

The Exotic Mammals of Argentina

RICARDO A. OJEDA, AGUSTINA NOVILLO & FERNANDA CUEVAS



The exotic mammals in South America represent **about 20% of world mammal introductions**.

We recorded feral populations of **18 species of exotic mammals** for Argentina (Novillo and Ojeda, 2008).

The majority of **introductions occurred between the 18th and 20th centuries** and their **ports of entry** were located in temperate ecosystems, **between 34° and 55° S**.

The majority of the species are from Eurasia, and most of their entry **pathways** were associated with **human activities** (e.g. sport hunting, food and fur industry).



Fig. 2. *Equus assinus* – © Ramiro Ovejero



Fig. 3. *Lepus europaeus* – © Agustina Novillo

Alien mammals display **good climatic matching** (i.e. occupy ecoregions similar to their native ranges), and some species have experienced a range expansion to new habitat types (e.g. hare, rabbit and wild boar).

Several attributes were suggested for the success of invasive species. The table lists some of these traits as applied to the invader mammals of Argentina (Novillo and Ojeda, 2008). These traits are not only intrinsic to the species (i.e. reproductive rate, body mass, abundance, size of native range, and so on) but also to the habitat they invade (i.e. vacant niches, climatic matching, diversity of resources, and so on).

The species encompassing most of these traits are *Sus scrofa*, *Cervus elaphus*, *Capra hircus*, *Lepus europaeus* and the old world rats (*Rattus* and *Mus*).

Six of the invader mammals occurring in Argentina are among the 100 worst invasive species in the world.

The fauna of exotic mammals of Argentina represents a wide diversity of ecological groups which offer an enormous opportunity for long-term ecological research.

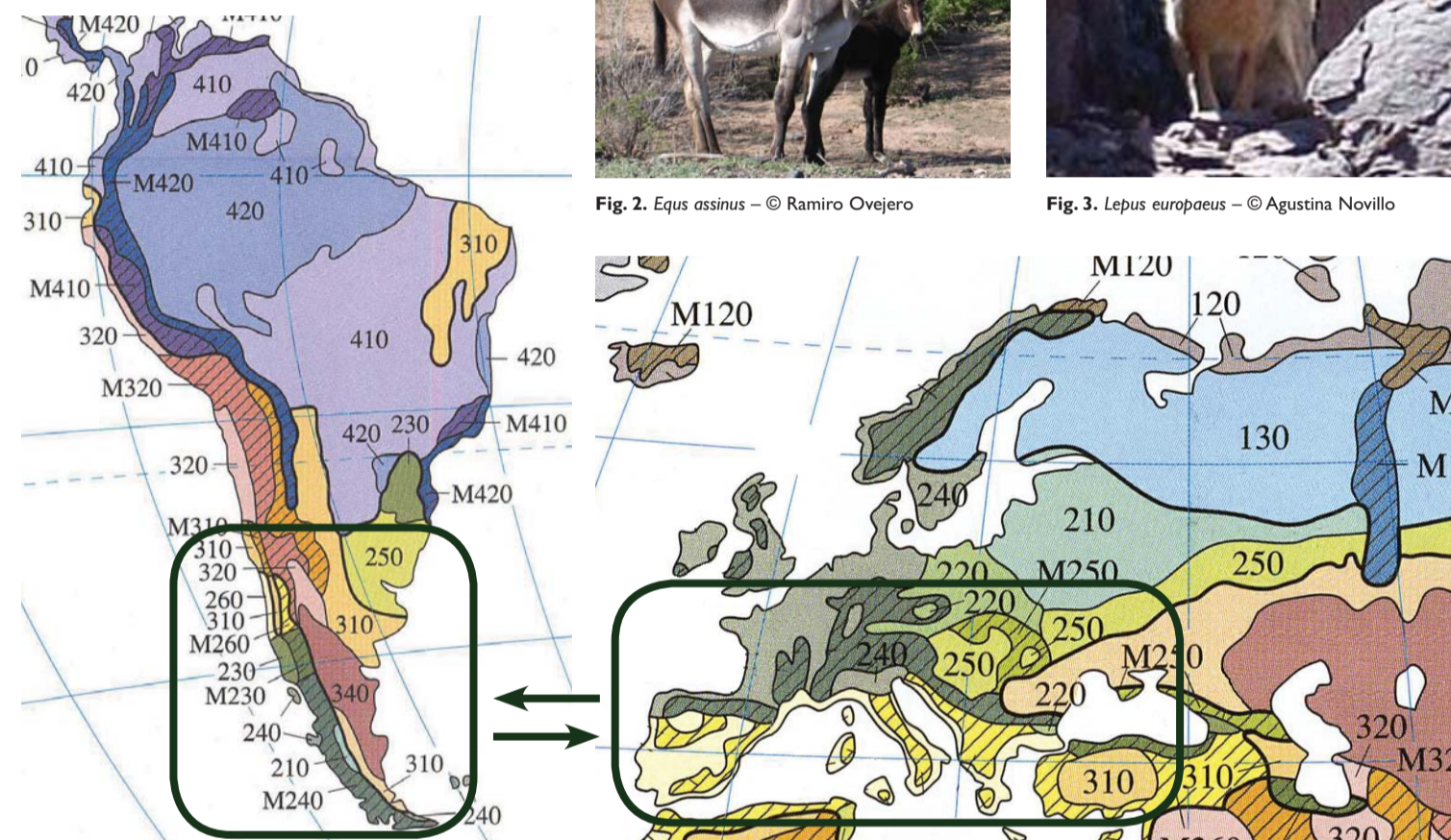


Fig. 1. Temperate South America shares similar ecoregions with Eurasia. This is reflected in the good matching between native and invaded ecoregions and partially explains the successful establishment of introduced mammals.



Fig. 4. *Callosciurus erythraeus* – © Fernando Milesi

Attributes of successful invaders

"Good" traits	Examples
Broad diet (generalist)	<i>Old world rats</i> ; <i>L. europaeus</i> ; <i>O. cuniculus</i> ; <i>C. hircus</i> ; <i>S. scrofa</i> ; <i>E. assinus</i> ; <i>E. caballus</i>
Larger than most relatives (advantage competition, dispersal)	<i>C. elaphus</i> ; <i>R. tarandus</i> ; <i>S. scrofa</i> ; <i>E. assinus</i> ; <i>E. caballus</i>
Associated with <i>Homo sapiens</i> (deliberate or no assistance)	<i>Old world rats</i> ; <i>L. europaeus</i> ; <i>O. cuniculus</i> ; <i>C. hircus</i> ; <i>S. scrofa</i> ; <i>E. assinus</i> ; <i>E. caballus</i> .
Generalist in habitat use – (Type of habitat is not a limiting factor)	<i>L. europaeus</i> ; <i>O. cuniculus</i> ; <i>A. axis</i> ; <i>C. elaphus</i> ; <i>D. dama</i> ; <i>R. tarandus</i> ; <i>C. hircus</i> ; <i>A. cervicapra</i> ; <i>S. scrofa</i> ; <i>E. assinus</i> ; <i>E. caballus</i> .
Short generation time (high reproductive capacity)	<i>M. vison</i> ; <i>C. canadensis</i> ; <i>O. zibethicus</i> <i>Old world rats</i> ; <i>L. europaeus</i> ; <i>O. cuniculus</i> ; <i>C. hircus</i> ; <i>S. scrofa</i>
Large native range	<i>M. vison</i> ; <i>C. canadensis</i> ; <i>O. zibethicus</i> ; <i>R. norvegicus</i> ; <i>L. europaeus</i> ; <i>C. elaphus</i> ; <i>R. tarandus</i> ; <i>S. scrofa</i>
No ecological counterpart (theory of vacant niche)	<i>C. canadensis</i> ; <i>O. zibethicus</i> ; <i>C. elaphus</i> ; <i>R. tarandus</i> ; <i>C. hircus</i> ; <i>A. cervicapra</i> ; <i>S. scrofa</i> ; <i>E. assinus</i> ; <i>E. caballus</i>
Climatic matching	<i>L. europaeus</i> ; <i>S. scrofa</i> ; <i>O. cuniculus</i>

Table 1. NA: North America, EA: Eurasia, NH: North Hemisphere, PI: Pakistan and India

Species	Native region	Date
<i>Mustela vison</i>	N.A	1930
<i>Castor canadensis</i>	N.A	1945
<i>Ondatra zibethicus</i>	N.A	1945
<i>Callosciurus erythraeus</i>	EA	1970
<i>Rattus norvegicus</i>	EA	1600–1800
<i>Rattus rattus</i>	EA	1600–1800
<i>Mus domesticus</i>	EA	1600–1800
<i>Lepus europaeus</i>	EA	1888
<i>Oryctolagus cuniculus</i>	EA	1945
<i>Axis axis</i>	Asia	1930
<i>Cervus elaphus</i>	EA, NA	1904–1906
<i>Dama dama</i>	EA	1930
<i>Rangifer tarandus</i>	NH	1909
<i>Capra hircus</i>	EA	1856
<i>Antilope cervicapra</i>	PI	Unknown
<i>Sus scrofa</i>	EA	1904–1906
<i>Equus assinus</i>	EA, N.Africa	Unknown
<i>Equus caballus</i>	EA	1600

The wild boar, *Sus scrofa*: a successful invader of the Monte Desert, Argentina

The wild boar, *Sus scrofa*, is native to Eurasia and northern Africa. In the early 1900's it was introduced onto Argentina's ranches as a game animal for hunting. During 1914 many individuals escaped, establishing feral populations and spreading their distribution over several provinces. In 1953, a national law declared the wild



Fig. 5. Wild boar. http://www.huntingchile.5u.com/about_1.htm



Fig. 6. A nest built by wild boar to give birth and to rest in – © Agustina Novillo



Fig. 7. Signs of rubbing: Once a boar leaves a mud bath, it rubs its body against trees, rocks or weeds – © Fernanda Cuevas

boar a “plague” species because of the economic damage caused to agriculture and livestock rearing activities.

Because of its impact on biodiversity and human activities, the wild boar has been classified as **one of the 100 worst Invasive species** in the world.

Why is the wild boar successful as an invasive species?

Among the possible causes are: its large body mass, wide natural geographic range (one of the largest geographic ranges among terrestrial mammals), adaptation to diverse ecoregions, high reproductive rate

(up to 2 litters per year), omnivorous diet, among others

Habitat

It prefers damp areas in coniferous, deciduous or mixed forests, marshes and grasslands. In Argentina the wild boar expanded its geographic range from the grasslands of western Patagonia to the shrublands of central Argentina. In Mendoza province the wild boar has invaded the protected areas of the MaB Reserve of Ñacuñán, (site under study) and Llancanelo (a wetland RAMSAR site).



Fig. 8. Soil rooting by wild boar – © Fernanda Cuevas



Fig. 9. Tracks and faeces – © Fernanda Cuevas

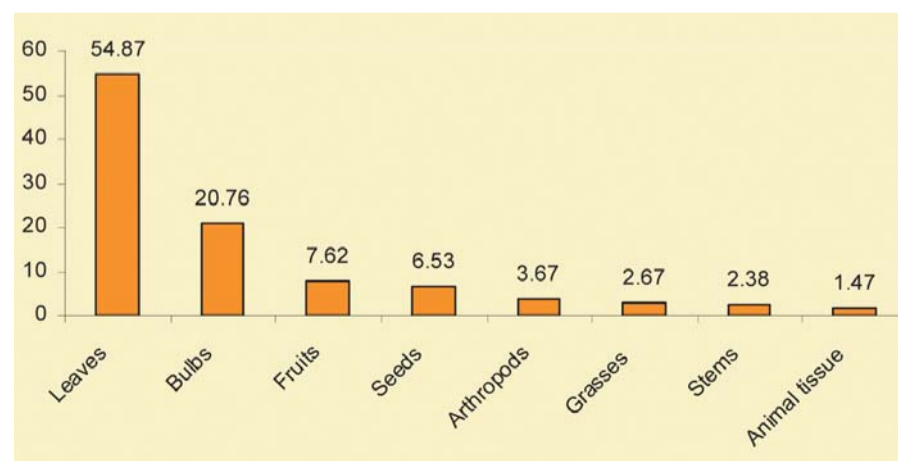


Fig. 10. Diet of wild boar in MaB Reserve of Ñacuñán, Mendoza, Argentina (Ongoing research)

Potential impacts in the Monte Desert ecosystem

- It generates large areas devoid of vegetation, changing the soil properties, plant structure and composition (ongoing research BY Fernanda Cuevas, GiB, IADIZA-CONICET). The establishment and expansion of plant species such as *Pitreaea cuneato-ovata* (Verbenaceae), seem to be associated with the wild boar's soil rooting activity. Furthermore, this plant species is an important item in its diet.
- Frugivory and seed predation (i.e. predation on legume seed pods; Campos & Ojeda, 1998)
- Predation on soil nesting birds and eggs (e.g. common rhea, *Rhea americana*, and tinamous *Eudromia*, *Nothoprocta*, *Nothura*; burrowing owl, *Athene cunicularia*; seed eating birds; eggs of tegu lizard, *Tupinambis rufescens*, desert turtle *Chelonoidis chilensis*, among others.
- Bark damage (scratching, gouging with tusks) to keystone species such as the legume trees algarrobo, *Prosopis flexuosa* and chañar, *Geofroea decorticans*.
- Damage to crops and transmission of diseases to humans as *Trichinella* and *Cysticercosis*.

It is also common in departments of La Paz, General Alvear and Lavalle

Diet

It is omnivorous. Its diet is based mainly on leaves (54.86 %), rhizomes of *Pitreaea cuneato-ovata* (Verbenaceae; 20.76 %) and fruits (7.62 %). They may include animal matter as small rodents and birds, eggs, invertebrates and carrion.



References

- BAILEY RG (1989) Ecoregions. The ecosystem geography of the oceans and continents. Springer, USA
- CAMPOS C, OJEDA RA (1997). Dispersal and germination of *Prosopis flexuosa* (Fabaceae) seeds by desert mammals in Argentina. *Journal of Arid Environments* **35**: 707-714
- CUEVAS MF, NOVILLO A, DACAR M, CAMPOS C, OJEDA RA (2006). Ecología del jabalí, *Sus scrofa*, en el desierto del Monte. XXII Reunión Argentina de Ecología. Agosto, Córdoba, Argentina.
- LONG JL (2003) Introduced mammals of the World their history, distribution and influence. CABI, UK.
- NOVILLO A, OJEDA RA (2008) The Exotic Mammals of Argentina. *Biological Invasions*, **10**(8): 1333-1344.