NOTES ON THE HAIRY-TAILED MOLE (PARASCALOPS BREWERI) IN THE CUMBERLAND MOUNTAINS OF TENNESSEE

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ABSTRACT

Single Parascalops breweri specimens were captured on Brushy and Massengale Mountains in Campbell County, Tennessee. These specimens represent a southwestern range extension of approximately 65 km down the Cumberland Mountains in Tennessee. Quantitative habitat data are provided to characterize the capture sites.

INTRODUCTION

Previous records of the hairy-tailed mole (Parascalops breweri) exist from the Appalachian Mountains of eastern Tennessee (Kennedy and Harvey, 1979), the Cumberland Plateau and southeastern mountains of Kentucky (Barbour and Davis, 1974), and from Claiborne County in the Cumberland Mountains of Tennessee (Copeland, 1981). The Claiborne County record represents the first P. breweri specimen collected in the Cumberland Mountains of Tennessee. Since few specimens have been collected in Tennessee, very little information exists concerning the natural history of P. breweri in the State, and no quantitative habitat data for the species have been reported. Hallett (1978) has summarized the existing literature concerning P. breweri. The purposes of this paper are to report on two specimens of P. breweri captured in Campbell County, Tennessee, and to quantitatively describe the habitats in which each was found.

MATERIALS AND METHODS

The study areas were located on Massengale Mountain and Brushy Mountain in Campbell County, Tennessee. Victor mousetraps baited with a peanut butter and rolled oat mixture were used in sampling.

Capture sites were within the mixed mesophytic forest region described by Braun (1950) and were representative of conditions in much of Ecoregion Province 2210, Eastern Deciduous Forest (Bailey, 1976). This region is characterized by low mountains, where less than 20% of the land is gently sloping and the local relief is 305-941 m (Hammond, 1964). Abandoned, active, and newly reclaimed contour surface mines were in close proximity to the capture sites. Specimens upon which this report is based were deposited in the Memphis State University Museum of Zoology, Memphis, Tennessee.

Quantitative plant community data for each capture site were determined for 10 0.04-ha circular plots using a modification of the technique developed by James and Shugari (1970). Two perpendicular transects, each 22.6 m in length, were established within each plot, with sampling intervals designated at 1, 5, 10, 15, and 20 m along each transect (10 stations/plot). All herbaceous ground cover (<0.5 m in height) was identified within 1-m² plots at each of the 10 designated sampling intervals. Percent ground cover was measured on both sides of each sampling station (20/plot) using a comblike point count instrument composed of 10 teeth or points. The instrument was placed perpendicular to the ground, and the number of teeth in contact with vegetation was recorded (Mueller-Dombois and Ellenburg, 1974). Each tooth represented 10% cover, so vegetation contact with all 10 points represented 100% ground cover. Twenty of these measurements were taken within each plot and averaged to obtain a mean percent ground cover estimate for the woodland sites.

All understory woody vegetation less than 0.08 m d.b.h. and greater than 0.05 m in height was identified, and the number of stems along a 1-m path on each side of the established transects counted. Interplot stem densities were averaged and a mean stem density/ha calculated. Species composition and density of overstory vegetation (<0.08 m d.b.h.) were determined within each 0.04-ha circular plot. Percent canopy cover was determined by sighting upward from each sampling station (1-, 5-, 10-, 15-, and 20-m intervals along transects) and estimating the percentage of the canopy that was closed. Plot estimates were averaged to yield a mean canopy cover for each site.

RESULTS AND DISCUSSION

One specimen, an adult female P. breweri, was hand captured on 28 April 1980 on Massengale Mountain in loose, moist soil beneath a decomposing log. It measured 152 mm total length, 28 mm tail length, and 17 mm hind foot length and weighed 36 g. The capture site was located within a ravine on Massengale Mountain, approximately 300 m surface distance below a reclaimed contour surface mine, at an elevation of approximately 700 m (36°17'30" N, 84°19'30" W). A small stream was located within 10 m of the capture point. An oak-maple forest (85% canopy cover) with an understory of flowering dogwood (Cornus florida), red maple (Acer rubrum), and black gum (Nyssa sylvatica) occurred at the site. Understory stem density was 6,755 stems/ha. Herbaceous ground cover (39%) consisted of thongwhorts (Eupatorium spp.), tick-trefoil (Desmodium sp.), aster (Aster sp.), southern lady fern (Athyrium asplenioides), and poison ivy (Rhus radicans).

A second specimen (adult male) was trapped on 22 June 1980 on Brushy Mountain within 10 m surface distance of a newly reclaimed contour surface mine (36°19'30" N, 84°17'30" W). It measured 173 mm total length, 38 mm tail length, and 18 mm hind foot length and weighed 48 g. Elevation at this capture site was approximately 869 m, and
soils were very dry and hard-packed with little leaf litter present. Forest at the capture site consisted of an oak-maple overstory (85% canopy cover) and an understory of black gum, sassafras (Sassafras albidum), ash (Fraxinus sp.), and sugar maple (A. saccharum). Understory stem density was 9,719 stems/ha. Virginia creeper (Parthenocissus quinquefolia), brambles (Rubus spp.), and Solomon's seal (Polygonatum sp.) dominated the herbaceous ground cover (45%). The adjacent reclaimed surface mine supported various species of grasses and legumes, interspersed with rows of wildlife shrubs as described by Fowler and Turner (1981). Two ponds (<0.5 ha), located approximately 260 m and 390 m from the trap site, were the nearest permanent water sources.

These captures, plus the specimen collected by Copeland (1981), indicated that P. brevior is more widely distributed in Tennessee than previously thought. Until now, P. brevior in Tennessee was known primarily from the extreme eastern portion of the State. Due to the scarcity of records, it has been deemed in need of "management" in Tennessee by the Tennessee Wildlife Resources Agency. Although P. brevior appears uncommon in Tennessee, Barbour and Davis (1974) reported it to be the common mole in the eastern forested region of Kentucky. Low population densities, a secretive life style, and the absence of well-defined tunnels (Hallett, 1978) probably account for the paucity of information regarding this species in Tennessee. Additional investigations are needed within Tennessee to determine the exact status and range of the species. Quantified habitat data provided in this report should be useful in determining habitat suitability for P. brevior. Although conventional word descriptions of the physiognomy of an area are valuable, habitats can be compared more precisely if quantifiable habitat measurements are taken.

Acknowledgments
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Literature Cited
the Tennessee Wildlife Resources Agency (TWRA), in cooperation with the United States Fish and Wildlife Service, conducted an investigation into lead shot consumption by mallards in western Tennessee (unpublished TWRA manuscript). Upon the completion of their study, 763 mallard gizzards were forwarded to the authors by TWRA for an analysis of their food content. Numbers of gizzards collected in each of six western Tennessee counties were as follows: Benton, 158; Dyer, 201; Lake, 130; Lauderdale, 110; Obion, 73; and Tipton, 91. Of the gizzards examined, 148 were found to contain no food materials. Consequently, this study reflects results from the analysis of 615 gizzards.

Procedures described by Davison (1940) and Martin et al. (1946) were followed in the analysis of food materials. Contents of each gizzard were separated and measured volumetrically in a graduated cylinder by water displacement. Food items amounting to less than 1% of total volume were recorded as trace, while others were recorded to the nearest 0.1 ml. Percent frequency of occurrence and percent aggregate volume of each food item were also recorded. Martin and Barkley (1973) and Schopmeyer (1974) were the primary sources used in the identification of food materials. Scientific and common names of plants follow Scott and Wasser (1980).

**RESULTS**

A total of 63 different food items was identified. The 20 most important of these are given in Table 1 along with their volumes, volume percentages, frequencies of occurrence, and percentages of frequencies of occurrences. Forty-three additional food items which occurred in trace amounts or in only a few gizzards were omitted; however, a list of these items is available from the authors upon request.

**TABLE 1. Important food items found in the gizzards of 615 mallards collected in western Tennessee during the 1977-1978 waterfowl hunting season. Food items are listed in order of greatest occurrence. Volumes are in ml.**

<table>
<thead>
<tr>
<th>Latin Name</th>
<th>Common Name</th>
<th>Vol.</th>
<th>V%</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polygonum autumnale</td>
<td>Knotweed</td>
<td>74.3</td>
<td>35.2</td>
<td>222</td>
</tr>
<tr>
<td>Polygonum convolvulus</td>
<td>Parthenocissus knotweed</td>
<td>8.7</td>
<td>3.6</td>
<td>138</td>
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<tr>
<td>Cephalanthus occidentalis</td>
<td>Common buttonbush</td>
<td>12.0</td>
<td>5.5</td>
<td>111</td>
</tr>
<tr>
<td>Solidago virgaurea</td>
<td>Goldenrod</td>
<td>7.6</td>
<td>3.7</td>
<td>66</td>
</tr>
<tr>
<td>Panicum dichotomiflorum</td>
<td>Tall panicle</td>
<td>6.7</td>
<td>2.0</td>
<td>111</td>
</tr>
<tr>
<td>Chrysopsis</td>
<td>Bees</td>
<td>6.3</td>
<td>2.9</td>
<td>66</td>
</tr>
<tr>
<td>Polygonum lapathifolium</td>
<td>Creeping ladyslip</td>
<td>3.3</td>
<td>1.2</td>
<td>66</td>
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<tr>
<td>Polygonum convolvulus</td>
<td>Swamp panicle</td>
<td>2.7</td>
<td>1.2</td>
<td>66</td>
</tr>
<tr>
<td>Bicolora</td>
<td>Snails and clams</td>
<td>1.8</td>
<td>0.6</td>
<td>42</td>
</tr>
<tr>
<td>Aphanthodium gramineum</td>
<td>Water hemp</td>
<td>2.2</td>
<td>0.9</td>
<td>45</td>
</tr>
<tr>
<td>Zizia aurea</td>
<td>Oregano</td>
<td>5.2</td>
<td>2.3</td>
<td>45</td>
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<td>Wild grass panicum</td>
<td>6.1</td>
<td>2.9</td>
<td>65</td>
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<tr>
<td>Coreopsis maritima</td>
<td>American hornweed</td>
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<td>1.0</td>
<td>33</td>
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<td>Physalia</td>
<td>Black gum soybean</td>
<td>15.2</td>
<td>6.4</td>
<td>25</td>
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<tr>
<td>Aquatica graminea</td>
<td>Water hemp</td>
<td>1.3</td>
<td>0.5</td>
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<tr>
<td>Cynodon dactylon</td>
<td>Bentgrass</td>
<td>7.8</td>
<td>3.3</td>
<td>19</td>
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<td>3.1</td>
<td>18</td>
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<tr>
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<td>Sedge lychnis</td>
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<td>1.3</td>
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<td>Orthosiphon</td>
<td>Grasshoppers</td>
<td>3.1</td>
<td>1.3</td>
<td>5</td>
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</tbody>
</table>

* T = Trace  
** Less than 1%