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Noteworthy County Records for 14 Bat Species Based on Specimens Submitted to the Texas Department of State Health Services

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Abstract

Bats submitted to the Texas Department of State Health Services (DSHS) for rabies testing have been useful for studying chiropteran distributions within the state. Over 10,000 rabies-negative specimens were received by the DSHS for testing from 2004 to 2011 and the majority were identified using morphological features. We extracted tissues and prepared fluid-preserved vouchers from a subset of these specimens. Each specimen's location was compared to the known distribution of the species to determine new county records or range extensions. Species that had been documented from a county solely based on published literature (no known voucher specimens) were considered county records as well. Herein, we report on 14 species from 70 Texas counties. A total of 103 new county records (including seven range extensions) were documented including one phyllostomid (*Choeronycteris mexicana*), 12 vespertilionids of seven genera (*Myotis*, *Lasiurus*, *Lasionycteris*, *Perimyotis*, *Eptesicus*, *Nycticeius*, and *Antrozous*) and one molossid (*Nyctinomops macrotis*). Although the specimens in this study were not obtained by traditional methods, they document important occurrences of bat species in the state of Texas.

Key words: Chiroptera, county records, distribution, rabies-negative, Texas

Introduction

Documenting the distribution of bat species traditionally has relied on the actions of mammalogists capturing specimens and reporting their occurrence across the 254 counties in the state of Texas (Ammerman et al. 2012). A less traditional approach, examining specimens submitted by the public to the Texas Department of Health (TDH) for rabies testing, also has resulted in important county records (Yancey and Jones 1996; Higginbotham and Jones 2001; Balin 2009; Tipps et al., In press) and an increased understanding of changes in species occurrence. Although the data associated with each specimen is less detailed (primarily date and county), these vouchers document occurrence in the counties from which they were collected and can contribute to our knowledge of changing species distributions. The purpose of our study was to evaluate specimens submitted for rabies testing from 2004 to 2011 to the Texas Department of State Health Services (DSHS), formerly TDH, for any noteworthy or new county records of occurrence.

METHODS

Bats from throughout the state were submitted to the DSHS rabies laboratory in Austin, Texas, between 2004 and 2011 and were tested for the presence of rabies virus. During that time period, approximately 10,500 rabies-negative specimens were frozen and entered into a database that was sorted and evaluated for new county records. Counties that specimens were recorded from were compared to distribution maps in Schmidly (2004) and Ammerman et al. (2012) and to the website that lists all bat specimens examined for *Bats of Texas* (Ammerman et al. 2012; www.batsoftexas.com) in order to determine new county records. Specimens were considered new county records if no museum voucher specimen was known or discovered for that county. Some counties were designated by Schmidly (1991, 2004) as having a literature record or a TDH/DSHS database record in the distribution maps. However, bats submitted to TDH/DSHS in some years were incinerated after being recorded in a database and therefore no museum voucher specimen exists to verify species identifications. Four species (*Lasiurus seminolus*, *L. borealis*, *Eptesicus fuscus*, and *Nycticeius humeralis*) were documented as having a specimen record in a specific county (see accounts below for specific information), but after further review of the literature and/or lists of specimens examined, it was determined that no voucher existed.

Fluid voucher specimens were preserved in 70% ethanol and deposited at the Natural Science Research Laboratory of the Museum of Texas Tech University (TTU) or the Angelo State Natural History Collection (ASNHC). Some specimens prepared as skull or skeleton only were deposited in the ASNHC. The date of receipt at DSHS and county of collection were recorded for each specimen. Specimen receipt dates were generally one to three days subsequent to collection dates (collection date was not stated for some specimens). Unfortunately, the Health Information Portability and Accountability Act of 1996 (HIPAA) prevents the release of more specific locality information by DSHS. Sex and age were determined when possible and standard morphological measurements (total length, tail length, hind foot length, ear length, and length of the forearm) were taken for each specimen. These measurements were compared to key characteristics in Ammerman et al. (2012) in order to confirm species identity. Tissue samples (heart, lung, liver, and kidney) were collected when possible, frozen, and deposited at either TTU (given a TK number), ASNHC (given an ASK number), or both.

SPECIES ACCOUNTS

Family Phyllostomidae

Choeronycteris mexicana Tschudi 1844

Mexican Long-tongued Bat

The Mexican long-tongued bat is one of three species of phyllostomid bats found in Texas (Ammerman et al. 2012). The species was first captured in Texas on 11 December 1970 at the Santa Ana Wildlife Refuge in Hidalgo County. Since then, occurrences of the Mexican long-tongued bat have been documented in Cameron County at the Laguna Atascosa National Wildlife Refuge (Fernandez et al. 2000), El Paso County (Balin 2009), and in Midland County as a result of a specimen turned into DSHS (Schmidly 2004). Two additional specimens submitted to DSHS are new county records for *C. mexicana* in Nueces and Hays counties. Thus, the distribution of this bat in Texas is enigmatic.

Hays County.—A specimen (TTU 114602, TK 173102) was received on 19 October 2010. This specimen represents a new county record for the Edwards Plateau region.

Nueces County.—A specimen (ASNHC 14494, TK 171146, skeleton only) was received on 26 November 2008. This specimen represents a new county record for the Western Gulf Coastal Plains region.

Family Vespertilionidae
***Myotis austroriparius* (Rhodes 1897)**
Southeastern Myotis

The southeastern myotis is known throughout the southeastern United States and as far west as Texas where it can be found in the Pineywoods, Central Texas Plains, and Western Gulf Coastal Plains of the state (Ammerman et al. 2012). The distribution for this bat in Texas is restricted to the eastern part of the state with the exception of a record in Comanche County. The male specimen collected in Comanche on 13 October 1995 extended the known range for the species by 240 km (Higginbotham and Jones 2001). We report on five voucher specimens supporting the report by Mirowsky et al. (2004) of *M. austroriparius* roosting in Smith County in eastern Texas.

Smith County.—Two adult males were received on 9 July 2009 and 7 November 2009 (TTU 113398, TK 171010; TTU 113400, TK 171012). An adult female (TTU 113389, TK 171001) was received on 14 March 2010. Juvenile males were received on 17 June 2010 and 13 July 2010 (TTU 113397, TK 171009; TTU 113401, TK 171013). Partial sequences from the cytochrome-*b* gene from two of these specimens (TK 171001 and TK 171009) were collected and compared to reference sequences from GenBank as additional confirmation of species identification.

***Myotis velifer* (J.A. Allen 1890)**
Cave Myotis

The cave myotis is a year-round resident of Texas. Seasonal variations in the species' distribution are common, but from late Spring through early Fall, the cave myotis occupies every ecological region in the state with the exception of the South Central Plains (Ammerman et al. 2012). We report on new occurrences of this bat in two counties.

Gillespie County.—Four specimens were received from Gillespie County. An adult male (TTU 113986, TK 171398) was received on 26 March 2009. On 8 August 2009 a second adult male (TTU 113995, TK 171407) was received. An adult female (TTU 114013, TK 171425) was received on 18 August 2009. An additional adult male (TTU 114000, TK 171412) was received on 3 November 2009.

Mills County.—Five voucher specimens were received on 28 June 2011. Three females (TTU 114075, TK 171487; TTU 114559, TK 173059; TTU 114546, TK 173046) were received with a male (TTU 114522, TK 173022) and another specimen whose sex was not determined (TTU 114536, TK 173036).

***Lasiurus borealis* (Muller 1776)**
Eastern Red Bat

The eastern red bat is a statewide and year-long resident of Texas. Although this bat occurs in Texas throughout the year, it is highly migratory and capture records have shown a dramatic decrease in state distribution throughout winter months. *L. borealis* is a tree roosting and forest dwelling species. The distribution of the eastern red bat is largely influenced by the vegetation found within each region. Records within the Chihuahuan Desert Region are limited to mountainous areas and emphasize the importance of habitat for this species (Ammerman et al. 2012). DSHS specimens add seven new counties to the distribution of *L. borealis* in Texas. These counties are Caldwell, Ellis, Lee, Midland, Potter, Taylor, and Titus counties. Ellis, Lee, Midland and Taylor counties previously were listed as TDH/DSHS records. However, given that the specimens supporting these records originally were discarded, we consider the new vouchers as county records.

Caldwell County.—An adult male (TTU 113947, TK 171359) was received on 12 May 2009.

Ellis County.—An adult female (TTU 113934, TK 171346) was received on 3 July 2009.

Lee County.—Four specimens were received on 3 July 2009. One specimen was an adult male (TTU 113891, TK 171303); three others were juvenile males (TTU 113959, TK 171371; TTU 113966, TK 171378, TTU 113970, TK 171382).

Midland County.—Two adult males were received on 17 June 2009 and on 2 September 2009

(TTU 113882, TK 171294; TTU 113870, TK 171282), respectively. One adult female (TTU 113862, TK 171274) was received on 2 September 2009.

Potter County.—Potter County previously was listed as a TDH record (Schmidly 1991) but lacked a voucher specimen; therefore we consider the following specimen a new county record. An adult female (TTU 113932, TK 171344) was received on 21 June 2009.

Taylor County.—An adult male (TTU 113963, TK 171375) was received on 4 September 2009.

Titus County.— Schmidly (2004) and Ammerman et al. (2012) depict a record for this species; however, no voucher specimen of *L. borealis* from Titus County was found to accompany that designation. A juvenile male (TTU 113894, TK 171306) was received on 1 July 2009 and is the first documented voucher specimen of this species from Titus County.

***Lasiurus cinereus* (Palisot de Beauvois 1796)**
Hoary Bat

The hoary bat is a statewide, migratory species documented in every ecological region within Texas. This bat displays the common spring-fall migration pattern, although in Texas, males and females demonstrate geographical segregation (Ammerman et al. 2012). The hoary bat is a forest dwelling species (Schmidly 2004; Ammerman et al. 2012). New records of *L. cinereus* were documented from ten counties. Gregg County previously was listed as a TDH/DSHS record (Ammerman et al. 2012). However, because the specimen supporting this record was never archived, we consider the new specimen as a county record.

Bastrop County.—An adult female (TTU 113609, TK 171221) was received on 8 September 2008.

Collin County.—A male (TTU 114584, TK 173084) was received on 20 August 2010.

Crane County.—A male (TTU 113392, TK 171004) was received on 18 May 2008.

Ector County.—An adult male (TTU 113506, TK 171118) was received on 14 May 2009.

Gregg County.—An adult female (TTU 113626, TK 171238) was received on 24 May 2008.

Johnson County.—An adult male (TTU 113569, TK 171181) was received on 20 October 2007.

Parker County.—A female (TTU 114604, TK 173104) was received on 13 September 2010.

Smith County.—Six females (four adult and two juvenile) were received between July 2007 and July 2008. The first adult specimen (TTU 113566, TK 171178) was received on 14 July 2007. The other five specimens were received in 2008 with three of those being received on 27 June, two juveniles (TTU 113633, TK 171245; TTU 113632, TK 171244) and one adult (TTU 113556, TK 171168). The remaining two adult specimens were received on 2 July (TTU 113563, TK 171175) and on 16 July (TTU 113554, TK 171166).

Williamson County.—An adult male (TTU 113607, TK 171219) was received on 18 August 2008. An adult female (TTU 113505, TK 17117) was received on 13 October 2009.

Young County.—A specimen (TTU 113640, TK 172002) of undetermined sex was received on 27 May 2010. Young County occupies both the Central Great Plains and Cross Timbers ecoregions (Griffith et al. 2004).

***Lasiurus ega* (Gervais 1856)**
Southern Yellow Bat

The southern yellow bat is a neotropical species that has expanded its range northward into the United States in recent years (Ammerman et al. 2012). It has been suggested by Spencer et al. (1988) that these bats are using the increasing number of ornamental palm trees planted by residents in the Southern Texas Plains and Gulf Coastal Plains ecoregions of Texas. This medium sized yellow bat is sometimes confused with *Lasiurus intermedius*, the northern yellow bat, which also occurs in southern Texas. Several morphological features vary between the two species. Overall size can be used for determining if an adult specimen is *L. ega* (average total length of 118 mm) or *L. intermedius* (average total length of 133 mm) (Ammerman et al.

2012). Skull features are difficult to use in specimens from DSHS because of damage that occurs to the skull when brain tissue is removed for rabies testing. In that case, and when specimens are juveniles, additional confirmation (such as from molecular data) might be required in order to determine the species (Tipps et al., in press). *L. xanthinus*, the western yellow bat, is also similar to *L. ega* (Baker et al. 1988). However, confusion between these two species is rare because they occur in different ecological regions of Texas (Schmidly 2004). We present a total of six county records including records in Fayette and Comal counties that extend the known range of the southern yellow bat northward by more than 200 km.

Aransas County.—Aransas County is just outside the northeastern limit of the southern yellow bat's previously known range. A female specimen (TTU 113429, TK 171041) was received on 7 July 2010; this Gulf Coast county expands the known distribution of the species. The specimen had a recorded total length of 78 mm, a hind foot length of 8 mm, and a forearm length of 48 mm.

Comal County.—An adult male specimen (ASNHC 15072, ASK 9381) was received on 1 December 2011. This specimen had a total length of 111 mm, a hind foot length of 10 mm, and a forearm length of 47 mm. This record extends the known range of the southern yellow bat into the Edwards Plateau and the Texas Blackland Prairies ecoregions.

Fayette County.—An adult female (TTU 113509, TK 171121) was received on 17 November 2009 with a recorded total length of 115 mm, a hind foot length of 9 mm, and a forearm length of 46 mm. The total length of the specimen complies with the expected length of *L. ega*. Therefore, Fayette County extends the known range of the southern yellow bat. Fayette County is included in the Texas Blackland Prairies and East Central Texas Plains ecoregions.

Hidalgo County.—Hidalgo County previously was listed by Ammerman et al. (2012) as a literature record based on Chapman and Chapman (1990). Chapman and Chapman (1990) examined a single specimen housed at Pan American University. An additional six specimens of *L. ega* were received from this county and are important for validating established populations there. The first was a female specimen (TTU 113592, TK 171204) on 23 April 2008. Another adult female (TTU 113594, TK 171206) was received on 4 May 2008. A female (TTU 113432, TK 171044) was received on 9 June 2009. In 2010, an adult female (TTU 113436, TK 171048) was received on 18 February. A male (TTU 113434, TK 171046) was received on 30 June 2010. On 8 July 2010, a juvenile female (TTU 113433, TK 171045) was received. Thus, populations of *L. ega* appear to be established in Hidalgo County.

Webb County.—A female specimen (TTU 113425, TK 171037) was received on 18 March 2010. This county is located within the Southern Texas Plains and previously was documented as a DSHS record. However, because the specimen supporting this record was discarded, we consider the new voucher as a county record.

Willacy County.—A female specimen (TTU 113438, TK 171050) was received on 11 December 2008. The specimen had a hind foot length of 9 mm and a forearm length of 47 mm. Total body length was not recorded for this specimen. This record is within the previously known distribution for the species.

***Lasiurus intermedius* H. Allen 1862**
Northern Yellow bat

The northern yellow bat previously was thought to occur primarily along the Gulf Coast. Inland records in the South Central Plains, East Central Great Plains, and Blackland Prairies ecological regions were rare (Ammerman et al. 2012). The distribution of *L. intermedius* seems to be closely linked with the distribution of Spanish moss, a preferred roosting site of the bat (Schmidly 2004). In southern Texas, palm trees also serve as a common roosting site. Because palm trees are utilized by both *L. ega* and *L. intermedius*, these species have been found roosting together in the large dead leaves (Spencer et al. 1988; Chapman and Chapman 1990). *L. intermedius* may be distinguished from *L. ega* by its larger size (average total body length = 133 mm, average forearm = 53 mm). Specimens submitted to DSHS have expanded the known distribution of the species across the southern tip of Texas from the Gulf Coast to the bend of the Rio Grande (Frio, Starr, Uvalde, and Webb counties) and also provide new records from

additional counties within the known distribution of the species (Ammerman et al. 2012).

Frio County.—An adult female specimen (TTU 113405, TK 171017) was received from this county in the Southern Texas Plains region of Texas on 18 March 2010. The recorded measurements for the specimen were a total length of 135 mm, hind foot length of 12 mm, and a forearm length of 53 mm.

Jim Wells County.—An adult male specimen (TTU 113565, TK 171177) was received on 17 July 2008. The specimen had a recorded total length of 118 mm, a hind foot length of 9 mm, and a forearm length of 52 mm. Jim Wells County was previously listed as a DSHS record. Because the specimen supporting the record was discarded, we consider the new voucher specimen a new county record.

Starr County.—Three specimens were received from this county in the Southern Texas Plains region. A female (TTU 113574, TK 171186) received on 5 July 2008 had a total body length of 124 mm and forearm measurement of 57 mm. An adult female specimen (TTU 113575, TK 171187), with a total body length of 125 mm and a forearm length of 51 mm, was received on 11 July 2008. A male specimen (TTU 113595, TK 171207) with a recorded total body length of 127 mm and a forearm measurement of 53 mm was received on 26 July 2008.

Uvalde County.—A juvenile male (TTU 113409, TK 171021) received on 10 July 2010 expanded the geographic range of *L. intermedius* to the west. This county occupies two ecoregions, the Edwards Plateau and the Southern Texas Plains.

Webb County.—Webb County previously was outside of the known range for *L. intermedius*. Between August 2008 and June 2010, six northern yellow bat specimens were received from Webb County, resulting in an extension of the known distribution. On 23 August 2008, a female (TTU 113407, TK 171019) was received. The following year two female specimens were received, one on 22 April 2009 (TTU 113459, TK 171071) and a second on 28 August 2009 (TTU 113404, TK 171016). Three specimens were received in 2010; a female (TTU 113403, TK 171015) received on 12 January, an adult male (TTU 113408, TK 171020) received on 23 March, and a female (TTU 113410, TK 171022) received on 15 June. Webb County is located in the Southern Texas Plains ecoregion.

Willacy County.—Eight specimens represent new county records for the species (Ammerman et al. 2012). An adult female was received on 17 March 2009 (TTU 113461, TK 171073). An adult male was received on 27 June 2009 (TTU 113463, TK 171075). A second adult female was received on 8 July 2009 (TTU 113462, TK 171074). Two females (TTU 114576, TK 173076; TTU 114582, TK 173082), a male (TTU 114628, TK 173128), and two specimens of undetermined sex (TTU 114627, TK 173127; TTU 114620, TK 173120) were received on 24 June 2011.

Lasiurus seminolus **(Rhodes 1895)**
Seminole Bat

A year-long resident of Texas, the Seminole bat has been documented within six ecological regions. The majority of these regions (South Central Plains, Gulf Coast Plains, East Central Great Plains, Blackland Prairies, and Cross Timbers) are found in the eastern part of the state. An exception is a record (ASNHC 10650) at the western edge of Edwards Plateau (Brant and Dowler 2000) in Val Verde County. The resulting record was 425 km west of the previous range for the species. The far westward extension of the range was suggested to be a result of the Rio Grande Valley acting as a corridor for the species (Brant and Dowler 2000). Cameron County, found at the southern tip of Texas, also was an extreme range extension for the species. Hall (1981) reported the occurrence of *L. seminolus* in this border county. However, no known specimens have been reported across the Rio Grande border in Mexico (Ceballos and Oliva 2005). Despite the far western and southern occurrences, the Seminole bat is commonly found within the pine-oak forest of East Texas. We report sixteen new county records for *L. seminolus*. Some are within the expected distribution for *L. seminolus*, but two counties, Nueces and Hidalgo, are extensions to the south. Four counties (Brazoria, Dallas, Gregg, and Smith) previously have been documented as DSHS records but lacked voucher specimens.

Bastrop County.—A male (TTU 113625, TK 171237) was received on 17 January 2006 and a female (TTU 114517, TK 173017) on 17 June 2011.

Brazoria County.—Three female specimens were received: the first specimen (TTU 114088, TK 171500) was received on 14 June 2011; the second and third specimens (TTU 114568, TK 173068; TTU 114603, TK 173103) were received on 21 June 2011.

Brazos County.—Three specimens were received between June 2007 and June 2010. A female (TTU 113580, TK 171192) was received on 13 June 2007, a male (TTU 113456, TK 171068) was received on 15 August 2009, and a juvenile male (TTU 113980, TK 171392) was received on 24 June 2010.

Dallas County.—A male (TTU 113600, TK 171212) was received on 21 September 2006.

Gregg County.—Six specimens were submitted to DSHS and represent new county records. An adult female (TTU 113421, TK 171033) was received on 20 May 2008, an adult male (TTU 113441, TK 171053) was received on 12 January 2010, and an adult female (TTU 113442, TK 171054) was received on 26 January 2010. An adult female (TTU 113443, TK 171055) was received on 17 April 2010 and an adult male (TTU 113444, TK 171056) was received on 25 April 2010. A female (TTU 114510, TK 173010) was received on 2 February 2011.

Grimes County.—An adult female (TTU 113623, TK 171235) was received on 21 August 2006.

Henderson County.—A female (TTU 113424, TK 171036) was received on 9 May 2008.

Hidalgo County.—In 2008, two *L. seminolus* specimens were submitted from this county on the Texas/Mexico border. A male specimen (TTU 113591, TK 171203) was received on 24 June 2008. A female specimen (TTU 113390, TK 171002) was received on 21 November 2008. The Seminole bat is not known in Mexico (Ceballos and Oliva 2005) and therefore, this new record and a report of *L. seminolus* in neighboring Cameron County (Hall 1981), represent the southernmost documentation of the species. Hidalgo County occupies both the Southern Texas Plains and Western Gulf Coastal Plains ecoregions.

Jackson County.—Three juvenile male specimens were received on 9 June 2009 (TTU 113450, TK 171062; TTU 113451, TK 171063; TTU 113452 TK 171064).

Lee County.—An adult female (TTU 113608, TK 171220) and four pups (TTU 113843, TK 171255; TTU 113844, TK 171256; TTU 113845, TK 171257; TTU 113846, 171258) were received on 2 June 2006. Forearm size on the pups ranged from 17 to 20 mm. An additional female (TTU 114610, TK 173110) was received on 29 June 2010.

Leon County.—A female (TTU 113606, TK 171218) was received on 8 August 2006.

Nueces County.—Nueces County is outside the known distribution for *L. seminolus* (Ammerman et al. 2012). Although it is not the southernmost occurrence of the species, a specimen from this county bridges the gap from East Texas populations to Hidalgo and Cameron counties in South Texas. The Nueces County specimen is an adult female (TTU 114585, TK 173085) that was received on 20 November 2010.

Smith County.—Smith County previously was listed as a DSHS record (Schmidly 1991), however the original specimen was discarded. Thirteen voucher specimens have been collected from the county establishing it as a part of the range of *L. seminolus*. A female (TTU 113616, TK 171228) received on 16 February 2006 was the first recorded voucher specimen. A second female (TTU 113602, TK 171214) was received on 22 April 2006, a male (TTU 113611 TK171223) on 27 June 2006, and a female (TTU 113637, TK 171249) on 26 July 2006. A second male (TTU 113631, TK 171243) was received on 29 July 2006. One juvenile female (TTU 113567, TK 171179) was received on 30 June 2007. A female (TTU 113423, TK 171035) was received on 12 February 2008 and a male (TTU 113422, TK 171034) was received on 18 July 2008. Three specimens were received in 2009; a female (TTU 113446, TK 171058) on 11 February 2009, a juvenile female (TTU 113447, TK71059) on 11 July, and a male (TTU 113448, TK 171060) on 22 August.

Two specimens were received in 2010; a male (TTU 113440, TK 171052) on 27 January, and a female (TTU 113445, TK 171057) on 9 March.

Tarrant County.—A specimen (TTU 114544, TK 173044) of undetermined sex was received on 16 June 2011.

Upshur County.—A male (TTU 113457, TK 171069) was received on 18 August 2009, and a female (TTU 114615, TK 173115) was received on 3 August 2010.

Washington County.—Two juvenile male specimens were received in 2007, one (TTU 113590, TK 171202) on 15 June and the other (TTU 113584, TK 171196) on 19 June.

***Lasionycteris noctivagans* Le Conte 1831**
Silver-haired Bat

Like *Lasiurus*, the primary habitat of the silver-haired bat consists of forested areas. However, this medium sized bat prefers hollowed-out tree cavities or loose bark as its daytime retreat instead of hanging from elevated limbs as is traditional with tree bats (Schmidly 2004). Among the many chiroptera species found in Texas, *L. noctivagans* is one of the most broadly but intermittently distributed. Its pattern of dispersal has been attributed to fall and spring migrations. Collection records also suggest that the species is typically absent in Texas during summer months (Ammerman et al. 2012). The recent collection of four male specimens in May and June suggest that sexual segregation in the summer could result in males residing as far south as Texas (Ammerman 2005). This species had been recorded in every region in Texas except for East Central Texas Plains, Blackland Prairies, Cross Timbers, and the Southern Texas Plains (Ammerman et al. 2012). In this report we document the occurrence of *L. noctivagans* in the following counties: Bailey, Collin, Dallas, Midland, Parmer, Potter, Swisher, Travis, and Williamson.

Bailey County.—A female (TTU 113513, TK 171125) was received on 29 September 2009.

Collin County.—A *L. noctivagans* specimen (TTU 113573, TK 171185) was received on 22 September 2006. Collin County is located within the Texas Blackland Prairies, an ecoregion previously not recorded for the species.

Dallas County.—A female (TTU 113494, TK 171106) was received on 10 October 2009. Dallas County, like Collin County, is located within the Blackland Prairies.

Midland County.—A male (TTU 113597, TK 171209) was received on 23 October 2007. A female specimen (TTU 113605, TK 171217) was received on 29 October 2008.

Parmer County.—A male (TTU 114607, TK 173107) was received on 13 October 2010.

Potter County.—A TDH record was documented previously by Schmidly (1991). Due to the lack of a voucher specimen, however, we consider the following specimens a new county record. The first specimen received was a male *L. noctivagans* (TTU 113582, TK 171194) on 12 October 2007. A second male (TTU 113552, TK 171164) was received on 2 November 2008.

Swisher County.—An adult female (TTU 113549, TK 171161) was received on 13 May 2008.

Travis County.—An adult male (TTU 113394, TK 171006) was received on 19 November 2008. Travis County is located within the Edwards Plateau and the Blackland Prairies ecoregions.

Williamson County.—A male (TTU 113415, TK 171027) was received on 6 November 2007. Williamson County is within three ecological regions: the Cross Timbers, the Blackland Prairies, and the Edwards Plateau. Both the Cross Timbers and Blackland Prairies regions previously lack documentation of this species. The exact ecoregion for the specimen cannot be determined due to the lack of a specific capture locality.

***Perimyotis subflavus* (F. Cuvier 1832)**
American Perimyotis

The American perimyotis, *Perimyotis subflavus*, is a year-round resident of Texas (Ammerman et al. 2012) and is common within the eastern half of the state

(Schmidly 2004). *P. subflavus* has been found in 10 physiographic regions within the state (Ammerman et al. 2012) and is associated closely with riparian woodlands within the area (Schmidly 2004). Waterways are highly utilized by this species (Fujita and Kunz 1984). The species recently has been determined a resident of New Mexico (Valdez et al. 2009) and Armstrong et al. (2006) suggested that it also is a resident of Colorado. Within Texas, recent records in Lubbock, Presidio, and Brewster counties (Yancey et al. 1995; Schmidly 2004; Ammerman 2005) suggest that the species may be expanding its range westward. The addition of three new county records in the Panhandle from Moore, Potter, and Hutchinson counties support this expansion. However, Armstrong et al. (2006) speculated whether the individual specimens in Colorado represented an actual range expansion in recent decades or merely an extension of our knowledge of bat distribution in the state. Sixteen new Texas county records and one noteworthy occurrence for *P. subflavus* are presented herein.

Bell County.—Three specimens were received in 2009; a female (TTU 113559, TK 171171) on 7 October, and a female (TTU 113557, TK 171169) and a male (TTU 113558, TK 171170) on 27 October.

Cherokee County.—A male specimen (TTU 113614, TK 171226) was received on 28 December 2006.

Denton County.—A male (TTU 113562, TK 171174) was received on 28 October 2009.

Franklin County.—A male (TTU 113617, TK 171229) was received on 17 August 2006.

Gregg County.—A male (TTU 113553, TK 171165) was received on 5 October 2007. On 1 October 2009, a second male (TTU 113560, TK 171172) was received. Five individuals were received on 18 March 2011; three males (TTU 114508, TK 173008; TTU 114548, TK 173048; TTU 114524, TK 173024), a female (TTU 114555, TK173055), and one of unidentified sex (TTU 114560, TK 173060).

Grimes County.—A male (TTU 113619, TK 171231) was received on 2 December 2006.

Harrison County.—A female (TTU 113622, TK 171234) was received on 23 July 2008.

Hopkins County.—A male (TTU 113618, TK 171230) was received on 20 December 2006.

Hunt County.—A male (TTU 113634, TK 171246) was received on 22 August 2006.

Hutchinson County.—A female (TTU 113615, TK 171227) was received on 20 April 2008.

Marion County.—A juvenile female (TTU 113636, TK 171248) was received on 30 June 2009.

Moore County.—A male (TTU 113540, TK 171152) was received on 5 October 2008.

Potter County.—An adult male (TTU 113585, TK 171197) was received on 16 June 2009.

Robertson County.—A specimen of undetermined sex (TTU 113621, TK 171233) was received on 19 June 2007.

Rusk County.—A male (TTU 113840, TK 171252) was received on 5 October 2006, and a female (TTU 113581, TK 171193) was received on 9 September 2008. Johnson et al. (2005) previously reported a single specimen of *P. subflavus* at Stephen F. Austin State University (#3078) captured in 1974, but we were unable to locate this specimen. Therefore, our vouchers are not new county records, but instead provide additional verification of the occurrence of *P. subflavus* in Rusk County.

Smith County.—Eleven specimens have been submitted from this county. Three specimens were received on 16 August 2006; a male (TTU 113624, TK 171236), a female (TTU 113629, TK 171241), and a specimen of undetermined sex (TTU 113630, TK 171242). A female (TTU 113628, TK 171240) was received on 22 August 2006, a male (TTU 113627, TK 171239) on 5 September 2006, a female (TTU 113587, TK 171199) on 15 August 2007, a female (TTU 113586, TK 171198) on 17 August 2007, and a male (TTU 113568, TK 171180) on 28 August 2007. A male (TTU 113635, TK 171247) was received on 11 March 2008. An additional male (TTU 113588, TK 171200) was

received on 26 March 2009. A female (TTU 113589, TK 171201) was received on 7 October 2009.

Upshur County.—A female specimen (TTU113674, TK 172036) was received on 21 July 2009.

***Eptesicus fuscus* (Palisot de Beauvois 1796)**
Big Brown Bat

The big brown bat is one of the most widely distributed mammals in North America (Hall 1981) and is found throughout the U.S. with the exception of the southern tip of Florida (Ammerman et al. 2012). This species is a year-round resident of Texas. Allopatric distribution between the two subspecies (*E. f. pallidus* and *E. f. fuscus*) occurs in the state resulting in two separate populations. *E. f. fuscus* typically is found in northern and eastern Texas whereas *E. f. pallidus* occurs in western Texas. An unverified record in Bexar County previously extended the *E. fuscus* distribution into south-central Texas (Brennan 1945). This species has not yet been found in central Texas. New county records are presented for the following counties: Castro, Jasper, Lynn, Randall, and Tarrant.

Castro County.—A single individual of undetermined sex was received on 12 August 2008 (ASNHC 14736, skull only).

Jasper County.—A female (TTU 113601, TK 171213) was received on 22 August 2007.

Lynn County.—Lynn County was erroneously documented as a specimen record by Ammerman et al. (2012), when in fact it was a DSHS record. Therefore, we consider the following juvenile male (TTU 113599, TK 171211) that was received from Lynn County on 2 August 2007 as a vouchered county record.

Randall County.—Randall County was documented previously as a DSHS record (Ammerman et al. 2012). Because the specimen representing this record has been disposed, we consider the following specimens new county records. A specimen of undetermined sex was received on 7 July 2005 (ASNHC 14735, skull only). A male (TTU 113507, TK 171119) was received on 28 July 2009. Two females (TTU 113508, TK 171120; TTU 113510, TK 171122) were received on 18 November 2009.

Tarrant County.—A specimen (TTU 113669, TK 172031) of undetermined sex was received on 3 July 2009.

***Nycticeius humeralis* (Rafinesque 1818)**
Evening Bat

The evening bat, *Nycticeius humeralis*, generally is considered a species of forested areas, especially along rivers, and has been known to utilize buildings and other manmade structures (Schmidly 2004). This species commonly is found throughout most of the eastern United States and has traditionally occupied East Texas ranging from the Red River in the north to the Rio Grande in the south. Collection of the evening bat in Val Verde, Presidio, and Tom Green counties, as well as previous DSHS records in Yoakum and Bailey counties, suggest a westward expansion of the species throughout Texas (Dowler et al. 1999; Ammerman et al. 2012). This species has not been documented in New Mexico (Reid 2006). Therefore, these West Texas records represent the western range limit of the species. Nineteen new county records help define the distribution of *N. humeralis* within Texas. Four of the counties (Guadalupe, Nueces, Smith, and Tarrant) were previous DSHS records.

Collin County.—A female (TTU 113533, TK 171145) was received on 27 October 2009.

Colorado County.—An adult male (TTU 113546, TK 171158) was received on 30 June 2009 and a female (TTU 114708, TK 173208) was received on 10 June 2011.

Comal County.—Two males, a juvenile (TTU 113531, TK 171143) received on 11 June 2009 and an adult (TTU 113518, TK 171130) received on 4 September 2009, serve as county records.

Coryell County.—One male (TTU 114671, TK 173171) was received on 17 May 2011.

Denton County.—A female (TTU 113517, TK 171129) was received on 11 March 2009.

Ellis County.—A juvenile female (TTU 113532, TK 171144) was received on 5 October 2009.

Grayson County.—An adult male (TTU 113544, TK 171156) was received on 21 August 2009. An additional specimen of unknown sex (TTU 114651, TK 173151) was received on 11 June 2011.

Guadalupe County.—An adult male (TTU 113516, TK 171128) was received on 12 September 2009.

Hays County.—A male (TTU 114718, TK 173218) was received on 29 May 2011. In addition, a male (TTU 114737, TK 173237) and female (TTU 114716, TK 173216) were received on 3 June 2011.

Hill County.—A male (TTU 113539, TK 171151) was received on 19 August 2009.

Hood County.—Seven specimens of *N. humeralis* were received from this county. A male (TTU 113537, TK 171149) was received on 29 May 2009, another juvenile male (TTU 113529, TK 171141) was received on 23 June 2009, a juvenile female (TTU 113543, TK 171155) was received on 29 June 2009, and an adult female (TTU 113538, TK 171150) was received on 23 December 2009. Two specimens were received in 2011; a female (TTU 114667, TK 173167) received on 27 May 2011, and a male (TTU 114713, TK 173213) on 12 May 2011. Another male (TTU 114736, TK 173236) was received on 4 August 2011.

Houston County.—A specimen of unknown sex (TTU 114726, TK 173226) was received on 24 May 2011.

Lee County.—A male (TTU 113528, TK 171140) was received on 3 July 2009.

McLennan County.—A specimen of unknown sex (TTU 114666, TK 173166) was received on 7 July 2011.

Nueces County.—Two specimens were received in 2009. A male (TTU 113523, TK 171135) was received on 12 March 2009 and a female (TTU 113530, TK 171142) was received on 21 July 2009.

Smith County.—Seventeen specimens were received in 2009. A male (TTU 114022, TK 171434) was received on 1 February 2009 and an additional male on 4 March 2009 (TTU 114070, TK 171482). Two females were received in April 2009, one (TTU 114065, TK 171477) on 7 April and another female (TTU 114049, TK 171461) on 17 April. A female (TTU 114044, TK 171456) was received on 5 May 2009, and a male (TTU 114047, TK 171459) was received on 6 May 2009. One male (TTU 114067, TK 171479) was received on 6 June 2009. One female (TTU 114064, TK 171476) was received on 24 June 2009. A juvenile female (TTU 114066, TK 171478) was received on 9 July 2009. A male (TTU 114055, TK 171467) was received on 31 July 2009. Three specimens, two males (TTU 114037, TK 171449; TTU 114060, TK 171472) and a female (TTU 114043, TK 171455) were received on 11 August 2009. A male (TTU 114045, TK 171457) was received on 17 September 2009. A female (TTU 114031, TK 171443) was received 21 October 2009. Two males were received in December 2009, one (TTU 114032, TK 171444) on 11 December and another (TTU 114025, TK 171437) on 23 December. Five specimens were received in 2011; a male (TTU 114669, TK 173169) was received on 22 January, a female (TTU 114640, TK 173140) was received on 22 April, a male (TTU 114717, TK 173217) was received on 3 June, a female (TTU 114697, TK 173197) was received on 7 June, and a specimen of undetermined sex (TTU 114734, TK 173234) was received on 8 July.

Tarrant County.—A juvenile male (TTU 113542, TK 171154) was received on 24 June 2009. A female (TTU 114677, TK 173177) was received on 11 June 2011. *N. humeralis* was shown by Schmidly (2004) and Ammerman et al. (2012) to occur in Tarrant County, however this was based on a DSHS record and we were unable to locate a voucher specimen. Therefore, these specimens serve as a voucher for this county.

Washington County.—A female (TTU 114637, TK 173137) was received on 6 July 2011.

Williamson County.—A male (TTU 113520, TK 171132) was received on 17 February 2009. A female (TTU 113521, TK 171133) was received on 6 November 2009. Two additional males (TTU 114684, TK 173184 and TTU 114683, TK 173183) were received on 27 April 2011 and 30 June 2011, respectively.

***Antrozous pallidus* (Le Conte 1865)**
Pallid Bat

The pallid bat, *Antrozous pallidus*, is a common and abundant resident of the western half of Texas. Two subspecies, *A.p. bunkeri* and *A. p. pallidus*, are recognized. *A. p. bunkeri* occupies the Texas Panhandle whereas *A. p. pallidus* is found from the Trans-Pecos region to the southern tip of the state (Ammerman et al. 2012). The pallid bat favors rocky outcrops, mountainous areas, and lowland desert that represent typical West Texas terrain. Documented roosting sites include rock crevices, caves, manmade structures, and hollow trees (Schmidly 2004; Ammerman et al. 2012). *A. pallidus* occurs in the Chihuahuan Desert, Arizona/New Mexico mountains, Edwards Plateau, Southern Texas Plains, Central Great Plains, Southwestern Tablelands, and the High plains (Ammerman et al. 2012). A new county record has been obtained from Crosby County.

Crosby County.—A female (TTU 113527, TK 171139) was received from this county (within the distribution of *A. p. bunkeri*) on 29 April 2009.

Family Molossidae
***Nyctinomops macrotis* (Gray 1839)**
Big Free-tailed Bat

The big free-tailed bat, *Nyctinomops macrotis*, is uncommon and its distribution is poorly known in Texas (Ammerman et al. 2012). The species seems to be a seasonal habitant of primarily rocky country in lowland and highland habitats of the Trans-Pecos region (Schmidly 2004). The only report of winter activity within Texas is a single specimen collected in San Patricio County on 23 December 1959 (Raun 1961). Specimens primarily are collected between March and November within the Chihuahuan Desert, Arizona/New Mexico Mountains, High Plains, Southwestern Tablelands, Edwards Plateau, East Central Texas Plains, and Gulf Coastal Plains regions (Ammerman et al. 2012). Three new counties, Colorado, Nueces, and Webb, can now be confirmed for the big free-tailed bat.

Colorado County.—A specimen was received on 1 December 2004 (TTU 114506 TK 173006). Colorado County occupies three ecological regions: the Blackland Prairies, East Central Texas Plains, and Western Gulf Coastal Plains.

Nueces County.—A specimen was received on 26 October 2010 (TTU 114625, TK 173125). Nueces County occupies the Western Gulf Coastal Plains ecoregion.

Webb County.—Two specimens were received. The first was a female (TTU 113396, TK 171008) received on 19 October 2007. The second (TTU 113402, TK 171014) was received on 2 December 2008; the sex of this specimen was not determined. Webb County is found within the Southern Texas Plains ecoregion.

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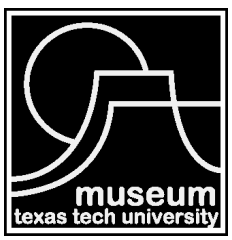

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