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## AVIFAUNA OF JUÁREZ MUNICIPALITY, CHIHUAHUA, MEXICO

ISRAEL MORENO-CONTRERAS, Laboratorio de Ecología y Biodiversidad Animal (LEBA), Departamento de Ciencias Químico-Biológicas, Instituto de Ciencias Biomédicas, Universidad Autónoma de Ciudad Juárez, Anillo Envolvente del Pronaf y Estocolmo s/n, C.P. 32300, Ciudad Juárez, Chihuahua, México; al103860@alumnos.uacj.mx (current address: Museo de Zoología "Alfonso L. Herrera," Facultad de Ciencias, Universidad Nacional Autónoma de México, A.P. 70-399, México, D.F., 04510, México) HÉCTOR GÓMEZ DE SILVA, Xola 314-E, 03100 México, D.F., México; hector.gomezdesilva@gmail.com

ADRIÁN TORRES-VIVANCO, Programa de Biología, Departamento de Ciencias Químico-Biológicas, Instituto de Ciencias Biomédicas, Universidad Autónoma de Ciudad Juárez, Ciudad Juárez, Chihuahua, México

NOHEMI VILLALPANDO-NAVARRETE, José Clemente Orozco, C.P. 32340, Ciudad Juárez, Chihuahua, México; nohemi\_villalpando@yahoo.com

ALEJANDRO BOTELLO, Departamento de Ciencias Químico-Biológicas, Instituto de Ciencias Biomédicas, Universidad Autónoma de Ciudad Juárez, Ciudad Juárez, Chihuahua, México

**ABSTRACT:** We provide the results of avifaunal inventories in Juárez Municipality, a poorly known part of the relatively under-birded Mexican state of Chihuahua. Patterns observed are highly consistent with published literature on the avifauna of westernmost Texas. Our findings modify the status of some species, including the addition of rare migrants (Grace's Warbler and Zone-tailed Hawk), first records for Chihuahua (Downy Woodpecker, Blue-headed Vireo, Pine Warbler, and Rose-breasted Grosbeak), range expansions (Neotropic Cormorant, Eurasian Collared-Dove, American Crow), and changes of seasonal status (Great Blue Heron, Vermilion Flycatcher, and Cassin's Kingbird).

Ornithological surveys in Mexico have been characterized by a lack of continuity, and available avifaunal information is considered incomplete (Escalante et al. 1993). The first detailed maps of the ranges of all bird species in Mexico were presented by Howell and Webb (1995), but those maps omitted many specimen records in Mexican bird collections (Peterson and Navarro-Sigüenza 1996).

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**Table 1** Sites of Bird Surveys in Juárez Municipality, Chihuahua, Mexico

Sampling site <sup>a</sup>	Geographic coordinates	Elevation (m)	Habitat <sup>b</sup>
1. El Bocán	31° 20' N, 106° 23.5' W	1250	Ds
2. El Chamizal	31° 45' N, 106° 27' W	1130	Up
3. Parque Central	31° 41' N, 106° 25' W	1130	Up
4. Club Campestre	31° 43' N, 106° 24' W	1130	Up
5. Trepachanga	31° 40' N, 106° 30' W	1290	Ds
6. Zaragoza	31° 40' N, 106° 20' W	1120	Af
7. Puerta Juárez	31° 32' N, 106° 28' W	1230	Ds
8. Loma Blanca	31° 35' N, 106° 18' W	1120	Af
9. Ojo de la Punta	31° 23' N, 106° 36' W	1240	Ds
10. Rancho Alegre	31° 13' N, 106° 40' W	1220	Gr

<sup>a</sup>Numbered as in Figure 1.

<sup>b</sup>Ds, desert scrub; Gr, grasslands; Af, agricultural fields; Up, urban parks.

Navarro-Sigüenza and Peterson (2007) produced a second set of detailed range maps for Mexican birds, and much new data published in recent years has expanded our understanding of their distributions (Navarro-Sigüenza et al. 2003). The avifauna of Chihuahua remains poorly studied, despite early explorations in the state (Allen 1893, Griscom 1933, Thompson 1962) and more recent surveys (e.g., Manzano-Fischer et al. 2006, Miller and Chambers 2007). Records accumulated from these and other efforts have provided a baseline understanding of regional distributions of species, both geographically and temporally.

The purpose of this paper is to provide an avifaunal inventory of the municipio (municipality) of Juárez, a region of northern Chihuahua that has received little attention (Moreno-Contreras et al. 2012). We comment on seasonality, threat categories, habitats, and noteworthy records.

## METHODS

### Study Area

Juárez Municipality, located in the north of the Mexican state of Chihuahua (31° 48' to 31° 07' N, 106° 58' to 106° 10' W, elevation 1000–1900 m; Figure 1), encompasses an area of 3561.14 km<sup>2</sup> (<http://www3.inegi.org.mx/sistemas/biinegi/default.aspx>). It is bordered on the west, south, and northeast by the municipalities of Ascensión, Ahumada, and Guadalupe, respectively, and on the north by El Paso County, Texas, and Doña Ana County, New Mexico (INEGI 2010). The climate is dry and temperate with rainy summers (July to September). The mean monthly temperature varies from 5.8 °C in January to 27.5 °C in July, and annual precipitation averages 220 mm (INEGI 2010).

Four main types of habitats are present: desert scrub, grasslands, agricultural fields, and urban parks (INEGI 2010). The desert scrub is dominated by creosote bush (*Larrea tridentata*), ocotillo (*Fouquieria splendens*), tarbush (*Flourensia cernua*), viscid acacia (*Acacia neovernicosa*), honey mesquite

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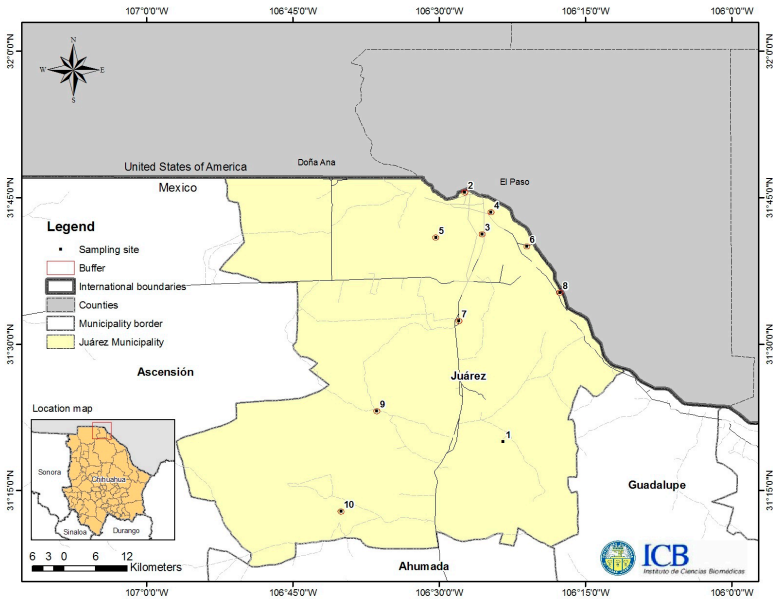


Figure 1. Sites of bird sampling in Juárez Municipality, northern Chihuahua, Mexico. 1, El Bocán; 2, El Chamizal; 3, Parque Central; 4, Club Campestre; 5, Trepachanga; 6, Zaragoza; 7, Puerta Juárez; 8, Loma Blanca; 9, Ojo de la Punta; 10, Rancho Alegre.

(*Prosopis glandulosa*), lechugilla (*Agave lechugilla*), yucca (*Yucca* spp.), and joint-pine (*Ephedra* spp.; Rzedowski 2006). Grasslands are characterized by muhly grass (*Muhlenbergia* sp.), tobosa (*Hilaria mutica*), and grama (*Bouteloua* sp.; INEGI 2010).

Agricultural fields generally include alfalfa (*Medicago sativa*), Mexican cotton (*Gossypium hirsutum*), and scattered shrubs and trees. The dominant trees in urban parks include Afghan pine (*Pinus eldarica*), Arizona cypress (*Cupressus arizonica*), willows (*Salix* spp.), ash (*Fraxinus* spp.), white mulberry (*Morus alba*), Mexican fan palm (*Washingtonia robusta*), chinaberry tree (*Melia azedarach*), elms (*Ulmus* spp.), and cottonwoods (*Populus* spp.), among others.

### Bird Surveys

Gómez de Silva searched a plot of 1 km<sup>2</sup> at El Bocán, Samalayuca, over five days every three months from March 1997 to September 1998, for a total of 30 days of field work. The study area was a relatively homogeneous rolling sandy desert with open mesquite scrub and scattered sagebrush (*Artemisia filifolia*). Annuals and grasses were scarce. The study area was bounded to the south and west by unvegetated gypsum dunes.

Villalpando conducted a winter bird count at El Chamizal from 27 December 2007 to 13 February 2008, making additional observations at Loma Blanca on 28 December 2007.

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Figure 2. Mississippi Kite (*Ictinia mississippiensis*) at El Chamizal on 17 June 2013.

*Photo by Israel Moreno-Contreras*

Moreno, Torres, and Botello surveyed birds across Juárez Municipality monthly from June 2012 through May 2015 (except November 2012, and June, September, and October 2014). The surveys covered all habitat types in the municipality and at all seasons. The method consisted of three 20-min counts in which the observers moved around in an area of 3 ha (Ralph et al. 1993). By this approach unfamiliar songs and calls could be tracked down and silent birds could be found. At each sampling site (except El Bocán, Samalayuca), we defined, using ArcGIS 9.3 (ESRI, Redlands, CA), a series of concentric circles with radius of 500 m. Each of the nine main sampling sites was walked once or twice per season (except the Rancho Alegre grasslands, which were surveyed only in July, September, and December 2014), resulting in 161 survey days.

Most surveys were conducted during periods of peak bird activity from 06:00 to between 09:00 and 11:00, with occasional nocturnal observations from 17:00 to 19:30. We avoided rainy and windy conditions. Birds were surveyed and identified by sight with the aid of 10× binoculars. Photos of



Figure 3. Zone-tailed Hawk (*Buteo albonotatus*) at El Chamizal on 25 March 2013.

*Photo by Adrián Torres-Vivanco*

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noteworthy birds taken during the 2012–2015 surveys are deposited at the Colección Científica de Vertebrados of the Universidad Autónoma de Ciudad Juárez (CCV-UACJ), Ciudad Juárez, Chihuahua, Mexico. Distributional data have been deposited at the Unidad de Cartografía Digital, Instituto de Ciencias Biomédicas, Ciudad Juárez.

### RESULTS

We report a total of 221 species, belonging to 134 genera and 47 families. The most species-rich families in Juárez Municipality were the Anatidae (21), Emberizidae (20), Parulidae (17), and Tyrannidae (15). Of the total, 57 were permanent residents, 24 summer residents, 87 winter visitors (one of which also breeds locally at Parque Central; see the annotated list), and 53 transients. We found 12 species listed by Mexican law under the “special protection” category, and four species are listed as “threatened.” Avian richness was higher in urban parks (157) than in agricultural fields (117), desert scrub (123), and grasslands (30). Ninety-nine species were restricted to a single habitat type.

Systematic and phylogenetic order follow the American Ornithologists’ Union (AOU 1998) and supplements (<http://checklist.aou.org/>), with two exceptions (*Anas diazi*, *Setophaga auduboni*), which follow Navarro-Sigüenza and Peterson (2004). With respect to seasonality, we categorize species as permanent resident (observed year round), summer resident (species breeding or spending the summer), winter visitor, and transient (species present during migration only and not spending the winter in the area). Species’ seasonal status has been cross-referenced with published data for Mexico and adjacent regions of the United States (Howell and Webb 1995, Peterson and Zimmer 1998, Navarro-Sigüenza and Peterson 2007, Lockwood and Freeman 2014). The categories of conservation status defined under Mexican law (SEMARNAT 2010) are “special protection” and “threatened.”

Abundance designations are qualitative: common (species encountered frequently or in large numbers), fairly common (species encountered routinely in moderate numbers), uncommon (species encountered infrequently and in small numbers), and rare (species encountered fewer than five times). Abundances were based on the maximum number of individuals recorded on a survey (“low” =  $\leq 5$ ; “moderate” = 6 to 10, “numerous” =  $> 10$ ).

Snow Goose (*Chen caerulescens*). Uncommon winter visitor to urban parks.

Ross’s Goose (*Chen rossii*). Uncommon winter visitor to urban parks.

Cackling Goose (*Branta hutchinsii*). Rare winter visitor, recorded only at Parque Central. This species is considered rare in the El Paso area (Lockwood and Freeman 2014). One or two are seen most years, but it is less numerous than the Canada Goose. One has wintered with feral Canada Goose at Ascarate Park since at least 2011 (B. Zimmer in litt., 2014).

Canada Goose (*Branta canadensis*). Uncommon winter visitor to urban parks: seen in low to moderate numbers at Parque Central and Club Campestre.

Wood Duck (*Aix sponsa*). Rare winter visitor in urban parks: one male at Parque Central from 9 December 2014 to 16 January 2015 (IMC). The Wood Duck was mapped as a winter visitor in Chihuahua by Howell and Webb (1995) and Navarro-Sigüenza and

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- Peterson (2007). In western Trans-Pecos Texas, it is a locally uncommon permanent resident along the Rio Grande (Peterson and Zimmer 1998, Lockwood and Freeman 2014), so it has probably been overlooked in the Juárez region.
- Gadwall (*Anas strepera*). Fairly common winter visitor to urban parks and a pond at Ojo de la Punta in desert scrub.
- American Wigeon (*Anas americana*). Fairly common winter visitor to urban parks.
- Mallard (*Anas platyrhynchos*). Fairly common winter visitor (late September–early May) to agricultural fields and urban parks.
- Mexican Duck (*Anas diazi*). Common permanent resident in agricultural fields, urban parks, and a small pond bordered with desert scrub at Ojo de la Punta. This species is designated as “threatened” under Mexican law, but it is a common year-round resident in northern Chihuahua (IMC).
- Blue-winged Teal (*Anas discors*). Fairly common transient in agricultural fields: seen only at the Rio Grande near Loma Blanca (spring and fall; IMC). Uncommon transient in urban parks. Howell and Webb (1995) mapped the species as a winter visitor, but our results suggest it is absent from Juárez Municipality during the winter. Although there are two winter records from El Paso County, this species is generally absent at that season (Peterson and Zimmer 1998).
- Cinnamon Teal (*Anas cyanoptera*). Fairly common permanent resident in agricultural fields of Loma Blanca, less common in urban parks. Rarely seen in the Samalayuca area. This species is a very scarce breeder in the area. There is a two-month period from November to early January when there are very few records for the El Paso area (Peterson and Zimmer 1998).
- Northern Shoveler (*Anas clypeata*). Common winter visitor. Recorded only in urban parks and at Loma Blanca.
- Northern Pintail (*Anas acuta*). Uncommon winter visitor. At Club Campestre, recorded only in spring. This species can be abundant at times in El Paso (Peterson and Zimmer 1998), but perhaps the habitat is more limited in Juárez.
- Green-winged Teal (*Anas crecca*). Common winter visitor in urban parks (Parque Central and Club Campestre).
- Canvasback (*Aythya valisineria*). Uncommon winter visitor to urban parks: a pair (male and female) was at Parque Central in January 2015 (IMC).
- Redhead (*Aythya americana*). Uncommon winter visitor, recorded only at Club Campestre.
- Ring-necked Duck (*Aythya collaris*). Fairly common winter visitor to urban parks.
- Lesser Scaup (*Aythya affinis*). Fairly common winter visitor to urban parks.
- Bufflehead (*Bucephala albeola*). Fairly common winter visitor to urban parks.
- Hooded Merganser (*Lophodytes cucullatus*). Rare winter visitor. Three records of two females during migration at Parque Central, on 16 December 2012, 9 December 2014, and 15 January 2015 (IMC). Only a handful of previous records exist from Chihuahua: one record mapped by Howell and Webb (1995) and three December–January records from Laguna Fierro, Nuevo Casas Grandes Municipality, on 2 December 2000 by M. J. Iliff ([www.ebird.org](http://www.ebird.org); eBird), in early January 2003 (Gómez de Silva 2003a), and in early January 2007 (Gómez de Silva 2007a). Regular winter visitor in west Texas and adjacent regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014). In the El Paso area, several individuals can be found each winter on Ascarate Lake (B. Zimmer in litt., 2014).
- Common Merganser (*Mergus merganser*). Rare winter visitor, with only two records from Club Campestre. This species generally prefers large reservoirs.
- Ruddy Duck (*Oxyura jamaicensis*). Fairly common winter visitor in urban parks, but also an uncommon permanent resident at Parque Central. Mapped as a permanent resident by Howell and Webb (1995). Peterson and Zimmer (1998) considered it to be a fairly common migrant and winter visitor but also an uncommon and local breeding species.

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Figure 4. Short-eared Owl (*Asio flammeus*) at Zaragoza on 16 April 2014 and seen later that day flying across the Rio Grande into the El Paso area.

Photo by Israel Moreno-Contreras

Scaled Quail (*Callipepla squamata*). Common permanent resident in most desert habitats throughout Juárez Municipality; absent from the study area at El Bocán, though present in the small mountain ranges only 5 km to the north (HGdS).

Gambel Quail's (*Callipepla gambelii*). Common breeding resident in desert scrub and agricultural lands. Less often observed in grasslands.

Pied-billed Grebe (*Podilymbus podiceps*). Common permanent resident in urban parks, though encountered in only small numbers in summer.

Eared Grebe (*Podiceps nigricollis*). Fairly common winter visitor to urban parks.

Western Grebe (*Aechmophorus occidentalis*). Rare winter visitor to urban parks.

Only one record, at Club Campestre 9 December 2014–16 January 2015 (IMC). Howell and Webb (1995) and Navarro-Sigüenza and Peterson (2007) did not map the species from Juárez Municipality. In Trans-Pecos Texas, it is a fairly common migrant and winter visitor and nest irregularly (Peterson and Zimmer 1998, Lockwood and Freeman 2014).

Neotropic Cormorant (*Phalacrocorax brasilianus*). Common permanent resident found in moderate numbers in urban parks (IMC). Slightly higher numbers recorded in summer and fall (IMC, ATV). There is only one other record from Chihuahua, of a single individual at El Vado, Meoqui Municipality, on 29 January 2012 (Mondaca-Fernández and Moreno-Contreras 2014). This species was not mapped in Chihuahua or adjacent states by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007), but it is a regular breeding resident in west Texas and adjacent



Figure 5. Blue-headed Vireo (*Vireo solitarius*) at Club Campestre on 1 February 2014. First record for the state of Chihuahua.

Photo by Israel Moreno-Contreras

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Figure 6. American Crow (*Corvus brachyrhynchos*) at Loma Blanca on 1 February 2014. First photographic evidence of the species in Chihuahua.

*Photo by Israel Moreno-Contreras*

regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014). The first breeding record for Trans-Pecos Texas was of four nests at Fort Hancock Reservoir, Hudspeth County, on 4 May 1996, which fledged 12 young in June (Lasley et al. 1996). In addition, the Neotropic Cormorant has bred at Cemex pond in El Paso County for probably ten years or more, over which time it has definitely increased in that county, especially in winter (J. Paton in litt., 2015).



Figure 7. Pine Warbler (*Setophaga pinus*) at Club Campestre on 6 January 2015; it stayed to 24 January 2015. First record for the state of Chihuahua.

*Photo by Israel Moreno-Contreras*

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- Double-crested Cormorant (*Phalacrocorax auritus*). Common permanent resident. Recorded in high numbers in urban parks from 2012 to 2014 (IMC, ATV). This species was not mapped for Chihuahua or adjacent states by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007), but it is a regular winter visitor in west Texas and adjacent regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014). It can be found year round in El Paso, breeding in some years (B. Zimmer in litt., 2014).
- American White Pelican (*Pelecanus erythrorhynchos*). Two were at Parque Central in winter 2012 and 2014 (IMC).
- Great Blue Heron (*Ardea herodias*). Permanent resident. Seen frequently in agricultural lands and urban parks in low numbers (IMC). Recorded rarely in desert scrub at Ojo de la Punta (IMC). Howell and Webb (1995) mapped this species as a winter visitor in Chihuahua, but over the past two decades it has become an irregular breeder in the El Paso area, where it can be found in all months of the year, though rare in midsummer (Peterson and Zimmer 1998, Lockwood and Freeman 2014, J. Paton in litt., 2015). The Great Blue Heron does breed regularly in other parts of Trans-Pecos Texas (B. Zimmer in litt., 2014).
- Great Egret (*Ardea alba*). Permanent resident. Seen frequently but in low numbers in agricultural fields and urban parks. Howell and Webb (1995) mapped this species as a winter visitor in Chihuahua, but it breeds irregularly in west Texas (three nests at McNary Reservoir, Hudspeth County, on 22 July 1994), where it is found all months of the year as nonbreeding resident (Peterson and Zimmer 1998). This species has become more frequent in winter in El Paso County in the last ten years (J. Paton in litt., 2015).
- Snowy Egret (*Egretta thula*). Fairly common permanent resident. Found in low to moderate numbers in agricultural fields and urban parks (IMC). Howell and Webb (1995) mapped this species as a winter visitor in Chihuahua, but it breeds regularly in west Texas and adjacent regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Cattle Egret (*Bubulcus ibis*). Locally fairly common permanent resident in agricultural fields of Loma Blanca. Found in high numbers in spring and fall, less commonly in winter.
- Green Heron (*Butorides virescens*). Rare in agricultural fields of Loma Blanca but a fairly common breeding resident in urban parks.
- Black-crowned Night-Heron (*Nycticorax nycticorax*). Permanent resident. Seen frequently in low numbers in urban parks (apparently breeding at Club Campestre) and agricultural fields (IMC). Rare in desert scrub (Ojo de la Punta, IMC). Howell and Webb (1995) mapped this species as a winter visitor in Chihuahua, but it breeds regularly in west Texas and adjacent regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- White-faced Ibis (*Plegadis chihi*). Recorded only as a common transient in high numbers in agricultural fields of Loma Blanca. Uncommon migrant at Zaragoza. Uncommon migrant in urban parks and a rare migrant at Ojo de la Punta, Samalayuca (IMC). Howell and Webb (1995) mapped this species as a winter visitor in Chihuahua. It is a regular migrant and casual winter visitor in west Texas and adjacent regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Turkey Vulture (*Cathartes aura*). Common summer resident. Found in high numbers from April to September. Howell and Webb (1995) mapped it as a permanent resident in northern Chihuahua, but in west Texas and adjacent regions it is recorded regularly only as a summer resident (Peterson and Zimmer 1998, Lockwood and Freeman 2014). Since 2011 four or five birds have overwintered at Rio Bosque Park, El Paso County (normally the species is present in the county only from mid-March to late October; Lockwood and Freeman 2014).
- Osprey (*Pandion haliaetus*). Rare transient migrant in urban parks: our only obser-

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- vation is of two adults at Club Campestre on 13 April 2013 (IMC). Peterson and Zimmer (1998) considered this species an uncommon migrant in the El Paso area. White-tailed Kite (*Elanus leucurus*). Three records, all from Loma Blanca, of one on 27 December 2007 (NVN) and on 5 and 20 February 2015 (IMC). Not mapped in this part of Chihuahua by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007), but the White-tailed Kite nests very rarely at El Paso and is a rare visitor at all seasons elsewhere in El Paso County (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Mississippi Kite (*Ictinia mississippiensis*). Probably a rare transient, though possibly breeds nearby. Recorded several times in moderate numbers in urban parks from mid-June to late August (IMC, ATV; Figure 2). There are only a handful of previous Chihuahua records: a juvenile near Batosárachi on 12 and 13 August 1997 (Gómez de Silva 2002); a group of five individuals along the Río Casas Grandes on 21 August 2014 (A. McAndrews and J. Montejo; eBird), which is slightly earlier than typical for fall migration in Mexico; and two to five in late May 2001, 2003, 2005, and 2008, slightly later than typical for spring migration (eBird, Gómez de Silva 2003b, 2005b, 2008). This species was not mapped in Chihuahua or adjacent states by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007), but it breeds locally in western El Paso County where there are large trees. The Mississippi Kite is not widespread in west Texas as a breeding species (Peterson and Zimmer 1998, Lockwood and Freeman 2014, B. Zimmer in litt, 2014). "Special protection."
- Northern Harrier (*Circus cyaneus*). Uncommon winter visitor with records of small numbers in desert scrub at El Bocán and Puerta Juárez and in agricultural fields at Loma Blanca. "Special protection."
- Sharp-shinned Hawk (*Accipiter striatus*). Uncommon winter visitor to agricultural fields, but a fairly common winter visitor to urban parks (IMC). Recorded in desert scrub (El Bocán, HGdS). "Special protection."
- Cooper's Hawk (*Accipiter cooperii*). Fairly common winter visitor to urban parks; uncommon winter visitor in desert scrub and agricultural fields. "Special protection."
- Common Black Hawk (*Buteogallus anthracinus*). Rare migrant in urban parks: one record of an adult at Club Campestre on 30 March 2015 (IMC). The species was not mapped in Juárez Municipality by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007), but it is a regular summer resident in the Sierra Madre Occidental of Chihuahua and a year-round resident farther south. In Trans-Pecos Texas, it is a rare and local summer resident in the Davis Mountains and a regular nester along the Rio Grande. Farther west, it is considered a vagrant to El Paso County (Peterson and Zimmer 1998, Lockwood and Freeman 2014). "Special protection."
- Harris's Hawk (*Parabuteo unicinctus*). Rare visitor to agricultural fields. A single bird seen at Loma Blanca on 13 September 2014 (IMC, ATV). Harris's Hawk breeds locally in the El Paso area (Peterson and Zimmer 1998, Lockwood and Freeman 2014). The species was not mapped in Juárez Municipality by Howell and Webb (1995). "Special protection."
- Swainson's Hawk (*Buteo swainsoni*). Common summer resident throughout the Juárez Municipality. One pair breeds annually at the Club Campestre (IMC). "Special protection."
- Zone-tailed Hawk (*Buteo albonotatus*). Rare transient in urban parks. On 25 March 2013, we recorded an adult soaring low over El Chamizal (IMC, ATV; Figure 3). Howell and Webb (1995) mapped this species as an uncommon summer resident in northern Chihuahua, but Peterson and Zimmer (1998) and Lockwood and Freeman (2014) considered it accidental at El Paso. In central Trans-Pecos Texas, the Zone-tailed Hawk breeds regularly in low density in the Davis and Chisos mountains (in the Franklin Mountains of El Paso County there are probably not enough trees

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Figure 8. Grace's Warbler (*Setophaga graciae*) at Club Campestre on 18 April 2014. This species is rarely detected in migration in west Texas.

*Photo by Israel Moreno-Contreras*

for nesting). It also nests about 193 km north in New Mexico (B. Zimmer in litt., 2014). "Special protection."

Red-tailed Hawk (*Buteo jamaicensis*). Common breeding resident throughout the Juárez Municipality; numerous in winter.

Ferruginous Hawk (*Buteo regalis*). Rare winter visitor in desert scrub, agricultural fields, and urban parks: single birds seen near El Bocán on 6 February 1998



Figure 9. Rose-breasted Grosbeak (*Pheucticus ludovicianus*) at Ojo de la Punta on 12 May 2015. First record for the state of Chihuahua.

*Photo by Israel Moreno-Contreras*

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- (HGdS), El Chamizal on 14 March 2012 and 13 February 2013 (IMC, ATV), and Loma Blanca on 30 December 2013 (IMC). "Special protection."
- Golden Eagle (*Aquila chrysaetos*). Two records from desert scrub: one at El Bocán on 2 December 1997 (HGdS); one near Samalayuca on 20 April 2015 (P. Dominguez in litt., 2015). This species is a permanent resident in Trans-Pecos Texas, though somewhat more common in winter (Peterson and Zimmer 1998, Lockwood and Freeman 2014). In addition, one pair breeds annually in the Franklin Mountains of El Paso. "Threatened."
- Sora (*Porzana carolina*). Rare winter visitor in agricultural fields but perhaps uncommon during migration. One along the Rio Grande near Loma Blanca on 8 and 11 December 2014 (IMC). In El Paso County, the Sora is a fairly common transient migrant and an uncommon to rare winter visitor (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Common Gallinule (*Gallinula galeata*). Locally uncommon permanent resident. Found only along the Rio Grande near Loma Blanca (IMC).
- American Coot (*Fulica americana*). Common permanent resident. Observed in moderate numbers in urban parks, in high numbers at Loma Blanca.
- Killdeer (*Charadrius vociferus*). Common permanent resident throughout the municipality.
- Black-necked Stilt (*Himantopus mexicanus*). Common permanent resident. Found year-round in small numbers at Parque Central and numerous there in spring and fall. Recorded in high numbers in spring and fall in agricultural lands of Loma Blanca (IMC). Howell and Webb (1995) mapped this species as a transient in northern Chihuahua, but it is a regular breeding species in west Texas and adjacent regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014). In addition, it is generally uncommon and localized in winter around El Paso (Peterson and Zimmer 1998).
- American Avocet (*Recurvirostra americana*). Fairly common migrant in agricultural fields of Loma Blanca. It breeds regularly in El Paso County (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Spotted Sandpiper (*Actitis macularius*). Fairly common winter visitor in agricultural fields of Loma Blanca; rare in urban parks (IMC). Around El Paso, the species is a fairly common migrant and uncommon to rare in winter (Peterson and Zimmer 1998).
- Solitary Sandpiper (*Tringa solitaria*). Fairly common transient in agricultural fields of Loma Blanca.
- Greater Yellowlegs (*Tringa melanoleuca*). Uncommon winter visitor in agricultural lands of Loma Blanca.
- Lesser Yellowlegs (*Tringa flavipes*). Uncommon transient in agricultural lands of Loma Blanca.
- Long-billed Curlew (*Numenius americanus*). Uncommon winter visitor in agricultural fields of Loma Blanca.
- Least Sandpiper (*Calidris minutilla*). Regular winter visitor, found in high numbers only at Loma Blanca.
- Pectoral Sandpiper (*Calidris melanotos*). Rare transient in agricultural lands: seen only once at Loma Blanca in fall 2013. Very uncommon to rare at El Paso (Peterson and Zimmer 1998).
- Western Sandpiper (*Calidris mauri*). Uncommon transient in agricultural lands, seen only at Loma Blanca (spring and fall).
- Long-billed Dowitcher (*Limnodromus scolopaceus*). Uncommon winter visitor in agricultural lands, recorded only at Loma Blanca.
- Wilson's Snipe (*Gallinago delicata*). Uncommon winter visitor in agricultural fields but found in high numbers at Loma Blanca. Rare in urban parks where recorded on only three occasions at El Chamizal.
- Wilson's Phalarope (*Phalaropus tricolor*). Uncommon transient in urban parks.

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- Ring-billed Gull (*Larus delawarensis*). Fairly common winter visitor but recorded in moderate numbers only at Club Campestre (IMC).
- Rock Pigeon (*Columba livia*). Abundant breeding resident in urban parks and uncommon to rare elsewhere.
- Eurasian Collared-Dove (*Streptopelia decaocto*). From 2012 to 2015, a common permanent resident throughout the Juárez Municipality (IMC). Not recorded in 1997 or 1998 (HGdS). At that time, the species had not yet reached adjacent Texas (Peterson and Zimmer 1998). Its rapid invasion of Mexico began in the early 2000s (Álvarez-Romero et al. 2008). The first El Paso records were in 2001, after which the dove quickly became a common and widespread resident (B. Zimmer in litt., 2014).
- Inca Dove (*Columbina inca*). Locally fairly common permanent resident in agricultural fields and urban parks. Rarely seen in desert scrub (Trepachanga and Ojo de la Punta, IMC).
- White-winged Dove (*Zenaida asiatica*). Fairly common permanent resident in desert scrub, grasslands, and agricultural fields. Large numbers can be found in urban parks.
- Mourning Dove (*Zenaida macroura*). Fairly common permanent resident in all habitats surveyed.
- Greater Roadrunner (*Geococcyx californianus*). Fairly common permanent resident throughout the municipality.
- Barn Owl (*Tyto alba*). Uncommon permanent resident in desert scrub (El Bocán) and urban parks (El Chamizal and Club Campestre).
- Great Horned Owl (*Bubo virginianus*). Uncommon permanent resident in desert scrub (El Bocán, HGdS) and urban parks (Club Campestre, IMC); one record in agricultural lands near Zaragoza, 13 July 2013 (EG).
- Burrowing Owl (*Athene cunicularia*). Fairly common permanent resident, found in moderate numbers in desert scrub. Uncommon permanent resident in agricultural fields, observed in small numbers at Zaragoza and Loma Blanca. In the Juárez–El Paso region less common in winter (Peterson and Zimmer 1998). “Special protection.”
- Short-eared Owl (*Asio flammeus*). Rare winter visitor. Only one record: one bird observed and photographed in agricultural fields of Zaragoza on 16 April 2014 and seen later that day flying across the Rio Grande to El Paso (IMC; Figure 4). This date is the latest recorded for Chihuahua; the species occurs irregularly between October and March (Howell and Webb 1995). There have been no reliable records in El Paso County, Texas, since 1984, where Peterson and Zimmer (1998) noted the Short-eared Owl as a casual winter visitor. “Special protection.”
- Lesser Nighthawk (*Chordeiles acutipennis*). Common summer resident in arid habitats. Uncommon to rare in urban parks, where recorded only in summer 2013 at El Chamizal.
- Common Nighthawk (*Chordeiles minor*). Uncommon migrant in desert scrub, but single individuals were seen and heard making the typical nasal “peer” call on 6 June 1998 (El Bocán, HGdS) and on 4 July 2014 (Ojo de la Punta, IMC), suggesting the species probably breeds in hills near Samalayuca. Uncommon migrant and local breeder in adjacent parts of Texas (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Common Poorwill (*Phalaenoptilus nuttallii*). Fairly common summer resident in arid habitats. Mapped as a permanent resident by Howell and Webb (1995).
- White-throated Swift (*Aeronautes saxatalis*). Rare summer resident in urban parks: only two records from El Chamizal (IMC). It probably breeds in hills near Samalayuca and in the Sierra de Juárez (Navarro-Sigüenza and Peterson 2007). Howell and Webb (1995) did not map the species in Juárez Municipality, but Peterson and

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- Zimmer (1998) and Lockwood and Freeman (2014) recorded it as a regular breeding resident in west Texas and adjacent regions.
- Black-chinned Hummingbird (*Archilochus alexandri*). Uncommon summer resident in desert scrub and agricultural fields, found in small numbers at El Bocán, Trepachanga, Zaragoza, and Loma Blanca. Common summer resident in urban parks.
- Broad-tailed Hummingbird (*Selasphorus platycercus*). Uncommon transient. Recorded only at El Bocán (flying low to fairly high over desert scrub in May and August–September) and Loma Blanca (IMC).
- Rufous Hummingbird (*Selasphorus rufus*). Rare migrant in agricultural fields of Loma Blanca. Fairly common fall migrant in urban parks.
- Belted Kingfisher (*Megaceryle alcyon*). Winter visitor, uncommon in urban parks, rare at Ojo de la Punta (IMC).
- Williamson's Sapsucker (*Sphyrapicus thyroideus*). Rare winter visitor. One sighting of a male at El Chamizal on 30 December 2012: mostly black with long white shoulder patch, white rump, white facial stripes, and yellow belly (IMC). This species was not mapped in Juárez Municipality by Howell and Webb (1995), but it has been noted as an irregular winter visitor in west Texas and adjacent regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Yellow-bellied Sapsucker (*Sphyrapicus varius*). Rare winter visitor. One record at El Chamizal, 1 January 2015 (IMC). Neither Howell and Webb (1995) nor Navarro-Sigüenza and Peterson (2007) mapped this species in northern Chihuahua, but Peterson and Zimmer (1998) and Lockwood and Freeman (2014) considered it a rare winter visitor in west Texas and adjacent regions.
- Red-naped Sapsucker (*Sphyrapicus nuchalis*). Winter visitor, uncommon in urban parks, rare in desert scrub (Ojo de la Punta, IMC).
- Downy Woodpecker (*Picoides pubescens*). Rare winter visitor to urban parks: NVN saw one at El Chamizal on 1 January and 13 February 2008. Field identification was based on black wings with white spots, white back (broad white stripe down the center), top of head black, white supercilium, black eyestripe, white malar stripe, black tail, size more or less similar to a Ladder-backed Woodpecker's, moving more acrobatically than other woodpeckers. This is the first record of the Downy Woodpecker for Chihuahua or anywhere in Mexico away from extreme northwestern Baja California (Erickson et al. 2001). The species is a very rare winter visitor in El Paso, with about eight or ten total records (Peterson and Zimmer 1998, Lockwood and Freeman 2014, B. Zimmer in litt., 2014).
- Ladder-backed Woodpecker (*Picoides scalaris*). Widespread permanent resident.
- Northern Flicker (*Colaptes auratus*). Common winter visitor to urban parks, but uncommon in desert scrub and agricultural fields (IMC, HGdS). This species was not mapped in Juárez Municipality by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007), but it is a regular winter visitor in west Texas and adjacent regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014). In addition, it breeds at El Paso in small numbers (Peterson and Zimmer 1998).
- American Kestrel (*Falco sparverius*). Fairly common permanent resident, seen in small numbers in desert scrub, grasslands, agricultural fields, and urban parks.
- Merlin (*Falco columbarius*). Rare in desert scrub and uncommon winter visitor in urban parks.
- Peregrine Falcon (*Falco peregrinus*). Rare transient in agricultural fields with only one seen, at Loma Blanca on 19 July 2014 (IMC). Howell and Webb (1995) mapped the species as a permanent resident in northern Chihuahua; Peterson and Zimmer (1998) and Lockwood and Freeman (2014) it considered an uncommon to rare migrant and a localized breeder around El Paso. "Threatened."
- Prairie Falcon (*Falco mexicanus*). Rare winter visitor in desert scrub and agricultural fields with one record from El Bocán 7–8 February 1998 (HGdS), one record from

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- Puerta Juárez, and three records from Loma Blanca (IMC). Mapped as a permanent resident in Juárez Municipality by Howell and Webb (1995). “Threatened.” Olive-sided Flycatcher (*Contopus cooperi*). Transient, uncommon in desert scrub (Ojo de la Punta) and agricultural fields (Loma Blanca); common in urban parks.
- Western Wood-Pewee (*Contopus sordidulus*). Common transient in desert scrub, grasslands, agricultural fields, and urban parks.
- Willow Flycatcher (*Empidonax traillii*). Uncommon transient in urban parks (somewhat more numerous in the fall).
- Least Flycatcher (*Empidonax minimus*). Rare migrant in desert scrub and urban parks with single birds at El Bocán on 1 May and 16 August 1997 (HGdS) and at Club Campestre on 21 May 2014 and the unusually early date of 30 March–1 April 2015 (IMC). Rare to casual migrant in adjacent parts of Texas (Peterson and Zimmer 1998, Lockwood and Freeman 2014), but B. Zimmer (in litt., 2014) considers it rare to uncommon.
- Hammond’s Flycatcher (*Empidonax hammondii*). Rare migrant in desert scrub; uncommon migrant in urban parks.
- Gray Flycatcher (*Empidonax wrightii*). Uncommon transient. Found in small numbers in grasslands, agricultural fields and urban parks, more commonly in desert scrub (as expected for the species; Rowland 2009).
- Dusky Flycatcher (*Empidonax oberholseri*). Fairly common migrant in urban parks.
- Cordilleran Flycatcher (*Empidonax occidentalis*). Fairly common transient in desert scrub (Trepachanga) and urban parks.
- Black Phoebe (*Sayornis nigricans*). Fairly common permanent resident in urban parks; seen in moderate numbers during winter. Uncommon at Loma Blanca.
- Eastern Phoebe (*Sayornis phoebe*). Rare winter visitor in urban parks with only two records from Parque Central in winter 2012 (IMC).
- Say’s Phoebe (*Sayornis saya*). Fairly common permanent resident in desert scrub, grasslands, agricultural lands, and urban parks. Usually more common in winter and spring.
- Vermilion Flycatcher (*Pyrocephalus rubinus*). Rare winter visitor in urban parks, desert scrub, and agricultural fields: one seen at Club Campestre on 13 March 2014, one at Ojo de la Punta on 4 July 2014, and one female at Loma Blanca on 8 December 2014 (IMC). Mapped as a permanent resident by Howell and Webb (1995). It does not breed around El Paso, being found only as a rare winter visitor and migrant (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Ash-throated Flycatcher (*Myiarchus cinerascens*). Fairly common summer resident, seen in moderate numbers in desert scrub and grasslands, in small numbers in urban parks. One summer record from agricultural fields at Zaragoza, 20 June 2013 (IMC).
- Cassin’s Kingbird (*Tyrannus vociferans*). Fairly common transient. Found in small numbers in desert scrub, agricultural fields, and urban parks. Howell and Webb (1995) and Navarro-Sigüenza and Peterson (2007) mapped the species as a summer resident in northern Chihuahua. It is basically just a migrant in El Paso County (Peterson and Zimmer 1998) with a single breeding record about 25 years ago. It does breed in eastern Hudspeth County, just east of El Paso County (Lockwood and Freeman 2014).
- Western Kingbird (*Tyrannus verticalis*). Common summer resident. Numerous in all habitats.
- Loggerhead Shrike (*Lanius ludovicianus*). Common permanent resident in desert scrub and grasslands throughout Juárez Municipality. Rare in urban parks with only one seen at Club Campestre on 12 September 2014 and 6 March 2015 (IMC).
- Bell’s Vireo (*Vireo bellii*). Uncommon summer resident in urban parks: recorded only at El Chamizal and Club Campestre in small numbers (IMC). Rare at Ojo de la Punta (IMC). The species breeds regularly along the Rio Grande (Peterson and Zimmer 1998).

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- Plumbeous Vireo (*Vireo plumbeus*). Fairly common transient in urban parks (IMC) with one record in desert scrub (El Bocán, 29 April 1997, HGdS).
- Cassin's Vireo (*Vireo cassinii*). Rare transient with one record at Club Campestre, 19 May 2015 (IMC). The species is uncommon to rare transient in El Paso County, Texas (Lockwood and Freeman 2014).
- Blue-headed Vireo (*Vireo solitarius*). Rare winter visitor. The first recorded for the state of Chihuahua, an adult was seen in good light conditions in a mixed-species flock containing Ruby-crowned Kinglets and Audubon's Warblers at Club Campestre on 1 February 2014 (IMC; Figure 5). Another (returning?) was at the same site on 6 January 2015 (IMC). Field identification was based on the blue-gray head contrasting strongly with green back and white throat; crisp contrast at the malar, bold white spectacles, greenish yellow wash on flanks and undertail; belly white and bold wingbars (Heindel 1996, M. Heindel in litt., 2014). Additionally, this record coincided with the largest incursion of the Blue-headed Vireo ever recorded in Trans-Pecos Texas (at least five documented between 15 December 2013 and 27 February 2014; Texas Ornithological Society, Trans-Pecos winter report December 2013–February 2014, <http://www.texasbirds.org/>); Peterson and Zimmer (1998) and Lockwood and Freeman (2014) considered it a “casual winter visitor” there.
- Warbling Vireo (*Vireo gilvus*). Rare migrant in desert scrub, recorded only at El Bocán on 15 August 1997 (HGdS), at Trepachanga on 18 May 2014, and at Ojo de la Punta on 12 May 2015 (IMC). Fairly common migrant in urban parks (IMC).
- Stellar's Jay (*Cyanocitta stelleri*). Probably a rare winter visitor, though possibly common during invasion years. Recorded in flocks of up to eight in urban parks from mid-December 2013 to mid-April 2014 (IMC). These records coincided with an invasion of the lowlands of Trans-Pecos Texas in the same winter (Texas Ornithological Society, Trans-Pecos winter report December 2013–February 2014, <http://www.texasbirds.org/>). This species was not mapped in Juárez Municipality by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007), but Peterson and Zimmer (1998) and Lockwood and Freeman (2014) considered it a very irregular winter visitor in west Texas. Invasions occur on the average about once every five years as birds move down out of the mountains in search of food around El Paso (Peterson and Zimmer 1998, B. Zimmer in litt., 2014).
- American Crow (*Corvus brachyrhynchos*). Common winter visitor in agricultural fields, where found in high numbers from winter to early spring at Loma Blanca and Zaragoza (IMC; Figure 6). Two records for urban parks: two at El Chamizal on 1 January 2015; three at Club Campestre on 1 April 2015 (IMC). Not mapped in Chihuahua by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007). The only previous Chihuahua records are from near Galeana, ~210 km southwest of Ciudad Juárez, of 25 on 14 February 1986 and 35 on 7 February 1987 (Hubbard 1987); Howell and Webb (1995) believed these to require verification. Our records represent the first photographic evidence of the American Crow in Chihuahua. At least for the past four decades, it has been a regular winter visitor in west Texas and adjacent regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Chihuahuan Raven (*Corvus cryptoleucus*). Common permanent resident. Found in moderate numbers in arid habitats. Uncommon in agricultural fields of Loma Blanca.
- Tree Swallow (*Tachycineta bicolor*). Fairly common transient, recorded only in moderate numbers in urban parks and agricultural fields (IMC, ATV).
- Violet-green Swallow (*Tachycineta thalassina*). Uncommon summer resident in urban parks.
- Northern Rough-winged Swallow (*Stelgidopteryx serripennis*). Fairly common summer resident. Usually encountered in high numbers from early March to late September (IMC). Uncommon summer resident at Ojo de la Punta (IMC). One record in agricultural fields (20 June 2013, Zaragoza, IMC). Howell and Webb (1995)

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- mapped this species as a transient in Chihuahua, but its nesting has been confirmed in northwestern Chihuahua (Gómez de Silva 2003b). In west Texas, it is a regular summer resident (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Bank Swallow (*Riparia riparia*). Recorded only as a fairly common transient in agricultural lands of Loma Blanca (IMC).
- Cliff Swallow (*Petrochelidon pyrrhonota*). Fairly common summer resident. Found in moderate numbers in urban parks and agricultural fields (IMC).
- Cave Swallow (*Petrochelidon fulva*). Fairly common summer resident. Found in moderate numbers in urban parks and agricultural fields and seen in small groups in desert scrub (IMC). This species was not mapped in Juárez Municipality by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007), but it has become a regular summer resident in west Texas and adjacent regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014). First found in the El Paso area in 1983, the Cave Swallow quickly increased and became the second most common swallow after the Barn Swallow (Peterson and Zimmer 1998). Additionally, the Cave Swallow is now wintering in small numbers almost every year around Rio Bosque (B. Zimmer in litt., 2014).
- Barn Swallow (*Hirundo rustica*). Widespread summer resident in the municipality.
- Verdin (*Auriparus flaviceps*). Common permanent resident. Found in small numbers in desert scrub, grasslands, and agricultural lands. Rare in urban parks (IMC).
- Red-breasted Nuthatch (*Sitta canadensis*). Irregularly fairly common winter visitor, less frequent in late spring during surveys 2012–2015. Found in moderate numbers in fall and winter in urban parks, but numbers large in some years, nearly absent in others. Seen in low numbers at El Chamizal in winter 2007–2008 (NVN). A notable early record, the species' distinctive call was heard at Club Campestre on 8 August 2013 (IMC), presumably related to the "massive" invasion of Trans-Pecos Texas from fall 2012 to spring 2013 (Lockwood et al. 2013a, b). There are only a handful of previous Chihuahua records (Gómez de Silva 2005a, Moreno-Contreras et al. 2012, M. Bujanda in litt., 2014) and most recently records of two at the Ejido Large Parrot Reserve by W. H. Howe on 13 September 2012 (Gómez de Silva et al. 2013), and in extreme northwestern Chihuahua by Amy McAndrews and Jorge Montejo on 21 August 2014 (eBird). This species was not mapped in Chihuahua or adjacent states by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007), but it is an irregular winter visitor in west Texas (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- White-breasted Nuthatch (*Sitta carolinensis*). Rare winter visitor to urban parks: single birds seen at El Chamizal on 1 and 16 January 2008 (NVN). This species was not mapped in Juárez Municipality by Howell and Webb (1995), Peterson and Zimmer (1998) and Lockwood and Freeman (2014) considered it a rare and very irregular winter visitor around El Paso.
- Brown Creeper (*Certhia americana*). Rare winter visitor in urban parks: two records, of single birds at Club Campestre on 9 March 2013 and at El Chamizal on 22 February 2015 (IMC, ATV). This species was not mapped in Juárez Municipality by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007), but it has become an irregular winter visitor in west Texas (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Rock Wren (*Salpinctes obsoletus*). Common permanent resident, recorded in high numbers in arid habitats.
- Canyon Wren (*Catherpes mexicanus*). Fairly common permanent resident, recorded in moderate numbers in arid habitats.
- House Wren (*Troglodytes aedon*). Uncommon winter visitor. Seen generally in small numbers in desert scrub and urban parks. At times a common migrant in the El Paso area (Peterson and Zimmer 1998).
- Marsh Wren (*Cistothorus palustris*). Uncommon but very local winter visitor in agri-

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cultural lands of Juárez Municipality. Three to five noisy birds were along the Rio Grande at Loma Blanca on 8 and 11 December 2014 (IMC). The lack of records is attributable to the species' reclusiveness and choice of cattails or other dense marsh vegetation (Howell and Webb 1995).

Bewick's Wren (*Thryomanes bewickii*). Fairly common winter visitor. Seen in moderate numbers in arid habitats but absent in summer. Mapped as a permanent resident by Howell and Webb (1995). In Trans-Pecos Texas, a winter visitor away from oak-juniper woodlands (Peterson and Zimmer 1998). Nested a few times in the Franklin Mountains of El Paso in the 1980s, but basically absent in summer there for the past 20 years (B. Zimmer in litt., 2014).

Cactus Wren (*Campylorhynchus brunneicapillus*). Common permanent resident in arid habitats.

Blue-gray Gnatcatcher (*Polioptila caerulea*). Uncommon winter visitor in brushy vegetation, where found in moderate numbers.

Black-tailed Gnatcatcher (*Polioptila melanura*). Fairly common permanent resident.

Seen generally in brushy habitats, but in very small numbers. Apparently the freeze of February 2011 decimated Black-tailed Gnatcatcher populations in the Juárez–El Paso region (Texas Ornithological Society, Trans-Pecos winter report December 2011–February 2012, <http://www.texasbirds.org/>).

Ruby-crowned Kinglet (*Regulus calendula*). Common winter visitor. Numerous in desert scrub, agricultural lands, and urban parks.

Eastern Bluebird (*Sialia sialis*). Rare winter visitor. A flock of about six was at El Chamizal in January and February 2015. The species was mapped in northern Chihuahua by neither Howell and Webb (1995) nor Navarro-Sigüenza and Peterson (2007). It is a rare and somewhat irregular winter visitor in El Paso County, Texas (Peterson and Zimmer 1998, Lockwood and Freeman 2014).

Western Bluebird (*Sialia mexicana*). Common but irregular winter visitor, in desert scrub and urban parks. It is uncommon and irregular around El Paso (Peterson and Zimmer 1998, Lockwood and Freeman 2014).

Mountain Bluebird (*Sialia currucoides*). Uncommon and very irregular winter visitor. Recorded in high numbers in desert scrub in the winter of 2013 only (IMC).

Swainson's Thrush (*Catharus ustulatus*). Rare transient. One record at Loma Blanca on 5 May 2015 (IMC). The species is a rare migrant in El Paso County, Texas (Lockwood and Freeman 2014).

Hermit Thrush (*Catharus guttatus*). Fairly common winter visitor near foothills.

Uncommon winter visitor in urban parks (IMC). Occasional at Ojo de la Punta (IMC).

American Robin (*Turdus migratorius*). Common resident breeder in agricultural lands and urban parks. Recorded during the entire 2012–2015 study period in moderate numbers but much less common in summer (IMC). Howell and Webb (1995) mapped this species as a winter visitor in Chihuahua, but it has become a regular breeding resident in west Texas and adjacent regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014). In El Paso, it is an uncommon breeder in much of the city, becoming common only in the country club area of western El Paso where large trees are numerous (Peterson and Zimmer 1998).

Curve-billed Thrasher (*Toxostoma curvirostre*). Uncommon permanent resident, recorded in desert scrub in low numbers.

Crissal Thrasher (*Toxostoma crissale*). Fairly common permanent resident. Found in moderate numbers in desert scrub.

Sage Thrasher (*Oreoscoptes montanus*). Uncommon winter visitor. Recorded irregularly in desert scrub (IMC). One at El Bocán on 17 August 1997 was unusually early (HGdS).

Northern Mockingbird (*Mimus polyglottos*). Common permanent resident throughout the municipality but less numerous in winter.

European Starling (*Sturnus vulgaris*). Common permanent resident in urban parks.

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- Fairly common permanent resident in the town of Samalayuca and surrounding desert scrub (IMC). Rare permanent resident in agricultural fields of Loma Blanca.
- American Pipit (*Anthus rubescens*). Common winter visitor in agricultural fields, but in high numbers only at Loma Blanca.
- Cedar Waxwing (*Bombycilla cedrorum*). Fairly common winter visitor in urban parks but numbers fluctuate from one winter to the next.
- Phainopepla (*Phainopepla nitens*). Locally fairly common permanent resident at Club Campestre (IMC, ATV). Seen rarely at El Bocán (HGdS), Zaragoza, and El Chamizal (IMC).
- Northern Waterthrush (*Parkesia noveboracensis*). Rare transient in urban parks: seen only at Club Campestre (fall).
- Black-and-white Warbler (*Mniotilta varia*). Rare transient in urban parks, where a female was at Club Campestre on 14 September 2013 (IMC).
- Orange-crowned Warbler (*Oreothlypis celata*). Uncommon winter visitor to agricultural fields and urban parks. Found in moderate numbers in fall, less numerous in winter and spring (IMC). Howell and Webb (1995) mapped this species as a migrant in Chihuahua, but it has become a regular sparse winter visitor in west Texas, where it is also a common migrant (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Lucy's Warbler (*Oreothlypis luciae*). Rare summer resident in desert scrub: four males were vocalizing at Ojo de la Punta, Samalayuca, on 24 March, 1 and 12 May 2015 (IMC). The species was not mapped in Juárez Municipality by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007), though the former described it as a fairly common summer resident in northwestern Chihuahua and a fairly common winter visitor in the southwestern portion of the state. In western Texas, Lucy's Warbler is a rare to locally uncommon summer resident in mesquite woodlands along the Rio Grande from southern Hudspeth County to western Brewster County; in El Paso County it is principally a rare migrant but increasing as a summer visitor (Peterson and Zimmer 1998, Lockwood and Freeman 2014). It nests occasionally in Sierra County, New Mexico (B. Zimmer in litt., 2015).
- Nashville Warbler (*Oreothlypis ruficapilla*). Seen only as a rare migrant at Club Campestre on 18 April 2014 (IMC).
- Virginia's Warbler (*Oreothlypis virginiae*). Uncommon transient. Seen in urban parks in small numbers (spring and fall). Rare migrant in desert scrub (Ojo de la Punta, IMC).
- MacGillivray's Warbler (*Geothlypis tolmiei*). Fairly common migrant in desert scrub, agricultural fields, and urban parks.
- Common Yellowthroat (*Geothlypis trichas*). Fairly common summer resident in agricultural fields of Loma Blanca and uncommon summer resident in urban parks. Mapped as a permanent resident by Howell and Webb (1995). In addition, it is a fairly common summer resident and a rare but regular winter visitor around El Paso (Peterson and Zimmer 1998).
- Hooded Warbler (*Setophaga citrina*). Rare migrant: one sighting of an adult male at Club Campestre on 25 April 2014 (IMC). The identification was based on the black hood, rest of underparts yellow, and upperparts yellow-olive with white tail spots. There is only previous Chihuahua record of the Hooded Warbler, from Mesa de las Guacamayas, Janos Municipality (Gómez de Silva 2007b), but there have been about 6–10 records for the El Paso area in the last 35 years (B. Zimmer in litt., 2014).
- American Redstart (*Setophaga ruticilla*). Rare migrant with one record from agricultural fields at Zaragoza on 25 September 2014 (IMC).
- Yellow Warbler (*Setophaga petechia*). Uncommon migrant to agricultural fields of Loma Blanca. Rarely observed at Ojo de la Punta (IMC). Common migrant in urban parks, where found in moderate numbers in spring and fall (IMC). Howell

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and Webb (1995) mapped the species as a summer resident in Juárez Municipality, but it is now extirpated as a breeding species from nearby Texas (Lockwood and Freeman 2014).

**Pine Warbler (*Setophaga pinus*).** First state record for Chihuahua. A bright male was observed and photographed in good light high in Afghan pines and elms at Club Campestre, from 6 to 24 January 2015 (IMC; Figure 7). Field identification was based on underparts yellow except for whitish belly and undertail coverts and blurry streaks on side of breast, two white bars on gray wings, fairly long bill, stout appearance, and “tchik” call (Howell and Webb 1995). The species was not mapped in Chihuahua or adjacent states by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007). The former considered it to be an uncommon to rare (perhaps irregular) winter visitor to northeastern Mexico. Elsewhere in Mexico, this species has been recorded occasionally in the Yucatan (MacKinnon et al. 2011) and Baja California peninsulas (Erickson et al. 2013). The Pine Warbler is a casual winter visitor to El Paso County, Texas (Lockwood and Freeman 2014).

**Myrtle Warbler (*Setophaga coronata*).** Uncommon winter visitor to urban parks.

**Audubon’s Warbler (*Setophaga auduboni*).** Common winter visitor throughout the municipality.

**Grace’s Warbler (*Setophaga graciae*).** Rare migrant with one spring record: IMC saw one at close range in a grove of small pines with a mixed-species flock at Club Campestre on 18 April 2014 (Figure 8). The following characters were noted: short yellow supercilium, subocular crescent, yellow throat and chest, gray back, two white wing bars, and dark streaks on sides. This species was not mapped for the lowlands of Chihuahua by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007). Grace’s Warbler is rarely seen during migration in west Texas (Peterson and Zimmer 1998, Lockwood and Freeman 2014) but nests just 64 km to the north in the Organ Mountains near Las Cruces, Doña Ana County, New Mexico (B. Zimmer in litt., 2014).

**Black-throated Gray Warbler (*Setophaga nigrescens*).** Fairly common migrant in urban parks but rare in desert scrub.

**Townsend’s Warbler (*Setophaga townsendi*).** Fairly common migrant in urban parks; less common in desert scrub.

**Wilson’s Warbler (*Cardellina pusilla*).** Common migrant in urban parks (numerous in both spring and fall), desert scrub, grasslands, and agricultural lands. One unseasonal summer record, of a male at Club Campestre on 4 July 2014 (IMC).

**Yellow-breasted Chat (*Icteria virens*).** Uncommon summer resident along the Río Grande floodplain near the agricultural lands of Loma Blanca. Observed rarely at Club Campestre (IMC).

**Green-tailed Towhee (*Pipilo chlorurus*).** Fairly common winter visitor. Found in small numbers in desert scrub. Observed occasionally at Club Campestre (IMC).

**Spotted Towhee (*Pipilo maculatus*).** Fairly common winter visitor, occurring in small numbers in desert scrub.

**Rufous-crowned Sparrow (*Aimophila ruficeps*).** Rare and very local permanent resident in desert scrub; it has probably been overlooked in Juárez Municipality. Two sightings, from Trepachanga (foothills and rocky hillsides of the Sierra de Juárez), of about three on 25 January 2014 and two on 17 December 2014 (IMC). This species was not mapped in Juárez Municipality by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007), but it is a regular breeding resident in west Texas (Peterson and Zimmer 1998, Lockwood and Freeman 2014) and in mountainous regions of Chihuahua.

**Canyon Towhee (*Melospiza fusca*).** Fairly common permanent resident in desert scrub. Uncommon in agricultural lands of Zaragoza and Loma Blanca; rare in urban parks (El Chamizal).

**Cassin’s Sparrow (*Peucaea cassinii*).** Uncommon summer resident in desert scrub:

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- recorded only at Puerta Juárez from March to early September. Mapped as a permanent resident by Howell and Webb (1995). In El Paso County, a fairly common summer resident with a few mid-winter records (Peterson and Zimmer 1998).
- Chipping Sparrow (*Spizella passerina*). Common winter visitor. Found in moderate numbers in desert scrub, grasslands, and agricultural fields. Numerous in urban parks during spring.
- Clay-colored Sparrow (*Spizella pallida*). Fairly common migrant. Found in small numbers in desert scrub; numerous in agricultural fields.
- Brewer's Sparrow (*Spizella breweri*). Common winter visitor in desert scrub and grasslands.
- Black-chinned Sparrow (*Spizella atrogularis*). Uncommon winter visitor in desert scrub. One record from El Chamizal.
- Vesper Sparrow (*Poocetes gramineus*). Uncommon winter visitor to desert scrub, grasslands, and agricultural fields (Loma Blanca).
- Lark Sparrow (*Chondestes grammacus*). Uncommon migrant. Usually seen in moderate numbers in desert scrub from mid-August to September (IMC). Uncommon in urban parks. This species was mapped as a breeding resident in Chihuahua (Howell and Webb 1995), but around El Paso it is noted only as a regular migrant and summer resident (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Black-throated Sparrow (*Amphispiza bilineata*). Common permanent resident. Frequently seen in desert scrub and grasslands.
- Sagebrush Sparrow (*Artemisospiza nevadensis*). Uncommon and local winter visitor to desert scrub and grasslands.
- Lark Bunting (*Calamospiza melanocorys*). Common winter visitor to desert scrub, agricultural fields, and grasslands.
- Savannah Sparrow (*Passerculus sandwichensis*). Common winter visitor. Found in moderate numbers in desert scrub, grasslands, and agricultural fields.
- Grasshopper Sparrow (*Ammodramus savannarum*). Rare transient in urban parks: one record of two birds at Club Campestre on 30 March 2015 (IMC). Mapped as a winter visitor in northern Chihuahua (Howell and Webb 1995). The species is an uncommon to casual migrant and winter visitor to Trans-Pecos Texas (Peterson and Zimmer 1998).
- Song Sparrow (*Melospiza melodia*). Uncommon winter visitor throughout the municipality.
- Lincoln's Sparrow (*Melospiza lincolni*). Common winter visitor throughout the municipality.
- Swamp Sparrow (*Melospiza georgiana*). Uncommon winter visitor in agricultural fields, but perhaps overlooked in Juárez Municipality. Two individuals seen and photographed along the Río Grande at Loma Blanca on 8 and 11 December 2014 (IMC).
- White-crowned Sparrow (*Zonotrichia leucophrys*). Common winter visitor throughout the municipality.
- Dark-eyed Junco (*Junco hyemalis*). Common winter visitor. Seen in moderate numbers in desert scrub, agricultural lands, and urban parks.
- Summer Tanager (*Piranga rubra*). Transient in desert scrub: one record at Ojo de la Punta, Samalayuca, on 12 May 2015 (IMC). The Summer Tanager is an uncommon and local summer resident in El Paso County, Texas (Peterson and Zimmer 1998, Lockwood and Freeman 2014). Possibly overlooked in the Juárez region.
- Western Tanager (*Piranga ludoviciana*). Common transient in desert scrub and urban parks.
- Northern Cardinal (*Cardinalis cardinalis*). Rare permanent resident in desert scrub with only two records from Puerta Juárez. One record from El Chamizal. The cardinal is a rare permanent resident in El Paso County, Texas (Peterson and Zimmer 1998).

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- Pyrrhuloxia (*Cardinalis sinuatus*). Common permanent resident in desert scrub. Uncommon permanent resident in grasslands, and rare in agricultural fields (Zaragoza, IMC).
- Rose-breasted Grosbeak (*Pheucticus ludovicianus*). First record for Chihuahua. Rare transient with one record in desert scrub at Ojo de la Punta on 12 May 2015 (IMC; Figure 9). Not mapped for interior Chihuahua (Howell and Webb 1995, Navarro-Sigüenza and Peterson 2007) and rare in Trans-Pecos Texas (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Black-headed Grosbeak (*Pheucticus melanocephalus*). Uncommon transient in agricultural lands of Loma Blanca, desert scrub, and urban parks (IMC). Howell and Webb (1995) mapped the species as a summer resident in northern Chihuahua, but it does not breed in the Juárez region. It is a fairly common to uncommon migrant in El Paso County, Texas (Peterson and Zimmer 1998).
- Blue Grosbeak (*Passerina caerulea*). Common summer resident. Found in small numbers in agricultural fields. Numerous in desert scrub and grasslands.
- Lazuli Bunting (*Passerina amoena*). Transient. Two records, of one at El Bocán, 19 August 1997 (HGdS), and a pair (male and female) at Ojo de la Punta, 1 May 2015 (IMC). The species is a fairly common migrant around El Paso (Peterson and Zimmer 1998, Lockwood and Freeman 2014), so it has probably been overlooked in Juárez Municipality.
- Painted Bunting (*Passerina ciris*). Rare transient. Two records: one at Loma Blanca on 10 August 2014; two at Club Campestre on 10 September 2014 (IMC). This species breeds in small numbers along the river southeast of El Paso and is an uncommon fall migrant in El Paso County generally (Peterson and Zimmer 1998). "Special protection."
- Dickcissel (*Spiza americana*). One record of migrants flying over El Bocán, 17–21 September 1997 (HGdS). There is only one previous Chihuahua record, of one collected in Ramos Municipality on 6 September 1948 (Miller et al. 1957), mapped by Howell and Webb (1995). Navarro-Sigüenza and Peterson (2007) did not map this species in Chihuahua. Uncommon to rare fall migrant in nearby Texas (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Red-winged Blackbird (*Agelaius phoeniceus*). Common permanent resident. It occurred throughout the 2012–2015 study period in high numbers in agricultural fields but in low numbers in urban parks (IMC). Uncommon permanent resident in desert scrub at Ojo de la Punta (IMC). This species was not mapped in Juárez Municipality by Howell and Webb (1995) or Navarro-Sigüenza and Peterson (2007) but is a regular breeding resident in west Texas and adjacent regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Eastern Meadowlark (*Sturnella magna*). Recorded only as a rare winter visitor in agricultural lands of Loma Blanca. Rare in El Paso in winter, and very uncommon and localized as a breeder (Peterson and Zimmer 1998, Lockwood and Freeman 2014). Mapped as a permanent resident in Juárez Municipality by Howell and Webb (1995). Possibly the species does breed locally in grasslands south of Juárez Municipality.
- Western Meadowlark (*Sturnella neglecta*). Fairly common permanent resident in desert scrub (Puerta Juárez) and agricultural lands (Loma Blanca).
- Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*). Fairly common winter visitor. Found in high numbers in agricultural lands and urban parks. Uncommon winter visitor at Ojo de la Punta, though it can be a fairly common winter visitor in the nearby town of Samalayuca.
- Brewer's Blackbird (*Euphagus cyanocephalus*). Fairly common winter visitor. Found in high numbers in agricultural lands and urban parks.
- Great-tailed Grackle (*Quiscalus mexicanus*). Common permanent resident in urban parks and agricultural fields. Uncommon in desert scrub.

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- Bronzed Cowbird (*Molothrus aeneus*). Uncommon summer resident in agricultural fields.
- Brown-headed Cowbird (*Molothrus ater*). Fairly common summer resident in the agricultural lands. Uncommon in urban parks where seen in small numbers. At El Paso a common summer resident but also present in small numbers locally in winter, especially around horse stables (Peterson and Zimmer 1998). Mapped as a permanent resident by Howell and Webb (1995).
- Bullock's Oriole (*Icterus bullockii*). Fairly common summer resident in desert scrub, agricultural fields, and urban parks.
- Scott's Oriole (*Icterus parisorum*). Fairly common summer resident in desert scrub.
- House Finch (*Haemorhous mexicanus*). Common permanent resident throughout.
- Red Crossbill (*Loxia curvirostra*). Irregular winter visitor to urban parks. In 2007 and 2008, recorded in low numbers at El Chamizal (NVN). From 2012 to 2015 recorded only in late March 2013 at Club Campestre (IMC, ATV). These records coincided with the "massive" invasion of Trans-Pecos Texas from fall 2012 to spring 2013 (Lockwood et al. 2013a, b). This species was mapped in Juárez Municipality by neither Howell and Webb (1995) nor Navarro-Sigüenza and Peterson (2007) but is an irregular winter visitor in west Texas and adjacent regions (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- Pine Siskin (*Spinus pinus*). Fairly common winter visitor to desert scrub and urban parks.
- Lesser Goldfinch (*Spinus psaltria*). Fairly common permanent resident. Recorded in small groups in desert scrub, agricultural fields, and urban parks. Scarce in mid-summer, being a very localized breeder in El Paso County (Peterson and Zimmer 1998).
- American Goldfinch (*Spinus tristis*). Rare winter visitor in urban parks with three individuals at Club Campestre on 24 March 2013 and one on 2 January 2014 (IMC, ATV). There are a few records for northwestern Chihuahua (Dieni et al. 2003). This species was mapped in Chihuahua by neither Howell and Webb (1995) nor Navarro-Sigüenza and Peterson (2007) but it is a regular winter visitor in west Texas (Peterson and Zimmer 1998, Lockwood and Freeman 2014).
- House Sparrow (*Passer domesticus*). Abundant permanent resident.

## DISCUSSION

The 221 species recorded in our study constitute 68% of the species recorded from Chihuahua (CONABIO 2014) and 19% of the Mexican avifauna (Navarro-Sigüenza et al. 2013). Our records reveal several discrepancies with range maps and seasonality information provided by Howell and Webb (1995) and with range maps by Navarro-Sigüenza and Peterson (2007). For example, 31 species we recorded were not mapped at all in this part of Chihuahua by Howell and Webb (1995): the Hooded Merganser, Western Grebe, Neotropic Cormorant, Double-crested Cormorant, White-tailed Kite, Mississippi Kite, Common Black Hawk, Harris's Hawk, White-throated Swift, Williamson's Sapsucker, Yellow-bellied Sapsucker, Downy Woodpecker, Northern Flicker, Blue-headed Vireo, Steller's Jay, American Crow, Cave Swallow, Red-breasted Nuthatch, White-breasted Nuthatch, Brown Creeper, Eastern Bluebird, Lucy's Warbler, Hooded Warbler, Pine Warbler, Grace's Warbler, Rufous-crowned Sparrow, Rose-breasted Grosbeak, Dickcissel, Red-winged Blackbird, Red Crossbill, and American Goldfinch. Neither were 27 of these (all of the above except Harris's Hawk, White-throated Swift, Williamson's Sapsucker, and White-breasted Nuthatch) mapped in

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this area by Navarro-Sigüenza and Peterson (2007). These species were simply missed because the area is poorly known, or because the species' range is expanding, as in the cases of the Neotropic Cormorant, Eurasian Collared-Dove, Cave Swallow, and American Crow.

We found the seasonality of several additional species different from that indicated by Howell and Webb (1995). Several herons listed as winter visitors are now established as breeding residents, whereas other species previously mentioned as permanent residents are only migrants or winter visitors in the Juárez–El Paso region. On the other hand, our records are highly consistent with published literature on the avifauna of west Texas (Peterson and Zimmer 1998, Lockwood and Freeman 2014). The adjacent regions of Texas have received relatively intense study for many decades, and the habitats are similar, particularly in the westernmost counties of El Paso and Hudspeth.

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