Technical Guidance Series

CIEEM Chartered Institute of Ecology and Environmental Management

In association with The Mammal Society

Competencies for Species Survey: Red Squirrel

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1. Introduction

The purpose of this document is to set out the knowledge, skills and experience required to survey, disturb or to carry out research works (hereinafter referred to generically as 'survey') for the red squirrel *Sciurus vulgaris* in a professional capacity. To be undertaking such work, CIEEM would consider attainment of the criteria outlined in this guidance to be a minimum for an individual to competently survey for red squirrels. The Institute aims to drive up standards in the ecological profession for the benefit not only of ecologists but also of the public.

This document does not provide guidance on the techniques to be employed in carrying out survey activities: references to published sources of guidance on survey methods are listed in Section 5.

2. Status

Red squirrels have a restricted distribution in the UK, following major range contractions resulting from the loss and fragmentation of native habitats and the introduction of the grey squirrel from North America. Grey squirrels can outcompete red squirrels and also carry a poxvirus which is often fatal to red squirrels. Red squirrel populations are thought to be further declining as grey squirrels spread. Red squirrels are now one of the most threatened native mammals in the UK.

Scotland is the main stronghold for red squirrels, with fragmented populations found on islands or in large coniferous forests in England, Wales and Ireland. In 1995 the red squirrel population was put at 161,000 in Great Britain (70-75% of these in Scotland) (Harris *et al.* 1995). A more recent estimate of their total population in Britain is about 140,000, with 120,000 in Scotland, 3000 in Wales and 15,000 in England (Forestry Commission 2011). In England, most red squirrels are found in the north of the country, but they are still present on the Isle of Wight, and the islands of Brownsea and Furzey off the south coast. In 2008, it was estimated that there were 40,000 red squirrels in the whole of Ireland (see National Parks & Wildlife Service; Northern Ireland Environment Agency 2008).

The red squirrel is a UK BAP Priority Species, but is listed as a species of least concern on the IUCN Red List of Threatened Species as it is still 'sufficiently common' in many parts of Europe.

3. Legislation and Licensing

Legislation

Red squirrels are protected under the following legislation. This outline of legislation is not comprehensive and the appropriate legislation should always be consulted for a definitive list of offences.

COUNTRY	LEGISLATION GIVING PROTECTION	SCHEDULE OR ANNEX LISTING
England	Wildlife and Countryside Act 1981 (as amended)	Schedule 5 & 6
Wales	Wildlife and Countryside Act 1981 (as amended)	Schedule 5 & 6
Scotland	Wildlife and Countryside Act 1981 (as amended)	Schedule 5 & 6
Northern Ireland	Wildlife (Northern Ireland) Order 1985	Schedules 5, 6 & 7
Republic of Ireland	Wildlife Act 1976 (as amended)	Schedule 5

Licensing

The following Statutory Nature Conservation Organisations (SNCOs) are responsible for issuing licences to permit actions that would otherwise be illegal under the relevant legislation:

COUNTRY	SNCO
England	Natural England
Wales	Natural Resources Wales
Scotland	Scottish Natural Heritage
Northern Ireland	Northern Ireland Environment Agency
Republic of Ireland	National Parks & Wildlife Service

A *survey licence is required*: for any survey work that would interfere with the animals or their dreys, *e.g.* if an animal were to be caught for any purpose, such as marking or tagging, or if surveys involved the disturbance of an animal at a resting place or interference with such a resting place, *e.g.*, nest boxes.

A *survey licence is not required*: to carry out indirect survey for red squirrels (*e.g.* visual survey, hair tube survey, drey counts, feeding sign surveys or for using whole maize bait), providing that the surveyor takes reasonable precautions to avoid disturbing these animals in their dreys.

It is the role of the appropriate licensing authority to define the criteria for issuing such licences as may be required for survey work, therefore, attainment of the skills set out is no guarantee that a licence will be obtained; other criteria will need to be considered.

4. Knowledge, Skills and Experience

To plan, undertake and interpret surveys for, or research upon, red squirrels independently and competently, an individual would be expected to possess all of the following knowledge, skills and experience.

A surveyor needs to recognise their level of attainment along a continuum. Those without the breadth and depth of the knowledge, skills and experience that CIEEM consider a minimum, should always work with, or seek advice from, an adequately experienced individual.

Knowledge

Individuals should have a knowledge and understanding of:

a. conservation status;
b. distribution;
c. threats to red squirrel populations, species range and species survival;
d. red squirrel ecology, biology and behaviour;
e. known ecological requirements ;
f. legal protection;
g. licensing and permissions;
h. appropriate survey seasons;
i. current relevant guidance on survey methods and standards;
j. survey methods used to survey for red squirrels (including indirect methods such visual surveys, hair tubes, drey counts, feeding sign surveys and use of whole maize baits and direct methods such as trapping, marking/tagging and using nest boxes) and the strengths, weaknesses and limitations of these methods;
k. appropriate equipment, methods and licensing requirements for humane live-capture, handling and sedation of red squirrels (if intending to use these techniques) and the legal issues surrounding potential by-catch;
l. identification issues with red squirrel and grey squirrel;
m. range of factors that might lead to bias in the survey results, and false negatives;
n. the possibility of disease transmission between squirrels (red and grey), with particular knowledge of Squirrelpox virus, and how to proceed if the virus is identified;
o. sources of information on known occurrence and distribution of red squirrels (including NBN Gateway, national surveys, local biological/environmental records and local contacts and red squirrel groups);
p. metadata standards / data sharing; and
q. health and safety issues commonly associated with surveying for red squirrels.

Skills

Individuals should have skills and experience enabling them to:

a. identify and differentiate between the red and grey squirrel (fur colour not always an accurate method);
b. confidently identify field signs of the red and grey squirrel (*e.g.* feeding signs);
c. identify sick squirrels, especially those suffering from Squirrelpox virus infection;
d. assess habitat potential for red squirrels, in particular differentiate blocks of forest and woodland of high and low quality in terms of foraging and nesting opportunities for red squirrels;
e. carry out appropriate spatial scoping of field work;
f. plan and implement sound scientific surveys;
g. carry out surveys using indirect methods, including deployment of hair tubes;
h. photograph squirrels for identification purposes;
i. analyse and interpret survey data;
j. take appropriate biosecurity precautions; and
k. take appropriate health and safety precautions.

If surveying using nest boxes or traps, where relevant, individuals should be able to:

a. deploy and monitor nest boxes;
b. deploy and monitor live traps effectively (*e.g.* at correct spacing);
c. legally and humanely handle live squirrels;
d. effectively record biometric data (*e.g.* sex, weight) from live squirrels;
e. legally and humanely mark/tag squirrels (if using this technique); and
f. correctly identify and handle a range of potential by-catch from live-traps, with due regard to relevant legislation (it is an offence to release a grey squirrel into the wild).

[1] Anyone applying sedatives to animals for research purposes must be a vet or licensed under the Animals (Scientific Procedures) Act 1986

Practical Experience

Whilst some of the knowledge and skills set out in this guidance can effectively be gained from personal study, involvement with local experts, Mammal Group field work and/or training courses would be advisable. Red squirrel surveyors should have gained practical experience (in varying seasons), under the direct supervision of an experienced surveyor, which equips them with the skills outlined above.

5. Reading

The following references are essential reading for those wishing to gain the necessary knowledge, skills and experience to survey for red squirrels.

Carey M, Hamilton G, Poole A and Lawton C (2007) *The Irish squirrel survey 2007*. COFORD, Dublin.

Forestry Commission (2011) Wildlife: red squirrel. www.forestry.gov.uk/forestry/redsquirrel

Gurnell J and Pepper H (1994) Red squirrel conservation: Field study methods. *Research Information Note* **255**. Forestry Commission, Edinburgh.

Gurnell J, Lurz P, Shirley M, Magris L and Steele J (2004) A critical look at methods for monitoring red and grey squirrels. *Mammal Review* **34**: 51-74.

Gurnell J, Lurz P, McDonald R and Pepper H (2009) Practical Techniques for Surveying and Monitoring Squirrels. *Practice Note*. Forestry Commission, Edinburgh.

Gurnell J, Mcdonald R and Lurz P (in press) Making red squirrels more visible: the use of baited visual counts to monitor populations. *Mammal Review*.

Gurnell J and Pepper H (1993) A critical look at conserving the British red squirrel *Sciurus vulgaris*. *Mammal Review* **23**: 125-136.

Gurnell J, Rushton SP, Lurz PWW, Sainsbury AW, Nettleton P, Shirley MDF, Bruemmer C and Geddes N (2006) Squirrel poxvirus: Landscape scale strategies for managing disease threat. *Biological Conservation* **131**: 287-295.

Kenward R, Hodder K, Rose R, Walls C, Parish T, Holm J, Morris P, Walls S and Doyle F (1998) Comparative demography of red squirrels (*Sciurus vulgaris*) and grey squirrels (*Sciurus carolinensis*) in deciduous and conifer woodland. *Journal of Zoology* **244**: 7–21.

Natural England (2011) Urban grey squirrels 2nd Edition. Natural England *Technical Information Note* **TIN056**.

National Parks & Wildlife Service; Northern Ireland Environment Agency (2008) *All Ireland Species Action Plan: Red Squirrel*. National Parks & Wildlife Service, Dublin & Environment & Heritage Service, Northern Ireland.

Pepper H and Patterson G (1998) Red squirrel conservation. *Practice Note* **5**. Forestry Commission, Edinburgh.

Save Our Squirrels (2011) Squirrelpox Virus Fact Sheet. saveoursquirrels.org/pge/cms_uploaded_files/squirrelpox%20virus%20for%20vets.pdf

UK Red Squirrel Group (2004) Red Squirrels and the law. *Advice Note* **UKRSG A1**

UK Red Squirrel Group: Country Groups. www.snh.org.uk/ukredsquirrelgroup/countryGroups.asp

6. Acknowledgements

This guidance has been produced by John Gurnell of The Mammal Society on behalf of the Chartered Institute of Ecology and Environmental Management with the support of the Professional Standards Committee.

Cover photographs (left to right) taken by: Derek Crawley, wildstock.co.uk and Derek Crawley.

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