

Hooded warbler (*Setophaga citrina*) and other noteworthy bird records from Guerrero, Mexico

R. Carlos Almazán-Núñez,^{1*} Alejandro Meléndez-Herrada,² César S. García-Vega,³ Pablo Sierra-Morales¹ and Alfredo Méndez-Bahena¹

Abstract

We present a list of noteworthy distribution records for 12 bird species in the state of Guerrero, Mexico, which were observed and captured during field work from 2006–2013 in different environments. One of the records (*Setophaga citrina*) is new to the state, and observations of an additional five species (e.g., *Pelecanus erythrorhynchos*, *Mycteria americana*, *Setophaga dominica*) have expanded their geographical distribution to biotic provinces where their presence was previously unrecorded. The presence of another six species (e.g., *Elanus leucurus*, *Setophaga palmarum*) with scarce distributional information was confirmed. Records presented in this scientific note highlight the importance of continuing inventory work in unexplored environments, and even in areas that are apparently well-surveyed. Coupled with biogeography, taxonomy and ecology studies, such studies will help to improve the understanding of the natural history of birds and their means of conservation.

Keywords: Biotic provinces, distributional areas, conservation, Neotropics, human activities.

Chipe encapuchado (*Setophaga citrina*) y otros registros notables de aves de Guerrero, México

Resumen

Presentamos una lista de registros de distribución notable para 12 especies de aves en el estado de Guerrero, México, las cuales observamos y colectamos durante el trabajo de campo llevado a cabo de 2006-2013 en diferentes ambientes del estado. Uno de los registros (*Setophaga citrina*) es nuevo para el estado, y otras cinco especies (e.g., *Pelecanus erythrorhynchos*, *Mycteria americana*, *Setophaga dominica*) ampliaron su distribución geográfica a una provincia biótica donde su presencia no había sido previamente registrada. Confirmamos la presencia de otras seis especies (e.g., *Elanus leucurus*, *Setophaga palmarum*) con escasa información distribucional. Los registros presentados en esta nota científica muestran la importancia de continuar el trabajo de inventario en ambientes inexplorados e incluso en áreas que aparentemente están bien documentadas. Este tipo de información junto con estudios sobre la biogeografía, taxonomía y ecología, ayudarán a comprender mejor la historia natural de las aves y su conservación.

Palabras clave: Provincias bióticas, áreas de distribución, conservación, Neotrópico, actividades humanas.

Recibido: 30 de marzo de 2016. **Aceptado:** 6 de agosto de 2016

Editor asociado: Borja Milá Valcárcel

Introduction

The lack of knowledge on bird distribution in the Neotropics has been frequently cited, as information is gathered at a slow pace and is often incomplete or unbalanced (Vuilleumier 2000, Rojas-Soto and Oliveras de Ita 2005, Freeman *et al.* 2012). The continual extension of the distributions of known species for this region and the frequent description of new bird species

demonstrate the need to continue distributional studies of birds (Vuilleumier *et al.* 1992, Cuervo *et al.* 2003, Hilty *et al.* 2013, Hosner *et al.* 2013). Although the distributional area of a species is not static in time or space (Rapoport and Monjeau 2003), in Neotropical regions the loss of natural habitats, largely due to anthropogenic activities, has further modified distribution areas at a rapid pace. Thus, biogeographical studies and conservation plans are often limited in scale or only relevant for specific environmental conditions (García-Moreno *et al.* 2007).

In Mexico, as in the rest of the world, bird species richness increases with decreasing latitude (Navarro and Sánchez-González 2003, Navarro-Sigüenza *et al.* 2014), and correspondingly, the southern Mexican states are the most diverse. The state of Guerrero, in southwestern Mexico, has been widely

¹ Laboratorio Integral de Fauna Silvestre, Facultad de Ciencias Químico Biológicas, Universidad Autónoma de Guerrero. C.P. 39000, Chilpancingo, Guerrero, México. * rcarlos.almazan@gmail.com

² Departamento El Hombre y su Ambiente, Universidad Autónoma Metropolitana Unidad Xochimilco. C.P. 04960, México, D.F., México.

³ Laboratorio de Zoología, Instituto Tecnológico de Cd. Altamirano. C.P. 40660, Cd. Altamirano, Guerrero, México.

recognized for its diversity and number of endemic birds, and has even been considered as a priority entity for conservation (Álvarez and Morrone 2004). Its complex orography has given rise to different climatic and ecological zones, placing it among the states with the greatest bird diversity (Almazán-Núñez *et al.* 2009, Rojas-Soto *et al.* 2009, Navarro-Sigüenza *et al.* 2014).

Knowledge on distribution of birds in the state of Guerrero has increased, although it continues to be fragmented and disperse. Historically, several areas have been more intensively sampled for bird community studies, resulting in the capture of new specimens and species descriptions (Navarro and Escalante 1993, Navarro-Sigüenza *et al.* 2013). In addition, the mountainous terrain of the Sierra Madre del Sur has led to the geographical isolation of populations and resulted in the emergence of differentiated populations. For example, Guerrero Brush Finch (*Arremon kuehnerii*) was recently recognized as a new species in the cloud forest of central Guerrero based on molecular studies (Navarro-Sigüenza *et al.* 2013). However, extensive areas have not been well-surveyed, which is evident by the recently documented presence of species once considered to be locally extinct, such as the Military Macaw (*Ara militaris*; Almazán-Núñez and Nova-Muñoz 2006). Other migratory birds have been recently found, and represent the first warbler records for the state, including Blackpoll Warbler (*Setophaga striata*; Almazán-Núñez *et al.* 2009) and Blackburnian Warbler (*S. fusca*; Rojas-Soto *et al.* 2009).

In this note, we present a new record of Hooded Warbler (*Setophaga citrina*) for the avifauna of the state of Guerrero, and also include noteworthy distributional records within the state for eleven other species. Of these records, five species have extended their geographic distribution to other previously unrecorded biotic provinces, and presence was confirmed for another six species with scarce information on their distribution patterns.

Methods

Study area

The state of Guerrero is located in southwestern Mexico between 16° and 18° N and 98° and 102° W. Four biotic provinces converge in this region: the Pacific coastal plain, the Sierra Madre del Sur, the Balsas basin and the Mexican volcanic belt. Within this orographic and geological mosaic, elevations range from sea level to above 3000 m (Figure 1). Main vegetation types are pine-oak forest, oak forest, pine forest, tropical dry forest, cloud forest, tropical semi-deciduous forest, wetlands, grasslands, mangroves and táscale forest (*Curatella americana*; INEGI 2010).

Data collection

We obtained bird records from 2006 to 2013 in different environments of three biotic provinces: the Pacific coastal plain, the Balsas basin and the Sierra Madre del Sur (Table 1, Figure 1). Records were obtained through the selective collection of specimens in mist-nets located in various habitats. These habitats were selected at random and as part of others studies performed on the ecology and biogeography of birds in the state of Guerrero. In these same biotic provinces, visual and vocalization records were also obtained through random surveys along transects of certain localities, using point counts of varying observation radii and performing intensive searches for species (Ralph *et al.* 1995). As part of the sampling effort, we carried out 4320 hours of observation (the equivalent of 180 days of sampling), and 7200 net hours for gathering specimens. Some collected specimens were prepared in skin and deposited in the collection of birds of the Laboratorio Integral de Fauna Silvestre (LIFAS) of the Universidad Autónoma de Guerrero (UAGro). In order to compare bird records in this study with those obtained previously, we reviewed published literature on the avifauna of Guerrero, as well as databases of scientific collections, including the Atlas of the Birds of Mexico (Navarro-Sigüenza *et al.* 2003) and the eBird (2015) database, which stores bird observation records from different regions of the country. Nomenclature follow the American Ornithologists' Union (1998) and addenda (www.aou.org). After the scientific name we included a code of four letters, shown in Table 1. For some species photographic evidence exists and is indicated with an asterisk after the scientific name. Since these bird records are of variable interest, we divided them into three sections: 1) new bird records, 2) range extensions to other biotic provinces and 3) uncommon species records.

Results

New bird records

*Setophaga citrina** (SECI). Hooded Warbler. This record is new for the state of Guerrero. We observed an adult male on 13 November 2008 in tropical dry forest of Huamilule hill, 1.3 km southeast of Barra de Potosí. In this same place we collected an adult individual on 14 November 2010 (Figure 2a). In Mexico, this species is usually distributed throughout the Gulf (Howell and Webb 1995), although there are also atypical records along the northern Pacific coast (Contreras-Martínez *et al.* 2006). This species has been additionally reported in Oaxaca (Winker 1995),

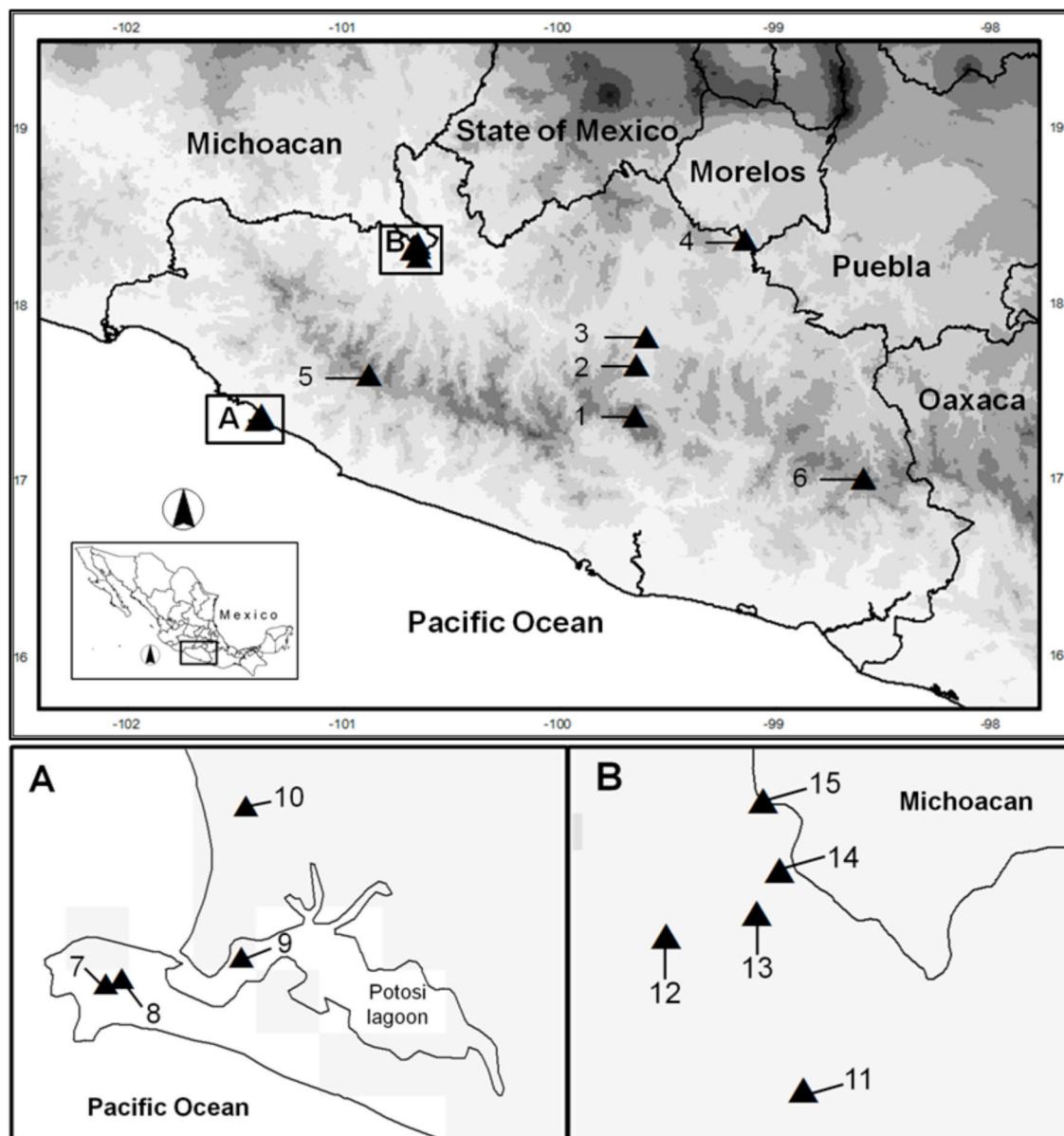


Figure 1. Map of localities where birds were sampled in Guerrero, Mexico. The numbers correspond to the localities of Table 1. Gray tones represent elevation.

evidencing its ability to inhabit different environments, and thus, its presence was also expected within the state of Guerrero.

Range extensions to other biotic provinces

*Mycteria americana** (MYAM). Wood Stork. In Guerrero, this species has been documented in the Pacific coastal plain (Navarro 1998), where in fact, the presence of this species is common over an area extending from Ixtapa to the Valentine Lagoon, its nesting site. This species is under special protection. We have frequently observed this species since 2007 during the August to March period along the Cutzamala River, in the Balsas ba-

sin. Nine individuals were observed on 30 and 31 November 2013 in the Arenera-Mezcalá region, within the same depression of the Balsas River (Figure 2b). Some juveniles were also observed in this group, suggesting that the population possibly reproduces in this area.

*Pelecanus erythrorhynchos** (PEER). American White Pelican. This species is an irregular winter visitor in the lagoons of the Pacific coastal plain, although there has been no previous evidence of their presence in the interior water bodies of Guerrero, or in particular, in the Balsas basin. We observed 63 individuals flying over the Balsas River near its confluence with the Cutzamala River on 16 October 2011 (Figure 2c). Between 6 and 14 October 2012, around 28 individuals were observed again along

Table 1. Localities where birds were sampled in Guerrero, Mexico. Numbers correspond to the localities in Figure 1.

| No. | Locality | Geographic coordinates | Elevation (m) | Habitat | Biotic province | Bird species (code) |
|-----|--|----------------------------------|---------------|----------------------------------|-----------------|---------------------|
| 1 | Simaroa-Xocomanatlán | 99°38'07.94"W 17°32'58.41"N | 1897 | Pine-oak forest | SMS | GRGU, MEAL |
| 2 | 1.8 km southeast of Xochipala | 99°37'53.95" 17°47'53.54"N | 1106 | Tropical dry forest | BB | ELLE |
| 3 | Arenera-Mezcala | 99° 35.742'W 17° 56.150'N | 486 | Riparian vegetation | BB | MYAM |
| 4 | San Juan Teocalcingo | 99° 06' 8.4"W 18° 24' 16.8"N | 690 | Tropical dry forest | BB | MESE |
| 5 | El Entremedio | 100° 54' 57.7"W 17° 45" 06.6"N | 1807 | Pine-oak forest | SMS | PAAM |
| 6 | Zilacayotilán | 98° 32.840'W 17° 15.945'N | 2353 | Pine-oak forest | SMS | MEAL |
| 7 | Huamilule hill | 101° 27' 11.08"W 17° 31' 55.72"N | 94 | Tropical dry forest | CP | MESE |
| 8 | 1.3 km southeast of Barra de Potosí | 101°27'3.55"W 17°31'58.18"N | 11 | Tropical dry forest | CP | SECI |
| 9 | Potosí Lagoon | 101°26'6.92"W 17°32'8.10"N | 3 | Lagoon | CP | GAIM |
| 10 | 2.2 km north of Barra de Potosí | 101°26'4.46"W 17°33'20.06"N | 6 | Tropical dry forest and mangrove | CP | SEPA |
| 11 | 400 m north of La Bajada | 100°40'27.48"W 18°19'14.10"N | 245 | Riparian vegetation | BB | CHWI |
| 12 | Balsas River, west of Altamirano City | 100°42'21.01"W 18°21'20.40"N | 224 | Riparian vegetation | BB | PEER, ELLE |
| 13 | Chuperio Hill of Altamirano City | 100°41'06.49W 18°21'39.12"N | 254 | Secondary vegetation | BB | SEDO |
| 14 | Instituto Tecnológico of Altamirano City | 100°40'47.66"W 18°22'15.21"N | 251 | Secondary vegetation | BB | SEDO |
| 15 | Cutzamala River | 100°41'01.08"W 18°23'12"N | 237 | Riparian vegetation | BB | MYAM, PEER |

The biotic provinces are indicated as CP: Pacific coastal plain, SMS: Sierra Madre del Sur and BB: Balsas basin. The codes for each recorded species are mentioned below: GRGU: *Grallaria guatimalensis*, MEAL: *Meliozone albicollis*, ELLE: *Elanus leucurus*, MYAM: *Mycteria americana*, MESE: *Megascops seductus*, PAAM: *Passerina amoena*, SECI: *Setophaga citrina*, GAIM: *Gavia immer*, SEPA: *Setophaga palmarum*, CHWI: *Charadrius wilsonia*, PEER: *Pelecanus erythrorhynchos*, SEDO: *Setophaga dominica*.

the Balsas River, west of Altamirano City. Another observation of 30 individuals was found on 2 July 2009 at the Presa Infiernillo in the Balsas basin of Michoacán, 144 km east of a recent record (eBird 2015), suggesting that it is potentially the same population.

*Charadrius wilsonia** (CHWI). Wilson's Plover. We observed seven individuals on 28 October 2013, of which three were adult males with nesting plumage and were encountered performing courtship displays on the shores of the Balsas River, 400 m north of La Bajada (Figure 2d). Other observations were obtained between 1 and 10 November at the same site. Previously,

this species had only been recorded at beaches and coastal wetlands, where it is a rare resident (Howell and Webb 1994).

*Megascops seductus** (MESE). Balsas Screech-Owl. This rare species is endemic to the Balsas basin and is also threatened. Its presence is known due to the collection of three individuals at Mezcala (Navarro 1998), and recent observations have confirmed its presence in the Balsas basin (Nova-Muñoz et al. 2011) and the Sierra Madre del Sur (eBird 2015). On 19 December 2013 we observed an individual at San Juan Teocalcingo (Figure 2e) in a tropical dry forest. We recorded vocalizations of this spe-

cies several times at Huamilule hill on 12 November 2012, to the south of Barra de Potosí in the Pacific coastal plain. There had been no previous evidence of its presence in this biotic region.

*Setophaga dominica** (SEDO). Yellow-throated Warbler. This species has been scarcely recorded on the Guerrero coast and in the Sierra Madre del Sur (eBird 2015), where it is apparently a rare winter migratory bird (Miller et al. 1957). We observed some individuals at the foot of the Chuperio Hill of Altamirano City on 19 September 2007 and among some corn crops on 2 October 2009 (Figure 2f). Additional observations occurred on January 2011, on 28 January 2012 and 9 September 2012 and between 1 and 19 September 2013 within of the Instituto Tecnológico of Altamirano City. These records represent the first for the semiarid zones of the Balsas basin in Guerrero.

Uncommon species records

Gavia immer (GAIM). Common Loon. We observed an adult swimming in almost full winter plumage at Potosí Lagoon on

26 October 2015, which is the second record for the state. Gómez de Silva (2002) previously recorded the Common Loon in the lagoons of Acapulco about 183 km west of the present record. Howell and Webb (1995) had previously listed the species as rare and irregular in Guerrero.

*Elanus leucurus** (ELLE). White-tailed Kite. The few records of this species in Guerrero have occurred along the coast (Howell and Webb 1995, Navarro and Peterson 1999), although recently their presence was documented for the first time in the Balsas basin (Rojas-Soto et al. 2009). We observed two individuals 1.8 km southeast of Xochipala in the Balsas basin on 16 December 2010 (Figure 2g), 76 km southeast of the record obtained by Rojas-Soto et al. (2009). We have frequently observed the species since July 16, 2005 in open areas along the Balsas River, west of Altamirano City. These records represent the second for the semiarid zones of the Balsas basin in Guerrero.

Grallaria guatimalensis (GRGU). Scaled Antpitta. This is a rare and threatened species of the cloud forest and humid pine-oak forest of the Sierra Madre del Sur (Howell and Webb 1995).

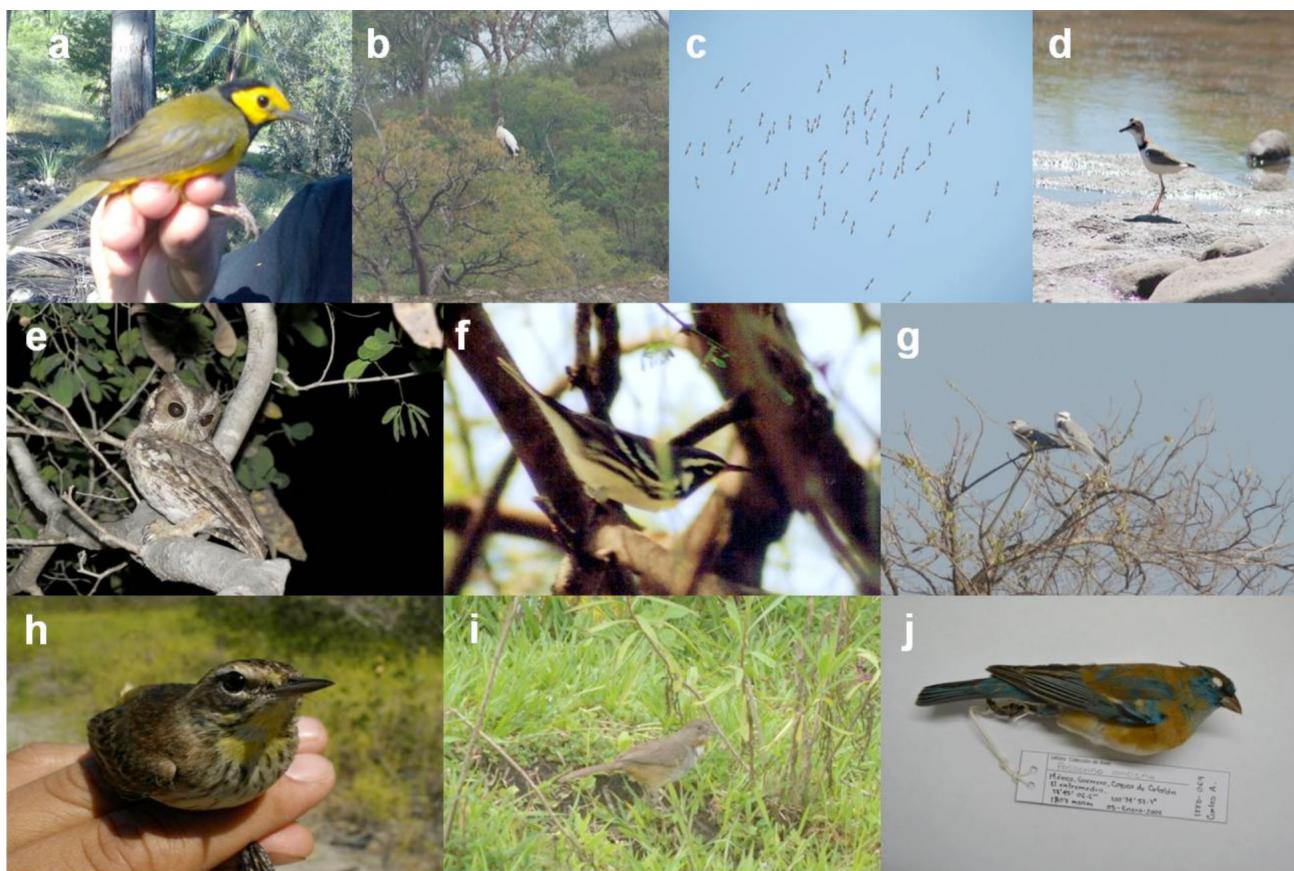


Figure 2. Photographic evidence of the records of several birds in the state of Guerrero: (a) *Setophaga citrina* (b), *Mycteria americana* (c), *Pelecanus erythrorhynchos* (d), *Charadrius wilsonia* (e), *Megascops seductus* (f), *Setophaga dominica* (g), *Elanus leucurus* (h), *Setophaga palmarum* (i), *Melozone albicollis* and (j) *Passerina amoena*. Photos: g, i, j (R.C. Almazán-Núñez); a, c, d, f, h (C.S. García-Vega); b (P. Sierra-Morales); e (J.A. Almazán-Catalán).

In Guerrero, its presence is known due to several collected specimens in the Sierra de Atoyac (Navarro 1992) and recent observations of an individual at this same place (eBird 2015). We observed an individual in the understory of a marshy area in a pine-oak forest of the Simaroa-Xocomanatlan region on 14 December 2013. This record increases the knowledge of their distribution in the state. Populations of this species in Guerrero are morphologically different than the rest of the country, and thus it has been suggested that it be considered a distinct species (Navarro-Sigüenza and Peterson 2004).

*Setophaga palmarum** (SEPA). Palm Warbler. This species is an occasional visitor or transient during winter. It has been recorded in Guerrero at Iguala (Navarro 1998), in addition to recent observations of three individuals at Ventura Beach, a locality of the Pacific coastal plain (eBird 2015). We collected an individual on 8 March 2009 (Figure 2h) in a mangrove area with coconut (*Cocos nucifera*) cultivation and tropical dry forest, 2.2 km north of Barra de Potosi. Another three individuals were observed in the same area on 11 November 2010. Howell and Webb (1995) listed the species as errant along the Pacific coast from mid-October to early April and noted their presence along the Guerrero coast and the Oaxacan border. These records are one of the few sightings of this species in the coast of Guerrero.

*Melozone albicollis** (MEAL). White-throated Towhee. This species is endemic to southern Mexico. In Guerrero its presence is known due to voucher specimens obtained from the central portion of the state (Navarro and Escalante 1993) and the recent observation of an individual in the eastern portion of Guerrero (eBird 2015). We collected an individual at Zilacayotitlan on 12 March 2009 (LIFAS-UAGro 649), which is the first specimen for the eastern portion of the entity (Howell and Webb 1995). Additionally, we observed more than ten individuals in the Simaroa-Xocomanatlan region on 21 July 2012 while they were eating grains in a crop field (Figure 2i).

*Passerina amoena** (PAAM). Lazuli Bunting. Previous records of this species in Guerrero come from the Balsas basin (eBird 2015, Howell and Webb 1995) and the interior slope of the Sierra Madre del Sur (Griscom 1934). We collected a voucher specimen (LIFAS-UAGro 262) on 5 January 2006 in a mixed pine-oak and *Alnus* forest at Entremedio (Figure 2j), thus confirming its presence along the western edge of the Sierra Madre del Sur, where it had not yet been recorded.

Discussion

Despite recent efforts to complete the inventory of the Mesoamerican avifauna, some important gaps still exist, preventing

a comprehensive knowledge on the distribution of the majority of the region's bird species (Rojas-Soto and Oliveras de Ita 2005, Munera-Roldán et al. 2007). In the case of Guerrero, its orography coupled with the lack of accessibility to certain areas, in addition to social problems, do not allow for more inclusive avifaunal surveys (Almazán-Núñez et al. 2009). For example, over the past five years, six species have been added to the species list of Guerrero (including the new state record, *Setophaga citrina*), resulting in a present inventory of 545 species. One species was recently recognized as a new species in the mountains of the Sierra Madre del Sur (*Arremon kuehni*); Navarro et al. 2013), and three more are winter visitors (*Setophaga striata*, *S. fusca*, *S. citrina*; Almazán-Núñez et al. 2009, Rojas-Soto et al. 2009). The final two represent populations of invasive birds that have begun to settle in different regions of the state (*Streptopelia decaocto* and *Myiopsitta monachus*; Almazán-Núñez 2014, Almazán-Núñez et al. 2015).

Several of the records presented in this survey come from rugged, poorly explored mountains (e.g., *Melozone albicollis*, *Passerina amoena*). This confirms the importance of continuing to focus efforts in these areas, thereby bridging the information gap on species distributions. Another limiting factor is the apparent lack of interest and focus on observing changes in the seasonal or annual presence of species (Rojas-Soto and Oliveras de Ita 2005). For example, the records of *Gavia immer*, *Setophaga citrina* and *S. palmarum*, among others, were obtained along the Pacific coastal plain, a touristic region within the state with a well-connected network of highways, where accessibility is not an issue. Surprisingly, many records of birds previously unknown to Guerrero also come from this region and particularly from lacustrine and marine environments, such as species from the Anatidae, Scolopacidae and Laridae families (Navarro 1998). However, these coastal habitats are also at risk due to mass tourism projects and changes in land uses.

On the other hand, the records presented herein acquire greater relevance since they constitute range extensions to different biotic provinces that, accordingly, could imply interactions with other species (e.g., *Pelecanus erythrorhynchos*, *Charadrius wilsonia*, *Megascops seductus*, *Setophaga dominica*). Reports of new interactions and the discovery of new populations, particularly of resident species, may have implications for the biogeographic and evolutionary history of taxa and even for conservation-related issues (Sánchez-González 2013). In the case of the migratory birds, there has been much discussion on whether they select habitats based on quality or availability of food, regardless of the state of the habitat (Martin 1985, Hutto 1998, Wolfe et al. 2014). In either case, the record

of migratory birds in areas that do not form part of their usual migration routes, the observations of their interactions may contribute towards understanding their behavioral adaptations and ability to successfully inhabit the temperate and tropical environments of southern Mexico (Wolfe et al. 2014).

Human activities modify the natural environment and this limits the distribution areas of bird species (García-Moreno et al. 2007). Thus, basic research to document regional species, coupled with new analytical methods for studying the biogeography, ecology and taxonomy of birds, will help to improve the understanding of their natural history and means of conservation.

Acknowledgements

The authors thank Oscar Nova, Roberto Bahena, Trinidad Cruz, Brenda Pérez, Jeraldín González, Noemí González, Nefris Jacinto, Antonio Estrada, Liliana Parra, Génesis Benítez and numerous other biology and ecology undergraduate students from the Universidad Autónoma de Guerrero for their valuable support in the fieldwork. The manuscript was greatly improved by the comments of two anonymous reviewers. We also thank Adolfo Navarro for the permit to consult of the Atlas of the Birds of Mexico. Financial support for the fieldwork was obtained from CONACYT, CONAFOR, COINBIO and the Universidad Autónoma Metropolitana. The number of capture authorized for SEMARNAT was DFG/DRNVS/112/04. Allison M. Jermain reviewed the English translation.

Literature cited

Almazán-Núñez, R.C. and O. Nova-Muñoz. 2006. La guacamaya verde (*Ara militaris*) en la Sierra Madre del Sur, Guerrero, México. *Huitzil* 7:20-22.

Almazán-Núñez, R.C., O. Nova-Muñoz, O.R. Rojas-Soto and A.G. Navarro-Sigüenza. 2009. Blackpoll warbler (*Dendroica striata*) and other records of birds from Guerrero, Mexico. *Southwestern Naturalist* 54:510-514.

Almazán-Núñez, R.C. 2014. Nuevos registros de la paloma turca (*Streptopelia decaocto*) en el estado de Guerrero, México. *Acta Zoológica Mexicana* 30:701-706.

Almazán-Núñez, R.C., P. Sierra-Morales and A. Méndez-Bahena. 2015. Primer registro de la cotorra argentina (*Myiopsitta monachus*) en Guerrero, México. *Huitzil* 16:48-51.

Álvarez, E. and J.J. Morrone. 2004. Propuesta de áreas para la conservación de aves de México, empleando herramientas panbiogeográficas e índices de complementariedad. *Interciencia* 29:112-120.

AOU (American Ornithologists' Union). 1998. Check-list of North American birds, 7a ed. American Ornithologists' Union. Washington, DC, EUA.

Contreras-Martínez, S., N. Villalpando-Navarrete, J.C. Gómez-Llamas, B.Y. Cruz-Rivera and L.I. Iñiguez-Ávalos. 2006. *Wilsonia citrina*, nuevo registro para el Estado de Jalisco, México. *Huitzil* 7:1-3.

Cuervo, A.M., F.G. Stiles, C.D. Cadena, J.L. Toro and G.A. Londoño. 2003. New and noteworthy bird records from the northern sector of the Western Andes of Colombia. *Bulletin British Ornithologists' Club* 123:7-24.

eBird. 2015. eBird: An online database of bird distribution and abundance [web application]. eBird, Cornell Lab of Ornithology, Ithaca, New York. Available at <http://www.ebird.org/> (Accessed 18 June 2015).

Freeman, B.G., S.L. Hilty, D. Calderón, T. Ellery and L.E. Urueña. 2012. New and noteworthy bird records from central and northern Colombia. *Cotinga* 34:5-16.

García-Moreno, J., R.P. Clay and C.A. Ríos-Muñoz. 2007. The importance of birds for conservation in the Neotropical region. *Journal of Ornithology* 148:321-326.

Gómez de Silva, H. 2002. Sección México. *North American Birds* 56:362-369.

Griscom, L. 1934. The ornithology of Guerrero, Mexico. *Bulletin of the Museum of Comparative Zoology* 75:367-422.

Hilty, S.L., D. Ascanio and A. Whittaker. 2013. A new species of softtail (Furnariidae: *Thripophaga*) from the Delta of the Orinoco river in Venezuela. *Condor* 115:143-154.

Hosner, P.A., M.B. Robbins, T. Valqui and A.T. Peterson. 2013. A new species of *Scytalopus tapaculo* (Aves: Passeriformes: Rhinocryptidae) from the Andes of Central Peru. *The Wilson Journal of Ornithology* 125:233-242.

Howell S.N.G. and S. Webb. 1994. Additional information on the birds of Guerrero, Mexico. *Bulletin British Ornithologists' Club* 114:232-243.

Howell, S.N.G. and S. Webb. 1995. A guide to the birds of Mexico and northern Central America. Oxford University. New York. 851 pp.

Hutto, R.L. 1998. On the importance of stopover sites to migrating birds. *Auk* 115:823-825.

INEGI (Instituto Nacional de Estadística y Geografía). 2010. Conjunto de datos vectoriales de la carta de uso del suelo y vegetación: escala 1:250 000. Serie IV (continuo nacional). Aguascalientes, México. Instituto Nacional de Estadística y Geografía.

Martin, T.M. 1985. Selection of second-growth woodlands by

frugivorous migrating birds in Panama: an effect of fruit size and plant density? *Journal of Tropical Ecology* 1:157-170.

Miller, A.H., H. Friedmann, L. Griscom and R.T. Moore. 1957. *Distributional Check-List of the birds of Mexico, Part 2. Pacific Coast Avifauna* 33:1-436.

Munera-Roldán, C., M.L. Cody, R.H. Schiele-Zavala, B.F. Sigel, S. Woltmann and J.P. Kjeldsen. 2007. New and noteworthy records of birds from south-eastern Nicaragua. *Bulletin British Ornithologists' Club* 127:152-161.

Navarro, A.G. 1992. Altitudinal distribution of birds in the Sierra Madre del Sur, Guerrero, Mexico. *Condor* 94:29-39.

Navarro, A.G. and P. Escalante. 1993. Aves. Pp. 443-501. In: I. Luna and J. Llorente (eds.). *Historia Natural del Parque Ecológico Estatal Omiltemi, CONABIO-UNAM*. México, DF.

Navarro, A.G. 1998. Distribución geográfica y ecológica de la avifauna del estado de Guerrero. Tesis de Doctorado. Universidad Nacional Autónoma de México. México. DF.

Navarro, A.G. and A.T. Peterson. 1999. Extensión del área de distribución de aves en el oeste de Guerrero, México. *Anales del Instituto de Biología. Universidad Nacional Autónoma de México. Serie Zoología* 70:41-50.

Navarro, A.G. and L.A. Sánchez-González. 2003. La diversidad de las aves. Pp. 24-85. In: H. Gómez de Silva and A. Oliveras de Ita (eds.). *Conservación de las aves. Experiencias en México*, CIPAMEX, NFWF, CONABIO. México, DF.

Navarro-Sigüenza, A.G. and A.T. Peterson. 2004. An alternative species taxonomy of the birds of Mexico. *Biota Neotropica* 4:1-13.

Navarro-Sigüenza, A.G., M.A. García-Hernández and A.T. Peterson. 2013. A new species of brush-finches (*Arremon*; Emberizidae) from western Mexico. *Wilson Journal of Ornithology* 125:443-684.

Navarro-Sigüenza, A.G., M.F. Rebón-Gallardo, A. Gordillo-Martínez., A.T. Peterson., H. Berlanga-García and L.A. Sánchez-González. 2014. Biodiversidad de aves en México. *Revista Mexicana de Biodiversidad* 85:S476-S495.

Nova-Muñoz, O., R.C. Almazán-Núñez, R. Bahena-Toribio, M.T. Cruz-Palacios and F. Puebla-Olivares. 2011. Riqueza y abundancia de aves de la subcuenca de Tuxpan, Guerrero, México. *Universidad y Ciencia* 27:299-313.

Ralph, J.C., G.R. Geupel, P. Pyle, T.E. Martin, D.F. DeSante and B. Mila. 1995. *Manual de métodos de campo para el monitoreo de aves terrestres*. Gen. Tech. Rep. PSW-GTR.159. Pacific Southwest Research Station, Forest Service, U. S. Department of Agriculture. Albany, CA.

Rapoport, E.H. and J.A. Monjeau. 2003. *Areografía*. Pp. 23-30. In: J. Llorente and J. J. Morrone (eds.). *Introducción a la biogeografía en Latinoamérica: teorías, conceptos, métodos y aplicaciones*, Facultad de Ciencias, UNAM. México, DF.

Rojas-Soto, O.R. and A. Oliveras de Ita. 2005. Los inventarios avifaunísticos: reflexiones sobre su desarrollo en el neotrópico. *Ornitología Neotropical* 16:441-445.

Rojas-Soto, O.R., A. Oliveras de Ita, R.C. Almazán-Núñez, A.G. Navarro-Sigüenza and L.A. Sánchez-González. 2009. *Avifauna de Campo Morado, Guerrero, México*. *Revista Mexicana de Biodiversidad* 80:741-749.

Sánchez-González, L.A. 2013. Cuando "un nuevo registro" es realmente un nuevo registro: consideraciones para su publicación. *Huitzil* 14:17-21.

Vuilleumier, F., M. LeCroy and E. Mayr. 1992. New species of birds described from 1981 to 1990. *Bulletin British Ornithologists' Club* 112:267-310.

Vuilleumier, F. 2000. Further collecting of birds in the neotropics is still needed. *Ornitología Neotropical* 11:269-274.

Winker, K. 1995. Autumn stopover on the Isthmus of Tehuantepec by woodland Nearctic-Neotropic migrants. *Auk* 112:690-700.

Wolfe, J.D., M.D. Johnson and C.J. Ralph. 2014. Do birds select habitat or food resources? Nearctic-Neotropic migrants in Northeastern Costa Rica. *PLOS ONE* 9(1):e86221. doi:10.1371/journal.pone.0086221.



Sociedad para el Estudio y Conservación
de las Aves en México, A.C.