

# OCCASIONAL PAPERS THE MUSEUM TEXAS TECH UNIVERSITY

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NUMBER 123

21 OCTOBER 1988

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## A NEW SUBSPECIES OF FRINGED MYOTIS, MYOTIS THYSANODES, FROM THE NORTHWESTERN COAST OF THE UNITED STATES

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In the course of study of long-eared myotis from the western United States, the presence of an undescribed race of *Myotis thysanodes* from the Pacific Northwest became apparent. This new taxon is named and described as follows.

### *Myotis thysanodes vespertinus*, new subspecies

*Holotype*.—Adult female, skin and skull, Museum of Vertebrate Zoology no. 104,858, from Tillamook, Tillamook Co., Oregon; obtained on 3 August 1940 by Alex Walker, original no. 1574.

Selected external and cranial measurements (in millimeters) of the holotype are: total length, 81; length of tail, 36; length of forearm, 37.8; greatest length of skull, 15.4; condylobasal length, 14.3; postorbital constriction, 3.8; zygomatic breadth, 9.2; mastoid breadth, 7.5; breadth of braincase, 7.3; length of rostrum, 6.8; depth of braincase, 5.1; breadth across upper canines, 3.5; breadth across M3-M3, 5.8; length of maxillary toothrow, 5.8; greatest length of dentary, 10.9; length of mandibular toothrow (c-m3), 6.3.

*Distribution*.—West of Cascade Mountains in southwestern Washington (Barbour and Davis, 1969:85), western Oregon, and northwestern California, south approximately to Humboldt and Shasta counties. The nominate subspecies occurs to the east of the range in Washington and Oregon and to the east and south in California.

*Diagnosis.*—Size small, both externally and cranially (see Table 1); dorsal and ventral pelage relatively dark in color; membranes, especially ears, blackish; fringe of stiff hairs on posterior border of uropatagium not so conspicuously developed as in other races of species; braincase rising relatively abruptly from rostrum.

*Comparisons.*—The new subspecies needs direct comparison solely with *M. t. thysanodes*, the only one of the three other races of the species with which it is in geographic contact. The dorsal pelage is dark, burnished brown in overall color, quite in contrast to the paler appearance of the nominate race. The basal blackish color of individual dorsal hairs extends for fully two-thirds of the shaft, hairs tipped with dark brown (in *M. t. thysanodes* the dark basal color of individual hairs extends approximately halfway up the shaft, and the distal part is pale brownish to straw-colored). The venter of *M. t. vespertinus* also is darker than in *thysanodes*, as are the membranes, especially the ears.

As a measure of overall dorsal coloration, specimens from western Oregon were compared (Table 2) with those in a series from Kern County, California, near the type locality of *M. t. thysanodes*, using readings from a Photovolt Photoelectric Reflection Meter, Model 610, whereby colors are recorded as a percentage reflectance of pure white. A sample from Marin County, on the California coast just north of San Francisco Bay, also was included as an indication that bats from there and elsewhere in north-central California are intermediate in color between the two races even though they clearly associate with *M. t. thysanodes* in terms of size.

As noted, *M. t. vespertinus* averages smaller than *M. t. thysanodes* in both external and cranial dimensions (Table 1), and the slope from rostrum to braincase is more abrupt on the average. The difference in size is readily apparent by comparison of average measurements, but is even more conspicuous when one measurement is plotted against another on a scatter diagram (Fig. 1). Additionally, even though clearly present, the stiff hairs on the posterior border of the uropatagium are not as long, nor do they extend as far toward the foot, as in *M. t. thysanodes*, and the thumbs are shorter in direct comparison.

*Remarks.*—When Miller and Allen (1928) revised American *Myotis*, they had no specimens of *Myotis thysanodes* available to them from the Pacific States save for the type series from Old Fort Tejon, Kern Co., California, and one other Californian specimen.

TABLE 1.—Selected comparative measurements (mm) of adults of two subspecies of *Myotis thysanodes*. Sample sizes in parentheses. Superscript numbers denote smaller sample for some measurements.

Measurement	<i>Myotis thysanodes thysanodes</i>		<i>Myotis thysanodes vespertinus</i>
	Southern California (16)*	Marin County, California (15)**	Western Oregon (8)**
Length of forearm			
Ave. $\pm$ 1 S.E.	40.9 $\pm$ 0.3	39.8 $\pm$ 0.2	38.4 $\pm$ 0.3 <sup>7</sup>
Range	38.9-42.6	38.1-41.0	37.5-39.6
C.V.	2.5	1.7	2.3
Greatest length of skull			
Ave. $\pm$ 1 S.E.	16.1 $\pm$ 0.1	16.4 $\pm$ 0.1	15.5 $\pm$ 0.1
Range	15.8-16.4	15.7-17.4	15.1-15.9
C.V.	1.1	3.2	2.1
Zygomatic breadth			
Ave. $\pm$ 1 S.E.	10.0 $\pm$ 0.1	10.2 $\pm$ 0.1	9.4 $\pm$ 0.1 <sup>6</sup>
Range	9.6-10.2	9.8-10.7	9.1-9.7
C.V.	1.9	2.9	2.3
Mastoid breadth			
Ave. $\pm$ 1 S.E.	7.9 $\pm$ 0.1	8.2 $\pm$ 0.1	7.6 $\pm$ 0.1
Range	7.7-8.1	7.9-8.5	7.3-7.9
C.V.	1.4	2.5	2.6
Breadth of braincase			
Ave. $\pm$ 1 S.E.	7.5 $\pm$ 0.1	7.8 $\pm$ 0.1	7.3 $\pm$ 0.1
Range	7.4-7.9	7.3-8.2	6.9-7.7
C.V.	1.9	3.3	3.7
Breadth across M3-M3			
Ave. $\pm$ 1 S.E.	6.3 $\pm$ 0.1	6.4 $\pm$ 0.1	5.9 $\pm$ 0.1
Range	6.0-6.6	6.1-6.7	5.6-6.1
C.V.	2.9	2.7	2.3
Length of max. tooththrow			
Ave. $\pm$ 1 S.E.	6.1 $\pm$ 0.1	6.2 $\pm$ 0.1	5.9 $\pm$ 0.1
Range	5.7-6.3	6.0-6.6	5.7-6.1
C.V.	2.9	3.0	3.2
Length of lower c-m3			
Ave. $\pm$ 1 S.E.	6.6 $\pm$ 0.1	6.7 $\pm$ 0.1	6.3 $\pm$ 0.1
Range	6.2-7.0	6.4-7.3	5.9-6.5
C.V.	3.4	3.3	3.3

\*Inyo, Kern, and San Bernadino counties.

\*\*See specimens examined.

In succeeding years, the species was recorded by several authors from coastal California and Oregon (Hall, 1981), but the differences between northwest coastal populations and those from southern California have not been documented previously,

TABLE 2.—Comparative reflectance of red, green, and blue colors (as a percentage of pure white) in dorsal pelage of three samples of *Myotis thysanodes* from California and Oregon. Average, one standard error, and range are given for each measurement. Sample sizes are in parentheses following localities.

Sample	Red	Green	Blue
<i>Myotis thysanodes thysanodes</i>			
Kern County, California (10)	13.6 ± 2.1 (10.0-16.5)	6.2 ± 1.7 (4.0-9.0)	4.9 ± 1.1 (2.5-6.5)
Marin County, California (13)	11.3 ± 1.7 (9.5-14.5)	4.5 ± 0.6 (4.0-5.5)	3.7 ± 0.6 (3.0-4.5)
<i>Myotis thysanodes vespertinus</i>			
Western Oregon (7)	8.6 ± 1.7 (6.5-11.5)	3.4 ± 1.8 (2.5-6.5)	3.3 ± 0.9 (2.5-4.0)

although Barbour and Davis (1969) noted that: "A small, dark, undescribed race with a reduced fringe occurs in southwestern Washington." The presence of smaller, dark-colored bats of this species in the Pacific Northwest parallels variation exhibited by several other species of *Myotis*.

Typical specimens of *M. t. vespertinus* examined by us all came from Oregon. From northern California, we have at hand one from Humboldt County and another from Shasta County that resemble the new subspecies both in color and size to a much greater degree than they resemble *M. t. thysanodes*, and we refer them to *vespertinus*. Southwardly, even though some specimens are intermediate in color (Marin County sample, for example) between the two races, they clearly are assignable to the nominate subspecies on the basis of size. Similarly, a specimen of *M. t. thysanodes* from Okanagon County, Washington, on the east slope of the Cascades, approaches *vespertinus* in color but not in size.

The species-group name *vespertinus* is from the Latin and means "of the evening."

*Specimens examined*.—OREGON. *Clatsop Co.*: Old Fort Clatsop, 100 ft., 1 (MVZ). *Jackson Co.*: East Pilot Rock Spring (T. 41 S, R. 2 E), Mt. Ashland, 1 (PSM). *Klamath Co.*: Lake Klamath, 1 (OSU). *Lincoln Co.*: Cascade Head Exp. Forest (T. 6 S, R. 10 W, SW .25 sec. 21), 240 ft., 2 (PSM); no specific locality, 1 (PSM). *Tillamook Co.*: Tillamook, 2 (1 PSM, 1 MVZ—the holotype). CALIFORNIA. *Humboldt Co.*: Jacoby Creek, 1 (HSU). *Shasta Co.*: Cassel, 1 (MVZ).

*Specimens of M. t. thysanodes* used in comparisons (all MVZ unless otherwise noted).—CALIFORNIA. *Amadora Co.*: 1 mi. SW Cole Creek Cabin (T. 8 N, R. 16 E, sec. 23), 1 (HSU). *Fresno Co.*: 8 mi. WSW Coalinga, 1. *Inyo Co.*: Death Valley National Monument, Grapevine Mts., 0.5 mi. SE Leadfield, 2. *Kern Co.*: 1 mi. W Isabella, 2500 ft., 1; Lebec, 1; Tejon Ranch, 1400 ft., 10. *Lake Co.*: Lucerne, Clear Lake, 4. *Marin Co.*: Red Barn, National Seashore Headquarters, 1 mi. W Olema,

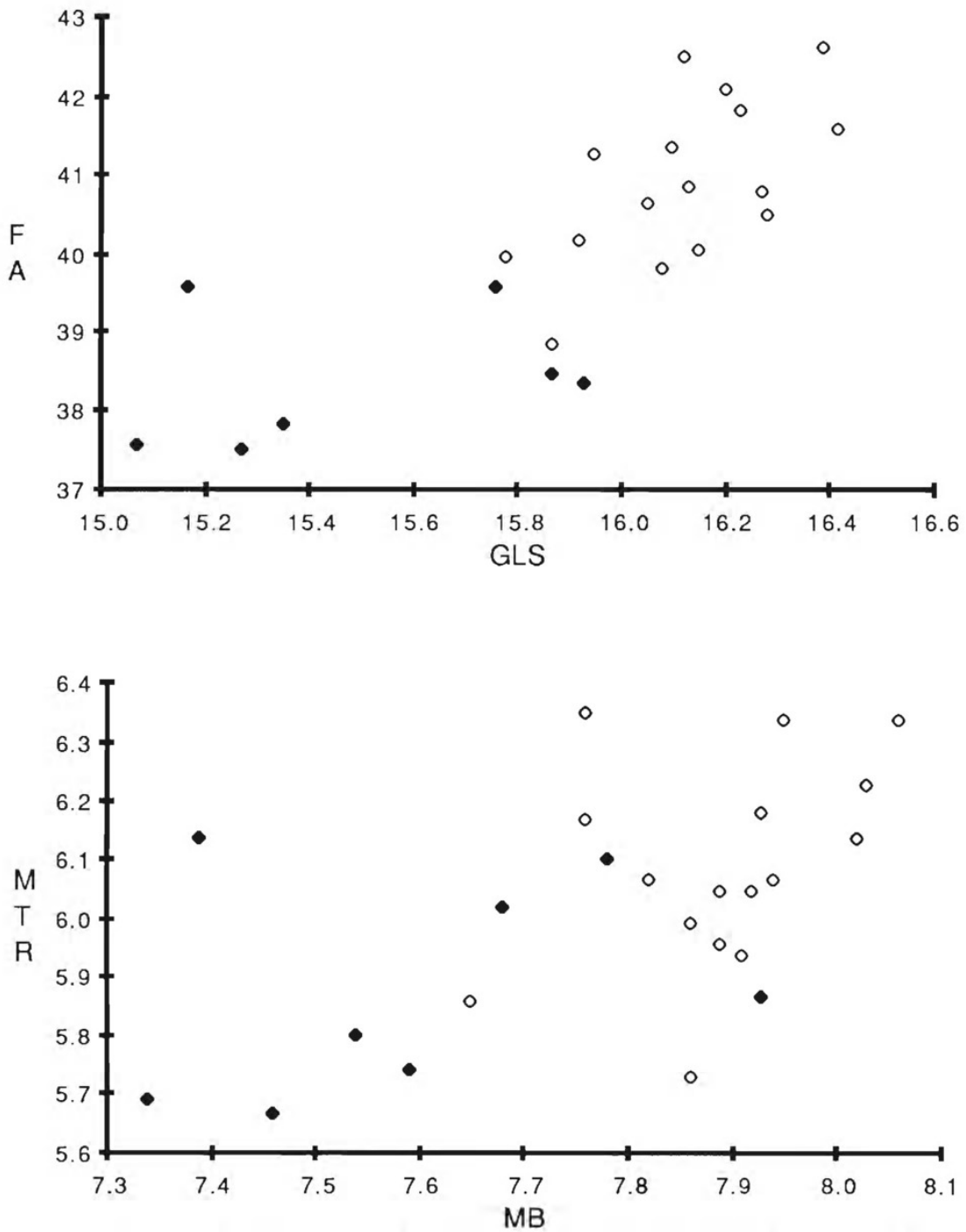


FIG. 1.—Scatter diagrams on which are plotted measurements (mm) of *Myotis thysanodes thysanodes* (open symbols) and *M. t. vespertinus* (closed symbols). Upper figure, forearm plotted against greatest length of skull; lower figure, maxillary toothrow plotted against mastoid breadth.

15 (3 TTU). *Mariposa Co.*: Dudley, 3000 ft., 1. *Monterey Co.*: Hatton Ranch, 1.3 mi. SE Carmel, 100 ft., 1; Fremont Peak, N end Gabilan Range, 1; mouth of Lime Kiln Creek, 1; 6.3 mi. NE Soledad, 1; The Shuttin, Nacimiento River, 1000 ft., 1. *Napa Co.*: 0.5 mi. S Angwin, 1600 ft., 6. *Placer Co.*: Tahoe City, 2. *Riverside Co.*: Lower Covington Flat, 5000 ft., 1. *San Benito Co.*: 1.25 mi. S New Idria, 3500 ft., 1; Silver Creek, 900 ft., 7.5 mi. ESE Panoche, 1. *San Bernadino*



Manning, Richard W. and Jones, J. Knox. 1988. "A new subspecies of fringed Myotis, *Myotis thysanodes*, from the northwestern coast of the United States." *A new subspecies of fringed myotis, Myotis thysanodes, from the northwestern coast of the United States* 123, 1–6.

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