

PRESENCE AND DISTRIBUTION OF MEXICAN OWLS: A REVIEW

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ABSTRACT.—Mexico has a rich owl assemblage, represented by 27 species. Eighteen of these species occur in the Nearctic and Neotropical regions, and nine species occur only in the Neotropical region. Their biology, ecology and distribution, however, are poorly known. We recorded 3683 specimens collected between 1840 and 1991 from 11 national and 37 foreign museums, and reviewed the literature concerning these owls. From these data we present a more unified distribution of Mexican owls. Four species, Barn Owl (*Tyto alba*), Great Horned Owl (*Bubo virginianus*), Ferruginous Pygmy-Owl (*Glaucidium brasilianum*) and Burrowing Owl (*Speotyto cunicularia*), have a wide distribution. The Balsas Screech Owl (*Otus seductus*) is endemic to the central Pacific region. Oaxaca and Michoacan had the highest owl species richness with 21 and 19 species, respectively. Aguascalientes, Campeche and Tlaxcala had the lowest owl species richness, four, five, and five respectively. The Ferruginous Pygmy-Owl was the most collected owl, representing 30.7% of the specimens, and the Unspotted Saw-whet Owl (*Aegolius ridgwayi*) the least with 0.19%. Of the Neotropical species, the Unspotted Saw-whet Owl, Striped Owl (*Asio clamator*), and Stygian Owl (*A. stygius*) are considered endangered by the Mexican government. The screech-owl group (*Otus*) and the Barred Owl (*Strix varia*)/Fulvous Owl (*S. fulvescens* = *S. v. fulvescens*) have uncertain distributions due to taxonomic uncertainties.

Presencia y distribución de los búhos Mexicanas: una revisión

RESUMEN.—México tiene una alta riqueza de especies de búhos, representada por 27 especies. Dieciocho de estas especies se encuentran tanto en la región neártica como en la neotropical, y nueve de las especies se localizan solo en la región neotropical. Su biología, ecología así como su distribución es poco conocida. Nosotros compilamos 3683 datos de especímenes de búhos colectados en México; con registros desde 1840 hasta 1991, de 11 museos nacionales y de 37 extranjeros, adicionalmente revisamos intensamente la literatura disponible. Combinando estos datos, damos una distribución unificada de los búhos de México. Cuatro especies, la Lechuza de Campanario (*Tyto alba*), el Búho Cornado Americano (*Bubo virginianus*), el Tecolotito Bajero (*Glaucidium brasilianum*) y el Tecolote Zancón (*Speotyto cunicularia*) tienen una amplia distribución en el continente Americano. El Tecolote Ojoscuro del Balsas (*Otus seductus*) es endémico para la región del Pacífico Central de México. Los estados de mayor riqueza de especies fueron Oaxaca y Michoacán con 21 y 19 especies respectivamente, por el contrario los estados con menor riqueza fueron Aguascalientes, Campeche y Tlaxcala con 4, 5 y 5 respectivamente. El Tecolotito Bajero ha sido la especie de búho más colectada, representando el 30.7% de los especímenes, y el que registro con menos colectas fué el Tecolote Abetero Sureño (*Aegolius ridgwayi*) representando tan solo el 0.19%. De las especies neotropicales, el Tecolote Abetero Sureño, el Búho Cornado Cariblanco (*Asio clamator*) y el Búho Cornado Oscuro (*A. stygius*) son consideradas como amenazadas por el gobierno Mexicano. El grupo *Otus* así como el Búho Serrano Vientrirrayado (*Strix varia*)/Búho Serrano Sureño (*S. fulvescens* = *S. v. fulvescens*) tienen distribuciones controversiales debidas a su clasificación incierta.

[Traducción Autores]

Currently, there are 178 species of owls recognized in the world (Sibley and Alquist 1990), of which 27 (15%) species occur in Mexico. This exceeds the owl species diversity ($N = 22$) of northern

forests, north of 35° (Norberg 1987). Although, there is some overlap.

Owls in Mexico have been little studied and most literature is old (Ridgway 1895, Kelso and Kelso



Figure 1. Map of the Mexican Republic showing locations of 32 states.

1936, Moore 1937a, 1937b, 1941, 1947a, Moore and Peters 1939, Alvarez del Toro 1949, Briggs 1954, Moore and Marshall 1959, Buchanan 1964, Northern 1965). Generally, most Mexican owl species have limited morphological descriptions and only approximated distributions (Friedman et al. 1950, Blake 1972, Davis 1972, Peterson and Chalif 1973, 1989, Edwards 1989). Unfortunately, these distributions are often controversial. Here, we present a review of the distribution and relative status of Mexican owls based on museum specimen data and available literature.

STUDY AREA AND METHODS

Mexico (2 million km²) has 32 states (Fig. 1) with > 50% of the land mass above 1000 m elevation (Ramos 1985). Its 32 vegetation types (Rzedowski 1986), geographic location, and topography contribute to a rich diversity of fauna and flora.

To obtain information on Mexican owl specimens we wrote letters to or visited 11 national museums (Colección Ornitológica del Instituto de Biología, Colección Ornitológica de San Nicolás de Hidalgo, Universidad de Mi-

choacán, Escuela Nacional de Ciencias Biológicas, Instituto de Historia Natural de Chiapas, Instituto Nacional de Investigaciones Forestales y Agropecuarias-Bacalar, Instituto Nacional de Investigaciones sobre Recursos Bióticos, Laboratorio Natural de Las Joyas, Universidad de Guadalajara, Museo de Zoología de la Facultad de Ciencias, Museo de Zoología Iztacala, Salón de las Aves de Saltillo Coahuila, Universidad Autónoma de Baja California Sur and 37 foreign museums (Australian Museum, Anniston Museum of Natural History, Academy of Natural Sciences of Philadelphia, Bell Museum of Natural History, British Museum, Carnegie Museum of Natural History, Cornell University Collection, Collection Zoology Museum Amsterdam-Nederland, Denver Museum of Natural History, Delaware Museum of Natural History, Fort Hays Museum, Florida Museum of Natural History, Forschungsinstitut und Naturmuseum Senckenberg, Harvard Museum of Comparative Zoology, Illinois State Museum Collection, Kansas University Collection, Los Angeles California Museum-Natural History, Louisiana State University Museum Zoology, Moore Laboratory of Zoology-Occidental College, Museo Nacional de Ciencias Naturales-España, Museum of Natural History-Chicago, Museum of Vertebrate Zoology-University of California Berkeley, Oklahoma Museum of Natural History, Provincial Museum of Alberta, Peabody Museum Col-

lection—Yale University, Royal Ontario Museum, Rijksmuseum Van Natuurlijke Historie—Leiden, Santa Barbara Museum of Natural History, Southwestern College Collection, San Diego Museum of Natural History, Staatliches Museum für Naturkunde in Stuttgart, Texas Cooperative Wildlife Collection, National Museum of Natural History—Smithsonian Institute, University of Washington, Thomas Burke Memorial State Museum, University of Wisconsin Zoological Museum, Western Foundation Vertebrate Zoology Collection, Zoological Institute of the Academy of Sciences—URSS). Additionally, we reviewed the existing literature for information concerning Mexican owls. For vegetation types, we followed Rzedowski (1986).

State boundaries were the unit used to delineate distributions of the owls. We applied the taxonomy used by Amadon and Bull (1988) for most of the owl species which occur in Mexico. We followed Marshall et al. (1991) for recent changes of Vermiculated Screech-Owl (*Otus guatemalae*) to Variable Screech-Owl (*O. atricapillus*), and A.O.U. (1991) for generic change of the Burrowing Owl from *Athene* to *Speotyto*. We included the Fulvous Owl (*Strix fulvescens*) as a subspecies of the Barred Owl (*Strix varia*) = *S. v. fulvescens* (Edwards 1989, J. Marshall pers. comm.).

RESULTS

We compiled and analyzed data on 3683 specimens of Mexican owls. Twenty-seven Mexican owl species from both the Nearctic and Neotropical zoogeographic regions are represented. Eighteen species occur in the Nearctic and Neotropical regions, while nine species occur only in the Neotropical region. The Balsas Screech-Owl (*Otus seductus*) is endemic to Mexico's Pacific slope region. The Bearded Screech-Owl (*Otus barbarus*) and Unspotted Saw-whet Owl (*Aegolius ridgwayi*) are found only in Chiapas.

The greatest number of museum specimens were of the Ferruginous Pygmy-Owl (*Glaucidium brasilianum*) and least number of the Unspotted Saw-whet Owl. The richest owl assemblage came from Oaxaca and Michoacan with 21 and 19 species, respectively.

Species Accounts

Barn Owl (TALB) *Tyto alba*

The most widely distributed owl in Mexico, it inhabits forest, open areas, villages and cities, and islands from sea level to 3500 m in elevation. One hundred forty-one specimens from 31 states were recorded (Fig. 2). Friedman et al. (1950) also reported Barn Owls from Hidalgo and Quintana Roo, as have we (Enríquez-Rocha and Rangel-Salazar pers. obs.). Paynter (1955) and Hartig (1979) did not report the Barn Owl from the Yucatan Penin-

STATES	SPECIES																										
	TALB	OFLA	OASI	OKEN	OBEN	OCOO	OTRI	OBAR	OGUA	LORI	PFER	BWIR	CVIR	CNIS	SWAR	SOCC	GNNO	GMIN	GBRA	MWHI	SCUN	AACA	ARID	AGLA	ASTU	ADTU	AFEA
AGS																											
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Figure 2. Presence of owl species by state in Mexico. Codes are described in the text. (O = museum records and X = literature records.)

sula. Blake (1972) and Grossman and Hamlet (1988) considered them widely distributed throughout Mexico.

Flammulated Owl (OFLA) *Otus flammeolus*

Flammulated Owl inhabits highlands and pine forest from 2100–3000 m elevation. It is migratory in southern Sinaloa, central Mexico and south through the highlands of Chiapas. Eighty-one specimens from 16 states were recorded (Fig. 2). Additionally, it has been reported for Distrito Federal (Ridgway 1914, Friedman et al. 1950, Blake 1972) and Nuevo León (A.O.U. 1983, Contreras-Balderas 1992).

Eastern Screech-Owl (OASI) *Otus asio*

Eastern Screech-Owl inhabits pine forest, pine-oak forest and riparian habitats from sea level to 1500 m elevation. One hundred and seven specimens from 19 states were recorded (Fig. 2). Its distribution is restricted to northeastern and southern Mexico, which agrees with Marshall (1967) and Rowley (1984).

Western Screech-Owl (OKEN) *Otus kennicottii*

Western Screech-Owl inhabits dense pine and pine-oak forests, open habitats, and semi-desert vegetation from 0–2400 m elevation. One hundred and forty-eight specimens from 15 states were recorded (Fig. 2). There is confusion regarding species and subspecies distributions due to taxonomic changes (Marshall 1967). Our data conflict with Blake (1972) who reported this species in Queretaro and Hidalgo. Its distribution is northcentral, southwestern, and Baja California.

Balsas Screech-Owl (OSED) *Otus seductus*

Balsas Screech-Owl inhabits tropical deciduous forest and arid tropical scrub, and the edges of cropland. It ranges from sea level to 1200 m elevation. Twenty-five specimens from two states were recorded (Fig. 2). It has also been recorded in Guerrero (Marshall 1967, Peterson and Chalif 1973, A.O.U. 1983). This, the only endemic Mexican owl, is currently found only in Michoacan and Colima.

Pacific Screech-Owl (OCOO) *Otus cooperi*

Pacific Screech-Owl inhabits tropical lowlands, mangroves, open forests, palm groves, and swamps. It occurs from sea level to 90 m elevation. Twenty-three specimens from six states were recorded (Fig. 2). It appears to exist only along the Pacific slope in southwestern Mexico.

Whiskered Screech-Owl (OTRI) *Otus trichopsis*

Whiskered Screech-Owl inhabits highlands, in pine-oak forest, pine forest and dry oak. It ranges from 1200–3000 m elevation. One hundred and ninety-three specimens from 20 states were recorded (Fig. 2). Additionally, it has been reported from Hidalgo and Puebla (Davis 1972, A.O.U. 1983). It has a wide distribution but is absent in the Yucatan and Baja California peninsulas.

Bearded Screech-Owl (OBAR) *Otus barbarus*

Bearded Screech-Owl inhabits pine and pine-oak forest from 1400–1800 m elevation. Only nine specimens, all from Chiapas, were recorded (Fig. 2), but Ridgway (1914) reported it south of Chiapas in the highlands of Guatemala. It has the most restricted distribution of any Mexican owl.

Vermiculated Screech-Owl (OGUA)

Otus guatemalae

Vermiculated Screech-Owl inhabits riparian areas, tropical semi-deciduous and deciduous forests, and forest edges. It ranges from sea level to 1500 m

elevation. One hundred and six specimens from 16 states were recorded (Fig. 2). Although reported from Campeche and Tabasco (Friedman et al. 1950, Paynter 1955, Storer 1961, Davis 1972), no specimens were located. This is the only species from the *Otus* genus found in the Yucatan Peninsula.

Crested Owl (LCRI) *Lophostrix cristata*

Crested Owl occurs in southern Mexico and inhabits tropical evergreen and semi-deciduous forest, riparian areas, partial clearings, and foothills. It ranges from sea level to 1000 m elevation. Twenty-two specimens from four states were recorded (Fig. 2). Grossman and Hamlet (1988) reported it from the Yucatan Peninsula, but we could not confirm this.

Spectacled Owl (PPER) *Pulsatrix perspicillata*

Spectacled Owl inhabits tropical evergreen and semi-deciduous forests, riparian areas, partial clearings, and forest edges. It ranges from sea level to 900 m. Thirty-one specimens from three states were recorded (Fig. 2). It appears restricted to southern Mexico, but Grossman and Hamlet (1988) report it for the Yucatan Peninsula. We are uncertain of this.

Great Horned Owl (BVIR) *Bubo virginianus*

Great Horned Owl inhabits a wide diversity of habitats from forest land to open areas. It ranges from sea level to 2700 m elevation. Two hundred thirty-six specimens from 26 states were recorded (Fig. 2). Brodtkorb (1943) reported it for Tabasco, but no specimens exist. The present distribution encompasses almost the entire country and its presence in Tabasco seems likely.

Mottled Owl (CVIR) *Ciccaba virgata*

Mottled Owl inhabits tropical lowland forest, open tropical forest, and foothills. It ranges from sea level to 2100 m elevation. Four hundred and one specimens from 22 states were recorded (Fig. 2). It has a wide distribution, but is not yet reported from Baja Peninsula and northcentral Mexico.

Black and White Owl (CNIG)

Ciccaba nigrolineata

Black and White Owl appears to have discontinuous distribution within Mexico. It inhabits tropical evergreen and semi-deciduous forests, forest edge, or partial clearings. It ranges from sea level to 1200 m elevation. Forty-six specimens from five states were recorded (Fig. 2). Our museum data agree with the

literature (Ridgway 1914, Friedman et al. 1950, Blake 1972, Davis 1972, Peterson and Chalif 1973, A.O.U. 1983, Edwards 1989). Paynter (1955) reported one specimen from Quintana Roo, and we have additional specimens from there.

Barred Owl (SVAR) *Strix varia*

Found in pine and pine-oak forests, and ranges from 1500–3000 m elevation. Thirty-nine specimens from 10 states were recorded (Fig. 2). Some authors (Ridgway 1914, Peters 1940, Friedman et al. 1950, Davis 1972, A.O.U. 1983) reported it for Puebla, but we located no museum specimens. Alvarez del Toro (1980) reported the Fulvous Owl (*Strix fulvescens*) from the Cloud Forest of Chiapas, but we identified only one museum specimen from the Cloud Forest as *Strix varia fulvescens*. Six specimens in three museums identified as *Strix varia* were reclassified as *S. v. fulvescens* by J.T. Marshall (pers. comm.). Also, two other specimens from Oaxaca were identified as *S. fulvescens*, but they should be reclassified as *S. v. fulvescens*.

Spotted Owl (SOCC) *Strix occidentalis*

Spotted Owl has a discontinuous distribution, inhabiting pine and pine-oak forests from 1200–2500 m elevation. Twenty-seven specimens from eight states were recorded (Fig. 2). It has been reported in Baja California (Ridgway 1914, A.O.U. 1983, Edwards 1989, Peterson and Chalif 1989), but no specimens exist from there. A specimen from San Luis Potosi and one sight record from Durango do exist (R. Clark pers. comm.), but we were not able to confirm this.

Northern Pygmy-Owl (GGNO) *Glaucidium gnoma*

Northern Pygmy-Owl inhabits pine-oak forest and scrub vegetation, from 1800–3700 m elevation. One hundred eighty-eight specimens from 25 states were recorded (Fig. 2). It has also been reported from Colima (Ridgway 1914, Friedman et al. 1950), but no museum specimens are known.

Least Pygmy-Owl (GMIN) *Glaucidium minutissimum*

Least Pygmy-Owl inhabits tropical forest, forest edge, plantations, and barrancas from sea level to 1800 m elevation. One hundred thirty-nine specimens from 14 states were recorded (Fig. 2). The specimen data agree with the distributions given by Davis (1972) and Peterson and Chalif (1989). It has

not been reported from Mexico's peninsulas or the northcentral and central plateaus.

Ferruginous Pygmy-Owl (GBRA)

Glaucidium brasilianum

Ferruginous Pygmy-Owl inhabits lowland riparian forest, forest edge, second growth, and thickets from sea level to 1500 m elevation. One thousand one hundred thirty-one specimens from 23 states were recorded (Fig. 2). It has not been reported in the Baja California Peninsula. Friedman et al. (1950), and A.O.U. (1983) report it for Distrito Federal and Coahuila but no museum specimens exist.

Elf Owl (MWHI) *Micrathene whitneyi*

Elf Owl inhabits saguaro deserts and arid tropical scrub from sea level to 1800 m elevation. One hundred sixty-seven specimens from 16 states were recorded (Fig. 2). This includes the Revillagigedo Islands in the Pacific Ocean. It has also been reported for the state of Mexico (Peters 1940, Blake 1972), and Tamaulipas (Grossman and Hamlet 1988), but no specimens exist. It does not occur in southern Mexico.

Burrowing Owl (SCUN) *Speotyto cunicularia*

Burrowing Owl inhabits open lands, grasslands, prairies, and tropical scrub from sea level to 1800 m elevation. Two hundred seventy-seven specimens from 27 states were recorded (Fig. 2). It has a wide distribution and occurs throughout the country in suitable habitat (Grossman and Hamlet 1988).

Northern Saw-whet Owl (AACA)

Aegolius acadicus

Northern Saw-whet Owl inhabits foothills with pine and pine-oak forests from 1800–2800 m elevation. Twenty-six specimens from 11 states were recorded (Fig. 2). It occurs in northcentral and central Mexico, and has been reported from Chihuahua, Jalisco, and Veracruz (Ridgway 1914, Friedman et al. 1950, Blake 1972, Davis 1972).

Unspotted Saw-whet Owl (ARID)

Aegolius ridgwayi

Unspotted Saw-whet Owl inhabits cloud forest, pine, and pine-oak forest from 2100–3000 m elevation. Only seven specimens, all from Chiapas were recorded (Fig. 2). It has been reported previously from Chiapas (Moore 1947b, Alvarez del Toro 1980, Davis 1972, Peterson and Chalif 1973, A.O.U. 1983, Enríquez and Rangel-Salazar (pers. obs.). The

A.O.U. (1983) reported a questionable specimen record from Oaxaca.

Striped Owl (ACLA) *Asio clamator*

Striped Owl inhabits dense tropical evergreen forest, forest gaps, and forest edge from sea level to 900 m elevation. Twenty-six specimens from 3 states were recorded (Fig. 2). It occurs primarily in southeastern Mexico, but also in Veracruz, Chiapas (Blake 1972, Davis 1972, Peterson and Chalif 1973), and Oaxaca (Binford 1989).

Stygian Owl (ASTY) *Asio stygius*

Stygian Owl inhabits dense cloud forest in the mountains and ranges from 1500–3000 m elevation. Seventeen specimens from nine states were recorded (Fig. 2). It has also been reported in Chiapas (Friedman et al. 1950, Davis 1972, Alvarez del Toro 1980, A.O.U. 1983) and the Yucatan Peninsula (A.O.U. 1983, Edwards 1989), but, this does not agree with our data or that of Paynter (1955) and Hartig (1979).

Long-eared Owl (AOTU) *Asio otus*

Long-eared Owl inhabits pine and pine-oak forest and riparian forest from sea level to 1800 m elevation. Forty-one specimens from 13 states were recorded (Fig. 2). Museum data and the literature are in close agreement (Ridgway 1914, Friedman et al. 1950, Blake 1972, A.O.U. 1983). There are band recoveries of long distance migrants to Mexico from Saskatchewan, Canada (Houston 1966), Montana, U.S.A. (D. Holt pers. obs.), and Minnesota, U.S.A. (D. Evans pers. comm.).

Short-eared Owl (AFLA) *Asio flammeus*

Short-eared Owl inhabits grasslands, open tropical forests, prairies, and marshes from sea level to 1500 m elevation. Twenty-nine specimens from 14 states were recorded (Fig. 2). It has also been reported from Jalisco, Oaxaca, Puebla, Veracruz, Quintana Roo and Yucatan (Friedman et al. 1950, Hartig 1979, A.O.U. 1983, Binford 1989, MacKinnon 1992).

DISCUSSION

The taxonomy and distribution of most Mexican owls is still incomplete. For example, subspecies of the screech owls (*Otus*) group discussed by Marshall (1967) were reported only from eastern Mexico. Our museum data, however, indicate that some of these subspecies occur in western Mexico. The Fulvous Owl has been considered a subspecies of the Barred

Owl (Edwards 1989, J. Marshall pers. comm.); however, field work is still needed to verify this.

The Unspotted Saw-whet Owl, Striped Owl, and Stygian Owl are listed as endangered by the Mexican government (SEDUE 1991). The Balsas Screech-Owl, Bearded Screech-Owl, Crested Owl, Spectacled Owl, Black and White Owl, Barred Owl and Spotted Owl are being considered for endangered status because of their low numbers, restricted distribution, and habitat loss.

Museum collection data can help delineate geographic distribution and estimate relative abundance. Lack of museum collections may indicate a rare, uncommon, or easily overlooked species. Museum data can be important also for comparing present and historical distributions. Threatened and endangered species data in collections are also important for historic location sites. On the other hand, for some museum specimens the accompanying data are incomplete or completely wrong. Often date of collection and other important information were not included.

This is the first attempt in Mexico to draw information together about this taxonomic group. We hope this paper acts as a catalyst to spur further investigations into Mexican owl distribution, status, biology, ecology, and conservation.

ACKNOWLEDGMENTS

We are very grateful to the museums that provided information. We thank J.T. Marshall for comments on the manuscript and additional information. We thank R.J. Clark, C.D. Marti, H. Mikkola and an anonymous referee for comments on the manuscript.

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Received 13 November 1992; accepted 15 June 1993