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RESEARCH ARTICLE

ADDITIONAL NOTES ON THE DISTRIBUTION OF *EURYCEA LONGICAUDA* (GREEN, 1818) IN MARYLAND

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ABSTRACT

An updated, mostly specimen-based map of the distribution of the long-tailed salamander, *Eurycea longicauda* (Green, 1818), in Maryland is presented. Errors in the literature are corrected, overlooked references are cited, and unsubstantiated mapped localities on or adjacent the Coastal Plain are discarded. Comparisons in relative abundance in the Piedmont are made between *Eurycea bislineata* (Green, 1818) and *E. longicauda*.

Keywords: Coastal Plain, *Eurycea bislineata*, *Eurycea guttolineata*, long-tailed salamander, two-lined salamander, three-lined salamander.

INTRODUCTION

The long-tailed salamander, *Eurycea longicauda* (Green, 1818), is almost entirely confined to the Piedmont and mountains of Maryland, with a minimum penetration onto the Coastal Plain (Miller, 1984). Dunn (1926), in his monograph on the Plethodontidae, was the first author to map the distribution of *E. longicauda* throughout its range. Two sites were listed for Maryland (Jennings and Oakland, Garrett County) and two for the District of Columbia (High Island and Rock Creek). [The former site is in Montgomery County. Reed (1957) also mislisted this specimen.] In addition, Dunn plotted a literature record for Conowingo, Cecil County (Fowler, 1925). Accurate range maps for the species have been published numerous times (e.g., Conant, 1958; Petranka, 1998; Powell et al., 2016), Ireland (1979) being the exception. Ireland, based on two alleged specimens of *E. guttolineata* (Holbrook, 1838) in his private collection from one locality “‘between Church Hill and Mountville’ (ca. 11 km SW Frederick, Frederick County) ...”

(Miller, 1980), mapped an extensive distribution of *E. guttolineata* in Maryland. This came at the expense of *E. longicauda*. Miller (1980) noted this and later (2009) showed there was no sound basis for the inclusion of *E. guttolineata* in Maryland. However, the Maryland Biodiversity Project (2024), based on a defunct Towson University web page, stated: “one record of [the] Three-lined Salamander has been documented in Maryland. It was collected in the town [of] Frederick and has been presumed an escapee.” As just noted, the alleged specimens were not taken in Frederick and there is no accounting for how someone could have claimed that they were escapees.

Forty years have passed since the documented distribution of *Eurycea longicauda* was reviewed in Maryland (Miller, 1984). Since that time additional collecting by Towson University personnel, the donation of James A. Fowler’s collection to the Carnegie Museum of Natural History, the donation of Richard Highton’s collection to the National Museum of Natural History, and the advent of VertNet, have resulted in the collection of 168 specimens. With some modifications to my previous map and the inclusion of literature reports, this has added about 30 new localities. Although none of these sites alters the overall picture of this species’ range in Maryland, they do present a fuller picture than my previous map. Gronert (2018) published a general account of *E. longicauda*, which included a site-specific distribution map that was based on Confirmed localities (photographs) and Reported localities, which had no bases. Her map and all others in the species accounts in Cunningham & Nazdrowicz (2018) were prepared by Lynn M. Davidson (personal communication, 2024). Three dubious sites on or adjacent the Coastal Plain, discussed below, were plotted. Specimens cited in Miller (1984) are not repeated here, although certain collection abbreviations need updating. The collections of Richard Highton and the US Biological Survey are now in the National Museum of Natural History. My use of the abbreviation NHSM/HSH–RSS (Natural History Society of Maryland/Herbert S. Harris, Jr.,–Robert S. Simmons), although initiated and used often by these authors (e.g., Harris & Simmons, 1976) was not correct. Both Harris and Simmons had their own private collections long before beginning their misadventures in rattlesnake taxonomy (e.g., McCranie & Wilson, 1979). NHSM/HSH would have been the correct abbreviation to use. Specimens cited are in the following collections: Academy of Natural Sciences of Drexel University (ANSP), American Museum of Natural History (AMNH), California Academy of Sciences (CAS), Carnegie Museum of Natural History (CM), Chicago Academy of Science (CHAS), Museum of Biological Diversity, Ohio State University (OSUM), National Museum of Natural History (USNM), Natural History Museum of Los Angeles County (LACM), Sam Noble Museum, University of Oklahoma (OMNH) and Towson University (TSU). MARA (Maryland Amphibian and Reptile Atlas = Cunningham & Nazdrowicz, 2018) is also used. Specimens I collected were deposited at Towson University.

DISCUSSION

Miller (1984) noted the absence of specimens from Cecil County where they would be expected to occur in the Piedmont. On 9 June 1994 I collected one specimen (TSU 8972) 0.8 km W Rock Springs from an unnamed tributary to Conowingo Creek. An additional specimen (TSU 9153) was taken 2.25 km WNW Rock Springs along Conowingo Creek on 9 June 1995. In addition, John E. Cooper (personal communication, 1984) informed me that he found the species upstream from the Rowlandsville bridge (Doctor Jack Road), along Octoraro Creek while on fishing trips. I was unable to learn when these trips took place, but apparently they occurred in the late 1940s. Fowler (1925) reported the species from Conowingo, a locality essentially the same as Cooper’s. However, there are no specimens, and an undated note I discovered while working in

Roger Conant's Delmarva files in 2021 read simply "I don't trust Fowler." Also, numerous NHSM members, Towson University students, and others collected the Conowingo area from the time of Cooper (1947, 1949) until at least 2012 (Miller, 2024a). If anyone found *E. longicauda*, none were preserved and deposited in a museum collection. Fowler (1925) also reported *Bufo fowleri* Hinckley, 1882, *Rana pipiens* Schreber, 1782, *Clemmys guttata* (Schneider, 1792), *Glyptemys insculpta* (Le Conte, 1830), *Sternotherus odoratus* (Latreille in Sonnini & Latreille, 1801), *Plestiodon fasciatus* (Linnaeus, 1758), *Heterodon platirhinos* Latreille, 1801, and *Agkistrodon contortrix* (Linnaeus, 1766) from Jennings, Garrett County. These reports are for species that are currently considered to be either very rare, limited in distribution, or to not occur at all on the Allegheny Plateau of Maryland (Cooper, 1960b, 1965; Harris, 1969, 1975; Franz, 1968; Thompson, 1984; Miller, 2015; Powell et al., 2016; Cunningham & Nazdrowicz, 2018). That these eight species, none vouchered, could all occur at one locality is extremely unlikely. Fowler (1925) listed the 18 species reported by Keim (1914), including his *R. pipiens* report, although Keim's report of *Bufo americanus* was listed by Fowler as *B. fowleri*. This specimen, ANSP 17826, – June 1907, has been reidentified as *B. americanus*. Fowler (1925) did not cite Keim (1914), although he stated: "Collections were made at Jennings in Garrett County by Mr. T. D. Keim, June 24 to 26, 1907; by Mr. Hermann Behr, March 2, 1922; and by Dr. Witmer Stone, August 15, 1911." It is therefore advisable to accept Fowler's (1925) reports, even for uncontroversial localities, only when they are based on specimens. This would also apply to Fowler (1915) despite his statement: "This list represents material I have examined or collected, unless otherwise stated." Most of his reports of *B. americanus* from several localities in Cecil County ["Bohemia Manor at Bohemia Bridge, near Warwick and Cecilton, Bohemia Mills and Little Bohemia Creek. Northeast (North East), Bacon Hill, Elkton and Singerly"] are unsubstantiated and dubious. ANSP 17117 (Bacon Hill, 10 August 1905), ANSP 18364-18365 ["Big" (Great) Bohemia Creek, 30 April 1910] and ANSP 19106 (near Warwick, 31 May 1908) were reidentified as *B. fowleri*, the first and third sites by Roger Conant.

Harris (2004) overlooked the recent literature bearing on the relationship between *Eurycea guttolineata* (which he consistently misspelled "*glutolineata*") and *E. longicauda*. First, he treated these species as one (a polytypic *E. longicauda*), unaware that Carlin (1997) showed that *E. guttolineata* is distinct. Petranksa (1998) followed Carlin, which Harris was also not aware of. Second, Harris copied Tobey's (1985) maps and plotted two localities for *E. longicauda* in Clarke County, two in Fairfax County, and three in central Loudoun County unaware of Mitchell & Reay (1999) who rejected all records from these counties (among numerous others), with the exception of one site in extreme southwestern Loudoun County. (Mitchell & Reay did note that "Unusual phenotypes or potential hybrids with *E. longicauda* occur in some streams in Fairfax County.") Finally, Harris's (2004) Maryland maps, which do not even match and are crudely based on Harris (1975), overlooked the map published by Miller (1984). This is particularly odd since it was published in Harris's own privately controlled journal.

The most recent author to deal with *Eurycea longicauda* in Maryland was Gronert (2018). One article of substance does not appear in her account (Miller, 1984), although it was cited in MARA. She did note that Miller (1979) reported the first record of this species on the Coastal Plain of Maryland. This was based on TSU 1860 (5) from Race Road, Anne Arundel County, 4 May 1977. (My statement that this site was roughly 5.0 km below the Fall Line was overstated; ca. 2.5 km would have been more accurate.) However, since she was not aware of Miller (1984), she did not know that, based on new information, the specimens were collected on the Howard County portion of Race Road. At that time, I stated that the revised locality made it debatable

whether this site was on the Coastal Plain. However, since the publication of this statement I have visited the area and have confirmed that it is on the Coastal Plain. The stream the salamanders would have used for reproduction is Deep Run, a shallow, muddy, low-gradient stream typical of this physiographic province. Since Gronert overlooked Miller (1984), she was not aware that I reported two sites unquestionably on the Coastal Plain in Prince George's County. In Gronert's account, MARA mapped three localities on or near the Coastal Plain. One appeared to be in Cecil County, one was definitely in Harford County, and the other straddled the Susquehanna River, which could mean Cecil County, Harford County or both. One needs confirmation and the other two have no documentation. Lynn M. Davidson (personal communication, 2024) informed me the Harford County site is based on a photograph from the Anita C. Leight Estuary Center, dating from one of 40 trips by Donald T. McKnight between 28 February and 18 September 2011. The photo was independently examined by a MARA committee of three. McKnight disputes MARA's interpretation of his photo (personal communication, 2024) and believes the salamander depicted to be *Eurycea bislineata*. This report has not been mapped. The other two localities were submitted by Nathan H. Nazdrowicz; however, he did not provide any locality data (L. M. Davidson, personal communication, 2024). Nazdrowicz was unresponsive to an email I sent on 27 July 2024; thus these sites are currently unsubstantiated and have also not been mapped. Minor errors in Gronert include an overlooked behavioral note by Cooper (1960a) and a citation of "Franz 1967a." There is no Franz 1967b in MARA.

Figure 1 presents an updated distribution map for Maryland, including the District of Columbia. Literature reports have been mapped for Bedford Road, ca. 2.5 miles (1.6 km) "N" (NE) Cumberland, Allegany County (Keller, 1945); Notch Cliff, Baltimore County (Reed, 1957); Old Salamander Cave, Garrett County (Franz & Slifer, 1971); near Lander, Frederick County (Forester, 2000); "Falling Waters Spring," Washington County (Thompson, 2000) and Antietam National Battlefield, Washington County (Kubel et al., 2002). Other literature reports by Brady (1937), Prince et al. (1955), Manville (1968), Franz & Slifer (1971), Forester (2000) and Thompson (2000) have been subsumed by specimens. Sites mapped from Robert S. Simmons catalogue are: Lutherville, Baltimore County (RSS S29, – August 1940, no specimen), Washington Monument State Park, Washington County (RSS S59, 7 May 1953, no specimen) and Clarysville, Allegany County, from L. Richard Franz's catalogue (LRF 145, – May 1960, no specimen). Following Miller (2024b), who noted peculiarities between *Plethodon cinereus* vs. *P. glutinosus*, and *Eurycea bislineata* vs. *E. longicauda*, Tables 1 and 2 show the number of sites and relative abundance of the latter two species I collected in the Maryland Piedmont, 1978–2008.

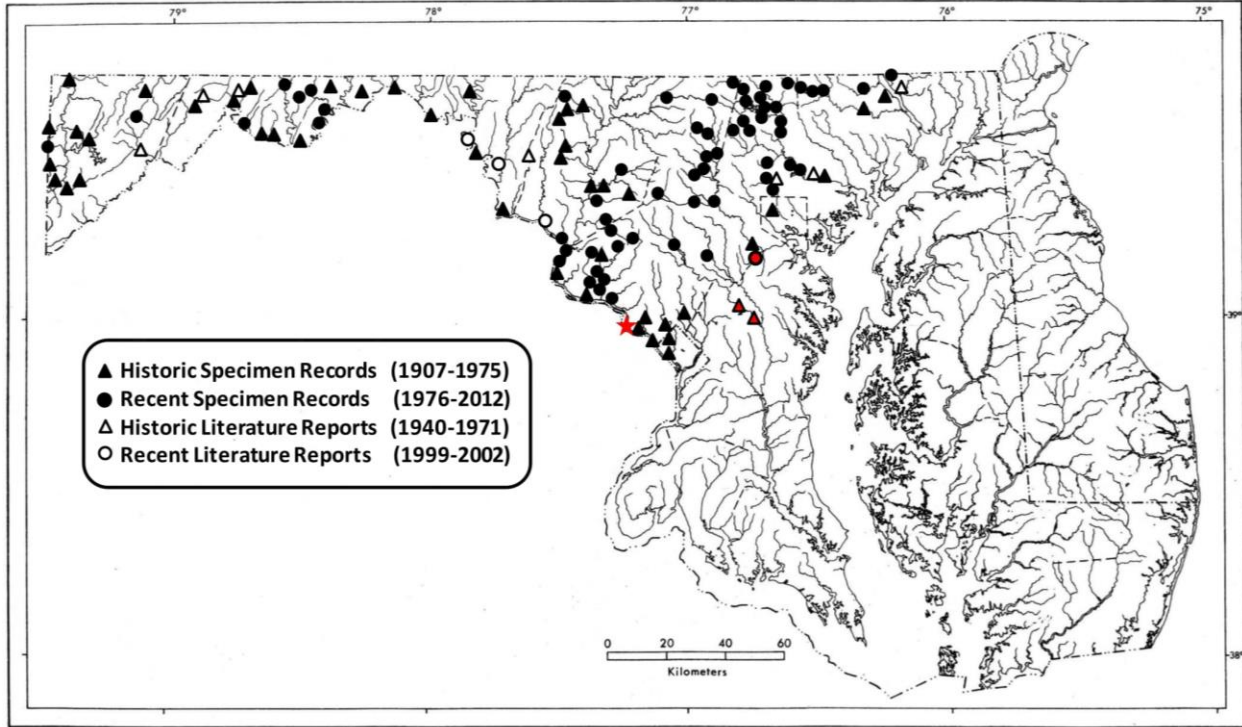


Figure 1. Map of Maryland, Delaware and the District of Columbia showing locality records and reports for the long-tailed salamander, *Eurycea longicauda*, in Maryland and the District of Columbia. Red-filled symbols indicate Coastal Plain records. Star shows probable hybrid between *E. guttolineata* and *E. longicauda*; see Miller (1980).

Table 1. Comparison of collection sites (1978–2008) by the author of *Eurycea bislineata* and *E. longicauda* in the Maryland Piedmont.

Month	<i>Eurycea bislineata</i>	<i>Eurycea longicauda</i>	Ratio
January	—	—	—
February	—	—	—
March	9	0	0
April	46	4	0.09
May	47	27	0.58
June	14	5	0.36
July	2	0	0
August	4	2	0.50
September	20	11	0.55
October	12	2	0.17
November	—	—	—
December	—	—	—
Totals	154	51	0.33

Table 2. Comparison of numbers of specimens collected (1978–2008) by the author of *Eurycea bislineata* and *E. longicauda* in the Maryland Piedmont.

Month	<i>Eurycea bislineata</i>	<i>Eurycea longicauda</i>	Ratio
January	–	–	–
February	–	–	–
March	21	0	0
April	124	8	0.06
May	154	79	0.51
June	45	9	0.20
July	8	0	0
August	17	2	0.12
September	61	28	0.46
October	34	4	0.12
November	–	–	–
December	–	–	–
Totals	464	130	0.28

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Appendix. Specimens cited.

Specimens examined

Allegany County: CHAS 17184; CM 138812-138814; LACM 124406-124408; TSU 7605-7606.

Baltimore County: LACM 124409; TSU 6558, 8842, 9944-9945, 10431. 1.2 km SW Ruxton (TSU uncatalogued).

Carroll County: TSU 7926-7929, 8433-8435, 9454.

Cecil County: TSU 8972, 9153.

Frederick County: OMNH 24682, 24687-24688, 24695-24696, 30268; TSU 6351-6352, 6476-6481, 6511-6519, 10309-10312.

Garrett County: ANSP 17803-17808, 18562; CM 138819-138820, 138821-138822; OSUM 2897; TSU 8507-8512, 8772-8774.

Harford County: CM 138815-138816; TSU 9278.

Howard County: TSU 7916.

Montgomery County: CM 138802-138804, 138805, 138806-138807, 138809, 138810-138811, 138817-138818; TSU 6467-6468, 9408, 9419-9422, 9521, 9590-9595, 9705-9708, 9830-9831, 9878, 9936-9939, 9970, 9981-9982, 9992-9994, 10161.

Washington County: CM 138808; LACM 124410-124411.

Specimens unexamined

Allegany County: USNM 240936-240940, 240959-240960, 240961-240963, 497881, 511093-511094.

Frederick County: USNM 262649, 377445, 376618-376619, 380213, 380646, 380894, 380976, 382323.

Montgomery County: AMNH 22994-22995; CAS 223815-223817; USNM 61721, 268718-268721.

Washington County: USNM 276409, 378613-378617, 378750, 379172, 379269.