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INTRODUCED MAMMALS INTO PATAGONIA, SOUTHERN ARGENTINA: consequeces, problems and management strategies

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INTRODUCED MAMMALS IN PATAGONIA, SOUTHERN ARGENTINA: CONSEQUENCES, PROBLEMS, AND MANAGEMENT CONSIDERATIONS

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Abstract: Nearly all mammal species introduced in Argentina are found in semiarid Patagonia. Some were released deliberately for sport hunting of fur trade; others have been released accidentally from fur farms. Exotic species have become well established and most are dispersing nto new areas. Also, there is evidence that many have detrimental impacts on native biota or agricultural activities. Lack of adequate legislation concerning importation of exotic wildlife or strict control of its spread explains unplanned introductions of exotic mammals into Patagonia and their consequences.

Resumen: En este trabajo se resume la información disponible sobre los mamíferos exóticos establecidos en la Patagonia y las consecuencias de su introducción y se realizan algunas consideraciones generales sobre el manejo de fauna exótica. En dicha región se encuentran casi todas las especies de mamíferos introducidos en la Argentina. Muchas especies tales como, la liebre europea, el ciervo colorado, el jabalí y el castor, fueron liberadas intencionalmente con fines deportivos o peleteros; otras, como el visón americano, se liberaron accidental o negligentemente de criaderos comerciales. No solo que ninguna de las especies exótivas cumplió con el objetivo de su introducción, sino que la mayoría a de ellas se estableieron como especies que causan alguna clase de perjuicio. Se estima que la falta de una legislaciónadecuada sobre la importación de fauna silvestre exótica y/o de un control estricto en el cumplimiento de la misma, serían las causas principales de las introducciones no planificadas de mamíferos exóticos en la Patagonia y sus consecuencias.

Key words: Argentina, exotic species, mammals, management, Patagonia, pest mammals.

Over the centuries many mammal species have been translocated by man, either willingly or unintentionally, into several areas of the world where they never occurred previously. Most of these animal introductions failed and many successful introductions havebeen detrimental to man or existing natural communities)De Vos et al. 1956, Scott 1967, Baker 1986). This is especially true for Patagonia, a semiarid region located in souther Argentina that includes Neuquén, Río Negro, Chubut, Santa Cruz, and Tierra del Fuego provinces and the Southern Atlantic islands. With an area of approximately 7 million ha, this regin contains most of the mammal species introduced into Argentina (Daciuk 1978, Navas 1987).

Little has been published on exotic mammals in Argentina including Patagonia, and most of what is known can be found only in departmental reports or the personal knowledge of mammologists in wildlife departments. Our objective is to compile the literature and unpublished information to review the introductions of exotic mammals in Patagonia and its consequences. I also suggest management options for exotic wildlife.

ACCOUNTS OF INTRODUCED SPECIES

The exotic mammals established in Patagonia are: American mink (*Mustela vison*), American beaver (*Castor canadensis*), muskrat (*Ondatraz zibethicus*), European hare (*Lepus europaeus*), European wild rabbit (*Oryctolagus cuniculus*), wild boar (*Sus scrofa*), red deer (*Cervus elaphus*), fallow deer (*Dama dama*), axis deer (*Axis axis*), and reindeer (*Rangifer tarandus*). This list excludes the murine rodents and other ungulate specie confined to private game parks, such as white-tailed deer (*Odocoileus virginianus*), blackbuck antelope (*Antilope cervicapra*), wapiti (*Cervus canadensis*), Pere David´s deer (*Elaphurus davidianus*), Himalayan thar (*Hemitragus jemlahicus*), Barbary sheep (*Ammotragus lervia*), wisent (*Bison bonasus*), chamois (*Rupicapra rupicapra*), mouflon (*Ovis musimon*), and ibex (*Capra ibex*) (Navas 1987, Wilson and Reeder 1993).

The European hare eas first introduced into the central part of Argentina in the late nineteenth century. The hare became established throughout all of Patagonia from these releases, except Tierra del Fuego Island (Grigera and Rapoport 1983).

Althought the damage from hares is obvious in grasslands, crops, and orchards, quantitative data that analyze their effects under different land and livestock management are rar. The only available information in Patagonia indicates that hare compete with domestic stock for grazing (Bonino et al. 1986) and cause damage in forested areas (R. Gadder, Neuquén Appl. Ecol. Cent., unpubl. Data). Under existing national legislation this species is classified as a pest and may be taken any time by any legal means it it is causing damage. This species is probably the most important game animal in Argentina where >6 million hares are shot annually for their mwat which is exported to Europe (Jackson 1986). However, in Patagonia the commercial hunting of hares is apparently uneconomical because of heterogeneous distribution of hares, difficult access due to rough topography, and long distances to populated centers.

European wild rabbit was first introduced into Chile and invaded northwestern and southwestern parts of Argentinean Patagonia. In the northwest, rabbits invaded the Neuquén province in about 1945, beginning a process of geographic dispersion that still continues (Howard and amaya 1975, Bonino and Gader 1987). In the southwest, rabbits invaded the Argentinen side of Tierra del Fuego island in about 1936. Here, this species reached pest proportions but the Myxoma virus decimated their populations (Jaksic and Yáñez 1983). In 1985, the rabbit was finally detected in the southwest of the Santa Cruz province (Clarke and Amaya 1986) and it is now widespread. Bonino and Gader (1987) estimated that practically all of Patagonia will eventually be colonized by this species. Although rabbits compete with livestock for food and damage crops, orchards and forestry in Patagonia (Bonino 1985), there are no quantitative data about their effets as pest species. In the provinces wher rabbits wxist, they are normally classified as pests and may be controlled if causing damage.

The American mink was deliberately introduced for commercial fur production in several Patagonian provinces in 1930 (Daciuk 1978). Mink escaped or were released from farms in Chubut province; in a short time these minks together with of dispersion that still continues. Mink occur in the Chubyt and Río Negro provinces and Tierra del Fuego island (Pagnoni et al. 1986, Fabbro 1989). Mink effect wildlife, specially waterfowl, native mammals and fishes (B.R. Foerster, National Park Serv., unpubl.

Data; C. Chehebar National Park Re., Bariloche, 1983). Rural inhabitants proclaim that mink occasionally kill domestic poultry and lambs (a. Rojas, Río Mayo Expl Range, pers.commun.). However, there are no systematic studies on their impact. In Chubut province, this species is considered a pest (Navas 1987) and as such, may be taken any time by any legal means.

The American beaver was introduced as a valuable furbearing mammal that became established in Tierra del Fuego around 1948 (Godoy 1963). Curretly, it is found only on this island, separated from the continent by the Straits of Magellan. Available data indicate that the environmental alterations caused by beavers on the forest ecosystems are a result of dam building and wood cutting of flooding (M.S. Lizarralde, CADIC-CONICET Sci.Rep., 1992). Since 1981, legislation of Tierra del Fuego regulates commercial hunting of beavers, although their explitation has been extremely difficult for several reasons (M.S. Lizarralde, CADIC-CONICET Sci. Rep., 1991).

The muskrat was introduced into Tierra del Fuego as a furbearer species at the same time as the American beaver. It is only found in Tierra del Fuego (Godoy 1963=. Rural inhabitants report that muskrat undermines dam walls, embankments, and irrigation channels (e. Fabbro, Tierra del Fuego Wildl, Dep., unpubl. Data). It has been a pest since 1954 and provincial legislation contains regulatios regarding tis commercial hunting (Fabro 1989).

Red deer were originally introduced in central Argentina about in 1906 for sport hunting, and soon after were translocated to the Neuquén province (Daciuk 1978). They are now found in Río Negro and Chubut; the continuing dispersal is further assisted by trnaslocations to areas previously without red deer have significantly modified forest under-stories and have impaired the regeneration of canopu tree species (Veblen et al. 1989, 1992). Forested areas show a moderate impact from deer browsing and rubbing of velvet (R. Gader, Neuquén Appl. Ecol. Cent., unpubl. data). Although the effects of hits species on the native flora and forested areas is now recognized, hardly anything is known about possible competition with the native fauna (Rapoport 1976, Flueck and Smith-Fluek 1993). Generally, provinces with red deer manage them as big game animals. Some provinces permit shooting deer outside of the normal sport hunting season as a method to reduce their populations.

Azis and fallow deer were introduced at the same time as red deer, but in contrast they remained scarce and restricted to very limted areas in the Nahuel Huapi National Park in Neuquén province (Daciuk 1978, Navas 1987). Allthough the effects of these species on the native vegetation has been described as detrimental (Daciuk 1978), there have not been any systematic evaluatins of the impact.

Reindeer were released in about 1948 into Tierra del Fuego where they disappeared because of furtive hunting and-or difficulties in their acclimatization (Fabbro 1989). Also, they were introduced in the South Georgia islands in 1911 and 1925, where today 3 herds exist (Leader-Williams et al. 1989). On south Georgia, grazing by reindeer has caused maor changes in vegetation cover and species composition from very limited areas (Leader-Williams et al. 1987). Despite being introduced, reindeer are protected and may only be shot on issue of a permit.

Wild boar were imported with red deer and introduced into central Argentina in about 1906. Soon after translocation to Neuquén province it spread to Chubut, Río Negro and Santa Cruz provinces (Daciuk 1978, Navas 1987). Wild boar may reach pest proportions in agricultural areas by rooting and trampling; it also preys on lambs, goat kids, newly born calves, and probably some small native fauna (Jackson 1988). This species is considered a pest by all provincial legislatures and, as a control method, Río Negro province pays rural inhabitants to hunt htem.

GENERAL CONSIDERATIONS

All exotic mammals now established in Patagonia were imported deliberately, except the European rabbit, for sport hunting and fur trade. However, not only have they not fulfilled the objetctives of the introductions, but most of them have established themselves as species causing many types of damage. This is a consequence of the lack of previous ecological studies of the animal and the ecosystem proposed for a release site. These studies probably would have prevented the importtion and release of mammals that had already been reported as causing damage in other countries (Howard 1964, Bratton 1974, Lever 1978, Scanlon 1990).

It is important to consider the potential to have more species become established in Patagonia, particularly exotic mammals already imported and confined in private game parks. Such introductions are of concern to nature conservation officials and others because those animals are not intensively controlled to prevent escapes and many game parks are located near national parks (e.g., Laní n and Nahuel Huapi). In this respect, serious efforts should be made to educate those ownig exotic game to the cological risks inherent in idvertent releases. On the other hand, no exotic animals should be permited in national parks of other public lands. Today, most of the 9 Patagonian national parks already have from 1 to 4 exotic species established on them.

Experience with introduced mammals leads to the general conclusion that the deliberate or accidental release of any exotic species is highly dangerous if legislation does not exist that clearly indicates the conditions for considering introductions of exotics. Each importation must be preceded by ecological studies demonstrating that the exotic species is ecologically suitable for introduction into a new ecosystem and that it will not be deleterious to desirable native species or cause any alteration to the cological system. Moreover, the implmentation of introductions must be restricted to Nacional or Provincial Wildlife Departments; the introductions by other levels of the government of by private xitizens, as happened in the past, should be prevented.

Finally, coordinated provincial legislatures should be established for considering further introductions of exotic animals and these presumably will preclude repetition of past mistakes. In proposing new introductions, managers must assess a broad spectrum of social goals and not just those of sportsmen if wildlife management is to assume its fullest meaning.

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