

PRACTICE NOTE

ISSUED BY FORESTRY PRACTICE

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INTRODUCTION

Our native red squirrel has disappeared from large parts of its natural range in the UK over the past 50 years. This is mainly as a result of the spread of the introduced grey squirrel which is better able to live in most broadleaved and mixed woodland areas, although habitat fragmentation and disease may also have played a part. It is hoped that red squirrels are secure in many conifer forests in the Scottish Highlands, but elsewhere they are vulnerable.

Red squirrels are protected under the Wildlife and Countryside Act 1981 (W&CA) and the Wildlife (Northern Ireland) Order 1985, which make it an offence to intentionally kill, injure, take or sell the animal, or damage, destroy or obstruct access to its nesting place. Grey squirrels are not protected and their release or introduction is prohibited.

Conservation efforts are growing in response to the decline and loss of red squirrels and many groups and individuals including woodland owners and managers are involved.

A Species Action Plan for the red squirrel has been published by the Government (see Table 1) as part of the UK Biodiversity Action Plan.

This Practice Note has been prepared on behalf of the UK Red Squirrel Group (UKRSG) and supports the delivery of the Action Plan.

It aims to help by:

- increasing awareness and understanding of the need for red squirrel conservation and the approach being taken to achieve it;
- describing the key principles and factors to be considered when deciding where and how to plan for red squirrel conservation in our woodlands;
- providing a guide to sources of more detailed advice and information.

THE CHALLENGE

Because grey squirrels (greys) are now an established part of our forest wildlife, with a population of 2.5 million, it is not practical to aim to re-establish red squirrels (reds) to their former range. The current distribution of reds is shown on the map (Figure 1). Greys continue to expand their range and this threatens the remaining red population. For example, where major red populations meet the potentially expanding greys (the 'red/grey interface') reds are usually displaced within 15 years of the arrival of greys. However, the population dynamics are not clearly understood. Many Scottish Highland conifer forests could remain core areas of suitable habitat where reds will not be threatened, but there is no room for complacency, as greys have colonised extensive conifer forests in Derbyshire, North York Moors and Thetford. Also, many of the discrete Welsh, northern English and southern Scottish red populations are likely to contract further.



Alfie Baxter

Red squirrels are now largely confined to conifer forests in upland regions.

Figure 1 The current range of the red squirrel in the British Isles.

Summarised by the Forestry Commission from data supplied by UK Red Squirrel Group members and the Department of Agriculture for Northern Ireland (DANI).

The Government encourages a continued overall expansion of woodland of all types. Broadleaved and mixed broadleaved/conifer woodlands yield many benefits for wildlife, landscape, recreation and sport as well as timber (Anon., 1995). However, they will further encourage grey expansion, especially where beech, oak or chestnut are planted. Red conservation will therefore require difficult choices about the types of woodland and wildlife we want. To be successful red squirrel conservation projects will usually need to be sustained indefinitely over large areas, often involving many landowners.



CONSERVATION AIMS

The UK Strategy for red squirrel conservation (Joint Nature Conservation Committee, 1996), prepared in consultation with a wide range of interested parties, identified aims in priority order as:

1. To maintain self-sustaining populations of red squirrels in areas where red squirrel populations are healthy and where grey squirrels are currently rare or absent. Such areas might be either unsuitable for grey squirrels or vulnerable to grey squirrel invasion.
2. Wherever practicable, to maintain or expand red squirrel populations that are currently threatened because of isolation, small size or proximity to grey squirrel populations.
3. To reintroduce red squirrels to selected areas in their former natural range where the ecosystem can be effectively managed to support viable populations.

The key messages of the Strategy are that:

- sustainable woodland management favouring reds and discouraging greys is the preferred option;
- it may not be possible to protect all current populations and reintroduction of reds should only be considered after aims 1 and 2 have been fully addressed.

The UK Species Action Plan for red squirrels was published in 1995. It is the means of implementing the UK Strategy and it sets targets for action up until 2010.

SELECTION OF PRIORITY AREAS FOR ACTION

Selecting priority areas for action can be achieved by:

- Setting up local squirrel groups.
- Preparing local distribution maps of both species and identifying potential areas for action, e.g. where red squirrels are declining or grey squirrels are spreading into red areas.
- Determining regional and local strategies based on habitat management, and grey control if necessary (as indicated in the decision chart in Figure 2). These usually need to be applied over large woodland areas.
- Selecting reserve areas to target effort, especially in regions where greys are well established.

The UK Red Squirrel Group is encouraging squirrel groups to propose priority areas for action in order to guide the allocation of resources.

MANAGING WOODLANDS FOR RED SQUIRREL CONSERVATION

Conservation management should be based on two principles:

- maintaining or improving the habitat to sustain viable populations of reds;
- minimising competition from greys.

Table 1 Key points from the UK Species Action Plan for red squirrels

Objectives	Key target dates
<ul style="list-style-type: none"> • Maintain and enhance current populations, where appropriate. • Re-establish red squirrel populations, where appropriate. 	<ul style="list-style-type: none"> • Prepare and implement site management plans for all viable populations by 2005 and for marginal sites by 2000.
	Key contributory actions
	<ul style="list-style-type: none"> • Ensure effective implementation of relevant legislation. • Improve knowledge through conservation research and advice. • Promote education and awareness of red squirrel conservation. • Survey and monitor red squirrel populations.

The following aspects need to be considered.

Surveying and monitoring

Long-term management of the habitat for reds cannot be accurately described at present, although their preferences are known. Habitat surveys will indicate areas preferred by reds and areas that have the potential for habitat improvement to favour reds. Together with monitoring of red and grey populations, these surveys will provide information on habitat use, population dynamics in a locality, and where overlap with grey populations occurs. Monitoring is important to provide data which may highlight future problems.

How should this surveying and monitoring be done? Standard techniques are recommended so that regional results and effects can be co-ordinated, e.g. hair-tube surveys, time–area observation counts. How these methods are best deployed is still being researched. Therefore the latest advice on these and other techniques should be obtained from the organisations listed at the end of this Note.

Size of the woodland

An area of conifer forest between 2000 and 5000 hectares (ha) is considered to be ideal to conserve a population of reds with a high chance of success. It may be possible to support a small viable red population in core reserves of as little as 200–300 ha, together with buffer zones (see Habitat management), by maintaining a suitable age structure and diversity of trees and shrubs, with grey control where needed. Such areas will always be under threat from greys, and more extensive habitat improvement to adjacent woods should be planned. For owners of smaller woodlands, the only possibility of conserving reds



A hair-tube and removable sticky block (bottom left) with squirrel hair attached.

is through co-operative or group action in a number of linked (usually adjacent) woods which could make up a core reserve of at least 200 ha of conifer containing less than 10% large-seeded broadleaves. However, the prospects for such areas are very dubious.

Habitat management

Suitable sites

Red squirrels are woodland animals and their habitat requires the features noted on page 5. These requirements, such as not planting oak, may prevent the achievement of other conservation aims or woodland management objectives, hence red squirrel conservation must be considered in a wider perspective. The Forestry Commission will examine these factors when judging grant applications under the Woodland Grant Scheme (WGS).

- The reserve and nearby grey dominant areas should ideally be separated by a buffer zone 1–3 km wide. This should consist of unsuitable habitat for greys, i.e. conifer forest, broadleaved woodland of small-seeded species, arable land or moorland.
- The core of the most suitable sites should be identified and objectives for their woodland management defined through local consultation and agreement to provide the required mix of food (tree seed) and cover (age, structure and stocking density). Chosen sites should also have the potential to enable reds to expand into the less suitable areas.
- Ideally, there should be around one-third of each of the following tree age classes: younger than 15 years, 15–30 years, older than 30 years.



Spruce forest with good red squirrel habitat: 3 age classes, both Norway and Sitka spruce and small-seeded broadleaved species.

Site management

Some sites may require management to improve carrying capacity for reds and to discourage greys.

- Within extensive areas of single species (Sitka spruce, for example) up to 20% of the following species should be encouraged over time by planting in mixtures or groups concentrated on ride sides and edges to promote heavy coning and fruiting:
 - Scots pine, larch, Norway spruce, lodgepole pine, firs, yew and hawthorn, all of which have direct value for reds;
 - birch, rowan, ash, willow, aspen and alder which have general conservation value and do not encourage greys.
- Thinning should be tailored where possible to improve seed production.
- Oak, beech, chestnuts and hazel should not be planted. Established trees should only be removed if they aid grey incursion, in which case trees over 30 years old should be removed first as they produce significant seed crops. Newly planted trees will not produce significant seed crops for at least 30 years after planting.
- Extensive harvesting of contiguous blocks at the same time should be avoided as movement between canopies would become restricted.
- Suitable species should be used to form links from the reserve to the wider forest by the promotion of streamside trees and internal edges such as ride sides (particularly those with a south-facing aspect). These links should contain mature coning trees and mixed species.
- Forests and woods should be planned to maximise beneficial seed production by exploiting or encouraging the following:
 - south-facing aspects;
 - irregular shapes to increase periphery;
 - long south-facing edges to east/west rides;
 - delayed felling of large-crowned trees;
 - alternative silvicultural systems to clearfelling;
 - creation of uneven-aged woodland to ensure constant supply of seed-producing trees;
 - different tree species.

Some of these measures will result in loss of future revenue but they will also have other positive effects for wildlife conservation.



Conifer forests like this with mixed ages and species of trees are the best hope for the long-term survival of the red squirrel.

Minimising grey squirrel competition

Regional or national elimination of established grey populations is not feasible but local control is sometimes a practical aim. Greys are very opportunistic and populations can quickly increase in size. Recolonisation after control can be rapid, particularly from suburban areas that can support high populations and in which co-ordinated control would be very hard to sustain. The only currently legal and recommended grey control methods in red areas are shooting and live-capture cage trapping. Shooting may appear effective, but less than 20% of an established or colonising population is removed and reds may be taken by mistake. Spring trapping is indiscriminate and not recommended in Great Britain. It is prohibited in Northern Ireland. Co-ordinated cage trapping can be successful at reducing the population by up to 90% and thus slowing colonisation. To maintain this low population, constant labour-intensive control is required needing around 0.5 of a man hour per hectare per trapping session. To this must be added the material cost of traps and maize to bait them. More than one trapping session per year will be required in any one area. The level of reduction of grey populations required to benefit reds is unknown but information is being gathered.



Scots pine cones stripped by red squirrels.

Alistair Baxter

Ideally there should be *locally* targeted control within priority conservation areas plus a 3 km wide buffer zone rather than attempts to control greys over a whole region. Control to save a local red population, or to prevent colonisation by greys, should only be considered where a widespread co-ordinated campaign can be sustained until sufficient favourable habitat exists to sustain reds. This is a huge commitment that must not be underrated.

Grey squirrel control to prevent damage to trees requires a different approach which has developed over the past 25 years. Detailed advice is given in Practice Note 4 *Controlling Grey Squirrel Damage to Woodlands* (Forestry Commission, 1998).

MANAGEMENT PLANS

Management plans for red squirrel conservation will be encouraged by the Forestry Commission (FC), the Department of Agriculture, Northern Ireland (DANI) and nature conservation agencies especially for areas identified as priorities by the UK Red Squirrel Group (UKRSG). Forest Enterprise have prepared a GB plan for red squirrels on FC land. FC may pay a grant to help prepare plans, and FC and DANI can help fund habitat management and grey control where a suitable plan has been agreed. Other sources of funds are being sought by the UKRSG and other squirrel groups.

TRANSLOCATION AND REINTRODUCTION

These involve complex procedures which, if not fully observed, will create a high risk of failure. Generally it should be a lower priority than sustaining existing populations. Advice should be sought from the organisations listed at the end of this Practice Note.

HOW YOU CAN HELP

You can help by:

- Making records of (a) red squirrel sightings and (b) grey squirrel observations in new areas, and sending them to your local squirrel group.
- Surveying and monitoring.



Time-area counts are useful in woods with an open structure such as old pine woods.

- Joining/forming a local squirrel group and joining Wildlife Trusts.
- Helping to control grey squirrels*.
- Supplementing the food of reds*.

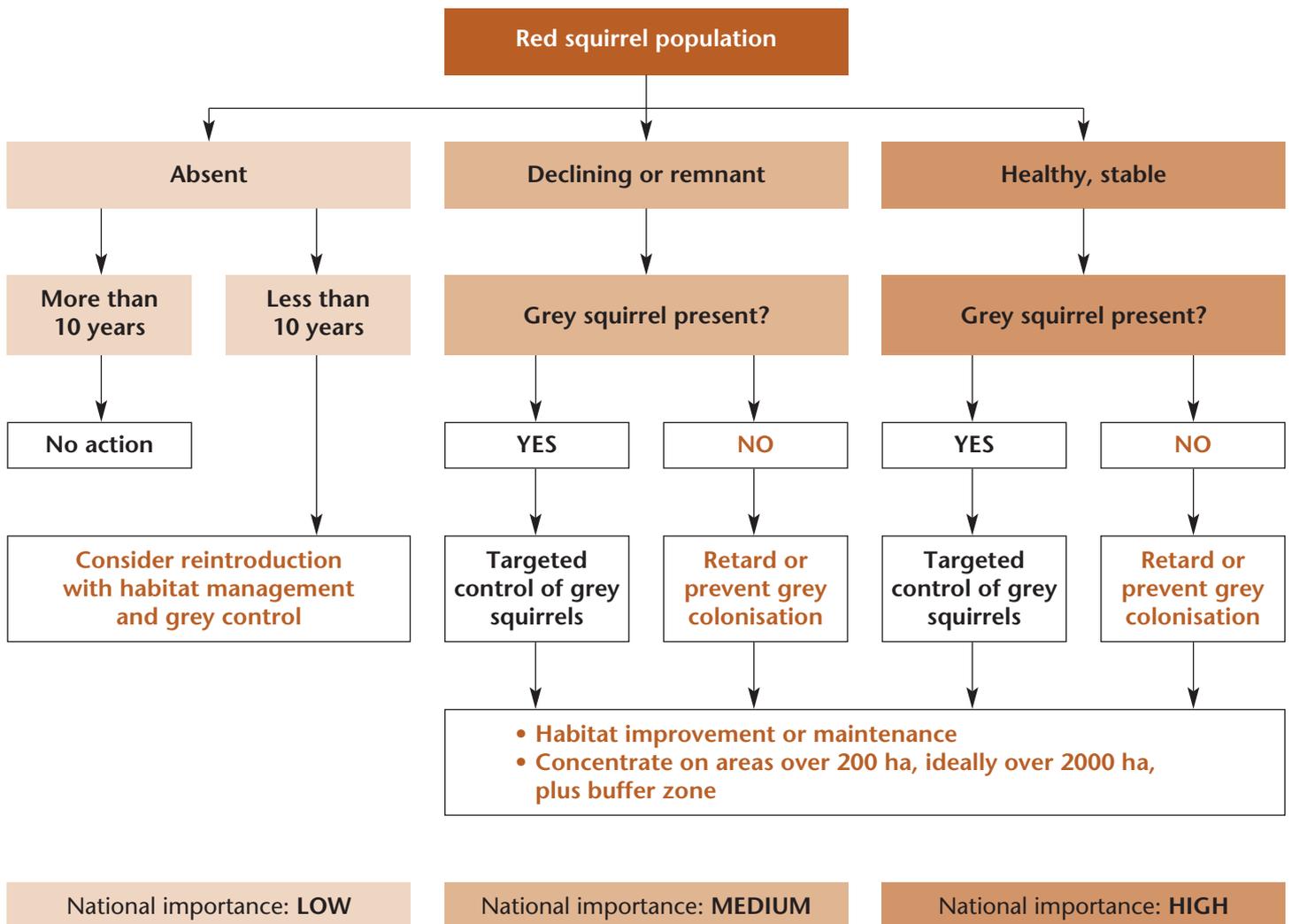
Landowners and managers are recommended to seek advice on the presence of reds and to co-operate with neighbours. A co-ordinated effort is best and should produce the most effective methods of management.

Recommendations for establishing a local squirrel group

- Plan and tailor the group to suit local requirements and priorities.
- Harness local enthusiasm from landowners, farmers and the public, and support/augment with Wildlife Trusts, farming and landowning organisations, NGOs, the Forestry Commission, DANI Forest Service and Countryside Agencies.
- Obtain technical information from the nearest official organisation.
- Maximise limited resources by following a targeted approach.

* If these are part of a red squirrel management plan.

Figure 2 Decision chart: suggested priorities for conservation action



- Notes:
1. This decision chart is a simplified version of Figures 1 and 2 and Section 5 of the *UK strategy for red squirrel conservation* (JNCC, 1996).
 2. The national importance indicated is the general conservation importance of these categories. Other factors need to be taken into account in deciding the priority to be given to conserving individual populations when allocating resources. For example, proximity to large human populations might increase the priority given to conserving remnant red squirrel populations.

The views of a wide range of organisations and individuals involved in red squirrel conservation and woodland management have been taken into account during the preparation of this Practice Note.

Detailed advice on all aspects of the conservation of reds and the control of greys can be obtained from the UK red squirrel co-ordinator and the organisations listed on page 8. This advice will be revised as research improves our knowledge.

REFERENCES

ANON. (1995)
Biodiversity: the UK Steering Group report. Vol. 2: Action plans. (Red squirrel action plan on pages 91–92.) HMSO, London.

JOINT NATURE CONSERVATION COMMITTEE (1996)
UK strategy for red squirrel conservation. JNCC, Peterborough.

FORESTRY COMMISSION (1998)
Controlling grey squirrel damage to woodlands. Practice Note 4. Forestry Commission, Edinburgh.

USEFUL ADDRESSES

UK Red Squirrel Group (Working group chaired by JNCC)

Responsible for:

- Co-ordination and delivery of Red Squirrel Species Action Plan
- Includes UK Co-ordinator (see below)

UK Co-ordinator for Red Squirrel Conservation

NPI Red Alert

Cumbria Wildlife Trust

Brock Hole

Windermere

Cumbria

LA23 1LJ

Tel: 015394 48280

Responsible for:

- General advice
- Information on UK Red Squirrel Species Action Plan

Joint Nature Conservation (JNCC)

Monkstone House

City Road

Peterborough

PE1 1JY

Tel: 01733 562626

Responsible for:

- The UK red squirrel strategy
- Chairing the UK Red Squirrel Group

English Nature (EN)

Northminster House

Peterborough

PE1 1UA

Tel: 01733 455000

Countryside Council for Wales (CCW)

Plas Penrhos

Penrhos Road

Bangor

Gwynedd

LL57 2LQ

Tel: 01248 385500

Scottish Natural Heritage (SNH)

Research & Advisory Directorate

2 Anderson Place

Edinburgh

EH6 5NP

Tel: 0131 554 9797

Responsible for:

- National and regional red squirrel strategy
- Grants and advice under the species recovery programme

The Forestry Commission

231 Corstorphine Road

Edinburgh

EH12 7AT

Tel: 0131 334 0303

Assists red squirrel conservation by:

- Providing funds under the Woodland Grant Scheme to encourage management for red squirrels
- Management (by Forest Enterprise) of selected areas for red squirrel conservation

Forest Research

Alice Holt Lodge

Wrecclesham

Farnham

Surrey

GU10 4LH

Tel: 01420 22255

Responsible for:

- Research and technical advice

DANI Forest Service Agency

Dundonald House

Upper Newtownards Road

Belfast

BT4 3SB

Tel: 01232 520100

Responsible for:

- Woodland grants
- Woodland management and advice in Northern Ireland

Wildlife Trusts and Red Alert: for addresses and phone numbers see Local Directories or via EN, CCW and SNH.

Enquiries relating to this publication should be addressed to:

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