New distributional and temporal bird records from Chihuahua, Mexico

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Summary.—We present noteworthy records from Chihuahua, northern Mexico, including several first state occurrences (e.g. White Ibis *Eudocimus albus*, Red-shouldered Hawk *Buteo lineatus*) or species with very few previous state records (e.g. Tricoloured Heron *Egretta tricolor*, Baltimore Oriole *Icterus galbula*). We also report the first Chihuahuan records of Red-tailed Hawk *Buteo jamaicensis harlani* and 'White-winged' Dark-eyed Junco *Junco hyemalis aikeni* (the latter only the second Mexican record). Other records improve our knowledge of the distribution of winter visitors to the Chihuahuan Desert ecoregion that formerly were considered transients, including several parulids. Our field work has also improved knowledge of the distribution of certain Near Threatened (e.g. Snowy Plover *Charadrius nivosus*) and Vulnerable species (e.g. Pinyon Jay *Gymnorhinus cyanocephalus*). We also confirmed various breeding localities for Yellow-crowned Night Heron *Nyctanassa violacea* in Chihuahua.

The avian diversity of Mexico encompasses 95 families, 493 genera and 1,150 species following IOC taxonomy (*cf*. Navarro-Sigüenza *et al*. 2014) or *c*.11% of total avian richness worldwide. Mexico is ranked as the 11th most important country in terms of bird species richness and fourth in the proportion of endemic species (Navarro-Sigüenza *et al*. 2014). However, Chihuahua—the largest Mexican state—is poorly surveyed ornithologically, mostly at sites in and around the Sierra Madre Occidental (e.g., Stager 1954, Miller *et al*. 1957, Webb 1984, Gómez de Silva 2002a, Dieni *et al*. 2003, Flesch *et al*. 2016), with few publications referring to a handful of localities away from there (Vuilleumier & Williams 1964, Leukering & Bradley 1997, Mondaca-Fernández & Moreno-Contreras 2014, Moreno-Contreras *et al*. 2015a, Torres-Vivanco *et al*. 2015). Here, we present new distributional data for 29 bird species in Chihuahua and compare these with recent assessments of their status and distribution in adjacent states of Mexico and the USA. Three species and two subspecies represent new records for the state and six 'transients' are demonstrated to be winter visitors. Of the species reported here, five and two are nationally and / or globally threatened, respectively.

Methods

Between 2007 and 2016, we conducted field work at 36 Chihuahuan localities at altitudes of 970–2,700 m (Fig. 1, Table 1). Birds were identified using binoculars, telescopes and by their vocalisations. Geographical coordinates for each locality are largely taken from CONABIO (2014) and digital gazetteers (http://www.fallingrain.com/; Table 1). Taxonomy and nomenclature follow the IOC (Gill & Donsker 2016). Elevational data were obtained by extracting point values for each locality from the Hydro 1k project, a digital elevation model (DEM) projected at WGS84 (https://lta.cr.usgs.gov/HYDRO1K). Subspecies are stated if known with certainty. Conservation status is based on Mexican law (SEMARNAT 2010) and

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TABLE 1
Localities surveyed in Chihuahua, Mexico.

Locality	Municipality	Coordinates	Elevation (m)
1. Vado de Meoqui	Meoqui	28°15′45.5′′N, 105°28′21.0′′W	1,150
2. Presa Chuvíscar	Chihuahua	28°35′56′′N, 106°06′59′′W	1,485
3. Naica	Saucillo	27°51′17′′N, 105°29′33′′W	1,495
4. Presa Francisco I. Madero	Rosales	28°05′40.12′′N, 105°40′49′′W	1,255
5. Delicias	Delicias	28°10′17.6′′N, 105°29′09.1′′W	1,180
6. El Torreón	Meoqui	28°19′33′′N, 105°24′51′′W	1,140
7. Río Conchos (I)	Camargo	27°42′49′′N, 105°11′08.1′′W	1,240
8. Río Falomir, Maclovio Herrera	Aldama	29°03′50.2′′N, 105°08′45.6′′W	1,010
9. Jesús Carranza	Juárez	31°29′19.73′′N, 106°13′50.09′′W	1,115
10. La Mesa	Aldama	28°46′11′′N, 105°58′05′′W	1,325
11. near Rancho El Refugio	La Cruz	27°51′0.8′′N, 105°11′35.5′′W	1,215
12. El Floreño	Camargo	27°46′50.5′′N, 105°09′48.8′′W	1,210
13. Colonia Vicente Guerrero	Saucillo	28°02′02′′N, 105°18′55′′W	1,205
14. Colonia 10 de Mayo	Meoqui	28°25′28′′N, 105°33′29′′W	1,175
15. Orinda	Rosales	28°15′54′′N, 105°33′54′′W	1,255
16. El Gato Negro	Saucillo	28°05′07′′N, 105°20′42′′W	1,210
17. Vado de Rosales	Rosales	28°11′11.4′′N, 105°32′60′′W	1,185
18. Camargo	Camargo	27°42′03.3′′N, 105°10′38′′W	1,225
19. Río Conchos (II)	Julimes	27°25′58.8′′N, 105°25′22.8′′W	1,140
20. Estación Consuelo	Meoqui	28°19′00′′N, 105°35′60′′W	1,195
21. La Garita	Rosales	28°08′12.8′′N, 105°11′35.5′′W	1,195
22. Loma Blanca	Juárez	31°34′47′′N, 106°17′55′′W	1,120
23. Laguna San Juan	Ascensión	31°12′24′′N, 108°00′09.7′′W	1,295
24. El Herradero	Chihuahua	28°34′38.9′′N, 106°09′35.8′′W	1,540
25. Hidalgo del Parral	Hidalgo del Parral	28°55′57′′N, 105°39′47′′W	1,710
26. Barrancas del Cobre	Urique	27°13′33.1′′N, 107°52′49.8′′W	970
27. Ojo de Enmedio	Juárez	31°22′44′′N, 106°35′11′′W	1,240
28. El Chamizal	Juárez	31°45′31.8′′N, 106°27′24′′W	1,130
29. Sierra San Luis	Janos	31°18′32.4′′N, 108°44′49.2′′W	1,965
30. Cinco Millas	Madera	29°19′53′′N, 108°12′27′′W	2,700
31. Mesa de las Guacamayas	Janos	30°32′17.9′′N, 108°35′49.2′′W	2,295
32. Presa El Rejón	Chihuahua	28°34′15.6′′N, 106°09′57.7′′W	1,540
33. near Neder	Rosales	28°12′11.4′′N, 105°31′49.1′′W	1,175
34. Cumbres de Majalca National Park	Chihuahua	28°48′14.4′′N, 106°30′18′′W	2,135
35. near Río Sacramento	Chihuahua	28°29′37.1′′N, 105°31′58.5′′W	1,150
36. near El Jaral	Chihuahua	28°42′42.1′′N, 105°59′12.1′′W	1,350

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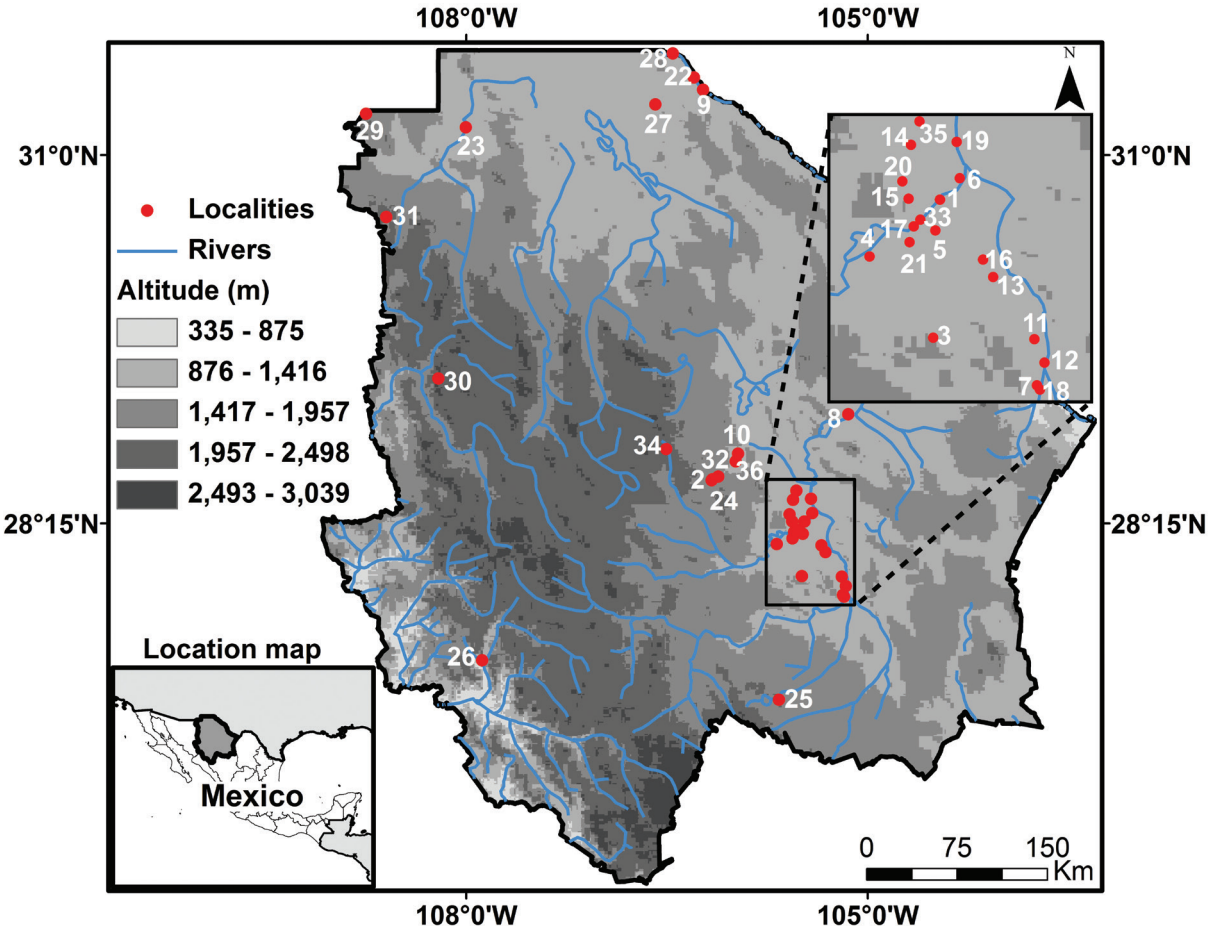

Figure 1. Map showing localities surveyed in Chihuahua, Mexico. Localities numbered following the sequence in Table 1.

the IUCN Red List (IUCN 2016). Distributional data have been deposited at the Unidad de Cartografía Digital, Instituto de Ciencias Biomédicas, Ciudad Juárez, Chihuahua, Mexico.

We determined records of interest following the criteria recommended by Sánchez-González (2013), i.e. (1) the species was not previously reported in the state, (2) the species was not previously mapped in the relevant ecoregion, biome or biogeographic province, and (3) a new locality within a continuum of suitable habitat from where there were no previous records confirming the species' presence there.

To analyse our data geographically, we obtained primary occurrence localities for the relevant species from several sources; by searching the 'Atlas of Mexican bird distributions' (Navarro-Sigüenza *et al*. 2003) and two principal online sources in May 2016 (http://portal.vertnet.org/search; www.ebird.org), as well as by reviewing relevant literature. We only selected those records properly supported by evidence such as specimens in scientific collections, photographs showing diagnostic characteristics or detailed field observations of species that could, according to published data, occur in the relevant region of Chihuahua. We discuss new additions to the list of bird species recorded in Chihuahua in light of these geographic data and by cross-referencing published information for adjoining states (Peterson & Zimmer 1998, Russell & Monson 1998, Lockwood & Freeman 2014).

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Species accounts

BLACK-BELLIED WHISTLING DUCK *Dendrocygna autumnalis*
Five at Vado de Meoqui from 25 December 2015 (MJ) to 27 May 2016 (IM-C, FM, MJ, JR-M; Fig. 2A). Although the species was not mapped in Chihuahua (Howell & Webb 1995), there are previous year-round reports from Vado de Meoqui and other inland waterbodies (i.e., Presa Francisco I. Madero) (M. Bujanda *in litt*. 2016). In Sonora, it is an uncommon summer resident (Russell & Monson 1998).

HOODED MERGANSER *Lophodytes cucullatus*
A pair at Presa Chuvíscar on 19 January 2016 (MJ; Fig. 2B). A regular winter visitor only to Juárez municipality, Chihuahua (Moreno-Contreras *et al*. 2015a); further south it is highly irregular and probably only a casual visitor to waterbodies such as Laguna Fierro (eBird 2016). To our knowledge, there are no records for the Sierra Madre Occidental of Chihuahua. Two records for Sonora, one at Río Mayo (24 March 1977), the other at Río Bavispe (6 February 1986) (Russell & Monson 1998).

MONTEZUMA QUAIL *Cyrtonyx montezumae*
One record in the Chihuahuan Desert ecoregion: a group of six near Naica on 18 October 2015, with one on 21 October 2015 (FM). An uncommon to fairly common resident at several localities in and around the Sierra Madre Occidental of western Chihuahua, including minor ranges to the east (Moreno-Contreras *et al*. 2015b). Occasionally disperses to drier habitats (e.g., desert scrub, desert grasslands), mainly during the wet season (IM-C pers. obs.). One historical record, at Hidalgo del Parral in late July 1976 (S. Williams *in litt*. 2014), was overlooked by Moreno-Contreras *et al*. (2015b). Special protection (SEMARNAT 2010).

BROWN PELICAN *Pelecanus occidentalis*
An adult was at Vado de Meoqui on 25 January 2015 (MJ). The only previous record for Chihuahua involved a juvenile at Presa Peñitas, 15 km north of Madera, on 9 July 2002 (Gómez de Silva 2002b). An irregular, uncommon to rare visitor inland in Mexico (Howell & Webb 1995), it is also a casual visitor inland throughout Texas, with records from virtually all areas of the state, being apparently almost annual in the El Paso area (Lockwood & Freeman 2014). In New Mexico, it is a rare visitor, now annual in occurrence, and most regular on the Rio Grande at Elephant Butte Reservoir, though it has occurred over much of the state (B. Howe *in litt*. 2015).

DOUBLE-CRESTED CORMORANT *Phalacrocorax auritus*
Recorded at two localities in south-central Chihuahua: five at Presa Francisco I. Madero on 19 February 2012 (FM), and singles at Vado de Meoqui on 22 February 2015 (JR-M) and 5 December 2015 (MJ), with 15 there on 25 and 27 February 2016 (IM-C, FM). Not mapped in Chihuahua (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007), but Moreno-Contreras *et al*. (2015a) considered it a common year-round resident in northern Chihuahua, with scattered records in central and southern Chihuahua (eBird 2016). Lockwood & Freeman (2014) mentioned it as an uncommon to abundant migrant throughout Texas. In New Mexico, it is an uncommon breeder on larger lakes and some rivers nearly statewide, being most numerous in the Rio Grande and Canadian River drainages; it is also a widespread migrant and common winter visitor to the lower Pecos Valley, with smaller numbers elsewhere (B. Howe *in litt*. 2015).

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Figure 2A: Black-bellied Whistling Duck *Dendrocygna autumnalis*, Vado de Meoqui, Chihuahua, Mexico, 27 May 2016 (Jaime Robles-Morales), B: Hooded Merganser *Lophodytes cucullatus*, Presa Chuvíscar, Chihuahua, Mexico, 19 January 2016 (Manuel Jurado), C: American White Ibis *Eudocimus albus*, Vado de Meoqui, Chihuahua, Mexico, 13 November 2011 (Jaime Robles-Morales), D: Yellow-crowned Night Heron *Nyctanassa violacea*, Delicias, Chihuahua, Mexico, 11 July 2014 (Jaime Robles-Morales), E: Tricoloured Heron *Egretta tricolor*, Río Falomir, Maclovio Herrera, Chihuahua, Mexico, 21 August 2015 (Jaime Robles-Carrillo), F: Mississippi Kite *Ictinia mississippiensis*, Camargo, Chihuahua, Mexico, 6 June 2016 (Alonso Alvidrez)

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AMERICAN WHITE IBIS *Eudocimus albus*
First record for Chihuahua. JR-M observed a juvenile at the San Pedro River (Vado de Meoqui) on 13 November 2011 (Fig. 2C). Apparently, the species was recently recorded in Nuevo Casas Grandes municipality, on 21 August 2012, by S. Whitebread (eBird 2016). A rare visitor to Sonora (Russell & Monson 1998) and an accidental visitor to western Texas (Lockwood & Freeman 2014) and New Mexico, with probably fewer than 20 records in the second-named state (B. Howe *in litt*. 2015).

YELLOW-CROWNED NIGHT HERON *Nyctanassa violacea*
Three locality records: FM observed an adult at Delicias on 13 May 2012, a pair at a nest there on 26 April 2016 and an adult on 11 July 2014 (JR-M; Fig. 2D). JR-C observed an adult and a juvenile at El Torreón on 8 June and 27 September 2015, with two adults at Río Conchos (I) on 26 February 2016 (IM-C, FM, AA). Perhaps a regular breeder in Chihuahua: three nests with nestlings and adults in tall cottonwoods west of Casas Grandes on 29 May 2003, seven adults at Colonia Juárez on 29 May 2003 (Gómez de Silva 2003), one at Río Conchos, Camargo municipality, on 13 April 2011, and several immatures at El Agate, Chihuahua municipality, on 5 September 2014 (eBird 2016). These records confirm its presence in Chihuahua, where it was not previously mapped (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). In south-west Texas, the species is considered a casual visitor in May–October, with most records in late summer (Peterson & Zimmer 1998, Lockwood & Freeman 2014). Formerly a very rare and irregular post-breeding visitor to New Mexico, but currently more numerous, with several reports annually and nesting has been documented in recent years at two localities (B. Howe *in litt*. 2015).

TRICOLOURED HERON *Egretta tricolor*
An immature at Río Falomir, Maclovio Herrera, on 21 August 2015 (JR-C; Fig. 2E). Second record for Chihuahua; the first was one near Hinojosa on 24 August 1962 (Vuilleumier & Williams 1964). Not mapped for Chihuahua (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). Scattered inland records in Sonora (Russell & Monson 1998).

WHITE-TAILED KITE *Elanus leucurus*
Single adults at La Mesa on 7 October 2011 (JR-C) and in a mosaic of agricultural fields and desert scrub near Jesús Carranza on 21 December 2014 (IM-C). Noted as a 'fairly common to common permanent resident' in parts of northern Mexico (Howell & Webb 1995); the species is regular in the Janos area (Dieni *et al*. 2003; B. Howe *in litt*. 2015) north of its mapped range in Chihuahua (Howell & Webb 1995). It breeds regularly in the El Paso area, Texas (Peterson & Zimmer 1998, Lockwood & Freeman 2014). In New Mexico, the species is a rare but regular visitor primarily to the south-west of the state (where it probably breeds occasionally), but also a fairly regularly visitor to the Mesilla Valley near Las Cruces (B. Howe *in litt*. 2015). Wandering birds have occurred north along the Rio Grande Valley to Albuquerque, with an exceptional record at Las Vegas National Wildlife Refuge (B. Howe *in litt*. 2015).

MISSISSIPPI KITE *Ictinia mississippiensis*
Seven locality records from southern Chihuahua: one near Rancho El Refugio on 27 August 2011; three at Floreño on 26 May 2012; one at Colonia Vicente Guerrero on 12 May 2013; two juveniles at Colonia 10 de Mayo on 31 August 2014; two at Orinda on 14 March 2015; four at El Gato Negro on 2 August 2015 (all JR-M); and one nesting at Camargo on 6 June 2016 (AA; Fig. 2F). We believe that this species may be a very local breeder in riparian areas

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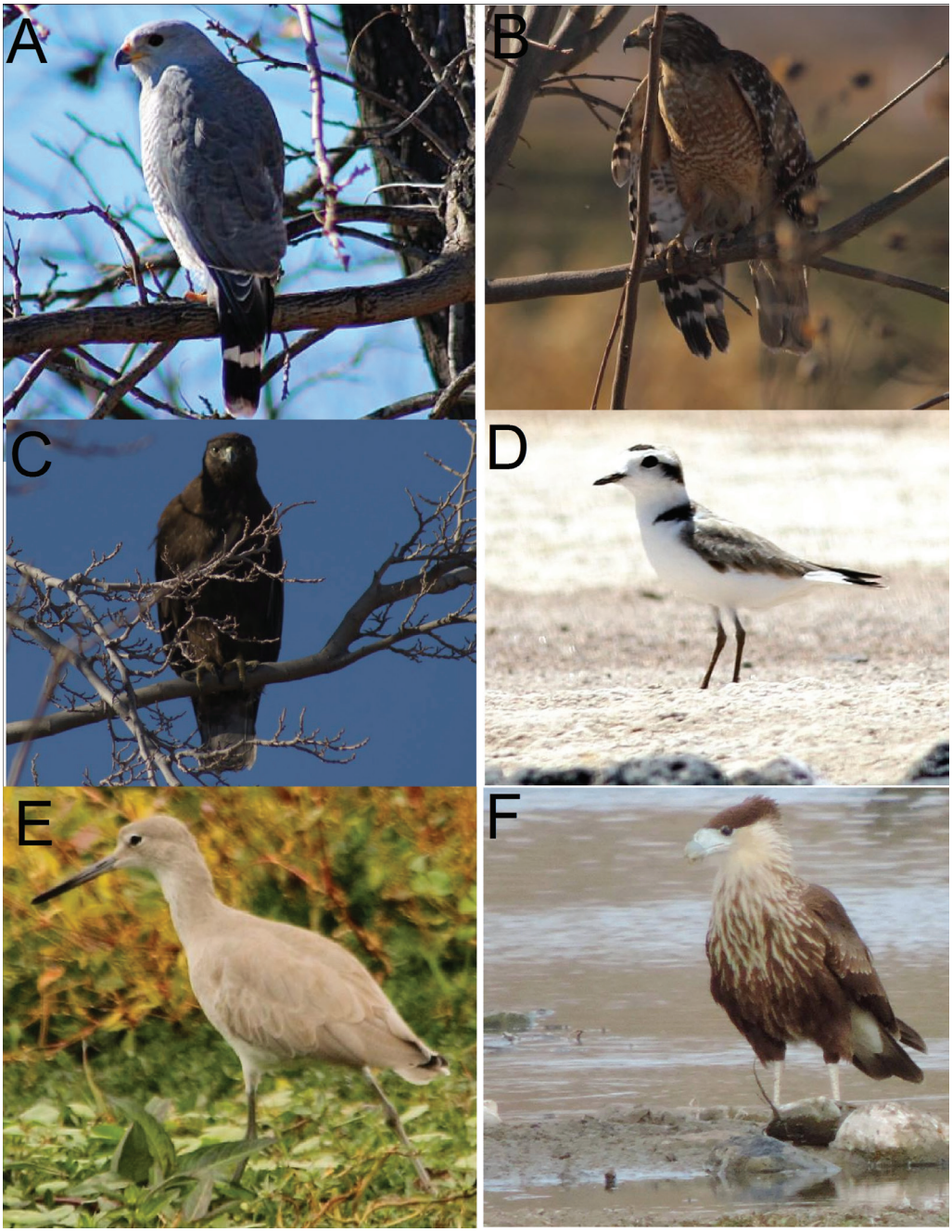

Figure 3A: Grey Hawk *Buteo plagiatus*, Presa Francisco I. Madero, Chihuahua, Mexico, 17 January 2016 (Jaime Robles-Carrillo); B: Red-shouldered Hawk *Buteo lineatus*, Estación Consuelo, Chihuahua, Mexico, 30 January 2016 (Jaime Robles-Morales); C: 'Harlan's' Red-tailed Hawk *Buteo jamaicensis harlani*, La Garita, Chihuahua, Mexico, 26 January 2014 (Jaime Robles-Morales); D: Snowy Plover *Charadrius nivosus*, Laguna San Juan, Chihuahua, Mexico, 30 May 2007 (Javier Cruz); E: Willet *Tringa semipalmata*, Vado de Meoqui, Chihuahua, Mexico, 8 November 2015 (Jaime Robles-Morales); F: Northern Crested Caracara *Caracara cheriway*, Vado de Meoqui, Chihuahua, Mexico, February 2014 (Manuel Jurado)

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or other sites with many trees mixed with agricultural fields in the Chihuahuan Desert ecoregion. Formerly considered a fairly common to common transient in the lowlands of Mexico (Howell & Webb 1995). The first record in Chihuahua was at Batosárachi (Gómez de Silva 2002a) and the first breeding record for Mexico was at Río Casas Grandes, northern Chihuahua, on 2 June 1998 (Williams 1998). Since then, there have been numerous reports at Río Casas Grandes (eBird 2016) and in Juárez municipality (Moreno-Contreras *et al*. 2015a). A common to uncommon migrant in Texas (Lockwood & Freeman 2014), it is now an uncommon summer resident in the west of the state (Peterson & Zimmer 1998, Lockwood & Freeman 2014). A locally numerous breeder in cities and towns of easternmost New Mexico, but rarer further west, although small numbers breed in the Pecos Valley from Carlsbad County north to Santa Rosa County, and in the Rio Grande Valley from Socorro north at least to around Albuquerque, possibly as far north as Espanola (B. Howe *in litt*. 2015). Special protection (SEMARNAT 2010).

GREY HAWK *Buteo plagiatus*

Five locality records: singles at Delicias on 21 December 2014 (FM), Vado de Rosales on 25 December 2014 (MJ), Camargo on 9 September 2015 (AA), Presa Francisco I. Madero on 17 January 2016 (JR-C; Fig. 3A) and Río Conchos (I) on 26 February 2016 (IM-C, FM, AA). These records confirm its presence away from the Sierra Madre Occidental where not previously mapped (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). Only a handful of previous records in Chihuahua: one sound-recorded near Casa de Janos on 31 May 2003 (Gómez de Silva 2003), a juvenile observed by B. Howe at Río San Pedro near Mesa de las Guacamayas on 30 May 2004, one seen by D. MacKay at Laguna Fierro, Nuevo Casas Grandes municipality on 19 August 2011, and another seen by R. Zamudio at Valle de Allende on 15 September 2013 (eBird 2016). The range expansion of Grey Hawk north and to higher elevations in the south-west USA and the interior of northern Mexico can be attributed to locally improved habitat conditions, including establishment of tall trees in riparian areas for nesting and brush encroachment in adjacent uplands for foraging, but might also reflect increasing temperatures, locally and regionally (Williams & Krueper 2008). Formerly a very rare visitor to New Mexico, but now breeds at two locations: Guadalupe Canyon in the south-west, and near Carlsbad in the south-east of the state (Williams & Krueper 2008; B. Howe *in litt*. 2015).

RED-SHOULDERED HAWK *Buteo lineatus*

First records for Chihuahua. Probably an uncommon but regular winter visitor to central and southern Chihuahua. Five records: singles at Vado de Rosales (Río San Pedro) on 26 January 2014 (MJ), near Río Conchos (II) on 16 February 2014 (JR-M), Naica on 10 December 2014 (FM), Camargo on 15 January 2015 (AA), and soaring over agricultural fields near Estación Consuelo on 30 January 2016 (JR-M; Fig. 3B). No Sonora records (Russell & Monson 1998). An uncommon to rare winter visitor to north-east and central Mexico (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). In Texas, Lockwood & Freeman (2014) considered it a common to uncommon resident throughout the eastern two-thirds of the state, and a rare to casual winter visitor further west. In New Mexico, a casual visitor primarily during migration and winter, with probably fewer than 20 records involving both the eastern (nominate) and western (*B. l. elegans*) subspecies (B. Howe *in litt*. 2015). Special protection (SEMARNAT 2010).

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'HARLAN'S' RED-TAILED HAWK *Buteo jamaicensis harlani*
First records for Chihuahua. JR-M observed a dark-morph Harlan's Hawk near Rancho, El Refugio municipality on 22 January 2012, and another near La Garita on 26 January 2014 (Fig. 3C). On 5 and 20 February 2015, IM-C photographed a dark-morph adult in agricultural fields with scattered trees and irrigation channels at Loma Blanca along the Río Grande. Only a handful of previous records for Mexico, all in Baja California: one at Mexicali on 1–15 December 1994 (Patten *et al*. 2001), one in Baja California Sur on 24–31 January and 10 March 2003 (Mlodinow *et al*. 2005) and two well-documented records, in 2008 (specific date not mentioned: Erickson *et al*. 2013) and on 22 January 2012 (Erickson *et al*. 2013). Additionally, Mlodinow *et al*. (2005) suggested that it may occur in Tamaulipas, given several records from the Texas side of the lower Rio Grande Valley (Lockwood & Freeman 2014, eBird 2016). In south-west Texas, Peterson & Zimmer (1998) considered it a 'rare winter visitor' to the Trans-Pecos region. In New Mexico a regular winter visitor in small numbers, primarily from the Rio Grande Valley east, where it is usually found in areas with many trees and agricultural fields (B. Howe *in litt*. 2015).

AMERICAN AVOCET *Recurvirostra americana*
JR-M observed a pair exhibiting breeding behaviour at El Vado (28°15'13.3''N, 105°29'33.3''W) on 27 May 2016. Subsequently, a nest with one egg was discovered on 5 June 2016 (JR-M). Formerly, a transient in northern Chihuahua and winter visitor further south (Howell & Webb 1995), the species has since been recorded regularly as a summer resident at several localities in Chihuahua (Venegas-Holguín *et al*. 2015). Mostly a common winter visitor and transient in Sonora, although some non-breeders over-summer in some years (Russell & Monson 1998).

SNOWY PLOVER *Charadrius nivosus*
First breeding record in Chihuahua. On 30 May 2007, a pair was nesting at Laguna San Juan (JC; Fig. 3D). Previously, just one record: a single at a Pemex station on Highway 16 near General Trías, *c*.30 km west of Chihuahua city, on 30 July 2005 (Gómez de Silva 2005b). Not mapped for interior Chihuahua (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). A fairly common to common transient and winter visitor on the Pacific coast from Baja California and Sonora to Nayarit, and uncommon to common on the Atlantic coast from Tamaulipas to the Yucatán Peninsula (Howell & Webb 1995). Breeds mainly on the Mexican Plateau (Howell & Webb 1995). In the Trans-Pecos region of Texas, Snowy Plover is a regular breeder at Lake Balmorhea, Toyah Lake, Imperial Reservoir and Red Bluff Lake (Peterson & Zimmer 1998). In New Mexico it is a regular breeder in the lower Pecos Valley and an occasional visitor and rare breeder along the Rio Grande north to Bosque del Apache National Wildlife Refuge (B. Howe *in litt.* 2015). Listed as threatened nationally (SEMARNAT 2010) and Near Threatened globally (IUCN 2016).

WILLET *Tringa semipalmata*
A single at Vado de Meoqui on 8 November 2015 (FM, JR-M; Fig. 3E). Previously observed at Laguna Fierro, Nuevo Casas Grandes municipality, on 22 May 2008 (eBird 2016), and at Vado de Meoqui in March and October 2015 (eBird 2016). Not mapped for interior Chihuahua (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). Russell & Monson (1998) listed five inland records for Sonora, all between 20 August and 15 September, except one on 30 April.

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YELLOW-BILLED CUCKOO *Coccyzus americanus*
A pair copulating at El Herradero on 3 June 2016 (MJ). This record confirms its presence as a breeder in central Chihuahua, where well-documented breeding records are lacking. The species is perhaps a summer resident in Meoqui municipality, where there are a few early-summer records, mainly in riparian vegetation bordered by cottonwoods *Populus* (FM). Mapped as a summer resident only in western and northern Chihuahua by Howell & Webb (1995), but over the east and centre of the state by Navarro-Sigüenza & Peterson (2007).

NORTHERN CRESTED CARACARA *Caracara cheriway*
An adult in desert scrub near the settlement of Hidalgo del Parral on 13 March 2010 (JC); a juvenile at Vado de Meoqui on 3 February 2014 (MJ; Fig 3F); and a breeding record at Barrancas del Cobre (Sinaloan dry forests ecoregion) on 17 June 2014 (JC). Apparently the species has expanded its range in the Chihuahuan Desert ecoregion. Navarro-Sigüenza & Peterson (2007) mapped it only for south-west Chihuahua. In nearby Sonora, it is a fairly common to common resident below 1,000 m (Russell & Monson 1998). In adjacent Texas, the species is a 'casual visitor' throughout the year to the Trans-Pecos region (Peterson & Zimmer 1998, Lockwood & Freeman 2014). Casual visitor to southern New Mexico, with on average one report every five years (B. Howe *in litt*. 2015).

GREY FLYCATCHER *Empidonax wrightii*
A single was in mesquite-creosote scrub at Ojo de Enmedio on 7 February 2015 (IM-C), north of its winter range in Mexico (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). The species is a fairly common to uncommon migrant in northern Chihuahua (Moreno-Contreras *et al*. 2015a), with the Janos area perhaps representing the regular northern winter limit east of south-east Arizona (Dieni *et al*. 2003). Very rare winter visitor to El Paso County, Texas (Peterson & Zimmer 1998, Lockwood & Freeman 2014) and New Mexico (B. Howe *in litt*. 2015). A common transient from the coastal plain to the lower limits of pine–oak woodland, and common in winter at elevations below 1,000 m and rare in higher pine–oak woodland (Russell & Monson 1998).

PLUMBEOUS VIREO *Vireo plumbeus*
Three winter records for the Chihuahuan Desert: singles at Presa Francisco I. Madero on 4 January 2015 (M. Bujanda *in litt*. 2015), El Chamizal on 11 and 31 January 2015 (IM-C) and Vado de Meoqui on 27 February 2016 (IM-C, FM). A winter visitor to the Sierra Madre Occidental (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). Our records confirm the species to be a regular winter visitor to the Chihuahuan Desert ecoregion. Rare but regular winter visitor to the Trans-Pecos region, Texas (Peterson & Zimmer 1998, Lockwood & Freeman 2014). Fairly common breeder in montane New Mexico and a very rare winter visitor mostly to the Rio Grande Valley from Elephant Butte Lake south (B. Howe *in litt*. 2015).

PINYON JAY *Gymnorhinus cyanocephalus*
An adult perched in an oak beside Highway 2 Janos–Agua Prieta, near Sierra San Luis, on 11 September 2015 (MJ). Formerly considered casual elsewhere in Chihuahua, with a record at Babícora Hills on 4 December 1936, and one collected at Rancho La Ciénega, *c*.27 km east La Junta, Guerrero municipality, on 10 June 1949 (Miller *et al*. 1957). Four records for Sonora, in April–May and October–November (Russell & Monson 1998). A detailed analysis of its status and distribution in Chihuahua will be published elsewhere. Considered Vulnerable globally (IUCN 2016).

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Figure 4A: Clark's Nutcracker *Nucifraga columbiana*, Cinco Millas, Chihuahua, Mexico, 10 January 2015 (Javier Cruz); B: Northern Rough-winged Swallow *Stelgidopteryx serripennis*, Conchos (I), Chihuahua, Mexico, 26 February 2016 (Israel Moreno-Contreras); C: Black-and-white Warbler *Mniotilta varia*, Vado de Meoqui, Chihuahua, Mexico, 29 December 2015 (Jaime Robles-Morales); D: Wilson's Warbler *Cardellina pusilla*, Vado de Meoqui, Chihuahua, Mexico, 9 January 2016 (Manuel Jurado); E: Baltimore Oriole *Icterus galbula*, Camargo, Chihuahua, Mexico, 18 August 2015 (Alonso Alvidrez); F: 'White-winged' Dark-eyed Junco *Junco hyemalis aikeni*, El Chamizal, Chihuahua, Mexico, 22 February 2015 (Israel Moreno-Contreras)

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CLARK'S NUTCRACKER *Nucifraga columbiana*
First records for Chihuahua. JC observed a flock of *c*.8 individuals in *Pseudotsuga menziesii*, *Pinus arizonica* and *Pinus ayacahuite* near Cinco Millas at 2,600 m on 30 April 2008, and a group of four at the same locality on 10 January 2015 (Fig. 4A). There is a previous report at Mesa de las Guacamayas on an unknown date in May 2009 (J. Olivo *in litt*. 2015). The species' potential distribution was considered to reach slightly into north-west Chihuahua (Navarro-Sigüenza & Peterson 2007). Recorded twice in Sonora (Russell & Monson 1998), a very rare winter visitor to the Trans-Pecos region (Peterson & Zimmer 1998, Lockwood & Freeman 2014) and an uncommon resident in the higher mountains of New Mexico, primarily above 2,500 m, with casual records in the lowlands in autumn / winter (B. Howe *in litt.* 2015). Endangered (SEMARNAT 2010).

NORTHERN ROUGH-WINGED SWALLOW *Stelgidopteryx serripennis*
Three winter records: a single at Loma Blanca on 18 February 2016 (IM-C), four at Río Conchos (I) on 26 February 2016 (IM-C, FM, AA; Fig. 4B) and two at Vado de Meoqui on 25 and 27 February 2016 (IM-C, FM). Howell & Webb (1995) and Navarro-Sigüenza & Peterson (2007) mapped the species as wintering in Chihuahua only in the extreme south-west. A handful of winter records in Chihuahua: 2–20 individuals at the San Pedro River, Satevó municipality, on 20–21 February 1998, six at Valle de Zaragoza on 9 February 1998 (M. Iliff), and one at Batopilas on 27 January 1999 (R. Cannings; eBird 2016).

BLACK-AND-WHITE WARBLER *Mniotilta varia*
An adult male at Vado de Meoqui on 29 December 2015 and 9 January 2016 (JR-M) was outside its winter range (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007); the species' winter status in the Chihuahuan Desert ecoregion requires elucidation. Howell & Webb (1995) considered the species to be a transient elsewhere in Chihuahua.

NASHVILLE WARBLER *Leiothlypis ruficapilla*
Two at Vado de Meoqui on 24 January 2016 (JR-M; Fig. 4C). Not previously mapped as a winter visitor to the Chihuahuan Desert ecoregion (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007), although there is another winter record in the same region (Rancho El Gato, 14 January 2012: eBird 2016). Howell & Webb (1995) considered the species to be a transient elsewhere in Chihuahua, but a regular winter visitor in the Sierra Madre Occidental (Navarro-Sigüenza & Peterson 2007).

WILSON'S WARBLER *Cardellina pusilla*
Singles at Presa El Rejón on 13 December 2014, near Neder on 24 December 2014, and at Vado de Meoqui on 9 January (MJ; Fig. 4D) and 28 February 2016 (IM-C, FM). The species' winter range includes the Sierra Madre Occidental of Chihuahua (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). Our records suggest it is a regular winter visitor to the Chihuahuan Desert ecoregion, where it was considered only a transient (Howell & Webb 1995). B. Howe & D. Hawksworth reported a male at the río Casas Grandes, just west of Nuevo Casas Grandes, northern Chihuahua, on 12 January 1997 (Leukering & Bradley 1997).

BALTIMORE ORIOLE *Icterus galbula*
The second record for Chihuahua: a female and male photographed at a ranch in Camargo on 18 August 2015 (Fig. 4E) and a male at the same site on 18 September 2015 (AA). The first record was a male collected at Camargo on 20 June 1949 (Navarro-Sigüenza *et al*. 2003).

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In north-west Mexico, vagrants reported from Baja California (Erickson *et al*. 2013), Sonora (Russell & Monson 1998) and Durango (F. San Martín *in litt*. 2015). Considered a 'casual visitor' to western Texas (Lockwood & Freeman 2014) and New Mexico (eBird 2016).

'WHITE-WINGED' DARK-EYED JUNCO *Junco hyemalis aikeni*
Probably the second and third records for Mexico, and first and second for Chihuahua: IM-C observed a single under excellent conditions at El Chamizal on 22 February 2015 (Fig. 4F), with a flock including Ruby-crowned Kinglets *Regulus calendula*, Audubon's Warblers *Setophaga auduboni*, and Oregon *Junco hyemalis cismontanus* and Pink-sided Juncos *J. h. mearnsi*. Another was observed by FM and R. Valdés at Cumbres de Majalca National Park on 25 October 2015. Both had grey upperparts, head and breast, dusky lores, bluish bill and white belly. At close range, White-winged Junco shows a considerable amount of white in the rectrices, apparently larger size and a longer tail than other juncos. Ten records for Texas (only seven accepted by the Texas Bird Records Committee) and considered a casual to very rare visitor in the Panhandle region, but an 'accidental visitor' to the rest of the Tran-Pecos region with *c*.3 well-documented records (Lockwood & Freeman 2014; M. W. Lockwood *in litt*. 2015). Howell & Webb (1995) did not mention its occurrence in Mexico, but there is at least one previous record (Puerto Peñasco, Sonora, 17 December 2000; eBird 2016). It is possible that the subspecies occurs in northern Mexico during irruptive movements.

INDIGO BUNTING *Passerina cyanea*
One near Río Sacramento on 2 June 2014 and two near El Jaral on 17 May 2015 (JC). Three previous records for Chihuahua: an adult male and second-year male at Río San Pedro on 29 May–1 June 2005 (Gómez de Silva 2005a), and nine and three individuals in Chihuahua municipality on 7 May 2011 and 19 May 2012, respectively (D. Venegas *in litt*. 2015). These records suggest that it is an uncommon but regular transient in western Chihuahua, where it is regular in the east and centre of the state (Howell & Webb 1995). Occasionally nests in riparian habitats in the Trans-Pecos region (Lockwood & Freeman 2014). Breeds over much of New Mexico in river valleys at lower and middle elevations, but not found in higher mountains (B. Howe *in litt*. 2015).

Discussion

The new records reported herein increase the Chihuahuan avifauna to 482 species, with the addition of American White Ibis *Eudocimus albus*, Red-shouldered Hawk *Buteo lineatus* and Clark's Nutcracker *Nucifraga columbiana*. We also added two new subspecies to the state list: 'Harlan's' Red-tailed Hawk *Buteo jamaicensis harlani* and 'White-winged' Dark-eyed Junco *Junco hyemalis aikeni* (the latter known from just one previous Mexican record).

Detailed and up-to-date knowledge of species' ranges and seasonal status is essential for conservation biology (Koleff & Urquiza-Haas 2011, Cantú-Salazar & Gaston 2013). The range maps in Howell & Webb (1995) and Navarro-Sigüenza & Peterson (2007) show that many migrant species were considered 'transients' in Chihuahua (at least outside the Sierra Madre Occidental). We provide evidence here and in Moreno-Contreras *et al*. (2015a) that at least some of these are probably regular winter visitors (e.g., Orange-crowned Warbler *Leiothlypis celata*). We noted a similar pattern for the central Chihuahua portion of the Mexican Plateau, with other records (e.g., Yellow-crowned Night Heron *Nyctanassa violacea*, Grey Hawk *Buteo plagiatus*) revealing year-round resident populations in the Chihuahuan Desert ecoregion of species that were formerly considered accidental in Chihuahua, at least outside the Sierra Madre Occidental (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). Leukering & Bradley (1997) also reported several new records of species that formerly

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were unknown as winter visitors or residents on the Mexican Plateau, indicating that there is still much to learn concerning the distribution and seasonal status of birds in Chihuahua.

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