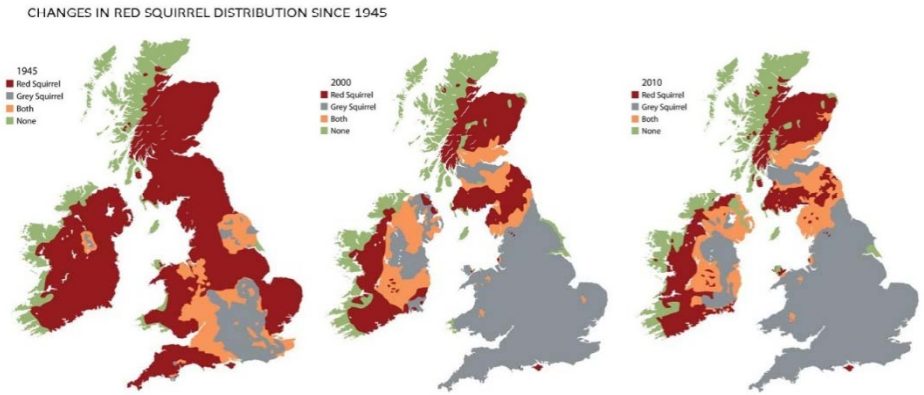
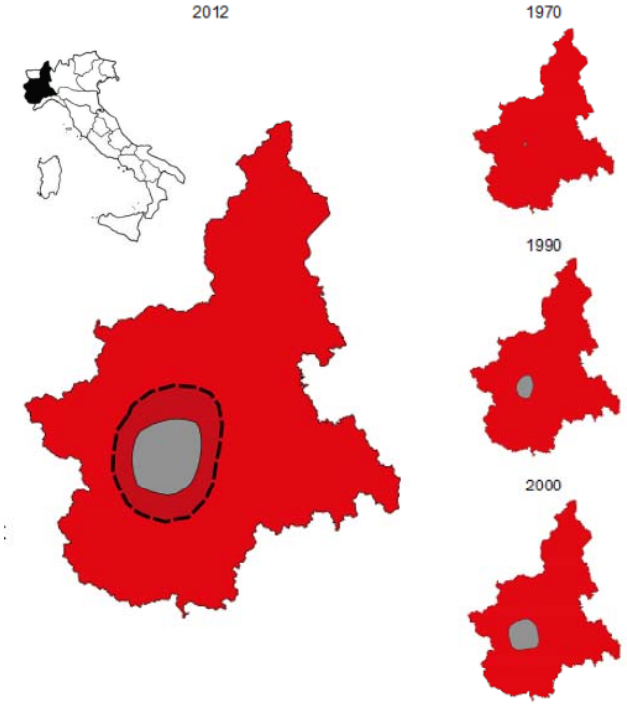
A new National Action Plan for the management of the grey squirrel in Italy

Bertolino Sandro
Dipartimento di Scienze della Vita e Biologia dei Sistemi

A Conservation Issue: in Europe the grey squirrel is outcompeting the native red squirrel to extinction



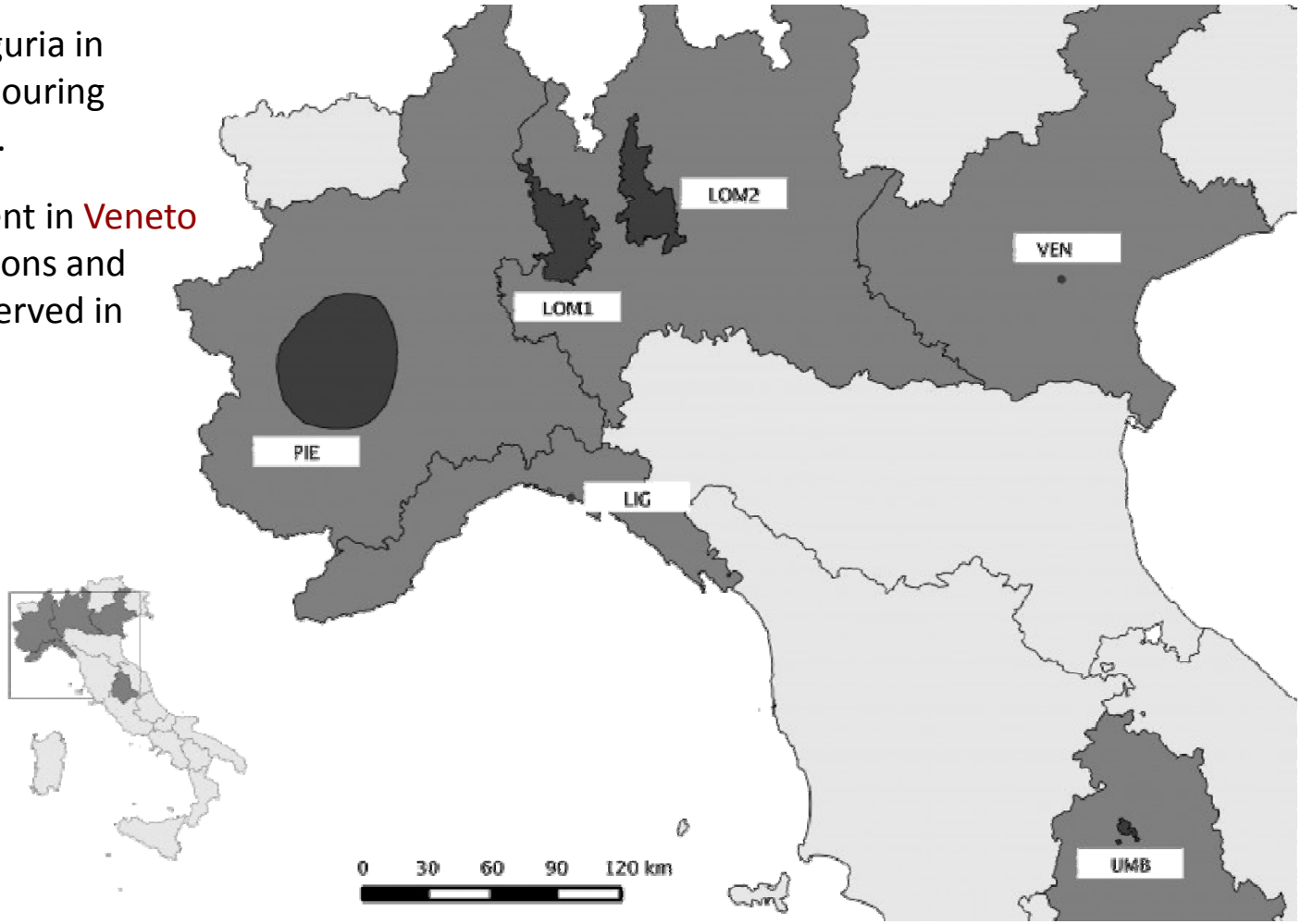


The grey squirrel is present in Italy with:

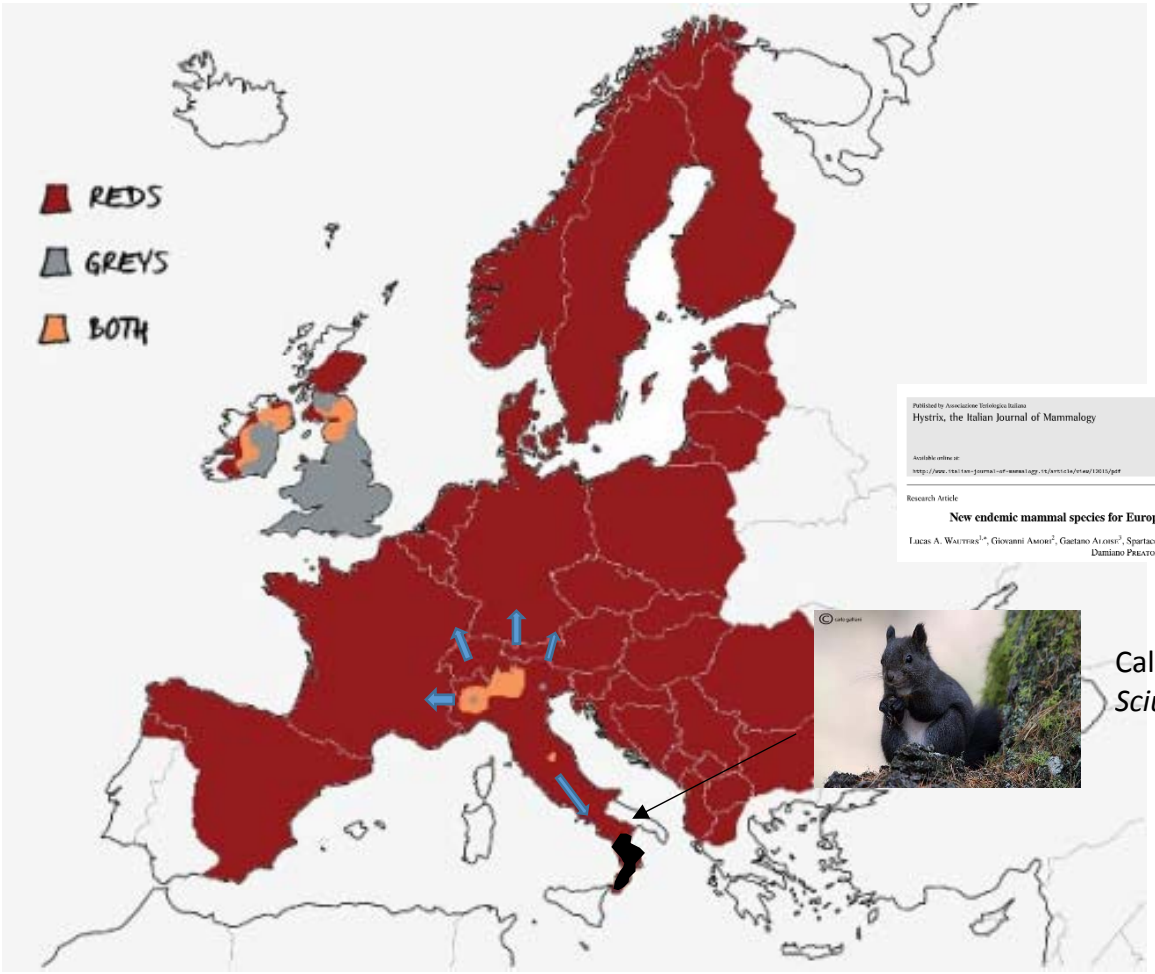
large populations in Piedmont, Lombardy and Umbria.

A small population in Liguria in Genoa Nervi and neighbouring areas, nearly eradicated.

The species is also present in Veneto with expanding populations and single animals were observed in Tuscany and Latium.



The grey squirrel in Italy is a threat for European squirrels




Hystrix, the Italian Journal of Mammalogy

Research Article

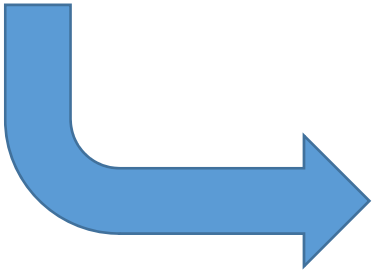
New endemic mammal species for Europe: *Sciurus meridionalis* (Rodentia, Sciuridae)

Calabrian black squirrel
Sciurus meridionalis

Map of distribution of the squirrels in Europe in 2014
(http://www.piattoscoiattolo.it/distribuzione/; data from the Societas Europaea Mammologica, Martinoli et al., 2010; Battiston & Amerini 2013; Signorile et al. 2014)

Within the **Regulation (EU) n. 1143/2014 on the prevention and management of the introduction and spread of invasive alien species**, the National Institute for Environmental Protection and Research (ISPRA) and the Ministry of the Environment and Protection of Land and Sea (MATTM) are preparing the national action plan for the control of the grey squirrel in Italy.

The action plan derives from the obligations foreseen by the European Regulation, which asks Member States to eradicate the invasive alien species (IAS) of Union concern present in the country and mitigate the impacts of those widely spread through populations control.



MINISTERO DELL'AMBIENTE
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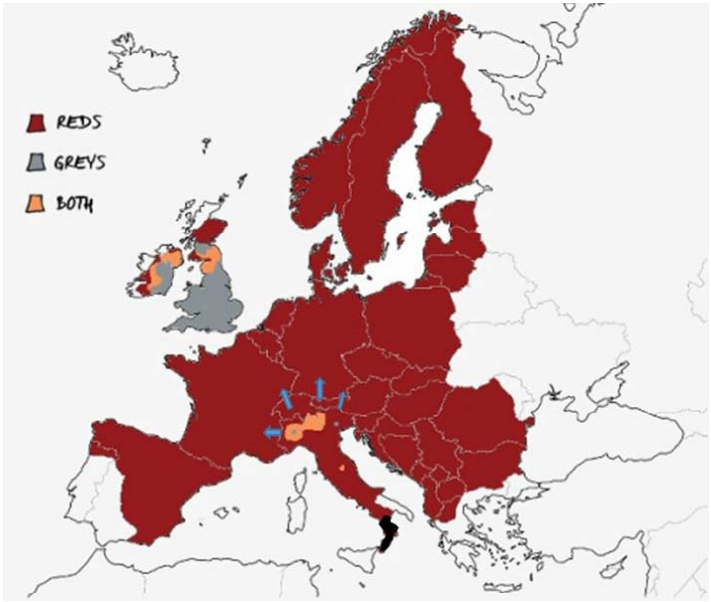
Action plan for the control of
the grey squirrel

Regulation (EU) n. 1143/2014

Member States shall ensure that containment measures are in place to avoid further spread of the invasive alien species to other Member States when, pursuant to paragraph 1, no eradication measures are applied. (art. 18.4)

Responsability of Italy in respect to other European countries



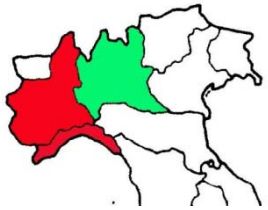
The management actions derive from:

• the post-LIFE action plans produced as part of the LIFE project EC-SQUARE (LIFE09 NAT/IT/00095) for Piedmont, Lombardy and Liguria

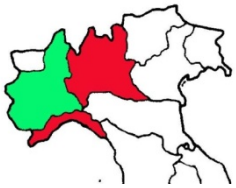
• the action plan produced for Umbria within the LIFE project U-SAVEREDS (LIFE13 BIO/IT/000204).

LIFE project EC-SQUARE

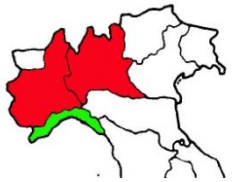
Lombardy: many populations that can be managed independently
Aims: probably a mixture of local eradications (when feasible) and long-term control to limit the spatial spread of populations



Piedmont: a single very large population
Aims: long-term control with the aim to limit the spatial spread population



Liguria: a small population in an urban park and neighbouring areas
Nearly eradicated with live-trapping and surgical sterilization



LIFE project U-SAVEREDS

Perugia (Umbria): a single large population (now few hundreds?)

Aims: eradication is ongoing within the LIFE project and will continue thereafter.

If eradication will not be achieved, long-term control with the aim to limit the spatial spread of the population in the Apennine and toward the area with the endemic Calabrian black squirrel *Sciurus meridionalis*

Veneto: monitoring of the population(s) and start of control activity as soon as possible. Evaluating if eradication is still possible, otherwise long-term control

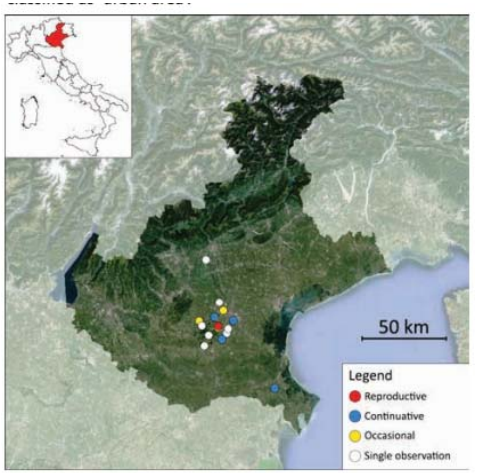


Figure 3. Records of grey squirrels from Veneto (Provinces of Vicenza, Padua, and Rovigo). Map: Google, DigitalGlobe.

Tuscany: scattered records; monitoring and removal to avoid establishing of populations

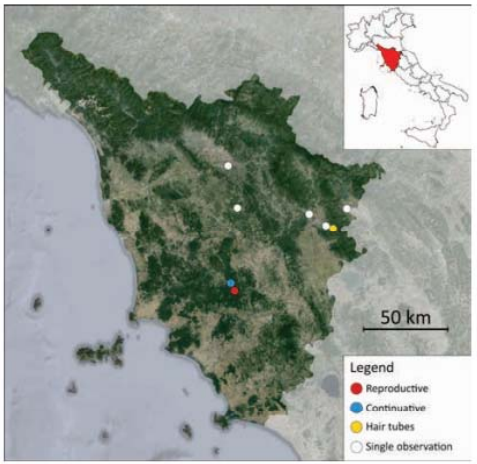
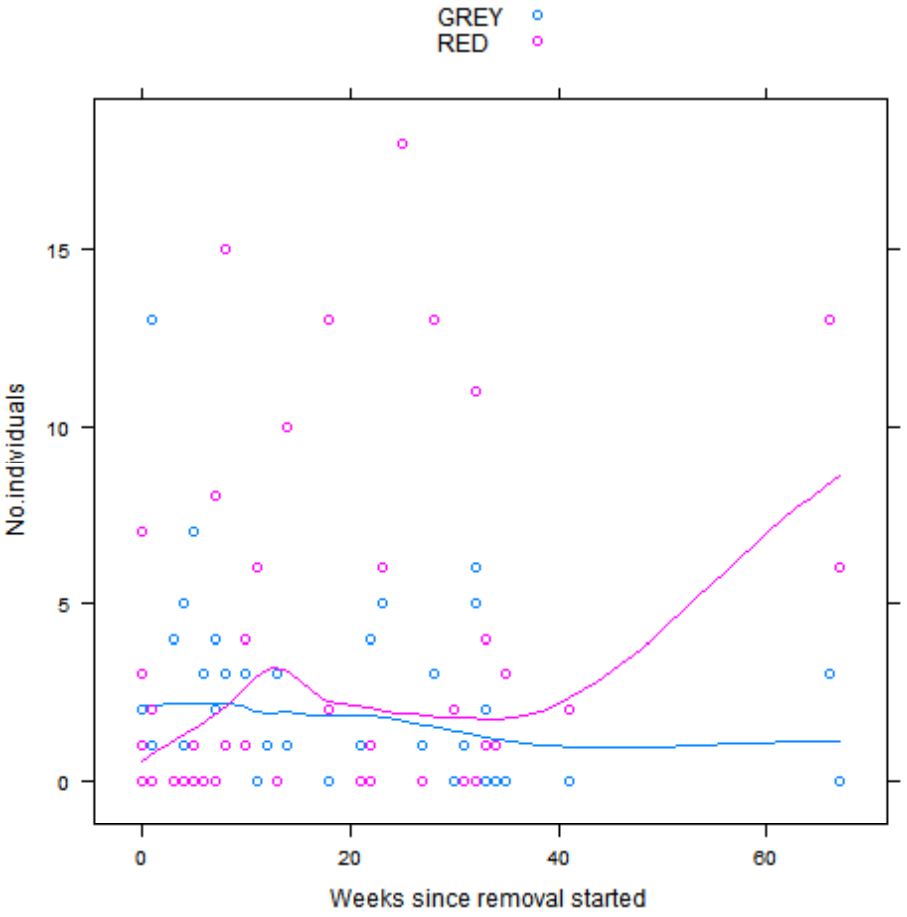


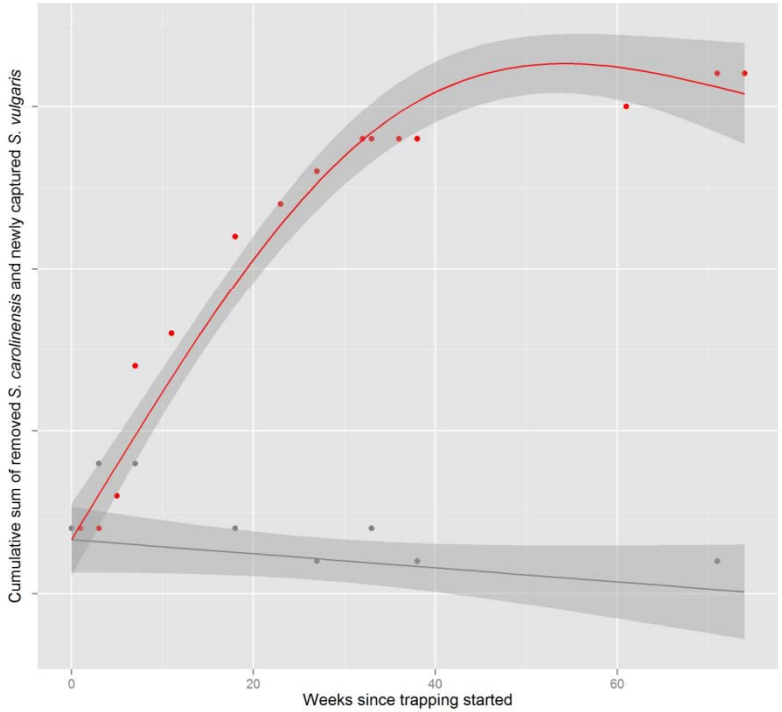
Figure 1. Records of grey squirrels from Tuscany (Provinces of Arezzo, Siena, and Florence). Map: Google, DigitalGlobe.

Results form LIFE projects



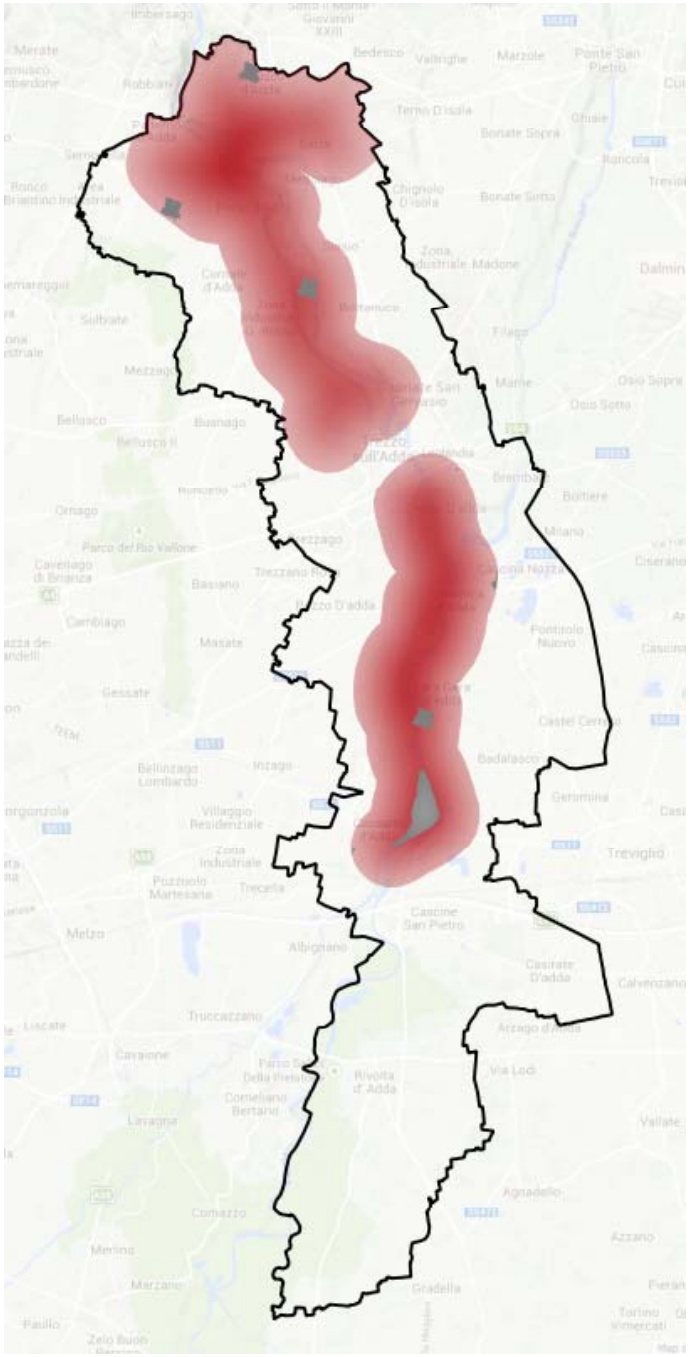
Where Grey squirrels are removed

Red squirrels are coming back!

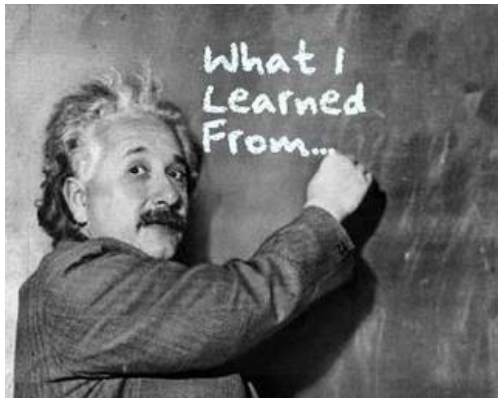


ERADICATION PROCESS

Eradication is possible!



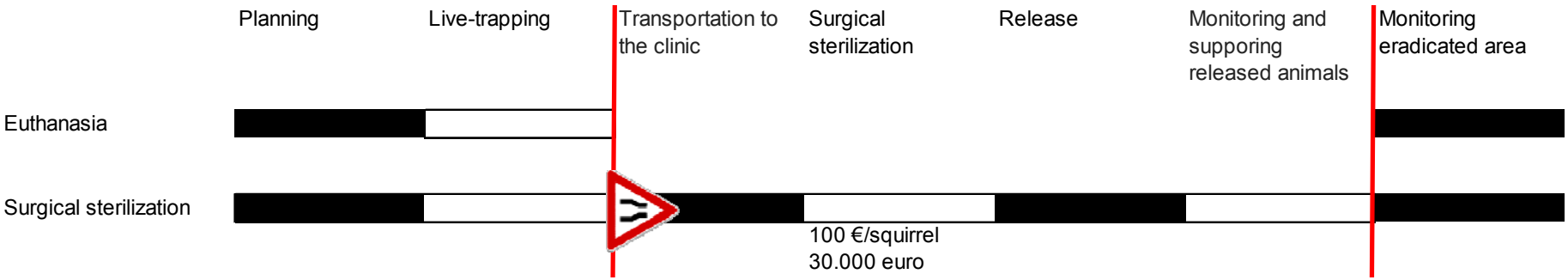
Take home message from LIFE projects EC-SQUARE



Grey squirrel eradication and control is possible,

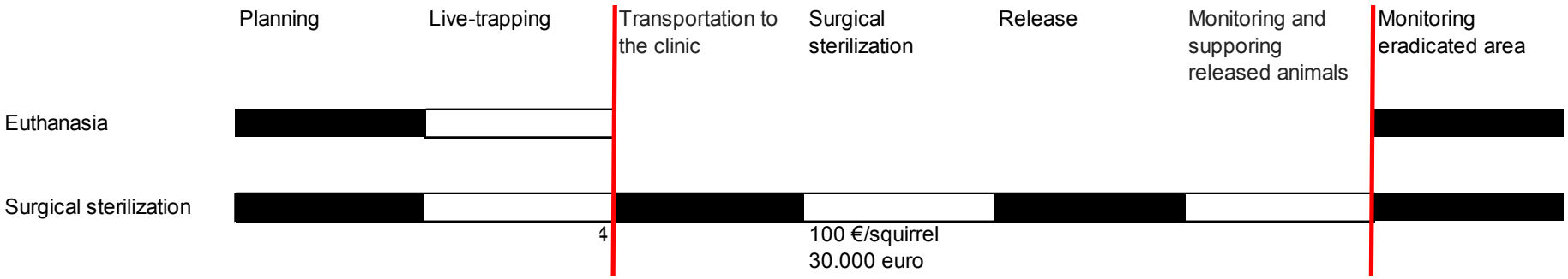
And this will bring reds back!

Surgical sterilization: a complex solution for small populations



Animals removed in accordance with the availability of the clinic to operate

Surgical sterilization: a complex solution for small populations



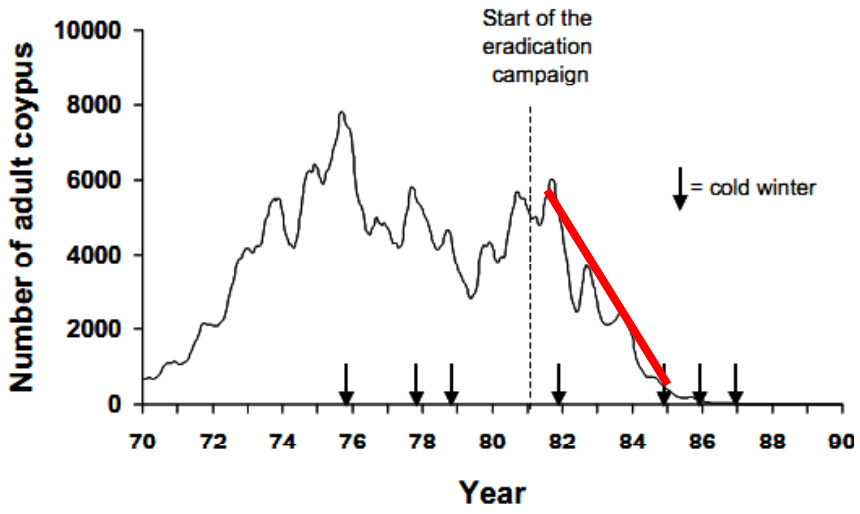
Locality	Area	Squirrels extimated (min. – max.)	Squirrels removed	Trap-days N° of traps x N° of days	Days of trapping (N° trappers)	Reference
Racconigi (TO)	70 ha woodland	300-350	188	1044	8 (2)	Bertolino & Genovesi 2003
Genova Nervi (GE)	12 ha urban park	197 (132-294)	188	1296	60 (4)	LIFE EC-SQUARE

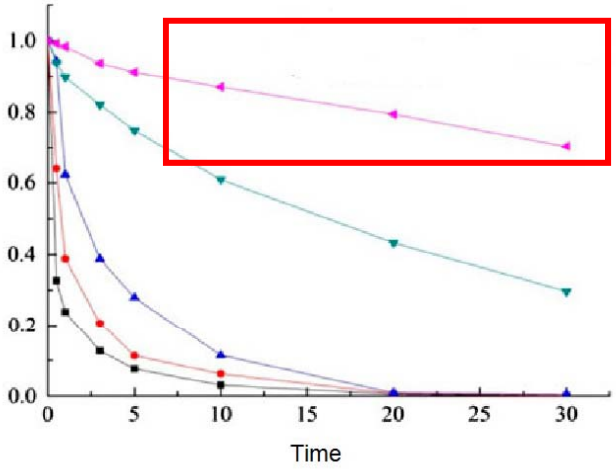
Removing the first 188 animals in a (closed) population →

Live-trapping and euthanasia: 8 days, 2 people

Live-trapping and sterilization: 60 days, 4 people

Effort 60/8 = 7.5 more





The population must decline over time, up to zero

Therefore the removal of animals must exceed (much) the reproductive success of the females

If few animals are removed, the population will not decline

The two LIFE projects developed methods to remove grey squirrels in different socio-ecological contexts

Showing that grey squirrel eradication and control is possible
And this will bring reds back!

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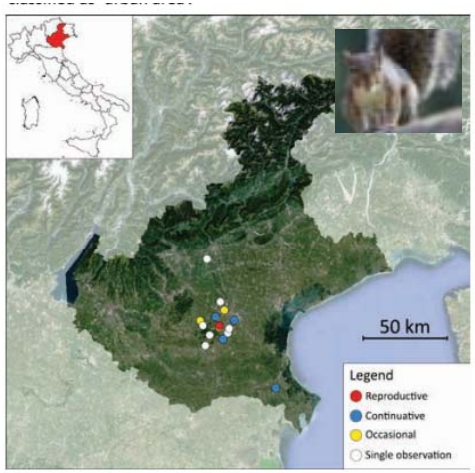
Action plan for the control of the grey squirrel

The new national action plan will review the procedure, helping to coordinate actions between different regions

New squirrel invasions



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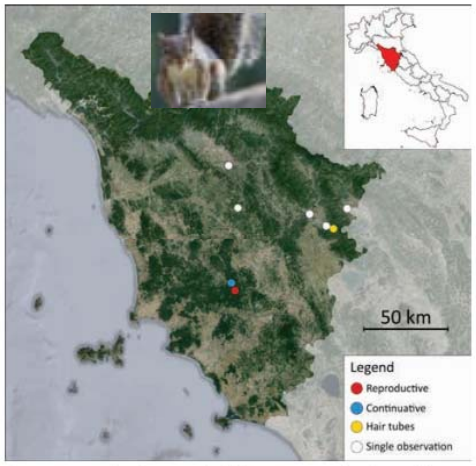

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ALIEN SQUIRREL EMERGENCY TEAM (ASET)
Established at the national level

Management of alien squirrels: from detection to management

Theoretical invasion curve with indication of the stages used in the assessment of each species' distribution and invasion history:

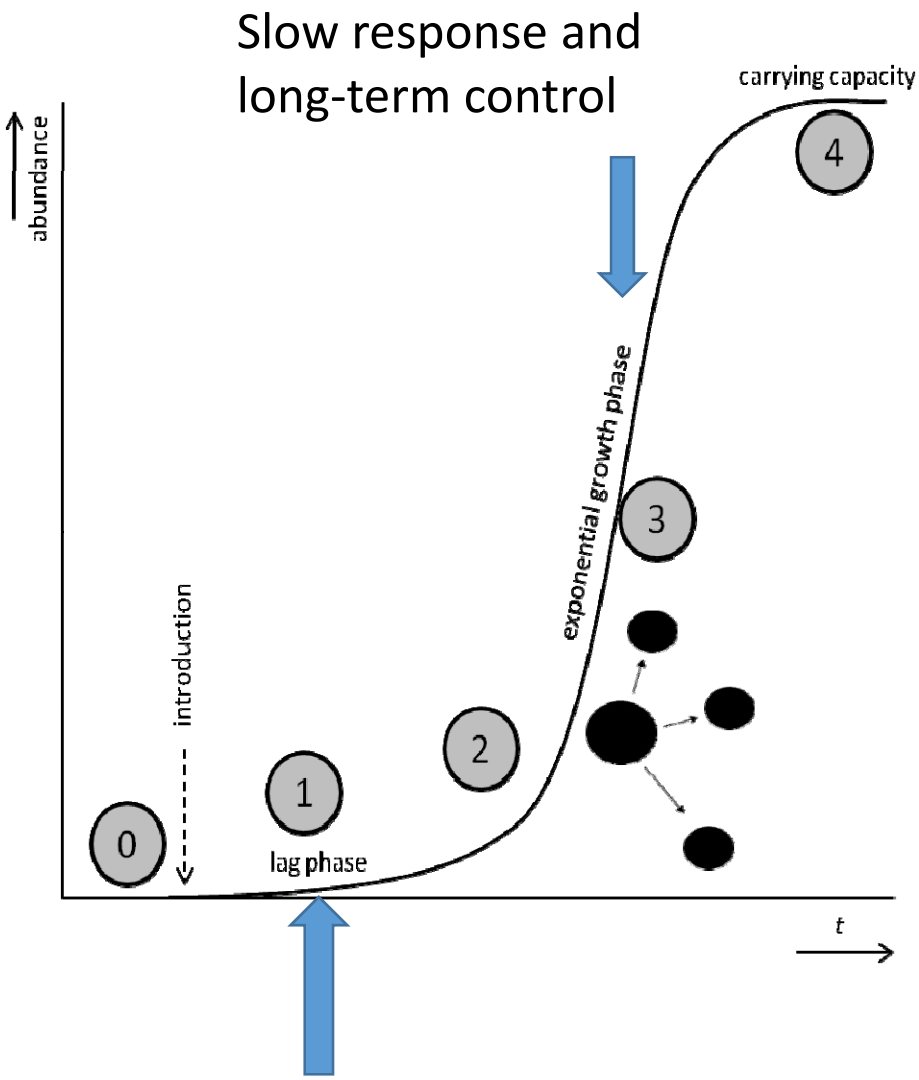
0 = absent;

1 = restricted to initial location of introduction;

2 = occurring over scattered locations;

3 = occurring over numerous locations / widespread;

4 = ubiquitous.

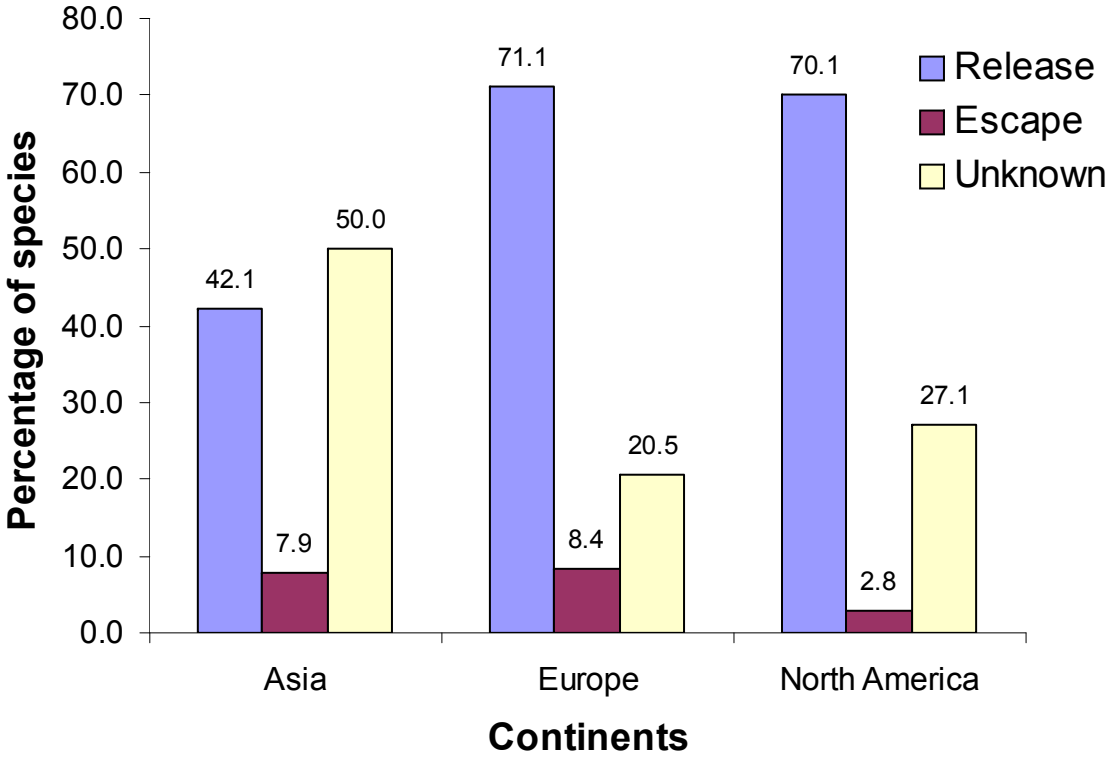


Carboneras et al. in press. J. Appl. Ecol.

What's the future?

Manage means to avoid the same mistakes!

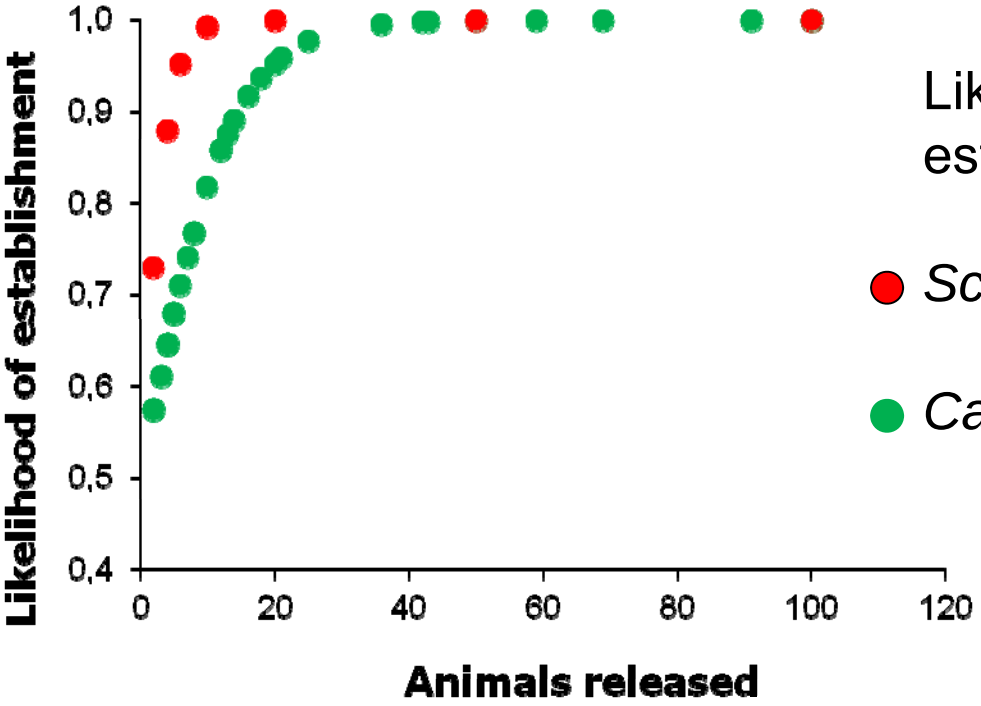
Patchways: How squirrel arrived in the new areas?



Mainly release/escape from the pet trade!

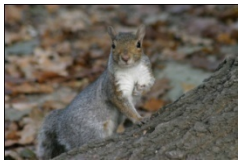
Squirrels are very successful invaders

From only few animals you could get a population!



Likelihood for a couple to establish a population:

- *Sciurus* 57%
- *Callosciurus* 73%



Likelihood of *Sciurus* and *Callosciurus* species establishment as a function of the number of animals released

Bertolino 2009. Diversity & Distribution 15: 701-708

Who is the next European invader?

Callosciurus finlaysonii

It is time for Environmental and Animal right NGOs, Researchers, Managers, Public bodies, to work together to limit the pet trade of squirrels and other species


Thank you
for your
attention!