(Invasive) alien vertebrates

Invasive species management strategies in a One Health system

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Grey squirrel (*Sciurus carolinensis*) is an invasive species in the UK which threatens plants through bark stripping and wildlife through disease transmission and competition. Grey squirrels are also of growing relevance to human health as reservoir hosts of both *Borrelia burgdorferi*, the agent of Lyme disease, and *Ixodes ricinus*, the tick vector which feeds on a range of animal species and people. Current strategies to manage grey squirrel populations require intense trapping and/or shooting. The potential of fertility control to reduce grey squirrel populations has not been tested. While fertility control may have a slower impact on population density, it would alter the age ratio in the population to reduce numbers of juvenile squirrels which are more likely to disperse and transmit pathogens and ticks than adults. In this project, we are comparing the potential efficacy of fertility and traditional control methods in isolated woodlands in Cumbria, UK. We estimated grey squirrel and tick densities before and after three culling treatments: no cull, full traditional cull, and a simulated fertility treatment cull whereby only juvenile squirrels are removed from the population. Ticks will be tested for pathogen presence and blood meal analysis performed to assess the host species being fed upon. Based on the results we will model the effectiveness of fertility control and culling in reducing the risk of Lyme's disease.