

FREE-RANGING POPULATION OF THE FINLAYSON'S  
SQUIRREL *CALLOSCIURUS FINLAYSONII* (HORSFIELD,  
1824) (RODENTIA, SCIURIDAE) IN SOUTH ITALY

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**RIASSUNTO - *Popolazione di scoiattolo di Finlayson Callosciurus finlaysonii* (Horsfield, 1824) (Rodentia, Sciuridae) introdotta in Sud Italia.** Il rilascio, a metà degli anni '80, di 3-4 coppie di scoiattolo di Finlayson (*Callosciurus finlaysonii*) è all'origine della popolazione che attualmente colonizza tutta la fascia costiera tirrenica della Basilicata e un breve tratto di quella della Campania. E' questa la seconda popolazione Europea della specie e la prima in ambiente naturale. Dopo una fase iniziale di incremento lieve, l'espansione della popolazione è stata rapidissima e, attualmente, interessa circa 26 Km<sup>2</sup> di territorio, con forte rischio di colonizzazione dei boschi di latifoglie dell'interno. Sono stati accertati rilevanti danni alla vegetazione per la rimozione di parti più o meno estese di corteccia dagli alberi.

*Parole chiave:* *Callosciurus finlaysonii*, specie alloctona, areale, danni, gestione

Italy is the European country with the highest number of introduced squirrel species (Mitchell-Jones *et al.*, 1999). Among the four species recorded, only the red squirrel (*Sciurus vulgaris*) is native, while the others are the result of intentional introductions or the escape of animals from captivity (Bertolino *et al.*, 2000).

The grey squirrel (*Sciurus carolinensis*) is present with three populations in Piedmont, Lombardy and Liguria regions (Genovesi and Bertolino, 2001; Tattoni *et al.*, in press). In Piedmont the species has been spreading faster in the last decades and the colonization of the Alps could occur in a near future (Lurz

*et al.*, 2001; Bertolino and Genovesi, 2003). The population in Lombardy seems to have still a low density, but the risk of colonization of the Ticino valley and of Switzerland is very high (Tattoni *et al.*, in press).

Free-ranging populations of the Siberian chipmunk (*Tamias sibiricus*) are found in Belluno, Verona and Rome, but single animals have been observed also in other areas (Amori and Gippoliti, 1995; Dal Farra *et al.*, 1996; Amori, 2002).

The only European population of Finlayson's squirrel (*Callosciurus finlaysonii* Horsfield, 1824) already known was introduced in an urban park

in Acqui Terme (province of Alessandria, north-western Italy) (Bertolino *et al.*, 1999). The population originated from two pairs released in 1981, and 40-50 individuals have been estimated in 1998 (Bertolino *et al.*, 2000).

Here we examine the expansion in range of a new population of this species, the first in natural environment, introduced at Maratea (N 39°50'58", E 15°40'15", Tyrrhenian coast, Basilicata region, southern Italy). The Tyrrhenian coast under consideration is characterised by an oceanic climate with frequent rainfalls (mean rainfall ranges from 1500 mm at sea level to over 2000 mm in the inland), and a mean winter temperature of about 10° C (Cantore *et al.*, 1987). The area already colonised by the squirrel is characterized by a more or less continuous narrow belt of coastal woods, which extend close to the sea, composed mainly of Aleppo pine *Pinus halepensis*, holm oak *Quercus ilex*, and locust tree *Certonia siliqua* in rocky soil, and by downy oak *Quercus virgiliana*, where the soil is deeper; the remaining part is covered by herbaceous plants alone. Through the valley bottoms, coastal woods are connected with the more internal deciduous woods of oaks (*Q. virgiliana* and *Q. cerris*), chestnut *Castanea sativa* and, at higher elevations, beech *Fagus sylvatica*. This forest area represents the possible next zone of colonization by the Finlayson's squirrel.

This species occurs in the Indochinese subregion, where it is present in Burma, Thailand, Laos, Cambodia, and South Vietnam (Lekagul and McNeely, 1988);

16 subspecies have been recognized (Corbet and Hill, 1992). The Finlayson's squirrel is extremely variable in body size and fur colour, and even within subspecies there is a great deal of variation (Lekagul and McNeely, 1988).

The origin of the animals present at Maratea is unknown, thus it is presently not possible to go back to determine the subspecies, also considering that the animals from different populations may have been cross bred in captivity.

The population of Maratea originated by the release of 3-4 pairs in the middle of the 80s. The spread of the species in Basilicata and the southern part of Campania (Fig. 1), was established using questionnaires to foresters, park-owners and people visiting the urban parks and by reports of bark-stripping on trees. Since 2002 we checked the area in order to confirm the presence of animals (Aloise *et al.*, 2003). The population range expansion followed a sigmoid curve, with a small lag phase and a successive rapid range increase till 26 km<sup>2</sup> in 2004 (Fig. 2). A similar trend was showed by the grey squirrel in Italy (Bertolino and Genovesi, 2003), while a population of the congeneric red-bellied tree squirrel (*Callosciurus erythraeus*) introduced in Japan has expanded to over 300 km<sup>2</sup> throughout 50 years (Tamura, 2004). The situation at Maratea is worsened by the risk of animal translocation into other areas. At least in one case, some animals were captured and released in the Noce valley (Fig. 1). This phenomenon is particularly dangerous because it could create new propagules and help the species to overcome ecological barriers increasing

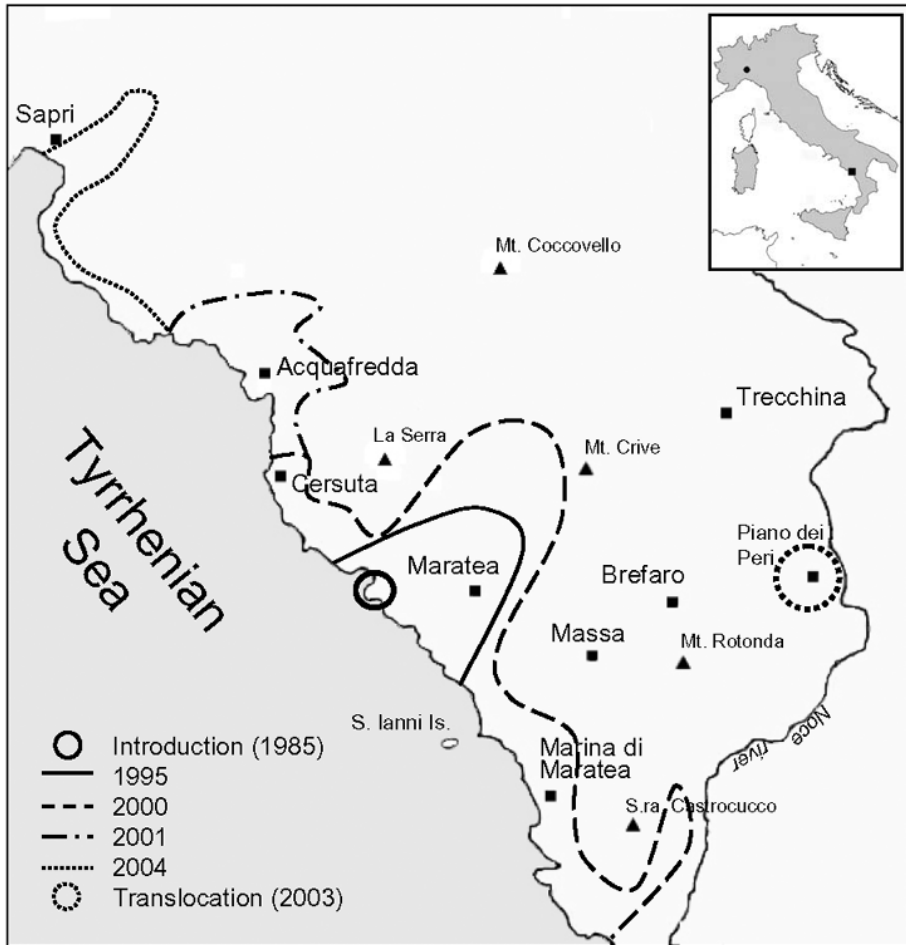


Figure 1 – Location of *C. finlaysonii* populations in Italy. • = Acqui Terme (AL, Bertolino *et al.*, 1999); ■ = Maratea (PZ, Authors' data). In detail the spread of the population in Basilicata and Campania regions.

the spread rate.

The introduction of alien tree squirrels often leads to unbalances in ecosystems, with negative consequences for plants and animals. The grey squirrel competes with the native red squirrel, and produces huge damage to trees (Gurnell and Pepper, 1993; Wauters *et al.*, 1997; Dagnall *et al.*, 1998). At Acqui Terme most of the trees in the park where the Finlayson's squirrel was

introduced are damaged due to bark-stripping (Bertolino *et al.*, 2004). A similar impact on vegetation has been recorded at Maratea with damages mostly on *Certonia siliqua*, *Quercus virgiliana*, *Q. ilex*, *Olea europea*, and *Pinus halepensis*.

The discovery of a new population of introduced squirrels confirms the ability of these rodents to adapt to new habitats. To cope with this treath, it is nec-

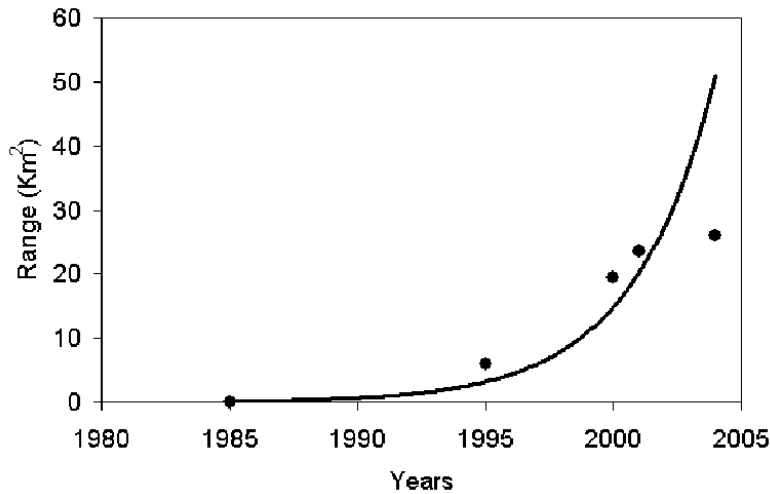


Figure 2 – An exponential growth model applied to the studied population of Finlayson’s squirrel ( $R^2 = 0.95$ ,  $y = 4E-267e^{0.31x}$ ).

essary to implement a national strategy on alien species considering also trade restriction.

With regards to accidental escapes or releases of alien species, it is necessary to build up a system which could promote prevention and assure early detection and rapid response.

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