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First Records of the Smoky Shrew (*Sorex fumeus*) in Alabama

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Abstract - Conserving biodiversity in the southeastern United States begins with documenting the distribution and natural history of all taxa. Using pitfall traps between March 2005 and January 2006, we collected the first *Sorex fumeus* (Smoky Shrew) specimens (44) from Alabama on the Cumberland Plateau in the northeastern portion of the state. Body size of specimens was generally smaller than reported for other populations. We recommend additional surveys throughout the Cumberland Plateau region in Alabama to better document this species' range in the state.

The southern terminus of the Appalachian Mountains, including the Cumberland Plateau, is noted for its high levels of biodiversity (Odum 2002). Considering the alarming rate at which biodiversity is currently being lost at local scales in this region (Chaplin et al. 2000, Wear et al. 2004), it is critical to document the distribution of various taxa. Small insectivorous mammals, including members of the genus *Sorex*, are important components of many ecosystems such as those found in the Southern Appalachians (Ford et al. 2006, Van Zyll de Jong 1983).

Herein we report on the presence of *Sorex fumeus* Miller (Smoky Shrew) in Jackson County, northeastern Alabama. This area was classed into the Cliff Section of the Cumberland Plateau in the Mixed Mesophytic Forest region by Braun (1950) and the Eastern Broadleaf Forest (Oceanic) Province and Northern Cumberland Plateau Section by Bailey et al. (1994). The area is characterized by steep slopes dissecting the Plateau surface and draining to the Tennessee River. Soils are shallow to deep, stony and gravelly loam or clay, and well-drained (Smalley 1982). Climate of the region was temperate with mild winters and moderately hot summers with a mean temperature of 13 °C and mean precipitation of 149 cm (Smalley 1982). Concurrent with a study examining silvicultural impacts to wildlife (Felix et al. 2008, Wang et al. 2006), we trapped shrews at 2 separate sites. One site was located on a south, southwest-facing slope of Miller Mountain (34°58'11"N, 86° 12'21"W), with elevations ranging from 457–518 m. The second site was located on a north-facing slope at Jack Gap (34°56'30"N, 86°04'00"W), with elevations ranging from 304–475 m. Dominant overstory tree species at both sites were oaks, including *Quercus velutina* Lamarck (Black Oak), *Q. rubra* L. (Northern Red Oak), *Q. alba* L. (White Oak), and *Q. prinus* L. (Chestnut Oak), with lesser amounts of hickories (*Carya* spp.), *Acer saccharum* Marsh. (Sugar Maple), and *Liriodendron tulipifera* L. (Yellow Poplar). Common understory species included *Cornus florida* L. (Flowering Dogwood), *Cercis canadensis* L. (Eastern Redbud), and *Oxydendrum arboreum* L. (Sourwood).

We captured small mammals in three 20-ha blocks; two of these blocks were located at Jack Gap, and one was located at Miller Mountain. Within each block, we established a total of fifteen 15-m long drift fences (spaced ≥50 m apart), each with a 19-L pitfall trap at each end. Pitfalls were opened each month between March and August, and again in October and November of 2005 and January of 2006. Collected shrews were deposited in the North Carolina Museum of Natural Sciences (NCSM).

We captured 44 Smoky Shrews over a total of 3210 pitfall nights. Of these, 13 were males, 24 were females, and 7 were of unknown sex. Other species of small mammals that we captured included *Blarina brevicauda* Say (Northern Short-tailed Shrew), *Sorex longirostris* Bachman (Southeastern Shrew), *Sorex hoyi* Baird (Pygmy Shrew), *Cryptotis parva* Say (Least Shrew), *Peromyscus leucopus* Rafinesque

(White-footed Mouse), *Peromyscus gossypinus* LeConte (Cotton Mouse), and *Microtus pinetorum* LeConte (Pine Vole).

The mean total length of Smoky Shrews we collected (106.6 ± 0.8 SE, range = 90–120 mm) was at the lower end of the range reported for the species, even for the south-central region (Choate et al. 1994, Whitaker and Hamilton 1998). Huggins and Kennedy (1989) concluded that body size of Smoky Shrews was greatest in the central portion of its range and decreased in the northern- and southernmost populations. We collected one male (109 mm total length) with enlarged testes on 6 May, 2005. A female (109 mm total length) collected on 2 June 2005 contained two embryos, both with a 4-mm crown–rump length. Over 90% of Smoky Shrews were captured on the upper portion of a north-facing slope at Jack Gap. Within this block, shrews were captured in a variety of forest stand-types, ranging from clearcuts to those with 50% of overstory trees retained to undisturbed stands. Smoky Shrews have been found in a variety of stand types and ages in other southern Appalachian forests (Ford et al. 2002, Greenberg and Miller 2004).

Our records for the Smoky Shrew are the first for Alabama (Mirarchi 2004) and extend the southwestern edge of the species' distribution 35 km from the nearest record in Franklin County, TN (Kennedy and Harvey 1980 [Fig. 1]). Smoky Shrews have been collected from the Cumberland Plateau in Walker County, GA (Laerm et al. 1995). Two specimens in the Georgia Museum of Natural History were taken from a site in Cloudland Canyon State Park in Dade County, GA approximately 8 km east of the Alabama border. Smoky Shrews may also occur in the Sand and Pigeon Mountain areas on the Cumberland Plateau south of the Tennessee River. Additional

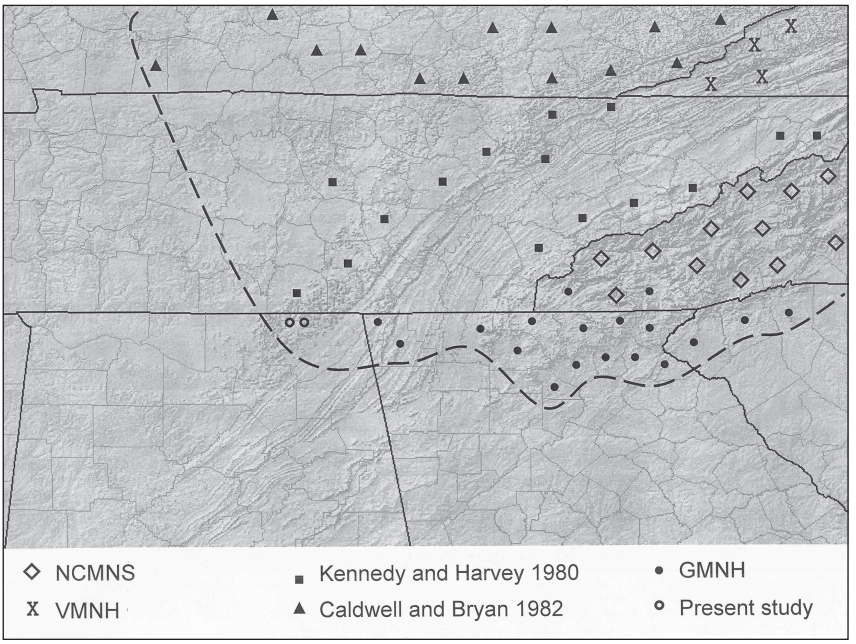

Figure 1. Distribution of *Sorex fumeus* (Smoky Shrew) in the southern Appalachian Mountains. County-level localities are taken from literature sources or museums cited below the map, while the specific locations of the two sites where Smoky Shrews were detected during the present study are shown. NCSM = North Carolina Museum of Natural Sciences, VMNH = Virginia Museum of Natural History, and GMNH = Georgia Museum of Natural History.

populations also likely occur on the Cumberland Plateau of northern Jackson and Madison counties. However, surveys by Laerm et al. (1995) did not detect Smoky Shrews in the Talladega National Forest of Alabama. The fact that Smoky Shrews remained undetected in Alabama until now points to the need for additional biotic inventories in many areas of the southeastern United States.

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