

## Habitat Management in Red Squirrel Reserves and Buffer Zones in Northern England

Red squirrel populations are suffering major decline in England. This is due to elements of habitat loss, and as a result of spread of the introduced grey squirrel. The Save Our Squirrels Project (SOS) aims to secure effective conservation of red squirrels in the north of England, based around 16 red squirrel reserves and surrounding 5km buffer zones.

Since their introduction in 1876, the expansion of grey squirrel populations and range has adversely affected red squirrel populations as a result of competitive interactions and transmission of disease.

Red squirrels prefer to remain within trees. In comparison grey squirrels readily cross open ground, allowing them to more readily exploit food sources and habitats. As well as competing directly for food, greys pilfer food cached by reds. Greys can rapidly replace reds in broadleaf and mixed woodlands.

Reds have only been known to persist for significant duration in the presence of greys in some conifer forests. Red squirrels gain a competitive advantage over greys within these forests. The reds can survive on small conifer seeds with low calorific value, whereas greys are more restricted to deciduous habitats that provide larger seeds of higher calorific value.

Squirrelpox Virus (SQPV) poses a significant threat to red squirrel populations. Infected grey squirrels produce antibodies to the disease, and can act as carriers. SQPV is highly infectious, and is lethal to red squirrels. Lesions that resemble those of myxomatosis in rabbits appear around the eyes, nose, mouth, ears and paws, and an infected squirrel is likely to die within 15 days of following onset.

**If a forest or woodland contains red squirrels, it is important that they are included in management objectives. Habitat management plays a key role in protecting red squirrel populations from further loss, and providing continued support to populations.** Habitat management focuses on two main agendas; to improve habitats to support red squirrels, and to make them less hospitable to grey squirrels.

### MANAGEMENT GUIDELINES FOR RED SQUIRREL RESERVES IN NORTHERN ENGLAND

In the absence of grey squirrels and associated SQPV, food supply is the most important factor influencing red squirrel population density. **Reserves should therefore be managed to sustain a continuous red squirrel food supply. Conifer species are of variable quality as a food source and the amount of seed produced depends on the age of the trees and a number of other factors. So conifer forests should be managed to:**

- **Maintain a continuous proportion of the forest composed of stands of seed bearing age. Conifer species do not tend to produce cones every year - some can take up to seven years between cycles and many species do not start to cone until they are 15-20 years old. An ideal age class structure for an area would include one third of trees aged 0-15 years, one third 16- 30 years, and the remaining third over 30 years. Red squirrels can move their home ranges to follow a food source; so as**

long as there are sufficient coning trees somewhere in a forest populations will continue to thrive.

- Ensure that a proportion of species other than Sitka spruce are present in the forest. But note that elevating the proportion of non-Sitka to a high level can make the forest a more suitable habitat for greys, so seek advice if such a change in species composition is being considered.
- Ensure that no large seeded broadleaved trees are planted in forests where there are very few already – particularly in those reserves where red squirrel persistence is largely dependent upon habitat management rather than grey control. Small seeded native broadleaves are a welcome addition to forest diversity.
- Ensure spatial continuity of forest habitat in designing the shape and location of any large felling coupes.
- Red squirrels prefer areas of forest where the tree canopy is constant and not fragmented. To achieve this requires a forest structure that contains stands of trees of a similar age. This will also help to reduce forest vulnerability to wind throw.
- Seek to avoid felling trees where reds are present and whilst dreys are occupied by young (potentially March – October). Squirrels are vulnerable to disturbance during their breeding season, and it is an offence under the Wildlife & Countryside Act (1981) to disturb an active drey.

The above means that forest managers should endeavour to plan felling and restocking over future decades. A long-term forest plan is the suggested approach – advice on this, and possibly funding, is available from the Forestry Commission.

## **MANAGEMENT GUIDELINES FOR RED SQUIRREL RESERVE BUFFER ZONES IN NORTHERN ENGLAND**

### **Land Management**

Land in the buffer zones, whether it is farmland or woodland, should be managed to maintain or improve habitat quality for red squirrels without improving habitat quality for grey squirrels. This means that:

- The planting of new large seeded broadleaved woodland such as that composed of oak and

beech, is strongly discouraged as this will encourage grey squirrels. In particular, avoid creating such woodland where it is likely to provide an incursion corridor for greys from a buffer zone, or land outwith it, to a reserve.

- An exception to the above is enlargement of ancient and semi-natural oak woodland as this is often desirable for a range of landscape and conservation reasons. However, any such extensions should be limited so as to achieve not more than a 10% increase in large seeded broadleaved woodland in the buffer zone over any 10 year period and enhancement of potential grey squirrel incursion corridors should be avoided.
- In restoring plantations on ancient woodland sites to a native woodland type, do not plant more than 5% large seeded broadleaves, as these will encourage grey squirrels.
- Manage woodland/forests in ways that sustain a continuous red squirrel food supply, e.g. ensure that there is a mix of conifer species and that there are always trees of seed bearing age present.
- Seek to avoid felling trees where reds are present and whilst dreys are occupied by young (potentially March – October).

### Mixed Broadleaf Woodland Management

Due to the ecological importance of mixed broadleaf woodlands, their management holds a higher priority than red squirrel conservation. Red squirrels can however be accounted for within woodland management through a number of operations:

- Maintenance of understorey vegetation and tree seedling regeneration improve woodland age structure and structural diversity, increasing availability of natural food sources.
- Conifers at cone producing age should be designated for long term retention where appropriate.
- Dead wood should be left to decompose in-situ to encourage fungal growth, providing another squirrel food source.

-2-

### TREE AND SHRUB SPECIES FOR RED SQUIRREL CONSERVATION

The following table outlines tree and shrub species and their impact to red squirrel conservation.

Conifer trees and understorey plants	Small seeded deciduous trees	Large seeded deciduous trees
<b>'Red Squirrel Friendly' trees</b> – good for red squirrels, even when grey squirrels are present	<b>'Squirrel Neutral' trees</b> – no problem - good for improving overall woodland habitat without detriment to the red squirrel	<b>'Red Squirrel Negative' trees</b> – good for reds but only when greys are totally absent
Blackthorn Bird Cherry Corsican pine Brambles Dog Rose Douglas Fir Guelder Rose Hawthorn Holly	Alder Ash Aspen Birches	Beech Hazel Horse Chestnut Oaks Sweet Chestnut Walnut

Rose Hawthorn Holly	Black poplar Box	
Larches	Cypress species Field Maple	
Lodgepole Pine Norway	Juniper	
Spruce Other conifer	Limes	
species Scots pine	Rowan	
Sitka Spruce	Sycamore Western Hemlock	
Wild Cherry	Whitebeam Willows	
Western Red Cedar Yew	Wych Elm	

## SUMMARY OF EFFECTIVE HABITAT MANAGEMENT

- In conifer plantation forests, maintain a continuous proportion of the forest composed of stands of trees of seed bearing age.
- Ensure that a proportion of species other than Sitka spruce are present in conifer plantation forests.
- Ensure that no large-seeded broadleaf tree species are planted in forests and buffer zone areas where there are very few already.
- Ensure spatial continuity of forest habitat in designing the shape and location of any large felling coupes.
- Seek to avoid felling trees whilst dreys are active where this is likely to significantly impact on the red squirrel population.
- Where the density of a forest canopy allows, under-storey planting can improve habitat diversity and broaden the variety of red squirrel food sources available.

-3-

## Sightings and Monitoring

Monitoring of red and grey squirrel populations is essential if the effectiveness of conservation work is to be understood. Allow, and where possible and appropriate, assist in red and grey squirrel monitoring work. Please report all new sightings of red and grey squirrels to an SOS Officer.

It is particularly important that you report sightings of dead red squirrels or those with disease symptoms resembling myxomatosis as it could be a case of squirrelpox virus disease, and may require treatment, blood testing or post mortem.

## Grey Squirrel Control

For the red squirrel to survive in northern England it is essential that land managers in the reserves and buffer zones undertake, or allow, an appropriate level of well-targeted grey squirrel control on their land. This should be focussed on broad-leaf woodland areas and wooded corridors, as these are the main dispersal and incursion routes used by grey squirrels.

Advice on grey squirrel control best practice and information on training, if this is required, is available from your SOS Conservation Officer. SOS may also be able to provide traps through a trap loan scheme. In Northern Cumbria, SOS Grey Squirrel Control Officer can provide practical assistance with grey squirrel control.

## **Further Information**

-4-