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# AGE, SEX, AND FAMILY COMPOSITION OF MONTEZUMA QUAIL COVEYS IN ARIZONA, NEW MEXICO, AND TEXAS

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## ABSTRACT

The Montezuma quail (*Cyrtonyx montezumae*) is a popular game bird in Arizona and New Mexico, USA, but hunting seasons remain closed in Texas, USA. Estimates of age structure parameters and sex ratios in game birds are essential information for predicting population trajectories and developing sustainable harvest and conservation strategies. Montezuma quail form coveys during the winter as a behavioral strategy for improved survival. In this regard, we harvested 1–4 individuals from 112 Montezuma quail coveys in Arizona, New Mexico, and West Texas from 2009 through 2020 to estimate sex and age composition (juvenile vs. adults) of coveys. We also estimated size for all coveys from which we harvested birds. Mean covey size ( $\pm$  standard error) was  $9.7 \pm 0.7$  individuals (range = 6–12),  $9.1 \pm 0.5$  (range = 2–20), and  $5.7 \pm 0.7$  (range = 2–12) for Arizona, New Mexico, and Texas, respectively although covey size decreased through the winter. The proportion of females among harvested birds was  $0.33 \pm 0.11$ ,  $0.40 \pm 0.04$ , and  $0.36 \pm 0.33$  for Arizona, New Mexico, and Texas, respectively. The proportion of juveniles among harvested birds was  $0.83 \pm 0.09$ ,  $0.71 \pm 0.04$ , and  $0.52 \pm 0.10$  for Arizona, New Mexico, and Texas, respectively. Coveys seem to contain more than one family group (paired birds with current progeny). We estimated that at least  $6.2 \pm 3.0\%$  and  $15.4 \pm 10.0\%$  of coveys were mixed families for New Mexico and Texas, respectively, as we harvested more than 2 adult males from the same covey. We did not collect same-sex adults from the same covey in Arizona. Our estimates set apart West Texas in lower average covey size and proportion of juveniles from Arizona and New Mexico at the northern edge of the species' distribution and may reflect a different population dynamic in the region. However, our estimates must be taken with caution as behavioral response differences between sexes and age categories may differ and may not accurately reflect the actual sex, age, and family composition of Montezuma quail coveys. In addition, results may be confounded by variability in environmental factors over our extended sampling period.

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**Key words:** age structure, *Cyrtonyx montezumae*, covey, Montezuma quail, sex ratio

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