

## NOTES ON GEOGRAPHIC DISTRIBUTION

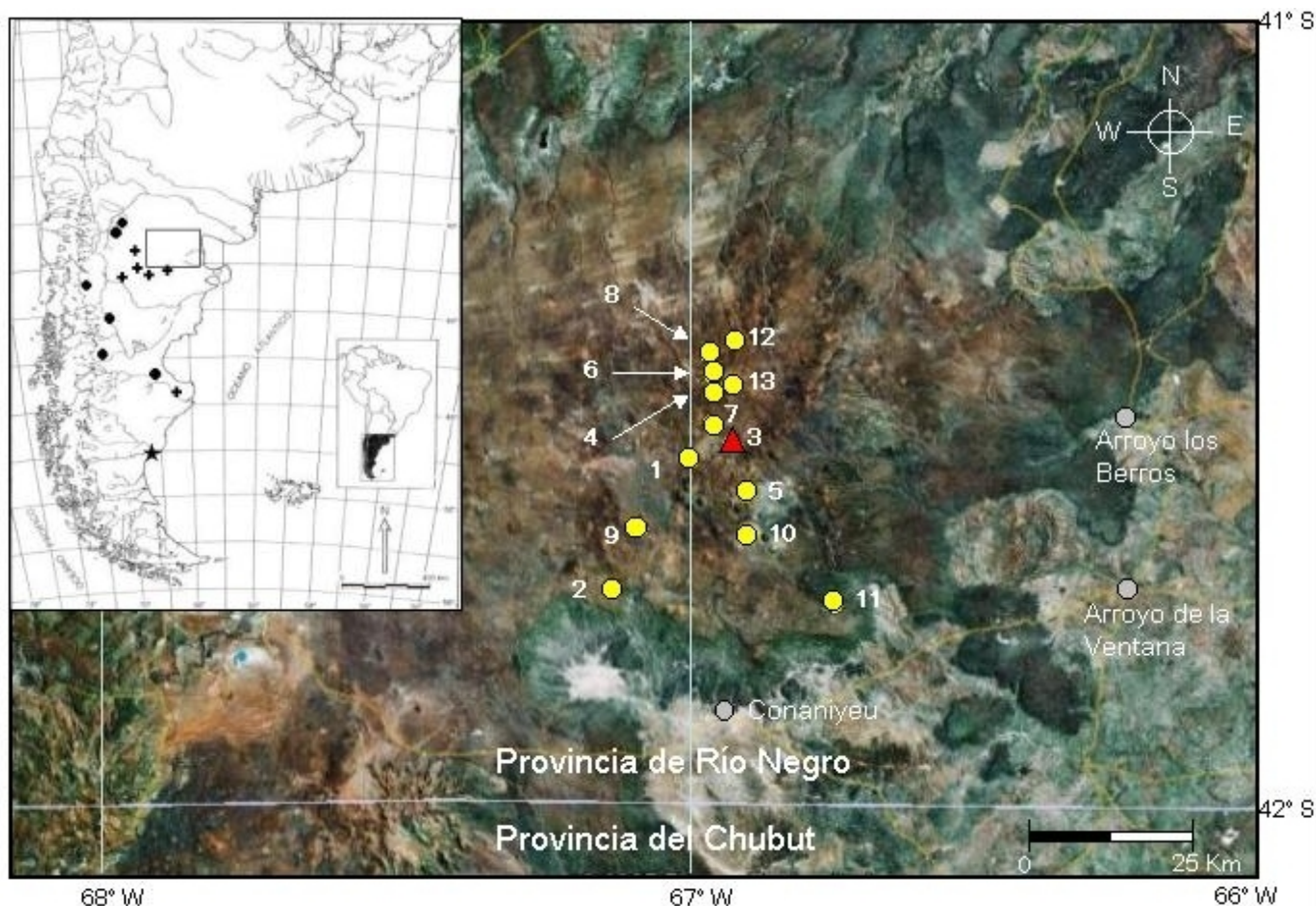
### Mammalia, Rodentia, Cricetidae, *Notiomys edwardsii* (Thomas, 1890): Distribution extension and geographic distribution map.

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*Notiomys edwardsii* is a small rodent species, endemic from Argentine Patagonian steppes; its geographic distribution, taxonomy and natural history is still poorly known. Lives a somewhat fossorial existence among shrubs and bunch-grasses eating insects from them (Pearson 1995). In the 100 years since the type of *N. edwardsii* was captured in southern province of Santa Cruz, near Puerto Santa Cruz locality (see Pardiñas and

Galliari 1998), only seven other specimens have been registered in literature in six localities from the provinces of Río Negro, Chubut, and Santa Cruz (Pearson 1984; Pardiñas and Galliari 1998; Martin and Archangelsky 2004). Six other records in Patagonia (Pardiñas and Galliari 1998; Teta and Andrade 2002; Teta et al. 2002; Jayat et al. 2006) belong to cranial and jaws remains recovered from owl pellets aggregations (Figure 1).



**Figure 1.** Geographic distribution of *Notiomys edwardsii* in Patagonia, Argentina. Left: localities reported in literature; star, type locality of *Notiomys edwardsii*; circles, animal capture localities; crosses, owl pellets aggregations. Right: Somuncurá plateau; circles represent new localities for *Notiomys edwardsii* reported here; numbers are detailed in text; triangle is the Corona volcano, the highest elevation of the plateau.

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*Notiomys edwardsii* is a short-tailed mouse with long front claws. It has bright colors: a rufous nose, bright lateral line and conspicuous fringe of hairs on the margins of the hind feet. The fur is silky. The pinnae are small and extremely thin, especially at the margin, where they are covered with long, silky, and white hairs. The skull is short and wide; the zygomatic plate is slanted short, and leans widely to the side forming a very open infraorbital foramen. The frontal region is inflated and the molars, small and simple. The coronoid process of the mandible is long (Pearson 1984; 1995).

Pearson (1984) proposed that as *N. edwardsii* is insectivorous and *Sapium* bushes seems to be host to a large number of insects, so distribution of this species might coincide with the distribution of *Sapium*, in areas with low grazing impact. However, Martin and Archangelsky (2004) noticed that environmental conditions where they captured a specimen, in the province of Chubut, are not the "ideal habitat" proposed by Pearson (1984), so we are far away from knowing ecological requirements of this species.

In this paper, 13 new record localities for this species in Patagonia are present (Figure 1). All of them are located in Somuncurá *plateau*, a massive 25,000 km<sup>2</sup> volcanic plain located in the middle of the Patagonian Steppe Ecoregion between the provinces of Río Negro and Chubut. The Somuncurá landscape is conformed by superimposed layers of basalt flows and elevated between 600 – 1,600 meters above the sea level. The effusive core is in the center of the *plateau* so the altitude decreases toward the edges.

The new localities in the province of Río Negro are: 1-Los Cuatro Cerros (41°28'58" S, 66°59'42" W), 2-Cañadón del Naciente (41°40'25" S, 67°09'18" W), 3-Cerro Corona (41°27'21" S, 66°54'52" W), 4-Cerro Corona Chico (41°22'09" S, 66°55'16" W), 5-Cerro Somuncurá Chico (41°32'07" S, 66°53'02" W), 6-Laguna del Paraguay (41°21'16" S, 66°57'18" W), 7-Laguna Blanca (41°25'35" S, 66°57'27" W), 8-Laguna La Fariña (41°19'24" S, 66°57'46" W), 9-Laguna Maciega (41°35'13" S, 67°05'51" W), 10-Cerro Mimbres (41°35'52" S, 66°52'49" W), 11-Arroyo Pinturas (41°42'04" S, 66°42'13" W), 12-Cerro

Puntudo (41°18'17" S, 66°54'22" W), 13-Laguna Buñuelo (41°22'56" S, 66°57'04" W). These records are cranial and jaws remains recovered from pellets regurgitated by *Athene cunicularia* and *Tyto alba*, two common owls in Somuncurá. Osteological remains were picked apart from pellets and *Notiomys edwardsii* was identified by comparison with the reference collection of the archaeological and anthropological unit, Centro Nacional Pata-gónico (CENPAT), Puerto Madryn, and identification keys (Pearson 1995). Some of these samples are deposited in the owl pellets collection of the Centro Nacional Patagónico, and some of them are located in CENPAT archaeological unit as comparative material.

A specimen of *Notiomys edwardsii* was collected in Laguna Blanca, in front of Corona volcano, the highest elevation of the Somuncurá's *plateau* (1,600 m a.s.l.). This animal, a young female, was found recently dead near a burrow of *Athene cunicularia* and was prepared as a museum specimen (Figure 2). This voucher, preserved as skin and skeleton, with the stomach preserved in formalin and tissues (liver) in ethanol, was deposited at the mammal collection of the Centro Nacional Patagónico, Puerto Madryn, Argentina (CNP 1). External measurements of this specimen are: head and body 115 mm, tail 35 mm, hind foot with claws 19 mm, hind foot without claws 17 mm, ear 7 mm, weight 17 g. Animal capture permits were granted by the Río Negro's faunal department (Resol. N 85172).

Laguna Blanca is one of the height lagoons, common in upper elevations of Somuncurá *plateau*. The vegetation around the basin is dominated by a bunchgrass of *Poa ligularis*, *Stipa speciosa* and *Festuca pallescens* (Beeskow et al. 1982). The other record localities are also dominated by Patagonian vegetation and located above 1,000 m a.s.l. This vegetation is a mixture of bunchgrasses and steppe bushes such as *Mulinum spinosum*, *Adesmia* sp., *Acaena imbricata* and *Senecio bractylactus*. Annual mean temperature is around 10 °C and precipitation under 150 mm in Somuncurá *plateau* (Pariello et al. 1998). At highest elevations, winter temperatures is 25 °C under absolute zero and summer temperature are above 35 °C (data given by DPA, Río Negro).

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**Figure 2.** Young female of *Notiomys edwardsii* collected in Laguna Blanca, Somuncurá plateau, province of Río Negro, Argentina. a) voucher skin, b) ventral view, c) dorsal view, d), e), and f) ventral and dorsal view of skull and mandible of a specimen of *Notiomys edwardsii* recovered from owl pellets remains.

The scarce collecting localities, mainly in central Patagonia, become *Notiomys edwardsii* in one of the less known sigmodontinae rodents from the vast territory of Argentine Patagonia. The fragmented distribution, added to the monotypic condition, allowed to consider it as a "rare" species and to be incorporated as vulnerable in the red list of Argentinean mammals. These new record localities, and the high abundance of *Notiomys edwardsii* in some of the owl pellet samples, will lead to reconsideration of the conservation status of this species in the future.

Its fossorial life style makes this rodent difficult to capture by traditional trap methods. This may be the cause for the scarce reported localities in the last 100 years. The high number of new localities reported here shows the importance of owl pellet aggregations in the detection of "rare" species. The high frequency of *Notiomys edwardsii* in *Athene cunicularia*'s pellets, compared with other micromammal species (Andrade 2007), must be related with the terrestrial behavior of this owl, building burrows and increasing the capture probability of fossorial preys.

These new records extend the distribution of *Notiomys edwardsii* towards the east throughout northern central Patagonia. Considering that all known record localities are related with Patagonian Phytogeographical Province (*sensu* Leon et al. 1998), distribution of *Notiomys edwardsii* would be associated with the Patagonian Biome. At least for Somuncurá plateau, this species is present in the area at elevations above 1,000 m a.s.l. and becomes abundant in the bunchgrasses of the higher elevations of the plateau. In agreement with Martin and Archangelsky (2004), environmental conditions for the establishment of this species not necessarily must be related with no overgrazed soils with rich growth of *Sapium* as Pearson (1984) proposed. As for most of Patagonia, Somuncurá plateau is under non-sustainable practices such as overgrazing leading to desertification, but instead *N. edwardsii* is still present at the area. Nevertheless, an intensive degradation of Patagonian steppe by cattle raising and wind erosion could lead, in the future, to local extinction of this species.

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Although the Somuncurá *plateau* was declared as a Protected Area by the Provincial Government of Río Negro, there are no wardens or control and a management plan has not been yet designed. Somuncurá would harbor a number of endemic species including fishes, amphibians, reptiles and mammals. Among the mammals, rodents and opossums are almost unknown. Understanding at least how this species is distributed and what are the main ecological associations, is critical as a baseline work to plan future conservation action.

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