Pallas's squirrel eradication in Belgium

Invasive species common name (Latin name)
Pallas's squirrel / red-bellied squirrel (*Callosciurus erythraeus*)

Native geography
Southern China and mainland Southeast Asia

Project name
Eradication of Pallas's squirrel from Dadizele, West Flanders (Belgium)

Project location or geographical area of conservation work
Province of West Flanders, municipality of Dadizele (Moorslede), Belgium

Lead organisation
Research Institute for Nature and Forest (INBO)

Key partners

- Agency for Nature and Forest (ANB)
- Municipality of Moorslede
- Site owner Mariënstede vzw
- Part of this work was performed and co-funded within the framework of the EU co-funded Interreg 2Seas project RINSE (Reducing the Impact of Non-Native Species in Europe) (www.rinse-europe.eu) (2012–2014), which sought to improve awareness of the threats posed by invasive species, and the methods to address them

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Map of project land area and brief description

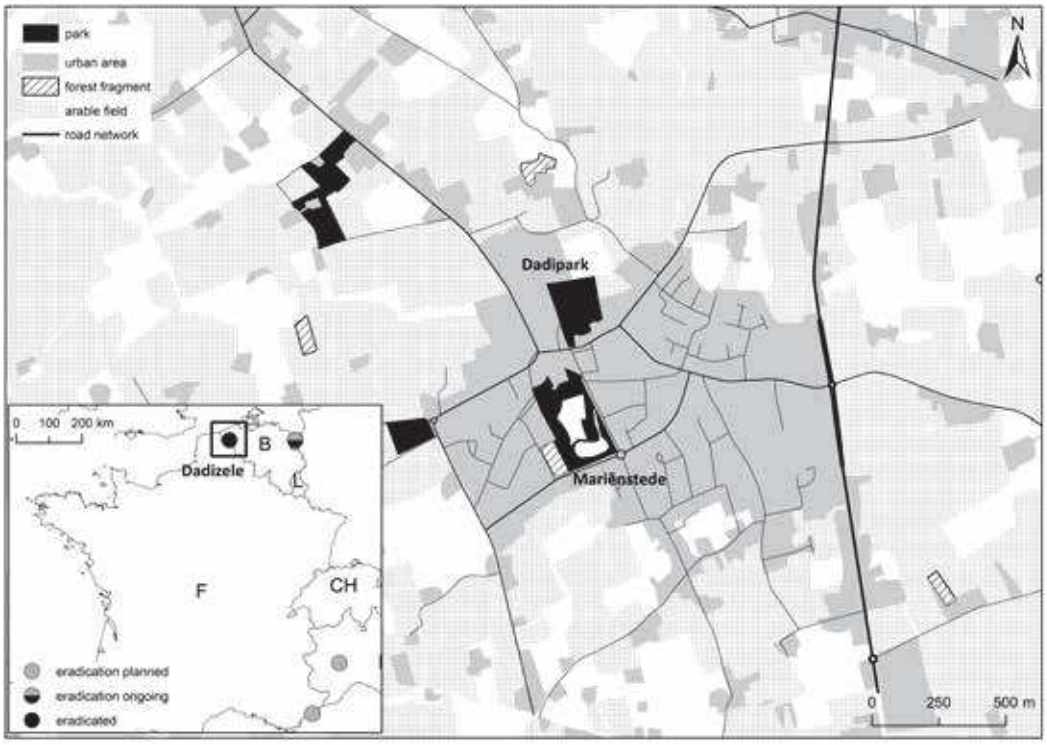

Figure 1: Pallas's squirrel eradication project area

Pallas's squirrel was successfully eradicated from Dadizele and currently the species is no longer established in the wild in Belgium.

Introduction and project background

Pallas's squirrel is a species of tree squirrel native to Asia. Like the North American eastern grey squirrel (*Sciurus carolinensis*), Pallas's squirrel can reach very high densities and outcompete native red squirrels (*Sciurus vulgaris*). The species is a known carrier of several macroparasites but their impact on native species is unknown. Tree bark stripping by this species can be severe and it causes damage in forests, parks and tree plantations. It is also notorious for gnawing cables and electrical wiring.

This invasive alien species (IAS) is established in Japan, Argentina, France and Italy, where most populations are under active control. It was historically established in Flanders and the Netherlands but was successfully eradicated.

The aim of the Dadizele project was to eradicate an established, but isolated population that probably originated from escaped individuals from an abandoned funfair park or a nearby pet shop. Outside the Park, the squirrels had very little habitat available to them, as the landscape matrix consists of arable land with very few trees. The work involved the removal of several animals present in the area using live capture trapping and wildlife cameras for surveillance. The project was run using existing capacity and resources.

The successful eradication of the Dadizele population meant that Pallas's squirrel (figure two) is currently no longer established in the wild in Belgium. Animals historically on the Belgian side in the border region with the Netherlands (Limburg), were also eradicated during the Weert eradication campaign described elsewhere in this volume.

Key project goals

- To prevent further damage to the park
- To prevent animals from colonising a larger area and to prevent any future associated damage costs
- Rapid eradication was considered the best option to achieve these goals

Description of the project activity

In 2005, bark stripping and cable gnawing were observed in a suburban park in west Flanders (northern Belgium). The damage was linked to the occurrence of Pallas's squirrels. The population most probably originated either from animals which escaped from an abandoned zoo in the nearby amusement park and/or from a nearby pet shop. To avoid further damage to ornamental trees in the park, the park manager decided to start trapping the squirrels.

Figure 2: Pallas's squirrel *(Callosciurus erythraeus)* © Andrew Hardacre Flickr 051217

Simple wire mesh live capture traps were placed near the trunks of large trees and baited with peanuts, walnuts or hazelnuts. Traps were checked daily in order to minimise the period of confinement for both target and non-target (bycatch) species. A total of 46 squirrels were caught and removed from the site during the first three months. This was an unexpectedly high number and with continued trapping the number increased from 100 in 2006 to 130 individuals by spring 2007. It was soon acknowledged that the problem had been underestimated and further action was no longer affordable for the local manager alone. Thus, regional authorities became involved. Considering potential damage, exotic status and invasive behaviour, authorities quickly agreed on action. Prior to the actions, political support was sought through a written statement of the High Council for Nature Conservation, an advisory body to the Minister of the Environment. A local contact point was set up at the municipality for communication to citizens.

By the end of spring 2008, an additional 78 were caught. After a period of 18 months without further sightings, squirrels were again reported in the park. Digital wildlife cameras were installed to detect any remaining squirrels. In successive years, the number of animals removed increased to 248 in total, and by 2011,

the last known animal was removed. Although the control started relatively quickly and the extent of the invasion was limited, the campaign still took over five years and required an investment of over €200,000 including 18 months of post-eradication surveying.

Detecting and managing spread

Project scope	
Main ways of IAS spread	Some Pallas's squirrel roadkill was reported 5km from the park, but presumably the limited natural spread recorded was because of the insular landscape context
Method of detection used	Visual searches for animals and nests Wildlife cameras including Reconyx models Bait points and baited nest boxes Liaison and interviews with local stakeholders
Detection methods considered but not used (and why)	
Methods of removal/control used	Live capture trapping with pre-baiting using simple mesh wire traps
Removal methods considered but not used (and why)	Shooting was not considered an option in the park, which was heavily used for recreation by villagers, also, this method would meet legal and practical restrictions.
Legislation in place to ensure high welfare standards	Law of 14 August 1986 on the protection and welfare of animals.

Major difficulties faced

- Initial misidentification of Pallas's squirrels as Chinese rock squirrel (*Sciurotamias davidianus*) slowed down the response
- Acquiring political support
- Lack of co-ordination, unclear mandates of different actors
- Committing sufficient human resources for trapping and keeping a constant trapping effort
- Initial lack of experience

Major lessons learned

- Eradication requires sufficient resources and ongoing monitoring
- Eradication required repeated intensive live capture trapping campaigns with intermittent periods of apparent zero-occurrence of squirrels
- A scientific approach to follow-up progress of the actions is important

Success indicators of project

- The indicator of success of the eradication programme was that no squirrels could be detected in the area anymore. There would be no sightings and no fresh signs of damage

Success of project

Measure		Confidence
Highly Successful		
Successful	X	High
Partially Successful		
Failure		

High confidence means that the assessor feels they have approximately 80% chance of the given score being correct. Medium confidence is defined as 51-79% chance of the assessor score being correct and Low confidence only 50% chance of being correct.

Reason(s) for success/failure

- We achieved all the measures required to demonstrate successful eradication of the population e.g. no prospects of recolonisation after eradication
- Response was timely as squirrel densities were low at the onset of the project (about 3 animals per hectare)
- Actions were supported by both the site manager and the local authority who communicated about them to the local community

References

- Adriaens T, Baert K, Breyne P et al. (2015) Successful eradication of a suburban Pallas's squirrel *Callosciurus erythraeus* (Pallas 1779) (Rodentia, Sciuridae) population in Flanders (northern Belgium). *Biological Invasions* 17: 2517-2526
- Adriaens T & Stuyck J (2015) *Flanders tackles tree squirrel invasion*. Newsletter European squirrel Initiative 30: 4
- Adriaens T, Verzelen Y, Pieters S, et al. (2017) Pallas' eekhoorn uitgeroeid in Dadizele (West-Vlaanderen). *De Levende Natuur* 118: 130-132
- Robertson PA, Adriaens T, Lambin X, et al. (2016) The large-scale removal of mammalian invasive alien species in Northern Europe. *Pest management science* 73: 273–279
- Online reference: https://www.ecopedia.be/project/wegvangen-van-een-gevestigde-populatie-pallas-eekhoorn (project description in Dutch)

Quantified summary data

Date commencement: The project started in 2005 and ended in 2011.
Surveillance effort in time and space: Continuous surveillance effort with traps placed when squirrels were detected and an additional 18 months of post-eradication surveying
Resources used: The trapping scheme consisted of five trapping periods with a varied number of traps deploying a minimum of 19 and a maximum of 44 (i.e. 4–9 traps per hectare). In total two, three trapper years (number of man-years of full-time trapper effort), efforts were concentrated in winter and spring. Materials and transport costs amounted to ca €50,000
Labour resource: The total costs summed up to ca. EUR 160,000
Detail of cumulative area over which these are applied: In total the area was ca. 2.7km2
Cost & Contingency funds available: Not necessary, as the population has been removed. If necessary, a new campaign can be started