mr. Holt (Holt Ranch, Canelo Hills); nine eggs; hen flushed and deserted; the eggs, examined on September 29, were about ready to hatch when disturbed. The site was hot and arid in open grassland of curly mesquite and blue grama at 5000 feet. It was several hundred yards from oak woodland, 200 yards from ranch buildings, and 6 feet from an irrigation ditch under construction. Water was abundant around the ranch buildings. The nest consisted of a chamber under a clump of curly mesquite. The roof contained many dead stems of showy goldeneye (*Viguiera multiflora*), and the floor was of grass stems. The interior of the chamber was 6 inches wide and slightly less in height.

Although males were never seen at the nests, the several families of Mearns Quail observed in the summer of 1950 were all accompanied by the male. Willard reported males on the eggs “in about half the nests examined” (Bent, *op. cit.*).

The canopied construction of nests may afford significant protection during the

frequent rains of the breeding season. In the nests where the canopy was flimsy or absent there was a dense over-story of broad-leaved trees which probably served the necessary protective function. However, shade may be as important as protection from rain for successful incubation.

If one may judge from these limited data, there is great latitude in the nesting requirements of Mearns Quail. In the Huachuca Mountains they were found to inhabit all the vegetation types but they were seen least frequently in the desert grassland below 5000 feet. Although the highest nest found was at 6000 feet, the presence of young broods indicated that nesting occurred at much higher elevations.

When the population was high, in 1950, there was obviously an increased use of the grassland areas, and this probably represented an expansion of range at that population level. It was mentioned by Mearns (1890) that the range of this quail overlaps that of "Gambel's Partridge" in certain parts of Arizona. On the north pediment of the Huachuca Mountains we found them in range occupied both by Gambel Quail and Scaled Quail. This was on plains broken by draws containing oaks, mesquites, and other shrubs. The grassland, consisting largely of plains lovegrass, curly mesquite, and several perennial grammas, had been protected and was much more dense than it is commonly found to be today in that region. The lowest record of occurrence obtained was at 4500 feet, near the Babocomari River, north of Fort Huachuca on the edge of relatively barren desert shrub vegetation.

In the period from July 1, 1949, to June 30, 1950, on the Fort Huachuca Wildlife Area, we observed at least 197 separate individuals in an area of about 25,000 acres. Surveying a small watershed more intensively, we found 45 individuals in the winter on approximately 1100 acres (Wallmo, 1951). If this density prevailed generally, as it seemed to, the 25,000 acres would have contained some 1000 birds. All of the Huachuca Mountains, about 20 miles in length, would, at that density, have had a population of perhaps 2500 birds. While it should be emphasized that such expansion of the data may not be justified, it serves to give an indication of the approximate population level.

#### LITERATURE CITED

- Bent, A. C.  
1932. Life histories of North American gallinaceous birds. Bull. U. S. Nat. Mus. No. 162.
- Brandt, H.  
1951. Arizona and its bird life (Bird Research Foundation, Cleveland).
- Campbell, B.  
1934. Bird notes from southern Arizona. Condor, 44:57-65.
- Mearns, E. A.  
1890. Observations on the avifauna of certain portions of Arizona. Auk, 7:45-55.
- Robertson, J. McB.  
1932. Minutes of Cooper Club meetings, Southern Division. Condor, 34:109.
- Scott, W. E. D.  
1886. On the avifauna of Pinal County, Arizona. Auk, 3:383-389.
- Sutton, G. M., and Phillips, A. R.  
1942. June bird life of the Papago Indian Reservation, Arizona. Condor, 44:57-65.
- Swarth, H. S.  
1909. Distribution and molt of the Mearns quail. Condor, 11:39-43.
- Wallmo, O. C.  
1951. Fort Huachuca Wildlife Area surveys (Arizona Game and Fish Commission).
- Willard, F. C.  
1913. Late nesting of certain birds in Arizona. Condor, 15:227.

*Division of Wildlife Restoration, Texas Game and Fish Commission, Austin, Texas, December 7, 1953.*