NOTES ON THE ECOLOGY OF *DACTYLORTYX THORACICUS*

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THE following notes on the life history and ecology of the Singing Quail (*Dactylortyx thoracicus*) are offered as a supplement to the comprehensive paper by Warner and Harrell (1957). Our studies, which were confined to one population, were conducted in the oak–sweet gum cloud forest (Fig. 1) on the Rancho del Cielo, owned by W. Frank Harrison and situated about five miles northwest of Gómez Farías in southwestern Tamaulipas, Mexico. This area, its geology, climatology, and vegetational characteristics have been described thoroughly by Harrell (1951 MS) and Martin (1958). In 1951, lumbering operations were begun in the area and the floristic and ecologic conditions were altered; most noticeable has been the general opening of the forest crown followed by a more dense growth of the understory (Figs. 2 and 3). We stayed in the field from April through June, 1953; and from April through July, 1954, J. LeFebvre again studied in this area. The following notes are a product of part of the studies made at these times.

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HABITAT

Dactylortyx is found throughout the oak–sweet gum cloud forest at the Rancho del Cielo. Although, as Warner and Harrell (1957:125) point out, this species is regarded as a bird of the dense undergrowth, we found it common in the more open areas of the forest. However, there was some type of overhanging or screening vegetation in the areas where the quail were feeding, and an undergrowth was not distant from these feeding areas. Salvin and Godman (1897–1904:309) report finding quail at the edges of ravines in the mountainside forests where they "bask in open sunny spots."

To cite examples of the range of habitats utilized by the quail at Rancho del Cielo, a brief description follows. In several sections of the forest the quail occupy relatively undisturbed habitat which characteristically includes four layers: a small number of very tall oaks (*Quercus* spp.) and sweet gum (*Liquidambar styraciflua*) that provide an almost complete canopy; numer-

ous small and medium-sized oaks and sweet gum plus *Rhamnus caroliniana*, *Clethra macrophylla*, *Eugenia* spp. and *Ternstroemia* sp.; and shrubs and herbs common in the understory. The forest floor was thickly covered with leaf litter and mosses. In other regions of the forest, the canopy and secondary tree strata were similar to those described, but the ground cover was reduced, consisting only of a few scattered herbs. In those localities where most of the large oaks and sweet gum had been removed, a dense cover of pokeweed (*Phytolacca* sp.) and shrubby plants had invaded as an undercover

FIG. 1. (*left*) Relatively undisturbed area of oak–sweet gum cloud forest. FIG. 2. (*right*) Second-growth forest of partially lumbered area.

providing a changed habitat for the Singing Quail. Quail were observed frequently feeding on low-hanging pokeweed fruits. The pattern of the cutting operations in this locality left the cut-over areas greatly interdigitated with pockets, of varying sizes, of virgin or practically undisturbed timber. Most of the quail we observed in the disturbed habitat lived near the edges of these uncut areas, and certainly occupied sites which included both types of habitats. We observed quail feeding daily in the disturbed habitat and at all times of the day. This utilization of changed habitat agrees with the observations of Dickey and Van Rossem (1938:155), who found in El Salvador that the quail showed a decided tendency to favor the coffee groves instead of their natural oak scrub habitat.

We found no evidence of quail in certain areas within the oak–sweet gum cloud forest where the terrain was rocky and uneven and where there was little or no accumulation of soil or leaf litter among the moss-covered rocks. In these sites varying from one-quarter to three acres in extent, the vegetation did not differ markedly when compared to other sections of the forest.

Population Density

In the area comprising 20 acres enclosing and surrounding Mr. Harrison's ranch we located five pairs of quail in 1953 and four pairs in 1954. All except two pairs were found immediately adjacent to the ranch clearing. We estimated that elsewhere in the cut-over sections of the forest there was at least one pair of quail per 20 acres. Comparing these figures with the 3.5 pairs per 100 acres obtained by Harrell (1951 MS) in both 1950 and 1951 in the undisturbed forest, our estimate suggests a slight increase in the population in the changed habitat. Undoubtedly, these values are subject to error, but they indicate that in 1953 and 1954, the Singing Quail was maintaining its population density in the disturbed habitat.

Voice

The song of *Dactylortyx*, which has been described by Sutton and Pettingill (1942) and Warner and Harrell (1957:130), is both loud and musical. Most birds sang in the early morning and at dusk; however, the summer of 1953 was unusually dry and the amount of singing by this species as well as by other birds at the ranch was greatly reduced. On especially hot or dry days, no singing was heard at all, whereas cool, foggy or cloudy mornings prompted a few birds to sing. These observations agree with those of Sutton and Pettingill (1942).

In addition to the thrilling, thrush-like song, this species has at least two calls. One is a low-pitched, twittering call which we heard on almost all occasions when the birds were feeding. Often, too, when we came upon them in the forest, the quail would utter this call. Warner and Harrell (1957:130) suggest that this may be a location call for the family group. We had one particularly good observation of a bird giving this call when we flushed a pair of quail; the male landed 12 feet ahead of us on a rock and uttered the "twitter-call." We noted at that time, and on at least two other occasions, a peculiar quality in that this call often sounded like a duet with one voice just one note out of phase with the other.

The second call is a loud, sharp alarm whistle. We heard this only once in 1953, but it was recorded on several occasions in 1954, whenever the adults were accompanied by young. Once the alarm was issued, the adults would continue uttering the low "twitter-call," or on one occasion when we were examining the young, the parents clucked excitedly.

Behavior

Dactylortyx is primarily a bird of the forest floor and prefers to remain on the ground even when avoiding enemies. Although Warner and Harrell (1957:128) report no perching in this species, we have on four occasions seen them perching above the ground. In three cases when flushed or shot at, adult quail hopped onto nearby branches ranging in height from four to 12 feet. There they continued to twitter and began to bob their heads vigorously. When approached, these birds flew into nearby cover. In the fourth case, on May 7, E. LeFebvre observed a quail fly up onto a branch about 15 feet above the ground where it remained until darkness. This was the only case of arboreal retirement that we have noted.

Fig. 3. A recently lumbered area showing extent of removal of plant cover.

Some writers have stated that this species is wary, and that opportunity to observe it closely is seldom obtained. Our observations agree with those of Warner and Harrell (1957:7) in that *Dactylortyx* appears to be very tame at Rancho del Cielo. Certain pairs of quail became more wary, perhaps as a result of contact with people when lumbering activities began and transient workers moved into the region. The onset of the nesting season may also result in increased wariness. One pair of quail under almost daily observation showed little concern over our presence early in the study period, but several weeks later (about mid-June) it became increasingly difficult to approach this pair.

Care of Young

Behavior of the adults at the nest is not known, but both parents protect and care for the young once they have left the nest. On April 14, 1954, J. LeFebvre was alerted by

a sharp whistle given by a male standing at the side of a path. When it was approached, all bedlam broke loose. The female appeared, clucked very excitedly, and feigned injury by scurrying about with short, rapid steps and drooping wings. Both adults began to circle at a distance not more than five feet from the observer; meanwhile two young had scooted into a partly hollowed tree stump. They were found close together, heads hidden, and tails pointed upward and out. While one young was examined and replaced, the other one disappeared. The adult male tried to attract attention away from the young by calling and scurrying about. J. LeFebvre sat down about 20 feet away from the stump but both parents remained excited. Later the observer retreated further and the female flew onto a limb five feet about the ground, where she twisted, turned and clucked continually. The male had disappeared by this time and was no longer calling. Once the observer was hidden from view, the female stopped calling, hopped down from her perch and ran over to where the young had first been seen; the male came back to the stump, clucked once and disappeared. When the stump was examined, the second young was gone.

These downy young were estimated to be one to three days old. When the young was handled for measurements, it was turned over on its back; it struggled vigorously to regain its normal position but it did not give the slightest sound. It appeared very much afraid as it crouched in the hand, and it would not perch on one's finger.

Feeding Habits

We made numerous observations on the feeding habits of the Singing Quail in the cloud forest. In many cases the birds moved slowly and warily as they fed, but quickened their pace when they crossed a small clearing. The quail fed much in the manner of a domestic hen (*Gallus gallus*), by scratching first with one foot and then with the other, taking four or five strokes with each foot. The action is somewhat slower than that of a domestic hen and the length of each stroke a bit longer. We have never seen the method of obtaining food in which the bird makes a long sweeping stroke with one foot and then feeds in the debris (Warner and Harrell, 1957:128).

Normally the quail fed in the thick leaf litter of the forest floor, but it was not uncommon to see them feeding on moss-covered rocks and picking on moss-covered logs. As the birds continued to scratch for food, their bodies became half buried in the leaves. These depressions were conspicuous and enabled us to locate feeding areas when the quail were not singing.

Often, when a male found a large insect or other morsel, the female came quickly to take the particle from his bill. No note or call had been heard by us; yet the female had been, on occasions, feeding in another direction and must have been called by the male.

We examined the stomach and crop contents of two quail. One female, collected May 14, 1954, had 159 pokeweed seeds in the crop and 59 more in the stomach, an indication of the importance this seral newcomer to the forest may have in the food habits of this species. The animal remains in the crop consisted of five Coleoptera larvae (Elateridae), a pupa and an adult Lepidoptera, an adult Diptera, seven Hemiptera, and three spiders (Arachnida). The second bird, a male collected on May 17, 1953, by Paul S. Martin in the open pine–oak forests near La Joya de Salas, Tamaulipas, had nine

unidentifiable seeds, two larval Coleoptera (Elateridae), one adult Carabidae, one larva and one pupa Lepidoptera, and one Acarina in the crop. The animal matter in the stomachs of both birds was too finely macerated for specific identification, but it consisted of insect remains.

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