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Lists of Species

Mammals of protected area "La Poligonal" and neighborhood areas in Tandilia hills, Buenos Aires, Argentina

Melina Alicia Velasco [1*], María Ayelén Lutz [2,3] Berkunsky Igor [3,4], Kacoliris Federico Pablo [3,5] and María Silvia López-Santoro [4]

1 Universidad Nacional de La Plata, Facultad de Ciencias Naturales y Museo. Paseo del bosque s/n. La Plata (1900). Buenos Aires, Argentina.
2 Universidad Nacional de La Plata, Facultad de Ciencias Naturales y Museo, Departamento de Vertebrados, Sección Mastozoología. Paseo del bosque s/n. La Plata (1900). Buenos Aires, Argentina.
3 Consejo Nacional de Investigaciones Científica y Técnicas (CONICET) Avenida Rivadavia N° 1917 (1033). Buenos Aires, Argentina.
4 Universidad Nacional del Centro de la Provincia de Buenos Aires, Instituto Multidisciplinario sobre Ecosistemas y Desarrollo Sustentable. Campus Universitario, Paraje Arroyo Seco (7000) Tandil. Buenos Aires, Argentina.
5 Universidad Nacional de La Plata, Facultad de Ciencias Naturales y Museo, Departamento de Vertebrados Sección Herpetología. Paseo del bosque s/n. La Plata (1900). Buenos Aires, Argentina.
* Corresponding author. E-mail: *mellazuli@hotmail.com*

Abstract: The information about richness and distribution of the mammals that inhabit the highland grasslands of the Tandilia hills is scarce. The main objective of this work was to provide a list of the mammal species that inhabiting the protected area "La Poligonal" in the Tandilia hills. We report species of confirmed presence and also species of potential presence. We also identified the conservation status of each one. Our results showed a total of 39 mammal species, with 32 native species and seven exotic species. These species represent 35 genera, and are grouped in 17 families and seven orders. The most diverse order was Rodentia represented for 15 species. Two species in Argentina are catalogued as Near Threatened, one is vulnerable and the rest are catalogued as Least Concern. We hope this work lead to further research aimed at deeper understanding of the biodiversity of mammals of the Tandilia hills.

Introduction

The richness and distribution of the mammals that inhabit the Pampa grasslands of Buenos Aires Province in Argentina is asymmetrical regarding time and space (Galliari *et al.* 1991). Due to this sparseness in species records, currently there are great portions of the region with little information. This is the case for the southeastern region of the Province of Buenos Aires, in areas such as the hills' systems of Tandilia and Ventania (Pardiñas *et al*. 2004). In the particular case of the highland grasslands of the locality of Tandil, there are few references in the literature that considers the diversity of mammal species (Galliari *et al*. 1991; Quintana 2004).

The highland grasslands of the Tandilia hills are part of the Pampas region (León and Burkart 1998). Due to singular geologic and soil conditions, these highland grasslands of Tandilia maintain several distinctive plant communities with a high number of endemic species (e.g. *Baccharis tandilensis*, *Nierembergia tandilensis*, *Plantago brasiliensis*) making it unique in the Pampas region (Frangi 1975). Moreover, this area contains several portions of grasslands in good conservation. The conservation of biodiversity in the Pampas is so important that the Tandilia hills were declared as Valuable Grassland Area for south of South America (Bilenca and Miñarro 2004) and, recently, a new provincial protected area was created: La Poligonal.

In order to increase the knowledge about the diversity of mammals inhabiting the grassland of the Tandilia hills, this study aims to create an updated taxonomic list.

Materials and Methods

We considered as the study area the recently protected area La Poligonal and its neighborhood in Tandil, Buenos Aires-Province (37°21' S, 59°07' W) (Figure 1).

The climate in the area is seasonal sub humid, with an average annual rainfall of 892.6 mm. Average monthly temperatures vary from 6°C in July to 20.5ºC in January (Campo *et al.* 2010). The vegetation is dominated by *Paspalum quadrifarium* and several species of the genus *Nassella* and *Piptochaetium* (Bilenca and Miñaro 2004). In a zoogeographic frame, this area is located in the Tandilico sector of the Pampean Dominion (Ringuelet 1961). For a detailed description of the physiographic and geomorphological context of the Tandilia system see Ringuelet (1956).

We used three sources of information to create the species list: 1) data coming from field observations recorded between 1992 and 2012, through occasional walks in the whole area; 2) voucher specimens deposited in museums: Museo de La Plata (MLP) and Museo Argentino de Ciencias Naturales Bernardino Rivadavia (MACN) (see Appendix 1); 3) literature review: Galliari *et al*. (1991); Galliari *et al*. (1996); Barquez *et al*. (1999); Massoia *et al*. 2000; Ojeda *et al.* (2002); Barquez *et.al* (2006); Abba and Vizcaíno (2011) and Fernández *et al.* (2012). We divided the information gathered into two groups: species with confirmed presence, taking into consideration direct observations, voucher specimens and/or high quality literature; and species with potential presence, those

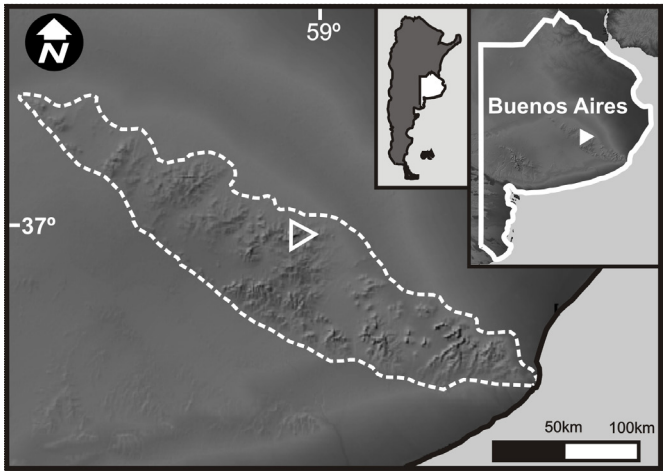

Figure 1. Map showing the Tandilian hill´s system (dotted line) and La Poligonal (triangle).

species with a probable distribution in the area taking into consideration the main distributional range (coming from literature), but not yet confirmed with specific vouchers for Tandil.

We followed Wilson and Reeder (2005) for the nomenclature of the exotic species; whereas we followed Ojeda *et al.* (2012), for the rest of the families included in the list. We also followed Ojeda *et al.* (2012) for the conservation status at national level and the IUCN red list for the conservation status at international level (IUCN 2013).

Results and Discussion

In "La Poligonal" of Tandil, we confirmed the presence of 32 mammal species, 26 native and six exotic mammal species (Table 1). Furthermore, we included seven species with potential presence in the area (six of these species are native and one is exotic). All species are grouped in seven orders and 17 families, and they represent 35 genera.

The most diverse order in the area was Rodentia (15 species). About bat species should be noted that *Myotis dinellii* Thomas, 1902 and *Myotis levis* (I. Geoffroy Saint-Hilaire, 1824) were previously considered subspecies of *M. levis* (Barquez *et al*. 1999). Recently, Barquez *et al.* (2006) treats them as different species, and so Barquez and Díaz (2009) include them in the last guide for Argentinean bats indicating fur color differences, although there is not yet a deep study confirming their taxonomic status. Museum specimens MACN 16860 and MACN 16861 are identified as *M. levis* on their tags, but they are assigned to *M. dinellii* because of their dorsal fur color, so we decided to include this species. More studies on this genus could resolve the taxonomic question, while intensive bat research in the area would be helpful and possibly increase the number of bat species.

Regarding the conservation status of the listed species, two native species are catalogued as Near Threatened at the Argentinean Red List (Ojeda *et al*. 2012), *Dasypus hybridus* (Desmarest, 1804) and *Hydrochoerus hydrochaeris* (Linnaeus, 1766) whereas one species is catalogued as Vulnerable, *Galictis cuja* (Molina, 1782). Considering the IUCN Red List, two native species are catalogued as Near Threatened, *Dasypus hybridus* (Desmarest, 1804) and *Leopardus geoffroyi* (d´Orbigny and Gervais, 1844) and the rest of the species are catalogued as Least Concern.

It is important to emphasize the impact of the exotic species on native biota. In Tandil, deer species *Axis axis* (Erxleben, 1777) and *Dama dama* (Linnaeus, 1758) and wild-boar *Sus scrofa* Linnaeus, 1758 were introduced for commercial hunting. However, some individuals escaped, thriving and establishing wild populations in the area. As stated in Novillo and Ojeda (2008), these species together with the European hare (*Lepus europaeus* Pallas, 1778), could have an impact on the natural regeneration of the native flora due to seedlings consumption. Another two species to take into consideration are the rodents *Mus musculus* Linnaeus, 1758 and *Rattus norvegicus* (Berkenhout, 1769), because they are hosts for several human diseases and *M. musculus* also compete with native rodent species (Novillo and Ojeda 2008). For these reasons, the populations of exotic species should be managed in the future, in order to avoid their impact on native biota.

The Pampas cat *Leopardus colocolo* (Molina, 1782) was not included in the list, although on some distributional maps it is assumed to occur over the whole range of the Buenos Aires Province (Canevari and Vaccaro 2007). Clavijo and Ramirez (2009) propose a distributional range for this cat species in the center and south of the Buenos Aires Province, but it is not clear if the mapped area includes or not the hills of Tandil. However, the same authors discuss declining and local extinctions of this species at several points of the Pampas region due to human impact. Quintana (2004) mentioned bony assemblages that belong to *L. colocolo* in Tandil hills, but these remains are dated near 1000 years B.P. (Quintana, personal communication). Based on our records, and the knowledge about the area, we assume that the presence of the Pampas cat in the Tandil hills is less probable. On the other hand, Quintana (2004) mentioned that the cougar, *Puma concolor* (Linnaeus, 1771), occurs in areas near Eastern Tandilia hills, but most of these records are based on local people comments from twenty years ago (Quintana, personal communication). There are no current reliable records about pumas in Tandil hills, so we decided not to include this felid as a probable species.

It is highly probable that six bat species and one rat, indeed occur in Tandil, as they are found on nearby areas, although their presence was not yet confirmed at Tandil. We assumed the presence of these species because they are present in localities around Tandil (see Appendix 2) in similar habitats (Barquez *et al*. 1999; Galliari *et al.* 1991). More field work is necessary to assess the occurrence of these species in the Tandil grasslands. We hope this work leads to further research aimed at obtaining a depth of understanding about the biodiversity of mammals of the Tandilia hills. Our results provide baseline information for the management plan of the protected area "La Poligonal".

Table 1. List of mammal species inhabiting Tandil hills: C: confirmed species; P: probable presence. Conservation status: NT: Near Threatened; LC: Least Concern; V: Vulnerable; NE: Not Evaluated; Source of records: B: Bibliography; O: Observations; V: Vouchers. * indicates exotic species.

SPECIES	PRESENCE	SOURCE OF RECORDS	CONSERVATION STATUS	
			NATIONAL	INTERNATIONAL
Order Didelphimorphia				
Family Didelphidae				
Didelphis albiventris	C	B	LC	LC
Lutreolina crassicaudata	C	B	LC	LC
Monodelphis dimidiata	C	B, O	LC	LC
Thylamys pallidior	C	B	LC	NE
Order Cingulata				
Family Dasypodidae				
Chaetophractus villosus	C	B	LC	LC
Dasypus hybridus	C	B, O	NT	NT
Order Chiroptera				
Family Molossidae				
Molossus molossus	P	B	LC	LC
Tadarida brasiliensis	C	B, O, V	LC	LC
Family Vespertilionidae				
Dasypterus ega	P	B, V	LC	NE
Eptesicus furinalis	P	V	LC	LC
Histiotus montanus	P	B	LC	LC
Lasiurus blossevillii	P	B, V	LC	LC
Lasiurus cinereus	C	B, V	LC	LC
Myotis albescens	P	B	LC	LC
Myotis dinelli	C	B, V	LC	LC
Myotis levis	C	B, V	LC	LC
Order Carnivora				
Family Canidae				
Lycalopex gymnocercus	C	B, O	LC	LC
Family Felidae				
Leopardus geoffroyi	C	B, O	LC	NT
Family Mephitidae				
Conepatus chinga	C	B, O	LC	LC
Family Mustelidae				
Galictis cuja	C	B, O	VU	LC
Order Artiodactyla				
Family Cervidae				
*Axis axis**	C	B, O	LC	LC
*Dama dama**	C	B, O	LC	LC
Family Suidae				
*Sus scrofa**	C	B, O	LC	LC
Order Rodentia				
Family Caviidae				
Cavia aperea	C	B, O	LC	LC
Galea musteloides	C	B, O, V	LC	LC
Family Chinchillidae				
Lagostomus maximus	C	B, O, V	LC	LC
Family Cricetidae				
Akodon azarae	C	B, V	LC	LC
Calomys cf. C. laucha-C. musculinus	C	B	LC	LC
Holochilus brasiliensis	C	B	LC	LC
Necromys lasiurus	C	B	LC	LC
Oligoryzomys flavescens	C	B, V	LC	LC
Oxymycterus rufus	C	B, V	LC	LC
Reithrodon auritus	C	B, O	LC	LC
Family Hydrochaeridae				
Hydrochoerus hydrochaeris	C	B, O	NT	LC
Family Muridae				
*Mus musculus**	C	B, O	LC	LC
*Rattus norvegicus**	C	B	LC	LC
*Rattus rattus**	P	B, O	LC	LC
Family Myocastoridae				
Myocastor coypus	C	B, O	LC	LC
Order Lagomorpha				
Family Leporidae				
*Lepus europaeus**	C	B, O	LC	LC

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Appendix 1. Voucher specimens deposited in museums.
MACN: Museo Argentino de Ciencias Naturales Bernardino Rivadavia; MLP Museo de La Plata.

Voucher list: *Akodon cf. A. azarae* (MACN 27.42, MLP 13.XII.02.3); *Galea musteloides* (MLP 6943); *Lagostomus maximus* (MACN 32.143); *Lasiurus cinereus* (MACN 22141); *Mus musculus* (MACN 27.40; MACN 27.41; MACN 27.43 and MACN 27.44); *Myotis dinelli* (MACN 16860 and MACN 16861) *Myotis levis* (MACN 15344); *Oligoryzomys flavescens* (MLP 19.X.00.7); *Oxymycterus rufus* (MLP 13.XII.02.3); *Tadarida brasiliensis* (MACN 22103 and MACN 22997).

Appendix 2. Voucher specimens and literature records from localities around Tandil.
MACN: Museo Argentino de Ciencias Naturales Bernardino Rivadavia; MLP Museo de La Plata.

Dasypterus ega:(MACN 26220), *Eptesicus furinalis:* (MLP 25.IV.01.20, MLP 25.IV.01.21); *Histiotus montanus:* Barquez *et al*. (1999); *Lasiurus blossevillii* (MACN 21912, MLP 15.V.98.1, MLP 25.IV.01.22) and Barquez *et al*. (1999); *Molossus molossus*: Barquez *et al*. (1999); *Myotis albescens*: Barquez *et al*. (1999); *Rattus rattus*: Galliari *et al.* (1991) and Gómez-Villafañe *et al*. (2005).