

## **OCCASIONAL PAPERS**

### **of the MUSEUM OF NATURAL HISTORY The University of Kansas Lawrence, Kansas**

---

NUMBER 145, PAGES 1–12

6 DECEMBER 1991

---

#### **ANNOTATED CHECKLIST OF THE MAMMALS OF CUZCO AMAZONICO, PERU**

NEAL WOODMAN<sup>1</sup>, ROBERT M. TIMM<sup>1</sup>, ROSA ARANA C.<sup>2</sup>, VÍCTOR  
PACHECO<sup>2</sup>, CHERYL A. SCHMIDT<sup>3</sup>, ERROL D. HOOPER<sup>1</sup>, AND  
CECILIA PACHECO A.<sup>2</sup>

Complete or nearly complete inventories of mammalian species are available for few specific localities in the neotropics because of insufficient sampling. Inferences about abundances of most of the species inhabiting an area can be made for even fewer localities (e.g., Terborgh et al., 1984; Timm, in press). This lack of information severely limits our ability to compare mammalian faunas among sites or study broad patterns of mammalian distributions in the neotropics. The situation is aggravated by the increasing deterioration of natural habitats and the resulting extirpation of many species.

To increase our knowledge of neotropical rain forest mammals, the mammal survey team of the neotropical Biological Diversity Program (BIOTROP) developed and tested a formal protocol for surveying neotropical mammals that allows direct comparisons to be made among sites. This study was one part of the BIOTROP pilot project, a joint venture by The University of Kansas Museum of Natural History (KU), Museo de Historia Natural, Universidad Nacional Mayor de San Marcos (MUSM), Missouri Botanical Garden, and Harvard University. The goal of this project was to develop and

---

<sup>1</sup>Museum of Natural History and Department of Systematics and Ecology, The University of Kansas, Lawrence, Kansas 66045-2454, USA.

<sup>2</sup>Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Apartado 14-0434, Lima-14, Peru.

<sup>3</sup>Department of Biology, University of South Dakota, Vermillion, South Dakota 57069, USA.

implement a strategy for rapidly inventorying neotropical sites to obtain data on species richness and associations of species for selected groups of organisms in relation to certain measurable environmental variables.

The study site, Reserva Cuzco Amazónico, is a national wildlife reserve located along the north bank of the Río Madre de Dios, 14 km east of Puerto Maldonado, Provincia de Tambopata, Departamento de Madre de Dios, southeastern Peru ( $12^{\circ}33'S$ ,  $69^{\circ}03'W$ ). The Reserve is approximately 300 km east-northeast of the city of Cuzco and about 50 km west of the Bolivian border. The elevation of Cuzco Amazónico is approximately 200 m. Cuzco Amazónico includes approximately 10,000 ha of relatively undisturbed lowland rain forest under the management of José E. Koechlin, who operates a tourist lodge (Albergue Cuzco Amazónico, SA) located near the southwest corner of the reserve. Two 500-m  $\times$  500-m study areas dedicated specifically to BIOTROP field studies were established within the Reserve. One study area, Zone 1, was in seasonally inundated swamp forest, whereas the second, Zone 2, was located in lowland forest relatively free of standing water throughout the year. A complete description of the study zones including maps was presented in Duellman and Koechlin (1991). Amphibians and reptiles from Cuzco Amazónico were described by Duellman and Salas (1991); a list of the birds from the Reserve was provided by Davis et al. (1991).

The list of mammals presented herein (Table 1) represents the preliminary results of field work completed by the BIOTROP mammal survey team at Reserva Cuzco Amazónico from 8 June–20 July 1989 and 19 January–1 March 1990. More detailed accounts of the natural histories of the mammal species we encountered are in preparation and will be presented in a forthcoming paper. We also include records of specimens collected at this locality by J. E. Cadle, J. L. Patton, E. D. Pierson, R. M. Warner, and E. Yensen at various times between 1979 and 1984; these specimens are deposited in the collections of the MUSM, the Museum of Vertebrate Zoology, University of California, Berkeley, and the College of Idaho Museum of Natural History, Caldwell. All species of marsupials, bats, and rodents that we captured are represented by voucher specimens deposited at MUSM and KU.

## METHODS

Small terrestrial and arboreal mammals were surveyed primarily by trapping along four 500-m long trails that marked the boundaries of the two BIOTROP study zones. Trap stations were located at approximately 20-m intervals along each trail and consisted of two pairs of traps, each of which included a Sherman live trap and a Victor rat trap. One pair of traps was placed on the ground and the other located from 0.2–2 m above the ground on branches, lianas, fallen trees, or in shrubs. Trapping was carried out for 12

consecutive days on each trail. Traps were baited with peanut butter mixed with rolled oats for 6 days and a suet-seed-fruit mixture for 6 days. Trap stations along two trails (one trail per zone; a total of 200 traps) were monitored simultaneously. Trapping was conducted in the zones once during the dry season (June–July) and once in the wet season (January–February), for a total of 9,600 trapnights. This was augmented by additional trapping in areas containing habitat types not represented in the two zones to sample other species that might occur in the Reserve. Tomahawk live traps were used to sample medium-sized mammals too large for Sherman or Victor traps. One Tomahawk trap was placed every 100 m along traplines in the zones. Mist nets were used to capture bats along forest trails, in clearings, and over streams. We were unable to sample the forest canopy. Larger mammals were censused by recording sightings of the animals or identifiable tracks. More detailed accounts of our mammal sampling techniques and results will be published at a later date.

We estimated abundances of small marsupials and rodents from the absolute numbers of captures in the zones. Abundances of other mammals were estimated from frequency of sightings and from previous knowledge about their habits and habitat requirements (e.g., nocturnal vs. diurnal; wide-ranging vs. relatively sedentary). These estimates are influenced by the likelihood of these animals to enter traps, their attraction to baits, and possibly, seasonal and/or annual abundances in the habitats encompassed by the study zones. Populations of a mammal species in the tropics can vary greatly in numbers from year to year; however, our estimates provide a baseline from which more intensive population studies can be undertaken. Disturbance resulting from our activities in the study areas probably affected the number of sightings of mid-sized and larger mammals. Because of this, we undoubtedly have underestimated abundances of some species.

## RESULTS AND DISCUSSION

Reserva Cuzco Amazónico supports a mammalian fauna of at least 100 species belonging to 9 orders and 28 families (Table 1). Included are 9 marsupials, 42 bats, 7 primates, 5 xenarthrans, 1 rabbit, 24 rodents, 9 carnivores, 1 tapir, and 2 artiodactyls. On the basis of our observations of mammals in adjacent areas (e.g., Lago Sandoval), reports in the published literature, and our knowledge of species' distributions and habitat requirements, we estimate that an additional marsupial, 12 bats, 6 monkeys, 4 xenarthrans, 3 rodents, 6 carnivores, and 3 artiodactyls probably are occasional or scarce members of the fauna. If a total of 135 mammal species is correct, our efforts recorded 74% of the mammal fauna of Cuzco Amazónico.

Seven mammal species collected by us from Cuzco Amazónico represent

either extensions of known ranges or are among first records for Departamento de Madre de Dios. Our specimens of *Marmosops parvidens*, *Philander andersoni*, and *Molossus coibensis* are the first records of these species from southeastern Peru, and the specimens of *Neacomys tenuipes* are the first reported from Peru. Despite intensive effort, we were able to collect only a single specimen of *Monodelphis adusta*. This is the first published record for the species from Departamento de Madre de Dios. Two *Peropteryx leucoptera*, collected from a day roost in a hollow formed by the struts of a large, fallen tree, represent a considerable southern extension of the known range of this bat; this is only the second record of this rare emballonurid from Peru. Our record of *Choloepus hoffmanni* is the southernmost for the species. Recently, Ascorra et al. (1991) reported the first specimens from Departamento de Madre de Dios of *Choeroniscus minor*, *Micronycteris minuta*, *Mimon crenulatum*, and *Rhinophylla pumilio* from the Manu National Park area; we captured individuals of these species at Cuzco Amazónico as well.

Small terrestrial rodents and marsupials at Cuzco Amazónico are extremely abundant and diverse, in contrast to other lowland tropical sites. Twenty-three rodent species (exclusive of introduced murids) are confirmed from Cuzco Amazónico, in contrast to 15 species known from moist, lowland forest at La Selva, Costa Rica (Timm et al., 1989; Wilson, 1990), 15 species from Barro Colorado Island, Panama (Glanz, 1990), and 16 species from forest north of Manaus, Brazil (Malcolm, 1990). The rodent fauna is most comparable to that at Cocha Cashu, Peru, from which 24 species are known (Janson and Emmons, 1990). Bats, which are generally abundant at other lowland tropical sites where we have worked (see also Janzen and Wilson, 1983), were much less common at Cuzco Amazónico. For example, in the Caribbean lowlands of Costa Rica, we typically could capture 10–15 individuals or more in a 3-hr period. A typical catch at Cuzco Amazónico during the same time period was four to six individuals. Bat diversity also was somewhat low (42 confirmed species) in contrast to La Selva (63 species; Wilson, 1990), but in part, this may reflect our inability to sample in the canopy. Additional field work concentrating on bats undoubtedly will increase the number of species known from Cuzco Amazónico. We found that white-tailed deer, peccaries, tapirs, larger monkeys, and other large “game” animals were uncommon to rare. Although wildlife at Reserva Cuzco Amazónico has protected status, there are no full-time game wardens, and poaching continues to occur.

Populations of some mammals at Cuzco Amazónico have undergone changes just within the last few years. When Eric Yensen and Richard Warner visited the Reserve in 1984, *Metachirus nudicaudatus* and *Philander andersoni* were quite common and *Didelphis marsupialis* were so rare that they saw only a single individual (E. Yensen, pers. comm.). During our survey of the fauna 5 years later, *Metachirus* and *Philander* were uncommon, whereas *Didelphis* were very abundant.

Until quite recently, most of the smaller, long-tailed mouse-opossums of the family Didelphidae from Central and South America were included together under the single generic name *Marmosa*. We concur with Gardner and Creighton (1989) that this diversity is better represented taxonomically by the recognition of several genera. Hence, herein we use *Marmosa* for the species *M. murina*, *Marmosops* for *M. noctivagus* and *M. parvidens*, and *Micoureus* for *M. regina*. We follow Hershkovitz (pers. comm.) in recognizing *Philander andersoni* as specifically distinct from *P. opossum*.

Taxonomy of the fruit-eating bats of the genus *Artibeus* is currently under debate and much of it is in need of revision. For the purposes of this paper, we follow Koopman (1978) in considering the large, widely distributed form in the Amazon Basin, *A. planirostris*, as a distinct species; it sometimes is considered a subspecies of *A. jamaicensis*. We follow Handley (1989) in recognizing the large, blackish *Artibeus* of the Amazon Basin as *A. obscurus*; this species previously has been reported under the names *A. "davisi"*, *A. fuliginosus*, and *A. jamaicensis fuliginosus*. Koopman (pers. comm.) considers *A. obscurus* to be a subspecies of *A. jamaicensis*. We follow Owen (1987) in recognizing the smaller members of this group as a separate genus, *Dermanura*. Taxonomy of the small, fruit-eating bat, *Dermanura cinerea*, is problematic. Handley (1989) restricted this species to the Atlantic and Caribbean coastline of South America, from Brazil to Venezuela. Our specimens clearly represent a single species, and they are distinct from *D. anderseni*, *D. glauca*, and *D. gnoma*. The only appropriate name available for the specimens from Cuzco Amazónico is *D. cinerea*, and they match Handley's description and measurements fairly well.

In the checklist we follow Hall (1981) and Gardner and Ferrell (1990) in recognizing *Platyrrhinus* as the senior synonym of *Vampyrops*.

Spiny mice of the genus *Neacomys* are poorly known, and the taxonomy of these diminutive, spiny cricetids is greatly in need of revision. We refer larger members of the genus (total length of skull [GLS] > 21.5; maxillary toothrow [MTR] > 2.7) from Cuzco Amazónico to the widespread species, *N. spinosus*. The smaller *Neacomys* (GLS < 21.5; MTR < 2.7) are referred tentatively to *N. tenuipes*, although their average dimensions are somewhat smaller than those previously reported for this species (Lawrence, 1941). This is the first time that two species of these spiny mice have been reported from the same site in Peru.

Specimens of *Rhipidomys* from Cuzco Amazónico clearly represent two species, the larger of which (GLS > 36.0; head and body length [HB] > 140) we refer to *R. couesi*. Although the genus is being revised (C. Tribe, pers. comm.), species of *Rhipidomys* currently are poorly defined and there is a confusing array of available names. Because of this, we refer to the smaller species from Cuzco Amazónico as *Rhipidomys* sp. 2. Inspection by one of us (Timm) of specimens of *Rhipidomys* from Manu National Park, deposited at

the U.S. National Museum, indicates that these are conspecific with our *R. couesi* from Cuzco Amazónico. Previously, these specimens were reported as *R. leucodactylus* by Terborgh et al. (1984).

In Table 1 mammalian orders are arranged following Hall (1981). Families within orders, genera within families, and species within genera are listed alphabetically.

Table 1. Mammals of Cuzco Amazónico, Peru. Abbreviations.—Abundance: A = abundant, often observed and /or captured in appropriate habitats; small terrestrial /arboreal mammals represented by more than 15 captures in zones. C = common, frequently observed and /or captured in appropriate habitats; 10–15 captures in zones. U = uncommon, occasionally observed and /or captured in appropriate habitats; 5–10 captures in zones. R = rare, few sightings/captures in appropriate habitats; <5 captures in zones. P = probable, likely to occur in this area, but not observed or captured; in some cases, this may be the result of seasonal movements, rarity, or difficulty in discovery owing to habits and /or size. L = found at nearby Lago Sandoval, but not known at present from Cuzco Amazónico. An asterisk (\*) signifies that the species was observed, but is not represented by voucher specimens. Macrohabitats: A = arboreal; C = commensal with human habitations; T = terrestrial; V = volant; W = aquatic or aquatic margin.

Taxon	Abundance	Macrohabitat
<b>Marsupicarnivora</b>		
Didelphidae		
<i>Caluromys lanatus</i>	R	A, T, W
<i>Chironectes minimus</i>	P	W
<i>Didelphis marsupialis</i>	A	A, T, W
<i>Marmosa murina</i>	R	A, T
<i>Marmosops noctivagus</i>	A	A, T
<i>M. parvidens</i>	U	A, T
<i>Metachirus nudicaudatus</i>	U	T
<i>Micoureus regina</i>	A	A, T
<i>Monodelphis adusta</i>	R	T
<i>Philander andersoni</i>	U	W, T
<b>Chiroptera</b>		
Emballonuridae		
<i>Pteropteryx leucoptera</i>	U	V
<i>Rhynchonycteris naso</i> *	L	V
<i>Saccopteryx bilineata</i>	U	V
<i>S. leptura</i>	U	V
Molossidae		
<i>Molossus coibensis</i>	R	V
Noctilionidae		
<i>Noctilio albiventris</i>	C	V
<i>N. leporinus</i>	P	V

Table 1. Continued

Taxon	Abundance	Macrohabitat
Phyllostomidae		
<i>Anoura caudifer</i>	P	V
<i>Artibeus lituratus</i>	A	V
<i>A. obscurus</i>	A	V
<i>A. planirostris</i>	A	V
<i>Carollia brevicauda</i>	A	V
<i>C. castanea</i>	A	V
<i>C. perspicillata</i>	C	V
<i>Chiroderma salvini</i>	R	V
<i>C. villosum</i>	R	V
<i>Choeroniscus minor</i>	R	V
<i>Chrotopterus auritus</i>	R	V
<i>Dermanura cinerea</i>	U	V
<i>D. hartii</i>	P	V
<i>Desmodus rotundus</i>	R	V
<i>Glossophaga soricina</i>	C	V
<i>Lionycteris spurrelli</i>	P	V
<i>Lonchophylla thomasi</i>	R	V
<i>Macrophyllum macrophyllum</i>	P	V
<i>Micronycteris megalotis</i>	R	V
<i>M. minuta</i>	R	V
<i>Mimon crenulatum</i>	R	V
<i>Phylloderma stenops</i>	P	V
<i>Phyllostomus elongatus</i>	U	V
<i>P. hastatus</i>	C	V
<i>Platyrrhinus brachycephalus</i>	U	V
<i>P. dorsalis</i>	P	V
<i>P. infuscus</i>	R	V
<i>Rhinophylla pumilio</i>	C	V
<i>Sphaeronycteris toxophyllum</i>	P	V
<i>Sturnira lilium</i>	C	V
<i>S. magna</i>	P	V
<i>S. tildae</i>	R	V
<i>Tonatia bidens</i>	P	V
<i>T. silvicola</i>	R	V
<i>Trachops cirrhosus</i>	R	V
<i>Uroderma bilobatum</i>	C	V
<i>U. magnirostrum</i>	R	V
<i>Vampyressa macconnelli</i>	C	V
<i>V. pusilla</i>	C	V
<i>Vampyrodes caraccioli</i>	P	V
<i>Vampyrum spectrum</i>	R	V
Thyropteridae		
<i>Thyroptera tricolor</i>	R	V

Table 1. Continued

Taxon	Abundance	Macrohabitat
<b>Vespertilionidae</b>		
<i>Eptesicus brasiliensis</i>	R	V
<i>Lasiurus ega</i>	R	V
<i>Myotis albescentis</i>	R	V
<i>M. nigriscans</i>	U	V
<i>M. riparius</i>	R	V
<b>Primates</b>		
<b>Callithrichidae</b>		
<i>Callimico goeldii</i>	P	A, T
<i>Cebuella pygmaea</i>	P	A
<i>Saguinus fuscicollis</i> *	C	A
<i>S. imperator</i>	P	A
<b>Cebidae</b>		
<i>Alouatta seniculus</i> *	R	A
<i>Aotus nigriceps</i> *	C	A
<i>Ateles paniscus</i>	P	A
<i>Callicebus moloch</i>	P	A
<i>Cebus albifrons</i> *	R	A
<i>C. apella</i> *	R	A
<i>Lagothrix lagothricha</i> *	R	A
<i>Pithecia monachus</i>	P	A
<i>Saimiri boliviensis</i> *	C	A
<b>Xenarthra</b>		
<b>Bradypodidae</b>		
<i>Bradypus variegatus</i>	U	A
<b>Dasypodidae</b>		
<i>Cabassous unicinctus</i>	P	T
<i>Dasypus kappleri</i>	P	T
<i>D. novemcinctus</i>	U	T
<i>Priodontes maximus</i>	P	T
<b>Megalonychidae</b>		
<i>Choloepus hoffmanni</i>	U	A
<b>Myrmecophagidae</b>		
<i>Cyclopes didactylus</i>	P	A
<i>Myrmecophaga tridactyla</i> *	R	T
<i>Tamandua tetradactyla</i> *	U	A, T
<b>Lagomorpha</b>		
<b>Leporidae</b>		
<i>Sylvilagus brasiliensis</i> *	U	T
<b>Rodentia</b>		
<b>Agoutidae</b>		
<i>Agouti paca</i> *	U	T



Table 1. Continued

Taxon	Abundance	Macrohabitat
<b>Cricetidae</b>		
<i>Neacomys spinosus</i>	R	T
<i>N. tenuipes</i>	R	T
<i>Nectomys squamipes</i>	R	W
<i>Oecomys bicolor</i>	A	A
<i>O. tapajinus</i>	U	A
<i>O. superans</i>	R	A
<i>Oligoryzomys microtis</i>	U	C
<i>Oryzomys capito</i>	A	T
<i>O. niditus</i>	A	T
<i>O. yunganus</i>	U	T
<i>Rhipidomys couesi</i>	U	A
<i>Rhipidomys</i> sp. 2	U	A
<b>Dasyproctidae</b>		
<i>Dasyprocta variegata</i>	A	T
<i>Myoprocta pratti</i>	R	T
<b>Dinomyidae</b>		
<i>Dinomys branickii</i>	P	A, T
<b>Echimyidae</b>		
<i>Dactylomys dactylinus</i>	P	A
<i>Isothrix bistrata</i>	R	A
<i>Mesomys hispidus</i>	A	A
<i>Proechimys brevicauda</i>	C	T
<i>P. simonsi</i>	U	T
<i>P. steerei</i>	C	T
<b>Erethizontidae</b>		
<i>Coendou bicolor</i>	R	A, T
<b>Hydrochaeridae</b>		
<i>Hydrochaeris hydrochaeris</i>	P	A
<b>Muridae</b>		
<i>Rattus rattus</i>	U	C
<b>Sciuridae</b>		
<i>Sciurus ignitus</i>	C	A
<i>S. spadiceus</i>	A	A
<b>Carnivora</b>		
<b>Canidae</b>		
<i>Atelocynus microtis</i> *	R	T
<i>Speothos venaticus</i>	P	T
<b>Felidae</b>		
<i>Felis concolor</i> *	R	T
<i>F. pardalis</i>	R	T
<i>F. wiedii</i>	P	T, A
<i>F. yagouaroundi</i> *	R	T

Table 1. Continued

Taxon	Abundance	Macrohabitat
<i>Panthera onca</i> *	R	T
Mustelidae		
<i>Galictis vittata</i> *	R	T, W
<i>Eira barbara</i> *	R	T, A
<i>Lutra longicaudis</i> *	L	W
<i>Mustela</i> sp.*	R	T
<i>Pteronura brasiliensis</i> *	L	W
Procyonidae		
<i>Bassaricyon gabbii</i>	P	A
<i>Nasua nasua</i>	P	T, A
<i>Potos flavus</i> *	R	A
<b>Perissodactyla</b>		
Tapiridae		
<i>Tapirus terrestris</i> *	R	W
<b>Artiodactyla</b>		
Cervidae		
<i>Mazama americana</i>	P	T
<i>M. gouazoubira</i>	P	T
<i>Odocoileus virginianus</i> *	R	T
Tayassuidae		
<i>Tayassu pecari</i> *	P	T
<i>T. tajacu</i>	U	T

## ACKNOWLEDGMENTS

Field work was supported by National Geographic Society grant 4016-89. Funds for travel by Peruvian personnel were granted by the Consejo Nacional de Ciencia y Tecnología (CONCYTEC) to the Asociación de Ecología y Conservación (ECCO). We are grateful to William E. Duellman, Director of BIOTROP, for his skillful coordination of field work at Cuzco Amazónico. Philip S. Humphrey, Director of the Museum of Natural History, The University of Kansas, provided considerable moral and financial support. Gerardo Lamas M., Director of the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, arranged for interinstitutional collaboration. B. Anthony Luscombe, Vice President of ECCO, was instrumental in providing outstanding logistical support. We are particularly indebted to José E. Koechlin, owner of the Cuzco Amazónico Lodge, whose good will and interest provided impetus, as well as excellent facilities, for our work. Blgo. José Purisaca P. of the Dirección General Forestal y de Fauna, Ministerio de Agricultura, Lima, issued permits. James L. Patton, Barbara R. Stein, and Eric Yensen graciously allowed us access to specimens from Cuzco Amazónico

under their care and freely shared information with us. Michael D. Carleton, Alfred L. Gardner, and Bruce D. Patterson permitted us to examine South American comparative material in collections under their stewardship. Michael Carleton, Guy G. Musser, Karl F. Koopman, and Ronald H. Pine aided us with the respective taxonomies of *Oecomys*; *Oryzomys*; bats of the genera *Artibeus*, *Dermanura*, and *Myotis*; and mouse opossums. We thank our North American and Peruvian colleagues who worked with us at Cuzco Amazónico and whose contribution of specimens and /or observations of mammals aided our work there. Darrel R. Frost assisted with specimen preparation in the field; Bryant W. Buchanan and Erik R. Wild contributed significantly to our knowledge of the mammals of Cuzco Amazónico, and John J. Weins provided masterful assistance with armadillos. Thor Holmes skillfully prepared the skeletal material. César Ascorra, William Duellman, Philip Humphrey, Philip Myers, James Patton, and Linda Trueb critiqued earlier versions of this manuscript, providing comments that improved it substantially.

## RESUMEN

El trabajo de campo realizado por el equipo mastozoológico del Programa de Biodiversidad Biológica Neotropical (BIOTROP) en la Reserva Cuzco Amazónico, Departamento de Madre de Dios, Perú, dió por resultado un inventario de las especies de mamíferos que habitan en esta localidad. La fauna de mamíferos de Cuzco Amazónico consta de un mínimo de 100 especies pertenecientes a 9 órdenes. Esta fauna incluye 9 marsupiales, 42 quirópteros, 7 primates, 5 xenarthros, 1 lagomorfo, 24 roedores, 9 carnívoros, 1 perisodáctilo, y 2 artiodáctilos. Siete especies representan nuevos registros que extienden los rangos de distribución conocidos. Los pequeños roedores y marsupiales terrestres de Cuzco Amazónico son más abundantes y diversos en comparación a los de otras localidades de la selva baja neotropical. Los murciélagos, normalmente muy abundantes en estos últimos sitios, son menos comunes en Cuzco Amazónico.

## LITERATURE CITED

- ASCORRA, C. F., D. E. WILSON, AND M. ROMO. 1991. Lista anotada de los quirópteros del Parque Nacional Manu, Peru. Publ. Mus. Hist. Nat., Univ. Nac. May. San Marcos, Serie A Zoología 42:1–14.
- DAVIS, T. J., C. FOX, L. SALINAS, G. BALLÓN, AND C. ARANA 1991. Annotated checklist of the birds of Cuzco Amazónico, Peru. Occas. Pap. Mus. Nat. Hist., Univ. Kansas 144:1–19.
- DUELLMAN, W. E., AND J. E. KOEHLIN. 1991. The Reserva Cuzco Amazónico, Peru: Biological investigations, conservation, and ecotourism. Occas. Pap. Mus. Nat. Hist. Univ. Kansas 142:1–38.

- DUELLMAN, W. E., AND A. W. SALAS. 1991. Annotated checklist of the amphibians and reptiles of Cuzco Amazónico, Peru. *Occas. Pap. Mus. Nat. Hist. Univ. Kansas* 143:1–13.
- GARDNER, A. L., AND G. K. CREIGHTON. 1989. A new generic name for Tate's (1933) *Microtarsus* group of South American mouse opossums (Marsupialia: Didelphidae). *Proc. Biol. Soc. Washington* 102:3–7.
- GARDNER, A. L., AND C. S. FERRELL. 1990. Comments on the nomenclature of some Neotropical bats (Mammalia: Chiroptera). *Proc. Biol. Soc. Washington* 103:501–508.
- GLANZ, W. E. 1990. Neotropical mammal densities: how unusual is the community on Barro Colorado Island, Panama? Pp. 287–313 in A. H. Gentry (ed.), *Four Neotropical Rainforests*. New Haven, Connecticut: Yale Univ. Press.
- HALL, E. R. 1981. *The Mammals of North America*. 2nd ed. New York: John Wiley and Sons.
- HANDLEY, C. O., JR. 1989. The *Artibeus* of Gray 1838. Pp. 443–468 in K. H. Redford and J. F. Eisenberg (eds.), *Advances in Neotropical Mammalogy*. Gainesville, Florida: The Sandhill Crane Press, Inc.
- JANSON, C. H., AND L. H. EMMONS. 1990. Ecological structure of the nonflying mammal community at Cocha Cashu Biological Station, Manu National Park, Peru. Pp. 314–338 in A. H. Gentry (ed.), *Four Neotropical Rainforests*. New Haven, Connecticut: Yale Univ. Press.
- JANZEN, D. H., AND D. E. WILSON. 1983. Mammals: Introduction. Pp. 426–442 in D. H. Janzen (ed.), *Costa Rican Natural History*. Chicago, Illinois: Univ. of Chicago Press.
- KOOPMAN, K. F. 1978. Zoogeography of Peruvian bats with special emphasis on the role of the Andes. *Amer. Mus. Novitates* 2651:1–33.
- LAWRENCE, B. 1941. *Neacomys* from northwestern South America. *J. Mamm.* 22:418–427.
- MALCOLM, J. R. 1990. Estimation of mammalian densities in continuous forest north of Manaus. Pp. 339–357 in A. H. Gentry (ed.), *Four Neotropical Rainforests*. New Haven, Connecticut: Yale Univ. Press.
- OWEN, R. D. 1987. Phylogenetic analysis of the bat subfamily Stenodermatinae (Mammalia: Chiroptera). *Spec. Publ. Mus. Texas Tech Univ.* 26:1–65.
- TERBORGH, J. W., J. W. FITZPATRICK, AND L. EMMONS. 1984. Annotated checklist of bird and mammal species of Cocha Cachu Biological Station, Manu National Park, Peru. *Fieldiana Zool. (New Series)* 21:1–29.
- TIMM, R. M. In press. The mammalian fauna of La Selva. In L. A. McDade, K. S. Bawa, H. A. Hespenheide, and G. S. Hartshorn (eds.), *La Selva: Ecology and Natural History of a Tropical Rainforest*. Chicago, Illinois: Organization for Tropical Studies and Univ. of Chicago Press.
- TIMM, R. M., D. E. WILSON, B. L. CLAUSON, R. K. LAVAL, AND C. S. VAUGHAN. 1989. Mammals of the La Selva–Braulio Carrillo complex, Costa Rica. *N. Am. Fauna* 75:1–162.
- WILSON, D. E. 1990. Mammals of La Selva, Costa Rica. Pp. 273–286 in A. H. Gentry (ed.), *Four Neotropical Rainforests*. New Haven, Connecticut: Yale Univ. Press.

# UNIVERSITY OF KANSAS MUSEUM OF NATURAL HISTORY PUBLICATIONS

The University of Kansas Publications, Museum of Natural History, beginning with volume 1 in 1946, was discontinued with volume 20 in 1971. Shorter research papers formerly published in the above series are now published as The University of Kansas Museum of Natural History Occasional Papers. The University of Kansas Museum of Natural History Miscellaneous Publications began with number 1 in 1946. Longer research papers are published in that series. Monographs of the Museum of Natural History were initiated in 1970. Authors should contact the managing editor regarding style and submission procedures before manuscript submission. All manuscripts are subjected to critical review by intra- and extramural specialists; final acceptance is at the discretion of the Director.

This publication is printed on acid-free paper. Occasional Papers and Miscellaneous Publications are typeset using Microsoft® Word and Aldus PageMaker® on a Macintosh computer.

Institutional libraries interested in exchanging publications may obtain the Occasional Papers and Miscellaneous Publications by addressing the Exchange Librarian, The University of Kansas Library, Lawrence, Kansas 66045-2800, USA. Individuals may purchase separate numbers from the Office of Publications, Museum of Natural History, The University of Kansas, Lawrence, Kansas 66045-2454, USA.

*Editor:* Linda Trueb  
*Managing Editor:* Joseph T. Collins  
*Design and Typesetting:* Kate Shaw and Joseph T. Collins

PRINTED BY  
UNIVERSITY OF KANSAS PRINTING SERVICE  
LAWRENCE, KANSAS