

## Mamíferos invasores en la Patagonia argentina: el conejo silvestre europeo como caso emblemático

*Invaders mammals in Patagonia argentina: the european wild rabbit as emblematic case*

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### Resumen

Se brinda una reseña de los estudios biológicos y ecológicos realizados sobre el conejo silvestre europeo (*Oryctolagus cuniculus*), tal vez el más emblemático de los mamíferos exóticos introducidos en Argentina. En el sector continental argentino el conejo se encuentra establecido, y en proceso de dispersión, principalmente en las provincias de Mendoza y Neuquén (NO de la Patagonia). En esta región, el conejo ha demostrado tener un efecto negativo sobre la economía regional, especialmente en áreas ganaderas y en plantaciones comerciales de árboles frutales y maderables. No existen programas oficiales para controlar la dispersión geográfica y/o el impacto de esta especie exótica. La gente que se siente perjudicada por el conejo recurre a intentos individuales para controlar sus efectos negativos. Es necesario implementar monitoreos regulares de la dispersión del conejo para la detección temprana y el manejo de poblaciones recién establecidas; además, se requieren estudios comparativos tendientes a determinar los métodos más adecuados para controlar el impacto del conejo.

**Palabras clave:** Especies exóticas, impacto, invasiones biológicas, plaga.

### Abstract

It provides an overview of the biological and ecological studies conducted on the European wild rabbit (*Oryctolagus cuniculus*), perhaps the most emblematic of exotic mammals introduced in Argentina. In the Argentine continental rabbit industry is established, and em scattering process, mainly in the provinces of Mendoza and Neuquén (NW Patagonia). In this region, the rabbit has been shown to have a negative effect on the regional economy, especially in farming areas and commercial plantations of fruit trees and timber. There are no government programs to control the geographic dispersion and / or the impact of this exotic species. The people who feel wronged by the rabbit uses individual attempts to control its negative effects. You need to implement regular monitoring of the dispersion of the Rabbit for the early detection and management of newly established populations; also require comparative studies aimed at determining the most appropriate methods to monitor the impact of the rabbit.

**Key words:** Alien species, impact, biological invasions, plague.

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## Introduction

The term “invasive alien species” refers to species introduced outside of their normal range and that have potential for dispersal. In addition, its presence and its spread threaten ecosystems, habitats or native species, causing environmental, economic, socio-cultural damage and/or damage to health as established in 2002 by the Convention on Biological Diversity concluded in The Hague.

The intentional or accidental introduction of exotic species is a very old phenomenon, which has accompanied man in his movements throughout history, being an increasingly common practice. According to the International Union for Conservation of Nature (IUCN), the danger that invasive alien species represent for the planet's biodiversity increases exponentially with free trade and globalization. They are currently the second leading cause of threat and extinction of species, preceded only by habitat loss.

At the end of the 19th century, the colonization of Patagonia (extreme south of the Argentine territory) took place and towards the middle of the 20th century the phenomenon of the introduction, deliberate or not, of exotic wild animals began to take place to be used for different purposes, mainly hunting. Whether domestic or

wild, the exotic species introduced in Patagonia correspond to different orders of the animal kingdom, especially the mammals (Bonino 1995).

The main mammals involved are: red deer (*Cervus elaphus*), wild boar (*Sus scrofa*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), mink (*Mustela vison*), European hare (*Lepus europaeus*) and European wild rabbit (*Oryctolagus cuniculus*). The latter is perhaps the most emblematic of the exotic mammals introduced in Argentine Patagonia as it is included in the list "100 of the most harmful Invasive Alien Species in the world", published by the IUCN Global Program on Invasive Species. .

In South America, the European rabbit was first introduced in Chile from where it invaded part of the Argentine Patagonia (extreme south of the country). In this region, the rabbit is established mainly in the provinces of Mendoza and Neuquén, where it carries out an active process of dispersion and invasion of new areas (Bonino and Soriguer 2009).

The objective of this work is to provide a review of the results of biological and ecological studies of the European wild rabbit and the potential consequences (economic and environmental) that its introduction in Patagonia could entail.

### **Biological and ecological aspects of the European rabbit**

This species is in a process of dispersion and invasion of new areas in the provinces of Mendoza and Neuquén, in the NW of Patagonia. Population dispersal speed varies between 2 and 10 km/year, depending on the influence of various factors such as natural barriers, availability of suitable environments, genetic and reproductive characteristics (Bonino and Soriguer 2009).

Genetic studies have shown that the populations established in the Patagonian region belong to the subspecies *O. c. cuniculus*, from which the domestic varieties derive. This identification is consistent with the observations made in the region, regarding the great variation in the coloration of the coat and the large body size of the individuals (Bonino and Soriguer 2008).

The average weight recorded in adult rabbits (2000 g for females and 1740 g for males) exceeded that reported for this species, both in its area of origin (Europe) and in other

areas where it was introduced (Australia, New Zealand, Chile) ( Bonino and Donadio 2010).

This species is characterized by its high reproductive potential, which was corroborated in the Patagonian populations whose reproductive parameters turned out to be higher than those registered for the rabbit in its area of origin. As an example, the mean number of embryos per litter was 5.3, while the mean number of offspring that a female can have per year can reach 30 (Bonino and Donadio 2002).

Said reproductive potential and the presence of favorable environments for this species have been some of the reasons why, in certain areas of Andean and sub-Andean Patagonia, it is possible to observe densities that exceed 100 rabbits/ha of mallín (preferably hygrophilous meadow). herbaceous), which is the most important forage site for domestic livestock and many species of fauna. However, the annual average varies between 39 and 61 individuals/ha (Bonino 2009).

Studies show that the rabbit is a herbivore that consumes grasses, mainly gramineous and graminoid plants (Juncaceae and Ciperaceae), and that the dietary overlap between rabbits and sheep was 62% and between rabbits and cattle it was 60%. Considering these overlapping values and the daily consumption of each herbivore, the animal equivalence was 12 rabbits for one sheep and 86 rabbits for one cattle (Bonino 2006).

### **Economic and environmental impact of the species**

The European wild rabbit is one of the most interesting examples of the catastrophic consequences that the introduction, intentional or not, of alien animals into natural environments where they did not previously exist can cause. Although the comparisons may not be completely valid, the experience of countries such as Australia and New Zealand indicates that it is a species that can be extremely harmful in areas of agricultural-livestock production, in addition to producing changes in the ecosystem to the detriment of native species (Bomford and Hart 2002, Clout 2002).

Taking into account the density (annual average) of animals in the Andean and sub-Andean region of Patagonia, the forage consumed in common with cattle and the

market prices of meat (beef) and wool (sheep), the The impact of rabbits can reach US\$263/ha in fields dedicated to meat production or US\$347/ha in fields dedicated to wool production (Bonino 2011).

In commercial forest and fruit plantations in the Andean and pre-Andean areas of Patagonia, the damage caused by rabbits can exceed 80% of the plantation, especially in the first year of implantation (Bonino 2009). On the other hand, both Mendoza and Neuquén farmers have stated that rabbits cause considerable damage to vegetable crops (potatoes, carrots), cereals (rye), legumes (alfalfa) and fruit trees (vines, peaches, apples) ( Bonino and Soriguer 2009).

In addition, rabbit grazing could negatively affect the regeneration of some species of native vegetation, as has occurred in other regions of the world (Gibb and Morgan Williams 1994, Myers et al. 1994).

## conclusion

Currently, the European rabbit continues with the process of dispersion and colonization of Argentine Patagonia, behaving as an invasive exotic species.

The degree of overlap between the diet of rabbits and domestic cattle would indicate a potential trophic competition between them, with the consequent damage to livestock production. This, added to the high densities observed, would contribute to the overgrazing of the Patagonian grasslands, thus adding to the factors that favor the regional desertification process.

Regular monitoring of rabbit dispersal is necessary for early detection and management of newly established populations.

A common feature of all animal introductions in Argentina, including that of the European rabbit, was the arbitrariness with which they were carried out and the lack of planning and research to back them up. Thus, the result of most of them is frankly negative with respect to the interests of man or the environment.

## Bibliography

- Bomford, Mary & Hart, Quentin (2002). Non-indigenous vertebrates in Australia. New York: CRC Press.
- Bonino, N. (2006). Interacción trófica entre el conejo silvestre europeo y el ganado doméstico en el noroeste de la Patagonia Argentina. *Ecología Austral*. 16, 135-142.
- Bonino, N. (2009). Especies exóticas invasoras en la Patagonia: el conejo europeo. Desde la Patagonia. *Difundiendo Saberes*, 6, 34-41.
- Bonino, Never & Donadio, Emiliano (2002). Aspectos de la reproducción del conejo silvestre europeo (*Oryctolagus cuniculus*) en la región cordillerana de Neuquén. XVII Reunión Sociedad Argentina para el Estudio de los Mamíferos, Mar del Plata, Argentina, 18-21 noviembre (paper).
- Bonino, Never & Donadio, Emiliano (2010). Parámetros corporales y dimorfismo sexual en el conejo silvestre europeo (*Oryctolagus cuniculus*) introducido en Argentina. *Mastozoología Neotropical*. 17, 123-127.
- Bonino, Never & Soriguer, Ramón (2008). Genetic lineage of the feral populations of *Oryctolagus cuniculus* in Argentina. *Mammalia*, 78, 355-357.
- Bonino, Never & Soriguer, Ramón (2009). The invasion of Argentina by the European wild rabbit (*Oryctolagus cuniculus*). *Mammal Review*. 39, 159-166.
- Clout, Mick (2002). Ecological and economics costs of alien vertebrates in New Zealand. New York: CRC Press.
- Myers, Ken; Parer, I. Wood, David & Cooke, Brian (1994). The rabbit in Australia. Oxford: Oxford University Press.