

MOURNE HERITAGE TRUST



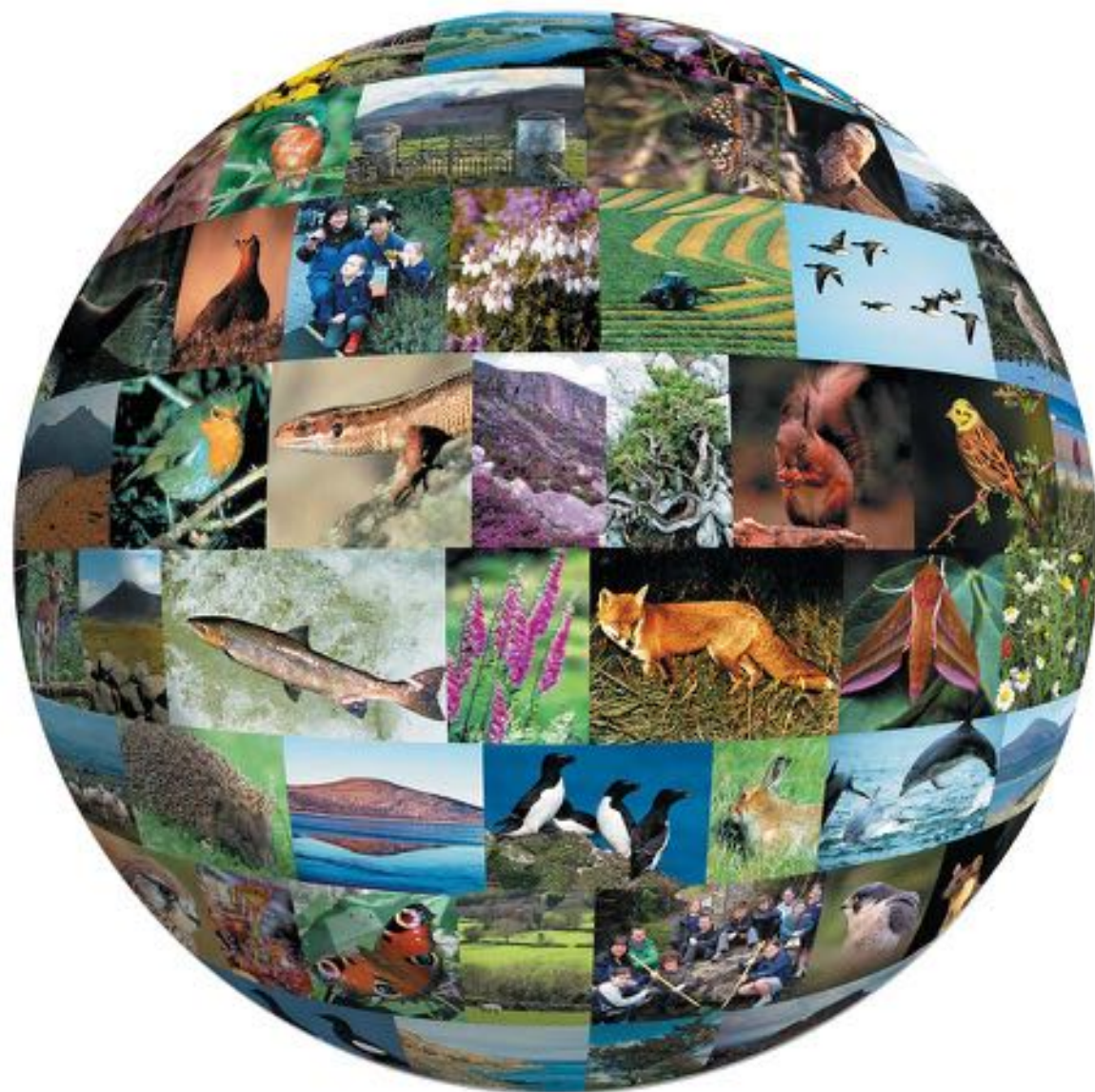
Tel. 028 4372 4059  
Email: mht@mourne.co.uk  
Web: www.mournelive.com

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Written by  
Tollymore Red Squirrel Group  
and Mourne Heritage Trust



With contributions by  
Forest Service



# MOURNE

Area of Outstanding Natural Beauty

## SPECIES DOCUMENT

# Red Squirrel Conservation Handbook

Handbook



Funded by:



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### Introduction to Red Squirrel Conservation

*Foreword by Anne McComb,  
Chair of Tollymore Red Squirrel Group*

Tollymore Red Squirrel Group was formed in 2004 by volunteers concerned about the decreasing population of red squirrels in Tollymore Forest Park. Our experience since then has inspired us, with the help of Mourne Heritage Trust, to produce this handbook as a reference for other groups concerned about red squirrel conservation. The work the group does is dependent on our partnership with DARDNI Forest Service (FS) the landowner of the forests in which we work.

Red squirrels have been recorded in Tollymore since 1880, grey squirrels arrived there in the mid 1990s. As the numbers of greys increased FS began to cull them to prevent tree damage. In early 2004 it could be seen that grey numbers were still increasing, while red numbers continued to decline. Something drastic would have to be done to save the red squirrel. Tollymore Red Squirrel Group was formed including FS staff, and was later joined by Mourne Heritage Trust.

Having sought advice and following much discussion it was decided the only way to save the red squirrels in Tollymore Park was to increase both the culling of the greys and the supplementary feeding of the reds.

FS increased the culling and permitted the setting up of red squirrel supplementary feeders in the park. They also provided the food and cleaned the feeders, while the volunteers filled and maintained them and monitored the squirrel populations. The group started off with 2 feeders, and, having grown in confidence and numbers today look after 16 feeders in Tollymore Park and outlying woods.

A responsibility we take very seriously is education about the plight of the red squirrel. We hold red squirrel days in local forests and at Belfast Zoo, and along with FS have devised red squirrel education programmes for primary and secondary schools. We also liaise with Councils and companies wanting to conserve red squirrels on their property, offer advice to any red squirrel groups starting out, and play an active part in the Northern Ireland Red Squirrel Forum.

Future plans are to continue to conserve the red squirrels in Tollymore Forest Park, to become a registered charity in order to ensure the sustainability of the group and to continue to look for ways to improve our methods of red squirrel conservation.

We hope you find this handbook a useful resource to aid you in conserving red squirrels and encourage you to contact us if we can help in any way.

### History of Red Squirrels in Ireland



The red squirrel is a small, charismatic mammal that depends on woodlands to live, eat and breed. Being dependent on woodland habitat, its population has fluctuated depending on woodland cover within Ireland. It is suspected that red squirrels have existed in Ireland since woodland became established after the end of the ice age around 10,000 years ago. On several occasions within the past 400 years, new stocks of red squirrels were introduced from the UK and the continent when the population of red squirrels dropped dramatically due to deforestation and hunting of the squirrel for its fur.

The arrival of the American grey squirrel at Co Longford in 1911 signified the end of the red squirrels dominance within deciduous woodland in Ireland. Greys are bigger, bolder, stronger and less specialised

than the red, able to make better use of unripe food sources such as acorns and hazelnuts. Grey squirrels' young are born earlier in the year, and greys are able to produce up to three litters a year, with up to 6 kittens in each. Red squirrels usually have only one and occasionally two litters a year of between 2-4 kittens. Their ability to breed is dependent on body weight and some years red squirrels are simply not in good enough condition to produce young.

This has given grey squirrels a distinct advantage over the more specialised, timid red, and over the past 100 years greys have steadily expanded their range, pushing the red squirrel out from established colonies. Reds are proven to do better than grey squirrels in coniferous woodland, and current strongholds are within areas of these plantations. The grey squirrel is predominantly a ground feeder. In coniferous woodland the tree seeds in the cones are high in the canopy and the red squirrel, a more aerial species, feeds mostly in the canopy. So it is no surprise that the red squirrels' current strongholds are within areas dominated by conifer plantations.

Grey squirrels are able to quickly replace red squirrels in the woodland environment within about 5-15 years of arriving, depending on the health and strength of the red squirrel population in the area. How grey squirrels do this is not entirely proven, but it is suspected that the main contributing factors are that they:

- Are able to better utilise and digest large tree seeds, e.g. hazelnuts and acorns, even when unripe

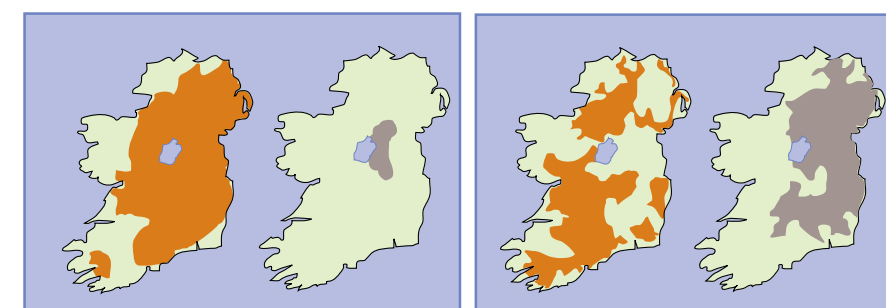
- Have the ability to produce larger litters, earlier in the year and more frequently than the red squirrel
- Are carriers of the squirrel pox virus which has no effect on them but is deadly to the red squirrel

*Please see page 11 for more information on squirrel pox.*



Grey squirrel

**We now face the possibility that red squirrels could disappear completely from Irish woodland if there is no human intervention. If nothing is done then at the current rate of expansion the red squirrel will have disappeared from Ireland by the middle of the 21st century. If Ireland were to experience a serious outbreak of squirrel pox, as has happened in parts of the UK, then it may be only a matter of decades before the red is gone forever.**



Red/grey squirrel distribution in the 1960s Red/grey squirrel distribution in 2007

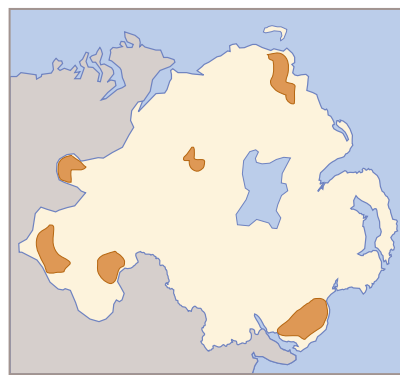
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## Red Squirrel Action Plans, Forums and Refuges

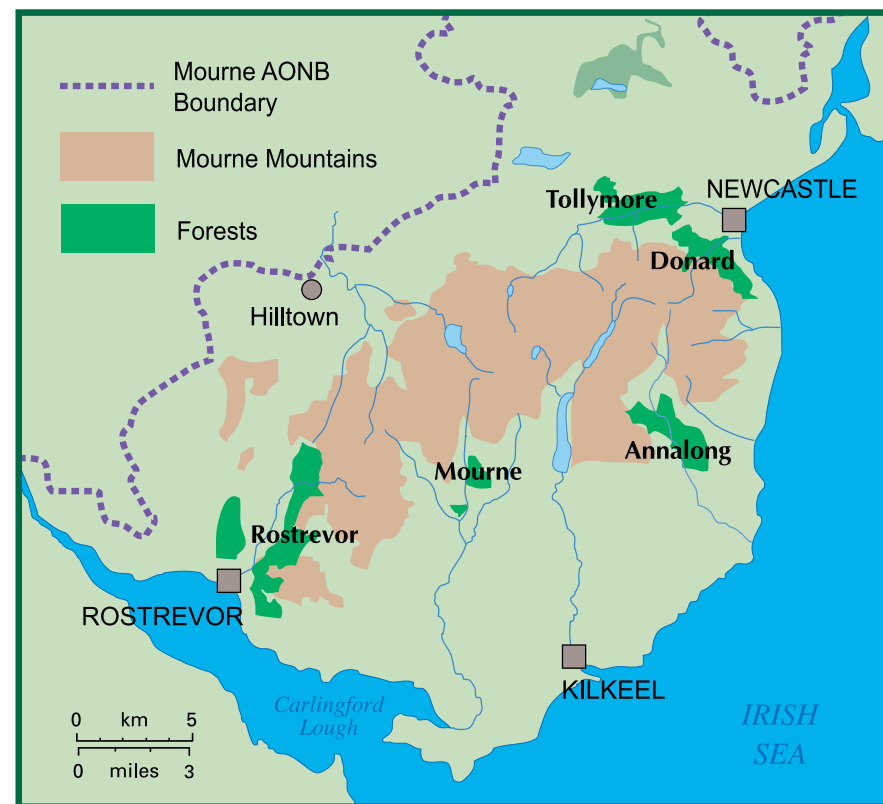
The red squirrel was identified as a species requiring conservation action in a draft list of Northern Ireland (NI) priority species in 1999, developed by the Northern Ireland Environment Agency (NIEA) and the Northern Ireland Biodiversity Group (NIBG). FS, the landowner and manager of Tollymore Forest Park and indeed most of the large conifer forests throughout NI, has been the partner lead agency to NIEA in taking forward action on red squirrels. These include the development of the first Red Squirrel Action Plan<sup>1</sup> for NI in 2000 and the All-Ireland Red Squirrel Action Plan published in 2008<sup>2</sup>. After a hiatus of some three years, the Northern Ireland Squirrel Forum<sup>3</sup> met in December 2009 and it is hoped that this Forum, now encompassing squirrel groups as well as experts from government, NGOs and research centres, will take



Proposed RSPAs in NI

the practical steps needed in order to ensure the ongoing survival of the red squirrel in NI.

One of the most important aspirations of the 2000 Action Plan was to develop Red Squirrel Preferred Areas (RSPAs) throughout the province. A RSPA was defined as "woodland which is managed to offer a long-term refuge for red squirrels. Each preferred area will comprise of a core area surrounded by a buffer zone"<sup>4</sup>. The RSPAs definition was based on limited



The forests in a proposed South Down RSPA

<sup>1</sup> [http://www.ni-environment.gov.uk/uk\\_stgy\\_red\\_squirrel\\_conservati.pdf](http://www.ni-environment.gov.uk/uk_stgy_red_squirrel_conservati.pdf)

<sup>2</sup> [http://www.ni-environment.gov.uk/all-ireland\\_red\\_squirrel\\_sap\\_web\\_version\\_may\\_08~changed~final\\_2\\_-3.pdf](http://www.ni-environment.gov.uk/all-ireland_red_squirrel_sap_web_version_may_08~changed~final_2_-3.pdf)

<sup>3</sup> [http://www.ni-environment.gov.uk/biodiversity/northern\\_ireland\\_squirrel\\_forum.htm](http://www.ni-environment.gov.uk/biodiversity/northern_ireland_squirrel_forum.htm)

<sup>4</sup> UK Strategy for Red Squirrel Conservation – Action Plan for Northern Ireland, Page 7

Currently there is one active red squirrel conservation group working within Tollymore Forest Park and its outlying woodlands. The establishment of red squirrel conservation groups to the west and south are vital in order to ensure the future survival of the red squirrel in South Down. This would be a local priority, and we would welcome any enquiries from local groups or individuals who would like to get involved.

data and tended to be set up in areas dominated by conifer plantations where red squirrels were widespread and where greys were absent or largely absent.

The All-Ireland Action Plan includes an action to identify RSPAs which meet specific criteria. It is possible that the large conifer plantations or Forest Management Units (FMUs) of Tollymore, Donard, Mourne, Annalong and Rostrevor consisting of some 2378 hectares of woodland, could form the nucleus of a revised RSPA in South Down. Grey squirrel control will be essential to sustain populations of red squirrels within these woodlands because of the widespread occurrence of large seeded broadleaf trees such as oak and beech. Forest management plans for forests lying within a revised RSPA can be expected to incorporate conservation measures to protect the red squirrel.

Here in South Down, the Mourne Mountains and the sea form a natural barrier to grey squirrel incursions, and much of the habitat surrounding these FMUs consist of bog and heath which also form a natural barrier to grey squirrels. This means that the area is considered particularly vulnerable to grey squirrel incursions from the north but is relatively well protected from the other directions. However, grey squirrel incursions have already taken place in the Annalong valley, Narrow Water and most recently Rostrevor forests.

## Conservation of Red Squirrels in Tollymore Forest Park - Lessons Learnt

The success of red squirrel conservation in Tollymore Forest Park is due to a close working relationship between FS and the Tollymore Red Squirrel Group (TRSG). Without both parties working together with a united goal and sharing their experiences and skills, the area would be too large and the task too great to make progress.

Moreover, only through being out in the woodlands and watching the red squirrels will you really understand their habits, favoured areas and favoured foods in a particular wood during the different seasons.

In the following sections we provide further guidance on the key elements of red squirrel conservation.

### Survey

It is essential to use recommended survey methods to gather a baseline of information in any area before carrying out squirrel conservation. It is then possible to monitor the results of your work over time and to help determine how successful your conservation efforts are. The results of your survey and future monitoring will help gather support for your project, identify areas that may need development, (e.g. increasing numbers of feeders) and also provide support for securing funding.

In 2004, before the supplementary feeding and grey squirrel control was augmented in Tollymore Forest Park, a Queen's University Masters student carried out a survey and recorded 11 red squirrels and 24 greys within the forest. In 2008 TRSG were able to replicate this study, showing a ten fold increase in red squirrels to 103 and a decrease in grey squirrels to just 3. *For more information on squirrel monitoring please see page 5.*

### Forest Management Plans

Forest Service has developed detailed harvesting and forest redesign plans for Tollymore Forest Park and other nearby forests under its management. These are long-term plans which are



Tollymore Forest Park

based on giving due consideration to the forest as a whole, before taking decisions on where to fell and the type of tree species to be replanted. The plans feature retention of trees for their environmental benefit beyond the age FS normally adopts. These are likely to consist of species favourable to red squirrels particularly if the forest lies within a RSPA. These plans have been developed with input from TRSG, which through the supplementary feeding programme and additional survey and monitoring has developed a detailed understanding of the areas most widely used by red squirrels within Tollymore Forest Park.

We would encourage groups to engage with local FS staff to help develop similar plans for other woodlands. FS reviews its management plans for each forest at five year intervals and local consultations form an integral part of this process. This is the most opportune time to contribute to the plans and to put forward proposals on red squirrel conservation measures.

### Supplementary Feeding

Having started out with a couple of feeders back in 2004, there are now 16 feeders throughout Tollymore and outlying woodlands. These are visited, filled and checked weekly, as well as being cleaned and disinfected fortnightly. Although FS owns the feeders and provides money for feed, it is TRSG who carry out the intensive maintenance and monitoring. *More detailed information about Feeding can be found on pages 6-8*

### Culling

Unfortunately, it is proven that supplementary feeding alone is not enough to save the red squirrel, so, in

order to ensure reds survive, localised control of grey squirrels is essential. Equally, grey squirrel control alone may not be enough without supplementary feeding.

Culling of grey squirrels has taken place in Tollymore since 2002 when grey squirrels first started damaging trees. This is done through live trapping with a strict code of practice adhered to by FS Wildlife Officers. This is continuously reviewed and improved as knowledge and experience increases. TRSG does not cull within the forest, but provides information about grey squirrel hotspots within the woodland. It is very important to keep records of the methods used, areas where you are carrying out control and also the effort put in. Grey squirrel control can be an intensive and time consuming operation.

*More general detail about grey squirrel control and recording effort can be found on pages 9&10. Best practice guidelines on grey squirrel control are also being developed by the NI Squirrel Forum, see page 14 for contact details.*

It must be remembered that FS (and other Agencies), as the landowner and also as a public owned body funded by the taxpayer, has limited resources and is required to meet other objectives be they social, economic or environmental. This is why a partnership approach such as the one with TRSG is likely to be the most successful way forward. Compromises will have to be made, but by knowing your area you can provide Agencies with quality data that will inform future decision making.

## Monitoring



Monitoring is vital. Unless you keep some sort of record of the squirrels in your forest you will not know whether the conservation tactics you are using are effective. The data you collect can help support your group in applying for funding and also provide vital information to the wider conservation community on the success or failure of various techniques in different areas.

Monitoring squirrels is not easy as they are small, fast, secretive, irregular in their habits and likely to run away if they hear you coming. A wide variety of different standardised techniques have and are being developed. It is essential to use a survey method which is approved, is repeatable, and which can be compared with other surveys in order to build up a wider picture of what is happening in your area and region.

There is not enough space in this handbook to provide a detailed explanation of the various monitoring techniques, so quick overviews of those we use are provided. The most important thing is to gather information at a scale which is both useful and achievable. For more information see the Forestry Commission document 'Practical Techniques for Surveying and Monitoring Squirrels'<sup>5</sup>.

### One-Off Sightings

This is a way to involve people in the area and gather simple presence or absence information about the distribution of both red and grey squirrels, seen dead or alive. It can be used at a local level to identify 'hot spot' areas of squirrel activity and has the benefit that people feel they are

### Information to record if you see a squirrel:

- squirrel type - red/grey
- number seen
- location (OS grid reference if possible, postcode and/or road name)
- date
- your name and address
- and any comment you care to make e.g. "road kill", "on my bird feeder" etc.

contributing to a wider project. However, this method has limited scientific value as there is no way of knowing whether areas that appear to have no sightings are truly empty of squirrels, or simply that no one has gone looking for them there yet.

All sighting records from the Mourne area should be sent to your local red squirrel group e.g. [www.tollymoreredsquirrelgroup.com](http://www.tollymoreredsquirrelgroup.com). If there is no group in your area send your records to the Centre for Environmental Data and Recording (CEDaR) - the Northern Ireland Biological Records Centre. See Page 14 for contact details.

### Visual Surveys

This technique is most useful if you are conserving squirrels within a block or blocks of woodland. It can be carried out by an individual or a group of volunteers, and will build up a set of data that over time will show trends in squirrel numbers.

Visual surveys involve making standardised time-area counts of squirrels, i.e. walking a set route within a woodland block with certain parameters such as the time of year and time of day. Over a period, these records can be compared and trends established. This involves setting up walks or 'transects' throughout an area, walking them when squirrels are likely to be active, and recording all squirrels seen.

Anecdotal evidence suggests that 'baiting the transect', i.e. putting down food along it for a couple of days before walking, increases squirrel numbers and the validity of this method.

### Hair Surveys

Hair surveys involve collecting hair from squirrels on sticky blocks which can be attached to a feeder or to a dedicated 'hair tube'. This is a cheap and painless way of gathering information and may be useful if you're not sure if you have red squirrels in an area. Grey and red squirrel hairs are different when looked at through a microscope and this survey gives you a presence/absence of who is using an area. Hair surveys have not yet been tried in Tollymore but the intention is to use this method on the feeders, as with new analysis techniques, DNA from the different hairs can be extracted to give profiles of individual squirrels.

### Camera Traps

Camera traps are a way of remotely recording what is happening in an area. A camera trap unit costs about £150 and is triggered by movement. These can be set up near feeding stations and will show you what is using your feeders, as well as the squirrels. They are very useful if you are working on a site with high visitor pressure as this is a way to guarantee people see red squirrels without having to go out into the forest and disturb them. They are also useful if you have installed a rope bridge to help squirrels traverse roads. The camera trap will help you monitor who uses your bridges and also record any predation of squirrels by raptors.



## Food and Feeding

### Red Squirrels Annual Food Cycle

A study has shown that in the wild red squirrels eat at least 14 different species of plant. In Ireland the bulk of a red squirrel's nutriment comes from the seeds of several species of conifer, such as Scots pine, lodgepole Pine, Norway spruce and European and Japanese larch. Feeding habits include:

- In spring, flowers, new shoots, catkins and cached food is eaten, as well as the buds and fruit blossom of various species of trees.
- Late spring and summer are difficult times for the red squirrel - autumn's caches have usually been used up and none of the tree seeds have yet matured. Caterpillars, fungi and certain flowers are eaten and tree bark is sometimes stripped to get at the nutritious sap beneath.
- Autumn is usually a bounteous time. Conifer tree seeds are mature and the hazelnut, beechnut and sweet chestnut are ripening. Contrary to cartoon depictions red squirrels do not eat many acorns as there is tannin on this seed that the red squirrels stomach has difficulty digesting. Sometimes tree seed crops can fail, perhaps due to a wet spring, and this can cause starvation in the red squirrel population. However, most years food is abundant in autumn and this is when food caching takes place as the squirrel prepares for the coming winter and early spring when little fresh food will be available.
- Winter is a time when the red squirrels' diet depends mostly on the food that it (and others) have cached during the autumn.



Red squirrel mixed diet



Hazelnuts, a red squirrel favourite

- Animal life is also eaten, probably consumed incidentally during the course of herbivorous feeding, and throughout the year squirrels will gnaw on old bones and antler to supplement their calcium intake.

### Feeding: The Facts

#### FEEDING RED SQUIRRELS IS A LONG TERM AND POTENTIALLY COSTLY EXERCISE.

Supplementary feeding is exactly as it says – supplementary, not replacing, the red squirrels' natural diet. It is best to set up a regime of support, i.e. filling up feeders only once a week, rather than continuously filling them, in order to encourage squirrels to forage and maintain their own natural behaviour.

It is best to feed red squirrels a mixed diet. The feed mix used by TRSG consists of:

- 1/6 hazelnuts (in their shells which help wear down the red squirrels continuously growing teeth)
- 3/6 maize kernels
- 1/6 peanuts (unsalted)
- 1/6 sunflower hearts

Red squirrels are picky and selective and will choose their favourite food (hazelnuts) to eat or cache first before eating other foods provided. We have found it better not to include hazelnuts with the feed mix but leave them separately on the spill tray. Greedy red squirrels will empty an entire hopper of food to get at the last hazelnut!

It is important when feeding red



Cuttlefish provided as a source of calcium with the McComb feeders

squirrels in their natural environment to ensure they receive a varied and balanced diet. Metabolic bone disease has been diagnosed in wild red squirrels in Britain and there may be an association with supplementary feeding. Affected squirrels may show lethargy, loss of weight and a hunched posture due to curvature of the spine.

If supplementary feed contains peanuts or sunflower seeds, they can leach calcium from red squirrels' bones through the digestive process. This is solved by providing a calcium rich source for them to gnaw on e.g. cuttlefish or boiled bones secured to a branch. As red squirrels are rodents their teeth grow continuously, and if they are not gnawing on hard foods this can lead to problems with their teeth.

It is not necessary to feed squirrels the full mix all year round, especially not in the autumn (September-December) when food in the wild is usually rich and plentiful. At these times of year the feeder should be filled with whole maize only, a dull but nutritious diet which means the squirrels are not too dependent on the feeder and will still forage for themselves. However, it is



Squirrels gnaw things like old bones and antlers to supplement their calcium intake

<sup>5</sup> <http://www.snh.org.uk/ukredsquirrelgroup/PDFs/UKRSG%20FC%20RS%20mon%20and%20surv.pdf>

essential for those maintaining feeders to be aware of conditions in the natural habitat, as in years of tree seed failure more varied supplementary food may be required.

Most of the recommended supplementary feed can be bought in bulk from animal or agricultural feed suppliers, but hazelnuts in their shells can currently only be purchased in NI from one supplier. Hazelnuts are by far the most expensive part of the feed mix.

#### Location of Feeders

##### o Garden Feeders

Many people want to have red squirrels in their gardens. The thrill of seeing red squirrels in your garden is definitely a moment never to be forgotten, but ultimately it is the welfare and safety of the red squirrels which is most important. A garden can be an extremely dangerous place for red squirrels to visit as they will encounter many unfamiliar hazards. Many red squirrels are killed on the roads attempting to cross into gardens; birds of prey predate on squirrels on bird tables or in open gardens; dogs, and especially cats, can cause fatalities; and if there are grey squirrel present there is a risk of disease transference.

#### Before setting up a feeder ask yourself the following questions:

- Will the red squirrels have to cross a road to get to my garden?
- Do grey squirrels visit my garden?
- Are there cats in the neighbourhood or in my garden?
- Is there a lack of cover (trees) for the red squirrels to escape attack from predators?

If your answer to any of these questions is "Yes" – it may be more beneficial for the red squirrels if you **do not** feed them. Instead, support a feeder in a local woodland to keep red squirrels safe in their natural habitat.

##### o Woodland Feeders

Red-only supplementary feeders should be used where both red and grey squirrels are present and should be situated in areas easily accessible for maintenance. If a feeder is on private land or land owned by FS it should not be erected without prior consultation with the landowner or FS staff.

Feeders should be set in woodland, at shoulder height from the ground, against the stem of a reasonably large tree. Ideally they should be out of view and away from main access routes - hidden in quiet areas of woodland where the chance of accidental discovery is low. The tree should connect with the canopy of other trees to allow access by red squirrels and provide escape routes. Feeders should not be placed at a height where ladders are required for routine maintenance. If deer are in the area, it may be worth trying to position the feeder above a sturdy branch to lessen the chance of it being butted off and damaged.

Feeders should be held in position by the use of thick rope or nylon cord, straps, copper nails or wooden pegs (ordinary nails must not be used as they will damage the tree and can cause further damage during the felling process). It is important to re-site the feeder around the designated feeding area occasionally to prevent the build up of debris and materials in the feeding station area which may harbor disease.

#### Maintaining Squirrel Feeders

**THE MOST IMPORTANT THING ABOUT MAINTAINING A FEEDER IS THAT IT MUST BE CLEANED AND DISINFECTED REGULARLY.**

Supplementary feeding of red squirrels in their natural environment poses a potential risk of disease transference. However, this is likely to be little more than they would encounter naturally if a strict cleaning protocol is maintained.

Squirrels are susceptible to a number of bacterial and viral diseases, in

particular the squirrel pox virus, which may be transmitted in a variety of ways including fleas, lice, skin and body fluid contact (through scent marking etc). Food hoppers are a potential source of disease because they attract animals such as grey squirrels, birds and other rodents too. This will contribute to a build up of hair, feathers, urine and excreta, as well as old food debris. It is essential to regularly remove this build up of debris, and then thoroughly disinfect the feeder with a DEFRA approved product.

It is also extremely important to demonstrate that your group is following best practice. If a feeder that has obviously been neglected is found by a member of the public, questions will be asked about the ability of the group to conserve squirrels.

#### Practicalities and Hygiene

Whenever fresh food is added, stale food must be removed first to reduce the risk the development of toxic moulds and of disease transmission.

Ideally, two squirrel feeders should be available for every one feeding station, with one feeder taken down every two weeks and cleaned and dried, and the other put up in its place.

#### Follow these procedures:

- Wear protective latex or plastic gloves when cleaning feeders to reduce the risk of disease being passed on to yourself.
- Use a fresh pair of gloves for each feeder to prevent transmission of disease between separate feeders.
- Scrub feeders with a stiff brush to remove encrusted grime.
- Use a DEFRA approved anti bacterial disinfectant on the feeder, as these have no lasting or harmful effects on wildlife, and are effective against the squirrel pox virus.
- Use any disinfectant strictly in accordance with the manufacturer's instructions.
- Thoroughly dry out hoppers that are damp inside and keep dry before re-use.
- Ensure hands are washed thoroughly after contact.



The McComb red squirrel feeder

N.B. Although the correct use of recommended disinfectants in cleaning food hoppers is important, thorough washing and removal of organic matter from all surfaces is even more so. Disinfectants are less effective in the presence of organic matter, increasing the likelihood that some organisms will survive.

#### The Right Feeder

What makes a perfect red squirrel feeder? This was the question often asked at TRSG meetings as both commercial and home made feeders were tried to find one that fulfilled the needs of the red squirrel.

We wanted to supplementary feed the red squirrels only, so we needed a feeder that would exclude the grey squirrels, and as much as possible birds, mice, rats or any other creature after the food. The feeder had to be red squirrel friendly and cause no harm to the users from injury and disease transference. It had to be easy to handle, install, maintain and clean. The feeder also had to be 'grey squirrel proof', as greys are infamous for destroying bird feeders and are known to easily eat through wood and aluminium.

While observing the red squirrels using the trial feeders over a period of time we discovered that the feeders needed to be made in such a way as to allow food debris and squirrel excreta to fall away from the feeder. Wood had to be excluded from the feeder's construction as it could potentially soak up urine and possibly harbour disease. Feeders that differentiated the squirrels by weight had an alarming tendency to allow young grey squirrels in, whilst excluding pregnant female red squirrels! A feed hopper that would keep the feed dry was essential. Another entrance/exit was needed to allow squirrels, birds etc. to escape the feeder when confronted by an aggressive, hungry red squirrel. It is also very important to label your feeder as such so people do not mistake it for a trap.

Through experimentation and trial and error the McComb Red Squirrel Feeder was developed. It is a box made of welder's steel 17.5mm mesh, with two 50mm stainless steel entrance holes. Inside there is a solid stainless steel feed hopper with a weighted flap that must be lifted by the red squirrel to get at the feed. This feeder is constructed to a high standard and there are no

sharp edges for squirrels or humans to get cut on. There are no toxic materials used in its construction. This feeder can be attached to a tree with nylon cord instead of nails, and is light-weight, easy to handle and to clean.

The McComb feeder works really well, but still we are observing and discussing what could be done to make the feeder even better for the red squirrels. Blueprints of the McComb feeder are available, kindly provided by Unicorn Containers Ltd. Contact TRSG for details. (See Page 14).



### Grey Squirrel Control: Eradication?

As mentioned, supplementary feeding on its own is not going to save the red squirrel. Grey squirrels live at a much higher density than reds, and breed earlier and more prolifically, therefore, quickly out-competing the red squirrel for space and food. They also threaten to pass on pox virus. A targeted control programme is essential to ensure the red squirrel population survives.

It is not considered humane, or financially practical, to attempt to eradicate all of the grey squirrels in Ireland, nor is there the will or the resources to make this happen. However, in areas where the red squirrel is still in evidence, and where there is a definite will to conserve this species, then controlling grey squirrels becomes an essential part of the process. If in the future, areas of Northern Ireland are set aside as red squirrel refuges, this will strengthen the arguments to conserve red squirrels in these areas. This will also help to bring on board other Agencies and land-owners as a united approach is really the only way forward. This handbook only gives a brief overview of grey squirrel control.



Photo: Laurie Campbell

Before embarking on any grey squirrel control programme, ensure that you have consulted Best Practice Guidelines provided by the Northern Ireland Squirrel Forum,

[http://www.ni-environment.gov.uk/biodiversity/northern\\_ireland\\_squirrel\\_forum.htm](http://www.ni-environment.gov.uk/biodiversity/northern_ireland_squirrel_forum.htm)

and if possible speak to red squirrel groups about their experiences in this area.

- It is essential to observe the highest possible standards of animal welfare at all times when carrying out grey squirrel control.
- Before undertaking any squirrel control, ensure you have permission from the landowner, preferably in writing, to be carrying out such operations.
- No one should attempt to hunt grey squirrels without having already had training provided by an experienced operator.
- It is illegal to release grey squirrels back into the wild. If you are trapping then humane dispatch is the only outcome possible.

More information can be sought from the Red Squirrel groups directly, or from the Northern Ireland Red Squirrel Forum who are developing Best Practise Guidelines for Grey Squirrel Control. See page 14 for contacts.

#### Methods

Grey squirrel control is the act of systematically removing grey squirrels from a mixed squirrel population. As the grey squirrel is an invasive species, once trapped it is a criminal offence to release it back into the wild under the Northern Ireland Wildlife Order and humane dispatch is the only option. There are two main methods used in grey squirrel control: live trapping and shooting. If trapping, remember also to observe the same strict levels of hygiene as you would use in a squirrel feeder in order to prevent the spread of disease. See page 7 for more information on hygiene.

Grey squirrels can cause extensive damage to broadleaf trees through bark stripping from the trunk and the main branches of the tree, between May and July. Damage by the grey squirrel often tends to be more severe than that caused by the red squirrel. This may be attributed to the high population densities that grey squirrels can attain in broadleaved woodland. FS has been culling grey squirrels in its woodlands for many years to protect the timber crop, and any grey squirrel culling that takes place on FS land is

carried out by trained wildlife officers following best practice guidelines.

Poisons such as Warfarin are not permitted as a means of grey squirrel control in NI due to the dangers of the indiscriminate killing of other wildlife, although it is used in mainland Britain. Drowning is not considered a humane method of dispatch and is therefore illegal.

It is essential to think carefully about the area in which you will be controlling grey squirrels. Defend a core area and develop buffer zones if you can. Think about access routes in and out of the area, hotspots such as litter bins or feeders which will attract scavengers such as grey squirrels. Where possible, work with neighbouring landowners to increase efficiency.

However, if grey numbers start to show a reduction, do not reduce efforts to control them through shooting or trapping as long term success depends on thorough, prolonged management.

### Keeping Records

If you are actively controlling grey squirrels in an area it is very important to keep records of the time and effort (man hours) put into culling, in order to look for seasonal trends and also to assess which methods work best in your area. The tables below are taken from a recent report on monitoring squirrels<sup>6</sup> and should be used as a guideline for creating your own proforma.

Filling in forms is often not seen as important by those carrying out grey squirrel control, but is crucial for us to gain a better understanding of what is being done where, by whom, and how effective these methods are. This information can then be used to identify gaps in coverage and to channel resources to priority areas.

Site/Wood	OS Grid GPS Coordinates	Trap Area	Date (period)	No. days	No. traps	No. kills	No. kills/trap day	No. kills/trap day/ha

Figure 1: Minimum data recording information for grey squirrel control

Date traps opened	Date traps closed	Woodland Name	Grid Ref/GPS	Woodland size hectares	Habitat type	Days bait	Days trapped	No. traps	Greys caught	Reds caught	No. days shot	No. greys shot	No. grey sightings	Reds sightings
17/7/09	26/7/09	Plas Newydd	SH600770	120	B	4	6	14	22	2	1	1	7	0
22/8/09	10/9/09	Bodorgon	SH600770	100	C	0	13	67	5	0	1	0	0	0
											0	0		

The fields would represent the minimum requirement for data collection and would not prevent projects from recording more detailed information.

Figure 2: Example of more detailed grey squirrel control recording form



Photo: Dr Jon Lees

<sup>6</sup> 2009 Shuttleworth, C, Squirrel population monitoring and data recording: Charting a way forward, Red Squirrel Survival Trust

## Pox Virus

### What is Squirrel Pox?

Squirrel Pox is a viral disease carried innocuously by grey squirrels, but which is lethal when contracted by red squirrels. The exact method of transmission is not known but is likely to be through contact with bodily fluids and/or transference by bites from shared ticks, fleas, lice and mites.

As of February 2010 there were no known outbreaks of squirrel pox in Ireland, but it was not known for certain that the disease was not present. Squirrels are small animals, and any squirrel carcasses would quickly be scavenged by predators in the wild. Research on grey squirrels, aided by FS and the Moredun Institute, Scotland, suggests that levels of pox virus antibodies found in grey squirrels increased in the years up to 2010 in NI. This would suggest that greys in NI have been exposed to the virus and are potentially carriers.

### What does pox do?

Squirrel pox causes red squirrels to break out in lesions and sores, mostly around the eyes, ears, feet, mouth and genitalia. As the disease progresses the squirrel develops respiratory problems and blindness, losing the ability to forage and becoming dehydrated and lethargic. It can take up to two weeks for the squirrel to die, although it is thought pox can kill in a matter of days, especially as it lowers the squirrel's natural ability to escape predation. The disease appears asymptomatic in grey squirrels, meaning they show no physical signs of distress or illness.

In England, it is thought that pox virus may well be responsible for the rapid decline in red squirrel numbers. At Formby National Nature Reserve in Lancashire, one of the last English strongholds of the red squirrel, pox virus arrived in October 2007. By October of 2008 the population had decreased by 90% with only about 100 surviving from the original



Photo: Sarah McNeil

population of some 800 -1000 red squirrels. Similarly in Scotland pox virus is rife along the border with the north of England and considerable resources are being made available to prevent the infected grey squirrels from moving north and coming into contact with the 'naïve' grey squirrel population in the centre of Scotland, who so far do not seem to be carriers of the disease.

The good news is that the Formby red squirrel population is recovering<sup>7</sup> and research is being carried out to examine the vectors of the virus to learn about transmission. It is not known if the surviving Formby red squirrels have developed an immunity to squirrel pox.

A separate piece of research carried out by the Institute of Zoology, released in October 2008<sup>8</sup>, reported that from 500 UK red squirrel autopsies carried out between 1993-2005, 8 red squirrels had shown antibodies to the pox virus, suggesting a developing immunity. However, it is unlikely this will develop fast enough to really help the red squirrels survive in the wild. There has been discussion about developing a red squirrel vaccine to protect them against

squirrel pox, but by 2010 this was not in commercial development (and may well be too late to save many red squirrel populations).

### What should I do if I think I have seen a squirrel with pox virus?

It is essential that local authorities are quickly made aware of a potential outbreak of pox virus in Ireland. Please follow the instructions on the opposite page **IMMEDIATELY** if you see a sick red squirrel or find a carcass that you suspect has pox virus.

### Squirrel Research

We are still learning about squirrels in Ireland, and the different natural predators and parasites that co-exist with them. Various groups throughout Ireland and the UK are looking to gather information on red and grey squirrels in order to better understand the relationship between them. Contact your local Red Squirrel Group for further information.

In addition to the squirrel pox monitoring referred to above, research on dead red or grey squirrels you suspect have **NOT** died of pox virus can tell us a lot too. Again, please follow the instructions on the opposite page.

## REPORT IT

- **IMMEDIATELY** - If you find a sick red squirrel **alive or dead that you suspect has pox virus**, and which has not been a victim of a road traffic accident

- If you find the body of a **red or grey squirrel** which you suspect has **NOT** died of pox virus

to: **07827 735610**

or **028 4372 4059**

Your report will be passed on to the relevant organisation and someone will contact you to advise on the next steps to take.

### As soon as you see or find the squirrel record the following information:

- **Your name, address and phone number**
- **Where found** (OS grid reference if possible, road name, nearest town and/or postcode)
- **Date & time of your find**
- **Condition of the squirrel**
- **Landowner's name if known**
- **Photograph of the animal** - in the location where you saw/found it (if possible)
- **Suspected cause of death** (if a carcass)
- **Storage conditions** (if collecting a carcass - see below)

If you have found a carcass of a red squirrel you suspect of having pox virus please collect it if possible. You may also, after reporting a carcass, be asked to collect the body. *We appreciate that finding a dead squirrel can be distressing and unpleasant, but it is vitally important that this information is collected if at all possible.* Do not touch the carcass directly, use plastic bags or plastic gloves to pick it up, and store it in a sealed container in the fridge. Wash your hands thoroughly afterwards.

You may be asked to post the carcass if it is not possible for someone to collect it. After you report it you will be contacted with the details of who to send it to.

Freeze the carcass if there is going to be delay in posting. However, freezing a carcass destroys the fragile cells of the virus. Storing at low temperatures without freezing means there is a chance to see if the squirrel carries pox or pox antibodies.

In the unlikely event of finding more than one body; more than one squirrel can be sent at once provided they are each bagged up separately. They can go into the same box if they fit.

## How to package a carcass for research purposes

*The Post Office have requested that anyone sending carcasses for research purposes follows these instructions as they may refuse to deliver dirty or smelly packages:*

- Pack the body in **plenty of absorbent material** such as kitchen roll, and seal in **three separately sealed tightly closed plastic bags**.
- Place the wrapped squirrel in a **watertight rigid box** e.g. a plastic tub or biscuit tin, and seal securely. Parcel this in brown paper or cardboard.
- Enclose the information you recorded when you found the squirrel.
- You must label the parcel **"PATHOLOGICAL SPECIMEN – FRAGILE. HANDLE WITH CARE"** and write the sender's address on the parcel too.
- Send by first class post, or guaranteed next day delivery (**essential if posting on a Thursday**).
- Phone the recipient and let them know when you are posting the body.
- Please do not post on a Friday as the laboratory may be closed over the weekend.
- Wash your hands after dealing with any squirrel carcasses and disinfect any surfaces or materials used.

**Remember to ensure your package will arrive on a weekday - a dead squirrel must not sit in the letter box over the weekend!**

<sup>7</sup> <http://www.nationaltrust.org.uk/main/w-vh/w-visits/w-findaplace/w-formby-2/w-formby-red-squirrels.htm>

<sup>8</sup> <http://news.bbc.co.uk/1/hi/7573535.stm>

## Setting up a Red Squirrel Group

Before setting up a squirrel group, contact the Northern Ireland Squirrel Forum to find out who else is working on squirrels in your area. There are currently 3 established groups in Northern Ireland, as well as numerous Biodiversity Officers linked to Councils and charities who are looking to encourage local action for red squirrels across the province.

Working effectively does not necessarily mean you need lots of people. TRSG started with just three local people who wanted to make a difference. It is more important to share the common goal of helping to conserve the red squirrel, and working together on what to do, where and how.

Talk to local landowners and agencies and find out if they are interested in helping you support red squirrels in the area.

If you want to start supplementary feeding, it is best to begin small with just one or two feeders. As you grow in confidence and experience you can increase the number of feeders, but taking on too many at the beginning will be counter-productive.

As your group develops, it is worth formally adopting a constitution. NICVA (Northern Ireland Council for Voluntary Action) has helped TRSG develop a constitution which it is happy to share with other groups. Becoming formally constituted means you are eligible to apply for funding.

Remember, you or the landowner will

potentially need insurance in order to be covered whilst carrying out voluntary work. There are various affiliation schemes for groups and individuals such as through the British Trust for Conservation Volunteers, or your local Rural Community Network who can help advise you on what insurance you will need.

If you are running educational activities with families and children, volunteers may need to be cleared through the Access NI system. Contact NICVA to find out more information about whether you need to apply and how.

**We hope you have been informed and inspired by this handbook and encourage you to contact TRSG or MHT for more information.**



## Contacts

There are hundreds of websites where you can get information about red squirrels, their conservation and groups that are protecting them. This is a selection of the current most useful and relevant links.

### Red Squirrel Groups

There are currently 3 established red squirrel groups in Northern Ireland which would welcome enquiries from anyone who would like to help conserve red squirrels in the province.

#### Tollymore Red Squirrel Group – South Down

Email: TollymoreRSG@googlemail.com  
<http://www.tollymoreredsquirrelgroup.com/>

#### Lagan Valley Red Squirrel Group – Belfast

Email: belvoir\_redsquirrelgroup@inbox.com

#### Glens Red Squirrel Group – Antrim

<http://www.glensredsquirrelgroup.com/>

There is currently no active group in the west, but contact Robert Scott [rwl.scott@abercorn-estates.com](mailto:rwl.scott@abercorn-estates.com) if you are interested in red squirrel conservation in Tyrone/Armagh.

### Northern Ireland Conservation Contacts

#### Northern Ireland Squirrel Forum

[http://www.ni-environment.gov.uk/biodiversity/northern\\_ireland\\_squirrel\\_forum.htm](http://www.ni-environment.gov.uk/biodiversity/northern_ireland_squirrel_forum.htm)

The Northern Ireland Squirrel Forum is an umbrella organisation chaired by the Northern Ireland Environment Agency that brings together all the statutory and non-statutory groups in Northern Ireland with an interest in conserving the red squirrel.

#### Northern Ireland Environment Agency

<http://www.ni-environment.gov.uk/>

NIEA is one of the 2 Key Partners helping to conserve the red squirrel in NI and you will find a lot of information on red squirrels including the All Ireland Species Action Plan, guidance documents and a comprehensive education pack on their site.

#### Forest Service (DARDNI)

<http://www.forestserviceni.gov.uk/index/environment/wildlife/red-squirrels/>

FS is one of the 2 Key Partners in helping to conserve the red squirrel in NI and you will find detailed information about woodland management and grants as well as general information about red squirrels on their site.

#### Biodiversity NI

<http://www.biodiversityni.com/>

Information and links to the local biodiversity officers and partnership organisations working to promote action for wildlife throughout NI.

#### Mourne Heritage Trust

<http://www.mournelive.com>

Management body for the Mourne Area of Outstanding Natural Beauty. BAP includes the red squirrel as a key species.

#### Ulster Wildlife Trust

<http://www.ulsterwildlifetrust.org/biodiversity/Key+Species+Project/Red+Squirrel.htm>

Additional information on the red squirrel provided through the Ulster Wildlife Trust's Key Species Project.

#### CEDaR

<http://www.habitas.org.uk/cedar/>

The Centre for Environmental Data and Recording is the biological database for wildlife sightings throughout Northern Ireland. Report your squirrel sightings to them.

### Community Group Contacts

- for group support and advice

#### NICVA

<http://www.nicva.org/>

NICVA promotes community development and provides a range of services including training and advice on running community groups, insurance and managing volunteers.

#### Rural Community Network

<http://www.ruralcommunitynetwork.org/>

The Rural Communities Network operates across NI and can provide advice on a range of subjects including governance of groups.

#### British Trust for Conservation Volunteers

[http://www2.btcv.org.uk/display/community\\_network](http://www2.btcv.org.uk/display/community_network)

BTCV works on environmental projects across the UK and has developed an affiliation scheme for groups. It can provide start-up and support grants, as well competitively priced insurance and additional support and advice.

### Other Squirrel Information Sites

#### Red Squirrel Survival Trust

<http://www.rsst.org.uk/>

A national group dedicated to saving the red squirrel, carrying out major restoration projects across the UK

#### The UK Red Squirrel Group

<http://www.ukredsquirrels.org>

A broad umbrella organisation for all regional groups, lots of general information and advice.

#### Save Our Squirrels (SOS)

<http://saveoursquirrels.org/>

A group working in the North of England as part of the 'Red Alert' programme through the Northumberland Wildlife Trust. Lots of information on squirrel ecology, education and events happening around the UK.

#### Northern Red Squirrels

<http://www.northernredsquirrels.org.uk/>

The Northern Red Squirrel Group is a 'network of voluntary action' providing a community and resource for all independent squirrel groups in the north of the UK.

#### SquirrelWeb

<http://www.squirrelweb.co.uk/>

Regularly updated with science-based report about red and grey squirrels.

#### European Squirrel Initiative

<http://www.europeansquirrelinitiative.org/>

A European wide group lobbying at top levels to ensure the protection and conservation of red squirrels throughout Europe.