

## Inverness College UHI Red Squirrel Project Update – February 2019

We would like to thank everybody who participated in our red squirrel research project by helping to classify the photos we uploaded to MammalWeb. We all know that red squirrel populations are under threat from the invasive grey squirrel through disease transmission and competition. As a result, the few remaining red squirrel populations (mostly to be found in Scotland) are protected under UK and Scottish legislation. Potential disturbance and/or damage to red squirrels and to their dreys (nests) is an offence and, when planning forest operations, this needs to be mitigated for. Our research aimed to find out whether nest boxes could be used as a potential mitigation measure. Specifically, we wanted to find out whether the use of nest boxes increased after forest operations, whether nest boxes would be used for breeding, and what factors influenced the uptake of nest boxes.

To do this, we placed 32 nest boxes in a woodland near Inverness, Scotland, and monitored their use with trail cameras during spring and summer 2017 and spring 2018. We had two types of boxes (insulated ones and non-insulated ones) that we placed at different heights (low, at approximately 2.5m, and high, at approximately 6m) in the trees (either Norway Spruce or Scots Pine). Thinning operations took place in May 2017.

You then helped us classify the 230,000 photos this yielded (!!!). Due to moving branches, spiderwebs and sun rays, many of these photos didn't show any animals on them (we knew some of the cameras had failed in this way, so we went through photos from those cameras ourselves). We only saw animals on 3.9% (8,877 photos) of the photos with 0.8% (1,773 photos) of these being red squirrels. Other animals that loved visiting our nest boxes included great tits, great spotted woodpecker, tawny owls and wood mouse (and the occasional human!).

The timing of the forest operations (end of May) coincided with the spring/summer divide. We did find an increased uptake of nest boxes after the forest operations or in summer compared to spring. This was mainly due to a sharp increase of nest box use in August, a few months after the forest operations. Around July/August time, juveniles born during the first (spring) litter will be moving from their breeding drey in search of a home range where they can settle. Rather than a direct response to forest operations, it seems more likely that the increase in nest box use was due to this juvenile dispersal. This would also explain why we found higher use of nest boxes placed low in Scots pine, where food availability was lower than in areas with Norway spruce; juvenile red squirrels might have needed to inhabit these 'sub-optimal' habitats, given the high density of red squirrels at the study site, and until they find a chance to move to higher quality habitats. We didn't find any evidence of the nest boxes being used for breeding.

We conclude that nest boxes could be used to mitigate for forest operations, but more so to increase chances of juvenile survival (and, thereby, breeding success) by providing temporary shelter, rather than by increasing breeding activity or adult survival. However, how nest boxes are used when all red squirrel habitat is lost, i.e. under clear-fell situations rather than thinning operations, remains to be investigated.

The nest box study was part of a larger research programme investigating the impact of forest operations on red squirrels that we are carrying out in close collaboration with Forest Enterprise Scotland. So far we have only looked at the impact of **thinning** operations on drey use, home range, survival, population density and breeding activity and we found that thinning operations did not seem to have a negative impact on any of these. If you're interested in learning more about the research programme and the results, go to <http://www.redsquirrelsunited.org.uk/news/> to watch a

webinar I recently gave for Red Squirrels United. The next step of our research programme will be to investigate the impact of clear-fell operations on red squirrels. We are particularly interested to learn how different levels of isolation (of the area to be clear-felled) impacts on red squirrel survival and, thereby, to learn more about dispersal barriers.

Alongside this, we are reviewing the policies in place to protect red squirrels in Scotland. In 2017, Forest Enterprise Scotland (FES) was provided with a “single license” from Scottish Natural Heritage (SNH) to cover any forest management activities that may affect red squirrels (and their dreys) on the national forest estate (NFE). FES and SNH have produced a guidance document that details the processes that FES follows and the mitigation packs to be used as conditions of this licence.

Inverness College UHI will review all 77 cases in which the single license was used during the pilot year (2017/2018) to evaluate the single license’s practicality, its strengths and challenges, and to review the process and communications related to it. In light of this, the current guidance document will be reviewed and, if needed, we will make recommendations for amendments. This will ensure that we have the best possible management practices for red squirrel conservation in Scotland.

I’m always happy to answer any questions or suggestions you may have –

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On behalf of the red squirrels and our team, thank you very much for your support.

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