Contributions in Natural History: A Memorial Volume in Honor of Clyde Jones

Edited by
Richard W. Manning, Jim R. Goetze, and Franklin D. Yancey, II
SPECIAL PUBLICATIONS

Museum of Texas Tech University

Number 65

Contributions in Natural History:
A Memorial Volume in Honor of Clyde Jones

EDITED BY

RICHARD W. MANNING, JIM R. GOETZE, AND FRANKLIN D. YANCEY, II
# Table of Contents

Editors’ Preface and Acknowledgments .................................................. 1

Abbreviated Résumé .................................................................................... 3

Bibliography ................................................................................................. 5

Prologue: “We learned about field work, and for some reason we loved it”—Oral History

Excerpts from the Reminiscences of Clyde Jones

*David Marshall*

**A New Species of *Myotis* (Chiroptera: Vespertilionidae) from Suriname**

*Ricardo Moratelli, Don E. Wilson, Alfred L. Gardner, Robert D. Fisher, and Eliécer E. Gutiérrez*

Non-volant Mammals of Ash Meadows National Wildlife Refuge, Nevada

*Richard W. Manning and Martin R. Heaney*

**A Resurvey of Bats at Dinosaur National Monument**

*Michael A. Bogan and Tony R. Mollhagen*

Distribution Records and Reported Sightings of the White-nosed Coati (*Nasua narica*) in Texas, with Comments on the Species’ Population and Conservation Status

*David J. Schmidly, John Karges, and Robert Dean*

Ecological Distribution and Foraging Activity of the Ghost-faced Bat (*Mormoops megalophylla*) in Big Bend Ranch State Park, Texas

*Franklin D. Yancey, II*

Pleistocene/Holocene Faunas from the Trans-Pecos

*Arthur H. Harris*

First Documented Record of Nutting’s Flycatcher (*Myiarchus nuttingi*) for Texas

*Mark W. Lockwood*

Bats of Kimball and Cheyenne Counties in the Panhandle of Nebraska

*Kenneth N. Geluso and Keith Geluso*

Molecular Systematics and Phylogeny of *Peromyscus nudipes* (Cricetidae: Neotominae)

*Robert D. Bradley, María Nuñez-Tabares, Taylor J. Soniat, Sara Kerr, Russell W. Raymond, and Nicté Ordóñez-Garza*

An Inventory of Bats in Arch Canyon, San Juan County, Utah

*Tony R. Mollhagen and Michael A. Bogan*
Comparison of Pasturelands Containing Texas Kangaroo Rat (*Dipodomys elator*) Burrows to Adjacent Roadsides in Wichita County, Texas, with Comments on Road Usage by *D. elator*

Jim R. Goetze, Allan D. Nelson, and Larry L. Choate

Encomia and Reflections

Photographs
A New Species of *Myotis* (Chiroptera: Vespertilionidae) from Suriname

*Ricardo Moratelli, Don E. Wilson, Alfred L. Gardner, Robert D. Fisher, and Eliécer E. Gutiérrez*

**ABSTRACT**

We describe a new species of bat in the genus *Myotis* (Vespertilionidae: Myotinae) from the district of Sipaliwini, Suriname. The new species (*Myotis clydejonesi* sp. nov.), known from a single specimen, is sister to a clade of *M. nigricans* (Schinz) from southern South America, but differs from all Neotropical species of *Myotis* in qualitative and quantitative morphological characters and in its cytochrome-\(b\) gene sequence. Our findings also indicate that *M. nigricans* remains composite and provide support for restricting *M. nigricans* (sensu stricto) to southern South America.

**Key words:** Guiana Shield, Myotinae, Neotropics, South America

**INTRODUCTION**

The Guiana Shield comprises part of eastern Colombia, southern Venezuela, northern Brazil, Guyana, Suriname, and French Guiana (Gibbs and Barron 1993; Huber 1994). Some authors (e.g., Hollowell et al. 2001; Lim et al. 2005) exclude eastern Colombia and northern Brazil from their definition of the Guiana Shield. For this more restricted area, Lim et al. (2005) reported 148 species of bats, including five species of *Myotis* Kaup, 1829—*Myotis albescens* (Geoffroy, 1806), *M. nigricans* (Schinz, 1821), *M. oxyotus* (Peters, 1866), *M. keaysi* Allen, 1914, and *M. riparius* Handley, 1960. Three of these (*albescens, nigricans, and riparius*) occur in Suriname (Husson 1962; Lim et al. 2005).

The three species that occur in Suriname are widespread in the Neotropics, their distributions extending from Central America southward into southern South America (Wilson 2008). Among them, *M. albescens* has been retrieved as a monophyletic, morphologically cohesive group (Moratelli and Oliveira 2011; Larsen et al. 2012). On the other hand, *M. nigricans*, as currently recognized, appears to be a composite of several species (Moratelli et al. 2011, 2013; Larsen et al. 2012).

In the course of a critical review of collections of Neotropical *Myotis*, we found one specimen from Sipaliwini, Suriname, that has a peculiar cranial morphology. Based on pelage color and texture, and cranial features, this specimen is unquestionably allied with species in the *albescens* group (sensu Moratelli et al. 2013), but qualitative and quantitative morphological features, along with its cytochrome-\(b\) (\(Cytb\)) profile, distinguish the Suriname specimen from these and all other Neotropical *Myotis*.

**METHODS**

*Specimens examined.*—The source of the material for the description of this new species is one adult lactating female deposited in the Museum of Texas Tech University (TTU 109227). It was collected by H. H. Genoways on 23 January 2008 at Raleigh Falls (04°43’ N, 56°12’ W), district of Sipaliwini, Suriname.

This research is part of a critical review of collections of Neotropical *Myotis* for which more than 3,800 specimens have been examined, including all species currently recognized (see Moratelli and Wilson 2014). Recognizing TTU 109227 as unusual, we compared it directly with 368 vouchers (Appendix) representing...
all species currently recognized from northern South America (see Moratelli et al. 2013), giving special attention to those species from the Guiana Shield (see Moratelli et al. 2015). These vouchers are preserved in the American Museum of Natural History (AMNH, New York, USA); Carnegie Museum of Natural History (CM, Pittsburgh, USA); Centre for the Study of Biological Diversity, University of Guyana (M, Georgetown, Guyana); Muséum d’histoire naturelle (MHNG, Geneva, Switzerland); Museum of Texas Tech University (TTU, Lubbock, USA); Museu de Zoologia da Universidade de São Paulo (MZUSP, São Paulo, Brazil); Natural History Museum, University of Kansas (KU, Lawrence, USA); National Museum of Natural History, Smithsonian Institution (USNM, Washington, DC, USA); and Royal Ontario Museum (ROM, Toronto, Canada). These specimens were identified according to criteria described by Moratelli et al. (2013, 2015).

**Morphology and morphometrics.**—Descriptive terminology for craniodental morphology follows Moratelli et al. (2013). Measurements were taken of adults only, and are reported in millimeters (mm), and the body mass is in grams (g). We recorded the total length (TL), tail, hind foot, ear, and body mass from skin labels, reported to the nearest millimeter or gram. Other measurements were taken using digital calipers accurate to 0.02 mm. Craniodental measurements were taken with the aid of binocular microscopes under low magnification (usually 6×). These dimensions were recorded and analyzed to the nearest 0.01 mm, but values were rounded off to 0.1 mm throughout the text because this is the smallest unit that allows accurate repeatability with calipers (Voss et al. 2013). Measurements, as defined in Moratelli et al. (2013:3), include forearm length (FA), third metacarpal length (3MC), length of dorsal hair (LDH), length of ventral hair (LVH), greatest length of skull (GLS), condylocanine length (CCL), condylobasal length (CBL), condyloincisive length (CIL), basal length (BAL), zygomatic breadth (ZB), mastoid breadth (MAB), braincase breadth (BCB), interorbital breadth (IOB), postorbital breadth (POB), breadth across canines (BAC), breadth across molars (BAM), maxillary toothrow length (MTL), length of the upper molars (M1–3), mandibular length (MAL), and mandibular toothrow length (MAN). Descriptive statistics (mean and range) were calculated for all dimensions with sample size \( n \geq 3 \). A discriminant function analysis (DFA) was applied to a subset of the craniodental dimensions (MAB, CIL, MAL, BAL, GLS, POB, M1–3, BAC) to compare TTU 109227 with representatives of the most similar species. Statistics was performed in SPSS (IBM Corp. 2012). The list of specimens used in the DFA is in the Appendix.

**Phylogenetic analyses.**—Phylogenetic analyses of Cytb sequences were conducted for Neotropical species of Myotis, which Ruedi et al. (2013) found to represent a monophyletic group. A total of 118 Cytb sequences for species in this clade, and four and seven sequences for Myotis brandtii and M. gracilis, respectively, were retrieved from GenBank (Table 1). We used Myotis brandtii and M. gracilis as an outgroup because Ruedi et al. (2013) found they were sister to the Neotropical clade. Sequences were aligned using default options of MAFFT v.7.017 (Katoh and Standley 2013) as implemented in Geneious v.7.1.5 (Biomatters, http://www.geneious.com/). Subsequently, the Bayesian Information Criterion (BIC), as implemented in PartitionFinder ver. 1.0.1 (Lanfear et al. 2012), was used to determine both the most suitable partition scheme and the best-fit models of nucleotide substitution. This analysis only considered models that can be applied in MrBayes (see below).

Maximum likelihood (ML) and Bayesian inference (BI) were used as optimality criteria. The ML analysis consisted of 20 independent searches in the Genetic Algorithm for Rapid Likelihood Inference (GARLI 2.0; Zwickl 2006) applying the best fit-model and the best partitioning scheme (see Results) and default settings. The Bayesian analysis was conducted in MrBayes v. 3.2 (Ronquist et al. 2012). The search started with a random tree. The Markov chains were run for 100 million generations, and trees were sampled every 1,000 generations. Default values were kept for the “relburnin” and “burninfrac” options in MrBayes; therefore, the first 25,000,000 generations (25,000 trees) were discarded as burn-in, and posterior probability estimates of all model parameters were based on the remaining (75,000) trees. Convergence and stationarity were assessed in the Bayesian analyses by plotting likelihood values in Tracer 1.5 (Rambaut and Drummond 2007).
Table 1. Terminals (focal species and putative species of the genus *Myotis*; see Methods) and corresponding GenBank accession numbers. Note that the information presented herein for terminal taxonomic identifications results from re-identification of voucher specimens (see Methods), and do not necessarily match those identifications assigned by researchers that generated the corresponding sequence(s) available at GenBank.

| Terminal                      | GenBank accession number                                                                                   |
|-------------------------------|-------------------------------------------------------------------------------------------------------------|
| *M. albescens*                | AF376839, JX130444, JX130445, JX130463–JX130465, JX130472, JX130500–JX130504, JX130522                 |
| *M. atacamensis*              | AM261882                                                                                                    |
| *M. australriarius*           | AM261885                                                                                                   |
| *M. brandtii*                 | AF376844, AM261886, AY665139, AY665168                                                                         |
| *M. cf. lavali*               | AF376864                                                                                                   |
| *M. cf. nigricans* (Suriname) | JN020570–JN020572                                                                                           |
| *M. cf. nigricans* (Tobago)   | JN020573, JN020574                                                                                           |
| *M. cf. nigricans* (western Ecuador) | JX130523, JX130541, JX130546–JX130550                                                                 |
| *M. cf. nigricans* (eastern Peru) | JX130452, JX130537, JX130538                                                                 |
| *M. cf. pilosatibialis*       | AF376852, JX130449, JX130489, JX130514, JX130519, JX130525                                                |
| *M. chiloensis*               | AM261888                                                                                                   |
| *M. clydejonesi*              | JX130520                                                                                                   |
| *M. dinelli*                  | JX130475                                                                                                   |
| *M. dominicensis*             | AF376848, JN020554–JN020556                                                                                |
| *M. gracilis*                 | AB106609, AB243025–AB243030                                                                                |
| *M. handleyi*                 | JN020569, JX130529–JX130533, JX130535, JX130543, JX130544                                                |
| *M. levis*                    | AF376853                                                                                                   |
| *M. martiniquensis*           | AM262332, JN020557–JN020561                                                                                |
| *Myotis* sp.                  | JX130493                                                                                                   |
| *M. nesopolus*                | JN020575–JN020577                                                                                           |
| *M. nigricans*                | JX130450, JX130455, JX130496, JX130498, JX130528, JX130539, JX130540                                      |
| *M. nyctor*                   | JN020562–JN020567                                                                                           |
| *M. oxyotus*                  | AF376865                                                                                                   |
| *M. pilosatibialis*           | JX130526                                                                                                   |
| *M. riparius*                 | AF376866, AF376867, AM261891, AM262336, JX130436, JX130469, JX130473, JX130474, JX130479–JX130481, JX130485, JX130486, JX130488, JX130491, JX130492, JX130506, JX130513, JX130515, JX130516, JX130572 |
| *M. velifer*                  | AF376870, AY460343, EF222340, EU680298, EU680299, JX130438, JX130462, JX130468, JX130477, JX130478, JX130589, JX130592 |
| *M. vivesi*                   | AJ504406, AJ504407                                                                                          |
| *M. yumanensis*               | AF376875                                                                                                   |
Nonparametric bootstrapping (Felsenstein 1985) for the ML analysis, and posterior probabilities for the BI analysis, were used to assess nodal support (Ronquist et al. 2012). The ML bootstrap analysis was performed in GARLI 2.0 using 100 pseudoreplicated data matrices, with 10 searches performed on each. Bayesian posterior probabilities were calculated simultaneously with the search for the best Bayesian topology, conducted as described earlier. Throughout the text, we refer to different degrees of nodal support for the ML bootstrap analysis using the following categories: strong support, for bootstrap values ≥ 75%; moderate support, for bootstrap values > 50% and < 75%; negligible support, for values ≤ 50%. For the BI analysis, we refer to degrees of nodal support with two categories, significant or strong in cases in which a node’s posterior probability was ≥ 0.95, and insignificant or negligible for posterior probability values < 0.95.

High values of sequence divergences are neither necessary nor sufficient for recognition of lineages at the species level (Ferguson 2002; Dávalos and Russell 2014). However, genetic distances provide a heuristically useful basis for comparisons of genetic variation within and among lineages (Gutiérrez et al. 2010). Therefore, we report average uncorrected (p) distance and average Kimura 2-parameter-corrected (K2P) distance within and among haplogroups of interest for our taxonomic objective. Genetic distances were calculated using MEGA version 5.2.1 (Tamura et al. 2011).

Results

Molecular analyses.—The Cytb matrix contained ca. 8% of missing data. PartitionFinder found that the most suitable partitioning scheme was not to use subsets, and that the best-fit model of nucleotide substitution was the Hasegawa, Kishino, and Yano model, with gamma-distributed rate heterogeneity and a proportion of invariant sites (HKY + Γ+ I).

Our results show that *M. nigricans*, as currently understood, is polyphyletic, with representatives in five distinct, strongly supported haplogroups (Fig. 1). One comprises samples from Bolivia and Paraguay, and whose sister terminal was found to be specimen TTU 109227. Another comprises samples from eastern Peru, and was recovered sister to *M. nesopolus* Miller, 1900, albeit with negligible nodal support. The third group comprises samples from western Ecuador, but its relationship to other closely related haplogroups remains equivocal. The fourth includes two samples from Tobago and was recovered, with strong support, as sister to the clade including the *M. cf. nigricans* haplogroup from western Ecuador; *M. cf. handleyi*, *Myotis* sp., *M. cf. nigricans* from eastern Peru; and *M. nesopolus*. The last *M. cf. nigricans* haplogroup includes samples from Suriname (except TTU 109227), and was recovered, with strong support, as sister to *M. nyctor* LaVal and Schwartz, 1974 from the Lesser Antilles. Our primary motivation for this research was to determine the identity and taxonomic status of TTU 109227; hence, our results and discussion are focused on the phylogenetic positioning and morphological distinctiveness of this specimen. From here on we refer to Bolivian and Paraguayan samples as *M. nigricans* due to geographical proximity to its type locality (southeastern Brazil [LaVal 1973; Moratelli et al. 2011]). We refer to the other population samples in the remaining haplogroups tentatively assigned to *M. nigricans* as *M. cf. nigricans*.

We found the specimen of interest—TTU 109227—to be sister to *M. nigricans* (Fig. 1). Sequence divergences between TTU 109227 and *M. nigricans* are 5.4% and 5.7% for p- and K2P-distances, respectively. Note that to accomplish the calculation of these between-groups distances, the DNA sequence of specimen TTU 109227 was duplicated. The within-group sequence divergence for the *M. nigricans* haplogroup is 1.5% for both metrics. Within-group sequence divergence could not be calculated for the clade containing TTU 109227 because only a single sequence is available for it.

Morphological analysis.—Considering the assemblages of *Myotis* known from northern South America (Moratelli et al. 2013) and the Guiana Shield (Moratelli et al. 2015), the Surinamese voucher TTU 109227 can be distinguished morphologically from species in the *ruber* group (i.e., *keaysi*, *pilosatibialis*,...
Figure 1. Phylogenetic tree resulting from the Bayesian inference analysis of the cytochrome-\(b\) sequence data. Nodal support from both the Bayesian inference and the maximum-likelihood analyses are shown right and left of slashes ("/"), respectively. See Methods for more information.
riparius, and simus) by its silky pelage, low sagittal and lambdoidal crests, and rounded, relatively uninflated occipital region. TTU 109227 is morphologically close to species in the albescens group (i.e., albescens, caucensis, handleyi, nigricans, oxyotus, and nesopolus laensis) in the traits described above. However, it can be distinguished from all species in this group by the depressed braincase (Fig. 2), and the unique combination of dorsal fur blackish and ventral fur with blackish bases and yellowish-red tips. From M. nigricans—the most closely related species—TTU 109227 can be distinguished by its anteriorly shallower rostrum, more robust occipital condyles, supraoccipital not as inflated and not projecting as far behind occipital condyles (Fig. 2), and more laterally expanded mastoid region. We provide additional information on its description and distinction from other species under the subheading “Morphological description and comparisons.”

*Morphometric analyses.*—In a discriminant analysis, the cranial morphology of TTU 109227 was compared with the morphology of M. nigricans from Bolivia and Paraguay and of M. cf. nigricans from Suriname (Fig. 3, Table 2). In this analysis, the first two discriminant functions (DF1 and DF2) summarized 100% of the among-group variation, with DF1 comprising 82% and DF2 18%. Along the first axis (DF1), TTU 109227 and M. nigricans had low negative values, and M. cf. nigricans had high positive values. Along the second axis (DF2), TTU 109227 had high negative

![Figure 2](image-url)
Figure 3. Plots of multivariate individual scores in the first two discriminant functions (DF1, DF2). Samples: *M. nigricans* from Paraguay (*n* = 10 [circles; group 1]), *M. cf. nigricans* from Suriname (*n* = 3 [diamonds; group 2]), and the holotype of *Myotis clydejonesi* (triangle; group 3).

Table 2. Coefficients of discriminant functions (DF1, DF2) for samples of *Myotis clydejonesi*, *M. cf. nigricans*, and *M. nigricans*. See Methods for variable abbreviations.

| Characters | DF1 (%) | DF2 (%) |
|------------|---------|---------|
| GLS        | -2.311  | 3.359   |
| CIL        | -25.173 | 1.013   |
| BAL        | 10.071  | -4.457  |
| MAB        | 1.353   | 1.327   |
| POB        | 3.272   | 0.711   |
| BAC        | -4.972  | 3.782   |
| M1–3       | 4.049   | 0.423   |
| MAL        | 18.634  | -4.209  |
values, whereas *M. nigricans* and *M. cf. nigricans* had low negative to high positive values. Thus, this analysis confirmed the distinctive cranial morphology peculiar to TTU 109227.

Comparing linear measurements of TTU 109227 with *M. nigricans* (*n* = 41–54) and *M. cf. nigricans* (*n* = 2–3), TTU 109227 has larger dimensions, without overlap, for most characters (all but M1–3) related to the length of skull (GLS, CCL, CBL, CIL, BAL) and rostrum (MTL, M1–3, MAL, MAN). On the other hand, all width measurements (MAB, BCB, IOB, POB) and rostrum (BAC, BAM) overlap with those from *M. nigricans* and *M. cf. nigricans*. These results indicate that TTU 109227 has a skull comparatively longer, but not wider, than the skulls of *M. cf. nigricans* and *M. nigricans*.

Combined results from morphological, morphometric, and molecular analyses show that TTU 109227 represents a unique lineage that differs from all species of *Neotropical Myotis* in qualitative and quantitative morphological characters and in its Cytb gene sequence. Based on these findings, we recognize TTU 109227 as a representative of an undescribed species, which we here name as:

**Myotis clydejonesi** sp. nov.  
Clyde Jones’s Myotis, *Myotis de Clyde Jones*  
Figs. 2, 4, 5; Table 3

**Holotype and type locality.**—The holotype (TTU 109227) comprises the skin and skull of an adult lactating female (Figs. 4, 5), including tissue (TK 151465), collected by H. H. Genoways (field number 6630) on 23 January 2008 at Raleigh Falls (04°43’ N, 56°12’ W; obtained from the skin label), Sipaliwini, Suriname. External and craniodental dimensions are in Table 3. The species is known from only the type locality (Fig. 6). This collecting site is located on an island in the Coppername River in the Central Suriname Nature Reserve. Relatively dense, near-mature tropical lowland forest with only a limited understory occupied most of the area. The mist net in which the holotype was captured was placed under the largest tropical trees near the banks of the Coppername River (Genoways and McLaren 2003).

**Diagnosis.**—*Myotis clydejonesi* can be distinguished from all other Neotropical species of *Myotis* by the flattened braincase, elongated rostrum, silky fur, and combination of dorsal and ventral pelage colors. The fur is silky; dorsal pelage is blackish, without contrast between bases and tips, and ventral fur is blackish basally (2/3 of the total hair length) and tipped yellowish-red on terminal third. The braincase is flatter and the pelage is silkier than in any other South American species known to us. This combination of the ventral and dorsal pelage colors appears to be unique among Neotropical *Myotis*. The following set of traits also is useful to distinguish *M. clydejonesi* from other *Myotis* that occur on the Guiana Shield: long, silky pelage; absence of a fringe along the trailing edge of uropatagium; low sagittal and lambdoidal crests; and rounded occipital region.

**Morphological description and comparisons.**—Among South American *Myotis*, *M. clydejonesi* is a medium-sized species (FA 34.9 mm, other measurements in Table 3). The pelage is silky. Dorsal fur is blackish without contrast between bases and tips. Ventral fur is blackish basally (2/3 of the total fur length) and yellowish-red on the tips (1/3), with strong contrast in color between bases and tips. Membranes are medium-brown. The plagiopatagium is attached to the foot at the level of the toes by a broad band of membrane (see López–González et al. 2001:141, fig. 1a). The dorsal surfaces of elbow and tibia are naked or nearly naked. The uropatagium lacks the fringe of hairs along the trailing edge. Like most species of *Myotis*, its dental formula is 2/3, 1/1, 3/3, 3/3 = 38. The P3 is aligned in the toothrow (not displaced lingually), and visible in lateral view. Frontals are slightly inclined, with a smooth transition from the rostrum to the braincase. The sagittal and lambdoidal crests are low. The occipital region is rounded, and does not project much behind level of occipital condyles. In contrast to other Neotropical *Myotis*, the skull is flattened, but not nearly so flattened as in *M. planiceps* Baker, 1955 (see photo of a *M. planiceps* skull in Haynie et al. 2016:703, fig. 2a).

In addition to the diagnostic traits, *M. clydejonesi* can be distinguished from those species that co-occur on the Guiana Shield (*albescens*, *keaysi*, *riparius*, *oxyotus*, *nigricans*) as follows: from *M. albescens* by...
Figure 4. Dorsal (A) and ventral (B) views of the skin of the holotype of *Myotis clydejonesi* (TTU 109227). See Table 3 for measurements.

Figure 5. Dorsal (A), ventral (B), and lateral (D) views of the skull, and dorsal (C) and lateral (E) views of the mandible of the holotype of *Myotis clydejonesi* (TTU 109227). Scale bar = 5 mm. See Table 3 for measurements.
Table 3. Selected measurements (mm) and body mass (g) of the holotype of *Myotis clydejonesi* (TTU 109227), and of samples of *M. cf. nigricans* from Suriname and *M. nigricans* from Paraguay. Mean calculated for \( n \geq 3 \); \( n = \) sample size (adults only). See Methods for variable abbreviations and Appendix for localities of specimens.

| Variable | TTU 109227, ♀ (Suriname) Holotype | Mean (Range), \( n \) | M. cf. nigricans (Suriname) | M. nigricans (Paraguay) |
|----------|----------------------------------|----------------|---------------------------|------------------------|
| TL       | 88                               | –              | –                         | –                      |
| Tail     | 38                               | –              | –                         | –                      |
| Hind foot| 6                                | –              | –                         | –                      |
| Ear      | 11                               | –              | –                         | –                      |
| Body mass| 4.3                              | –              | –                         | –                      |
| FA       | 34.9                             | 35.0, 1        | 32.9 (30.7–35.6), 54      |                        |
| 3ML      | 33.6                             | –              | 31.1 (28.8–34.5), 54      |                        |
| LDH      | 7.7                              | 5.6, 1         | –                         | –                      |
| LVH      | 6.1                              | 4.5, 1         | –                         | –                      |
| GLS      | 14.3                             | 13.9 (13.4–14.2), 3 | 13.7 (13.2–14.2), 53    |                        |
| CCL      | 12.8                             | 12.1 (11.7–12.3), 3 | 12.0 (11.7–12.5), 53    |                        |
| CBL      | 13.5                             | 12.7 (12.3–13.1), 3 | 12.7 (12.3–13.1), 52    |                        |
| CIL      | 13.7                             | 12.9 (12.5–13.2), 3 | 12.9 (12.5–13.3), 52    |                        |
| BAL      | 12.3                             | 11.7 (11.5–11.8), 3 | 11.6 (11.2–12.1), 52    |                        |
| ZB       | 8.8                              | 8.1, 8.3, 2    | –                         | –                      |
| MAB      | 7.0                              | 6.9 (6.7–7.2), 3 | 7.0 (6.8–7.3), 53        |                        |
| BCB      | 6.4                              | 6.6 (6.4–6.8), 3 | 6.5 (6.2–6.9), 52        |                        |
| IOB      | 4.4                              | 4.6 (4.5–4.8), 3 | 4.5 (4.0–4.8), 53        |                        |
| POB      | 3.4                              | 3.6 (3.6–3.7), 3 | 3.6 (3.4–3.8), 53        |                        |
| BAC      | 3.5                              | 3.5 (3.4–3.7), 3 | 3.5 (3.2–3.6), 41        |                        |
| BAM      | 5.7                              | 5.6 (5.5–5.7), 3 | 5.3 (5.1–5.5), 41        |                        |
| MTL      | 5.3                              | 5.1 (5.0–5.2), 3 | 5.0 (4.8–5.2), 52        |                        |
| M1–3     | 3.0                              | 2.9 (2.8–3.0), 3 | 2.9 (2.7–3.0), 53        |                        |
| MAL      | 10.2                             | 9.8 (9.5–10.1), 3 | 9.6 (9.2–10.0), 53       |                        |
| MAN      | 5.6                              | 5.4 (5.3–5.5), 3 | 5.3 (5.2–5.5), 53        |                        |
the absence of a fringe of hairs along the trailing edge of the uropatagium; from *M. oxyotus* by the frontals smoothly inclined (not steeply sloping as in *oxyotus*), and smaller external and cranial size (see Moratelli et al. 2013); from *M. keaysi* and *M. riparius* by the silky fur, and occipital region rounded; also, from *M. keaysi* by the dorsal fur on the uropatagium not reaching the knee, and the fur on the plagiopatagium along the body either absent or extremely sparse. Comparing *M. clydejonesi* with *M. cf. nigricans* from Suriname (using vouchers that were the sources of DNA for our *Cytb* analysis), *M. clydejonesi* also can be distinguished by the flattened skull and elongated rostrum. These characteristics also distinguish *M. clydejonesi* from *M. nigricans* sensu stricto (Bolivia, Paraguay, E Brazil).

**Etymology.**—*Myotis clydejonesi* honors Clyde Jones, in recognition of his outstanding contributions to mammalogy (see Jones 2005). Clyde was a mentor, colleague, supervisor, and friend; we find it particularly fitting that the type specimen of *M. clydejonesi* is housed in the Museum at Texas Tech University, the institution that holds a major part of his collections and legacy.

Figure 6. Map of part of South America illustrating the type locality (indicated by star) of *Myotis clydejonesi* at Raleigh Falls (04°43' N, 56°12' W), district of Sipaliwini, Suriname.
Discussion

With the description of *M. clydejonesi*, 21 formally described Neotropical species of *Myotis* currently are recognized (see Moratelli and Wilson 2014). Husson (1962) recognized three species of *Myotis* from Suriname—*M. albescens*, *M. nigricans*, and *M. surinamensis* Husson, 1962. The latter he proposed as a replacement name for *Vespertilio ferrugineus* Temminck. However, according to Carter and Dolan (1978:73) and Davis and Gardner (2008:445), the type of *V. ferrugineus* does not represent a South American bat. Subsequently, Lim et al. (2005) reported three species (*albescens*, *nigricans*, *riparius*), and *M. clydejonesi* now represents the fourth species for the country. Beyond the support for recognizing *M. clydejonesi*, our results also indicate that “*M. nigricans*” from Suriname possibly represents another undescribed species.

Our findings also provide additional support for Larsen et al.’s (2012) hypothesis that *M. nigricans* should be restricted to southern South America. The species, as traditionally recognized, is polyphyletic. We suggest retaining the name “*nigricans*” for the haplogroup formed by Bolivian and Paraguayan samples because they are geographically closer to the type locality of the species in southeastern Brazil (see LaVal 1973; Moratelli et al. 2011) than is any of the remaining haplogroups. Based on our results, at least four geographic groups previously assigned to *M. nigricans* may require new names (Suriname, western Ecuador, eastern Peru, and Tobago; see Fig. 1). Our results require additional analyses, and we will return to collections for further morphological comparisons. However, based on the frequency with which we find single museum specimens that we cannot assign to any of the currently recognized species (e.g., TTU 109227 when originally examined), we suspect that the diversity of Neotropical *Myotis* (~ 26 spp.) is still underestimated.

The results of our phylogenetic and morphological analyses unquestionably ally *M. clydejonesi* with other species in the *albescens* group (sensu Moratelli et al. 2013). In northern South America and the Guiana Shield, this group comprises *M. albescens*, *M. caucensis*, *M. clydejonesi*, *M. handleyi*, *M. nesopolus laensis*, *M. cf. nigricans*, and *M. oxyotus*. Other *Myotis* found in the same region (*M. keaysi*, *M. pilosatibialis*, *M. riparius*, and *M. simus*) are in the *ruber* group. Finally, *M. clydejonesi* can be distinguished from all species in the Neotropical subclade (sensu Ruedi et al. 2013) by its combination of ventral and dorsal pelage color and the depressed braincase. Although not so flattened as in *M. planiceps* Baker, 1955, these two species share this trait (much more accentuated in *planiceps*). The flattened braincase in these two species is an example of convergence; *M. planiceps* is a representative of the Nearctic subclade of *Myotis* (Haynie et al. 2016).

Acknowledgments

The following curators and collection staff provided access to specimens under their care: R. Timm (Biodiversity Institute, University of Kansas, Lawrence, USA); N. Simmons, E. Westwig (American Museum of Natural History, New York, USA); J. Wible, S. McLaren (Carnegie Museum of Natural History, Pittsburgh, USA); C. Bernard (Centre for the Study of Biological Diversity, University of Guyana, Guyana); M. de Vivo, J. Gualda (Museu de Zoologia da Universidade de São Paulo, Brazil); R. Baker, H. Garner (Museum of Texas Tech University, USA); M. Ruedi (Muséum d’histoire naturelle, Geneva, Switzerland); B. Lim (Royal Ontario Museum, Canada); K. Helgen, D. Lunde, and L. Gordon (Smithsonian’s National Museum of Natural History, USA). Support for Moratelli comes from the Brazilian National Council for Scientific and Technological Development / Science Without Borders Program (CNPq 202612/2012), and the Smithsonian Institution. Support for Fisher and Gardner comes from the USGS Ecosystems Mission Area. Support for E. Gutiérrez comes from Universidade de Brasília, the Brazilian Coordination for the Improvement of Higher Education Personnel (CAPES), and the Smithsonian Institution. Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. government.
The holotype was obtained during fieldwork supported by funds from Outside Magazine granted to T. H. Genoways and funds from the Joyce Genoways Field Expedition Fund. We are grateful to T. H. Genoways, M. Bogan, and R. A. Van Den Bussche for helpfully reviewing previous drafts of the manuscript.

**Literature Cited**

Allen, J. A. 1914. New South American bats and a new octodont. Bulletin of the American Museum of Natural History 33:381–389.

Baker, R. H. 1955. A new species of bat (genus *Myotis*) from Coahuila, Mexico. Proceedings of the Biological Society of Washington 68:165–166.

Carter, D. C., and P. G. Dolan. 1978. Catalog of type specimens of Neotropical bats in selected European museums. Special Publications, Museum of Texas Tech University 15:1–136.

Dávalos, L. M., and A. L. Russell. 2014. Sex-biased dispersal produces high error rates in mitochondrial distance-based and tree-based species delimitation. Journal of Mammalogy 95:781–791.

Davis, D. W., and A. L. Gardner. 2008 (2007). Genus *Eptesicus* Rafinesque, 1820. Pp. 440–450 in Mammals of South America, Vol. 1, Marsupials, Xenarthrans, Shrews, and Bats (A. L. Gardner, ed.). University of Chicago Press, Chicago. [Date of issue: March 31, 2008.]

Felsenstein, J. 1985. Confidence limits on phylogenies: An approach using the bootstrap. Evolution 39:783–791.

Ferguson, J. W. H. 2002. On the use of genetic divergence for identifying species. Biological Journal of the Linnean Society 75:509–516.

Genoways, H. H., and S. B. McLaren. 2003. Results of the ALCOA Foundation-Suriname Expeditions. XIII. Annotated gazetteer of mammal collecting sites in Suriname. Annals of the Carnegie Museum 72:223–239.

Geoffroy, É. 1806. Mémoire sur le genre et les espèces de Vespertilion, l’un des genres de la famille des chauve-souris. Annales du Muséum d’Histoire Naturelle 8:187–205.

Gibbs, A. K., and C. N. Barron. 1993. The geology of the Guiana Shield. Oxford University Press, Oxford. 246 pp.

Gutiérrez, E. E., S. A. Jansa, and R. S. Voss. 2010. Molecular systematics of mouse opossums (Didelphidae: Marmosa): Assessing species limits using mitochondrial DNA sequences, with comments on phylogenetic relationships and biogeography. American Museum Novitates 3692:1–22.

Handley, C. O., Jr. 1960. Descriptions of new bats from Panama. Proceedings of the United States National Museum 112:459–479.

Haynie, M. L. H., M. T. N. Tsuchiya, S. M. Ospina-Garcés, J. Arroyo-Cabrerales, R. A. Medellin, O. J. Polaco, and J. E. Maldonado. 2016. Placement of the rediscovered *Myotis planiceps* (Chiroptera: Vespertilionidae) within the *Myotis* phylogeny. Journal of Mammalogy 97:701–712.

Hollowell, T., P. Berry, V. Funk, and C. Kelloff. 2001. Preliminary checklist of the plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana; Surinam; French Guiana), Vol. 1: Acanthaceae—Lythraceae. Smithsonian Institution, Washington, DC. 129 pp.

Huber, O. 1994. Recent advances in the phytogeography of the Guyana Region, South America. Mémoires de la Société de Biogéographie 4:53–63.

Husson, A. M. 1962. The bats of Suriname. Zoologische Verhandelingen, Rijksmuseum van Natuurlijke Historie, Leiden 58:1–282, 30 pls.

IBM Corp. 2012. IBM SPSS statistics for Windows, ver. 21.0. IBM Corp, Armonk, New York.

Jones, C. 2005. You have to catch them first. Pp. 185–199 in Going Afield (C. J. Philips and C. Jones, eds.). Museum of Texas Tech University, Lubbock.

Katoh, K., and D. M. Standley. 2013. MAFFT multiple sequence alignment software version 7: Improvements in performance and usability. Molecular Biology and Evolution 30:772–780.

Kaup, J. 1829. Skizzierte Entwickelungs-Geschichte und natürliches System der europäischen Thierwelt. Carl Wilhelm Leste, Darmstadt und Leipzig.

Lanfear, R., B. Calcott, B., S. Y. W. Ho, and S. Guindon. 2012. PartitionFinder: combined selection of partitioning schemes and substitution models for phylogenetic analyses. Molecular Biology and Evolution 29:1695–1701.

Larsen, R. J., M. C. Knapp, H. H. Genoways, F. A. A. Khan, P. A. Larsen, D. E. Wilson, and R. J. Baker. 2012. Genetic diversity of Neotropical *Myotis* (Chiroptera: Vespertilionidae) with an emphasis on South American species. PLoS ONE 7:1–9.

LaVal, R. K. 1973. A revision of the Neotropical bats of the genus *Myotis*. Natural History Museum, Los Angeles County, Science Bulletin 15:1–54.

LaVal, R. K., and A. Schwartz. 1974. A new bat of the genus *Myotis* from Barbados. Caribbean Journal of Science 14:189–191.
Lim, B. K., M. D. Engstrom, and G. J. Ochoa. 2005. Mammals. Pp. 77–92 in Checklist of the terrestrial vertebrates of the Guiana Shield (T. Hollowell, R. P. Reynolds, eds.). Bulletin of the Biological Society of Washington 13, Biological Society of Washington, Washington DC.

López-González, C., S. J. Presley, R. D. Owen, and M. R. Willig. 2001. Taxonomic status of Myotis (Chiroptera: Vespertilionidae) in Paraguay. Journal of Mammalogy 82:138–160.

Miller, G. S., Jr. 1900. Three new bats from the island of Curacao. Proceedings of the Biological Society of Washington 13:123–127.

Moratelli, R., and J. A. Oliveira. 2011. Morphometric and morphological variation in South American populations of Myotis albuscens (Chiroptera: Vespertilionidae). Zoologia 28:789–802.

Moratelli, R., and D. E. Wilson. 2014. A new species of Myotis (Chiroptera, Vespertilionidae) from Bolivia. Journal of Mammalogy 95:E17–E25.

Moratelli, R., A. L. Peracchi, D. Dias, J. A. Oliveira. 2011. Geographic variation in South American populations of Myotis nigricans (Schinz) (Chiroptera, Vespertilionidae), with the description of two new species. Mammalian Biology 76:592–607.

Moratelli, R., A. L. Gardner, J. A. Oliveira, and D. E. Wilson. 2013. Review of Myotis (Chiroptera, Vespertilionidae) from northern South America, including description of a new species. American Museum Novitates 3780:1–36.

Moratelli R., L. Idárraga, and D. E. Wilson. 2015. Range extension of Myotis midastactus (Chiroptera, Vespertilionidae) to Paraguay. Biodiversity Data Journal 3:e5708.

Peters, W. 1866. Über einige neue oder weniger bekannte Flederthiere. Monatsberichte der Königlichen Preussische Akademie des Wissenschaften zu Berlin 1867:16–25.

Rambaut, A., and A. Drummond. 2007. Tracer 1.5. <http://tree.bio.ed.ac.uk/software/tracer/>. Accessed 28 June 2009.

Ronquist, F., M. Teslenko, P. van der Mark, D. L. Ayres, A. Darling, S. Höhna, B. Larget, L. Liu, M. A. Suchard, and J. P. Huelsenbeck. 2012. MrBayes 3.2: efficient Bayesian phylogenetic inference and model choice across a large model space. Systematic Biology 61:539–542.

Ruedi, M., B. Stadelmann, Y. Gager, E. J. P. Douzery, C. M. Francis, L.-K. Lin, A. Guillon-Servent, and A. Cibois. 2013. Molecular phylogenetic reconstructions identify East Asia as the cradle for the evolution of the cosmopolitan genus Myotis (Mammalia, Chiroptera). Molecular Phylogenetics and Evolution 69:437–449.

Schinz, H. R. 1821. Das Tierreich eingetheilt nach dem Bau der Thiere als Grundlage ihrer Naturgeschichte und der vergleichenden Anatomie von dem Herrn Ritter von Cuvier, vol. 1: Säugetiere und Vögel. Cotta’schen Buchhandlung, Stuttgart, Germany.

Tamura, K., D. Peterson, N. Peterson, G. Stecher, M. Nei, S. Kumar. 2011. MEGA5: molecular evolutionary genetics analysis using maximum likelihood, evolutionary distance, and maximum parsimony methods. Molecular Biology and Evolution 28:2731–2739.

Voss, R. S., B. K. Lim, J. F. Diaz-Nieto, and S. A. Jansa. 2013. A new species of Marmosops (Marsupialia: Didelphidae) from the pakaraima highlands of Guyana, with remarks on the origin of the endemic Pantepui mammal fauna. American Museum Novitates 3778:1–27.

Wilson, D. E. 2008 (2007). Genus Myotis Kaup, 1829. Pp. 468–481 in Mammals of South America, Vol. 1, Marsupials, Xenarthrans, Shrews, and Bats (A. L. Gardner, ed.). University of Chicago Press, Chicago. [Date of issue: March 31, 2008.]

Zwickl, D. J. 2006. Genetic algorithm approaches for the phylogenetic analysis of large biological sequence datasets under the maximum likelihood criterion. PhD Dissertation, University of Texas, Austin.

Addresses of authors:

**RICARDO MORATELLI**

Fiocruz Mata Atlântica
Fundação Oswaldo Cruz
Rio de Janeiro, RJ, CEP 22713-375
Brazil
rmoratelli@fiocruz.br

**DON E. WILSON**

Division of Mammals
National Museum of Natural History
Smithsonian Institution
P.O. Box 37012
Washington, DC 20013-7012, USA
wilsond@si.edu
ALFRED L. GARDNER

USGS Patuxent Wildlife Research Center, Biological Survey Unit
National Museum of Natural History
P.O. Box 37012
Washington, DC 20013-7012, USA
gardnera@si.edu

ROBERT D. FISHER

USGS Patuxent Wildlife Research Center, Biological Survey Unit
National Museum of Natural History
P.O. Box 37012
Washington, DC 20013-7012, USA
fisherr@si.edu

ELIÉCER E. GUTIERREZ

PPG Ecologia–PNPD
Departamento de Zoologia
Instituto de Ciências Biológicas, Campus UnB
Universidade de Brasília
Asa Norte, Brasília, DF, CEP 70910-900
Brazil
gutierreze@si.edu
Listed below are localities of specimens examined from northern South America, including northern Brazil, French Guiana, Guyana, Suriname, and Venezuela. They are preserved in the American Museum of Natural History (AMNH, New York, USA); Carnegie Museum of Natural History (CM, Pittsburgh, USA); Centre for the Study of Biological Diversity, University of Guyana (M, Georgetown, Guyana); Muséum d’histoire naturelle (MHNG, Geneva, Switzerland); Museum of Texas Tech University (TTU, Lubbock, USA); Museu de Zoologia da Universidade de São Paulo (MZUSP, São Paulo, Brazil); National Museum of Natural History, Smithsonian Institution (USNM, Washington, DC, USA); and Royal Ontario Museum (ROM, Toronto, Canada). Localities are arranged alphabetically by species and major political unities. Specimens marked with asterisks were used in Table 2, and those with two asterisks also were used in the discriminant function analysis.

Myotis albescens.—FRENCH GUIANA (1): Cayenne, Montsinery, Riviere des Cascades (MHNG 1990.017). GUIANA (18): Berbice, Dubulay (M 343); Essequibo, Chodikar River, 55 km SW of Gunn’s Strip (ROM 106655); Essequibo, Karanambo (ROM 97922); Potaro-Siparuni, Iwokrama Field Station, Iwokrama Forest (ROM 111997, 112041, 112048, 112625); Potaro-Siparuni, Iwokrama Reserve, Pakatau Mountain, Siparuni River, 42 km NW of Kurupukari (ROM 107115); Potaro-Siparuni, Kabukalli Landing, Iwokrama Forest (ROM 111658); Rupumini, Kanukumi (M 177); Upper Takutu-Upper Essequibo, Dadanawa Ranch Headquarters (ROM 31892, 31903); Upper Takutu-Upper Essequibo, Dadanawa, Kuitaro River, Mountain on Right Bank (ROM 33002, 33003, 33004, 33005, 33006, 33007). SURINAME (6): Nickerie, Grassalco (CM 63922); Amazonas, Belén, 56 km NW of Esmeralda, Río Cunucunuma (USNM 405790, 405794, 405796); Amazonas, Belén, 56 km NW of Esmeralda, Cano Essa (USNM 405792); Amazonas, Capibara, 106 km SW of Esmeralda, Brazo Casiquiare (USNM 409392, 409395, 416579); Amazonas, Cerro Neblina Base Camp (USNM 560807, 560808); Amazonas, Paria, 25 km S of Puerto Ayacucho (USNM 409416, 409420, 409422, 409425); Amazonas, Rio Mavaca, 108 km SSE Esmeralda (USNM 405798); Amazonas, San Juan, 163 km ESE Puerto Ayacucho, Rio Manapiare (USNM 409403, 409404, 409406–409408, 409410–409415, 409454, 416581); Amazonas, San Juan, Rio Manapiare (USNM 416580, 416582); Apure, Rio Cinaruco, 38 km NW Puerto Páez (USNM 373909, 373913–373917, 374008); Apure, Nulita, 29 km SSW Santo Domingo, Selvas de San Camilo (USNM 441714–441716); Bolívar, Rio Supamo, 50 km SE El Manteco (USNM 387693); Miranda, 7 km E Rio Chico, near Puerto Tuy (USNM 387697–387701, 387703); Miranda, 10 km SE Rio Chico, near Tacarique La Laguna (USNM 387702); Trujillo, Valera, 23 km NW Valera, Rio Motatán (USNM 370933); Zulia, El Rosario, 42 km NW Encontrados (USNM 441718).

Myotis clydejonesi.—SURINAME (1): Sipaliwini, Raleigh Falls (TTU 109227** [holotype]).

Myotis handleyi.—VENEZUELA (27): Aragua, Rancho Grande Biological Station, 13 km NW Maracay (USNM 517503, 562923, 562924, 562925, 562926, 562927, 562928, 562929, 562930, 562931, 562932, 562933, 562934, 562935, 562936, 562937); Distrito Federal, Pico Ávila, 5 km NE Caracas, near Hotel Humboldt (USNM 370932 [holotype]); Distrito Federal, Pico Ávila, 5 km NE Caracas, near Hotel Humboldt (USNM 370891 [paratype]); Miranda, Curupao, 5 km NW Guarenas (USNM 378723); Monagas, 3 km NW Caripí, near San Agustin (USNM 409391, 409429, 409430, 409431, 409433, 409435, 409437, 409438).

Myotis keaysi.—VENEZUELA (45): Aragua, Rancho Grande Biological Station, 13 km NW Maracay (USNM 370893–370895, 370898–370902, 370911–370913, 370915–370922, 370924, 370926, 370929); Aragua, Rancho Grande Biological Station, 13 km NW Maracay (USNM 370927, 370928, 370930, 370931); Aragua, Pico Guayamayo, 13 km NW Maracay (USNM 521564); Aragua, Rancho Grande, Portachuelo (USNM 562920, 563005, 563006); Aragua, Rancho Grande (USNM 562921); Bolivar, Gran Sabana (USNM 130625, 130626); Carabobo, Montalban, 4 km NW Montalban, La Copa (USNM 441741, 441742); Distrito Federal, Los Venados,
4 km NW Caracas (USNM 370889); Distrito Federal, Pico Ávila, 5 km NNE Caracas, near Hotel Humboldt (USNM 370890); Distrito Federal, junction Puerto Cruz Highway and Colonia Tovar Highway, 0.5 km W (USNM 562984); Guarico, Hacienda El Vira, 10 km NE Alttagracia (USNM 387707); Miranda, San Andres, 16 km SE Caracas (USNM 373920); Miranda, Curupao, 5 km NW Guarenas (USNM 387714–387716, 387718); Monagas, Caripe (USNM 534265).

**Myotis nesopolus.**—CURAÇAO (1): Punda area, Willemstad (USNM 101849 [holotype of M. nesopolus]).

VENEZUELA (9); Falcón, Capatarida (USNM 441710, 441735–441737, 441740); Falcón, 6 km SW Capatarida (USNM 441711); Falcón, Capatarida (USNM 441728); Lara, Río Tucuyo (AMNH 130709 [holotype of M. larensis]); Zulia, Near Cojoro, 35 km WNW Paraguioa (USNM 441721).

**Myotis nigricans.**—PARAGUAY (54): Presidente Hayes, 227 km NW Villa Hayes by road (MVZ 144707*, 144708*, 144710*, 144711*, 144714*, 144715*, 144716*, 144717*, 144719*, 144720*, 144722*, 144726*, 144727*, 144729*, 144730*, 144731*, 144732*, 144735*, 144738*, 144739*, 144741*, 144743*, 144744*, 144746*, 144747*, 144749*, 144750*, 144752*, 144753*, 144755*, 144756*, 144757*, 144761*, 144762*, 144763*, 144764*, 144766*, 144767*, 144768, 144769, 144770**, 144771**, 144772**, 144773**, 144774**, 144775**, 144776**, 144777**, 144778**).

**Myotis cf. nigricans.**—FRENCH GUIANA (7): (MHNG 1983.75, 1983.76, 1983.77, 1983.79, 1984.03, 1984.05, 1990.54). GUYANA (35): Cuyuni-Mazaruni, Paruima (ROM 108263); Demerara-Mahaica, Ceiba Biological Center (ROM, 113797, 112532, 112572, 112665); Upper Demerara-Berbice, Dubulay Ranch (USNM 582351, USNM 582352); Upper Demerara-Berbice, Tropenbos, 20 km SSE of Mabura Hill (ROM 103479, 103483); Upper Takutu-Upper Essequibo, Achimeriawu River, Mabi Wau, Near Achamere Wau (ROM 34042, 34043, 34044, 34045, 34046, 34047, 34048, 34049); Upper Takutu-Upper Essequibo, Chipirari Wau Mouth, 15 mi E of Dadanawa (ROM 34020); Upper Takutu-Upper Essequibo, Courchiwin Mountain, 10 mi E of Dadanawa (ROM 32890, 32892, 32893, 32894, 32896, 32897, 32900); Upper Takutu-Upper Essequibo, Essequibo River, 7 km S of Gunn’s Strip (ROM 106738); Upper Takutu-Upper Essequibo, Gunn’s Strip (ROM 106772); Upper Takutu-Upper Essequibo, Karamanbo (ROM 97931); Upper Takutu-Upper Essequibo, Komawariwau River, Comiwari Wau Mouth, 15 mi E of Dadanawa (ROM 34023, 34027, 34035, 34036); Upper Takutu-Upper Essequibo, Kuma River, 5 mi E, 5.5 mi S of Lethem, Kanuku Mountain (ROM 97827, 97828, 97879). SURINAME (3): Para, Zanderij (CM 63933**, 69053**, 77699**). VENEZUELA (64): Amazonas, Boca Mavaca, 84 km SE Esmeralda, 7 km up Rio Mavaca (USNM 405801); Amazonas, Paria, 25 km S Puerto Ayacucho (USNM 409424, 409455); Apure, Nulita, 29 km SW Santo Domingo, Selvas de San Camilo (USNM 441722); Aragua, 3 km S Ocumare de La Costa (USNM 517504, 517505); Bolivar, Maripa (AMNH 17069 [holotype of M. maripensis]); Carabobo, 10 km NW Urama, El Central (USNM 373921, 373922, 373923, 373924, 373925, 373926, 373927, 373928, 373929, 373930, 373931, 373932, 373933, 373934, 373935, 373936, 373937–373941, 373942, 373943, 373944, 373945, 373946, 373947, 373948, 373949, 373950, 373951–373959, 373989–374004); Carabobo, 6 km N Urama (USNM 374012); Trujillo, 11 km NW Urama, El Central (USNM 387708).

**Myotis oxyotus.**—VENEZUELA (9): Amazonas, Cerro Duida, Cano Culebra, 50 km NW Esmeralda (USNM 405799); Amazonas, Cerro Nebína, Camp VII (USNM 560809–560811); Bolivar, Km. 125, 85 km SE El Dorado (USNM 387712); Bolivar, El Pauji, 21 km NE Icabarú, El Pauji (USNM 441750); Distrito Federal, Alto Ño León, 33 km SW Caracas (USNM 409427); Merida, La Mucuy, 4 km E Tabay (USNM 373919, 387705).

**Myotis riparius.**—FRENCH GUIANA (2): Paracou, near Sinnamary (AMNH 266376, 268591). GUYANA (6): Barima-Waini, North West District (USNM 568021); Potaro-Siparuni, Iwokrama Field Station, Iwokrama Forest (ROM 112049); Potaro-Siparuni, Iwokrama Reserve, Burro Burro River, 25 km NW of Kurupukari (ROM 107278, 114620); Potaro-Siparuni, Mount Ayanganna, First Plateau Camp (ROM 114688, 114689); Upper
Myotis simus.—BRAZIL (42): Amazonas, Borba (AMNH 91886–91892, 94224, 94225, 94227, 94230–94234); Amazonas, Itacoatiara (MZUSP 4372); Amazonas, Manaus (AMNH 79534, 91472–91478, 91500); Amazonas, Parintins (AMNH 92983, 93489–93497, 93922–93925); Amazonas, Rio Juruá (MZUSP 638, 1074).