



Westmorland Red Squirrels

making the future safe for our red squirrels

Newsletter

Issue 14, Spring 2017

With the start of the trapping season upon us and the prospect of warmer weather on the way, Jessica Hall's article serves as a timely reminder to be aware of the danger of tick bites and the risk of Lyme disease, not just for those involved in red squirrel conservation but for anyone out walking or working in the countryside. We look forward to hearing the further results of Jessica's research as it progresses.

If you're new to red squirrels, all the various organisations involved in red squirrel conservation must seem baffling – even those of us who've been involved for many years find it hard to keep up with developments. The **UK Squirrel Accord** is the most recent organisation at the national, policy-making level and we're pleased to report here that the voluntary groups are in the process of gaining recognition in that forum. Regionally, the **Red Squirrels Northern England** (RSNE) project will still be processing our cull and sightings data and continuing their monitoring programme, but their capacity to provide practical conservation help is now very much reduced owing to a lack of funding. **Red Squirrels United** is the new UK-wide red squirrel project that you might hear about in the media, but unfortunately for us the project doesn't specifically include Cumbria. It's therefore more important than ever for us to work closely with our fellow voluntary groups through our membership of **Northern Red Squirrels Cumbria** in order to keep Cumbria's red squirrels high on the conservation agenda and in the public eye.

Once again I'd like to thank all you who continue to give your very generous financial and practical support to keep our red squirrels thriving in the Westmorland Red Squirrels' area.

Geoff Hetherington, Chairman

Arnside & Silverdale

Most major landowners have now agreed to trap or shoot greys on their land, including Leighton Hall, Dallam Tower, Levens Hall and Dalton Hall. The National Trust, Woodland Trust, Cumbria and Lancashire Wildlife Trusts, RSPB and Natural England are on board too.

We now have 150 traps deployed and regularly monitored by 45 trained volunteers, and in 2017 we plan to recruit more volunteers and engage contract trappers. Our focus will be west of the railway and along the estuary towards Beetham and Milnthorpe, creating a corridor for reds to re-colonise from known populations around Burton in Kendal and Killington, and just over the Kent Estuary in Meathop, Witherslack and Levens. These genetic reservoirs can seep into Arnside and Silverdale if we create the channels. All this is helped by financial support from Holgates and

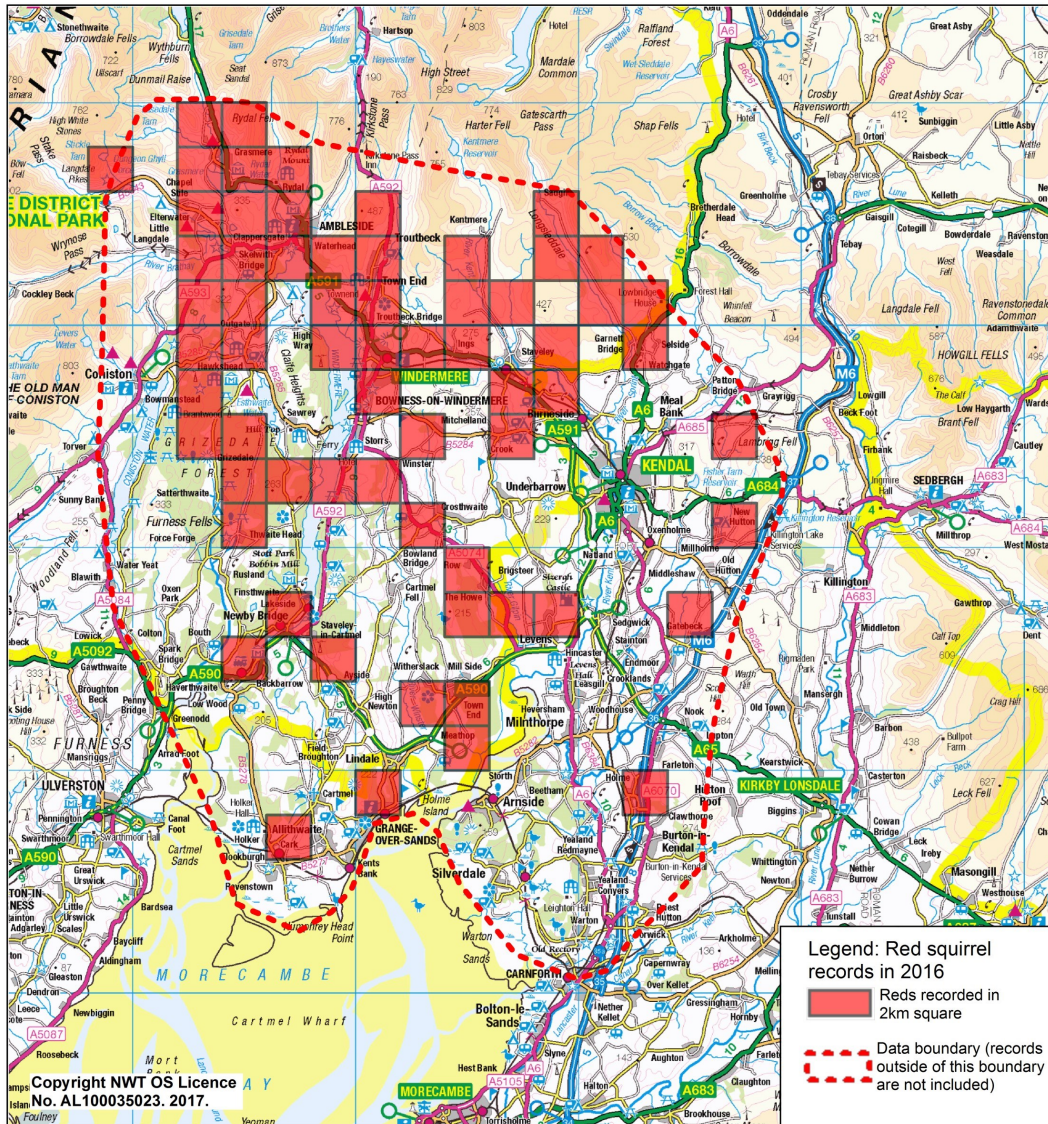


Arnside Knott Wood

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Beetham Caravan Parks, the Landscape Trust's AONB grant fund, The Barnes Charitable Trust and the Bittern Countryside Community Interest Company.

2016 red sightings map



The 2km squares marked in red show where red squirrels were reported in Westmorland's and Grasmere's areas in 2016.

2016 shows a slightly better red range than in 2015, with reds detected in 65 tetrads, compared with 60 in 2015. Missing from 2016 are reports of reds from the Coniston area, plus there's a noticeable gap around Claife Heights.

Our thanks to all those who have submitted their red sightings, and to RSNE for producing the map for us.

UK Squirrel Accord

Our Secretary, Bob Cartwright, attended the annual meeting of the UK Squirrel Accord in London at the end of January at the invitation of Adrian Vass, the Accord's Manager. Established by HRH Prince Charles, the Accord is the UK's main forum for discussing policy and practice with representatives from across the landowning community, the woodland and forestry industry and the major conservation organisations. There were excellent presentations on the Red Squirrels United project, on research into fertility control as a non-lethal method of grey

squirrel control to sit alongside trapping and shooting in an integrated squirrel control programme, and an explanation of the rigorous testing programme that is required before kill traps are licensed for use in the UK.

Northern Red Squirrels, the umbrella association of voluntary red squirrel groups across the north of England, is to be invited to become a signatory to the UK Squirrel Accord, which reflects the high

regard in which our contribution is held. The invitation will be considered by the constituent red squirrel group members over the next few months.



Discounts

- **WCF Pet and Equestrian** in Kendal is one of our latest corporate sponsors. They now generously offer a **10 per cent discount** to Westmorland Red Squirrels' members on all goods and have a wide range of squirrel-related products from squirrel-proof feeders to bait and traps. You can find them on the Mintsfeet Industrial Estate off the Shap Road.



- One of our members, Gary Tyson, works at **Malmo Guns** in Lancaster and has arranged a **5 per cent discount** on ammunition on presentation of proof of Westmorland Red Squirrels membership.

Rusland's Reds

Over the winter this project has swung into action thanks to the enthusiasm of the local community. Many of the major landowners are already on board and following a well-attended meeting in Bouth many local residents now have tester feeders, cameras and traps to begin the process of making space for reds to survive and thrive. The NPA's Rusland Horizon's apprentices are now actively engaged and a meeting with the Forestry Commission's staff at Grizedale has also secured their input.

Red sightings continue to be reported and there is every reason to think these will increase as we engage more folk. We also hope that some funding from the Forestry Commission will allow squirrel management to continue to the north of the

Rusland's Reds project area so that we maintain a buffer between the greys to the south and red strongholds around Skelwith, Rydal and Grasmere.



Dave Marshall speaking at the Bouth meeting



Renewal of NPA agreements

Licences to manage squirrels on properties owned by the Lake District National Park Authority offer us an important way of suppressing grey numbers, restoring red squirrel populations and promoting the message that red squirrel conservation requires a collaborative approach. Our annual licences have again been renewed for control on all of the Authority's properties in our area and our efforts were rewarded last year when reds returned to the Visitor Centre at Brockhole on Windermere. As a direct result, the Authority restored the bird hide,

the best place to spot returning reds, and celebrated by carving squirrel motifs in the door of the hide! The Authority is actively disposing of some of its property portfolio. Yewbarrow Woods in Longsleddale was sold in 2016 and Blue Hills and Red Bank Woods, Ambleside are on the market. Nonetheless, it remains a significant landowner and a valued partner in publicising the importance of red squirrels to the National Park's biodiversity. Brockhole also hosts a large interpretative panel, hosts our collecting boxes in the shop and café and retails squirrel-related items from which we receive a commission.

Troutbeck born and **bred**

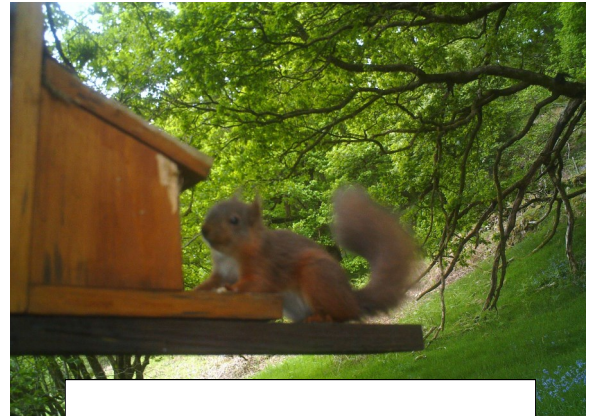
There were two litters of these charming baby red squirrels in the Troutbeck valley last year, and already this year reds are being spotted throughout the length of the valley.

2014 marked the turning point for the return of the

reds to Troutbeck—all thanks to the dedication and determination of our volunteers to remove the greys and at the same time make sure the returning reds didn't go hungry. The rewards speak for themselves.



11th May 2016



25th May 2016



25th October 2016



6th November 2016



Kentmere—caught on camera on January 4th, 2017

Red squirrel sightings—2017

We're already recording red squirrel sightings for 2017, including from Skelwith Bridge, Rydal, Troutbeck, Knipe Fold and Kentmere. The Staveley-in-Cartmel area seems to be a red hot-spot at the moment, and there's even a red been seen by the Rugby Club in Ambleside.

Please help us by reporting your red squirrel sightings and by encouraging others to do so via our website:

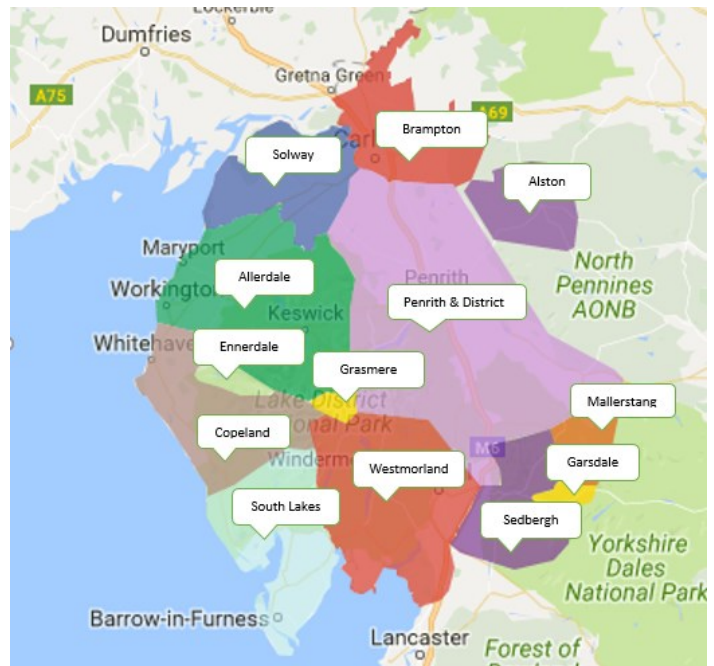
<http://westmorlandredsquirrels.org.uk/sightings>

Northern Red Squirrels Cumbria

Northern Red Squirrels is an umbrella group created to unite all the independent voluntary groups working to save our red squirrels in the North of England. **Northern Red Squirrels Cumbria** is made up of the 13 voluntary groups within Cumbria, as shown on the map to the right.

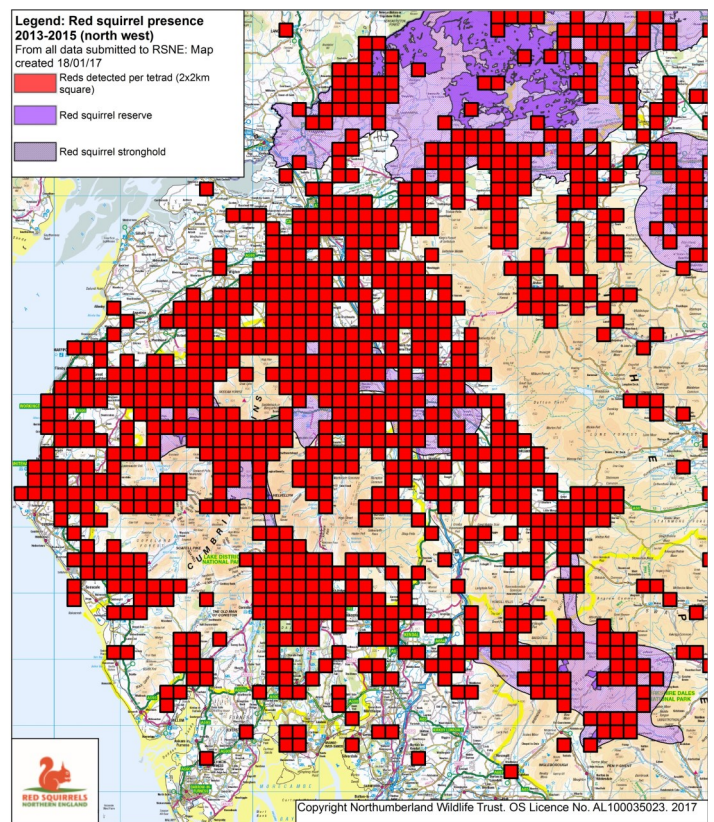
Our Chairman, Geoff Hetherington, was elected Chairman of Northern Red Squirrels Cumbria at their AGM in November last year. Geoff is committed to ensuring that all Cumbria's red squirrel groups work together to secure a viable future for our red squirrels. Perhaps the way we work in Westmorland, with several enthusiastic area sub-groups, offers a model for other areas of Cumbria? Over the year, Geoff wants to build even closer relationships with the organisations that are critical to red squirrel success including Cumbria Wildlife Trust, the Forestry Commission, National Trust and others, but crucially with landowners and the local community. He will also work with our friends in **Northern Red Squirrels Northumberland** to secure a common voice from the region.

This map to the right is produced by Red Squirrels Northern England and combines red sightings data in 2km tetrads for years 2013 to 2015. Cumbria's voluntary groups have worked continuously over the years to keep grey squirrel numbers under control, resulting in Cumbria's red squirrel populations having a remarkable range and connectivity considering their endangered status. There is, of course, still much work to be done, but with the prospect of science lending a helping hand in the form of a contraceptive for greys, there are good reasons to be optimistic for the long-term future of Cumbria's red squirrels.



Map showing the 13 voluntary red squirrel groups in Cumbria.

See: www.northernredsquirrels.org.uk/cumbria-groups



Can you help?

Could you give us regular updates on the squirrel situation around where you live—both red and grey? Or would you be able to put a notice up for us on your village notice board? These are just two of the ways you could help us to protect our red

squirrels—there are many other ways you can help to make a difference.

To find out more, please contact our Secretary, Bob Cartwright:

Tel: 01539 561514

Email: secretary@westmorlandredsquirrels.org.uk

The role of grey squirrels in the ecology of Lyme disease by Jessica Hall and Richard Birtles

Lyme disease is one of the fastest emerging infectious diseases in the UK, as demonstrated by a ten-fold rise in the number of reported cases over the last decade. Lyme disease is caused by a bacterium called *Borrelia burgdorferi*, which is transmitted via the bite of the deer (sheep) tick (*Ixodes ricinus*). Ticks are spider-like blood-feeding arthropods that are found over much of the UK, but there are “hotspots” such as Exmoor, the South Downs, the New Forest, the North Yorkshire Moors, Cumbria and the Scottish Highlands. Ticks cannot fly and are not very mobile; they live close to the ground and climb up vegetation to “quest”, which means waiting in ambush for an animal to pass so that they can latch on and feed. Ticks can live for up to three years, but feed only 2 or 3 times in their lifetime to obtain the energy they need to moult into their next life stage or lay eggs. Ticks are very small, particularly the immature life stages (larvae and nymphs); it is hard to see either with the naked eye when they first attach to you (see picture), although they get bigger as they take on blood as they feed. Ticks are very dependent on moisture, so tend to choose warm and moist areas of the body as feeding sites. As ticks begin to feed, they inject local anaesthetics into the skin so you don't feel their bite in the same way you would a midge or a mosquito. Thus, it's very important that you check your entire body carefully if you're concerned about tick bites.

Lyme disease is a zoonosis, which means that it is a disease acquired by humans from other animals. *B. burgdorferi* infects a range of non-human animals including rodents, some larger terrestrial mammals and birds. Although these animals are infected via tick-bite in the same way as humans, they do not usually develop Lyme disease, but rather remain infected asymptotically thereby becoming natural “reservoirs” so that ticks subsequently feeding on

Top Tips For Avoiding Ticks

- Wear long trousers, tucked into socks and long-sleeved shirts.
- Light coloured clothing will allow you to spot ticks and brush them off.
- Check yourself and your pet at the end of a walk or outdoor activity.
- Keep up to date with tick treatment for pets
- Stick to the paths

them acquire the bacterium. However not all wild animals act as reservoirs; some, such a deer, are not susceptible to infection at all. This means that the relative abundance of different wild animal species in a woodland community is likely to have a significant impact on the amount of *B. burgdorferi* present and thus on the Lyme disease risk posed by a particular woodland.

Grey squirrels were introduced into the UK about 150 years ago and have spread throughout most of the country. Their potential as *B. burgdorferi* reservoirs and hence their impact on the Lyme disease risk of the woodlands they now inhabit has not yet been properly assessed. This is the aim of our project. To address this aim we've been working with The Forestry Commission and wildlife expert Dave Marshall who have helped us obtain carcasses of grey squirrels culled as part of efforts to protect saplings and



The three life stages of *Ixodes ricinus*. (From top to bottom) a larva, a nymph and an adult female.

Photo taken by A. Gbobaniyi

local red squirrel populations across Southern Cumbria. Dave kindly put each squirrel in its own plastic bag as soon as it was dead, then bags went into the freezer. This meant the squirrels and their ticks were perfectly preserved for our studies.



**A squirrel being checked for ticks
under a dissecting microscope.
Photo taken by R. Birtles**

Firstly, we explored whether the squirrels were infested with ticks and, if so, which species were present. Initially we tested 109 squirrels taken from two sites (Arklid Woods and Grizedale Forest). Once we'd thawed out a squirrel, we determined its gender, weight and dimensions then carefully removed and counted any attached ticks. We used a combination of combing and close inspection of the groin, face and "arm-pits" (places where ticks are known to preferentially feed) to be as thorough as possible. We then looked at the ticks using a microscope to determine their identity. We found that most squirrels were indeed infested with ticks, with some individuals carrying a very high burden of about 100 ticks. We also confirmed that all ticks were *I. ricinus*.

Next, we determined if squirrels were infected with *B. burgdorferi* or not. To do this we took punch biopsies from their ears, extracted DNA from these biopsies and used ultra-sensitive molecular methods to detect the specific presence of *B. burgdorferi* DNA in each extract. Of the 109 squirrels we initially tested, we found *B. burgdorferi* DNA in 17 (16%). Taken together, these results

provide good evidence that grey squirrels are indeed reservoirs for *B. burgdorferi* in southern Cumbria, and that infections are transmitted between them by *I. ricinus*.

In the next stage of the project we are aiming to determine the relative importance of grey squirrels as reservoirs for *B. burgdorferi* – are squirrels key to the bacterium's presence in a particular woodland or just bit-part players? This is very hard to do because although we now have some idea about the proportion of squirrels that have ticks on them, and how many ticks, we don't know the overall size of the tick population in a woodland. However, we hope to overcome this hurdle by firstly fingerprinting the *B. burgdorferi* strains infecting squirrels then testing questing ticks to see how common these squirrel-associated fingerprints are. If lots of the *B. burgdorferi* strains in questing ticks possess the squirrel-associated fingerprint, this tells us that squirrels are important reservoirs for the bacterium.



**Blanket dragging technique.
Photo taken by R. Birtles**

So what? Well, if squirrels are important reservoirs, removing them may reduce the prevalence of *B. burgdorferi* in questing ticks thereby reducing the risk of humans being bitten by an infected tick; another reason for getting rid of grey squirrels! However, although the potential of the project looks great on paper, we've still a long way to go before we can claim any real success and there are lots of "ifs and buts" we will need to address beforehand. Over the last few months we've extended our survey of squirrels and we've now tested an extra 200 or so from Foulshaw Moss, Eggerslack Woods, Lakeside, Chapel House Woods and Gummer's How. We have also collected over

2000 questing ticks from across the region. We are still in the process of testing these samples but hope to complete the study later this year.

This study is part of a bigger project looking into the ecologies of tick-borne diseases in South Cumbria that embraces infections in livestock, domestic animals, people and the environment. We are setting up stalls at the Hawkshead (22nd August 2017) and Rusland (19th August 2017) country shows where we hope to share our research to the local community. Hope to see you there!

We would like to thank Dave Marshall for supplying us with squirrels and knowledge of the local area,

The Forestry Commission for access to the land and all the student "volunteers" at the University of Salford who have helped us collect the ticks.

Jess Hall is pursuing a PhD at the University of Salford. Her research is focused on better understanding the public health threat of tick-borne pathogens, in particular *B. burgdorferi*. At Salford University there is a wider group that are researching tick-borne diseases in wildlife, people, companion animals and livestock.

Glossary

Borrelia burgdorferi – the bacterium that causes Lyme disease

Ixodes ricinus – The sheep or deer tick that is abundant in the UK

Questing – Ticks that are waiting in the vegetation for an animal to pass by.

Reservoir host – Animals that carry the bacteria but do not suffer from the disease

Zoonotic – A disease that is mainly in animals but can pass to humans

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Enquiries to Bob Bradley. Tel: 015395 52340
Email: nestbox@westmorlandredsquirrels.org.uk



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