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## CHANGES IN DISTRIBUTIONS OF BATS IN TEXAS

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### ABSTRACT

Recent changes in geographic distributions of bats in Texas is discussed. Relationships between distributions and changing land-use practices, changes in climate, and global warming are presented also.

Key words: climate, distributions of bats, global warming, land-use practices

### INTRODUCTION

A comprehensive work on the bats of Texas was provided by Schmidly (1991), who commented on the fact that no other state has a bat fauna as diverse as that of Texas. In addition, Schmidly (1991) presented

distribution maps for each species occurring in the state. This information was updated by Schmidly (2004). The purpose of this report is to comment on some of the recent changes in distributions of bats in Texas.

### MATERIALS AND METHODS

The information presented herein was taken from our own records of recent changes in distributions of bats in Texas. In addition, information was gleaned from the recent literature, as well as from discussions

with colleagues. The names of bats used herein are those taken from Baker et al. (2003) and Hooper and Van Den Bussche (2003).

### RESULTS AND DISCUSSION

Some species of western bats have been documented to the east of their normal distributional range. For example, the western yellow bat (*Lasiurus*

*xanthinus*) was first reported in Texas by Higginbotham et al. (1999). Since then, this species has been reported from several localities in west Texas (Jones et al. 1999;

Bradley et al. 1999). There is some evidence that *Lasiurus xanthinus* is a permanent or at least a seasonal resident in Big Bend National Park (Higginbotham and Ammerman 2002). Two specimens of *Myotis thysanodes* (fringed myotis) from well east of their distributional range in Crosby County, Texas, have been explained as seasonal migrants (Schmidly 1991). The same explanation was reported for a specimen of *Myotis volans* (long-legged myotis) taken in Knox County, well east of its distributional range (Schmidly 1991). *Myotis ciliolabrum* (western small-footed myotis) is known from the Texas Panhandle based on two specimens reported from the Palo Duro Canyon area (Schmidly 1991).

Some species of eastern bats are showing up to the west of their distributional ranges. For example, the southeastern myotis (*Myotis austroriparius*) was recorded from Comanche County, almost in the center of Texas (Higginbotham and Jones 2001). Two species of eastern bats, the Seminole bat (*Lasiurus seminolus*) and the evening bat (*Nycticeius humeralis*), have been reported far to the west of their distributional ranges (Brant and Dowler 2000; Dowler et al. 1999). Yancey and Jones (1997) reported a specimen of Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) from Shelby County, Texas. The eastern pipistrelle (*Perimyotis subflavus*) was reported from west Texas by Yancey et al. (1995) and Ammerman (2005). The generic name *Perimyotis* is used here in accordance with the findings of Hooper and Van Den Bussche (2003). Geluso et al. (2005) discussed the westward expansion of *Perimyotis subflavus*, and provided new records of this species from New Mexico, South Dakota, as well as Texas. This species was first reported from Lubbock, Texas, by Jones et al. (1993). Recently, two examples of *Perimyotis subflavus* have been turned in to the South Plains Wildlife Rehabilitation Center, in Lubbock (Carole Lee, pers. comm.). Some unusual movements and relationships of eastern red bats (*Lasiurus borealis*) and western red bats (*Lasiurus blossovillii*) were reported in the Davis Mountains (Jones and Bradley 1999) and elsewhere (Goetze et al. 2003; Bradley et al. 1999).

There is evidence of northward movement by some previously known southern bats. DeBaca and Jones (2002) reported *Mormoops megalophila* (ghost-faced bat) from the Davis Mountains, and Bradley et al. (1999) reported this species from Elephant Moun-

tain, and commented on the northward expansion of the range of this bat. Sucheki et al. (2003) reported on the northernmost record of *Lasiurus ega* (southern yellow bat).

Also, there is some evidence of southward movement of some species of bats. For example, Brant et al. (2002) reported the silver-haired bat (*Lasionycteris noctivagans*) from southern Presidio County, Texas. This species also was found in the Chisos Mountains of Big Bend National Park, as reported by Ammerman (2005).

Incidentally, Benedict et al. (2000) found similar east to west movements of bats in Nebraska, such as *Myotis ciliolabrum*, *Myotis septentrionalis* (northern long-eared myotis), *Nycticeius humeralis*, and *Lasiurus borealis*. They equated most of the distributional changes in these bats with changing land-use practices.

In the past, bats found outside of their previously known distributional ranges have been described as seasonal migrants, lost during migration, vagrant wanderers, and the like. Other explanations have focused on lack of collecting, collecting in new areas, experience of collectors, and the like. Most of the aforementioned specimens were either adult males in reproductive condition or lactating females, and many were collected in the same place more than one time (see Higginbotham and Ammerman 2002; Higginbotham et al. 2002; Brant et al. 2002; Ammerman 2005). As mentioned above, changing land-use practices obviously have a role in the distributional ranges of bats.

The effects of global warming on geographic distributions and species richness of mammals have been described, discussed, and modeled by Cameron and Scheel (1993, 2001), Cameron et al. (1997), and specifically for bats by Scheel et al. (1996). Incidentally, for some more modern, popular views of global warming, see the articles in *Time* (3 April 2006) and *Vanity Fair* (May, 2006). It seems that the models presented by the authors mentioned above generally are correct for the bats of Texas, with few exceptions. For example, it was predicted that *Lasiurus ega* might not occur in the state of Texas under the predicted conditions (Scheel et al. 1996). However, Sucheki et al. (2003) extended the range of this species more

than 100 km to the north. It is certain, however, that global warming and corresponding climatic changes, periodic drought in the area, and changing land-use practices are important factors impacting the geographic distributions and species richness of bats that occur in Texas. In addition, other factors such as changes in the Pecos River (Jones and Parish 2001)

and the Rio Grande (Schmidly and Jones 2001) have resulted in their diminished importance as barriers to the distributions of bats in particular and mammals in general. Schmidly (2003, 2004) and Schmidly and Jones (2001) thought that changes in the Rio Grande may be serving as dispersal routes for eastern and western bats in Texas.

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#### LITERATURE CITED

- Ammerman, L. K. 2005. Noteworthy records of the eastern pipistrelle, *Perimyotis subflavus*, and the silver-haired bat, *Lasionycteris noctivagans* (Chiroptera: Vespertilionidae), from the Chisos Mountains, Texas. *Texas Journal of Science* 57:202-207.
- Baker, R. J., L. C. Bradley, R. D. Bradley, J. W. Dragoo, M. D. Engstrom, R. S. Hoffmann, C. A. Jones, F. Reid, D. W. Rice, and C. Jones. 2003. Revised checklist of North American mammals north of Mexico, 2003. *Occasional Papers, Museum of Texas Tech University* 229:1-23.
- Benedict, R. A., H. H. Genoways, and P. W. Freeman. 2000. Shifting distributional patterns of mammals in Nebraska. *Transactions of the Nebraska Academy of Science* 26:55-84.
- Bradley, R. D., D. S. Carroll, M. L. Clary, C. W. Edwards, I. Tiemann-Borge, M. J. Hamilton, R. A. Van Den Bussche, and C. Jones. 1999. Comments on some small mammals from the Big Bend and Trans-Pecos regions of Texas. *Occasional Papers, Museum of Texas Tech University* 193:1-6.
- Brant, J. G., and R. C. Dowler. 2000. Noteworthy record of the Seminole bat, *Lasiurus seminolus* (Chiroptera: Vespertilionidae), in Val Verde County, Texas. *Texas Journal of Science* 52:353-355.
- Brant, J. G., J. L. Higginbotham, and C. Jones. 2002. Noteworthy records of the silver-haired bat, *Lasionycteris noctivagans* (Chiroptera: Vespertilionidae), in Presidio County Texas. *Southwestern Naturalist* 47:633-635.
- Cameron, G. N., and D. Scheel. 1993. A GIS model of the effects of global climate change on mammals. *Geocarto International* 4:19-32.
- Cameron, G. N., and D. Scheel. 2001. Getting warmer: effect of global climate change on distributions of rodents in Texas. *Journal of Mammalogy* 82:652-680.
- Cameron, G. N., J. O. Seamon, and D. Scheel. 1997. Environmental change and mammalian richness: impact on preserve design and management in east Texas. *Texas Journal of Science* 49 (supplement):155-180.
- DeBaca, R. S., and C. Jones. 2002. The ghost-faced bat, *Mormoops megalophila* (Chiroptera: Vespertilionidae), from the Davis Mountains, Texas. *Texas Journal of Science* 54:89-91.
- Dowler, R. C., R. C. Dawkins, and T. C. Maxwell. 1999. Range extensions for the evening bat (*Nycticeius humeralis*) in west Texas. *Texas Journal of Science* 51:193-195.

- Geluso, K., T. R. Mollhagen, J. M. Tigner, and M. A. Bogan. 2005. Westward expansion of the eastern pipistrelle (*Pipistrellus subflavus*) in the United States, including new records from New Mexico, South Dakota, and Texas. *Western North American Naturalist* 65:405-409.
- Goetze, J. R., A. D. Nelson, and P. D. Sudman. 2003. Noteworthy records of bats from central and south Texas. *Texas Journal of Science* 55:365-367.
- Higginbotham, J. L., and L. K. Ammerman. 2002. Chiropteran community structure and seasonal dynamics in Big Bend National Park. *Special Publications, Museum of Texas Tech University* 44:1-44.
- Higginbotham, J. L., and C. Jones. 2001. The southeastern myotis, *Myotis austroriparius* (Chiroptera: Vespertilionidae), from Comanche County, Texas. *Texas Journal of Science* 53:193-195.
- Higginbotham, J. L., L. K. Ammerman, and M. T. Dixon. 1999. First record of *Lasiurus xanthinus* (Chiroptera: Vespertilionidae) in Texas. *Southwestern Naturalist* 44:343-347.
- Higginbotham, J. L., R. S. DeBaca, J. G. Brant, and C. Jones. 2002. Noteworthy records of bats from the Trans-Pecos region of Texas. *Texas Journal of Science* 54:277-282.
- Hooper, S. R., and R. A. Van Den Bussche. 2003. Molecular phylogenetics of the chiropteran family Vespertilionidae. *Acta Chiropterologica* 5 (supplement):1-63.
- Jones, C., and R. D. Bradley. 1999. Notes on red bats, *Lasiurus* (Chiroptera: Vespertilionidae), of the Davis Mountains and vicinity, Texas. *Texas Journal of Science* 51:341-344.
- Jones, C., and D. A. Parish. 2001. Effects of the Pecos River on the geographic distributions of mammals in western Texas. *Occasional Papers, Museum of Texas Tech University* 204:1-11.
- Jones, C., L. Hedges, and K. Bryan. 1999. The western yellow bat, *Lasiurus xanthinus* (Chiroptera: Vespertilionidae) from the Davis Mountains, Texas. *Texas Journal of Science* 51:267-269.
- Jones, J. K., Jr., R. W. Manning, F. D. Yancey, II, and C. Jones. 1993. Records of five species of mammals from western Texas. *Texas Journal of Science* 45:104-105.
- Scheel, D., T. L. S. Vincent, and G. N. Cameron. 1996. Global warming and species richness of bats in Texas. *Conservation Biology* 10:452-464.
- Schmidly, D. J. 1991. *The bats of Texas*. Texas A&M University Press, College Station. xvi + 188 pp.
- Schmidly, D. J. 2002. *Texas natural history: a century of change*. Texas Tech University Press, Lubbock. xvi + 534 pp.
- Schmidly, D. J. 2004. *The mammals of Texas, revised edition*. University of Texas Press, Austin. xviii + 501 pp.
- Schmidly, D. J., and C. Jones. 2001. 20th century changes in mammals and mammalian habitats along the Rio Grande/Rio Bravo from Fort Quitman to Amistad. Pp. 177-204 in *Binational Symposium Rio Grande/Rio Bravo: Ft. Quitman to Amistad Reservoir*. Proceedings, 14 June 2000, Ciudad Juarez, Chihuahua, Mexico. U.S. Department of the Interior, Secretariat of Environment and Natural Resources, International Boundary and Water Commission, Washington, D.C. x + 301 pp.
- Sucheki, J. R., B. R. Amman, D. Baxter, M. Cajimat, D. S. Carroll, N. D. Durish, C. F. Fulhorst, J. D. Hanson, M. L. Haynie, M. Kageyama, L. K. Longhofer, F. Mendez-Harclerode, C. Milazzo, Jr., M. L. Milazzo, S. A. Reeder, D. C. Ruthven, D. R. Synatzske, and R. D. Bradley. 2003. *Lasiurus ega* and other small mammal records from Dimmit and La Salle counties, Texas. *Occasional Papers, Museum of Texas Tech University* 225:1-3.
- Time. 2006. Special report: global warming. 3 April 167:96 pp.
- Vanity Fair. 2006. Special green issue. May 549:246 pp.
- Yancey, F. D., II, and C. Jones. 1997. Rafinesque's big-eared bat, *Plecotus rafinesquii* (Chiroptera: Vespertilionidae), from Shelby County, Texas. *Texas Journal of Science* 49:166-167.
- Yancey, F. D., II, C. Jones, and R. W. Manning. 1995. The eastern pipistrelle, *Pipistrellus subflavus* (Chiroptera: Vespertilionidae), from the Big Bend region of Texas. *Texas Journal of Science* 47:229-231.

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