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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 Hoofer 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 Hoofer 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 Mountain, 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 septentrianalis* (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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