Scottish Strategy for Red Squirrel Conservation

June 2015

Edited and produced on behalf of the

Scottish Squirrel Group

Introduction

This Strategy updates the 2004 Scottish Strategy for Red Squirrel Conservation and has been produced by Scottish Natural Heritage on behalf of the Scottish Squirrel Group. Current members of the Scottish Squirrel Group are listed in Appendix 1 and include government agencies, project staff, NGO's, representatives of forestry interests and local squirrel groups. The actions proposed are a statement of intent, but do not carry specific funding commitments from any of the Scottish Squirrel Group members. The Strategy remains principally a Strategy for *Red Squirrel Conservation*, but recognises the important contribution of grey squirrel control in delivering these aims.

The Strategy provides an overview of current and future priorities and reflects that we have adapted our approach to take account of new knowledge. It is recognised that some of the issues and details of implementation are complex and these are best developed in local action or project plans. The Strategy is accompanied by maps (Appendix 2), which provide an overview of squirrel distributions and strategic priorities. The document is intended to have a 10 year lifespan but the maps may be updated to reflect any changes to the priority areas for red squirrel conservation within this timescale.

A key feature of the new Strategy is to recognise the huge contribution that individuals and communities can make to red squirrel conservation in their own area and to seek to provide the information and support that can nurture this enthusiasm for the benefit of red squirrels. However, the need for ongoing encouragement and co-ordination is also recognised.

The strategy has three sections:

Section 1: Our aims;

Section 2: Conservation actions to deliver these aims;

Section 3: How we will deliver action for red squirrels.

Section 1. Our aims

The aim of the 2004 Strategy is retained (1.1), but is qualified in different parts of Scotland to reflect the current threats and opportunities.

1.1 Maintain populations of red squirrels across their current range.
In all parts of the Highlands, Argyll, North-east Scotland, northern Tayside and Stirling where there are currently no grey squirrels; • **to have well-defended, thriving and expanding red squirrel populations**
In NE Scotland; • **to see red squirrels recover their former range and secured for the long-term by the removal of this isolated population of grey squirrels**
In Central and Southern Scotland where grey squirrels are already established; • **to defend priority red squirrel populations from the threats of replacement by grey squirrels and from disease**

1.2 Develop long-term sustainable approaches to red squirrel conservation
Through informing and engaging the public, communities and land managers and by providing co-ordination and support for local action
By targeting conservation action to strategic priorities (see 2.1) and promoting voluntary action more widely
Sustaining red squirrel populations through good forest management (2.3)

Section 2. Conservation actions to deliver these aims

Conservation actions have been divided into the following headings, although there is overlap between many of these activities. The delivery of these actions is similarly shared between a range of interest groups which is explored further in section 3.

2.1 Reducing the competitive effects of grey squirrels on red squirrels

The benefits to red squirrels of reducing competition from grey squirrels are now more evident. This is by and large due to the evaluation of the work co-ordinated by the Saving Scotland's Red Squirrels Project. Targeted grey squirrel control is now generally viewed as part of a long-term approach to achieving the Strategy aims.

Control of grey squirrels for other reasons, including timber protection, is complimentary to red squirrel conservation efforts. However, co-ordinated grey squirrel control for red squirrel conservation should be targeted to the areas where it will have most benefit to red squirrels.

Targeted grey squirrel control is viewed as a parallel approach to habitat management (2.3). While research continues to explore alternatives to lethal control, it is recognised that grey squirrel control by trapping is likely to be required for the foreseeable future.

Targeting of grey squirrel control is aligned to the aims for red squirrels in different parts of Scotland. Specifically the **strategic priorities for grey squirrel control are** in the following order:

1. **To defend the red-only areas north of the Highland Red Squirrel Protection Line from incursion, by controlling grey squirrels along this line** (refer also to 2.2)

2. **Controlling grey squirrels in NE Scotland to reduce their distribution and abundance**

3. **Defending Stronghold forests from grey squirrel incursion**

4. **Controlling grey squirrels in priority areas within the grey squirrel range** (refer also to 2.2).

The Saving Scotland's Red Squirrels (SSRS) Project has identified priority areas for red squirrel conservation in south Scotland (Appendix 2). These areas include locations where there has been significant local effort and support for red squirrel conservation in the last 7 years, by landowners and local volunteers, as supported by the SSRS project and its predecessors. Each of these areas is judged to have significant red squirrel populations and is considered to be of sufficient scale to promote viability of a local (meta) population. The areas selected reflect places where there has been success in retaining red squirrels despite the presence of grey squirrels and squirrelpox outbreaks and areas where there is a sizable local community to get involved in this work. The areas also maximise the opportunities for cross-border working with the Red Squirrels Northern England project and present opportunities to view red squirrels.

Currently priority areas have only been defined in south Scotland where there is support from SSRS and FCS on the National Forest Estate. The justification for defending significant red squirrel populations in other parts of Scotland that already have grey squirrels, for example in Fife, Clackmannan and Kinross, would be similar to that in south Scotland, however, would be subject to adequate resourcing being available. The map of priority areas (Appendix 2) is illustrative and can

be updated if further priority areas are identified.

The Scottish Rural Development Programme (SRDP) supported the control of grey squirrels for red squirrel conservation 2009-2014. Eligibility was prioritised within control zones in Aberdeenshire, Tayside, Forth and south Scotland. It is expected that SRDP funds will be more limited in the next Programme (2015- 2020) hence there is a continued need to target resources to strategic priorities. It is intended that eligibility will be guided by the principle of supporting these strategic priorities (aligned with 2.2). In priority areas, there is likely to be an onus on applicants to demonstrate there is collaborative and sustainable support for local red squirrel conservation. The new SRDP includes some support for developing collaborative applications.

2.2 Managing disease impacts on red squirrels

Squirrelpox virus has emerged as a significant threat to red squirrel populations in the last 10 years. Experience and modelling has indicated that it is extremely challenging to prevent the spread of the virus into areas where grey squirrels are already well established.

Our understanding of squirrelpox transmission is still developing; we know the composition of habitats in wooded and urban environments influences grey squirrel densities and hence the defend-ability of local red squirrel populations. However, evidence suggests grey squirrel control can help to reduce the proportion of grey squirrels that carry the disease and the incidence of squirrelpox outbreaks in red squirrels, allowing local population recovery[1,2,3]. Further research into the demographic and habitat factors that facilitate red squirrel persistence is identified as a research priority (2.6).

The Strategy recognises that squirrelpox is likely to continue to spread across the grey squirrel distribution in Scotland, but seeks to equip land managers and communities with the tools and resources to maintain viable red squirrel populations in identified priority areas. It is intended to minimise the impact of squirrelpox outbreaks in currently red-only areas by intensive surveillance and grey squirrel control along the Highland Red Squirrel Protection line (aligned with action under 2.1).

There is broad support for further research to develop a squirrelpox vaccine. However, distributing a vaccine to protect red squirrels on a landscape scale on an ongoing basis is likely to be very challenging and is unlikely to be available in the short-medium term. Hence in areas that have grey squirrels, the immediate focus is on protecting priority red squirrel populations via grey squirrel trapping (priorities aligned with 2.1).

Monitoring grey squirrels for the squirrelpox virus is viewed as important for informing disease risks to red squirrels at a local level. Such surveillance will also help to improve our understanding of the

[1] White, A. & Lurz, P.W.W. 2014. A modelling assessment of control strategies to prevent/ reduce Squirrelpox spread. *Scottish Natural Heritage Commissioned Report No. 627.* http://www.snh.org.uk/pdfs/publications/commissioned_reports/627.pdf

[2] White, A., Bell, S. S., Lurz, P. W. W. & Boots, M. (2014). Conservation management within strongholds in the face of disease-mediated invasion: red and grey squirrels as a case study. Journal of Applied Ecology 51: 1631-1642.

[3] Lurz P.W.W., White, A., Meredith A., McInnes, C. & Boots, M. (2015). Living with pox project: Forest management for areas affected by squirrelpox Virus. Report to Forestry Commission Scotland.

efficacy of control measures with regard to the incidence of outbreaks in red squirrels. However, squirrelpox is now regarded as endemic in the grey squirrel population in parts of south Scotland. Hence the focus of testing should be as an early warning in areas where squirrelpox virus is not already established.

The Strategy seeks to remain alert to new emerging squirrel diseases that may have a significant impact on the viability of populations.

n.b. (2.1) Identifies there is a need to reduce the competitive effects of grey squirrels in the absence of squirrelpox virus.

2.3 Managing habitats for red squirrels

Red squirrel populations depend on having a sufficient area of wooded habitats, which continuously provide seeds and nuts to support populations in the long-term. Many woodland types are suitable for red squirrels, but in areas with grey squirrels, the mix of tree species can influence the balance of competition between the species. Habitat management guidelines to benefit red squirrels have been produced by Forestry Commission Scotland[4]. Good forest management is complimentary to all other management approaches and is applicable across the red squirrel range.

Long term-forest planning and FCS Land Management Plans provide a means of ensuring continuity of forest habitats. Increasingly forest planting policy needs to take account of tree disease, which will have implications for red squirrels (see 2.6). Good forest practice for red squirrels should be widely promoted and adopted[5].

However, recognising the multiple objectives of forestry, there will be a greater emphasis on forest management specifically for red squirrels in Stronghold forests than in the wider countryside. The 18 Stronghold forests and the Isle of Arran were selected on the basis that they provide large areas of suitable forest habitats that can be managed for the benefit of red squirrels in the long-term. They are not a formal designation.

More than two thirds of the total proposed Stronghold area is on the National Forest Estate, where FCS will be responsible for securing populations of red squirrels in the long-term. For Stronghold areas that are on private land, FCS will advise and support landowners to develop and implement suitable forest plans.

Work is ongoing to agree the Stronghold boundaries and the best management approach for each woodland within a Stronghold. This will include balancing local priorities to make sure that the wider biodiversity aims for these woodlands are achieved alongside red squirrel conservation. Advice statements are being prepared for each Stronghold to guide their future management.

The selection of Stronghold forests took some account of their defend-ability from grey squirrels and pre-dated the immediate threat of squirrelpox. Hence Stronghold forests reflect a specific set of criteria and are complemented by other red squirrel protection networks or priority areas for grey

[4] http://scotland.forestry.gov.uk/supporting/strategy-policy-guidance/biodiversity/conserving-scotlands-red-squirrels/guidance-for-managing-strongholds

[5] Forestry Commission Information Note 33 – Forest Operations and red squirrels in Scottish forests – 2006

squirrel control.

The focus of priority areas is on targeted grey squirrel control and on delivery via community engagement – whilst taking account of habitat management principles. The focus of Stronghold forests is on habitat management - whilst taking measures to defend them from grey squirrels and squirrelpox outbreaks. Currently only the Fleet Basin and Eskdalemuir Strongholds are within the grey squirrel range.

Stronghold forests provide an opportunity for more public awareness of red squirrel conservation approaches; which can raise the public profile of Strongholds at the same time as providing opportunities to visit and view red squirrels.

Across the UK there is other terminology and criteria for selecting red squirrel conservation areas and networks. We need to communicate clearly the purpose and benefits of the approach in Scotland and where possible align this with other UK approaches.

2.4 Monitoring squirrel populations

Squirrel records are now routinely submitted to the National Biodiversity Network via the Scottish Wildlife Trust. The systematic monitoring undertaken by the Saving Scotland's Red Squirrel's project has also hugely improved our knowledge of squirrel distributions and our ability to assess trends within the project areas.

Knowledge has also been improved in the Highlands, Fife, Perth & Kinross and Ayrshire by surveys carried out by Local Squirrel Groups and project staff.

It will be important to continue to monitor red squirrel distributions to assess the effectiveness of the conservation measures being applied. Presence/ absence monitoring (by methods as appropriate to local circumstances) is recommended as the standard[6].

Additional monitoring may be desired in specific project areas or for example of food availability.

In addition to monitoring red squirrel populations, keeping records of grey squirrel control effort is strongly encouraged (including locations, dates, trapping effort and number of captures) to assist co-ordination and targeting of control efforts.

Monitoring methods should seek to involve and engage local people and the results communicated back to illustrate the benefits of the work. However, much of this monitoring requires some project or centralised support to co-ordinate sampling approaches and data analysis. Where more detailed analyses are required, it may be helpful to involve academic partners in the study design and analysis.

See 2.2 for disease surveillance recommendations.

[6] FCS Practice note 11 (2009) - Practical techniques for surveying and monitoring squirrels - http://www.forestry.gov.uk/pdf/fcpn011.pdf/$FILE/fcpn011.pdf

2.5 Maintaining public support for red squirrel conservation

The strength of public interest in red squirrels is indicated by their being voted[7] Scotland's second favourite wildlife species. Despite this, fundraising for red squirrel conservation is becoming increasingly challenging. There is a need to maintain levels of support and to convert this enthusiasm into direct conservation action to maximise the public support that is available.

Essentially people enjoy seeing red squirrels; whether in their garden, in their local woods or on their holidays. People develop associations with their experiences of having seen red squirrels. Actions to explore and develop these values and associations will help to maintain levels of support for conservation action. This can take the form of public campaigns, communications, local events, talks, schools education, interpretation and providing viewing opportunities.

Under delivering action (2.8) it is recognised that there is an increasing role for land managers, volunteers and communities in red squirrel conservation. Hence there is a need to promote community participation and engender a collective responsibility for this work. Sustaining volunteer efforts depends on providing acknowledgement of the value of this work and good feedback on results. We need to learn more about what levels of conservation action can be delivered by volunteer networks and how it can be sustained.

There is a recognised need for an on-going staff resource to co-ordinate and support these efforts, but this support will need to be prioritised. A lot can be achieved in the absence of dedicated staff resources and other forms of support can be explored to facilitate action where there is a strong public desire to protect red squirrels; whilst providing safeguards for animal welfare standards.

Awareness of red squirrel protection and priority areas (Strongholds and priority areas for grey squirrel control) should be raised.

It is important to promote to local communities and the wider public, the successes of conservation actions being carried out – where they are real and demonstrable.

Through raising awareness, the public understanding of the need for grey squirrel control has grown. Communications should aim to be open and transparent about the range of work being carried out and should aim to reach a broader section of society than may have traditionally been involved in land management and conservation.

2.6 Improving understanding to benefit red squirrels

There is a long list of research questions that would improve our current understanding to benefit red squirrels. Given unlimited resources, many of these questions could be usefully explored. However, several questions are proposed as research priorities. These are:

- Developing a better understanding of squirrelpox transmission and the demographic and habitat factors that affect the incidence of outbreaks in red squirrels.

[7] SNH Year of Natural Scotland Big 5 Campaign.

- Understanding if pine martens differentially affect the distribution and abundance of red and grey squirrels and by what means[8].

- Further development of a squirrelpox vaccine for use at a landscape scale.

Commissioned research and academic partnerships will be explored along these themes.

Further topics identified where research is encouraged include:

- the effects of forest operations on red squirrels
- grey squirrel behaviour and ecology in conifer forests and urban habitats
- the impact of tree disease on forest management and red squirrels

2.7 Expanding the red squirrel range via conservation translocations and re-introductions

The Strategy recognises there is some enthusiasm for conservation translocations to re-introduce red squirrels to parts of their former range, particularly in the Highlands. This action is regarded as a lower priority than defending extant red squirrel populations that are currently under threat. However, where private resources are available and proposals comply with the necessary guidelines[9] and species licensing, translocations may be viewed as an opportunity with other benefits for engaging the public in red squirrel conservation.

The translocation guidelines require that the reasons for red squirrels loss from an area (and any changes that have taken place to alter these factors) are explored prior to re-introductions taking place. The guidelines also call for an assessment of habitat availability and that the species could not be expected to recolonize by natural expansion. Hence proposals for Highland translocations will be better informed by looking at these issues across the former range and making recommendations for where translocations and habitat connections/ management could in parallel, provide the strongest basis for population expansion.

There is no evidence to support that red squirrels were formerly present on the Scottish islands[10], hence proposals for conservation translocations are more likely to be supported in areas of former range.

Translocation should also take account of the best available advice on disease screening and biosecurity.

[8] Investigations are already underway by researchers based at Aberdeen University.
[9] International Union for the Conservation of Nature (IUCN) Guidelines for Reintroductions and Other Conservation Translocations, 2013, The Scottish Code for Conservation Translocations, SNH 2014.
[10] The population on Arran was introduced in the 1950's.

Section 3. How we will deliver action for red squirrels

Section 2 sets out a range of conservation actions that could be carried out to help deliver the aims in Section 1. Section 3 explores how this work may be delivered, taking account of likely financial limitations.

While no detailed delivery plan exists for the Strategy as a whole, the SSRS project does have a two year project plan that aims to deliver key areas of this Strategy. We expect the work of SSRS will be ongoing. In addition, financial support for the strategic priorities; principally targeted grey squirrel control and forest management is available via the Scottish Rural Development Programme (2015-2020). Support for collaborative action may also be available through SRDP. Red squirrel conservation is recognised as an on-going priority with on-going financial implications. However, the resources that will be required in the long-term need to be further explored.

The availability of resources to support action will depend on the levels of public and private funding that can be generated going forward. Public resources will be directed to help deliver national strategic priorities 1-3 in the first instance.

Delivery will involve a wide range of partners and individuals from project staff, government agencies, land managers, NGO's, local communities, volunteers and researchers. This document captures the range of red squirrel conservation action that is currently anticipated. Table 1. is not intended to be exhaustive or prohibitive, but provides an indication of the levels of anticipated activity by different interest groups in delivering each of the strategy aims.

3.1 Co-ordinating action for red squirrels

- At a regional and local level - Local Squirrel Groups and initiatives, land managers and volunteers.

There is support for volunteers and local communities playing an increasing role in red squirrel conservation; partly from necessity and partly because it helps to raise awareness and build long-term investment in red squirrels. Volunteering has added benefits to communities and to individuals.

Local Squirrel Groups, (where they exist) have a recognised role in helping to develop the local volunteer base and assisting with the co-ordination of local action. However, there is likely to be an ongoing need for co-ordination and support for Local Squirrel Groups.

- At a Scottish level - Scottish Squirrel Group and national projects

The Scottish Squirrel Group is a forum of interest groups that aims to facilitate communications and to co-ordinate activities with a view to conserving red squirrels in Scotland.

SSRS – is a partnership project led by the Scottish Wildlife Trust that operates across key parts of Scotland in line with the recognised strategic aims for red squirrel conservation. SWT also co-ordinate squirrel records across Scotland.

- At a UK level - UKRSG, UK Squirrel Accord

The UK Red Squirrel Group aims to provide support and advice on red squirrel conservation matters. The group membership includes government agencies, representatives of key NGOs and squirrel experts from Scotland, England, Wales and Northern Ireland.

The UK Squirrel Accord seeks to facilitate communications, promote scientific understanding and raise awareness relating to squirrel management.

Table 1. Indicative model for delivering red squirrel conservation

	Dedicated / project staff	Local squirrel groups	Community/ volunteers	Land managers	Public agencies/ funding	NGOs	Researchers
Grey squirrel; control	*	*	**	***	**	*	
Disease surveillance	***	*	*	*	*		**
Managing habitats		*		***	***	*	
Co-ordination of grey squirrel control/ monitoring/ surveillance	***	**			*		
Monitoring	***	**	**	**	*	*	*
Communications -press -facebook -websites -Talks/events -education -tourism	***	***	**	*	**	***	*
Fundraising	***	**	*	*	***	**	*
Research					**	*	***
Translocations and reintroductions		***		*	*	***	*

* Indicative scale of involvement.

Appendix 1

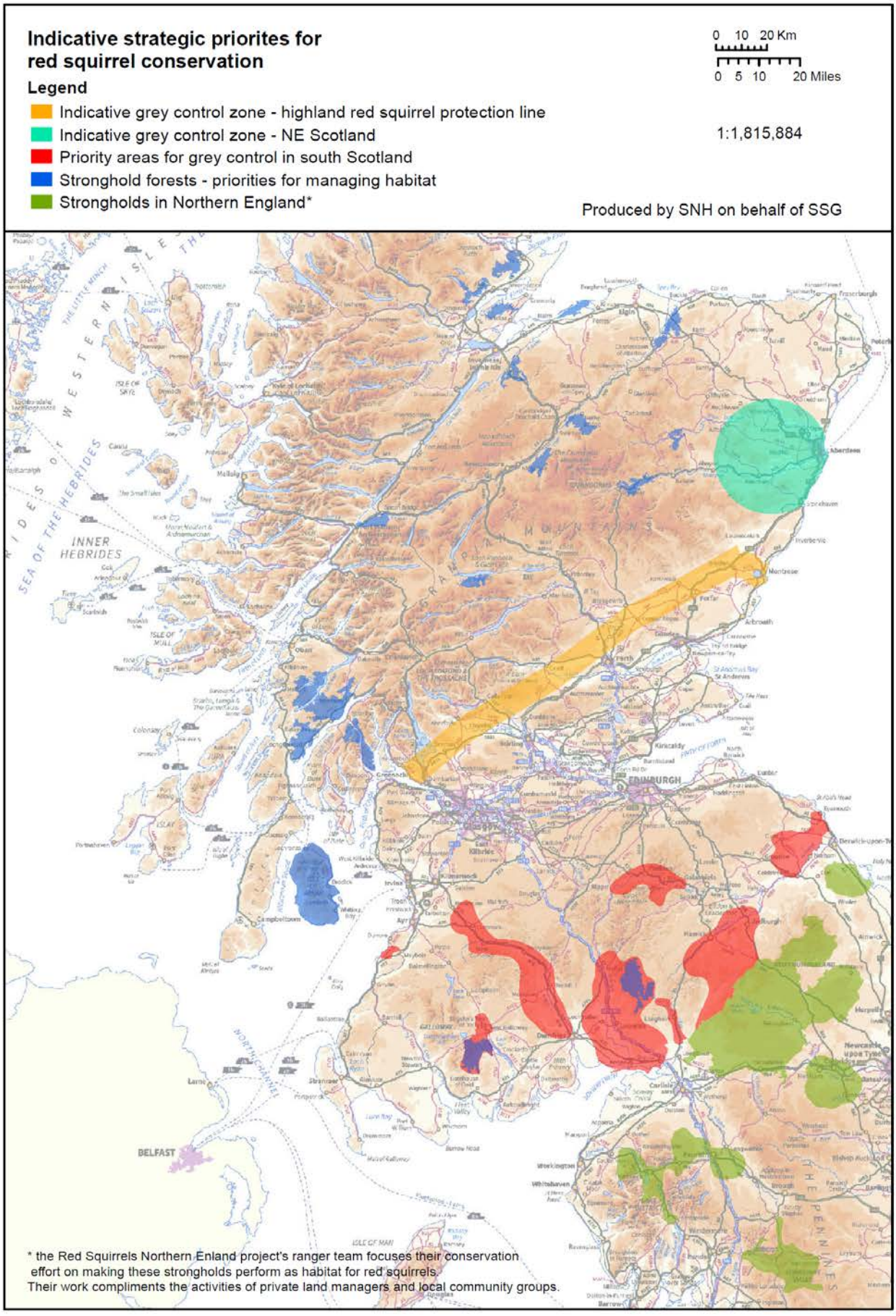
The Scottish Squirrel Group is composed of the following organisations:

Scottish Natural Heritage (Chair)
Forestry Commission Scotland
Saving Scotland's Red Squirrels
Scottish Land & Estates
RSPB Scotland
National Trust for Scotland
Forest Research
ConFor
European Squirrel Initiative
Loch Lomond & Trossachs National Park Authority
Highland Red Squirrel Group
Fife Red Squirrel Group
Ayrshire Red Squirrel Group
Grampian Squirrel Group
Red Alert South West Scotland
Perth and Kinross Red Squirrel Group

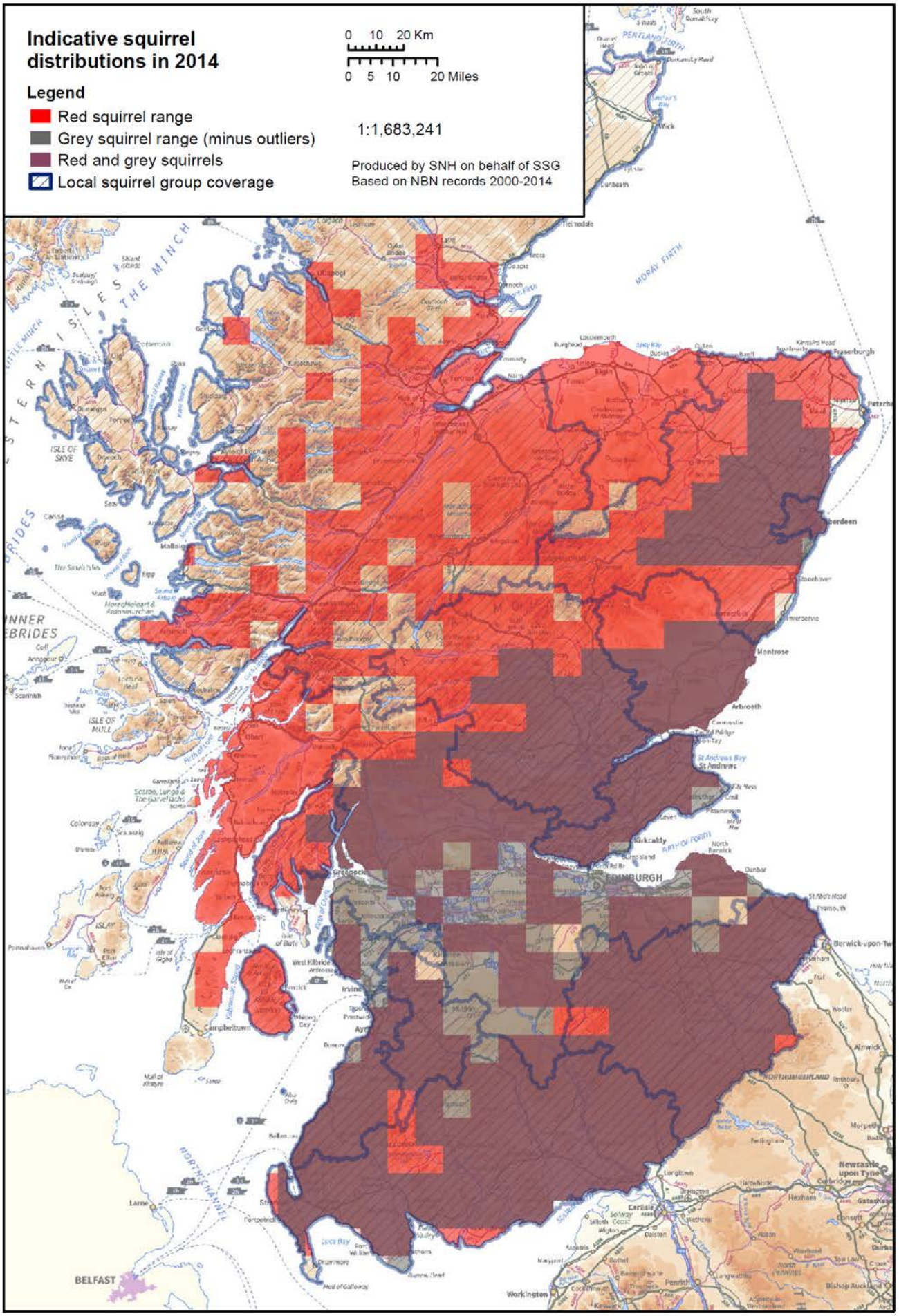
<u>Expert advisers</u>
Colin McInnes – Moredun Research Institute
Peter Lurz - Independent squirrel scientist

Appendix 2

Map 1 Indicative strategic priorities



Map 2 – Indicative squirrel distributions and local squirrel group coverage


Indicative squirrel distributions in 2014
Legend
Red squirrel range
Grey squirrel range (minus outliers)
Red and grey squirrels
Local squirrel group coverage
0 10 20 Km
0 5 10 20 Miles
1:1,683,241
Produced by SNH on behalf of SSG
Based on NBN records 2000-2014
THE MINCH
MORAY FIRTH
PENTLAND FIRTH
ISLE OF SKYE
ISLE OF MULL
ISLAY
EDINBURGH
BELFAST
NORTHUMBERLAND
Aberdeen
Montrose
Arbroath
St Andrews
Kirkcaldy
Berwick-upon-Tweed
Alnwick
Newcastle upon Tyne
Carlisle
Workington
Ayr
Campbeltown
Larne
Wick
Thurso
Fraserburgh
Peterhead
Inverness
Elgin
Oban
Fort William