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MAMMALIAN DIVERSITY IN THE SAVANNA FROM PERU, WITH THREE NEW ADDICTIONS FROM COUNTRY

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ABSTRACT

Bahuaja Sonene National Park protects the unique sample of subtropical humid savannas in Peru, which are known as "Pampas del Heath" with 6,136 hectares of area. Many endangered species and/or endemic from savannas occur there, however studies about the diversity of mammals in Pampas del Heath are limited and only three assessments there have been carried out since mid-1970s. Therefore we surveyed mammals in three habitat types of the Pampas del Heath (savanna, ecotonal area and forest) during late 2011. We used several methods of record for the different mammal groups including 1) capture techniques with mist nets, snap traps, Sherman traps, Tomahawk traps and pitfall traps, 2) and detection techniques direct by means of camera traps, visualization of mammals during long walk, observation of tracks and interviews to local people. Total capture efforts totalized 6,033 trap/nights, 136 mist-net/nights and 108 cameras/nights. Sixty-nine species of mammals were recorded: 33 in savanna, 33 in ecotonal area and 38 in forest. Sixteen species are new records for the Pampas del Heath and three are new records from Peru (Cryptonanus unduaviensis, Rhogeessa hussoni and Rhogeessa io). Analyses on the sampling effort, relative density, diversity and community structure of small mammals were made for the three habitats types. Moreover eight species are Threatened and 24 are listed in CITES. The new records here presented elevated the previous known mammal species richness in Peru from 538 to 541, and show the importance to conduct inventories to describe the biodiversity in remote areas, like the Pampas del Heath.

KEY-WORDS: Distribution; Mammals; Pampas del Heath; Richness.

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INTRODUCTION

The Cerrado Biome includes an array of forests and savannas that border the southern edge of the Amazon rain forest, located mainly in central Brazil, eastern Bolivia and some parts of Paraguay. These habitats have tropical climates with strong temperature, rainfall seasonality, nutrient-poor, poorly drained areas subject to annual flooding and desiccation support edaphic, fire- and flood-maintained grasslands, and savanna woodlands (Gottsberger & Silberbauer-Gottsberger, 2006).

The Bahuaja Sonene National Park (PNBS) protect the Pampas del Heath since 1996. These are the unique sample of savanna within Peruvian territorial limits, and home to many species known nowhere else in the country, such as the Maned Wolf *Chrysocyon brachyurus* and the Marsh Deer *Blastocerus dichotomus* (Hofmann *et al.*, 1976; Luna *et al.*, 2002). Studies about the diversity of mammals in Pampas del Heath are sparse and only three assessments there are since the mid-1970s to nowadays (Hofmann *et al.*, 1976; Emmons *et al.*, 1994; Luna *et al.*, 2002), which reduced the successful management of this protected area.

Under this premise the “Asociación para la Investigación y el Desarrollo Integral” (AIDER), the “Museo de Historia Natural de la Universidad Nacional San Agustín de Arequipa” (MUSA) and “Servicio Nacional de Áreas Naturales Protegidas por el Estado” (SERNANP) together made possible carry out an important expedition to the Pampas del Heath in 2011 in order to fill this information gaps. This paper documented the diversity of mammals of three localities placed in Pampas del Heath, according to three habitats types (savanna, ecotonal area and forest).

MATERIALS AND METHODS

Study area

The Pampas del Heath is located in the Madre de Dios Department, southeastern Peru, near border between Peru and Bolivia (Figure 1). It has an area of 6,136 hectares (MINAM, 2012), and it is an extension of Cerrado Paceño (Ibisch *et al.*, 2003) with a warm, humid and tropical climate (Hanagarth & Beck, 1996). Precipitation annual is approximately 2,000 mm and average temperature is between 24 and 26°C (Luna *et al.*, 2002).

The savanna in this region is characterized by herbaceous vegetation composed mainly of Poaceae

and Ciperaceae, occurring together with termite mounds surrounded by clayey poorly drained soils. Palms (*Mauritia flexuosa*) may also occur in the area either dispersed or concentrated along of marshes and forming Gallery forests (Figure 2). There are also patch forests like small islands of 100 m² composed by shrubs such plant of the family Melastomataceae (*Macairea thyrsoflora*, *Graffenrieda limbata*, between others) and small tree (*Matayba guianensis*, *Virola sebifera*, between others) (MINAM, 2012).

This mosaic of savannas is surrounded by seasonal evergreen Amazonian forests, with a canopy that reaches 30-35 m and emergent of up to 40 m, and the frequent presence of *Bertholletia excelsa*. The forest develops on well-drained soils of the lateritic rolling pen plain of the southwestern Amazon, where it represents the extensive matrix of vegetation cover in areas with humid pluviseasonal bioclimate of southern Peru, northern Bolivia and western Brazil (Josse *et al.*, 2007).

The ecotonal area between the savanna and forest has a variable size that could be of a few meters in burned areas, until 80 m in unburned area.

We surveyed mammals in three localities of the Pampas del Heath at the beginning of wet season,

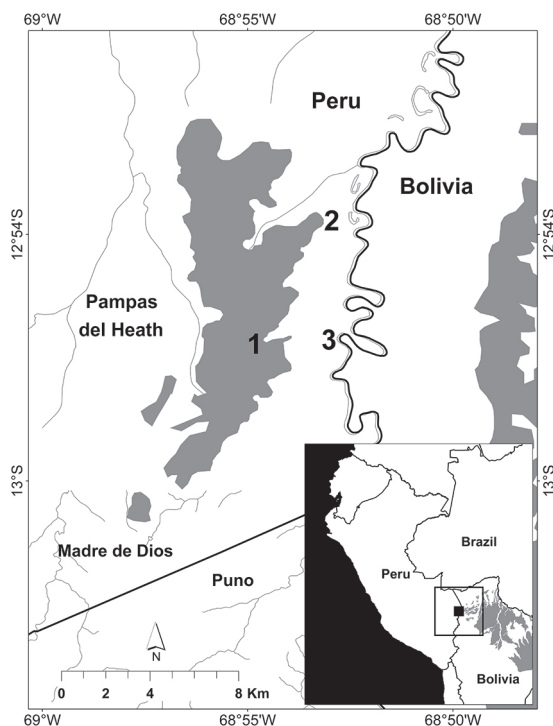


FIGURE 1: Location of Pampas del Heath from Peru: (1) Aguas Claras Camp; (2) Cocha Paujil; and (3) Refugio Juliaca. The gray area represents the Savanna (from Josse *et al.*, 2007).



FIGURE 2: Panoramic views of the Pampas del Heath from Peru (top) with patches of forests (middle) and palms (bottom).

since 30 November to 14 December 2011, which are following:

- a) Aguas Claras Camp ($-12^{\circ}57'20''\text{S}$, $-68^{\circ}54'46''\text{W}$, 216 m), located in a patch of forest inserted in the savanna (Figure 1). The surveys were carried out during 14 continuous days installing traps in two habitats (savanna and ecotonal area).
- b) Cocha Paujil ($-12^{\circ}53'33''\text{S}$, $-68^{\circ}53'12''\text{W}$, 218 m), located to approximately 7 km north-east Aguas Claras Camp. The surveys were carried out the last four days of the expedition installing traps in the ecotonal area habitat.
- c) Refugio Juliaca ($-12^{\circ}57'19''\text{S}$, $-68^{\circ}53'08''\text{W}$, 211 m), located next to Heath River. The surveys were carried out during 10 continuous days installing traps in the forest habitats.

Field methods

Marsupials and rodents were caught in Pitfall traps, Victor traps, Sherman traps and Tomahawk traps (Aplin *et al.*, 2003). Pitfall traps were installed in two transects of 60 m with 10 buckets of five gallons each one and with drift fences (Voss & Emmons, 1996; Patton *et al.*, 2000) which were checked every 12 hours. Other traps were placed in two transects of one km in length each one and that were used a bait composed of oat, vanilla and canned fish. In the forest, Victor traps were installed both on ground as to 1.5 m of height, meanwhile Tomahawk traps were installed at different heights (zero, two, eight and 15 m) following to Graipel (2001) but with some modifications, and these used as bait banana essence.

Bats were registered with mist nets standard, 12 m long by 2.5 m high, which were installed in different places of frequent passage by bats and to different heights, from level ground to 30 m, between palms. The mist nets were open from 18:00 until 6:00 hours and were checked regularly during the night. Additionally, we searched for bats in their shelters, such as hollow trees, under leaves, among others (Jones *et al.*, 1996).

Cuddeback camera traps with motion detection sensors were used in savanna following a trapping opportunistic methodology regarding the location and number of cameras. Cameras were separated by one to three km from each other, arranged on possible paths of the animals and programmed to take all day with a minimum interval of one minute between photos. Walks were made for observation and traces search of large mammals (feces, burrows, tracks, bones, etc.) which were performed at a speed of about one km/hour. Moreover interviews were conducted at park rangers following to Dietrich (1995) and with the support of color plates of species potentially present in the study area (Emmons & Feer, 1999; Eisenberg & Redford, 1999; Leite *et al.*, 2009).

Specimens were collected as material reference being preserved as skins or fluid following to López *et al.* (1998) and these were deposited in the Scientific Collection of Museo de Historia Natural de la Universidad Nacional de San Agustín (MUSA).

Data analyses

Captured or photographed specimens and different tracks founded in field were identified with taxonomic keys (Anderson, 1997; Emmons & Feer, 1999; Gardner, 2007a; Voss & Jansa, 2009; Weksler

& Percequillo, 2011), specialized literature (Patton *et al.*, 2000; Rossi, 2005; Percequillo *et al.*, 2008; Leite, 2009) and by comparison with housed specimens in MUSA. Taxonomy follows Pacheco *et al.* (2009).

Specimens representing new records for Peru were analyzed and compared with diagnostic characters and measurements available in the literature (Goodwin, 1958; LaVal, 1973; Ruedas & Bickham, 1992; Voss *et al.*, 2005; Bickman & Ruedas, 2007; Gardner, 2007b; Aires *et al.*, 2011; Baird *et al.*, 2012). Measurements obtained for each specimen include external measurements from tags or field notes: total length (TL), length of tail (LT), length of hind foot (HF), length of ear (Ear), length forearm only for bats (FA) and weight (W); head-and-body length was computed (HBL) by subtracting LT from TL. All measurements are in millimeter (mm) and weights are in gram (g). Cranial and mandibular measures were taken with help of a digital caliper to the nearest 0.01 mm. Marsupials were measured following definitions and illustrations of Voss *et al.* (2001, 2005). Vespertilionidae family bats were measured following LaVal (1973), and Ruedas & Bickham (1992) with some modifications by Baird *et al.* (2012).

Species accumulation curves for small mammals based on Clench model were calculated to determine if the sampling effort was adequate (Soberón & Llorente, 1993; Moreno, 2001). The randomization of the data was performed with Primer v.6 program (Clarke & Gorley, 2006), while the curves were drawn in Statistica v.7 program (StatSoft, 1998) with the adjustment method Simplex & Quasi-Newton (Jiménez-Valverde & Hortal, 2005).

Relative density of small mammals was estimated by Trap-Day Index which relates the number of individuals caught with the capture effort employed (Calhoun & Casby, 1958). For bats, the Index expresses the number of individuals captured (including those released) per 10 mist-net/nights, while for marsupials and rodents the number of individuals caught per 100 trap/nights.

The diversity of small mammals was analyzed with the Margalef (D_{Mg}) and the Menhinick (D_{Mn}) index based on data submitted previously to rarefaction (Magurran, 1988) while the community structure based on range-abundance curves (Feinsinger, 2001; Moreno, 2001). Trophic groups were assigned following Emmons & Feer (1999), Hice *et al.* (2004), do Nascimento (2007), Percequillo *et al.* (2008) and Guichón & Cassini (2009).

The conservation status of each species recorded was evaluated according to the criteria adopted by

national and international institutions (MINAGRI, 2014; IUCN, 2012; CITES, 2013). Endemic species were assigned following Pacheco *et al.* (2009).

RESULTS AND DISCUSSION

During 15 days of survey, we used 136 mist-nets (59 in savanna, 47 in ecotonal area and 30 in Forest), 6,033 traps-nights (2,925 in savanna, 2,287 in ecotonal area and 1,599 in forest) and 108 camera-nights (all in savanna) in sampling for a total of 331 small mammals caught and two large mammals photographed. The capture effort was larger than previous assessments in the Pampas del Heath (Emmons *et al.*, 1994; Luna *et al.*, 2002).

Richness

We reported 69 species of mammals, which belong to nine orders, 24 families and 55 genera (Table 1). The families Phyllostomidae (15 species) and Cricetidae (10 species) were the best represented following of Didelphidae (nine species), Molossidae (six species) and Vespertilionidae (six species).

The forest had the highest raw species richness, followed by ecotonal area and savanna (38, 33 and 33 species, respectively). Likewise, 18 species were recorded only in the savanna while nine were in the ecotonal area and 20 in the forest. In contrast, ten species were common in all three vegetation forms (Table 1).

Sixteen species represented new records for the Pampas del Heath (*Cryptomanus unduaviensis*, *Marmosa lepida*, *Marmosops bishopi*, *Marmosops* sp., *Euryoryzomys nitidus*, *Neacomys minutus*, *Neacomys spinosus*, *Oligoryzomys* sp., *Micronycteris minuta*, *Platyrrhinus incarum*, *Cynomops abrasus*, *Eumops patagonicus*, *Molossus coibensis*, *Rhogeessa hussoni*, *Rhogeessa io*, and *Bassaricyon alleni*) (Figure 3).

The outstanding records were three species unknown to the list of mammals from Peru, which are:

ORDER DIDELPHIMORPHIA Gill 1872

Family Didelphidae Gray 1821

Cryptomanus unduaviensis (Tate 1931)

Unduave Mouse Opossum

Specimen examined: adult female (MUSA 12695), collected at Aguas Claras Camp, Pampas del Heath, Madre de Dios (12°57'20"S, 68°54'46"W, 216 m). Measures see Table 2.

TABLE 1: Mammals registered in Pampas del Heath (Bahauja Sonene National Park). New records from the Area is denoted with triangles, meanwhile new records from Peru is with squares. Numbers in brackets include the relative densities of small mammal species. *Previous records*: α , Emmons *et al.* (1996); and β , Luna *et al.* (2002). *Trophic Group*: Fu, Fungivorous; In, Insectivorous; Fr, Frugivorous; Gr, Granivorous; He, Herbivorous; Cr, Carnivorous; Om, Omnivorous; Ne, Nectarivorous.

Code	Species Accounts	Common names	Vegetation forms			Previous records	Trophic Group
			Savanna	Ecotone	Forest		
DIDELPHIMORPHIA							
Didelphidae							
	<i>Caluromys lanatus</i>	Brown-eared Woolly Opossum				α, β	Fr, In
A	<i>Cryptonanus unduaviensis</i> ▲■	Unduave Mouse Opossum		X (0.04)			In, Fr
	<i>Didelphis marsupialis</i>	Common Opossum			X	α, β	Om
B	<i>Lutreolina crassicaudata</i>	Lutrine Opossum	X (0.03)			β	Cr
C	<i>Marmosa lepida</i> ▲	Rufous Mouse Opossum		X (0.04)			In, Fr
	<i>Marmosa murina</i>	Murine Opossum				β	In, Fr
D	<i>Marmosa (Micoureus) regina</i>	Bare-tailed Woolly Mouse Opossum	X (0.04)			α, β	Om
E	<i>Monodelphis peruviana</i>	Peruvian Short-tailed Opossum	X (0.17)	X (0.19)		β	In
F	<i>Marmosops bishopi</i> ▲	Bishop's Slender Opossum	X (0.09)	X (0.31)			In, Fr
G	<i>Marmosops</i> sp. ▲	Slender Opossum	X (0.03)	X (0.13)	X (0.13)		In, Fr
	<i>Marmosops impavidus</i>	Tschudi's Slender Opossum				β	In, Fr
H	<i>Marmosops noctivagus</i>	White-bellied Slender Opossum			X (0.06)	α	In, Fr
	<i>Philander opossum</i>	Gray Four-eyed Opossum				α, β	In, Cr
CINGULATA							
Dasypodidae							
	<i>Dasypus novemcinctus</i>	Nine-banded Armadillo	X			β	In, Cr
	<i>Dasypus</i> cf. <i>septemcinctus</i>	Brazilian Lesser Long-nosed Armadillo				α	In
	<i>Priodontes maximus</i>	Giant Armadillo			X	α	In
PILOSA							
Myrmecophagidae							
	<i>Myrmecophaga tridactyla</i>	Giant Anteater				α	In
	<i>Tamandua tetradactyla</i>	Southern Tamandua				β	In
PRIMATES							
Cevidae							
	<i>Cebus albifrons</i>	White-fronted Capuchin		X		β	Fr, In
	<i>Saguinus fuscicollis</i>	Brown-mantled Tamarin				α, β	Fr, Ne, In
	<i>Saguinus imperator</i>	Emperor Tamarin				β	Fr, Ne, In
	<i>Aotus azarae</i>	Azara's Night Monkey			X	α, β	Fr, In, Ne
	<i>Saimiri sciureus</i>	Tufted Capuchin				α, β	In, Fr, Ne
	<i>Sapajus apella</i>	Guianan/margarita Island Brown Capuchin				α, β	Om
Pitheciidae							
	<i>Callicebus</i> sp.	Titi		X		α, β	He, Fr
Atelidae							
	<i>Alouatta sara</i>	Bolivian Red Howler			X	α, β	Fr, He
	<i>Ateles chamek</i>	Peruvian Spider Monkey				α	Fr, He
RODENTIA							
Sciuridae							
	<i>Sciurus ignitus</i>	Bolivian Squirrel				α	Gr, Fr, Fu
	<i>Sciurus sanborni</i>	Sanborn's Squirrel				α	Gr
	<i>Sciurus spadiceus</i>	Southern Amazon Red Squirrel		X		α, β	Gr, Fr
Cricetidae							
I	<i>Cerradomys maracajuensis</i>	Maracaju's Rice rat	X (0.21)	X (0.26)		α, β	He, In
J	<i>Euryoryzomys nitidus</i> ▲	Elegant Oryzomys	X (0.03)	X (0.31)	X (0.50)		Fr, In, Gr
K	<i>Hylaeamys perenensis</i>	Western Amazonian's Rice Rat	X (0.07)	X (0.39)	X (0.50)	α, β	Fr, In, Gr
L	<i>Pseudoryzomys simplex</i>	Brazilian False Rice Rat	X (0.79)	X (0.04)		β	?

Code	Species Accounts	Common names	Vegetation forms			Previous records	Trophic Group
			Savanna	Ecotone	Forest		
M	<i>Neacomys minutus</i> ▲	Tiny Bristly Mouse		X (0.04)	X (0.06)		In, Fr
N	<i>Neacomys spinosus</i> ▲	Bristly Mouse		X (0.04)	X (0.13)		In, Fr
O	<i>Necomys lenguarum</i>	Bolo Mouse	X (2.70)	X (0.22)		α, β	In, Om
P	<i>Oecomys bicolor</i>	White-bellied Oecomys		X (0.13)	X (0.19)	α, β	Fr, Gr
Q	<i>Oligoryzomys microtis</i>	Small-eared Pygmy Rice Rat		X (0.04)		β	Gr, In
R	<i>Oligoryzomys</i> sp. ▲	Pygmy Rice Rat	X (0.03)				Gr, In
	Dinomyidae						
	<i>Dinomys branickii</i>	Pacarana				α	He
	Caviidae						
S	<i>Cavia aperea</i>	Brazilian Guinea Pig	X (0.21)			α, β	He
	<i>Hydrochoerus hydrochaeris</i>	Capybara			X	α, β	He
	Dasyproctidae						
	<i>Dasyprocta variegata</i>	Brown Agouti				α	Fr, In
	Echimyidae						
	<i>Mesomys hispidus</i>	Ferreira's Spiny Tree Rat				α	Fr, In
T	<i>Proechimys simonsi</i>	Simons' Spiny-Rat		X (0.31)	X (0.25)	α, β	Gr, Fr, Fu
	CHIRÓPTERA						
	Emballonuridae						
	<i>Rhynchonycteris naso</i>	Proboscis Bat			X	α, β	In
	<i>Saccopteryx bilineata</i>	Greater Sac-winged Bat				β	In
	<i>Peropteryx macrotis</i>	Lesser Dog-like Bat				β	In
	Phyllostomidae						
U	<i>Glossophaga soricina</i>	Pallas's Long-tongued Bat	X (0.17)	X (1.06)	X (0.33)	α	Ne, In, Fr
	<i>Lonchophylla thomasi</i>	Thomas's Nectar Bat				α	Ne, In
	<i>Lophostoma silvicolium</i>	White-throated Round-eared Bat				α, β	In, Fr
	<i>Chrotopterus auritus</i>	Woolly False Vampire Bat				α	Cr, In
	<i>Micronycteris megalotis</i>	Little Big-eared Bat				α	In, Fr
V	<i>Micronycteris minuta</i> ▲	Tiny Big-eared Bat			X (0.33)		In, Fr
	<i>Phyllostomus elongatus</i>	Lesser Spear-nosed Bat				α, β	Fr, In, Ne
	<i>Phyllostomus hastatus</i>	Greater Spear-nosed Bat				α, β	Fr, In, Ne
	<i>Tonatia saurophila</i>	Stripe-headed Round-eared Bat				β	In, Fr
W	<i>Trachops cirrhosus</i>	Fringe-lipped Bat		X (0.21)		α	Cr, In
	<i>Carollia benkeithi</i>	Southern Chesnut Short-tailed Bat				α, β	Fr, In, Ne
X	<i>Carollia brevicauda</i>	Silky Short-tailed Bat		X (0.21)	X (0.67)	α, β	Fr, In, Ne
Y	<i>Carollia perspicillata</i>	Seba's Short-tailed Bat	X (0.34)	X (0.85)	X (0.33)	α, β	Fr, In, Ne
Z	<i>Rhinophylla pumilio</i>	Dwarf Little Fruit Bat			X (0.33)	α, β	Fr, In, Ne
AA	<i>Artibeus gnomus</i>	Dwarf Fruit-eating Bat	X (0.17)	X (0.21)	X (1.33)	α, β	Fr
AB	<i>Artibeus lituratus</i>	Great Fruit-eating Bat	X (2.20)	X (0.64)	X (1.33)	α	Fr, In, Ne
AC	<i>Artibeus obscurus</i>	Dark Fruit-eating Bat		X (0.21)	X (1.33)	α, β	Fr, In, Ne
AD	<i>Artibeus planirostris</i>	Flat-faced Fruit-eating Bat	X (0.34)	X (0.21)	X (1.33)	α	Fr, In, Ne
	<i>Chiroderma trinitatum</i>	Little Big-eyed Bat				β	Fr, In, Ne
	<i>Chiroderma villosum</i>	Hairy Big-eyed Bat				α	Fr, In, Ne
	<i>Mesophylla macconnelli</i>	MacConnell's Bat				α	Fr, In, Ne
AE	<i>Platyrrhinus incarum</i> ▲	Inca Broad-nosed Bat	X (0.17)				Fr, In, Ne
	<i>Sturnira lilium</i>	Little Yellow-shouldered Bat				α, β	Fr, In, Ne
	<i>Sturnira magna</i>	Greater Yellow-shouldered Bat				α	Fr, In, Ne
AF	<i>Sturnira tildae</i>	Tilda's Yellow-shouldered Bat			X (0.33)	α, β	Fr, In, Ne
AG	<i>Uroderma bilobatum</i>	Common Tent-making Bat	X (0.85)	X (0.21)	X (0.33)	α, β	Fr, In, Ne
AH	<i>Uroderma magnirostrum</i>	Brown Tent-making Bat	X (0.34)	X (0.64)		α	Fr, In, Ne
AI	<i>Vampyriscus bidens</i>	Bidentate Yellow-eared Bat		X (0.21)	X (0.67)	α	Fr, In, Ne

Code	Species Accounts	Common names	Vegetation forms			Previous records	Trophic Group
			Savanna	Ecotone	Forest		
	<i>Vampyroides caraccioli</i>	Great Stripe-faced Bat				α	Fr, In, Ne
	Noctilionidae						
AJ	<i>Noctilio albiventris</i>	Lesser Bulldog Bat	X (0.34)			α, β	In
	Molossidae						
AK	<i>Cynomops abrasus</i> ▲	Cinnamon Dog-faced Bat	X (0.34)				In
AL	<i>Eumops maurus</i>	Guianan Bonneted Bat	X (0.51)			β	In
AM	<i>Eumops patagonicus</i> ▲	Patagonian Bonneted Bat	X (1.02)				In
AN	<i>Molossus coibensis</i> ▲	Coiban Mastiff Bat	X (0.51)				In
AO	<i>Molossus molossus</i>	Pallas's Mastiff Bat	X (0.17)		X (1.33)	α, β	In
AP	<i>Promops centralis</i>	Crested Mastiff Bat	X (0.51)			β	In
	Vespertilionidae						
	<i>Eptesicus brasiliensis</i>	Brazilian Brown Bat				α, β	
AQ	<i>Eptesicus furinalis</i>	Argentinian Brown Bat	X (0.51)			β	In
AR	<i>Myotis albescens</i>	Silver-tipped Myotis			X (0.33)	β	In
AS	<i>Myotis nigricans</i>	Black Myotis	X (1.86)			α	In
AT	<i>Myotis riparius</i>	Riparian Myotis	X (0.17)			α, β	In
	<i>Lasiurus cinereus</i>	Hoary Bat				β	
AU	<i>Rhogeessa hussoni</i> ▲■	Eastern Little Yellow Bat	X (0.17)				In
AV	<i>Rhogeessa io</i> ▲■	Southern Little Yellow Bat		X (0.21)			In
	CARNIVORA						
	Felidae						
	<i>Leopardus pardalis</i>	Ocelot				β	Cr
	<i>Leopardus wiedii</i>	Margay				α	Cr, In
	<i>Panthera onca</i>	Jaguar			X	α, β	Cr
	<i>Puma concolor</i>	Cougar				β	Cr
	Canidae						
	<i>Atelocynus microtis</i>	Short-eared Dog			X	α, β	Cr
	<i>Chrysocyon brachyurus</i>	Maned Wolf	X			α, β	Cr, Fr
	Mustelidae						
	<i>Eira barbara</i>	Tayra				α, β	Cr, In, Fr
	<i>Lontra longicaudis</i>	Neotropical Otter			X	β	Cr, In
	<i>Pteronura brasiliensis</i>	Giant Otter			X	α, β	Cr
	Procyonidae						
	<i>Bassaricyon alleni</i> ▲	Allen's Olingo			X		Fr, In
	<i>Nasua nasua</i>	South American Coati				α, β	Om
	<i>Potos flavus</i>	Kinkajou			X	α, β	Fr, In
	PERISSODACTYLA						
	Tapiridae						
	<i>Tapirus terrestris</i>	South American Tapir	X	X	X	α, β	He, Fr
	ARTIODACTYLA						
	Tayassuidae						
	<i>Pecari tajacu</i>	Collared Peccary	X	X		α, β	Fr, In, Cr
	<i>Tayassu pecari</i>	White-lipped Peccary				α, β	Fr, In
	Cervidae						
	<i>Blastocerus dichotomus</i>	Marsh Deer	X			α, β	He
	<i>Mazama americana</i>	South American Red Brocket			X	α, β	Fr, Fu
	<i>Mazama nemorivaga</i>	South American Brown Brocket				α, β	Fr
	Total orders		7	6	8		
	Total families		12	10	17		
	Total genera		27	25	32		
	Total species		33	33	38		

Remarks: The genus *Cryptonanus* contains five species distributed in Bolivia, Brazil, Paraguay, Argentina and Uruguay (Tate, 1931; Voss *et al.*, 2005); here we present the first report of this genus for Peru based in a specimen caught in a pitfall trap (Figure 3).

Our specimen was identified as *Cryptonanus* by the following combination of characters: small size, prehensile tail longer than head-and-body (Table 2),

dorsal surface of tail covered by tiny spines, plantar surface of manus with distinct plantar pads, manual digits III and IV subequal in length (Voss *et al.*, 2005). Nasals distinctly wider posteriorly than anteriorly, secondary foramen ovale absent, petrosal exposed on poster lateral surface of braincase through fenestra in parietal-squamosal suture, P3 taller than P2, unworn C1 with small accessory worn-out cusps (Figure 4).

TABLE 2: Measurements (mm) and weights (g) of the specimen of *Cryptonanus unduaviensis* from Peru and referred material to *C. unduaviensis* (data from Voss *et al.* 2005).

	Bolivia								Peru
	Santa Cruz		La Paz	Beni			Pando	Madre de Dios	
	IGP 157	MSB 58508	AMNH 72563 ¹	AMNH 209156	MSB 70752	AMNH 209154	FMNH 114658	MSB 57000	MUSA 12695
Sex	m	m	m	f	f	m	m	m	f
Head-body length	121 ²	86	102	97	111	106	110	105	96
Total length	135	120	120	112	112	132	115	133	119
Length of hind foot	18	17	17	17	16	17	15	19	17.2
Length of ear	18	14	—	—	14	16	17	17	17
Condylbasal length	30	25.9	—	25.6	26.9	28.2	—	28.3	26.3
Nasal breadth	4.4	3.3	3.3	3.5	3.7	4.2	3.5	4.2	3.7
Least interorbital breadth	5.3	4.8	—	4.7	4.6	5.2	4.9	5	4.8
Zygomatic breadth	17.6	14.7	—	14.2	15.3	15	—	16.3	14.8
Palatal length	16.2	14.2	—	14.1	14.6	15.7	14.8	15.5	14.5
Palatal breadth	9.6	8.4	—	8.2	8.3	8.1	8.6	8.3	8.6
Maxillary toothrow length	11	10.5	10.9	10.3	10.5	10.9	10.7	10.7	10.5
Length of molars	5.7	5.7	5.7	5.6	5.6	5.7	5.8	5.6	5.7
Length of M1-M3	4.9	4.9	4.9	4.8	4.8	5	5.1	4.8	4.9
Weight	40	15	—	18	21	24	28	26	22

¹ holotype; ² atypical measure.

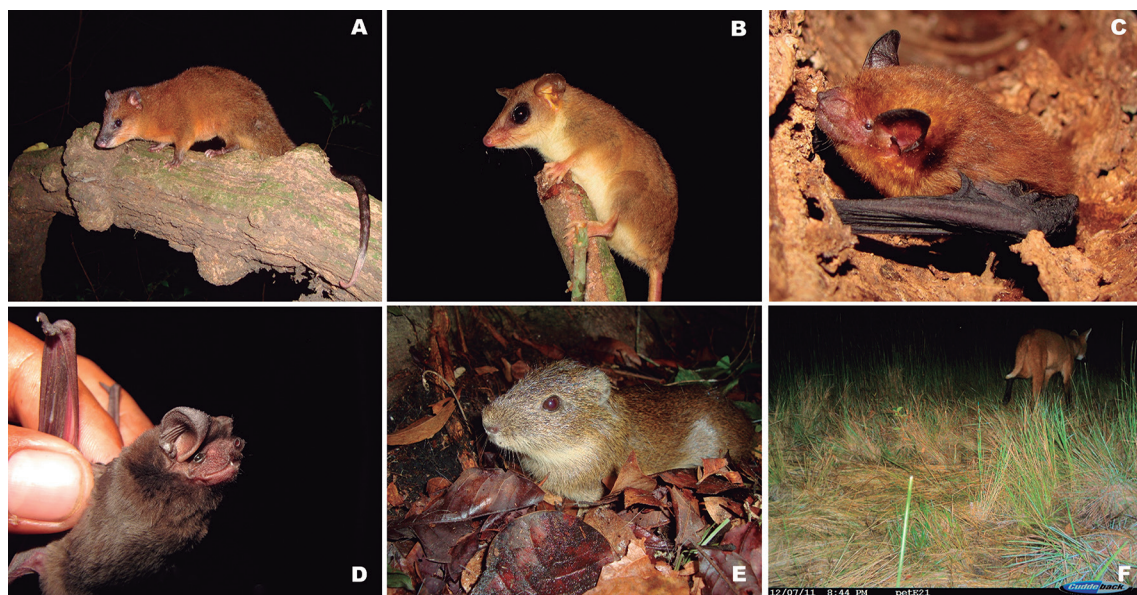


FIGURE 3: Some species registered in Pampas del Heath from Peru: (A) *Lutreolina crassicaudata*^{*}; (B) *Cryptonanus unduaviensis*^{*}; (C) *Rhoogeessa hussoni*^{*}; (D) *Eumops patagonicus*^{*}; (E) *Cavia apera*^{*}; and (F) *Chrysocyon brachyurus*^{*} (Photos by K. Pino^y and A. Pari^{*}).

All these characters agreed with the description of this genus (Voss *et al.*, 2005; Voss *com. pers.*). Furthermore, our specimen can be identified as *C. unduaviensis* by the following combination of characters: tail length more than 111 mm (Table 2), condylobasal length more than 25.5 mm, maxillary toothrow more than 10.0 mm, length of upper molar series (M1-M4) more than 5.5 mm; venter self-colored light yellowish buff. The characters and measurements of our specimen fell within the range of variation described for *C. unduaviensis* in the literature (Voss *et al.*, 2005; Gardner, 2007b; Voss & Jansa, 2009; Voss, *com. pers.*).

Habitat: Voss *et al.* (2005) reported that one individual of *C. unduaviensis* was collected on a tree island surrounded by seasonally flooded grassland and another was in grass at the edge of a marshy stream. Our specimen was caught in the ecotone of the Aguas Claras Camp, on the sixth day that the pitfall trap line was working. Other small mammals caught in the same trap lines are *Marmosops bishop*, *Neacomys minutus*, and *Necromys languarum*.

Distribution: The specimen MUSA 12695 extends the distribution range of *C. unduaviensis* southwest from Independence, Pando (Bolivia) by 223 km (Anderson, 1997).

ORDER CHIROPTERA Blumenbach 1779
Family Vespertilionidae Gray 1821
Rhogeessa hussoni Genoways & Baker 1996
Husson's Yellow Bat

Specimen examined: adult male (MUSA 12902), collected at Aguas Claras Camp, Pampas del Heath, Madre de Dios (12°57'20"S, 68°54'46"W, 216 m). Measurements see Table 3.

Remarks: The genus *Rhogeessa* is endemic to the Neotropical region and one group in that genus exhibits high species diversity despite a lack of morphological differentiation. The previously known complex of species named as *R. tumida* consists of five species (*R. aeneus*, *R. genowaysi*, *R. io*, *R. velilla*, and



FIGURE 4: Left to right, dorsal, ventral and lateral views of cranium and mandible. (A) *Cryptonanus unduaviensis* MUSA 12695; (B) *Rhogeessa hussoni* MUSA 12902; and (C) and *Rhogeessa io* MUSA 12903. Scale bar equal to 10 mm.

TABLE 3: Measurements (mm) and weights (g) of the specimens of *Rhogeessa hussoni* and *R. io* from Peru compare with referred material of the genus *Rhogeessa* in South America (data from Goodwin, 1958; Ruedas & Bickman, 1992; Genoways & Baker, 1996; Aires *et al.*, 2011). Holotype is denoted with asterisk and numbers in brackets include ranges.

Measures	<i>Rhogeessa hussoni</i>			<i>Rhogeessa io</i>		
	Suriname	Brasil	Peru	Venezuela		Peru
	*	n = 4	MUSA 12902	*	n = 10	MUSA 12903
Total length	—	—	81	—	—	70
Tail length	—	—	31	—	—	30
Hind foot length	—	(5.02 – 6.43)	6.1	—	—	6.3
Ear length	—	(8.07 – 11.84)	12.5	—	—	11.6
Forearm	30.2	(28.8 – 30.91)	28.6	28	—	28.8
3 rd digit metacarpal	29	(26.3 – 28.2)	28.5	—	(26.2 – 28.4)	26.8
4 th digit metacarpal	27.8	—	28.1	—	(25.9 – 27.4)	26.4
Greatest length of the skull	13.2	(12.6 – 13.2)	13.2	12.1	(11.7 – 12.6)	12.5
Condylbasal length	10	—	11.1	s/m	(8.5 – 9.1)	10.6
Mastoid width	7.1	—	7.3	7+	—	s/m
Breadth of braincase	5.7	—	6.2	6	—	6.1
Zygomatic width	8.9	—	8.9	8.1	—	8.3
Postorbital width	3.2	(3.41 – 3.80)	3.4	—	—	3.2
Width across upper canines	3.8	(3.78 – 4.09)	3.9	—	(3.4 – 3.6)	3.6
Width across second upper molars	5.6	—	5.7	5.5	(5.0 – 5.4)	5.6
Maxillary tooththrow	4.7	(4.56 – 4.89)	4.9	4.6	—	4.8
Postpalatal length	4.7	—	4.9	—	(4.0 – 4.4)	4.8
Mandibular tooththrow	5.2	(5.06 – 5.34)	5.6	—	(5.4 – 5.7)	5.4
Width across lower canines	—	(2.56 – 2.78)	2.8	—	—	2.6

R. hussoni), which are distributed in Middle America and north of South America (Audet *et al.*, 1993; Baird *et al.*, 2008; 2012).

Genoways & Baker (1996) described *R. hussoni* based on one specimen from Sipaliwini Airstrip, District of Nickerie (Suriname), and included other report from Maranhão (Brazil). Years afterwards, Aires *et al.* (2011) presented new locality records extending the west distribution extension in Brazil (Nova Lacerda, Mato Grosso). Here we present the first report of this species for Peru based on a specimen caught in a mist net installed at ground level in open savanna (Figure 3).

Our specimen is identified as *Rhogeessa hussoni* due to following combination of characters: one upper and three lower incisors on each side; space between upper incisors narrow; one upper premolar on each side; upper surface of uropatagium not densely furred; dorsal and ventral coloration golden brown with brown tips; pads inflated above the muzzle (Figure 3). Forearm greater than 27.1 mm. Parietals not inflated at juncture of the sagittal crest with the lambdoidal crests (helmet lacking) (Figure 4); greatest length of skull more than 12.6 mm; width across first upper canines more than 3.7 mm (Table 3). All this characters agreed with the description of *R. hussoni* (Genoways & Baker, 1996; Bickham & Ruedas, 2007; Aires *et al.*, 2011), however it necessary carry

out citogenetic and molecular studies to confirm that (Backer, *com. pers.*).

Habitat: *Rhogeessa hussoni* has been found in mixed savanna, gallery forest, lowland evergreen rainforest and Atlantic Forest (Genoways & Baker, 1996; Aires *et al.*, 2011). Our specimen was caught in the open savanna of Refugio Juliaca, the first night that the mist net was set. Others bats species caught in the same net were *Artibeus lituratus*, *Carollia perspicillata* and *Noctilio albiventris*.

Distribution: Our specimen MUSA 12902 extends the distribution range of *R. hussoni* in 1,031 km westwards from Córrego Areia Branca, Nova Lacerda, Brazil (Aires *et al.*, 2011).

***Rhogeessa io* Thomas 1903 Thomas's Yellow Bat**

Specimen examined: sub-adult male (MUSA 12903), collected at Aguas Claras Camp, Pampas del Heath, Madre de Dios (12°57'20"S, 68°54'46"W, 216 m). Measures see Table 3.

Remarks: Pacheco *et al.* (2007) were the first to report *Rhogeessa* in Peru, the species *R. io*, based in specimens

from northwest Peru (Zarumilla, Tumbes), however Pacheco *et al.* (2009), following Baird *et al.* (2008, 2009), tentatively assign that samples as *R. velilla* and therefore *R. io* was not considered in the last list of mammals of Peru. Nevertheless, here we present the first report of *R. io* for Peru based on a specimen caught in a mist net installed 2 m above level ground in the ecotone.

MUSA 12903 was identified as *Rhogeessa io* by the following character combinations: one upper and three lower incisors on each side; space between upper incisors narrow; one upper premolar on each side; upper surface of uropatagium not densely furred; dorsal coloration light brown and ventral coloration pale yellow; pads inconspicuous above the muzzle. Forearm greater than 27.1 mm. Parietals not inflated at juncture of the sagittal crest with the lambdoidal crests (helmet lacking) (Figure 4); greatest length of skull less than 12.6 mm; width across first upper canines less than 3.7 mm (Table 3). All this characters agreed with the description of *R. io* (Thomas, 1903; Bickham & Ruedas, 2007; Aires *et al.*, 2011), however it necessary carry out cytogenetic and molecular studies for confirm that (Backer, *com. pers.*).

Habitat: *Rhogeessa io* is the most widely distributed *Rhogeessa* in South America and it inhabits a variety of habitats, including evergreen and deciduous forest, thorn shrub, open areas, and villages (Bickham & Ruedas, 2007; Soriano & Tavares, 2008). Our specimen was caught in the ecotone of Refugio Juliaca, in the second night that the mist net was set. Others bats species caught in the same net were *Artibeus lituratus*, *Artibeus obscurus*, *Carollia brevicauda*, *Carollia perspicillata*, *Uroderma bilobatum*, and *Vampyriscus bidens*.

Distribution: The specimen MUSA 12903 extends the distribution range of *R. io* 444 km westward from Caravana, Beni, Bolivia (Bickham & Ruedas, 2007).

Our results suggest the existence of at least 111 species of mammals in Pampas del Heath and surrounding habitats, resulting number of the 69 species recorded here, 74 documented by Emmons *et al.* (1994) and 72 listed by Luna *et al.* (2002). However, due to isolated location of Pampas del Heath from rest of Cerrado, it possible that several forms of small mammals reported here (*e.g.*, *Lutreolina crassicaudata*, *Cerradomys maracajuensis* or *Pseudoryzomys simplex*) could be different afterward taxonomic studies more detailed (molecular analyzes).

Others small mammals species that could be potentially registered in the Pampas del Heath and surrounding are *Kunsia tomentosus*, *Caluromysiops*

irrupta, *Marmosa rubra*, *Marmosa (Micoureus) demerarae*, *Metachirus nudicaudatus*, *Holochilus sciureus*, *Juscelinomys* sp., *Diclidurus albus*, *Peropteryx kappleri*, *Saccopteryx leptura*, *S. canescens*, *Desmodus rotundus*, *Diphylla ecaudata*, *Micronycteris minuta*, *Phylloderma stenops*, *Artibeus anderseni*, *Vampyrum spectrum*, *Sphaeronycteris toxophyllum*, *Noctilio leporinus*, *Pteronotus parnelli*, and *Myotis simus*. Because of they have been recorded Protected Areas near to Pampas del Heath, or are commonly caught in the Bolivian's savanna (Emmons *et al.*, 2002; Emmons *et al.*, 2006a; 2006b; Solari *et al.*, 2006; Terán *et al.*, 2008; Emmons & Patton, 2012).

Our new records for Peru add one more genus and three species to the country reaching to 541 mammal species in Peru (Pacheco *et al.*, 2009; Lim *et al.*, 2010; Velazco *et al.*, 2010a, 2010b; Gregorin & Almeida, 2010; Gutiérrez *et al.*, 2010; Mantilla-Meluk & Baker, 2010; Díaz, 2011; Velazco & Cadenillas, 2011; Hice & Velazco, 2012; Larsen *et al.*, 2012; Medina *et al.*, 2012; Jiménez *et al.*, 2013; Marsh, 2014; Medina *et al.*, 2014; Pacheco *et al.*, 2014; Rengifo *et al.*, 2014; Velazco *et al.*, 2014; Zeballos *et al.*, 2014; Patton *et al.*, 2015; Hurtado & Pacheco, 2015; Vermeer & Tello-Alvarado, 2015). That show the importance of conduced Flora and Fauna Monitoring Programs for knowing better the diversity of Peruvian mammals in Peru as a whole and in Pampas del Heath in particular.

Sampling effort

Graphs of the species accumulation of small mammals built with the observed data show a trend of increasing richness species if it rises the sampling effort in each of the vegetation forms studied (Figure 5), suggesting that not overall species richness was registered.

Clench models obtained for the savanna, ecotonal area and forest had a good adjust with R2 values of 0.9992, 0.9993 and 0.9997, respectively. The model estimated a total of 45 species for the savanna, 53 for the ecotonal area and 49 for the forest (Figure 4), but in neither case is the asymptote reached (pending 1.52 in savanna, 1.65 in ecotonal area and 1.52 in forest). Moreover, the model indicates that 61% of total species have been registered during our assessment in the Savanna, while in the ecotone and forest have been 53% and 51%, respectively. The model estimated that 17, 28.9 and 29.8 days (sampling events) of assessment would be capable of recording the 80% of predicted species in the savanna, ecotonal area and forest (respectively), while Aguirre (2002) estimated

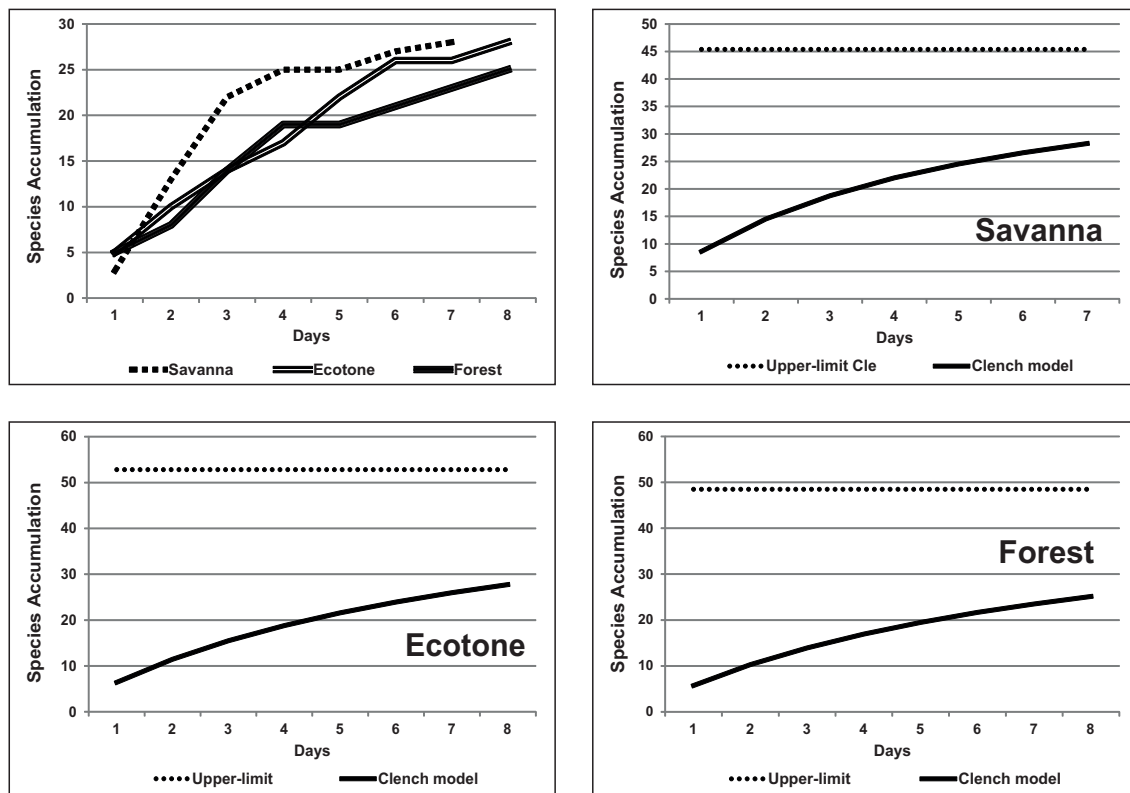


FIGURE 5: Species accumulation curves for each vegetation types evaluated. Empirical curves (upper left) and Clench models (the rest).

30 nights of sampling effort for to register the 88% of bats species in Bolivian's savanna.

Relative density

The marsupial *Marmosops bishopi*, the rodent *Necomys lenguarum*, and the bats *Artibeus lituratus* and *A. planirostris* were the most abundant during the survey. Less abundant species were usually represented by a single individual: the marsupials *Cryptonanus unduavensis*, *Lutreolina crassicaudata*, *Marmosa lepida*, *M. (Micoureus) regina* and *Marmosops noctivagus*; the rodents *Oligoryzomys microtis*, *Oligoryzomys* sp.; and the bats *Myotis riparius*, *Platyrrhinus incarum*, *Rhogeessa hussoni*, *R. io*, and *Trachops cirrhosus* (Table 1).

In the savanna, only two species of marsupials were reported and this were equally abundant (*Marmosops* sp. and *Lutreolina crassicaudata*). The most abundant rodents were *Necomys lenguarum* and *Pseudoryzomys simplex*, meanwhile in the bats were *Artibeus lituratus* and *Myotis nigricans* (Table 1). Respect to the bats, our relative densities in the savanna are similar to the surveys in Noel Kempff Mercado National Park and Espiritu's savanna, when frugivores bats (*Carollia* spp. and *Artibeus lituratus*) and slow-flying

insectivores bats (*Myotis nigricans* and *Noctilio albigiventris*) were the most commons, respectively (Aguirre, 2002; Emmons *et al.*, 2006b).

In the ecotonal area, the marsupial *Monodelphis peruviana*, the rodents *Euryoryzomys nitidus* and *Hyllaeamys perenensis*, and the bats *Glossophaga soricina* and *Carollia perspicillata* were the most abundant species, meanwhile in the forest were the marsupial *M. bishopi*, the rodents *H. perenensis* and *E. nitidus*, and the bats *Artibeus gnomus*, *A. lituratus*, *Artibeus obscurus* and *A. planirostris* (Table 1).

There were species occupying the three vegetation forms but these have fluctuation in their densities surely as response to the environments resources in each vegetation form (Mohammadi, 2010). Thus, we found some species more abundant in forest environments (*e.g.*, *Marmosops* sp., *E. nitidus*, *H. perenensis* and *A. gnomus*) than in open environments (*e.g.*, *Uroderma bilobatum* and *A. lituratus*), and vice versa (Table 1).

Diversity

The diversity of marsupial and rodents in the ecotonal area ($D_{Mg} = 3.53$ and $D_{Mn} = 2.26$) and forest (2.49 and 1.64) were upper than savanna (1.26

and 0.91), however the diversity of bats was similar between the Savanna (3.52 and 2.51), Ecotonal area (3.51 and 2.50) and Forest (3.53 and 2.52).

These fluctuations could be explained since several approaches (resource foods, refuges, temperature, between others) nevertheless we suspect of the influence of moonlight on behavior of the marsupials and rodents, due to during the survey in the savanna the moon was in waxing crescent (November 31), likewise in the ecotonal area and forest that was full (December 10) to waning gibbous (December 14) (US Naval Oceanography, 2012). Effect of moonlight has

been well documented for several nocturnal mammals by reducing their use of open space, or restricting their activity to darker periods of the night (Morrison, 1978; Gilbert & Boutin, 1991; Wolfe & Summerlin, 1989; Upham, 2008).

Community structure

Savanna's range-abundance curves showed bats assemblages dominated by two species, one frugivorous and other insectivorous, being remarkable the presence

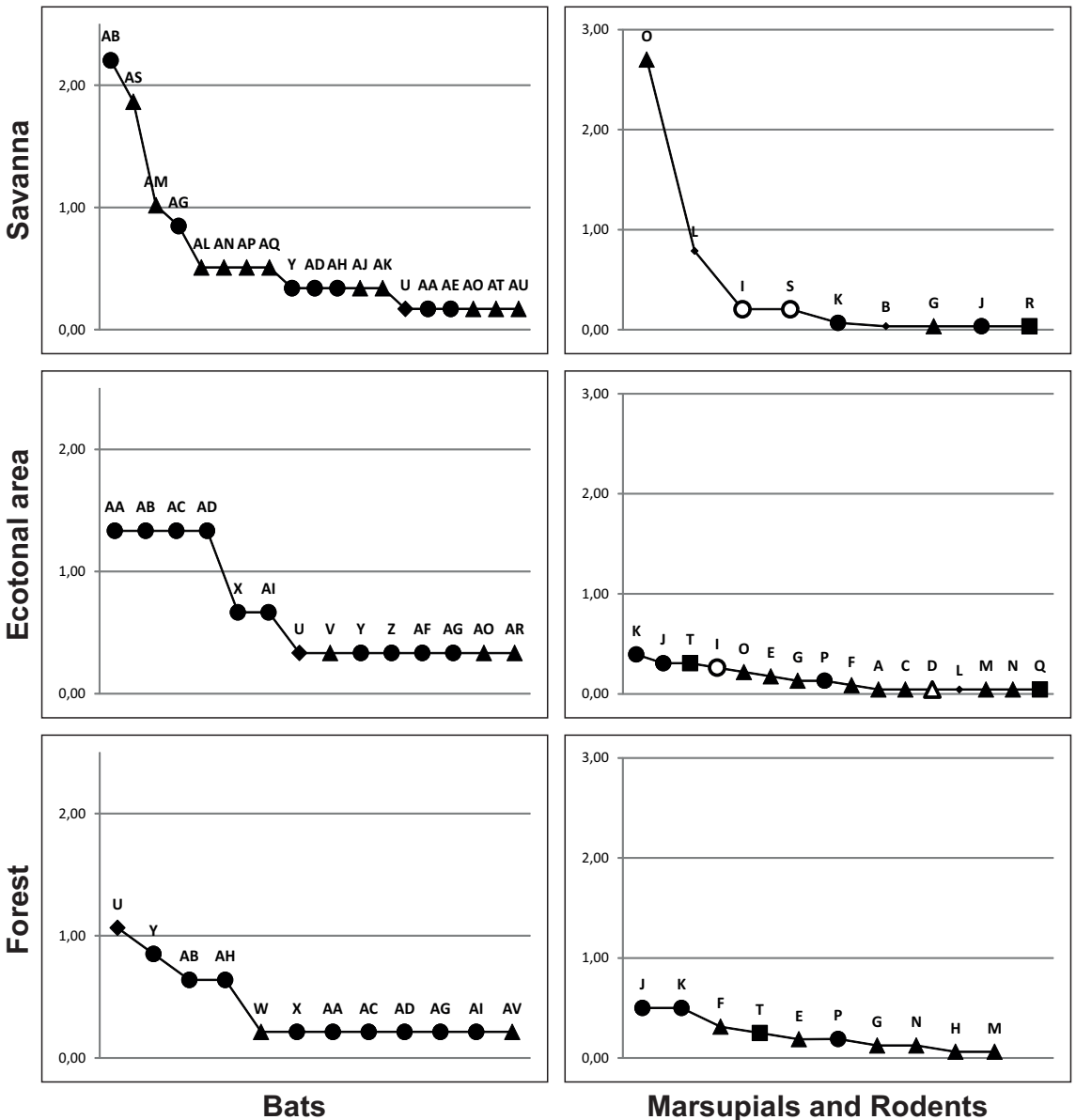


FIGURE 6: Range-abundance curves (pi) for small mammals from Pampas del Heath. Codes of each species are denoted in Table 1. Trophic group: Insectivorous (full triangles), Frugivorous (circles), Herbivorous (empty circles), Carnivorous (stars), Omnivorous (empty triangles), Nectarivorous (diamonds) and Granivorous species (squares).

of a greater number of insectivores species (1 sp.) compared with the rest of trophic groups (eight sp., frugivorous and nectarivorous). On the other hand the marsupials and rodents assemblages showed a wide variety of trophic groups, which were greatly dominated by insectivorous species (Figure 6). Both curves resemble the Fishers's logarithmic series model (Fisher *et al.*, 1943), which describes a community dominated by one or two species very abundant followed by many with lower abundances. This model generally applies to small communities under stress or pioneers, where one or a few factors dominate the ecology of the community (Moreno, 2001; Magurran, 1988).

Ecotone's range-abundance curves showed a bats assemblages dominated by frugivorous species, followed by some insectivorous and nectarivorous species. Whereas for the marsupials and rodents community showed a wide variety of trophic groups, whose species had similar abundances (Figure 6).

Forest's range-abundance curves showed a bats assemblages dominated by two species, one nectarivorous and other frugivorous, with the presence of a greater number of frugivorous species (nine sp.) compare with the rest of trophic groups. Whereas the marsupials and rodents assemblages showed a slight dominance by frugivorous species and there was a greater richness of insectivorous species (six species) compared with the other trophic groups (four species, frugivorous and granivorous) (Figure 6).

Curves constructed for the ecotonal area and forest seem fit to a Log normal distribution model (Sugihara, 1980), which describe communities with light equilibria between number of the most abundant species and least abundant species. This model generally characterize samples of large, mature and diverse communities due to there is a hierarchical segregation of niche used by the organisms (Moreno, 2001; Magurran, 1988).

Emmons *et al.* (1994) and Luna *et al.* (2002) reported a high richness of insectivorous bat species in Pampas del Heath, however it is notable replacement of organisms between the savanna, ecotonal area and forest. Our data showed a great dominance of insectivorous species in open habitats, like savanna, which are gradually replaced by frugivorous species conform the vegetation change forward arboreal habitats, like ecotonal area and forest (Figure 6).

Conservation status

Thirteen species are categorize as threatened according to Peruvian and international law, which two

are in Data insufficient (IUCN, 2012; MINAGRI, 2014). Additionally 24 suffer pressure of International Trade (CITES, 2013), which seven are categorized on Appendice I, 15 on Appendice II and two on Appendice III (Table 4).

Eight species corresponding to endemic mammals from Neotropical savannas (Table 4) (Emmons *et al.*, 1994; Luna *et al.*, 2002; Voss *et al.*, 2005; Emmons *et al.*, 2002; 2006a; 2006b; Percequillo *et al.*, 2008).

TABLE 4: Conservation status of mammals registered during the study.

Species Accounts	Conservation status			Endemic from Savanna
	DS 04-2014	IUCN	CITES	
DIDELPHIMORPHIA				
<i>Cryptonanus unduaviensis</i>				X
<i>Lutreolina crassicaudata</i>				X
CINGULATA				
<i>Priodontes maximus</i>	VU	VU	I	
PILOSA				
<i>Myrmecophaga tridactyla</i>	VU		II	
PRIMATES				
<i>Cebus albifrons</i>			II	
<i>Saguinus fuscicollis</i>			II	
<i>Saguinus imperator</i>			II	
<i>Aotus azarae</i>			II	
<i>Saimiri sciureus</i>			II	
<i>Sapajus apella</i>			II	
<i>Callicebus sp.</i>			II	
<i>Alouatta sara</i>			II	
<i>Ateles chamek</i>	EN	EN	II	
RODENTIA				
<i>Cerradomys maracajuensis</i>				X
<i>Pseudoryzomys simplex</i>				X
<i>Oligoryzomys sp.</i>				X
<i>Dinomys branickii</i>	VU	VU		
<i>Cavia aperea</i>				X
CARNIVORA				
<i>Leopardus pardalis</i>			I	
<i>Leopardus wiedii</i>	DD		I	
<i>Panthera onca</i>	NT		I	
<i>Puma concolor</i>	NT		II	
<i>Atelocynus microtis</i>	VU			
<i>Chrysocyon brachyurus</i>			II	X
<i>Eira barbara</i>			III	
<i>Lontra longicaudis</i>			I	
<i>Pteronura brasiliensis</i>	EN	EN	I	
<i>Potos flavus</i>			III	
PERISSODACTYLA				
<i>Tapirus terrestris</i>	NT	VU	II	
ARTIODACTYLA				
<i>Pecari tajacu</i>			II	
<i>Tayassu pecari</i>	NT	VU	II	
<i>Blastocercus dichotomus</i>	VU	VU	I	X
<i>Mazama americana</i>	DD			
Total species	13	7	24	8

Future studies that may be interesting to Pampas del Heath are the dynamic between particular vegetation of the savanna and mammal with the skilled of modifying that such as *Cavia aperea* and *Blastocerus dichotomus* (herbivorous species), or studies about population status of carnivorous species (*Lutreolina crassicaudata* and *Chrysocyon brachyurus*).

RESUMEN

El Parque Nacional Bahuaja Sonene (PNBS) alberga la única muestra de la sabana húmeda tropical sudamericana en Perú la cual es conocida como "Pampas del Heath", con sólo 6,136 hectáreas de superficie. En su ámbito ocurren muchas especies en peligro de extinción y/o endémicas de sabana, sin embargo estudios que dan a conocer la diversidad de mamíferos en las Pampas del Heath son escasos contándose con sólo tres evaluaciones desde 1977 hasta el presente. Por tanto, desarrollamos relevamientos de mamíferos en tres tipos de hábitats de las Pampas del Heath (sabana, área ecotonal y bosque) a fines del año 2011. Utilizamos varios métodos de registro para los diferentes grupos de mamíferos muestreados, incluyendo 1) técnicas de captura con redes de niebla, trampas de golpe, trampas Sherman, trampas Tomahawk y trampas de Caída, y 2) técnicas de detección directa por medio de cámaras trampa, avistamiento de mamíferos en senderos, búsqueda de rastros y entrevistas a pobladores locales. El esfuerzo de captura fue de 6,033 trampas/noche, 136 redes/noche y 108 cámaras/noche. Registramos un total de 69 especies de mamíferos: 33 en la sabana, 33 en el área ecotonal y 38 en el bosque. Dieciséis especies son nuevos reportes para las Pampas del Heath y tres son nuevos registros para el Perú (Cryptonanus unduaviensis, Rhogeessa hussoni and Rhogeessa io). Se realizó análisis del esfuerzo de muestreo, densidad relativa, diversidad y estructura comunitaria de los mamíferos pequeños para los tres tipos de hábitats. Además siete especies se encuentran Amenazadas y 24 están en CITES. Los nuevos registros aquí presentados incrementan el listado de mamíferos del Perú de 538 a 541 y ponen en evidencia la importancia de conducir inventarios biológicos para describir la biodiversidad de áreas remotas, como las Pampas del Heath.

PALABRAS-CLAVE: Distribución; Mamíferos; Pampas del Heath; Riqueza.

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