

Grey squirrel fertility control research update – November 2023

Latest update on the research phase of the UK Squirrel Accord's (UKSA) grey squirrel fertility control programme. The Animal and Plant Health Agency (APHA) is delivering much of this current phase. The aim is to create an effective oral contraceptive and species-specific feeding hopper to offer an effective new option for grey squirrel management (see appendix for a general overview).

Oral contraceptive

Current research is focused on more effectively protecting the immunocontraceptive to ensure that once eaten it survives the digestive tract and enters the bloodstream. APHA is working with Spromex Ltd and the University of Strathclyde to use SpECs and bilosomes to protect the contraceptive formula. Studies are also testing the dosing and delivery mechanisms needed. Further work is needed to refine the oral contraceptive formula and will require an extension into 2024/25.

Work is being commissioned through Knoell, a leading service provider for worldwide registration and regulatory compliance. A full report is being compiled by Knoell to outline the registration process needed to market a version of the current oral contraceptive formula being tested. Part of their initial advice highlights the need for early identification of a suitable manufacturer.

Feeding hopper

Analysis is ongoing of the data collected during the field study on bait delivery and individual patterns of bait uptake by grey squirrels carried out in spring 2023. Grey squirrels were monitored across two seven-hectare woods in North Yorkshire. Results showed only a slight improvement in numbers of grey squirrels visiting feeders when three feeders per hectare were deployed compared to two feeders per hectare. Data were collected on numbers of visits to feeders and amount of bait taken per visit by male and female squirrels. This will help optimise delivery methods by informing potential contraceptive doses for delivery to grey squirrels in the field in different seasons using different feeder densities.

To enable the oral contraceptive to be deployed in areas containing both red and grey squirrels, a more complex feeder design is required than the simple weighted door mechanism. Field trials continue to collect data on red and grey squirrel body weights, adding to the data already collected in different locations and different seasons. This feeds into the specifications of a feeding hopper that uses a weighing platform connected to an electronic door opener. The settings would only allow the door to open for an animal with a specified minimum body weight. Analysis so far suggests that a minimum weight threshold of 450g would exclude all red squirrels while allowing access by over 90% of grey squirrels.

Manufacturers with experience of producing wildlife devices and/or developing novel wildlife/environmental devices are being contacted and quotes for development and manufacture of the grey squirrel feeder designs requested. Feeder manufacture is needed for the landscape-scale fertility control field trial included in The National Heritage Lottery Fund backed Red Squirrel Recovery Network project, which is currently in its one-year development phase.

Modelling

Currently the model created can indicate how a grey squirrel management strategy might perform but not on ways to improve it. A framework is being developed to explore options and identify optimal management – balancing effort and benefit. The extended model consider and compare alternative management scenarios and pressures that may reduce grey squirrel numbers, such as

pine marten predation and shooting. Work is also underway to produce a new national estimate for grey squirrel numbers, including seasonal fluctuations for pre- and post-breeding.

Next steps

A new contract will be drawn up with APHA to cover the extended research and development phase. The Fertility Control Project Board is exploring the length of the extension and the resources required. Development is underway of the large landscape-scale field trial that will start in 2025 in areas of Southern Scotland and Northern England. Discussions are underway on how to build on the initial [behavioural insights research](#) into public messaging to increase support for grey squirrel fertility control. Fundraising for the fertility control programme continues.

UKSA thanks everyone involved in supporting this fertility control research, which should greatly improve the protection of the red squirrels, trees and woodland ecosystems of the British Isles.

Please direct any questions to info@squirrelaccord.uk. Donations to support UKSA and the fertility control programme can be made online. Details available here: www.squirrelaccord.uk/donate.

Appendix

Established in 2015, UKSA is a partnership of 45 signatories working collaboratively to protect the UK's red squirrels and broadleaf trees from the negative impacts of introduced grey squirrels.

An important area of work is the development and delivery of a grey squirrel fertility control programme. UKSA and supporters are funding the research phase being conducted by the Animal and Plant Health Agency. The aim is to develop an oral contraceptive and species-specific feeding hopper. This should provide an effective, non-lethal and less labour-intensive option for managing a widespread invasive species.

The four phases of the grey squirrel fertility control programme are:

1. Research and development – 1-2 years remaining*
2. Landscape-scale trials – 2-3 years*
3. Testing for registration – 5-7 years*
4. Widespread availability of registered methods – 7-10 years*

* Please note, some phases will run simultaneously. The end goal is seven to ten years from 2023.

Contraceptive research is concentrated on developing an oral formulation of a mammal-specific immunocontraceptive based on the same principle of a currently-used successful injectable vaccine. The oral formulation must survive the digestive processes and stimulate the immune system via the gut. So far, laboratory research has shown positive results for a proof of contraceptive effect from a liquid bait, which induced a strong immune response in rats.

Development of a species-specific feeding hopper is important to ensure only grey squirrels access the bait that will eventually contain the oral contraceptive. Field trials of two designs are underway. The simplest option uses a weighted door and could be used for grey-only areas, but is not suitable for red-grey areas as larger red squirrels can open the door. The second design is based on an electronic weighing platform that only opens the door if the animal's weight is within a certain range. This could be used in areas with both squirrel species, as there is little overlap between red and grey squirrel weights.

A [frequently asked questions](#) document is available on our website. While webinar updates on the fertility control work can be viewed via our [YouTube channel](#). Sign up to our [mailing list](#) for news.