Western Specialty: White-tailed Ptarmigan

Photo by Cole J. Wolf of Albuquerque, New Mexico:
Female White-tailed Ptarmigan (Lagopus leucura) in mid-summer plumage, Santa Barbara Ridge near Jicarita Peak, Taos County, New Mexico, 4 August 2012. This locale, west of Holman, Mora County, is a consistently reliable area for this species. In 1981, 43 White-tailed Ptarmigan from Colorado were translocated to this area of New Mexico to augment a native population whose status was tenuous. After 33 years, the translocation still appears successful, as detailed in this issue of Western Birds by Clait E. Braun and Sartor O. Williams III (pp. 233–243).
Avifauna of Juárez Municipality, Chihuahua, Mexico
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Front cover photo by © Rachel Hopper of Fort Collins, Colorado: Colorado’s first Sandwich Tern (Thalasseus sandvicensis) at Manitou Lake, Teller Co., 28–30 June 2013, apparently unrelated to any storm.

Back cover: “Featured Photos” by © Steve Zamek of Los Altos, California: Nest of a Mountain Bluebird (Sialia currucoides) near Prosser Creek Reservoir, Nevada Co., California—and a Pygmy Nuthatch (Sitta pygmaea) that fed the nestling bluebirds repeatedly.
AVIFAUNA OF JUÁREZ MUNICIPALITY, CHIHUAHUA, MEXICO

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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).
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 km² (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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### Table 1
Sites of Bird Surveys in Juárez Municipality, Chihuahua, Mexico

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

*a* Numbered as in Figure 1.

*b* Ds, desert scrub; Gr, grasslands; Af, agricultural fields; Up, urban parks.
(Prosopis glandulosa), lechugilla (Agave lechuguilla), 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 km² 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.
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 2. Mississippi Kite (*Ictinia mississippiensis*) at El Chamizal on 17 June 2013.  
*Photo by Israel Moreno-Contreras*

Figure 3. Zone-tailed Hawk (*Buteo albonotatus*) at El Chamizal on 25 March 2013.  
*Photo by Adrián Torres-Vivanco*
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” = ≤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
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 to 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.


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.
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.


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, Mevento 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 states.

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*

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*
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*
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).


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).


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-
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.”


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

**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*

**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*
(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).

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).


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.

Least Sandpiper (Calidris minutilla). Regular winter visitor, found in high numbers only at Loma Blanca.


Western Sandpiper (Calidris mauri). Uncommon transient in agricultural lands, seen only at Loma Blanca (spring and fall).

Wilson’s Phalarope (Phalaropus tricolor). Uncommon transient in urban parks.
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.

Barn Owl (*Tyto alba*). Uncommon permanent resident in desert scrub (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).


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...
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, Tre-pachanga, 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).


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.


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...
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).
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 an 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).

Steller’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)
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 Río 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.


Marsh Wren (*Cistothorus palustris*). Uncommon but very local winter visitor in agri-
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.


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


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.
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 numerously 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., 2014).

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
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 Rio Grande floodplain near the agricultural lands of Loma Blanca. Observed rarely 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 (Melozone 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 cassini). Uncommon summer resident in desert scrub:

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 (Pooecetes 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 (Artemisiospiza 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 lincolnii). 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 Rio 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.


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).
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).


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.”


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).


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.
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 a regular 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 midsummer, 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, Neotropical 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...
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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LITERATURE CITED


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ABSTRACT: Since 1985, 58 species have been added to the Colorado list, 49 confirmed as new to the state, 8 to reclassification of subspecies as species, and 1 to description of a new species (the Gunnison Sage-Grouse, Centrocercus minimus). The changes include discovery of a resident population of the Ruffed Grouse (Bonasa umbellus), transitory colonization of the Inca Dove (Columbina inca), marginal colonization of the Acorn Woodpecker (Melanerpes formicivorus), the Glossy Ibis (Plegadis falcinellus) becoming a regular spring migrant, massive colonization of the Eurasian Collared-Dove (Streptopelia decaocto), vagrancy of four species of Old World origin, and vagrancy of one species of Southern Hemisphere origin, the Kelp Gull (Larus dominicanus).

The Colorado Bird Records Committee (CBRC) last published a report in Western Birds in 1987 (Gent 1987). Since that time, its reports have been published exclusively within the journal published by the Colorado Field Ornithologists (C.F.O. Journal, Journal of the Colorado Field Ornithologists, and Colorado Birds). All of the CBRC’s reports can be downloaded from its website (www.coloradobirdrecords.org). This report summarizes species added to the Colorado list since publication of Gent (1987), including additions due to taxonomic revision.

The Colorado state list totaled 440 species at the end of 1985 (Gent 1987). This report discusses 58 additions to the Colorado list (8 due to taxonomic splits), as well as four additional species that could have represented changes to the list. All species on the 1985 list remain on the current list. Thus, as of review of all documentation through 2013, the Colorado state list stood at 498 species. Per CBRC bylaws, all accepted first state records received a 7–0 or 6–1 vote to accept (up to three rounds of voting) and were based on physical evidence (e.g., photo, audio recording, specimen) or written documentation from multiple observers. Single-observer records may be accepted provisionally until one of the aforementioned requirements is met for a subsequent occurrence, at which time the species is added to the state list (for an example, see the Common Ground-Dove). Basic information on all records evaluated can be retrieved from the CBRC website. The CBRC has had nine chairs from 1986 to 2013: Richard Bunn, Doug Faulkner, Peter Gent, Mark Janos, Tony Leukering, Bill Lisowsky, Duane Nelson, Bill Prather, and Larry Semo.

REPORT FORMAT

The initials of the contributing observer(s) and the record’s accession number are given for each first state record. The initials of the observer(s) who found the bird, if known, are italicized and presented first only if that person also contributed documentation; additional contributors follow in alphabetical order by last name. If the initial observer is known with certainty, but he or she did not submit documentation, those initials are italicized and presented last.
Observers submitting a photograph or video are indicated with a dagger (†), those who submitted video by (v), those who submitted audio spectrograms or recordings by (s), and those who submitted a sketch by (sk).

In this report, county names are italicized. The committee recognizes only those dates for which a bird was documented as dates of occurrence. The full span of dates for each record is given when possible; however, the seasonal summary reports in the Colorado Field Ornithologists’ quarterly journal are the primary source of those dates. Abbreviations used in the report: CBC, Christmas Bird Count; DMNS, Denver Museum of Nature and Science; NG, National Grassland; NM, National Monument; SP, State Park; SWA, State Wildlife Area.

SPECIES ADDED BECAUSE OF TAXONOMIC REVISIONS

All species added to the Colorado state list as a result of taxonomic splits by the American Ornithologists’ Union North American Classification Committee were supported by records accepted by the CBRC or had been recognized as regularly occurring in the state (Andrews and Righter 1992). Except where noted, these species are not on the CBRC’s main review list.

Cackling Goose (Branta hutchinsii). Split from the Canada Goose (B. canadensis) (Banks et al. 2004). The Canada Goose is a year-round resident in Colorado, supplemented by migrants and winter visitors; the Cackling Goose is a common migrant and winter resident on the eastern plains, particularly in the southeast.

Gunnison Sage-Grouse (Centrocercus minimus). Distinguished as a species distinct from the Greater Sage-Grouse (C. urophasianus) in 2000 (Young et al. 2000, AOU 2000). These species are allopatric year-round residents in sagebrush steppe in Colorado. The Gunnison Sage-Grouse is patchily distributed in southwestern Colorado from eastern Gunnison and north-central Saguache west to the Utah state line.

Mexican (Antrostomus arizonae) and Eastern (A. vociferus) Whip-poor-wills. Formerly considered a single species, the Whip-poor-will (Caprimulgus vociferus), of which Colorado had just four records in 1985. One of those four was of a singing individual of the Mexican subspecies arizonae near Colorado Springs, El Paso, July 1981, the other three of the eastern nominate vociferus. Subsequently split (Chesser et al. 2010), both species are accidental in Colorado and on the CBRC’s main review list. Currently, Colorado has two records of the Mexican and nine records of the Eastern. Colorado’s second recorded Mexican Whip-poor-will was a calling individual along Fosset Gulch Road, Archuleta, on 22 June 1999. Eight of the state’s nine records of the Eastern are from east of the Rocky Mountains; the other is of one tape-recorded along the Little Snake River, Moffat, on 21 May 1992. Six of the nine Eastern Whip-poor-will records are from 13 to 26 May, the remaining three spanning September.

Blue-headed (Vireo solitarius) and Cassin’s (V. cassinii) Vireos. Split from the Plumbeous Vireo (V. plumbeus), which breeds regularly in Colorado (AOU 1997). The Blue-headed Vireo was on the main review list through 2013, after which the CBRC removed it because of its annual occurrence in small numbers (Faulkner 2014). That species is primarily a fall migrant (40 records) from 1 September to 25 October in eastern Colorado. Colorado has just six spring records (five from 6 to 19 May; one for 16 June). Cassin’s Vireo is a regular fall migrant in small numbers statewide, except on the extreme eastern plains, but it is considerably rarer during spring migration.

Eastern Towhee (Pipilo erythrophthalmus). Formerly considered conspecific as the Rufous-sided Towhee (also P. erythrophthalmus), this species and the Spotted
Towhee (P. maculatus) were split in 1995 (AOU 1995). The two species’ hybrid zone in the Great Plains, particularly along the Platte River drainage, has been well established, with birds showing Eastern Towhee characteristics occurring into northeastern Colorado (Sibley and West 1959, Rising 1983a). The Spotted Towhee is a widespread breeding species in the state. The Eastern Towhee remains on the main review list in part because of the lack of regular breeding in Colorado and inherent difficulties presented by the Great Plains hybrid swarm. The CBRC does not accept records of any birds exhibiting even minor Spotted Towhee features. As of 2013, Colorado had 32 records from along the Front Range and eastern plains. Most records (22) are of fall migrants and wintering birds, presumably originating from somewhere north and/or east of Colorado.

Baltimore Oriole (Icterus galbula). In 1995, the AOU resplit this species and Bullock’s Oriole (I. bullockii), which it had merged in 1973. Like that of the towhees, the hybrid zone for these species on the Great Plains has been well studied (Rising 1983a, b). But, in contrast to the situation of the towhees, phenotypically pure Baltimore Orioles breed regularly in the eastern tier of Colorado counties—thus that species is not on the main review list. Bullock’s Oriole breeds widely in the state.

Black (Leucosticte atrata) and Gray-crowned (L. tephrocotis) Rosy-Finches. The AOU (1993) reversed its decision of 1983 and resplit these species from the Brown-capped Rosy-Finch (L. australis), which is nearly endemic to Colorado. During winter, all three species are found regularly in mixed flocks throughout the Rocky Mountains in Colorado.

SPECIES ADDED AS A RESULT OF DISTRIBUTIONAL RECORDS

Fulvous Whistling-Duck (Dendrocygna bicolor). Colorado’s only record is of one at a small pond near Kersey, Weld, 15 October 1990 (JHm, JCo; 8-90-14). The question of this bird’s origin was of some concern to the CBRC, but Nelson (1992) noted that acceptance of this record was based partially on the species’ “strong tendency to wander after the breeding season.”

Mottled Duck (Anas fulvigula). Bailey and Niedrach (1965) noted two specimens taken in Colorado: one near Loveland, Larimer, 6 November 1907, and an adult male at Timnath Reservoir, Larimer, 18 September 1962 (DMNS 353 and 33794, respectively). It was on the basis of these specimens that the Mottled Duck was originally placed on the Colorado list when the Colorado Bird Records Committee (then the CFO Official Records Committee) was formed in 1972. However, the species was removed from the state list (Andrews 1979) after John Hubbard examined these specimens and reidentified them as having Mallard (A. platyrhynchos) influence (Hubbard 1977). Colorado’s only accepted record is of a male photographed at Andrick Ponds SWA, Morgan, 28–30 June 2013 (SM†, RH; 2013-186); it exhibited the blue-green speculum of A. f. maculosa (Bellrose 1976).

Garganey (Anas querquedula). A male at Jackson Reservoir, Morgan, 26 April 1990 (PG, MJ, JB; 8-90-11), was the first Garganey reported in Colorado. This bird was also reported on the 27th, but the CBRC has no documentation in support of its occurrence on that date. This occurrence follows the strong pattern in much of the U.S. and Canada for this species to be found in spring (Howell et al. 2014). The only other Colorado record is also of a male found during spring migration, at Sombrero Pond, Boulder, 28 March 1992.

Tufted Duck (Aythya fuligula). The state’s first was a male at Cottonwood Marsh, Boulder, 21–23 Mar 1997 (MP, PG, MJ, TL; 1997-16). Colorado has since recorded three more Tufted Ducks: one each in March 2000, January 2011, and December 2011. The latter two may have been the same (returning) adult female,
but they were at locations 14 km apart, and the CBRC decided that distance was enough to warrant the birds being considered as different.

Ruffed Grouse (*Bonasa umbellus*). Colorado’s first record is of one killed by a hunter on Hoy Mountain, Moffat, 26 October 1988, <1 km from the Utah state line (DMNS 39566). All subsequent records have also come from Hoy Mountain, where the Ruffed Grouse is likely a year-round resident.

Arctic Loon (*Gavia arctica*). The surprise of the 2002 fall migration was the appearance of a transitional-plumaged adult at a small gravel-pit pond near Franktown, Douglas, 17–20 November 2002 (HK, UK, DF†, RH†, TL†, RO†, GW, DWM†; 2002-105; Figure 1). This represented the first U.S. record away from Pacific coastal states. Colorado has a second record of an alternate-plumaged adult at Chatfield SP, Jefferson/Douglas, 28 September 2005.

Glossy Ibis (*Plegadis falcinellus*). This species has had a confusing history in Colorado dating back to at least 1898 (Faulkner 2004). It was on the CBRC’s original state list (Reddall 1973) on the basis of a specimen (DMNS 39079, collected May 1916), then later removed when reexamination revealed the bird to be a White-faced Ibis (*P. chihi*) (Gent 1987). The first accepted Colorado record of the Glossy is of an alternate-plumaged adult at Sweitzer Lake SP, Delta, 27 March 1986 (MJ sk, VJ; 7-86-10). This species is now regular, with an average of 3.3 records accepted annually from 1995 to 2004, 4.3 from 2005 to 2011. Owing to the annual occurrence of multiple individuals, the species has been removed from the state’s main review list (Faulkner 2012a). Nesting has not been confirmed in Colorado but was just across the state border near Laramie, Wyoming, in 2005 (Faulkner 2005).

Black Vulture (*Coragyps atratus*). Colorado’s first was represented by an adult that roosted near the John Martin Reservoir dam, Bent, 13–14 August 2002 (DN†, CLW†; 2004-83). Colorado has since accepted two more records, both of single adults, in July 2009 and July 2010. All three records are from eastern Colorado.

Figure 1. Transitional-plumaged Arctic Loon at Walker Pit near Franktown, Douglas, 19 November 2002.

*Photo by Tony Leukering*
Harris’s Hawk (*Parabuteo unicinctus*). The committee reviewed documentations for three occurrences in 1994, accepting two of them: one adult near Waterton, *Jefferson*, 17–23 December 1994 (JR, SS, JBH, MJ, JR†; 10-94-17) and one adult in Fort Collins, *Larimer*, 19 December 1994 (BLs; 10-94-18). An apparent movement by this species outside its normal range in 1994 was enough to assuage concerns regarding these birds’ origin (Prather 1997). Colorado has two additional records, from October 1995 and June 2007. Pending review are two additional records, both with photographs, from 2013 and 2014.

Zone-tailed Hawk (*Buteo albonotatus*). An adult soaring over Colorado NM, *Mesa*, 17 July 1999, was well documented by attendees and staff of the Rocky Mountain [né Colorado] Bird Observatory’s summer camp (NB, JDu†, MN, AW†, SY†; 1999-176) for the state’s first record. Colorado has another record from Pueblo City Park, *Pueblo*, 27 April 2002. The committee also has received photographs of one from spring 2014; the record is pending review.

Curlew Sandpiper (*Calidris ferruginea*). An alternate-plumaged female at Upper Queen Reservoir, *Kiowa*, 30 June–1 July 1998 (DN†, DSc; 1998-49) represents the first of currently four records for Colorado. The other three records are of single birds during fall migration in September 2005, August 2012, and August 2013.


Western Gull (*Larus occidentalis*). Colorado’s first Western Gull visited Chatfield SP, *Douglas/Jefferson*, 1–18 June 2011 (GW†, DA†, PG†, BMd†, BKP†, NP; 2011-81). This individual, which had a lame left leg, had the solid bright yellow orbital ring and black wingtips indicating a pure Western Gull and a saddle color within the range of variation of the northern subspecies *occidentalis*. Colorado has three other accepted records, of a third-cycle subadult and an alternate-plumaged adult, both from March 2012, and another adult in October 2013. All four of these records are from eastern Colorado. In a split decision, the CBRC did not accept a record of a Western-type gull, photographed in southwestern Colorado in April 2012, that appeared to have an infusion of Glaucous-winged Gull (*L. glaucescens*) genes.

Iceland Gull (*Larus glaucoides*). A first-cycle immature at Valco Ponds SWA and the Pueblo landfill, *Pueblo*, 9–10 January 1999 represented the first record for Colorado (RO, BKP, DQ, MJ, PG, TL†, TDv; 1999-171). Another in its first cycle occurred in March 2000, but it wasn’t until 2005 that the species became annual during late winter and early spring. Colorado currently has 33 records, with the initial dates of sightings in November (1), December (5), January (7), February (5), March (10), and April (5), and another one in the queue for review.


Kelp Gull (*Larus dominicanus*). Semo (2007) exhaustively reviewed the occurrence of a 3- or 4-year-old male Kelp Gull of the wide-ranging nominate subspecies *dominicanus* that was at Jackson Reservoir, *Morgan*, 17–27 September 2003, and between Fossil Creek Reservoir and Donath Reservoir, both *Larimer*, 19 October–20 November 2003 (HK, UK, PG, RH†, TL†, BMd†, NP, BS†, AS†; 2003-78; Figure 2). The committee acknowledged that it could not prove with certainty that this individual did not possess mixed-species heritage. The Herring Gull (*L. argentatus*) is the only species with which the Kelp Gull is known to have hybridized in the Northern Hemisphere, and this was the only pairing the committee considered. While F1 Kelp × Herring hybrids appear intermediate between the parental species, Kelp × post-F1
backcrosses can appear phenotypically identical to a pure Kelp Gull (Dittmann and Cardiff 2005). Expert opinion solicited for this record noted unanimously that this individual appeared to be a phenotypically pure Kelp Gull.

Sooty Tern (Onychoprion fuscatus). Colorado’s only Sooty Tern record is of an adult apparently driven inland by Hurricane Ike (BKP†, JK, BMd†, NP, BS, AST†, GW†; 2008-107). This bird, discovered 12 September 2008 at Lake Holbrook, Otero, disappeared for a brief period before anxious birders refound it at Lake Meredith, Crowley, 14.5 km to the northwest. The bird departed early the next morning (Percival 2009).

Royal Tern (Thalasseus maximus). One at Nee Noshe Reservoir, Kiowa, 15–16 July 1997, provided Colorado with its first record (DN†, MJ sk, DSc sk; 1997-42) (Nelson 1999). The state’s subsequent two records are of single birds making brief visits in June 2004 and July 2012. All three records are from eastern Colorado.

Sandwich Tern (Thalasseus sandvicensis). Quite unexpected, an adult was found at Manitou Lake, Teller, 27 June 2013, and actively foraged at Manitou Lake and along Trout Creek through 30 June 2013 (BLf†, RL, JDrt†, DF†, BK, PG†, BKPt; 2013-177; this issue’s front cover). The two New World subspecies, acuflavidus and eurygnathus, are distinct, as the latter usually has an entirely yellow or orange bill. The Eurasian subspecies sandvicensis, can be distinguished with caution, in part, by its longer, thinner, drooping bill. Efe et al. (2009) suggested it be distinguished as species, but Chesser et al. (2013) believed the evidence for this inadequate. Several photos of the Colorado tern showed that its bill was thick and fairly straight, as in acuflavidus. The origin of this bird is of some concern because there are very few inland records of this species, most (all?) of storm-driven birds. Colorado experienced no major weather systems before or during the time that this tern was found. However,
its behavior of actively plunge-diving for prey, the lack of leg bands, and lack of feather wear all suggested that this was a wild bird and not one recently escaped from captivity.

Black Skimmer (Rynchops niger). An adult found at Jett Reservoir, Kiowa, in southeastern Colorado, stayed for three days, 19–21 July 2001 (DF sk, PG, ROu, CLW†, DN: 2001-64). Colorado’s only other record is of one at Pastorius Reservoir, La Plata, 29 April 2004, in the southwest corner of the state.

Eurasian Collared-Dove (Streptopelia decaocto). A small colony of at least 11 birds in Rocky Ford, Otero, went undetected by the birding community until July 1996 (TL, PG, MJ; 25-96-34), though local residents related that the birds had been present since 1995 (Janos 1998). The species continued its well-documented U.S. expansion through the state and is now considered a common year-round resident in much of Colorado.

Inca Dove (Columbina inca). The committee received documentation for three occurrences in 1992, all of which were accepted. The first was of one at Lafayette, Boulder, 4 November–16 December 1992 (MJ, DN†, DMn; 25-92-3), the other two records of two birds at Vineland, Pueblo, 15 November 1992–4 January 1993, with one persisting to 28 February 1993 (MJ, MY, JW; 25-92-12), and three birds at Lamar, Prowers, 23 November–21 December 1992 (JS†; 25-92-2). The Inca Dove established very small breeding colonies in Rocky Ford, Otero, and Lamar, Prowers, during the early 2000s, but these populations disappeared by 2011. Colorado currently has 22 accepted records.

Common Ground-Dove (Columbina passerina). Colorado’s first record, of one at Deckers, Douglas, 8 November 1981 (DMl; 25-81-64), was quickly followed by the second, at Tamarack Ranch SWA, Logan, 17 December 1981 (GBr; 25-81-63). Given that these records, and another from December 1994, were all single-observer reports without physical evidence, it was not until multiple observers documented the occurrence of one at Jackson Reservoir, Morgan, in November 1999 that the species was added to the state list. Colorado has just one additional record, of one in November 2011, which contributed to establishing a pattern of late fall and early winter (November–December) occurrence of the Common Ground-Dove in the state.

Green Violetear (Colibri thalassinus). One visiting a feeder near Durango, La Plata, 25–26 July 1998 (MPx†; 1998-80), represented the state’s first record. Colorado has a second record, of one photographed at Conifer, Jefferson, 12 September–4 October 2003, which was originally identified as a Magnificent Hummingbird (Eugenes fulgens) (Faulkner 2012b). These records fit the Green Violetear’s pattern of summer vagrancy to the U.S., likely involving the partially migratory subspecies thalassinus of central Mexico (Howell et al. 2014).

Ruby-throated Hummingbird (Archilochus colubris). The state’s first record is represented by an adult male at Rye, Pueblo, 13 July 1991 (DSi, TS†; 31-91-42). Colorado now has 24 records of which 18 are of fall migrants with initial detection dates from 19 August to 3 October. Two other records for July are also likely of fall migrants, while the remaining four records are of spring migrants found 30 April–13 May.

Costa’s Hummingbird (Calypte costae). A male at Crow Valley Campground, Pawnee NG, Weld, 17–18 May 2001, provided Colorado’s first record (RD†, SD, RHv, SMc; 2001-46), which remains the only spring occurrence among the total of now seven records. The remaining six are from July (1), August (1), September (2), November (1), and December (1).

Broad-billed Hummingbird (Cynanthus latirostris). A female at Clifton, Mesa, 14–15 November 2002 (DF†, TL†, DN†, RO, GW†, CLW†, SB, BMr; 2002-100) represents the first of now three state records. The bird had apparently been present since at least July, but the Colorado birding community did not become aware of it
until November, when Steve Bouricius checked on the report of a late Black-chinned Hummingbird (*Archilochus alexandri*) that turned out to be this species (Leukering 2004). Remarkably, two of Colorado’s records are of birds previously banded in Louisiana! The female at Clifton had been banded in January 2002, and an adult male found at Colorado Springs, El Paso, on 13 April 2006 had been banded the previous December. An adult male found 11 km south of Lamar, Prowers, on 18 April 2005, was not captured (and photos do not show the legs well), so the committee is unaware whether or not it too had been previously banded.

White-eared Hummingbird (*Hylocharis leucotis*). Colorado’s first and second records overlapped during the same summer. An adult female visited feeders at a residence near Durango, La Plata; the committee received documentation for 19 June–24 July 2005 (JBe†, PG, JK†, CWi, SA; 2005-69; Figure 3), though the bird apparently stayed through 7 August. During this period, an immature female was first observed on 22 July in northern La Plata ~35 km north of the first bird, and it apparently also stayed until 7 August (DF†, LS†, RB; 2005-77). These White-eared Hummingbirds occurred during the species’ unprecedented movement during the summer and early autumn of 2005, which generated first records for northern Arizona, southeastern New Mexico, the Texas Panhandle, and only the second record east of the Mississippi River, of one in Michigan (Semo 2006).

Acorn Woodpecker (*Melanerpes formicivorus*). Currently, the state’s first accepted record is of four individuals just north of the New Mexico border at Lake Dorothey SWA, Las Animas, 20 July–4 September 1994 (PG, JM, MY; 33-94-43). The status of a provisionally accepted record at Billy Creek SWA, Ouray, 5 September 1980 (unknown observer; 33-80-60) mentioned by Chase (1982) is under review. A very small breeding colony has persisted near Durango, La Plata, since at least 1995, and a pair has nested at Pueblo Mountain Park near Beulah, Pueblo, since 2012. Colorado currently has 17 records, although a few of these may pertain to the same individuals over multiple years (e.g., the Durango breeding colony).

Figure 3. The first of two female White-eared Hummingbirds found in La Plata during mid-summer 2005 (here at Durango, 2 July).

*Photo by Bill Schmoker*
Crested Caracara (*Caracara cheriway*). An injured adult found near Trinidad, Las Animas, 29 September 1997, taken to a raptor rehabilitator, and ultimately released provided Colorado with its first record (GE†; 1997-21). This individual showed none of the telltale signs of previous captivity, such as worn tail feathers or abnormal bill or talon growth (Evans 1998). Colorado has two additional records, both of single adults, for October 2010 and July 2011.

Yellow-bellied Flycatcher (*Empidonax flaviventris*). Colorado’s first record was provisionally accepted as a single-observer report of one in Pueblo, Pueblo, on 28 May 2000 (MJ; 2000-165). Subsequently, one was photographed in August 2005, one was captured at a banding station in May 2006, and one was audio recorded in May 2008. There are currently nine records of this species.

Acadian Flycatcher (*Empidonax virescens*). One at Van’s Grove, Bent, 12 May 2008 (BKP†, JK†, BMd†; 2009-32; Figure 4) remains the only Acadian Flycatcher recorded in Colorado.

Buff-breasted Flycatcher (*Empidonax fulvifrons*). A singing male was at Hannah Ranch SWA, El Paso, 19 May 1991 (JCo, BPr, JP; 34-91-47). Despite a range contraction and population decrease between the late 1800s and 1970 (Conway and Kirkpatrick 2007), the species had historically ranged as far north as Prescott, Arizona, and west-central New Mexico, so its occurrence in Colorado was plausible.

Brown-crested Flycatcher (*Myiarchus tyrannulus*). One photographed at Crow Valley Campground, Pawnee NG, Weld, 29 October 2007 (DL†; 2007-76; Figure 5), provided Colorado with its first record. Its large bill implied it was of the subspecies *magister* of the southwestern U.S. and western Mexico. Colorado has a second record of one photographed in Alamosa, 29 June 2013. Still pending review is one photographed in 2014.

Great Kiskadee (*Pitangus sulphuratus*). Colorado’s sole record is of one observed for just 13 minutes in the backyard of a private residence near Lamar, Prowers, 21 June 2013 (JSt†; 2013-174). Kansas has a single record from Cimarron NG, Morton, 18–21 May 1995, ~120 km southeast of where this bird was observed in Colorado’s southeastern corner. The Colorado record currently represents the farthest north this species has been documented in North America.

Sulphur-bellied Flycatcher (*Myiodyastes luteiventris*). One record for Colorado, of an adult at Adobe Creek Reservoir, Bent, 18–19 September 2002 (DN†, RH†, TL†; 2002-77; Figure 6). Although ascertaining the age of *Myiodyastes* flycatchers can be difficult, photos of this bird show worn flight feathers and a long, wide dark shaft streak on the outermost rectrix, indicating an adult (Pyle 1997, Leukering and Semo 2004).

Thick-billed Kingbird (*Tyrannus crassirostris*). One at Waterton Canyon, Jefferson, 23 October 1992, provided Colorado with its first record (DWDj, JK sk; 34-92-190). The state’s only other record is of one photographed near Parker, Elbert, 3 July 2004.

Cave Swallow (*Petrochelidon fulva*). Leukering (2011) considered the Cave Swallow to be a “stealth” vagrant to Colorado. As he noted, it has been reported in the state on multiple occasions since 2003, but until 2013 the CBRC has received documentation for only one of those reports, which it did not accept in a mixed decision (Semo and Faulkner 2011). The only accepted record is of a juvenile photographed at Prewitt Reservoir, Washington, 17 July 2013 (SM†; 2013-183).

Pacific Wren (*Troglodytes pacificus*). After this species and the Winter Wren (*T. hiemalis*) were split from *T. troglodytes* in 2010 (Chesser et al. 2010), the CBRC received photographs of one at Two Buttes SWA, Baca, 2 January 2005 (TL†, CLW; 2010-88; 7-0). Prior to 2010, *T. hiemalis* was known to be of annual occurrence in Colorado but the status of *T. pacificus* as currently defined was unclear, with no records accepted by the CBRC. Subsequently, the committee has accepted nine Pacific
Wren records, all of which are from the eastern half of the state from mid-October to early January.

Smith’s Longspur (Calcarius pictus). Rather surprisingly, this migrant and winter resident in the Great Plains was first recorded in Colorado only in 2003, when one was observed at Nee Noshe Reservoir, Kiowa, 11–12 October 2003 (BS, SMa, JM, GW†; 2003-82). The state still has just a total of five records, all but one (from Boulder) from the far eastern plains. The Boulder record is also the only one for spring, 16 April 2013.

Tropical Parula. (Setophaga pitiayumi). A singing male set up territory in Grandview Cemetery, Ft. Collins, Larimer, 18 June–4 July 2005 (DF, PG, LG†, TH†, NL, JM†, NP s, BS†, CWi†, DL, JM; 2005-71; Figure 7). This record represents the northernmost documented occurrence of this species.

Red-faced Warbler (Cardellina rubrifrons). Colorado’s lone record is of one along the Wheat Ridge Greenbelt, Jefferson, 3 May 1993 (DN†, JR†, DSc, SS; 52-93-36).

Black-chinned Sparrow (Spizella atrogularis). Colorado’s first record is of one photographed in the southeastern corner of the state at a private residence near Lamar, Prowers, 16 September 2006 (JSr†; 2006-128). Since then, birders have documented multiple singing males near Durango, La Plata, in 2010; three records for the Devil’s Kitchen Trail, Colorado NM, Mesa, 2010-2012, including successful nesting in 2012; and a nonsinging individual in rural Huerfano in 2012.

Pyrrhuloxia (Cardinalis sinuatus). Colorado’s first of four records is of a female found 7 km west of the Kansas border near Holly, Prowers, 17–18 December 1989 (MJ, KK, DN†; 56-89-53). The other three records are from August 1996, April 1999, and June 2011. Vagrancy of the Pyrrhuloxia in the southern Great Plains typically occurs in late fall and winter, so the late spring and summer dates for three of Colorado’s four records are somewhat atypical (Patten 2006).

Bronzed Cowbird (Molothrus aeneus). An immature male, probably of the eastern subspecies aeneus, was near a private residence in Lakewood, Jefferson, 18 May–5 June 1990 (PG, MJ, BC, JSt; 54-90-76). The committee recently has received documentation for this bird’s continuing occurrence at its original location for 17 June and at another nearby residence on 30 June. This remains Colorado’s only record.

Hooded Oriole (Icterus cucullatus). A definitive-plumaged male occupied a small territory near Cortez, Montezuma, 19 June–14 July 2006 (RH†, JK†, BMd†, BKP†, NP, AS†, CWi†, NE, JR; 2006-102). It resembled the southwestern U.S. subspecies nelsoni in its yellow (less orange) plumage, long bill, and relatively short tail (Semo 2008). Still under review is the photograph of an adult female in May 2014.

Streak-backed Oriole (Icterus pustulatus). Colorado’s first, an apparent adult female, patronized feeders at a private residence in Loveland, Larimer, 8 December 2007–2 January 2008 (CK†, PG, GG†, TL†, BKP, NP, AS†, AK; 2007-103; Figure 8). It appeared to be of the subspecies microstictus of western Mexico. Colorado’s only other record is of one near Fountain, El Paso, 25 November 2011.

Hoary Redpoll (Acanthis hornemanni). The massive redpoll invasion of winter 2012–2013 yielded six records. The first was of multiple individuals coming to feeders at the Discovery Museum, Ft. Collins, Larimer, 23 December 2012–26 January 2013 (TH, KMD, RH†, BMd†, MM, SMl†; 2013-10; Figure 9). These birds occurred among the hundreds of Common Redpolls (A. flammea) also coming to those feeders but did not associate specifically with each other. All 14 documentations received were of single birds, and 10 of these included photographs. Sex and plumage differences evident in the photographs reveal up to three individuals per day but it is impractical for the committee to attempt to determine exactly how many individuals might have been documented over their month-long stay. The additional five records, all with photographs, date from 29 December 2012 to 3 March 2013. The committee
Figure 4. Colorado’s overdue (and still its only) Acadian Flycatcher at Van’s Grove, Bent, 12 May 2009.

Photo by Brandon Percival

Figure 5. This Brown-crested Flycatcher, of the subspecies magister, made a quick stop at Crow Valley Campground, Weld, 29 October 2007, in northeastern Colorado.

Photo by David Leatherman
Figure 6. Colorado’s only Sulphur-bellied Flycatcher, photographed during its two-day visit to a woodlot at Adobe Creek Reservoir, Bent, 18–19 September 2002 (here on 19 September).

Photo by Tony Leukering

Figure 7. This adult male Tropical Parula set up a territory at the Grandview Cemetery in Fort Collins, Larimer, 18 June–4 July 2005 (here on 22 June).

Photo by Rachel Hopper
did not accept six other reports, even though these also included photographs. For these, outside expert opinions were not decisive or at least two committee members concluded that the birds should be left unidentified to species because they were not classic examples of the Hoary Redpoll.

Lawrence’s Goldfinch (*Spinus lawrencei*). A male stayed at a private residence in Grand Junction, Mesa, 23 May–24 July 2007 (LA, PG, GG†, RH†, BM†, NP; 2007-38; Figure 10) and may have sired young with a female Lesser Goldfinch (*S. psaltria*) (Brinkley 2008). This species breeds in California and northern Baja California and winters regularly in southern Arizona and northwestern mainland Mexico, making occasional winter movements farther east to New Mexico, so the occurrence of one during summer was quite unexpected. Semo (2008 and references therein) noted that single males also occurred in 2007 in southwestern Utah (late March and presumably the same individual again in early September) and west-central New Mexico, 19 July–5 August, lending support to a pattern of anomalous vagrancy by that species in 2007.

**SPECIES NOT REPRESENTING A CHANGE FROM THE COLORADO LIST IN 1985**

Black-bellied Whistling-Duck (*Dendrocygna autumnalis*). This species was originally placed on the Colorado list on the basis of a record from Chatfield SP, Douglas/Jefferson, 21 September 1980 (Chase 1982). A subsequent committee removed this record, as well as another from 1981, because of concerns regarding origin (Nelson 1991), an issue the previous committee had considered (Leukering 2003). In 2002, after the species had established a pattern of vagrancy in the Great Plains, the committee re-reviewed four documented reports and accepted one: an adult at Adams and Bunker Reservoir No. 1, Weld, 11 July 1991 (GB†; 8-91-14). This remains the only accepted record for Colorado.

Emperor Goose (*Chen canagica*). Colorado’s only documented Emperor Goose is one killed by a hunter near Hudson, Weld, in late January 2009. Although the CBRC did not accept the record, its analysis may have implications for other potential extralimital records of the Emperor Goose in the interior U.S. (Semo 2011). Semo and I examined and photographed the mounted specimen, and the taxidermist allowed two underwing coverts to be pulled. The bird showed no sign of captivity, such as removal of the hallux from the right foot, leg bands, tattooing on foot webbing, or abnormal feather wear or calloused feet. Comparison of stable-isotope ratios in the pulled feathers by the U.S. Geological Survey with those in birds within their native range in Alaska implied that the Colorado specimen had molted those feathers at a latitude similar to Colorado (Semo 2011). Possibly, it was a wild bird that had spent the previous summer in or near Colorado. Regardless, the majority of committee members were conservative and voted to not accept because of the results of the stable-isotope analysis and the possibility that this Emperor Goose was not of wild provenance.

California Condor (*Gymnogyps californianus*). The identification of three birds at Land’s End on the Grand Mesa, Mesa, 25 August 1998 is not in doubt; however, because these birds originated from the recently introduced population in Arizona this occurrence does not qualify as a state record. Two second-year birds (N1 and N8) reported in 2015 had been released in Grand Canyon NP in September 2014. N8 was photographed in southwestern Colorado in mid-April, then approximately a week later in Los Alamos, New Mexico. N1 was observed in a Colorado Springs backyard in late May and captured for rehabilitation and re-release.

Common Black Hawk (*Buteogallus anthracinus*). This species was on the state list in 1985 (Gent 1987) on the basis of one at Chatfield State Park, Douglas, 20 June 1980 (RA, KK; 10-80-83). A later committee removed this record under the mistaken belief that the species was “quite sedentary” and cautioned that a pattern of vagrancy
should be established before that record was accepted (Nelson 1991). After the committee had received three additional reports, it unanimously re-accepted the 1980 record as Colorado’s first (Prather 1996). Colorado currently has 11 records of the Common Black Hawk, seven of them since 2005, from both sides of the continental divide. Their distribution by month is April (3), May (2), June (5), and September (1).

REPORTERS AND CITED OBSERVERS

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LITERATURE CITED


Banks, R. C., Cicero, C., Dunn, J. L., Kratter, A. W., Rasmussen, P. C., Remsen, J.
Figure 8. This Streak-backed Oriole frequented a feeder near Loveland, Larimer, 8 December 2007–2 January 2008 (here on 9 December).

Photo by Bill Schmoker

Figure 9. One of multiple Hoary Redpolls at the Discovery Museum, Larimer, part of a major redpoll invasion during the winter 2012-2013 (here on 11 January).

Photo by Rachel Hopper


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HISTORY AND STATUS OF THE WHITE-TAILED PTARMIGAN IN NEW MEXICO

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ABSTRACT: We reviewed the literature and observations of the occurrence and status of the White-tailed Ptarmigan (*Lagopus leucura*) in New Mexico. Historical reports were infrequent, likely because of an inadequate system for recording observations from the public, although by 1928 biologists had a good understanding of the distribution and status of the species in the state. By 1980, ptarmigan persisted in small numbers in the northern portion of the New Mexico range but were uncommon or absent in the southern portion of the range, prompting a transplant of White-tailed Ptarmigan from Colorado into the southern area in 1981. Following that successful transplant, observations initially increased and subsequently continued at a relatively low level with most reports coming from the southern portion but including others from throughout the historical range. White-tailed Ptarmigan are localized in suitable habitats, but their abundance in New Mexico may be affected by the decreasing size of alpine snowfields in summer, grazing in areas dominated by willow (*Salix* spp.), and the shift to a warmer and drier climate.

The White-tailed Ptarmigan (*Lagopus leucura*) occurs from Alaska south to New Mexico; its distribution is highly discontinuous and is most fragmented in the southern portion of its range (Braun et al. 1993). The abundance of the species is also quite variable (Braun, unpubl. data) and has been measured for only a few sites. Variation in abundance appears to depend on a site’s characteristics, especially the abundance of late-lying snow patches and rock and boulder fields, as well as the presence of willows (*Salix* spp.), which may be affected by moisture regimes.

The ptarmigan was first reported in New Mexico by B. J. D. Irwin prior to 1866 in the Sangre de Cristo Mountains near Cantonment Burgwyn near present-day Taos (Coues 1866, 1875, Bendire 1892). Bailey (1928) suggested those records were from the Truchas Peaks area farther south, although similar habitat existed closer in the Wheeler Peak area; the collection locale—latitude 37° north—is the present New Mexico–Colorado border (Coues 1875). While the actual collection date of the reported specimens is unknown, it was likely 1856–1857, as Irwin was stationed in New Mexico (at Fort Union) for only a short period between August 1856 and December 1857 (Hume 1942). It is likely Irwin visited the Burgwyn area sometime before leaving New Mexico and arriving at Fort Buchanan near Tucson, Arizona, in December 1857; he did not return to northern New Mexico. Cantonment Burgwyn was abandoned by the U.S. Army in 1860. The present location of the specimen(s) is unknown.

Bailey (1928) offered a bleak description of the species’ distribution and abundance in New Mexico in the earliest decades of the 20th century, as even extensive searches in some areas yielded few records. By 1928, however, specimen records and/or reports had accumulated from most or all of the known New Mexico distribution as it is understood today. Although its
habitat is limited, the White-tailed Ptarmigan has persisted in New Mexico to the present in essentially the same areas as occupied in the late 1920s. Our objectives are to report (1) on the occurrence of White-tailed Ptarmigan in New Mexico by two broad time intervals, separated by a transplant in 1981; (2) on efforts to locate extant populations before and after the transplant; (3) details of the transplant into the southern portion of the New Mexico range; and (4) estimate possible size of the area that the species could inhabit in the state. These data should be useful as the species is studied more intensively, the result of interest by some groups in the U.S. Fish and Wildlife Service in listing the White-tailed Ptarmigan as threatened or endangered because of a reduction projected from climate change.

METHODS

We searched the published literature, unpublished reports in the files of government agencies, and written reports of observations of White-tailed Ptarmigan maintained in the archives of the New Mexico Ornithological Society, inspected museum specimens (four that could be found), and, in 2004, Williams searched habitat appearing suitable on the basis of Braun’s extensive field experience in Colorado. We included only conclusive reports from the historic range (Ligon 1927, Bailey 1928) and in areas where birds transported from Colorado were released (spring and fall 1981).

Broadcasting tape-recorded White-tailed Ptarmigan calls (Braun et al. 1973), in 1969, 1979, and 2006 Braun searched apparently suitable habitat (Braun 1969, 1970, 1971, 1979, 2006) as follows: 10–11 September 1969 with New Mexico Department of Game and Fish (NMDGF) personnel in the Wheeler Peak area including Simpson Peak, Taos Cone, and Mount Walter, and also in the Latir Peaks area on 12 September 1969. Ten years later, Braun and personnel of the NMDGF and the U.S. Forest Service (USFS) made similar searches in the Latir Peaks 3-4 August 1979 and on Mount Walter above Taos Ski Valley on 5 August 1979. Also in 1979 they visited the southern portion of the New Mexico distribution, surveying portions of the Pecos Wilderness (Jicarita Peak, Serpent Lake, Santa Barbara Divide, Horseshoe Lake, Barbara Peak) as well as portions of the Truchas Peaks (Truchas Lake) and south to Pecos Baldy from 7 to 9 August. Santa Fe Baldy and nearby Lake Peak were searched on 10 August. In 2006, broadcasting calls of a male White-tailed Ptarmigan, Braun and USFS personnel searched the area above Serpent Lake to Jicarita Peak and along the Santa Barbara Divide trail from 12 to 14 June.

Using methods detailed by Braun and Rogers (1971:21) and areal measurements from U.S. Geological Survey topographic maps, Braun estimated the area above tree line (elevation 3505 m) in the Sangre de Cristo Mountains of New Mexico, as Pat Gioannini of the New Mexico Section of the American Alpine Club did independently. The latter estimate was based on a computer program that counted pixels above 3505 m in the area from Santa Fe Baldy north to the Colorado line in the vicinity of Stateline Peak. We made no distinction between area possibly available from May through October and in winter (November–April), as knowledge of habitats used by White-tailed Ptarmigan in winter in New Mexico is lacking.
RESULTS

Pre-1981 Observations

Bailey (1904, 1905) provided the first detailed overview of the distribution and status of White-tailed Ptarmigan in New Mexico, reporting specimens and observations (some of the latter second-hand and several years old) from many of the peaks in the Sangre de Cristo Mountains now understood as ptarmigan locales. She (Bailey 1904) recognized a lower-elevation gap of “some 30-40 miles” (48–64 km) that separated the northern peaks (Wheeler Peak northward) from the southern peaks of the upper Pecos region, and noted the species seemed to be scarce or absent in the southern area and in low numbers in the north. Ligon (1927:127–129) reported essentially the same status in the mid-1920s, noting the species formerly occurred on about a dozen high peaks and ridges in the Sangre de Cristo Mountains but had been “exterminated” from the southern peaks (e.g., Pecos Baldy, Truchas Peaks), was faring poorly in the Wheeler Peak and Gold Hill areas, and seemed to be surviving best in the Costilla Peak area near the Colorado line. Ligon estimated the total amount of alpine habitat in New Mexico at “less than 20 square miles” (< 52 km²) but reported that excessive summer grazing by domestic sheep was destroying the habitat and suggested only about 100 birds remained.

Bailey (1928) summarized the available historical distributional data, including mapping the range as extending from Santa Fe Baldy and Pecos Baldy north to the Colorado line. By 1928, the species was understood to occur, or have occurred, in the Costilla Peaks area near the Colorado border, the Latir Peaks area, Gold Hill, and the Wheeler Peak area in the north, and the Santa Barbara Divide ridge (“Mora Pass”), Truchas Peaks, Pecos Baldy, and Santa Fe Baldy areas in the south, these encompassing the alpine areas of present day Taos, Colfax, Rio Arriba, Mora, and Santa Fe counties (Figure 1).

Ligon (1961:88) revisited historical information and added at least one more recent observation, a report of a female and brood on “Costilla Peak” in mid-July 1952; we suspect the location, given as the “head of Ricardo Creek” is more likely Little Costilla Peak, an isolated 3825-m mountain on the Taos–Colfax county line and east of the principal peaks, including (Big) Costilla Peak in Taos County. Ligon (1961) reported seeing ptarmigan in New Mexico on but two occasions, on Wheeler Peak (in the 1920s) and on Costilla Peak, where he collected two specimens in November 1926. He concluded the species was, by the early 1960s, restricted to a few peaks in the northern portion of the distribution. Lee (1967) reiterated that the ptarmigan appeared to be surviving only in the northern part of the distribution, from Wheeler Peak north.

Hubbard (1970) summarized known locales and listed several further observations, including in the Santa Fe Baldy area in the mid-1960s (letter from Braun), in the Latir Peaks area in April 1969, and on Costilla Peak in February 1970, and later (1978) reported one photographed of five seen on Wheeler Peak in September 1976. Hubbard (1978) summarized the overall status at that time as rare to uncommon and local, although formerly more widespread and numerous; he made no mention that the species was
extirpated from New Mexico, contra Wolfe et al. (2011).

An important report from the mid-1970s was of two birds in winter plumage on 27 January 1974 at the headwaters of Nambe Creek near Santa Fe Baldy (correspondence of 12 February 1974 and 4 March 1974 from S. R. Bryan Jr.); this represents the southernmost factual record of living ptarmi-
gan. A report of two seen on Santa Fe Baldy in November 1976 (American Birds 31:208) represented the last report from the southern portion of the New Mexico range prior to 1981. A report by R. T. Peterson of two on Stateline Peak on 10 August 1979 indicated the species was still present near the Colorado border. We dismiss one report from the mid-1970s from “near Chama,” as the undetailed, second-hand observation of three birds on an unknown date in November 1974 was on Cumbres Pass in the San Juan Mountains of Colorado, not in New Mexico.

We located four museum specimens of the White-tailed Ptarmigan taken in New Mexico, all from Taos County. Three are in the U.S. National Museum (USNM 193236, adult male, 24 January 1904, 3.2 km north of Arroyo Seco; USNM 194589, adult male, 24 July 1904, 8 km south of Twining; USNM 194588, adult male, 6 August 1904, 8 km south of Twining), and one is in the Museum of Southwestern Biology at the University of New Mexico (MSB 891, yearling male, 19 June 1924, 32 km northeast of Taos at Wheeler Peak). We know of two additional Taos County specimens collected by J. S. Ligon on 28 November 1926 on Costilla Peak near the New Mexico–Colorado boundary (Ligon 1961). Those specimens were mounted and placed on exhibit at the Santa Fe office of the NMDGF (photograph in Ligon 1927), but their whereabouts today is unknown.

Braun initiated searches for ptarmigan in New Mexico in 1969; his field diary from work at Wheeler Peak on 10 and 11 September and at Latir Peak on 12 September 1969 does not mention finding any birds or sign (droppings or feathers) in those areas, although he found sign of the Dusky Grouse (Dendragapus obscurus) above treeline on Wheeler Peak. Three birds reported from Latir Peak in April 1969 (Hubbard 1970) were likely transients from farther north, owing to the general lack of willow habitat noted there on 1969 surveys. A decade later, however, J. P. Hubbard photographed two adults on Latir Peak on 6 August 1978, and K. J. Nelson of the USFS reported “broods and chicks” on both Latir Peak and Mount Walter in the Wheeler Peak area during August and September 1978.

In 1979, at the request of the NMDGF and the USFS, Braun searched for ptarmigan in New Mexico from 3 to 10 August. Areas investigated included the Latir and Wheeler Peak areas in the north and the Jicarita Peak, Truchas Peaks, Pecos Baldy, and Santa Fe Baldy (including Lake and Pentente peaks) areas in the south. He observed older winter ptarmigan sign on Latir Peak on 3 and 4 August and two broods (of five and three chicks) on Mount Walter above Horseshoe Lake on 5 August. Both adult females were captured, banded, photographed, and released; this was in the same area where K. J. Nelson reported broods and chicks in 1978 as well as one male on 29 June 1979 and a female with five chicks on 18 July 1979. On subsequent surveys of the area where Braun captured the two females with broods, Nelson found two additional adults in August. No ptarmigan or their sign were observed in any of the areas searched in the southern portion of the New Mexico range.

In 1980, M. R. Broschart (in litt.) reported he found three males in the Wheeler Peak area in late June 1980 by playing tape-recorded “challenge” calls of the White-tailed Ptarmigan. Nelson reported a pair of ptarmigan in the Heart Lake cirque of the Latir Peak area in 1980 as well as three
additional males in the Wheeler Peak area: one on the northeast ridge overlooking Lost Lake, one on the southeast side of La Cal Basin, and one on the ridge between Mount Walter and Simpson Peak. Nelson also observed a male on the east-facing slope of the saddle and ridge southeast of Gold Hill, and a female with one chick in the same area plus a male on the northeast slope of Gold Hill.

All sightings listed by Bailey (1904, 1905, 1928) and Ligon (1927, 1961) were from the northern mountains (Figure 1) from Wheeler Peak north to the Colorado State boundary. All known specimen records (6) from New Mexico are also from the northern mountains. From the southern mountains (Figure 1), before the 1960s there was no documentation, but there were second-hand reports of ptarmigan (Hubbard 1970). See Bailey (1904) for “Mora” Pass, and Bailey (1928:203) specifically mentioned reports from the “Truchas Peaks” in 1903 and from “peaks at the head of the Pecos” in 1919. Subsequently, prior to 1981, we know of only the two (1974, 1976) reports by Hubbard (1978), both at Santa Fe Baldy. Thus prior to 1981 there were at least 19 verifiable reports from the northern mountains versus at least five from the southern mountains.

The 1981 Transplant

The NMDGF, in cooperation with the USFS, formally requested a transplant of White-tailed Ptarmigan from Colorado in February 1981. The goal was to release birds into the southern portion of the New Mexico range, where there had been the fewest reports in recent years. That request was approved, and from 26 to 28 May 1981, 22 ptarmigan (11 mated pairs) captured in Colorado were released in the vicinity of the Santa Barbara Divide in the Pecos Wilderness of the Carson and Santa Fe national forests. An additional 21 birds (12 adult and yearling females, six adult and yearling males, and three young of the year) from Colorado were released into the same area on 10 September 1981 (Braun et al. 2011).

Post-1981 Observations

Following the 1981 transplants, reports increased in the southern portion of the range and continued in the northern portion. Some of these observations were reported by Wolfe et al. (2011) from Williams’s data collected while he was employed by the NMDGF. We found 50 separate observations of over 214 individual White-tailed Ptarmigan between 1982 and 2006. Of this total, 10 observations (38 individuals) were from the northern area (Figure 2) and 40 observations (176 individuals) were from the southern area (Figure 2). Reports of observations in the northern area were primarily from Wheeler Peak (including Mount Walter), Kachina Peak, Latir Peaks, and Stateline Peak. Those in the south were primarily in the area of Santa Barbara Divide including Jicarita Peak, Rincon Bonita, and Barbara Peak with some as far south as Santa Fe Baldy. The observations likely reflected the ptarmigan’s abundance, but their distribution was undoubtedly influenced by word of mouth from observers and may not represent the actual distribution. The largest group of up to 26 individuals was reported in 1983 in the vicinity of the 1981 releases (NMDGF 1983). Broods were observed in this area commonly, and Wolfe (2006) reported a nest on the summit of Barbara
Peak in August 1993. An observation by J. R. Oldenettel on Santa Barbara Ridge in July 2005 was of a hen possibly brooding a newly hatched chick. The consistency in sightings and sign (feathers and/or droppings) continued through 2006.

In 2006 the USFS contracted Braun to examine habitats in the Serpent Lake, Santa Barbara Divide, and Jicarita Peak areas to devise a survey for presence or absence. On 13 June 2006, above Serpent Lake, he heard and observed two males, capturing and banding one, and along the trail to Jicarita Peak observed a pair. On 14 June, two males were calling above camp at the headwaters of the East Fork of the Rio Santa Barbara. Ptarmigan feathers and droppings were noted at several locations along the Santa Barbara Divide during this trip. Also in 2006, D. J. Cleary (in litt.) visited Little Costilla Peak but detected no ptarmigan. Similarly, E. R. Rominger observed none in the northern portion of the range during helicopter surveys for bighorn sheep (*Ovis canadensis*) on 15 and 16 July.

Birders began to visit the Santa Barbara Divide–Jicarita Peak area beginning in the early 2000s specifically to locate ptarmigan, and these “ptarmigan treks” continued almost annually to 2014, skipping only 2010 and 2011. On all of these treks, conducted in July or August, ptarmigan were encountered, and adults with young were noted in 2005, 2009, and 2012. Wolfe et al. (2011) listed observations of ptarmigan in New Mexico from 2007 through 2010.
DISCUSSION

The historic distribution of the White-tailed Ptarmigan in New Mexico included all of the alpine habitat of the Sangre de Cristo Mountains from Santa Fe Baldy north to the Colorado boundary, a distance of some 132 km (Bailey 1928, Ligon 1961). All of the reported areas of occupancy in New Mexico are within the distance the species moves in Colorado (Hoffman and Braun 1975, Giesen and Braun 1993). New Mexico records are few from the 1920s to the late 1960s, when interest in the species increased after initiation of studies in adjacent Colorado (Braun and Rogers 1971) and with the establishment in 1974 of an endangered-species program by NMDGF, which listed the ptarmigan as endangered in 1975.

Brasso and Emslie (2006) reported late Pleistocene fossils of *Lagopus* from Sandia Cave in Las Huertas Canyon on the Sandoval–Bernalillo County line. The fossils were closest in size to the White-tailed Ptarmigan. The location, in the Sandia Mountains, is less than 50 km south of Santa Fe Baldy.

Bailey (1904, 1905) and Ligon (1927) commented on the apparent poor condition of alpine habitats in New Mexico, which they assumed was the result of livestock grazing, primarily by domestic sheep. This activity, coupled with illegal hunting, was assumed to have reduced abundance of the species (e.g., Bailey 1928, Ligon 1961). Grazing by domestic sheep has been observed to cause the ptarmigan to change its patterns of movement in summer (Braun 1971), and localized overharvest has been documented (Braun and Rogers 1971). Therefore we believe that Bailey’s and Ligon’s conclusions have merit.

Habitats the White-tailed Ptarmigan uses in New Mexico (Figure 2) appear similar to those used in southern Colorado except for the reduced abundance of willows and the lack of late-lying snowfields and wet seeps. Their floristic composition parallels those to the north in Colorado as described by Braun (1971).

Alpine areas used by ptarmigan in New Mexico are small, disjunct, frequently linear, and contain unsuitable habitats. Thus large numbers of individuals should not be expected. Two independent estimates of the area above tree line (about 3505 m) in the Sangre de Cristo Mountains distribution of the species in New Mexico are similar—up to about 285 km². Only a fraction of this area is suitable, however. Some areas have extensive steep rocky cliffs with little vegetation. A liberal assessment, based on field studies along the Front Range, Collegiate Range, and San Juan Mountains in Colorado (Braun and Rogers 1971), is that from May through October about one-half of the total, about 143 km², could be suitable for ptarmigan, a figure almost three times as large as Ligon’s (1927) estimate of 52 km².

The low density of the White-tailed Ptarmigan in New Mexico is due mostly to the small size of suitable alpine areas but probably also to the lack of shrub willows in the krummholz zone, especially in the drier locales such as Latir Peaks and Gold Hill, where snowfields do not linger into mid to late summer. Mat willow is locally common, especially in the Mount Walter area, and is likely the habitat most favorable for the species in the state. Thus the unavailability of taller willow in winter and spring suggest these are the periods limiting the White-tailed Ptarmigan in New Mexico, affecting overwinter survival and the
number of possible breeding territories. On the basis of work in Colorado (Braun and Rogers 1971), we estimate the ptarmigan’s population density in New Mexico in spring at 0.8 to 2.3 pairs/km² in occupied habitat. The best habitats in the state are in the Wheeler Peak area (especially Mount Walter) and farther north in the Costilla Peak area adjacent to occupied range in Colorado (because of probable linkage with Colorado populations). The best areas in the southern portion of the New Mexico distribution are those along the Santa Barbara Divide from Jicarita Peak to Barbara Peak.

White-tailed Ptarmigan can occupy most alpine areas in New Mexico in late spring and early summer. However, field investigations in 1969 and 1979 suggest that habitat can also be limiting in late summer and early fall because of the lack of late-lying snow fields and moist areas to provide succulent forage. In Colorado, grazing by domestic sheep tends to desiccate alpine vegetation in late summer and fall, causing ptarmigan to move farther upslope, if possible, or to steep rocky east- and north-facing slopes, which retain moisture and to which sheep have less access (Braun 1971).

The success of the releases of White-tailed Ptarmigan in New Mexico was expected from the success of transplants to Utah (Braun et al. 1978), an isolated area in Colorado (Hoffman and Giesen 1983), and California (Frederick and Gutiérrez 1992). Overall, the success of ptarmigan transplants within North America has been high (Kaler et al. 2010, Braun et al. 2011). Those releases were into suitable habitat, as they were also in New Mexico.

The number of observations of ptarmigan in New Mexico increased after the 1981 transplants, as did the locations where the birds were reported. The frequent absence of ptarmigan in some areas, such as Latir Peaks and Gold Hill in the north, Pecos Baldy and Santa Fe Baldy in the south, suggests fluctuations in abundance and distribution. In Colorado, these oscillations appear to have a period of 7–10 years but low amplitude (Braun et al. 1991). That pattern may prevail in New Mexico also. The best, most secure habitats for the species in the state appear to be in the north in the Mount Walter and Costilla Peak areas, where land ownership is mixed. Further legal protection for areas of mixed ownership important to White-tailed Ptarmigan may be needed.

Since 1966, nesting and hatching of the White-tailed Ptarmigan in Colorado has shifted earlier (Wang et al. 2002, Wann 2012). These changes could be profound farther south in the limited alpine habitats of New Mexico where population densities are low and occupancy is intermittent, as at Latir Peaks and Gold Hill. The scarcity of late-remaining snow fields and areas with taller or even mat willows, and the lack of connectivity of apparently suitable habitats in all alpine areas of New Mexico, suggest the effect of future changes in climate on the White-tailed Ptarmigan should be expressed and measurable in this state first.

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HISTORY AND STATUS OF THE WHITE-TAILED PTARMIGAN IN NEW MEXICO

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LOOP MIGRATION BY A WESTERN YELLOW-BILLED CUCKOO WINTERING IN THE GRAN CHACO

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ABSTRACT: A lack of information on the full life cycle of long-distance migrants, including nonbreeding periods, may hinder the recovery of threatened populations. In 2010, on the middle Rio Grande, Sechrist et al. (2012) recaptured a Yellow-billed Cuckoo (Coccyzus americanus) fitted with a light-level geolocator, revealing for the first time wintering grounds and migration routes of an individual of this species. To further this knowledge, in 2011 we placed light-level geolocators on eight Western Yellow-billed Cuckoos at breeding sites on the lower Colorado River in Arizona and California. We recaptured one female in July 2012 at her previous capture site and analyzed the stored light data. During fall migration the bird flew ~9500–9900 km, passing through the Caribbean region. It wintered from mid-November to late April in the Gran Chaco of central South America, around the junction of Paraguay, Bolivia, and Argentina. The more direct spring route back to the breeding grounds passed through Peru and Central America. Following recapture, we discovered the bird was nesting while wearing the geolocator, and she later fledged young from two nests. Before and after migration, the bird appeared to pause in southern Arizona or Sonora, paralleling the first tracked Western Yellow-billed Cuckoo, suggesting this monsoonal region may be important to the western population during these stages of the life cycle. The bird’s migration timing and loop route, though reversed in direction, were also strikingly similar to those of the first bird tracked, and their overlapping wintering grounds suggests the possibility of a distinct winter range for the western population. Given the continuing expansion of agriculture into natural areas throughout this large region of South America, conservation of these forested areas is essential.

In the western U.S., the decline of the breeding population and range of the Yellow-billed Cuckoo (Coccyzus americanus), recently listed as threatened under the Endangered Species Act as a “distinct population segment” (U. S. Fish and Wildlife Service 2014), is attributed mainly to loss or degradation of breeding habitat following large-scale modification of rivers (Gaines and Laymon 1984, Hughes 1999). Knowledge of the conditions the cuckoo experiences during the rest of its life cycle is limited, however, prohibiting a full assessment of its year-round conservation needs. Habitat quality in the winter range can affect an individual’s fitness, timing of its spring migration, and reproductive success (Marra et al. 1998, Tonra et al. 2011). The threats to western cuckoos once they leave their breeding grounds are unclear but may be driven by the loss of forest to increased human population and by the expansion and intensification of agriculture and cattle grazing, all exacerbated by climate change (Ramirez-Villegas et al. 2012).

Recent research spurred by the development of the light-level geolocator has revealed both stopover and wintering sites of many long-distance migrants (Bridge et al. 2013, McKinnon et al. 2013), and the evolution of this technology enables the tracking of smaller (<100 g) migratory birds to their stopover and wintering grounds. Although the devices’ precision
remains rough, particularly in latitude (in forest, error averaging close to 200 km; Fudickar et al. 2012), geolocators can reliably be used to track the movements of long-distance migrants (Ryder et al. 2011). The tracking of sufficient numbers of Yellow-billed Cuckoos could reveal the species’ migratory connectivity rangewide (Webster et al. 2002), including whether the western and eastern populations use separate migration corridors or wintering grounds, as found between distinct breeding populations of other species (Delmore et al. 2012). If the two populations are allopatric during the nonbreeding season, the decline of the western population may also be associated with greater rates of forest loss on its wintering grounds.

The first geolocator-carrying Yellow-billed Cuckoo to be tracked over one year was a female captured on the middle Rio Grande, New Mexico (Sechrist et al. 2012). The data revealed a post-breeding dispersal phase in northwest Mexico, fall migration through Mexico and Central America, wintering in central South America in the Gran Chaco region of Bolivia, Brazil, Paraguay, and Argentina, spring migration back to the breeding grounds via the Caribbean and Yucatan Peninsula, and a pre-breeding stop-over again in northwest Mexico. With the year-round movements of just one individual known, our objectives were to gain further understanding of western cuckoos’ migration and wintering periods, including identifying the main areas used for wintering. This information may help to clarify the birds’ risks year round.

METHODS

Between mid-June and mid-August 2011, we captured, banded, and weighed 29 adult cuckoos at three riparian-forest-restoration sites managed under the Lower Colorado River Multi-Species Conservation Program (2004): Palo Verde Ecological Reserve, California (33.7° N, 114.5° W), Cibola Valley Conservation Area, Arizona (33.41° N, 114.66° W), and Cibola National Wildlife Refuge, Arizona (33.36° N, 114.69° W). We modified a targeted mist-net technique (Sogge et al. 2001), raising the top of the net to the height of the canopy (up to 12 m) to increase the likelihood of capture. We attached two to four stacked mist nets (each 2.6 m high, 9–18 m long, mesh 60 mm) between two canopy poles (Bat Conservation and Management, Inc.) placed in a vegetation gap and broadcast cuckoo vocalizations from portable speakers hidden on each side of the net. From each bird captured, we drew up to 40 µL of blood for molecular sexing (McNeil et al. 2012). We fitted eight that we knew or assumed were breeding on the basis of nest observations, proximity to nests, or residency with Mk20 ASLT geolocators (British Antarctic Survey), with light stalks 15 mm long angled at 30°. Following Rappole and Tipton (1991), we attached the geolocators to lower-back leg-loop harnesses made of 1 mm elastic cord weighing 1.1 g total (0.9 g geolocator plus 0.2 g cord attachment; 1.5–1.9% of the birds’ total mass). We released the birds where captured, and the following breeding season we tried to recapture them at the same or adjacent sites to retrieve the geolocators.

We used BASTrak software to download and decompress geolocator data, and TransEdit to analyze the data (Fox 2010). We used a light threshold level
of 2 to define sunrise and sunset, visually assessed each of these transitions, and rated the quality of the transitions on a scale of 0 to 9. Transitions lacking smooth curves (evidence the bird was in deep shade) received low scores. We then rejected transitions scoring less than 8. We also discounted clearly erroneous locations, such as those >1000 km apart within 12 hours or falling far off shore. We used a sun-elevation angle of –4.09°, which best calibrated to the capture location for the week after deployment (8–15 August 2011), thus assuming a similar degree of shading throughout the year. We used BirdTracker software (Fox 2010) to estimate latitude and longitude (datum WGS 84) at noon and midnight each day. Because Yellow-billed Cuckoos migrate at night (Crawford and Stevenson 1984), we compensated for longitudinal movement when estimating latitude (Fox 2010). For the periods within 15 days of the fall and spring equinoxes (23 September 2011 and 20 March 2012, respectively) when day length was similar everywhere, we inferred coordinates in longitude only. We estimated mean positional error by measuring the distance between calculated and known locations for the week after deployment and the week before recapture, when the bird was at the breeding site. We imported the locations into ArcMap 9.3 (ESRI) for visual assessment, and defined a buffer around pre- and post-breeding points and around winter points, the width equal to our mean positional error, to represent the areas of staging for migration and wintering, respectively.

RESULTS

Of four males and four females fitted with geolocators in 2011, we recaptured one female on 17 July 2012 at the Palo Verde Ecological Reserve, at the same net location where initially captured on 7 August 2011. We failed to refind the other seven or any of the 21 other cuckoos banded but not fitted with geolocators. We removed the leg harness and geolocator and examined the bird thoroughly; she appeared healthy with no obvious ill effects from the harness. She weighed 64 g on recapture, 4 g heavier than when captured in 2011. We then fitted her with a tail-mounted radio transmitter (McNeil et al. 2013) and found her to be a week into nesting, about 230 m from the capture location. We radio-tracked her until 2 September, when we lost her signal and assumed she left the site. She nested three times in 2012, the first and last attempts successfully.

The geolocator generated 687 location points over 344 days between 7 August 2011 and 16 July 2012. We omitted 409 low-quality points (59.5%), including 114 (16.6%) near the equinoxes, when geolocation data are unreliable, and another 15 that were clearly erroneous (2.2%). This left 263 points (38.3%) with which we assessed the migration routes and winter range (Figures 1, 2). After the data from the first week of deployment (8–13 August) were calibrated to the capture location, the mean positional error during that week was 87.2 km (range 46.8–146.4 km, SD = 28.2 km, n = 11 points). Longitudinal error averaged 56.3 km (range 19.1–89.1 km, SD = 19.0 km, n = 11), and latitudinal error averaged 57.2 km (range 2.9–142.9 km, SD = 41.5 km, n = 11). The geolocator stopped recording data on removal so we were unable to calibrate it after retrieval. Because the bird was a week into nesting when recaptured, so presumably at or near
the nest the entire week, we compared the data from the week prior to recapture, 10–15 July 2012, to the location of her active nest. The mean distance between the estimated locations and the nest was 221.2 km (range 22.1–387.7 km, SD = 110 km, n = 10). We used this distance (221 km)
Figure 2. Comparison of migration routes, schedules, and wintering grounds of two Western Yellow-billed Cuckoos from the lower Colorado River (a) and the middle Rio Grande (b; data from Figure 2 in Sechrist et al. 2012). Points along the routes also coded as 1, capture/breeding location; 2, post-breeding, Aug–Sep, and pre-breeding, Jun; 3, fall migration, early Oct; 4, fall migration, mid-Oct; 5, winter range, Dec–Mar; 6, spring migration, late Apr; 7, spring migration, mid-May; 8, spring migration early Jun; 9, spring migration, mid-Jun.
as the width of the buffer to display positional error around the points. The mean latitudinal error from the nest was 211.2 km south (range 16.3–353.9 km, SD = 107.1 km, n = 10), or approximately 2° south, large compared to the longitudinal error (mean 57.2 km, range 10.7–158.3 km, SD = 43.6 km, n = 10). Visual assessment of the locations suggested that through the year, several other points outside the grasp of the equinoxes were shifted south by a similar amount, including a cluster of points placed in the Pacific Ocean south of Central America, when the bird was probably in Panama, Nicaragua, or Honduras during spring migration.

We inferred the following from the estimated locations:

Post-breeding Dispersal and Fall Migration

• The bird left the breeding site around 17 August, moving east toward central southern Arizona or northwest Mexico, where she remained until 13 September.
• On 14 September, she flew east to 104°–107° W longitude, staying until 27 September.
• After spending six weeks in the southwest U.S. or northern Mexico post-breeding, the bird swiftly moved east, apparently flying ~2000 km from 27 September to 1 October (mean 500 km/day). By 1 October she was at 85.5°–87.5° W longitude.
• On 3 October, she was in line with Florida, Cuba and Central America. From 6–19 October she was east of Florida’s longitude.
• From 20 to 25 October, she apparently moved through eastern Colombia, then spent late October to mid-November in Amazonian Brazil.

Winter

• The bird spent mid-November through March, and probably April, in the Gran Chaco of central South America, in the region where the borders of Paraguay, Bolivia, and Argentina intersect.
• Latitude data from 12 to 29 March were unusable, the dates being too near the equinox, but longitude was static. By late March she had possibly moved south toward coastal Argentina. It is unclear if this shift was error due to weather or a prolonged effect of the equinox.

Spring Migration

• She began moving north by 28 April and was in Central America from late May to early June.
• Data from June were largely unusable (possibly because of weather or the geolocator being too shaded), but she likely moved northwest through southern Mexico to arrive in central Mexico 18–23 June. By 28 June, she was back in southern Arizona or Sonora.
• By 9 July she had returned to the breeding site, and began nesting around 12 July.

Fall migration from the southwest U.S. to South America took three weeks (mean 225–250 km/day), with another month taken to arrive on the wintering grounds (mean 117 km/day). Spring migration lasted two months, one month
from the wintering grounds to Central America (mean 150 km/day), another to the southwest U.S. (mean 123 km/day). The distance from the breeding site to the core wintering grounds was 9500–9900 km (depending on the fall route), and the distance back to the breeding site was 9100–9200 km.

In comparison to that tracked by Sechrist et al. (2012), our cuckoo took a similar but reversed loop route (Figure 2). That is, she apparently migrated through the Caribbean in the fall and through Central America in the spring, whereas the cuckoo captured on the middle Rio Grande took a fall route through Central America and returned in the spring through the Caribbean. The timing of the two cuckoos’ migration was also strikingly similar; both apparently left their breeding grounds around late August, arrived in northern Colombia in mid-October, and arrived on the wintering grounds mid-November. Both began spring migration in late April, and after staging in other areas in northwest Mexico or southern Arizona, they both returned to their respective breeding grounds around the end of June.

DISCUSSION

Understanding the cuckoo’s migration strategies and where it stages and winters enables the expansion of management beyond the present limited scope of its breeding grounds. On a more basic ecological level, this information may help answer questions about flexibility in migration strategy and divergence of eastern and western Yellow-billed Cuckoo populations. Additionally, as geolocator technology for smaller birds is still evolving, our results support the application of this technology to smaller migratory land birds.

We did not find the geolocators to affect the cuckoos’ rate of recapture or ability to breed; the fraction 1/8 recaptured is comparable to the 9.9% rate of recapture of 183 cuckoos banded along the lower Colorado River from 2009 to 2012 (McNeil et al. 2013). In a review of geolocator studies, Bridge et al. (2013) also found rates of return of birds with and without geolocators to be comparable. Though we failed to find any of the 21 other adults captured but not fitted with geolocators in 2011, we recaptured three birds banded in the study area in earlier years (McNeil et al. 2013), suggesting some site fidelity with a relatively low probability of recapture. That all geolocator-fitted cuckoos thus far recaptured have been female (three including another female recaptured on the Pecos River whose geolocator failed soon after deployment, Sechrist and Best 2012) is somewhat unexpected because we typically capture and recapture fewer females than males (16% and 2.8% fewer, respectively; McNeil et al. 2013). Females average around 10% heavier than males (in this small sample of eight birds, the females averaged 14% heavier), though all our attachments weighed no more than 1.9% of the body mass of any bird, below the recommended limit of 3% (Gustafson et al. 1997). As birds may lose mass during migration, we recommend long-term attachments be as light as possible.

Our exclusion of over 60% of the data is consistent with other studies that have discarded as much as 62% of data from birds inhabiting forested environments (e.g., Ryder et al. 2011), the result of shade confounding the light-level readings from which locations are calculated (Fudickar et al. 2012). As we found, location error averaging over 200 km (Fudickar et al.
(Lisovski et al. 2012) is typical for latitude (see Hill 1994 for detailed explanation), and latitude data from the periods around the fall and spring equinoxes were largely unusable, often implying locations near the poles (data not shown). Unfortunately, our bird spent the period most affected by the fall equinox making the largest movements east. Because readings for longitude are unaffected during the equinoxes, we were able to infer possible routes for this portion of fall migration. As the first tracked cuckoo passed between the West Indies and Yucatan Peninsula (Sechrist et al. 2012), this route (though reversed in direction and season) seems the most plausible.

The apparent staging by both tracked cuckoos in southern Arizona or northern Mexico pre- and post-breeding suggests this region is important to the western population during these stages of its life cycle. The Yellow-billed Cuckoo is often described as wandering or nomadic during periods surrounding the breeding season, exploiting outbreaks of large insects (Hamilton and Hamilton 1965, Hughes 1999); birds of many species wander considerable distances after breeding but before migration (Rappole and Ballard 1987). Nomadic or exploratory behavior should aid the cuckoo in locating ephemeral patches of cottonwood–willow forest.

The North American monsoon typically develops over southwest Mexico from late May to early June, arriving in northwest Mexico from mid- to late June, and in the southwest U.S. by early July (Adams and Comrie 1997)—roughly tracking the movement of our cuckoo through Mexico in June to its arrival in the southwest U.S. by early July. The spike in rainfall in July and August over the center of the monsoonal region in northwest Mexico (Douglas et al. 1993) coincides with the peak of western cuckoo nesting. If cuckoos track monsoonal flushes of new vegetation and insects (Wallace et al. 2013), they may be pursuing a multi-stage strategy for breeding and migration, as found in some other birds (e.g., Stach et al. 2013).

Sechrist et al. (2012) raised “migratory double-brooding” (breeding in two regions in one year, separated by a migration) as a possible reason for cuckoos to visit Mexico late in the breeding season. First suggested by Rohwer et al. (2009), this hypothesis is based on circumstantial evidence alone, and it appears increasingly unlikely (Rohwer and Wood 2013). Sechrist et al. (2012) also suggested molt migration as a possible cause for the stopover in Mexico, while acknowledging that the stopover was too brief; also, the Yellow-billed Cuckoo molts its flight feathers mainly in its winter range (Pyle 1997, Rohwer and Wood 2013). Tracking many more individuals, through more than one annual cycle, is needed to test these hypotheses and assess fidelity to staging areas.

The similarity in the timing of the two tracked cuckoos’ migration was unsurprising. In long-distance migrants, it is often highly consistent within a population (Stanley et al. 2012) and determined genetically (Berthold and Helbig 1992), though it can be affected by factors such as energetic condition and nesting date (Stutchbury et al. 2011). Western cuckoos’ breeding much later than the eastern population (Hughes 1999) also suggests the western population may winter farther south and thus travel farther from the winter to the breeding grounds (Rubolini et al. 2005), or it may begin spring migration later than the eastern population. The lack of migration data on eastern individuals currently prevents further comparison.
The reversal of the two tracked cuckoos’ loop routes implies that western cuckoos’ migration routes are flexible, as found in some other species (Al-erstam et al. 2006, Vardanis et al. 2011, Stanley et al. 2012). Sechrist et al. (2012) already dispelled speculation that only eastern cuckoos migrate through the Caribbean (Hughes 1999), and both birds’ passing through the Caribbean suggests migration of western cuckoos through this area may even be common. Within a population, migration routes are generally more flexible than timing (Delmore et al. 2012, Stanley et al. 2012), as we found. Loop routes are common (Klaassen et al. 2010, Stanley et al. 2012), though typically the movement is in a consistent direction (e.g., clockwise). Because wind direction can be the greatest predictor of flight direction (Able 1973), the direction of the wind at the start of each migration may have driven each bird’s decision whether to pass through Central America or the Caribbean.

The threats to western cuckoos on their breeding grounds, primarily habitat loss and degradation (Gaines and Laymon 1984), increasingly exacerbated by long-term drought and climate change (Ault et al. 2014), may be even greater in their winter range. The Gran Chaco, containing the second largest native forest in South America after the Amazon Basin, has, over the last few decades, experienced large-scale conversion and fragmentation of forest for expanding cattle and soybean production (Berbery et al. 2006). Deforestation of the Chaco in Argentina, Paraguay, and Bolivia represents the greatest loss of forest cover globally in the 21st century (Hansen et al. 2013). From 2005 to 2010, annual rates of deforestation in this region (1.5–2.5%) surpassed Latin American and world averages (0.5% and 0.2%, respectively, reviewed by Seghezzo et al. 2011). Gasparri and Grau (2009) found deforestation of Chaco dry forest accelerating, with over 1.4 million ha destroyed in the last 35 years. Mastrangelo and Gavin (2014) encouraged alternatives to intensive agriculture, such as selective clearing, to lessen the continuing reduction of habitat for birds in this region. A better understanding of the winter range, including identifying and supporting actions to reduce these threats, will promote conservation of western cuckoos through their full life cycle.

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LOOP MIGRATION AND CHACO WINTERING BY A YELLOW-BILLED CUCKOO


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The Black-capped Vireo (*Vireo atricapilla*), listed as endangered by the U.S. Fish and Wildlife Service, breeds in southwestern Oklahoma, central Texas, and northern Mexico (Grzybowski 1995, Wilkins et al. 2006). Its breeding habitat is typically composed of low, deciduous shrubs and trees of irregular heights, heterogeneity that may result from local environmental conditions (e.g., soil type, climate) or must be maintained by periodic disturbance (e.g., wildfire, prescribed burning) (Graber 1961, Grzybowski 1995). Habitat loss (e.g., land-use conversion, vegetation succession), habitat degradation (e.g., grazing by domestic livestock, browsing by wild herbivores), and nest parasitism by the Brown-headed Cowbird (*Molothrus ater*) precipitated the species’ decline (Ratzlaff 1987). Since the vireo’s listing as endangered (Ratzlaff 1987), most of its management (e.g., cowbird removal, habitat manipulation) and research has taken place at a few prioritized study sites in Texas (e.g., Grzybowski et al. 1994, Stake and Cimprich 2003, Pope et al. 2013) and Oklahoma (e.g., Grzybowski et al. 1994). Smith et al. (2012) added to our understanding of vireo-habitat relationships in the southwestern portion of the breeding range in Texas. Information regarding the vireo’s occurrence, abundance, and reproductive status in relation to habitat characteristics is still lacking for north-central Texas.

In April 2011, four wildfires called the Possum Kingdom Complex burned 51,000 ha in Stephens, Palo Pinto, and Eastland counties in north-central Texas (McFarland et al. 2012). The vireo’s breeding range overlaps the area burned in these wildfires (Grzybowski 1995). Few vireo detections have been recorded in these counties, however (Wilkins et al. 2006, McFarland et al. 2013), and no information regarding the abundance or reproductive status of the vireo in this region has been published. In 2012, we searched for vireos at the 753-ha Possum Kingdom State Park, located in the northwest portion of Palo Pinto County and centrally located between three well-studied vireo sites in Texas and Oklahoma, the Kerr Wildlife Management Area (~440 km southwest, Texas), the Fort Hood Military Reservation (~300 km southeast, Texas), and the Wichita Mountains National Wildlife Refuge and adjacent Fort Sill (~220 km north, Oklahoma). There had been unpublished reports of male vireos at Possum Kingdom State Park in some years before the 2011 wildfire, which affected >70% of the park. We did not detect any vireos in the park in 2012 but did locate males, females, and fledglings during point counts and systematic searches in 2013 and 2014.

From 27 March to 26 June 2013 and from 23 March to 29 April 2014, two independent observers conducted each point count at ~2-week intervals along a grid of points spaced 400 m apart across the entire park. We used this spacing to minimize the risk of recounting individuals while maximizing the number of points we could visit.
within the park’s boundaries. Observers surveyed each point three times in 2013 and 2014, representing six independent surveys per point per year. During surveys, from 06:30–13:00, observers recorded all singing male vireos detected within 100 m of each point over 5 min. Although other species were not the focus of the study, we also recorded all singing male Golden-cheeked Warblers (Setophaga chrysoparia) and vocalizing cowbirds detected during our surveys. We did not count during inclement weather (e.g., excessive rain or wind >~20 km/hr) or any other conditions that could inhibit our ability to detect the vireo.

In addition, to assess the vireo’s breeding at this site, we systematically searched for females and fledglings at intervals of ~2–4 weeks from 27 March to 29 June 2013 and 23 March to 10 July 2014 along a 200-m grid established for vegetation measurement (see below). This smaller grid aligned with our larger 400-m grid so that our systematic surveys included the space between our count points. When we detected a vireo by either method, we checked if it was banded and searched the surrounding area for additional vireos. We recorded the coordinates of all vireos with hand-held Global Positioning System units and documented the behavior of all individuals observed.

We detected the first male vireo during a point count in burned vegetation in early May 2013, then found another in late May and a third in early June during systematic surveys in burned vegetation adjacent to mature woodland in the western portion of Possum Kingdom State Park. During systematic surveys in the same area in late June, we noted two males plus a family group (one male, one female, and two fledglings estimated to be ~1 week old). In 2014, during systematic surveys, we again detected vireos in burned vegetation in the western portion of the park (two males and one female in late May; three males, one female, and one fledgling estimated to be ~1 week old in early July). Also in 2014, we found vireos during point counts and systematic surveys in burned vegetation in the southeastern (six males in late April; two males and one female in late May; two males and two females in early July), central (three males in early July), and northern (one male in early July) portions of the park. No birds were banded, so the total number of detections over multiple visit can not specify the total population. But the number of vireos detected within the park increased over the three years after the fire.

There were no pre-fire vegetation data for Possum Kingdom State Park, but the fire’s intensity within the park was high (K. Skow, unpubl. data); most vegetation was completely cleared from plateaus, leaving only snags in previously wooded areas. After the fire, mature vegetation remained only along slopes and draws. At the end of the vireo’s breeding season in both 2013 and 2014, we sampled vegetation along a grid of points spaced 200 m apart and aligned with our bird-count points. At each vegetation-sampling point and at points located 5 m from the grid point in each cardinal direction, we recorded percent canopy cover of all live and dead woody plants ≥2 m to the nearest 10% with a tubular densitometer and canopy height to the nearest 0.5 m with a retractable meter stick. We apportioned canopy cover by tree species, considering snags as a separate category. We then established a circle of radius 5 m around the center point and divided the circle into four quadrants based on the four cardinal directions. Within each quadrant, we visually estimated percent shrub cover for all live and dead woody plants <2 m, percent herbaceous cover, and percent bare ground to the nearest 10%. As for trees, we divided our overall shrub measurements by species within the shrub layer, again segregating snags as a separate category.

We categorized our vegetation-sampling points as (1) mature woodland representing pre-fire conditions (“unburned”), (2) burned areas that were not occupied by vireos (“burned”), and (3) burned areas that were occupied by vireos (“occupied”). The last included all vegetation-measurement points within 200 m of a vireo detection. We then estimated the means and standard deviations for overall canopy cover and height, species-specific canopy cover and height, overall shrub cover, species-specific shrub cover, herbaceous cover, and bare ground within unburned, burned, and occupied
vegetation for each year of our study (Table 1). Given the small number of sampling points located in vegetation occupied by vireos compared to that in unburned and burned vegetation, we did not compare the vegetation categories statistically.

As expected, mean percent canopy cover and mean canopy height were much greater in unburned than burned and occupied areas (Table 1). Ashe juniper (*Juniperus ashei*) was the dominant canopy species of unburned areas, constituting ~80% of the available canopy cover both years. The remaining ~20% of canopy cover was composed of 8 deciduous species in 2013 and 11 deciduous species in 2014 (e.g., cedar elm, *Ulmus crassifolia*; Texas oak, *Quercus buckleyi*; shin oak, *Q. sinuata*). The mean height of Ashe juniper in unburned areas was 3.2 m in 2013 and 3.8 m in 2014. Mean overall canopy cover was minimal in burned and occupied areas, regardless of year (Table 1).

By contrast, mean percent shrub cover was greater in burned and occupied areas than in unburned areas and appeared to increase across all areas with time since the 2011 wildfire, most notably in areas occupied by vireos (Table 1). We recorded 14 and 19 species in the shrub layer of unburned areas in 2013 and 2014, respectively. Ashe juniper was the most prominent species in the shrub layer of unburned areas (33% of shrub cover in 2013, 36% in 2014). The remainder (67% in 2013 and 64% in 2014) was composed of deciduous species. In 2013, the three most prominent deciduous species in the shrub layer of unburned areas included shin oak (13%), snags (9%), and willow (*Salix* spp.; 7%). In 2014, the three most prominent deciduous species in the shrub layer of unburned areas included shin oak (11%), prickly pear (*Opuntia* spp.; 9%), and live oak (*Q. fusiformis*; 4%).

In burned areas, the number of shrub species was similar (14 in 2013 and 21 in 2014), but Ashe juniper was nearly lacking (0% of shrub cover in 2013, <1% in 2014). In 2013, the three most prominent shrub-layer species in burned areas were flame-leaf sumac (*Rhus lanceolata*; 23%) and shin oak (17%); snags constituted 18%. In 2014, the three most prominent shrub layer species were flame-leaf sumac (26%), prickly pear (*Opuntia* spp.; 25%), and shin oak (14%). We recorded fewer shrub species in occupied areas (6 in 2013 and 12 in 2014). As in burned areas, Ashe juniper was not a major component of the shrub layer in areas occupied by vireos (0% of shrub cover in 2013, <1% in 2014). In 2013, the three most prominent shrub species in occupied areas were shin oak (33%) and willow (14%), with snags representing 14% of cover. In 2014, the three most prominent shrubs in occupied areas were flame-leaf sumac (54%), shin oak (23%), and Texas elbow-bush (*Forestiera pubescens*; 2%). Herbaceous cover was more extensive and bare ground was less extensive in burned and occupied areas than in unburned areas (Table 1).

### Table 1  Vegetation Measurements in Unburned Areas, Burned Areas Not Occupied by Black-capped Vireos, and Burned Areas Occupied by Vireos at Possum Kingdom State Park, Palo Pinto County, Texas, Two and Three Years after a Wildfire

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<tr>
<td></td>
<td><em>n</em> = 72</td>
<td><em>n</em> = 91</td>
<td><em>n</em> = 4</td>
<td><em>n</em> = 65</td>
<td><em>n</em> = 81</td>
<td><em>n</em> = 16</td>
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<td>Overall canopy cover (%)</td>
<td>34 (23)</td>
<td>0.8 (2.4)</td>
<td>3 (6)</td>
<td>40 (18)</td>
<td>6 (10)</td>
<td>6 (12)</td>
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<td>Overall canopy height (m)</td>
<td>4.9 (1.9)</td>
<td>0.7 (1.5)</td>
<td>1.3 (2.5)</td>
<td>4.6 (1.8)</td>
<td>2.0 (2.5)</td>
<td>3.3 (2.8)</td>
</tr>
<tr>
<td>Overall shrub cover (%)</td>
<td>10 (12)</td>
<td>16 (14)</td>
<td>18 (12)</td>
<td>11 (13)</td>
<td>17 (19)</td>
<td>31 (19)</td>
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<tr>
<td>Herbaceous cover (%)</td>
<td>27 (23)</td>
<td>41 (23)</td>
<td>59 (26)</td>
<td>22 (20)</td>
<td>39 (20)</td>
<td>33 (12)</td>
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<tr>
<td>Bare ground (%)</td>
<td>47 (26)</td>
<td>34 (22)</td>
<td>21 (27)</td>
<td>51 (22)</td>
<td>27 (22)</td>
<td>24 (13)</td>
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*Means with standard deviations.*
Vegetation used by Black-capped Vireos breeding at our north-central Texas study site was similar to that the species uses in other parts of its breeding range, in that the cover of deciduous shrubs was greater than in nearby unoccupied habitat (Grabert 1961, Grzybowski 1995). In contrast to Kerr Wildlife Management Area (Pope et al. 2013) and Fort Hood Military Reservation (Conkling 2010), at Possum Kingdom State Park vireos did not occupy mature oak–juniper woodland, during the years of our study. On the basis of studies in Texas (Kerr Wildlife Management Area and Fort Hood Military Reservation) and Oklahoma (Wichita Mountains National Wildlife Refuge and adjacent Fort Sill), Grzybowski et al. (1994) reported shrub cover in suitable habitat to range from 35 to 65%. Similarly, at the Fort Hood Military Reservation Bailey and Thompson (2007) found that vireos were more likely to inhabit vegetation patches with intermediate (50%) levels of deciduous shrub cover. Our results from the north-central portion of the Black-capped Vireo’s breeding range indicate that the species can occupy and successfully breed in recently burned areas with less shrub cover (18% in 2013 and 31% in 2014).

The Black-capped Vireo’s use of recently disturbed vegetation depends on factors that influence post-fire vegetation succession, such as pre-fire characteristics of the plant community, fire intensity, weather before and after the fire, and time since last burn (Grzybowski 1995). At Kerr Wildlife Management Area, Dufault (2004) found that the vireo use of vegetation was greatest within 2 years of prescribed burning. At the Fort Hood Military Reservation, vireo abundance increased 3 to 4 years after wildfire (Cimprich 2002). At Possum Kingdom State Park, we detected more vireos in 2014 (3 years post-wildfire) than in 2013 (2 years post-wildfire), a pattern consistent with other areas in Texas. While catastrophic from a social perspective, the 2011 wildfire provided an excellent opportunity to gain information on the vireo’s responses to wildfire in an underrepresented portion of its breeding range. Additional research in north-central Texas would add to our knowledge of the Black-capped Vireo’s ecology and help inform efforts to conserve it.

This study was funded by the Joint Fire Science Program, a multiagency and development partnership formed to investigate all aspects of fire science. Access to Possum Kingdom State Park was granted by Texas Parks and Wildlife. We thank Tiffany McFarland for her contributions to this project and the Institute of Renewable Natural Resources for logistical support. We thank all field technicians who helped record our data. We acknowledge David Cimprich and an anonymous reviewer for providing helpful comments on an earlier draft of the manuscript.

LITERATURE CITED


NOTES


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GOLDEN-CHEEKED WARBLER: NEW MAXIMUM LONGEVITY RECORD

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The Golden-cheeked Warbler (Setophaga chrysoparia) breeds exclusively in juniper–oak woodlands in central Texas (Ladd and Gass 1999). It was listed as endangered in 1990 because of habitat loss and fragmentation (Smith 1990). Much of the research on the Golden-cheeked Warbler’s demography has been part of long-term monitoring at Fort Hood Military Reservation and at Balcones Canyonlands Preserve (see Groce et al. 2010). The species has been banded and monitored at other locations as well, including Kerr Wildlife Management Area (WMA), Kerr County.

On 19 April 2013, we observed an adult male Golden-cheeked Warbler at Kerr WMA with a single aluminum U.S. Geological Survey band on his left leg. On 14 May 2013, we captured the banded male by placing a mist net near him while he was singing and playing a recording of the species’ song to lure him into the net. With the bird in hand, we recorded the number on his band (2410-77143) and added three auxiliary color bands so that he could be identified later by sight. We continued to monitor the male over the 2013 breeding season (March to July). In 2014, five different observers independently identified the male on 12 separate occasions and accurately recorded his unique combination of color bands. He successfully paired and fledged young in both years. On 9 May 2015, Colón and Holden observed the male again and independently recorded the correct color band combination. The male was foraging quietly in the company of a female, an unbanded male, and fledglings.

The bird was originally banded at Kerr WMA on 19 April 2006 (D. A. Cimprich pers. comm.). We first located him in 2013 in the southern portion of Kerr WMA and found him in the same small patch of vegetation again in 2014 and 2015, supporting previous observations that the site fidelity of male Golden-cheeked Warblers to their breeding grounds is high (Pulich 1976, Peak and Thomas 2010). On the basis of his plumage, the male was at least two years old when banded in 2006. We last observed him on 9 May 2015, inferring a minimum age of 11 years.

Despite the Golden-cheeked Warbler’s endangered status and long-term efforts at banding and monitoring at other locations, little information exists regarding the species’ maximum longevity (see Groce et al. 2010). The oldest male and female Golden-cheeked Warblers previously reported were 8 and 6 years old, respectively (Ladd and Gass 1999, R. G. Peak, unpubl. data). Our observations extend the known maximum longevity of male Golden-cheeked Warblers beyond earlier reports. Our observations also place the Golden-cheeked Warbler among the few Setophaga warblers known to be capable of living to over 10 years. To our knowledge, longevity of ≥10 years has been reported for only six other species of Setophaga: Adelaide’s (S. adelaidae), Prairie (S. discolor), Townsend’s (S. townsendi), Yellow (S. petechia), and Yellow-rumped Warblers (S. coronata auduboni) and the American Redstart (S. ruticilla) (Kennard 1975, Klimkiewicz et al. 1983, Lutmerding and Love 2014).

Longevity is an important demographic trait with consequences for population dynamics. Long-lived species, for example, may be less sensitive to demographic variability and fluctuations in population size over time (Garcia et al. 2008, Morris et al. 2008). Our single record provides only a glimpse into the Golden-cheeked
Warbler’s maximum longevity. Continuing long-term monitoring, however, offers the possibility for further observations of this demographic variable. Future records may prove useful in models of population viability or growth, which can help improve conservation planning and management.

We thank the Texas Parks and Wildlife Department and the staff at Kerr WMA, especially Donnie Frels and Ryan Reitz. We also thank the many field technicians who assisted with monitoring at Kerr WMA in 2013 and 2014. We thank Danny Bystrak and the U.S. Geological Survey Bird Banding Laboratory for providing banding records, and we thank David A. Cimprich, James Giocomo, and others who reviewed early drafts of the manuscript. Funding for monitoring at Kerr WMA was provided by the Joint Fire Science Program. Logistical support was provided by the Texas A&M Institute of Natural Resources. The warbler was originally banded by Giri Athrey. We rebanded the warbler under U.S. Fish Wildlife Service endangered species permit TE195248-6 and bird-banding permit 21755.

LITERATURE CITED


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HYPERMELANISTIC AMERICAN PIPIT RETURNS TO WINTER IN CENTRAL CALIFORNIA

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On 1 December 2013, I observed a hypermelanistic American Pipit (Anthus rubescens) at Bedwell Bayfront Park in San Mateo County, California (Schneider 2014). This rather striking individual remained there through at least 4 January 2014. Almost a year later, on 5 November 2014, I found a similar pipit at the same location, where it remained through at least 28 January 2015. The bird was judged by photos to be in its first year when observed in 2013. Photographs of the bird in 2014–2015 again show a rather uniform medium-brown plumage with pale edging on the wing coverts and tertials and a blackish bill and legs, and the shape of the primary coverts, as well as other features of the plumage, made it possible to age the bird then as an adult. As the bird was not captured and banded in winter 2013–2014, it is difficult to prove that the pipit the following winter was in fact the same bird, but the rarity of this plumage abnormality in pipits, the similar overall appearance from one winter to the next, and the same location argue strongly that this was indeed the same bird. The progression in the apparent age of the bird from first year to adult also lends support to this conclusion.

One possible alternative to the earlier conclusion (Schneider 2014) was that I had not been able to exclude entirely the possibility of adventitious discoloration (as by soot or mud), but I think that the overall appearance of the bird, including the residual patterning with pale edges to many of the flight feathers, made this unlikely. That the dark plumage remained one year later and, presumably, after both a partial prealternate and complete prebasic molt provides further evidence that the coloration was an intrinsic abnormality (such as increased melanin pigment) and not a result of soiling or other external factors.

It is not clear whether or not this coloration would make the bird unusually conspicuous and vulnerable to predation, but it is of interest that such a bird apparently survived into its second year. Of perhaps greater interest, little has been learned about fidelity to wintering sites in this species (Hendricks and Verbeek 2012). Hudson (1928) reported the recurrence of a “partial albino” American Pipit wintering in South Carolina. My current observations add to the anecdotal evidence that flocks of American Pipits we observe in winter at any one locality may be composed of many of the same individual birds seen there in prior years. Studies with banded or otherwise marked or tracked birds could provide helpful insight into this question.

I thank Paul Hendricks for his encouragement and for pointing out the 1928 paper by Hudson. Peter Pyle was kind enough to examine my photos of the returning bird and aged the bird as an adult.

LITERATURE CITED


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FIRST OCCURRENCE OF THE CAVE SWALLOW IN BRITISH COLUMBIA

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On 11 November 2012 we observed a group of four swallows foraging over a freshwater pond at Iona Island Regional Park in Richmond, British Columbia (49° 21' N 123° 21' W). At a distance of 100 m, we quickly identified three of them as Barn Swallows (Hirundo rustica), while the fourth appeared at first to be a Cliff Swallow (Petrochelidon pyrrhonota). When it got closer to the observers, we identified the fourth bird—by its dark cinnamon-orange forehead, pale cinnamon-orange throat and chin, and dark cinnamon-orange rump—as a Cave Swallow (Petrochelidon fulva) (Figures 1 and 2), a species previously unknown in British Columbia. The bird remained at Iona Island for nine days (to 19 November), during which period it was seen and photographed by many. Photographs show that the bird was undergoing primary molt and that it had replaced primaries 1 through 6 (Figure 1). The prebasic molt of adult Cave Swallows begins promptly after breeding, with flight feathers being replaced from June through September. In contrast, the preformative molt of immature birds occurs later, in the fall and winter, with flight-feather replacement from September through March (Pyle 1997). Given the date of our observation and the extent of primary replacement, we aged the bird as an immature in preformative molt.

Of five generally accepted subspecies of the Cave Swallow (Strickler and West 2011), three (puertoricens in Puerto Rico, poeciloma in Jamaica, and citata in the Yucatan and Chiapas), are thought to be nonmigratory and are not known to have occurred in the United States or Canada. Two subspecies, P. f. fulva and P. f. pallida, are migratory and are known to occur in the United States and Canada. Nominate fulva breeds in Cuba, including the Isle of Pines, and Hispaniola (Strickler and West 2011), and in 1987 a breeding population became established in southern Florida (Smith et al. 1988). Subspecies pallida breeds in Texas, New Mexico, and north-central Mexico (Strickler and West 2011).

Subspecies pallida differs from the others by its longer wing and tail and paler rufous coloration (Ridgway 1904, Selander and Baker 1957, Turner and Rose 1989, Garrido et al. 1999). More specifically, nominate fulva has darker cinnamon-rufous or deep chestnut coloration on the forehead, cheeks, collar, throat, breast, flanks, vent, and rump, while pallida, in contrast, has the forehead and rump paler orange-rufous and the collar, throat, cheeks, and breast pale buffy-orange or cinnamon-orange. In contrast to those of P. f. fulva, the flanks and vent of P. f. pallida have limited rufous coloration and are mostly gray-brown.

The Iona Island Cave Swallow exhibited less extensive cinnamon-orange coloration on the rump and cheeks than does P. f. fulva, and its flanks and vent were gray-brown, with rufous nearly absent. The collar was mostly gray-brown with little cinnamon-orange at the base of the head, and the forehead was darker and more saturated than the cinnamon-orange of the rump, cheeks, throat, and breast (Figures 1 and 2). These plumage characteristics all strongly suggest that the bird was an example of the southwestern subspecies, P. f. pallida.

In Texas, the breeding population of P. f. pallida has increased considerably (10.8% annually), from 1957 to 1999 expanding its breeding range by 900% (Kosciuch et al. 2006). In eastern North America, extralimital occurrences of Cave Swallows (both...
subspecies) have increased in frequency, with reports extending from their breeding ranges north to the Great Lakes and east to Canadian Atlantic provinces. McNair and Post (2001) examined photographs and specimens of extralimital Cave Swallows in eastern North America and reported that spring occurrences on the Atlantic coast were of *P. f. fulva*, spring occurrences inland were of *P. f. pallida*, and fall occurrences at both coastal and inland localities were of *pallida*. Subsequently, a few Cave Swallows occurring along the Atlantic coast in spring appear to have included *pallida* as well (P. E. Lehman pers. comm.). Fewer occurrences have been recorded west of the normal breeding range of *pallida*: eight records in Arizona (Rosenberg et al. 2011) and nine in California (Tietz and McCaskie 2014). McNair and Post (2001) concluded that the single breeding pair in Arizona and the first Cave Swallow recorded from California were *pallida*. Hamilton et al. (2007) suggested that *pallida* is likely the subspecies to which all California records can be attributed.

Our record is the first of a Cave Swallow in western Canada and the Pacific Northwest but follows the pattern of increasing vagrancy in the East that is likely being driven by the expansion of the breeding population in Texas and New Mexico.

We thank Michelle Lamberson and David Tang for making their photographs available to us. Our manuscript was greatly improved through the reviews of Daniel Gibson and Steven Heinl.

LITERATURE CITED


NOTES


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DIRECT REMOVAL OF FECAL SACS BY ROCK WRENS

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Removal of fecal sacs from nests during nestlings’ development is an adaptive behavior shared by most species of passerines (Skutch 1976, Welty 1982, Weatherhead 1984). The selective forces that have shaped nest-sanitation behavior remain unclear, but clean nests are thought to be less likely to attract predators (Petit and Petit 1987, Petit et al. 1989; but see Ibáñez-Alamo et al. 2014a). Nest-sanitation behavior also appears to improve a host’s rejection of a brood parasite’s eggs (Moskat et al. 2003, Guigueno and Sealy 2012). In many studies nest sanitation is linked explicitly to measures of parental investment, including feeding rates (Ricklefs 1977, Gustafsson and Sutherland 1988, Markman et al. 2002). All of these studies indicate that the removal of fecal sacs can improve reproductive success for the parents, but fewer studies have focused on the role of nestlings’ behavior in nest sanitation, particularly in coordination with parental actions. Such behaviors have been known for some time. For example, Blair and Tucker (1941) described “active cooperation” behaviors, in which nestlings of multiple species with varied nest types were observed making deliberate movements to facilitate removal of their feces. Selection for behaviors that facilitate efficient removal of fecal material should be beneficial because they prevent nest contamination and decrease the time and energy expenditure given to nest sanitation (Thomson 1935, Spencer 2005, Ibáñez-Alamo et al. 2013). Nestlings of a few passerine species have been observed to raise their tails in response to adults’ visits to the nest in order to facilitate cloacal stimulation, after which the adults pick up the fecal sacs and either remove them from the nest or eat them (Selous 1933, Smith 1942, Davis 1978). Other researchers describe parent birds waiting near nestlings to remove fecal sacs from the nest floor (Gabrielson 1912, Laskey 1948, Ley and Williams 1998). In the House Wren (Troglydytes aedon) in Surinam, Haverschmidt (1952) described parents removing fecal sacs directly from the cloacae of nestlings, a behavior also described by Dobbs et al. (2001) in the Scaled Antpitta (Grallaria guatimalensis). This direct removal of fecal sacs likely eliminates a parent bird’s need to search for and pick up feces during the time of maximum provisioning effort, and it could limit the amount of potentially harmful bacteria within nests (Ibáñez-Alamo et al. 2014b). Direct removal of fecal sacs can be difficult to observe, particularly in cavity nests or nest boxes, and may therefore go underreported and undescribed. To date there have been few accounts of nestlings cooperating with parents to remove waste in species nesting in rock cavities, and even fewer photos or videos documenting such coordinated sanitation behaviors.

The Rock Wren (Salpinctes obsoletus) nests in rock cavities, with both males and females participating in chick rearing and nest sanitation (Lowther et al. 2000, Warning and Benedict 2015; Figure 1). From 2012 to 2014 we used direct observation and motion-activated cameras (Reconyx, Holmen, WI) to observe five pairs of Rock Wrens provisioning their young on public lands in montane shrublands near Fort Collins, Colorado (40° 31.56° N, 105° 09.29° W). The nests contained 3–5 chicks (average 4) with broods ranging in age from 7 to 14 days. We placed cameras (adjusted to 1 m focal length) ~1 m from three ground-based nests and directly observed two nests located in cliff cavities. We did not quantify rates of fecal-sac removal or standardize observation effort across nests so report only qualitative natural history data. Because
of shadowing within the nest cavities during our observations, we describe behaviors
near the nest-cavity entrances as nestlings became more mobile, within 1–2 days of
fledging.

At each of the five nests, we documented Rock Wrens removing fecal sacs both
from the floor of the nest cavity and directly from the cloacae of nestlings (Table 1).

During direct removal, which typically followed a feeding, a chick turned away from
its parent, raised its tail, and produced a fecal sac in apparent response to the approaching or waiting adult. The adult Rock Wren quickly removed the fecal sac directly from
the cloaca, carried the waste in flight, and dropped it away from the nest (Figure 2; see also video recorded by Meyer on 14 June 2012 at youtu.be/Uag8xfJ3qbM).

Our photos and video provide clear documentation of a phenomenon that has
previously been described in only a few bird species. Rock Wren nestlings coordinate
their behaviors with their parents’, aiding in efficient removal of waste from nests.
Many other species are likely to behave similarly. In other species researchers have
described unusual adaptive nest-sanitation behaviors and changes in nest-sanitation
behavior over time (Blair and Tucker 1941, Glück 1988). Further studies are needed
to determine the specific benefits of this behavior to the Rock Wren and to determine

Table 1 Locations, Active Dates, Observation Dates, and Methods of Observing
Fecal-Sac Removal from Five Rock Wren Nests in Larimer County, Colorado

<table>
<thead>
<tr>
<th>Location</th>
<th>Known active dates</th>
<th>Observation date(s) of fecal sac removal</th>
<th>Method</th>
<th>Type(s) of removal observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devils Backbone Open Space</td>
<td>5 June–16 June 2012</td>
<td>14 June</td>
<td>Direct observation</td>
<td>Cloacal</td>
</tr>
<tr>
<td>Lory State Park</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S. Valley Trail</td>
<td>30 June–7 July 2013</td>
<td>3 July, 7 July</td>
<td>Direct observation</td>
<td>Cloacal, nest floor</td>
</tr>
<tr>
<td>Quarry Cove</td>
<td>15 June–20 June 2014</td>
<td>19 June, 20 June</td>
<td>Motion camera</td>
<td>Cloacal</td>
</tr>
<tr>
<td>Shoreline Trail</td>
<td>16 June–24 June 2014</td>
<td>23 June, 24 June</td>
<td>Motion camera</td>
<td>Cloacal, nest floor</td>
</tr>
<tr>
<td>Pine Ridge Natural Area</td>
<td>22 June–28 June 2014</td>
<td>27 June</td>
<td>Motion camera</td>
<td>Cloacal, nest floor</td>
</tr>
</tbody>
</table>
Figure 2. Time sequence from a motion-activated camera showing a Rock Wren removing a fecal sac directly from the cloaca of a nestling on 23 June 2014.  

Photos by Nat Warning

how the prevalence and proportion of direct removal of fecal sacs may change over the course of nestlings’ development.

We thank D. Leatherman for assistance in the field and the city of Fort Collins Natural Areas Program and the Colorado Division of Parks and Wildlife for access to study sites. We also thank M. Guigueno for her critical review of the manuscript. The Denver Audubon Society and the Colorado Mountain Club provided funding for motion-activated cameras.

LITERATURE CITED

NOTES


Accepted 15 April 2015
PROLONGED INCUBATION AND TWO CLUTCHES IN A NEW MEXICO GREAT HORNED OWL NEST: 2011–2012

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Widely spread across the phylogenetic tree in three avian orders, birds of prey are linked by their food habits and convergent evolution of talons and strong beaks. Second clutches/broods are rare among raptors; instead, a tendency to extend incubation beyond the time required for hatching has been documented in 12 species of the Accipitriformes, four of the Falconiformes, but only two of the Strigiformes (Margalida et al. 2006). With an average incubation period of 33 days (Arturo et al. 2014), the Great Horned Owl (Bubo virginianus) has not previously been reported to extend incubation. Furthermore, the species was previously known to lay a second clutch only after the death of the male early in incubation of the first clutch (Marti 1969).

In late January 2008 a resident pair of Great Horned Owls chose to occupy an artificial nest I had maintained for five years in a pinyon pine (Pinus edulis) 50 m from my home office, 15 km south of Santa Fe, New Mexico. They subsequently used the same nest annually through 2015 and often roosted nearby while not nesting. The subdivision containing my house is located in pinyon pine–juniper (Juniperus sp.) savanna with a mean elevation of 2050 m above sea level. Large lots (0.5 to 1 ha), limits to yard/garden size, and extensive greenbelts have resulted in a largely intact natural habitat and prey base, but with an above-average density of roof-top perches.

From 2009 to 2012, the timing of these owls’ nesting was remarkably consistent. The adult female spent the full day of 11 or 12 February in an incubation posture on the nest. That was followed by one (2009, 2010) or two (2012) days with the female perched a few meters from the nest, then continuous incubation was initiated on 14 February. In each year, therefore, I estimated hatching on 17 March, and nestlings 5–6 weeks old were likely by the first week of May. This timing is typical of the Great Horned Owl in New Mexico (Dickerman et al. 2010).

On 12 February 2011 the “pre-incubation” day again occurred on schedule; the female was off the nest until I departed at 11:00 on 13 February for a 5-week field project. Neighbors confirmed incubation multiple times during my absence, but the exact day of initiation was not documented. On my return on 22 March, the female was still incubating/brooding, but as April passed it became clear that there were no chicks. Incubation continued until at least 5 May but became intermittent by 7 May. On 11 May the female was off the nest all afternoon, so I collected two addled eggs (deposited with the Museum of Southwestern Biology, University of New Mexico). Presuming incubation did begin on 14 February, the extended incubation in 2011 lasted ~75 days.

Again in 2012 the start of laying/incubation was unchanged, with full incubation initiated on 14 February. During the following weeks, I observed the female incubating throughout the day, though I was gone at intervals for multiple days. Incubation was continuous 9–11 March. On the afternoon of 11 March I observed an intense mobbing by Common Ravens (Corvus corax), which lasted 30 minutes and involved six to eight ravens approaching to within 1 m of the incubating female owl. The male owl pursued several ravens; he also stood for a time in the nest by the female. While the female never came off the eggs during the mobbing or the remainder of the day, she spent all of 12 March perched 1–2 m from the nest. I departed that evening and was gone 13–29 March. I observed the female incubating in late afternoon on 30 March and on each subsequent check throughout April and into May. I assumed she would eventually give up the effort as the female had in 2011, and she did appear to...
be sitting higher in the first week of May. After a 5-day absence, I found the female feeding two owlets ~2.5 weeks old (Arturo et al. 2014) on 20 May, so the incubation of the eggs that produced these two owlets was initiated ~1 April. Incubation on this one nest again lasted ~75 days, but two clutches had to be involved since the owlets could not have been from eggs incubated beginning mid-February. There were no eggs or eggshell fragments when I was first able to examine the nest post-branching/post-fledging on 25 June, when the young were roosting away from the nest and my visit no longer elicited a response from the adults.

While I have referred throughout to “the” female, it is not certain that there was only one adult female. It is also not certain when the first 2012 clutch failed, but the day off the eggs on 12 March, 26 days after initiation of incubation, likely would have killed any embryos. In captivity, a raptor of similar size, the Peregrine Falcon (Falco peregrinus), can be induced to double clutch only if eggs are removed early in the incubation of the first clutch (Platt et al. 2007), which suggests that one of the pair of these owls was replaced. It is possible that the female mobbed on 11 March was evicted by a second female as early as the intervening night, which could explain the day of no incubation. I heard no challenging or returned female hooting, though. Replacement could have occurred during my absence 13–29 March. Still, the intense mobbing the day before the apparent abandonment of the first clutch, which was part of almost daily raven mobbing of the owls every breeding season, is possibly more than coincidental. A female that prolonged incubation one year might have had the behavioral flexibility to double clutch the succeeding year.

This note, Eagle Environmental Publication 2, is the result of an unfunded, opportunistic, but scientifically motivated inquiry that serendipitously occurred where it could not be ignored. Neighbors L. and C. Williams documented incubation during my absences. I thank B. W. Smith for the many positive suggestions that greatly improved the original draft and concepts of this manuscript. Referee comments by J. L. Lincer, P. H. Bloom, and D. D. Gibson clarified thoughts and theories, particularly on possible explanations of the double clutch in 2012 and successful fledging of the second clutch.

LITERATURE CITED


Accepted 17 July 2015
On 17 June and 20 June 2014 Zamek and his sister, J. Zamek, observed an adult Pygmy Nuthatch (Sitta pygmaea) feeding Mountain Bluebird (Sialia currucoides) nestlings near Prosser Creek Reservoir, Nevada County, California. The bluebirds’ nest cavity was approximately 2 m above the ground in a large snag. An active Pygmy Nuthatch nest with nestlings was in a cavity in the same snag approximately 2 m above the bluebird nest. There were other nest holes in this snag, but they did not appear to contain active nests. During approximately two hours of observation in late afternoon on 17 June and three hours in early morning on 20 June, a female Mountain Bluebird frequently fed the three bluebird nestlings. A male Mountain Bluebird was also present and remained close to the nest most of the time but visited the nest only four times on 17 June and twice on 20 June. A Pygmy Nuthatch also fed the Mountain Bluebird nestlings at least ten times on 17 June and at least nine times on 20 June. The Pygmy Nuthatch also reached into the Mountain Bluebird nest and removed fecal sacs two times on 20 June. Zamek obtained photographs of the bluebirds and the nuthatch feeding the bluebird nestlings and removing a fecal sac (see this issue’s back cover), making this one of very few photographically documented examples of interspecific feeding of nestlings and nest maintenance.

The male bluebird jabbed at the nestlings’ open bills but did not actually feed them during two visits to the nest on 20 June. These apparent “mock” feedings occurred immediately after the male bluebird had chased the nuthatch away from the nest. The nuthatch was persistent in its attempts to feed the bluebird nestlings, despite the male bluebird’s aggression, making approximately as many visits as the female bluebird. The female bluebird never chased the nuthatch. The active Pygmy Nuthatch nest in this snag was well attended by at least two adult Pygmy Nuthatches, but Zamek never observed any nuthatch make a direct visit to the bluebird nest from the nuthatch nest. Although up to three nuthatches were observed simultaneously, it was not possible to determine if the bluebirds were being fed by one of the nesting pair or by the third nuthatch.


Pinkowski (1980) also observed a Pygmy Nuthatch feeding Mountain Bluebird nestlings and removing fecal sacs in Colorado, making the observation described here only the second published example of interspecific feeding between these two species. Pinkowski also noted that the frequency of feeding by the nuthatch was similar to that of the bluebirds and that the nuthatch removed fecal sacs by leaning into, but not entering, the nest cavity. In contrast to Zamek’s observations, Pinkowski noted that both bluebird parents chased the nuthatch. Shy (1982) proposed seven possible proximate causes for a bird of one species feeding the young of another: (1) the bird was raising a mixed-species clutch; (2) the original nest of the bird failed or was destroyed; (3) the nest of the other species was close to the nest of the bird engaging in interspecific feeding; (4) begging of the heterospecific young stimulated the bird to
feed them; (5) orphaned heterospecific young were “adopted” by the feeding bird; (6) a male bird with an active nest fed another species while his mate incubated; (7) an unmated bird formed an interspecific parental relationship with the actual parent of the young. In the case we describe, one can rule out a mixed-species clutch, orphaned heterospecific young, or an interspecific parental relationship as proximate causes. If the nuthatch feeding the bluebirds was one of the pair nesting in the same snag, then the proximity of the two nests could have been a contributing factor. While the presence of begging young may have been a factor, Zamek heard no begging from the nestlings during either of his visits. Still, the young may have begged at other times and thus stimulated the feeding response in this nuthatch. Therefore, the interspecific feeding reported here could have been due to one or more of the following factors: the nuthatch having lost a nest; proximity of the bluebird nest to the nuthatch nest; the nuthatch having an incubating female in a different nest in the general area; the presence of begging bluebirds stimulating the feeding instinct. It is possible that the nuthatch feeding the bluebirds was a nonparental helper at the nearby Pygmy Nuthatch nest, as such nest helpers have been observed at 17–40% of Pygmy Nuthatch nests studied (Norris 1958, Storer 1977, Sydeman et al. 1988).

We thank Luke George for very helpful comments on an earlier version of this manuscript. Peter LaTourrette and John Sterling provided useful suggestions about which photos to include to best illustrate the observed behaviors.

LITERATURE CITED


WFO’S 41ST ANNUAL CONFERENCE — HUMBOLDT COUNTY, CALIFORNIA

28 September–2 October 2016

Please join us for Western Field Ornithologists 41st annual conference, to be held 28 September through 2 October 2016 at the River Lodge Conference Center, on the Eel River in Fortuna, California.

Events will include indoor workshops on Friday and Saturday mornings, science sessions on Friday and Saturday, a no-host reception on Friday evening, our annual banquet on Saturday evening, and field trips Thursday, Friday, Saturday and Sunday.

Fortuna is within 14 miles of several important birding areas, including the Eel River State Wildlife Management Area, the Loleta Bottoms, the Ferndale Bottoms, and Russ Park. Within the southern portion of nearby Humboldt Bay are several more notable sites, including King Salmon, Fields Landing County Park, the Humboldt Bay National Wildlife Refuge’s Hookton Slough Trail and Shorebird Loop Trail and the Mattole Valley Loop. Farther afield, outstanding birding areas include the Arcata Marsh and Wildlife Sanctuary, the Eureka waterfront, Big Lagoon County Park, Woodley Island and Vance Road, Mad River County Park, the Blue Lake riparian area and Mad River Hatchery, and the Horse Mountain area.

We look forward to seeing you in Fortuna!

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WFO will be offering a tour of the central Sierra Nevada led by Jon Dunn, Lena Hayashi, Ed Pandolfino, and Dave Quady, 20–28 June 2016. This trip will cover all the Sierra’s best habitats on both the west and east sides of the range. It will include an evening of owling when we will try for the Spotted, Flammulated, Western Screech-, Northern Pygmy-, and Northern Saw-whet Owls. Other target birds include the Black Swift, White-headed Woodpecker, Williamson’s Sapsucker, Pinyon Jay, Mountain Bluebird, Gray-crowned Rosy-Finch, Pine Grosbeak, Red Crossbill, and Evening Grosbeak. Registration will open in November 2015, and full details and pricing will be announced via a WFO news e-mail. If you are not currently on our e-mail list, send a message to erpfromca@aol.com with your full name, city, state, and current e-mail address.

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Published 1 September 2015 ISSN 0045-3897
Western Specialty:
White-tailed Ptarmigan

Photo by Cole J. Wolf of Albuquerque, New Mexico:
Female White-tailed Ptarmigan (Lagopus leucura) in mid-summer plumage, Santa Barbara Ridge near Jicarita Peak, Taos County, New Mexico, 4 August 2012. This locale, west of Holman, Mora County, is a consistently reliable area for this species. In 1981, 43 White-tailed Ptarmigan from Colorado were translocated to this area of New Mexico to augment a native population whose status was tenuous. After 33 years, the translocation still appears successful, as detailed in this issue of *Western Birds* by Clait E. Braun and Sartor O. Williams III (pp. 233–243).