

## European red squirrel (*Sciurus vulgaris*) population declined due to squirrel pox brought by the grey squirrel (*Sciurus carolinensis*) invasion

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### INTRODUCTION & AIM

The European red squirrel (*Sciurus vulgaris*) is a species of tree squirrel from the genus *Sciurus*. This specie is common throughout Eurasia, inhabiting woodlands across the continent. However, in recent decades, this native species has experienced a significant de-cline, particularly in the UK and parts of mainland Europe. The culprit behind this alarming population drop is the introduction of the grey squirrel (*Sciurus carolinensis*), an invasive species from North America. While the grey squirrel competes with the red squirrel for food and habitat, it also carries the deadly squirrel pox virus, to which it is immune. The virus has devastating effects on red squirrels, causing severe illness and high mortality rates. As a result, red squirrel populations have plummeted in regions where the grey squirrel has established itself, putting the future of this native species in jeopardy.

This work aims to present a view regarding the impacts of this disease in European red squirrel (*Sciurus vulgaris*).



Red squirrel (*Sciurus vulgaris*)

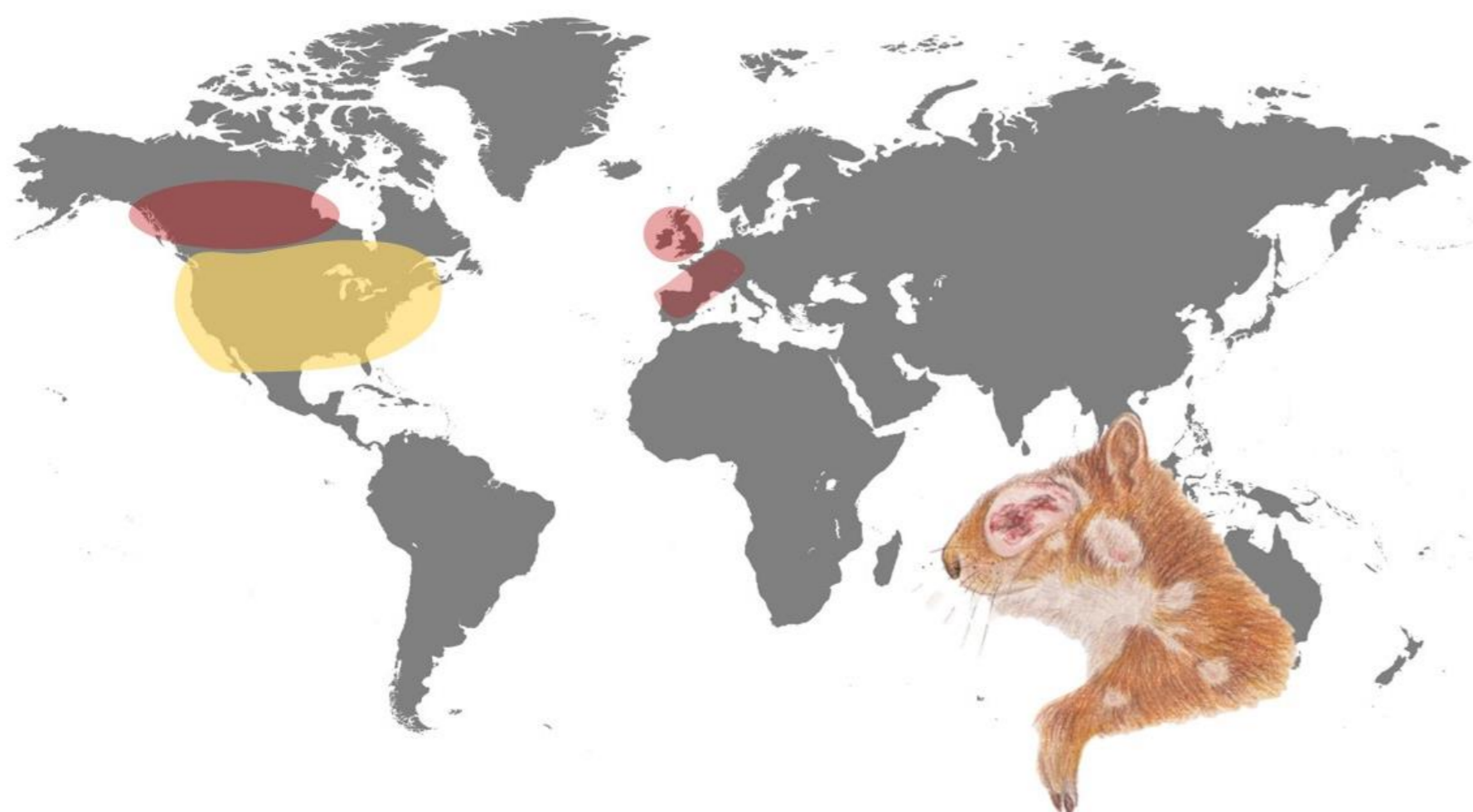


Grey squirrel (*Sciurus carolinensis*)

### PATHOGENY AND HOSTS

Squirrelpox virus (SQPV) is a poxvirus that affects the native red squirrel (*Sciurus vulgaris*), American red squirrel (*Tamiasciurus hudsonicus*) and the Eastern grey squirrel (*Sciurus carolinensis*). The virus belongs to the Poxviridae family.

Grey squirrels are asymptomatic carriers of SQPV. They spread the virus through direct contact, contaminated environments, or shared food sources, such as feeders. The virus typically enters the red squirrel's body through small cuts or abrasions, or through contact with mucous membranes (e.g., nose, mouth, eyes). Once inside, SQPV replicates in the skin cells and mucosal tissues, particularly in areas around the eyes, mouth, and genitalia.



Distribution of Squirrelpox virus (SQPV) with the regions where is invasive (red) and endemic (yellow)

### CLINICAL SIGNS



- Skin Lesions:** development of painful, ulcerative lesions on the skin, particularly around the face, eyes, and paws.
- Swelling and Scabs:** The lesions can become swollen, scab over, and ooze, making movement difficult and reducing the squirrel's ability to forage or groom.
- Secondary Infections:** Open sores make red squirrels more vulnerable to secondary bacterial infections, further weakening the animal.
- Dehydration and Starvation:** As the disease progresses, red squirrels often struggle to eat and drink, leading to dehydration and eventual starvation.

The disease is highly lethal to red squirrels, with mortality rates reaching nearly 100% within 1-2 weeks of symptom onset. Infected squirrels typically die from a combination of systemic organ failure, dehydration, and secondary infections. Grey squirrels, while carrying the virus, show no symptoms due to their evolved resistance. They serve as reservoirs for the virus, continually spreading it to vulnerable red squirrel populations.

### CONCLUSION

There is currently no specific treatment or cure for squirrelpox virus in red squirrels, and once infected, the prognosis is poor. The introduction of grey squirrels, and the subsequent spread of SQPV, has been a key factor in the decline of red squirrel populations in the UK and Europe. The combination of competition for resources and the high mortality caused by the virus has decimated many red squirrel populations.

Research is ongoing to develop a vaccine for SQPV that could be administered to red squirrels, but no widely available vaccine exists yet. Early trials have shown promise, but it is not yet implemented on a large scale.

Grey Squirrel Control: Managing grey squirrel populations in areas where red squirrels are present reduces the risk of SQPV transmission. Efforts such as culling or creating "grey-free zones" are been practiced in some areas.

### REFERENCES

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