NEW MONTEZUMA QUAIL RECORDS FROM CHIHUAHUA, MEXICO

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The Montezuma Quail (*Cyrtonyx montezumae*) occurs widely from central Arizona, southern New Mexico, and western Texas to southern Mexico, inhabiting pine–oak forests, arid montane scrub, and temperate grasslands (AOU 1998). In Mexico, the species occurs as an uncommon to fairly common year-round resident in the interior from Sonora and Coahuila south across the highlands to Oaxaca (Howell and Webb 1995). It is uncommon to fairly common (in suitable habitat) at several localities in and near the Sierra Madre Occidental of western Chihuahua, including minor ranges to the east (Howell and Webb 1995, Navarro and Peterson 2007, BirdLife International and NatureServe 2014; Figure 1), but it may now be rare or extirpated locally in much of its historic range.

We compiled Chihuahua records of the Montezuma Quail from published literature (Leopold and McCabe 1954, Howell and Webb 1995) and ebird.org. To put these records into historical and geographic context we also obtained specimen data from scientific collections cited in the Atlas of Mexican Bird Distributions (Navarro- Sigüenza 1994, Navarro-Sigüenza et al. 2003). We could not evaluate the validity of each of these records ourselves but relied instead on the judgment of those who published the records. Using the layers of potential distributions based on the program Genetic Algorithm for Rule-set Prediction from Navarro and Peterson (2007) and BirdLife International and NatureServe (2014), we generated a map in ArcGIS version 9.3 (Environmental Systems Research Institute, Redlands, CA). The analysis of status and distribution has been corroborated with multiple surveys in western Chihuahua from June 1998 through October 2014. Noteworthy distributional information is deposited at the Unidad de Cartografía Digital, Instituto de Ciencias Biomédicas, Ciudad Juárez, Chihuahua, Mexico.

We found 429 Montezuma Quail records for Mexico in the Atlas of Mexican Bird Distributions; of these, 85 are based on specimens from Chihuahua, from 22 localities, taken from 1884 to 1959. These records define the species' known distribution (Sierra Madre Occidental and nearby mountains). An exception is based on two birds (Western Foundation of Vertebrate Zoology) collected in north-central Chihuahua near San Pedro (30.77° N, 108.27° W) in May 1947. We doubt the accuracy of the data of a specimen (Delaware Museum of Natural History) supposedly taken about 45 km southeast of Ciudad Juárez at Rancho Blanco, Guadalupe Municipality (31.36° N, 106.20° W), far outside the estimated range, in June 1956.

With respect to recent records, we found at eBird 37 records from 21 localities in Chihuahua, 1994 to 2014. These largely correspond in habitat with the older data (records primarily from oak–pine woodlands, occasionally from grasslands or other drier habitats). Two records, however, are from outside the previously known range in grasslands of Janos Municipality. Our new records (triangles in Figure 1; Table 1) include two localities outside the estimated range. In the Sierra La Escondida, Nuevo Casas Grandes Municipality, Gatica and Omar Torres observed one in an ecotone

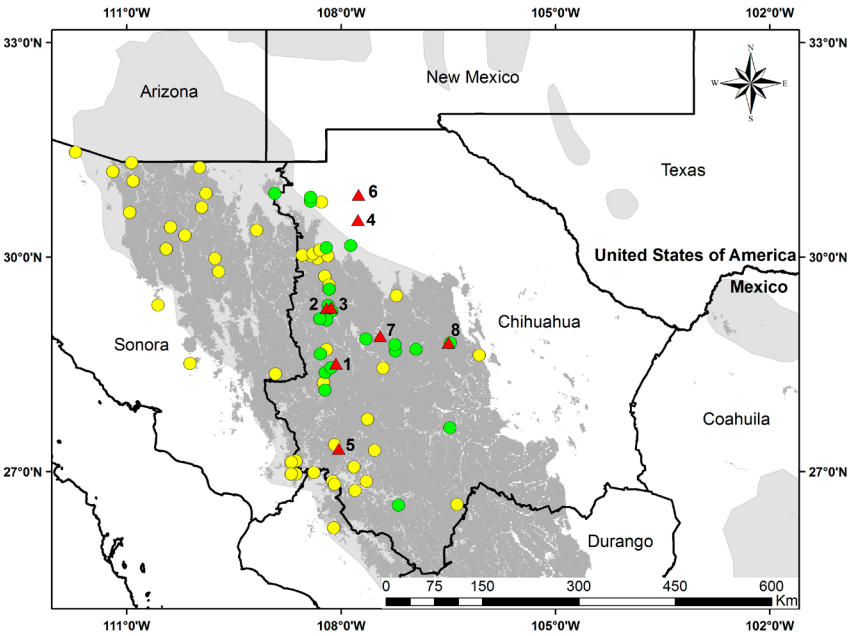

Figure 1. Distribution of the Montezuma Quail in Mexico as estimated by the Genetic Algorithm for Rule-set Prediction, including records from www.ebird.org (green circles), the atlas of the birds of Mexico (Navarro-Sigüenza et al. 2003; yellow circles), and our new records (red triangles). Dark gray shading, Mexican distribution as modeled by Navarro and Peterson (2007); light gray shading, distribution mapped by BirdLife International and NatureServe (2014).

between desert scrub and oak woodland with scattered meadows (*Agave* sp., *Larrea tridentata*, *Opuntia* sp., *Mammillaria* sp., and *Quercus* sp.) on 2 August 2006, and a dog captured another individual on 20 October 2007 (feathers deposited at the Colección Científica de Vertebrados, Universidad Autónoma de Ciudad Juárez [CHI-VER-189-08-06]). In the Sierra El Capulín, Ascensión Municipality, Gatica noted another on 3 August 2012 in an oak forest.

Apparently, all Chihuahua records (older and recent) are of subspecies *C. m. mearnsi*, although there are two records of *C. m. montezumae* from the Sinaloa–Chihuahua border (Navarro-Sigüenza et al. 2003). The majority of records (older and recent) are from the Sierra Madre Occidental in western Chihuahua (municipalities of Casas Grandes, Madera, Temósachic, Urique, and Batopilas, among others; eBird 2015). In eastern Chihuahua, there is only one record from the Sierra Rica, in Área de Protección de Flora y Fauna Cañón de Santa Elena near the town of Manuel Benavides (CEC 2014), but it lacks specific details. It is likely the Montezuma Quail is more common there than this single report suggests, given the records in nearby Big Bend National Park, Texas (Brennan 2007). More field work in eastern Chihuahua is needed to clarify status of the species there.

The Montezuma Quail is typically associated with wooded habitats, although occasionally it reaches elevations below the level of woodland in west Texas (Brennan 2007). Elsewhere, a pair was seen in desert dominated by creosote bush (*Larrea*

Table 1—New Records of the Montezuma Quail in Western Chihuahua, Mexico

Locality[a]	Geographic coordinates	Date	Observer
1. Vallecillo	28° 30.5′ N, 108° 04.3′ W	June 1998	Venegas
2. Cerro El Diablo	29° 17.0′ N, 108° 12.4′ W	November 1999	Venegas
3. Madera	29° 17.6′ N, 108° 08.4′ W	10 August 2002	Venegas
4. Sierra La Escondida[b]	30° 31.1′ N, 107° 45.8′ W	2 August 2006, 20 October 2007	Gatica
5. El Oso	27° 19.2′ N, 108° 02.1′ W	17 March 2007	Venegas
6. Sierra El Capulín[b]	30° 52.2′ N, 107° 45.4′ W	2 August 2012	Gatica
7. Teseachic	28° 53.7′ N, 107° 27.3′ W	2 August 2014	Venegas
8. Cumbres de Majalca	28° 48.0′ N, 106° 29.8′ W	18 October 2014	Venegas

[a]Numbered as in Figure 1.

[b]Outside previously estimated range.

tridentata) along Interstate 25 near Lordsburg, Hidalgo County, New Mexico, on 30 July 1992 during a rainy season (*Am. Birds* 46:1163, 1992). In Nuevo León there is a record from an area of desert scrub on 26 July 2013 (*N. Am. Birds* 66:737, 2013). It is possible, therefore, that the species disperses to drier habitats (e.g., desert grasslands, desert scrub, and riparian corridors) during the rainy season, which in northwestern Chihuahua is usually from mid-June into October (Comisión Nacional del Agua 2015, smn.cna.gob.mx/), as in the case of the record for Sierra La Escondida, Nuevo Casas Grandes Municipality. Since we expect that these birds are dispersing on foot, however, it is probable that the Montezuma Quail does not stray far from its preferred habitats. Stromberg (1990) observed a similar tendency in southeastern Arizona, where the species prefers north-facing slopes and thus is more likely to be near oak woodlands but occasionally reaches open grasslands 3 km from any tree. Because of its retiring behavior the Montezuma Quail might remain undetected for years even where it is a permanent resident.

In Mexico, the Montezuma Quail is accorded "special protection" (SEMARNAT 2010, www.profepa.gob.mx/). It is severely affected by cattle grazing and forest clearing (Ehrlich et al. 1988, Stromberg 2000), and in Chihuahua livestock populations have grown in recent years (Carreón-Hernández 2014), resulting in alarming habitat loss. The maintenance of grass cover is critical to this species because of its defensive behavior of hiding from predators. Hernández (2004) reported that when the primary defense mechanism—camouflage and crouching—are jeopardized, Montezuma Quail appear to be susceptible to predation by raptors and canids as well as to mortality from vehicular collisions and inclement weather (Brennan 2007). According to Brennan (2007), development of a conservation and management strategy for the Montezuma Quail will require further study of the species' life history, detection and monitoring of populations, basic research on population dynamics, and identifying potential habitat throughout the range.

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