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Distribution of Arkansas's Bottomland Bats

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The lower Mississippi River valley originally was the site of 10 million hectares of bottomland hardwood forests (Tiner 1984), but today less than half remain (Hefner and Brown 1985). Annual palustrine wetland loss has been estimated at 178,000 ha as of 1970, the majority of which (87%) is from conversion to agriculture (Tiner 1984).

These forested floodplains are important roosting and foraging sites for bottomland bats, including Rafinesque's big-eared bat (*Corynorhinus rafinesquii*; Gooding and Langford 2004) and the southeastern myotis (*Myotis austroriparius*; Mirowsky and Horner 1997), and their loss could be detrimental to populations of these poorly known (Sealander and Heidt 1990, Menzel et al. 2001) and rare bats (Harvey and Redman 2002). Yet only limited knowledge of the bats' distributions exist for the southeast (Mirowsky and Horner 1997, Fokidis et al. 2005).

To obtain current and detailed state distributions for these species, we conducted a mist-net survey of the forested bottomlands within their projected range in the Gulf Coastal Plain and Mississippi River Delta regions of Arkansas. We targeted primarily public lands such as Arkansas Game and Fish Commission Wildlife Management Areas (WMA), National Wildlife Refuges (NWR), U.S. Army Corps of Engineers' Parks, and Arkansas State Parks.

Our protocol mandated a minimum of 1 night and a maximum of 3 nights of netting in at least 1 location in each bottomland county that was lacking a documented record for either the southeastern myotis or Rafinesque's big-eared bat. Mist-netting was conducted from 6 May to 11 July 2005. Mist-nets were normally 2.6 x 6-12 m in size, although occasional use of high nets (two 2.6 x 6m nets united and placed one above the other) were made. Nets, supported by metal conduit poles, were set perpendicular to the expected flight path and rose from ground or water surface level upwards. Standard netting procedures were followed regarding net placement; and efforts were concentrated on potential bat foraging and gleaning areas including forest corridors, such as logging roads and access trails, and areas of standing water, such as ponds, ditches, and sloughs. The number of nets placed each night ranged from 2 to 9 depending upon terrain. Each net setup was maintained for a minimum of 5 hours beginning at dusk. Nets were checked for bats every 15 minutes. Species, gender, reproductive status, mass, forearm length, and presence/absence of external parasites were recorded for each bat captured.

We surveyed 22 sites in 16 counties in the Gulf Coastal Plain

and the Mississippi River Delta regions of Arkansas during 2005. Trapping efforts totaled 56 nights or 384 net-nights, with a more intensive continuous trapping effort put forth for 30 of those nights (31 May to June 29) by three investigators who netted three separate areas simultaneously. A net-night is defined as the sum of the number of nets open for 1 night of trapping. The 2005 season resulted in the capture of 401 individual bats and 6 recaptures and provided the 24 new county records detailed below.

Corynorhinus rafinesquii

1) Ashley Co. – Felsenthal NWR, 33°05' N 92°06' W, 18 May 2005. Logging road just outside boat launch parking lot. Two females, one pregnant and one non-reproductive (NR).

2) Chicot Co. – Lake Boggy Bayou, 33°56' N 91°45' W, 11 July 2005. Pond adjacent to road. NR male.

3) Crittenden Co. – Wapanocca NWR, 35°05' N 90°12' W, 20 June 2005. Pond on edge of farm field. NR Male.

4) Hempstead Co. – Bois d'Arc WMA, 33°35' N 93°44' W, 05 July 2005. Pond in forest interior. NR male.

5) Lincoln Co. – Cane Creek boat dock, AGFC, 33°56' N 91°45' W, 09 July 2005. Stream and stream access from boat dock. NR male.

6) Pike Co. – Saline Creek, 33°58' N 93°34' W, 07 July 2005. Stream near Highway 301 Bridge. NR male.

Eptesicus fuscus

7) Lincoln Co. – Cane Creek boat dock, AGFC, 33°56' N 91°45' W, 09 July 2005. Stream and stream access from boat dock. NR male.

8) Ashley Co. – Felsenthal NWR, 33°05' N 92°06' W, 18 May 2005. Logging road. Scrotal male and NR male.

Lasiurus borealis

9) Chicot Co. – Lake Boggy Bayou, 33°29' N 91°14' W, 11 July 2005. Pond adjacent to road. Two NR females.

10) Lincoln Co. – Cane Creek boat dock, AGFC, 33°56' N 91°45' W, 09 July 2005. Stream and stream access from boat dock. Two NR males.

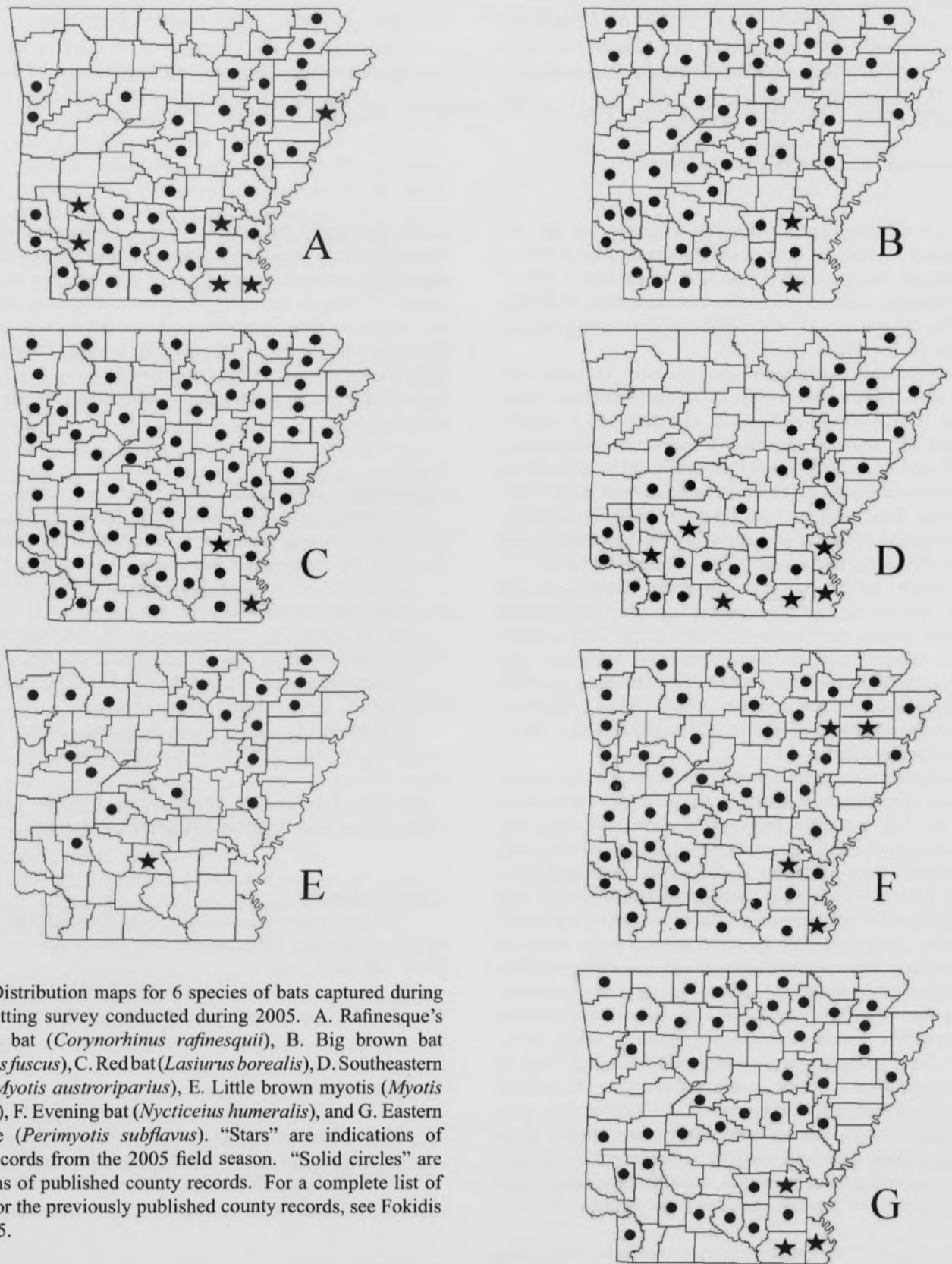


Fig. 1. Distribution maps for 6 species of bats captured during a mist-netting survey conducted during 2005. A. Rafinesque's big-eared bat (*Corynorhinus rafinesquii*), B. Big brown bat (*Eptesicus fuscus*), C. Redbat (*Lasiurus borealis*), D. Southeastern myotis (*Myotis austroriparius*), E. Little brown myotis (*Myotis lucifugus*), F. Evening bat (*Nycticeius humeralis*), and G. Eastern pipistrelle (*Perimyotis subflavus*). "Stars" are indications of county records from the 2005 field season. "Solid circles" are indications of published county records. For a complete list of sources for the previously published county records, see Fokidis et al. 2005.

Myotis austroriparius

- 11) Ashley Co. – Casey Jones WMA, 33°20' N 91°58' W, 17 May 2005. Unnamed logging road. Two NR males.
- 12) Chicot Co. – Lake Boggy Bayou, 33°29' N 91°14' W, 11 July 2005. Pond adjacent to road. One NR male.
- 13) Clark Co. – Big Timber WMA, 33°49' N 93°09' W, 12 May 2005. Crossing of creek and gravel road. Two NR males.
- 14) Desha Co. – Sutton Bayou, 33°53' N 91°11' W, 10 July 2005. Slough near bridge. One NR male.
- 15) Hempstead Co. – Bois d'Arc WMA, 33°35' N 93°44' W, 05 July 2005. Pond in forest interior. One lactating female and 1 NR male.
- 16) Union Co. – Felsenthal NWR, 33°11' N 92°44' W, 21 May 2005. Slough off of access trail. Lactating female.

Myotis lucifugus

- 17) Dallas Co. – Private land, 33°54' N 92°53' W, 08 July 2005. Gravel road. NR female.

Nycticeius humeralis

- 18) Chicot Co. – Lake Boggy Bayou, 33°29' N 91°14' W, 11 July 2005. Pond adjacent to road. NR female, NR male.
- 19) Lincoln Co. – Bayou Bartholomew, 33°56' N 91°46' W, 28 May 2005. Backwater from lake. Pregnant female.
- 20) Poinsett Co. – Bayou de View, 35°36' N 90°57' W, 31 May 2005. Handicap access trail. Scrotal male.
- 21) Jackson Co. – Cache River NWR, 35°32' N 91°08' W, 2 June 2005. River access road. NR male.

Perimyotis subflavus

- 22) Ashley Co. – Casey Jones WMA, 33°21' N 91°58' W, 17 July 2005. Logging road near bayou. Pregnant female.
- 23) Chicot Co. – Lake Boggy Bayou, 33°21' N 91°14' W, 11 July 2005. Pond adjacent to road. NR female.
- 24) Lincoln Co. – Cane Creek boat dock, AGFC, 33°56' N 91°45' W, 09 July 2005. Stream and stream access from boat dock. NR male.

We collected bottomland bat species presence / absence data across the Gulf Coastal Plain and Mississippi River Delta regions of Arkansas resulting in range expansion over published records for 7 species (Fig. 1). The results of this survey indicate that *M. austroriparius* and *C. rafinesquii* have a broad distribution in Arkansas and suggest that they may not be as rare as previously believed. We are presently working on a more in-depth analysis of these species populations in northeast Arkansas.

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