

OCCURRENCE OF PYGMY SALAMANDERS (*DESMOGNATHUS WRIGHTI*) IN MONROE COUNTY, TENNESSEE

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ABSTRACT—The pygmy salamander (*Desmognathus wrighti*) is a small terrestrial salamander found in high elevation mixed deciduous and spruce-fir forest habitats along the border of Tennessee and North Carolina. In Tennessee, this species is known from the Great Smoky Mountains National Park (Blount, Cocke, and Sevier counties). South of the national park, little spruce-fir forest exists in Tennessee. Consequently, the pygmy salamander is thought to be replaced by the seepage salamander (*D. aeneus*) in this region. We report the occurrence of pygmy salamander in Monroe County, Tennessee, and discuss ambiguous museum records of this species.

The Pygmy Salamander (*Desmognathus wrighti*) is a small terrestrial plethodontid salamander typically associated with red spruce (*Picea rubens*) and Fraser's fir (*Abies fraseri*) forest in the Southern Appalachian Mountains (Harrison, 2000). Populations also are associated with old growth and late stage secondary growth mixed hardwood deciduous forest at elevations above 762 m, which may represent remnant populations following the retreat of glacial spruce-fir forest (Bruce, 1977; Harrison, 2000). In Tennessee, this species has been reported from the Great Smoky Mountains National Park in Blount County northeast to the French Broad River in Cocke County along the North Carolina border, though populations have a patchy distribution in high elevation zones within this region (Crespi et al., 2003, 2010; Niemiller and Reynolds, in press). These populations appear to have remained fragmented for some time, restricted to high elevations and exhibiting little gene flow through lower elevation zones. This might reflect a preference for high elevation habitats and potential competitive barriers with other Appalachian salamanders (Crespi et al., 2003).

Crespi et al. (2003) identified the North Carolina (Graham County)–Tennessee (Monroe County) border as containing suitable spruce-fir habitat for this species, and the Pygmy Salamander has been collected from Graham County, North Carolina, near the Tennessee border. In Tennessee, Redmond and Scott (1996) do not list this species as occurring south of Blount County, though there are currently two museum specimens listed as *D. wrighti* from Monroe County. A specimen identified as *D. wrighti* was collected by R. Highton et al. 24 Mar 1979 off of Forest Road 26 (Cold Spring Road) near Jake Best Creek (National Museum of Natural History [USNM] 467126]). Herpetologists have not accepted this record because it was reported from an elevation (548 m) well below its normal range and because it was initially labeled as *D. aeneus* before being relabeled as *D. wrighti* by museum staff (W. Addison, pers. com.). A second museum record of *D. wrighti* from Monroe County, Tennessee, also exists (USNM 449247), although uncertainty exists pertaining to the associated collection information. A single specimen was collected 11

Aug 1969 by R. Highton et al. at 1630 m and confirmed as *D. wrighti* by J. Bernardo. It appears that this specimen, purportedly part of a series from Big Junction, Monroe County, near the North Carolina border (R. Highton field number 69-313), was erroneously attached to a series from Cowee Bald (R. Highton field number 69-219), Jackson County, North Carolina (W. Addison, pers. com.). Because of the irregularities of these museum records, *D. wrighti* has not been depicted as indigenous to Monroe County by Redmond and Scott (1996), Harrison (2000, 2005), or NatureServe (2009).

On 28 April 2009 we conducted a diurnal survey for terrestrial salamanders at four sites in the Cherokee National Forest in east-central Monroe County, Tennessee, near the North Carolina border (Fig. 1; Table 1). These sites consisted of steeply sloped, high elevation (> 1050 m) Southern Appalachian northern hardwood forest (NatureServe, 2009). Sites were selected based on the suitability of habitat for salamanders, including the presence of a permanent water source (stream or seep) and abundance of cover objects. We searched for salamanders underneath rocks and logs and within rotten logs at each site being careful to return them to their original positions to minimize disturbances and conserve habitat. We observed three adult pygmy salamanders, including one individual at three of the four sites searched (Table 1). An adult female was observed at Site 1 alongside a Southern Appalachian salamander (*Plethodon teyahalee*) within a 2-m-long rotten log located 5 m from a small stream at an elevation of 1225 m. An adult male was found at Site 3 underneath a 0.5-m-long rotting hardwood log located 10 m from the forest road and 10 m from a small stream at an elevation of 1418 m. A second adult female was observed at Site 4 within a rotting log 1 m from a forest road and 5 m from a small stream, at an elevation of 1166 m. Seven other salamander species were found sympatrically or syntopically with the pygmy salamander (Table 1), including one seepage salamander (*D. aeneus*) at Site 2. Color photo vouchers of *D. wrighti* from Monroe County are accessioned at Austin Peay State University (#s 19008, 19009, 19010, 19011).

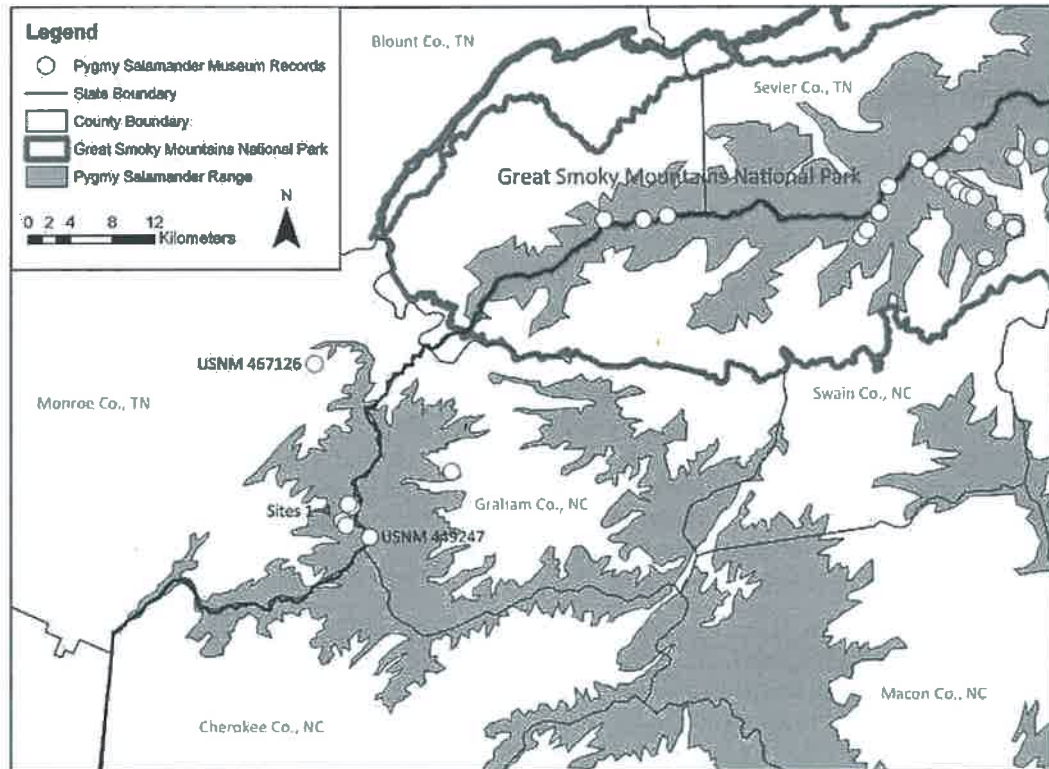


FIG. 1. Map of the range of *Desmognathus wrighti* in southeast Tennessee and southwest North Carolina. Gray areas are zones > 762 m in elevation within this region where *D. wrighti* might occur. Open circles denote known localities from museum records, literature reports, and personal observations. Additionally, the four sites sampled in this study are included, as well as the locations for the two museum records mentioned in the text. Note that USNM 467126 does not occur within the elevational range of *D. wrighti*.

We have clarified previously unreported ambiguities from museum specimens and verified that pygmy salamanders do occur in the Cherokee National Forest in Monroe County. Instead of being abruptly replaced by seepage salamanders, pygmy salamanders might occur in sympatry with seepage salamanders in at least the northeastern portion of Monroe County. Furthermore Dodd (2004) reports that individuals of *D. aeneus* have been found just across the North Carolina–Tennessee border in extreme southern Blount County, though it is currently unknown

whether the two species can be found in the same locations in that area. Further sound knowledge of the distribution of this species is beneficial for future management of pygmy salamanders as this species is considered in need of management in Tennessee.

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TABLE 1. Sites surveyed for terrestrial salamanders in the Cherokee National Forest, Monroe County, Tennessee. Coordinates are given in decimal degrees, WGS 84, as obtained from a Magellan SporTrack GPS unit.

Locality	Location	Elevation	Salamanders Observed
Site 1	35.3279°N–84.0398°W	1225 m	<i>D. wrighti</i> , <i>D. ocoee</i> , <i>D. quadramaculatus</i> , <i>D. santeetlah</i> , <i>Eurycea wilderae</i> , <i>Plethodon serratus</i> , <i>P. teyahalee</i>
Site 2	35.3162°N–84.0490°W	1194 m	<i>D. aeneus</i> , <i>D. ocoee</i> , <i>P. teyahalee</i>
Site 3	35.3122°N–84.0454°W	1418 m	<i>D. wrighti</i> , <i>P. serratus</i> , <i>P. teyahalee</i>
Site 4	35.3302°N–84.0428°W	1166 m	<i>D. wrighti</i> , <i>P. teyahalee</i>

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