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Report of the Independent Working Group on Snares

August 2005

Ms Tanya Arkle
Head of Wildlife Integration and Conservation
Defra

31st August 2005

Dear Ms Arkle

I have the pleasure of submitting the Report of the Independent Working Group on Snares.

In approaching the task of developing a code of good practice, the Working Group undertook a review of the use of snares in the UK to help inform the drafting of the Code. This review was helpful also in identifying areas in which we believe further work is needed and we have made a number of recommendations for research and legislative changes that we believe, with the Code, are also important for wildlife welfare. The Report includes the review, the Code of Good Practice, and recommendations for research and for regulatory changes.

I am sending to you also a separate document in which estimates are provided of the costs of the recommended further work (listed in Sections 2.10 and 2.11) regarding research and the Code of Good Practice.

I am very grateful to the members of the Working Group for their time, commitment, and great contributions to this project. I am very grateful also to Dr Ian Inglis and Ms Diane Owen in their capacity as secretariat for the Group, and to the other individuals and organisations who contributed information and views on the subject for the Group's consideration.

The Code and the recommendations are important for wildlife welfare and I hope that the Report will provide a useful source of information on the use of snares in the UK and that the Government and others interested in the subject will find it of value.

Yours sincerely

James K Kirkwood
Chairman, Independent Working Group on Snares

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Terms of reference of the Independent Working Group on Snares

Background

Dr. James Kirkwood was asked by Defra in October 2004 to form and Chair an Independent Working Group to address issues surrounding the use of snares. Defra's context and background for this was:

'*The use of snares is permitted by the Wildlife and Countryside Act 1981 and is an effective tool for the management of pests. However, there are incidences where snares occasionally cause injury and possible death to the animals caught. Snares, provided they are set correctly are not cruel. We believe the most effective way of ensuring snares are used correctly is to produce a code of practice to be endorsed and publicised by non-government organisations. In the last twenty-three years the use of snares has not been reviewed and the lack of information currently leaves practitioners open to inadvertently committing an offence, those determined to flout the law with a loophole to do so, and the enforcement authorities without clear guidance on when an offence has been confirmed. Defra is very interested in how we can improve the flow of information on best practice for the use of snares.*'

Objectives

Defra's objectives for the Group were:

- to seek agreement on good practice guidelines
- to produce a code of good practice*
- to advise Defra on the next steps including approximate costs of each proposal

* the ambitious aim was to do this by June 2005

In pursuit of this, Defra requested also that any significant issues that could not be resolved should be reported to Defra.

Membership of the Independent Working Group on Snares

The Chairman invited the following to be the Members of the Working Group:

Mr Dick Best, Veterinary Surgeon
Professor Neville Gregory, Royal Veterinary College
Professor David Macdonald, Wildlife Conservation Research Unit, Oxford
Dr Tony Mitchell-Jones, English Nature
Mr Charles Nodder, National Gamekeepers Organisation
Dr Jonathan Reynolds, The Game Conservancy Trust
Mr Stewart Scull, British Association for Shooting and Conservation
Mr Hugh Thomas, Union of Country Sports Workers
Mr Michael Waters, British Veterinary Association

Mr Colin Booty, RSPCA also attended the meetings to 20th May 2005 but, unfortunately, had then to withdraw from the process due to other work pressures. The resulting vacancy on the Working Group was taken up by Mr James Cormack, Chief Inspector SSPCA.

Dr Ian Inglis, Central Science Laboratory – Secretariat
Ms Diane Owen, Central Science Laboratory – Secretariat

The meetings were attended by Dr Jane Goodwin, European Wildlife Division, Defra.

Dealing with the diversity of opinion within the Working Group

With regards to the membership of the Working Group, some organisations and individuals believe that the use of snares can be justifiable whilst others hold the view that snares should never be used. The Working Group worked together with the common aim of encouraging the use of alternative more humane methods of control where appropriate and ensuring that snares are used to high standards and in accordance with agreed codes of practice, minimising risks to the welfare of both target and non-target animals.

Scope and Approach

In approaching the task set out in the objectives, the Working Group undertook a review of the use of snares in order to inform the forward look. This review focused on the use of snares in the UK and took into account the responses received during Defra's informal consultation exercise.

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Executive Summary

1. Snares are currently used in the UK in a number of different contexts, chiefly to catch foxes and rabbits. Most commonly they are used as part of population control measures (e.g. to reduce fox predation on other species or to protect crops from rabbits) but they are used in other contexts also, for example to harvest animals for food and to capture them for research. Snares involve the use of flexible materials to capture and restrain, and in this regard they have similarities to gill nets used for capture of sea fish and mist nets used in the capture of wild birds for ringing.

2. Whilst there is evidence that snares are used widely (for example a recent BASC survey indicated that 30% of foxes culled by gamekeepers were caught using snares), their use has been subject to little scientific study.

3. In contrast to the situation in some other countries (e.g. USA and Canada), snares are widely used in the UK to restrain animals for despatch rather than as killing devices. Self-locking snares, that can act only with a one-way ratchet effect to tighten around the neck as the animal pulls, are illegal in the UK (although no clear legal definition of 'self-locking' has been established).

4. There are very few data on the welfare impact of snares. It is believed that, if they are used carefully, their adverse welfare consequences can be relatively minor. For this reason they have been used, as the method of choice for capture of animals, in some research programmes into fox biology. On the other hand, at the other end of the spectrum, there is no doubt that if used carelessly or irresponsibly (and especially if not inspected, or if an animal escapes whilst still entangled by the snare) they can cause extremely severe welfare problems. Clearly much depends on operator practice. Because there are no adequate data it is not currently possible to assess the welfare impact of snares under routine use or how frequently severe problems occur.

5. There is a limited variety of other methods for capture or killing of the species for which snares are often used. However, there have been few studies of the welfare

impact of these either so that there are no firm bases from which to assess the welfare effects of snares compared with these other methods. It would appear that all methods can have welfare drawbacks in practice. For example, shooting can, if the shot destroys the brain (and specifically the brain stem), meet the humane ideal of causing instantaneous, irreversible, loss of consciousness followed by death without fear or pain. However, if the shot does not cause rapid death and the animal escapes injured (and there is good reason to believe this happens in a proportion of cases) it may suffer a prolonged and painful death.

6. The proportion of non-target species caught and held in snares set for foxes is often quite high (the results of various surveys reviewed here ranged from 21-69%). Whilst the capture rate of non-targets can be reduced through good field-craft (requiring training and careful attention to good practice), it may be difficult in some environments to reduce the overall proportion of non-target animals caught in fox snares to below about 40%.

7. We have found almost no information about the welfare impacts, or rates of non-target capture, associated with the setting of snares to catch rabbits. It seems to be commonly believed that snares often kill rabbits rapidly by breaking their necks. However, we have found no data with which to confirm or refute this and are unaware of any data on the clinical or pathological effects of snares on rabbits or on causes of death.

8. The lack of data available on the use of snares, and particularly on their welfare impact, is a serious problem both in making cost/benefit assessments about when the use of snares is justifiable (see below) and also in developing guidelines about good practice. We have therefore recommended that research is required (see below).

9. We have suggested that there are two important principles in the humane control of vertebrate pest species. The first is that when deciding whether and how to proceed, the expected benefits of proposed management procedures should be 'weighed' carefully against the possible costs in terms of harm to the welfare of the animals involved or to populations of non-target species. Procedures that have the

potential to harm the welfare of animals should not be used unless there are benefits in doing so that outweigh the welfare costs. The second is that, where it is decided that a certain procedure should be used, steps should be taken to, as far as practicable, minimise the risks of adverse welfare impacts.

10. The greater the scale of possible adverse impacts on animal welfare, the greater the need for formality and rigor in cost/benefit analysis. For a research or wildlife control programme at the national level we suggest it would be important that these matters are considered by a group and that soundly-reasoned, ethically-defensible decisions are reached collectively. For smaller, local issues such as rabbit control on a farm or other land, individual farmers or land managers are responsible for carefully considering the balance of possible welfare costs against benefits themselves but may often wish to discuss this with others.

11. We have developed a Code of Good Practice and recommend that Defra endorses and promotes this Code.

12. We have recommended that this Code be reviewed in three years in the light of research results and data collected in the interim on the use of snares.

13. We have recommended that research should be carried out in the following areas:

- survey of the use of snares in the UK, covering all their uses
- the welfare impact of snares, based on investigation of their physical (clinical and pathological), physiological and behavioural effects
- potential use of foot snares
- technical improvement to snares to reduce the risk of adverse welfare impacts, including the development of remote monitoring devices, and to reduce risks to non-target animals.

14. We have recommended that Defra encourages, and is open to, applications for funding to support work into (i) welfare refinements to existing methods of vertebrate pest control, and (ii) novel methods (these might include, for example, agents

delivered in a safe, species-specific, manner that humanely either kill or prevent breeding).

15. We have recommended that Defra consider making the following legislative changes:

- the Wildlife and Countryside Act 1981 be amended as soon as possible to require that on discovery snared animals be released or despatched and for the carcase to be removed the same day (See section 2.8.1.4).
- the wording concerning inspection intervals in the Wildlife and Countryside Act 1981 be amended as soon as possible because, at present, it allows for the possibility that animals could be held in snares for unacceptable periods. Unfortunately it has not been possible in the time available for the Working Group to agree an exact form of words to recommend to Defra. (It should be noted that the Code of Good Practice provides considerably tighter constraints on inspection interval than the current legal minimum).
- to make it a legal requirement to use a fixed 'stop' on all snares;
- that following review of the Code of Good Practice in three years time and in the light of research findings (see 12 and 13 above), Defra consider giving the Code a greater legal status.

1. Introduction

In December 2004 the Independent Working Group on Snares was established, at Defra's request, with the central aim of producing a Code of Good Practice concerning the use of snares (see section 3). In order to inform its deliberations on the production of this Code, the Working Group undertook a review of current knowledge about the use of snares in the UK. The aims of this review, which is presented as Section 2 of this Report, were to try to find out and report what is currently known about the design and deployment of snares, about their efficiency, about the incidence of capture of non-target species, and about their welfare impact on both target and non-target animals.

As human activities and demands for land-use have changed, there are many cases in the UK and around the world in which human interests are in conflict with the interest of wildlife species. Where such conflicts occur, they may have an adverse impact on species population viability, or on the welfare (the quality of life) of individual wild animals (or on both of these). The impact of human activities on wildlife at the population level has been the subject of a great deal of research and debate around the world and many conservation measures have been developed to try to prevent or minimise anthropogenic threats to wild animal species. By comparison, the effects of human activities on wildlife welfare have generally received much less attention (with a few notable exceptions, e.g. the fox-hunting debate). This is somewhat surprising considering the growth in public and scientific interest in the welfare of domesticated animals in recent decades.

In undertaking this review it has become apparent that, although snaring appears to be a common and widely used practice, particularly in the control of foxes and rabbits (for example, a survey by BASC (1995) found that 86% of gamekeepers used fox snares and that this method accounted for 30% of the total foxes killed by gamekeepers), in the UK there is very little scientific information on the subject and especially regarding the welfare impact of snares. A number of questions arose during the course of this review (e.g. regarding aspects of snare design and deployment),

answers to which would have been very useful to inform the production of the Code of Good Practice, but to which no answers can be provided at the present time because there are simply not the data to support them. Hence we have also made a number of recommendations for research.

Although snares are most commonly used for fox and rabbit population control, they are used also for a variety of other purposes (including, for example, capture of rabbits for food and of foxes for research: see Section 2.3). Whilst we have given consideration to the relative merits of snares versus other methods of capture/population control (albeit of a preliminary nature because of the lack of information), it was beyond the scope of this Working Group to consider the justification and merits of undertaking such interventions for wildlife population control (or harvesting or study). The approach we have taken here is to strongly advocate that each case should be carefully assessed on its own merits, taking into account the balance of the benefits and the potential costs (at individual and population levels) to the animals involved. Clearly everyone involved in the capture/control of wild animals has a moral obligation not to risk compromising the welfare of the animals involved unnecessarily.

We are not aware of any formal surveys of public opinion on the use of snares (but see White *et al*., 2003). There is certainly a body of opinion opposed to their use and there have been quite widely publicised calls for their use to be banned. On the other hand, some firmly believe that their use is justifiable for specific purposes, taking into account the welfare issues associated with other capture or control methods. Some organisations have made efforts to promote a responsible approach to their use.

The Working Group's review of snaring is presented below in Section 2, and this is followed by the Code of Good Practice in Section 3.

2 Review of snares and snaring in the UK

2.1 Introduction and history

The UK is one of a small number of European countries in which snaring is a permitted wildlife management technique. As is discussed later, in the UK it is illegal to set self-locking snares and the rationale for the inclusion of this point in the Wildlife and Countryside Act 1981 is thought to have been to reduce the risk of strangulation so that any non-target animals caught could be set free. In the UK, therefore, snares are widely used to capture and restrain target animals for despatch, rather than to kill. In some other countries in which snares are used, they are designed with the aim of causing death as rapidly as possible.

Although snaring appears to be most commonly and widely used for the control of foxes and rabbits (for example, a survey in 2000 found that 86% of gamekeepers used fox snares and that this method accounted for 30% of the total foxes killed by gamekeepers (BASC, 1995)), they may also be used to capture other species (e.g. mink, grey squirrel) and for a variety of other purposes (e.g. they have been chosen as the method of choice on grounds of efficiency and humaneness to catch foxes in wildlife research). However, the extent to which others involved in land use, farming, wildlife research and management and related fields use snares has not, as far as we are aware, been systematically surveyed (with the exception of three regions of England and Wales, Heydon & Reynolds, 2000).

Although the snare is an ancient hunting tool, the use of snares to capture canids, such as foxes, is a relatively recent development arising from the availability in the early 1900s of flexible steel cable. Earlier snares were constructed of materials such as cordage or brass wire that, whilst adequate to capture animals like rabbits, could be shredded easily by canid teeth. Whilst there is considerable ‘lore’ about the design and use of snares, despite its apparently wide use the practice of snaring has not been subject to much scientific scrutiny aimed either at determining the welfare impact or in designing improved technology.

2.2 Snares

2.2.1 Types of snares

Neck snares. A traditional neck snare is a running noose whose free end is attached to something sufficiently substantial that the noose draws up around the neck of the captured animal to hold it (see Figure 1). The neck snare is drawn up around the neck of the animal by the forward movements of the animal itself and, unlike the various forms of mechanical traps, does not require gravitational energy or the energy retained in a spring for its action.

There are two types of neck snare. A 'free-running' snare is a wire loop that relaxes when the animal stops pulling (see Figure 2), whilst a 'self-locking' snare is a wire loop that tightens progressively by a ratchet action as the animal struggles (see Figure 3). Self-locking snares are illegal in the UK (see section 2.8.1.1). However there is no legal definition of the term 'self-locking'; essentially it is a question of fact. To some extent self-locking properties can arise unintentionally, for example if a free-running snare is rusty, becomes entangled in obstacles, or becomes twisted and kinked by the movements of the trapped animal. Definition of these properties by examination of the hardware before or after capture is therefore fraught with difficulties. Some free-running snares have a fixed 'stop' (see section 2.2.5) that prevents closure of the noose beyond a certain limit so that although the animal is held securely it will not be strangled. Figure 1 shows the component parts of a neck snare.

There are also spring-powered neck snares, not approved for use in the UK, for example the 'Collarum'.

Foot or leg snares. Foot or leg snares require the action of a spring to tighten the noose around the leg of the animal and for this reason the use of foot snares in the UK falls within, and is licensed under, the Spring Traps Approval Order (1995). Currently only one foot snare, the Aldrich Spring Activated Animal Snare, is licensed and this

can be used "only for the purpose of killing or taking large, non-indigenous, mammalian carnivores".

Foot snares have been used for many years in North America (e.g. Novak, 1979, 1981; Berchielli & Tullar, 1980; Englund, 1982; Skinner & Todd, 1990) and the use of padded foot snares has been suggested by some animal welfare groups in North America as a more humane alternative to neck snaring for live capture. We are aware of two basic types of foot snare (a) the spring-arm foot snare developed in North America and, (b) the tubular foot snare developed in Scandinavia.

With the spring-arm foot snare, the snare noose is positioned horizontally on the ground encircling a trigger-pan connected to a spring. When an animal steps on the trigger the spring-arm flies up, tightening the noose around the leg. The two main designs of spring-arm foot snare are the Fremont and the Novak (e.g. Novak, 1979). A further design (the Godwin Humane Leghold Trap) involves a coil spring rather than an arm to raise and tighten the snare. In all these designs the noose is generally unpadded wire cable. However, it may be possible to develop a truly padded foot snare based on such designs by replacing the wire noose by a non-metal alternative, such as Kevlar that would reduce the risk of tooth damage and leg abrasion, or by covering the wire in a plastic coating: Englund (1982) concluded from trials of foot snares against foxes that "all physical injuries…can be virtually eliminated through the use of the plastic covered foot snare".

More recently a padded spring-arm foot snare called the Rose Leg Cuff has been developed. In this version the wire noose incorporates a Kevlar 'cuff' that encloses the trapped leg thereby minimising injuries. Some pen trials of the Rose Leg Cuff with foxes and badgers have recently been completed (Defra unpublished results). For both species the only injury that resulted from restraint in this device was a temporary swelling of the trapped paw that disappeared within 30 minutes of release from the cuff. However, preliminary results from small-scale field trials indicate that improvements need to be made to the triggering mechanism of the Rose Leg Cuff to increase its efficacy.

When tubular foot snares are triggered the energy of a coiled spring housed in a tube is used to tighten the noose the animal's leg. There are two main designs of tubular foot snare, Jan's Catcher and the Ezyonem. Both are normally hidden under snow when the trap is set. It is unclear whether they would be suitable for UK conditions or whether they could be modified to make them suitable.

It remains unclear at this stage whether foot snares could be effective methods of capture within the UK.

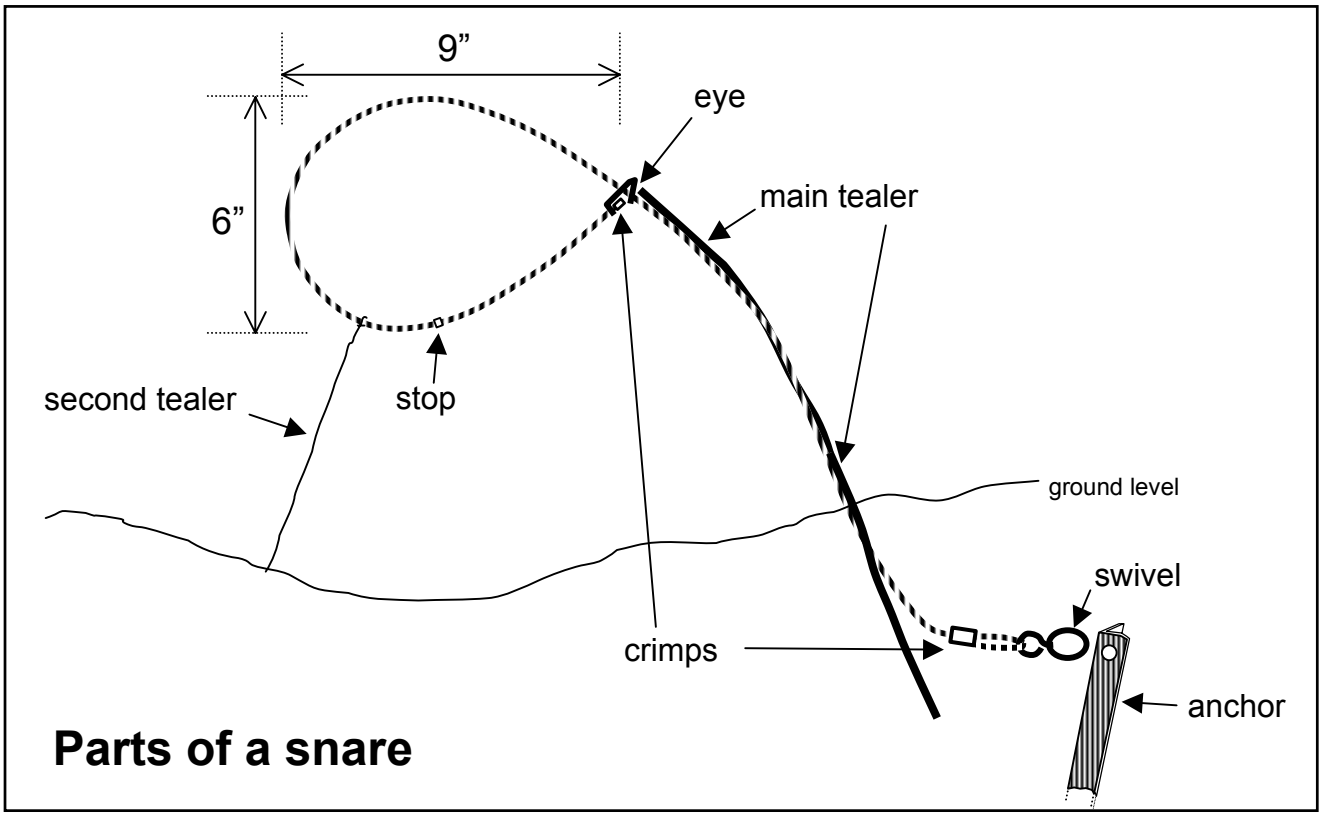

Figure 1. The main components of a snare.

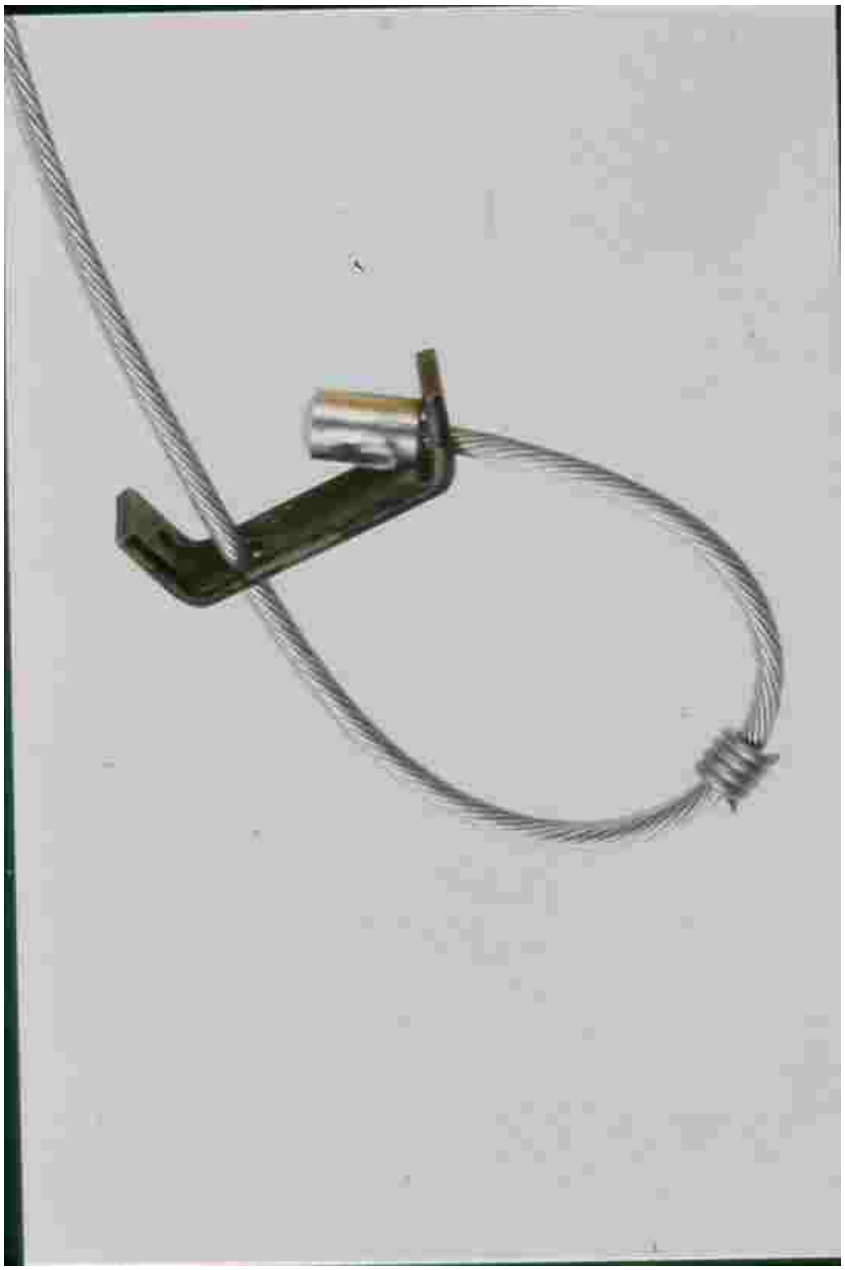

Figure 2: This design of snare is free-running when configured in this way.

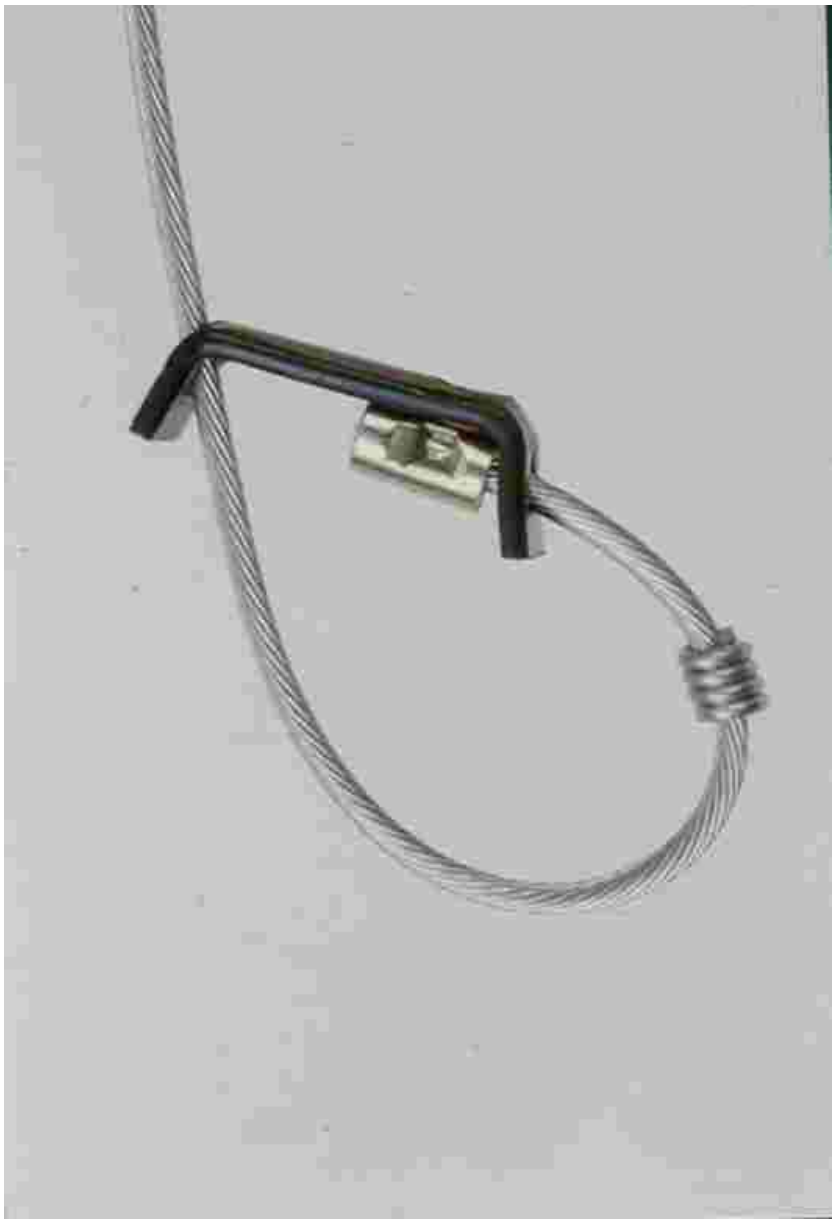

Figure 3: This snare, of the same components as in Fig 2, becomes self-locking when configured in this way (the wire passes through a different hole in the metal plate and the plate is reversed).

2.2.2 Types of cable Modern snares are constructed from brass or steel cables. Rabbit snares are made from soft annealed brass wire, usually 0.457 mm diameter (0.018 in). The usual construction is from 3 or 4 strands of wire, doubled around a brass eyelet which forms the eye of the snare (see section 2.2.4), so that there are 3 or 4 strands around the eyelet, and 6 or 8 elsewhere, which are twisted together. The lower end of the wire bundle is passed through a cord (that forms the tie-down to the anchor peg) and doubled back and twisted around itself.

Fox snares are constructed from steel cable and this comes in many forms. The important parameters of such cables are: overall diameter; construction (simple twist, core/sheath construction, or rope-laid); number of component bundles; number of wires within each bundle; diameter of individual wires; direction of lay of wires and of bundles; type of metal used; and surface finish. The construction of the cable affects performance in a number of ways, particularly in terms of its flexibility. Nooses made from more flexible cable require more physical support to hold the noose correctly at precisely the right location. This is done using a second 'tealer' (see section 2.2.3). However, the second tealer can impede the action of the snare in drawing up and also make the noose susceptible to being knocked out of position by passing animals. Stiffer cables make a noose that tends to flick back into its proper position if knocked but a stiffer wire may also have a greater tendency to spring open again when the pull is relaxed, releasing the animal. Stiffer cables have fewer, thicker component wires and are less likely to break under challenge by a captured animal through the separation and successive failure of each component wire. The surface texture of the cable is dependent on its structure, and it influences the ease with which the cable runs through the 'eye' of the snare. For example a 'Dyform' cable has a shaped outer surface and is especially smooth but is not usually available in small cable diameters. Some cable constructions have a greater tendency to kink, which can result in the snare becoming effectively self-locking. Snares made from thinner cables are less obtrusive and are therefore likely to be more effective in capture, but may also be weaker with greater risk of animals breaking free (at worst with the snare still around them), and may, we speculate, be more likely to cause tissue damage to the neck when the animal pulls against them.

Views differ on the optimal length of the cable. Longer cables allow captured animals to generate a greater force by acceleration before being brought up short, and thereby have the potential to cause more injury. On the other hand an animal held on a long snare is free to move around and perhaps into locations in which it feels more secure. As far as we are aware, optimum cable length has not been the subject of scientific enquiry.

2.2.3 The tealer The snare needs some form of support to hold the noose at head height for the target animal, and this is usually provided by a rigid stick or wire 'tealer' at one side of the run on which it is placed. In fox snaring, the tealer is potentially a visual and olfactory 'give-away', and it is thought to be advantageous in terms of capture efficiency to reduce its profile in both respects. Counter-intuitively, natural materials are said to be the poorer choice in most situations. For instance, tealers cut from branch-wood are attention-catching away from woodlands, have a large surface area to carry human scent, and cannot be cleaned of scent easily. However, Marchington (1987) records that during MAFF rabbit snaring trials it was found that rabbit capture rate was unaffected (if anything slightly higher) by peeling the bark from tealers, which left them white and highly visible.

Tealers of wire, especially copper wire, have a low visual profile, are easy to use, have little surface area to carry human scent, and can in any case be boiled to remove scent. Fox snares made of more flexible cable may require the use of a second tealer at the opposite side, to support the noose. Because such second tealers must be attached to the noose itself rather than the standing part of the snare, they have to be sufficiently insubstantial not to interfere with the drawing up of the noose. The GCT recommends florists' wire for this purpose.

2.2.4 The eye One end of the snare cable is passed through an eye at the other end to form a noose. The eye can be formed simply by the cable end being looped back on itself, or it may be an additional component attached to one end of the cable, with a hole or slot in it. Under UK legislation (see section 2.8) the cable must run freely through the eye because self-locking snares are illegal. As outlined above, the free sliding of the wire through the eye is influenced by the surface texture of the wire cable as well as by the design of the eye itself. It is highly desirable that either the eye

or its point of attachment should be the weakest part of the snare so that the noose will break at this point, if anywhere, thus ensuring that no animal can escape with part of the snare attached. There are several designs of eyes and three are outlined below.

(i) A simple loop formed by bending the end of the wire back on itself and fastening it with a crimp. Where a stop is fitted (see section 2.2.5), it may be necessary to add a washer between the stop and this kind of 'loop eye' to prevent the loop riding over the stop. A problem with this kind of eye is that it is difficult to ensure that the loop eye is formed at, or remains at, right angles to the cable running through it. If not, the cable may not run freely through it

(ii) Specially-formed metal plates with holes or slots drilled to precise dimensions, through which the cable runs. The design of these is critical to avoid the problem that the cable may cease to be free-running when pulled at certain angles. Some eyes of this type may act as self-locking snares if poorly-designed, used incorrectly, deliberately deformed, or not adequately maintained.

(iii) Breakaway devices, designed to break at a specific strain when an animal larger or stronger than the target species gets caught. Breakaways usually (and always should) operate at the eye so that if animals break free they will not have any part of the snare attached to them.

2.2.5 The stop The stop is a small crimp, knot in the wire, or other device on the cable that prevents the noose closing beyond a predetermined diameter both in order to prevent injury or death by strangulation, and to reduce the capture of non-target species (e.g. of deer that can otherwise be caught by the foot). Although there is no systematic evidence to demonstrate that stopped snares are better than un-stopped snares in either respect, the problems described above have not arisen when using stopped snares in the live-capture of foxes for radio-tagging (Reynolds, pers. Comm.). There is no legal requirement to use a stop.

The Field of 19 December 1891 reported the first 'humane rabbit snare', which was simply an ordinary snare with a knot in the wire 4½-4¾ inches (11.4–12.2 cm.) from the eye, to give a minimum noose diameter of 1½ inches (3.8 cm.) and prevent the noose tightening further. The main argument advanced in its favour was that rabbits

so taken would not be strangled but would "sit quietly", and could later be killed or liberated elsewhere (for re-stocking) if required. No evidence was given that this was the case in practice. Defra (2004a) advises that rabbit snares should have a stop at 5 inches (12.7 cm.) from the eye, which gives a minimum noose diameter of 1.6 inches (4.1 cm.). However, rabbit snares are usually sold without a stop.

Many fox snares are sold with a stop threaded onto the snare but not fixed, allowing operators to fix their own minimum loop size. Table 1 shows how the final diameter of noose results from the distance between stop and eye. A stop position of 9 inches (22.9 cm.) is the recommendation made by BASC for fox snares in their Code of Good Practice, and is also adopted by the GCT. The Snare Shop (Iowa, USA; www.snareshop.com) offers a snare for live-capture of foxes in which the stop is set at 8 inches (20.3 cm.). Lloyd (1980) recommended 11 inches (28 cm), based on the neck circumferences of a large (9 kg) fox rather than on field trials, giving a minimum noose diameter just over half an inch larger than the BASC/GCT guideline. The body size of adult foxes varies with sex and also between regions. In one part of Dorset, for example, vixens are typically 5.5 kg, and dog foxes 6.5 kg. Whilst setting the stop wide reduces the risk of strangulation or damage to neck tissues, it may increase the chances that target animals escape. It may also increase the risk that animals caught in the snare may slip one or both forelimbs through the noose and become trapped by the chest or waist. Capture by the waist is widely believed to result in more suffering than capture by the neck, though again there are no experimental data to support this perception. There have been no systematic studies into the optimal position of the stop.

Table 1: Relationship between the distance from the stop to the eye (c, in) and the diameter (d, in) of the drawn snare ($d = c/\pi$). BASC and the GCT recommend setting the stop at 9 in.

distance of stop from eye (in)	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12
minimum diameter of closed loop (in)	1.9	2.1	2.2	2.4	2.5	2.7	2.9	3.0	3.2	3.3	3.5	3.7	3.8

We recommend that there should be a legal requirement for all snares to be fitted with fixed stops to eliminate or minimise any risk of causing suffering through constriction.

2.2.6 The swivel A captured animal may repeatedly turn around in its efforts to escape, causing the cable to untwist with the subsequent breaking of the separated strands. A swivel helps to prevent this. There are advantages to placing the swivel at the bottom of the snare where it is out of sight and close to the anchor point to make it turn. However, in practice, a swivel placed near the anchor point may become jammed with vegetation and therefore fail to work. For these reasons we consider it good practice to use two swivels on fox snares, one at the base and one closer to the noose. It is important to ensure that the fastenings between the swivels and the cable are stronger than the eye of the snare. By tradition, swivels are not used in rabbit snares.

2.2.7 The anchor The end of the snare is attached firmly to the anchor point. The anchor point can be any fixed or sufficiently immobile object (e.g. a metal stake inserted into the ground for the purpose, a tree or a drag. A drag is an object of sufficient weight and size that, whilst allowing some movement and thus some give in

the snare, prevents the animal from moving more than a very short distance from the capture point. There are arguments for and against the use of drags.

The advantages are said to be:

- the captured animal moves quickly away from the capture site, which can be used again;
- fixed ground anchors are an extra expense, can be difficult to move, and can be a hazard to farm machinery;
- the captured animal can move into an area of cover where it will feel more secure and therefore less stressed;
- resistance to the animal's pull is softened by the freedom of the drag to move, and by the 'give' of any vegetation in which the drag ultimately becomes caught. This is said to result in less injury to the animal, but there has been no systematic study.

The potential disadvantages are that:

- the snared animal may be hard to find once it has moved away from the capture point, and could potentially be lost entirely. In Sweden Englund (1982) found that 13% of foxes held in foot snares fitted to drags moved more than 500 m from the site of capture;
- the snared animal may move away and become entangled in a fence or hedge adding to the risk of injury or death;
- the drag itself may damage crops;
- the drag is a sizeable feature that could conceivably divert the interest of the approaching animal and reduce capture rate;
- both breakaways and cushioning devices (devices which enable some give in snare cables) would be ineffectual where drags are used.

Because the weight of the drag has to be appropriate for the size and strength of the species to be snared, there is a danger that if a larger, stronger non-target animal is caught, the drag will not provide sufficient restraint. On balance we consider that a drag should not be used.

2.2.8 Selection of appropriate snare design

Given the many subtle differences in design of most features of snares, the operator has some influence on snare performance simply through his choice of snare and its anchor. Many other aspects of snare use are not features of the hardware but are under operator control. Practical aspects include the location, size of the loop, the height of the loop above the ground, orientation of the loop (eye uppermost or to the side), and steps taken to minimise scent cues that may catch the attention of the potential target animal. More strategic aspects under operator control include the season of use, the number of snares used, and the time for which individual snares are deployed (see section 2.3.1).

2.3 The use of snares

Snares are used for a variety of purposes, including the following:

- for the capture of rabbits for the protection of crops (to help manage rabbit infestations, the Ground Game Act 1880 gives every occupier of land a right to kill and take rabbits by any legal method and there is an Order under Section 1 of the Pests Act 1954 (see below) which obliges occupiers of land to destroy rabbits or prevent them causing damage);
- for the capture of rabbits for food;
- for the capture of foxes to protect livestock or game;
- for the capture of foxes and/or mink in protection of wildlife species in species conservation programmes;
- for the capture of foxes in disease management programmes;
- for the capture, in Scotland, of mountain hares in programmes to control louping ill (a disease of sheep and grouse carried by ticks of which the hare is also a host), and to protect forestry; and
- in the capture of a range of wild animals for research purposes.

The most common use of snares is the capture of foxes and rabbits for pest control purposes but we understand that they are also used on occasions in mink, rat and grey squirrel control.

All occupiers have statutory obligations regarding wild rabbits on their land. An Order has been made under Section One of the Pests Act 1954 by which England and Wales (except for the City of London, the Isles of Scilly and Skokholm Island) have been declared a Rabbit Clearance Area. In this area, every occupier of land is responsible for destroying wild rabbits on his/her land or for taking steps to prevent them causing damage. This is a continuing obligation.

No surveys have been undertaken, as far as we are aware, with the aim of trying to establish why snares are used, or to establish the rationale for the choice of snares as opposed to other methods. It is our understanding that the factors influencing the

decision to use snares have included perceptions and experiences relating to the following:

- that snares are an effective method in terms of operator hours
- that they are humane when used appropriately
- that the benefits of their use outweigh possible disadvantages
- that, in some cases, there are no practical alternatives. For example, as expanded upon below, it is believed that snares can be effective in capturing foxes that would otherwise, because of the circumstances, terrain or wiliness of the individual, be very hard to catch.

Snares differ from many other methods of fox or rabbit control in one important respect; namely they catch animals completely unawares. The physical structure of a snare is minimal, so that sensory cues are not readily apparent to the target animal. If the animal becomes aware of the snare, it will not be caught in it; not because it necessarily sees the snare as threatening, but because it will pause to examine the structure, and then avoid it. A fox treats a detected snare like any unfamiliar small object: it will walk round it, sniff, and even scent-mark the snare, thereby making it still more conspicuous and avoidable. Scent is also believed to be an important issue with rabbit snares. For instance, Marchington (1987) records the belief that rabbit snares that are set in the morning catch better than those that are set in the afternoon or evening, supposedly because odour cues have had a chance to evaporate.

Many of the alternative methods of fox culling carry substantial sensory cues that enable foxes to evade capture or culling through natural wariness or neophobia, often reinforced by learning. The relative ease in which urban foxes can be cage-trapped compared with rural foxes suggests that fox populations subject to regular culling pressure are more wary than others. Because the efficacy of snares is dependent upon their not being detected, snares are argued to be the only culling method available where prolonged use cannot eventually result in a fraction of the population becoming untrappable**.** Seasonal variation in catch-per-unit-effort is consistent with this: catch-per-unit-effort for snares peaks in mid-winter when dispersal is at its height, rather than summer or autumn when the highest proportion of the population consists of

young, naïve animals. Another supporting indication is that in radio-tracking studies, it is possible to recapture tagged individuals using snares.

2.3.1 Practical advice on snaring

Some leaflets providing advice on snaring have been published. The Fox Snaring Code of Practice produced by BASC is used widely and has, for example, become a component part of the National Foundation Course for Police Wildlife Crime Officers. The GCT has also produced a leaflet of practical advice on fox snaring. However, no equivalent standards and guidelines have been published which cover the snaring of rabbits, although relevant information is available in a number of books (e.g. Marchington 1987) and on the Defra website.

2.3.2 Sources of information on the use of snares

There have been only a few systematic studies of fox snaring in the UK, and none have been carried out with the aim of exploring welfare considerations. The following is thought to be an exhaustive list of unpublished studies, all of which were exploratory in nature. It should be noted that all these studies pre-date changes in legislation on fox control methods (i.e. Hunting Act 2004).

2.3.2.1 Ministry of Agriculture Fisheries and Food (MAFF) research prior to 1980

Lloyd (1980) mentions research on snares by his own team within MAFF. This research is significant because it formed the only systematic evidence available to legislators preparing and debating the Wildlife and Countryside Act, 1981. Unfortunately, records relating to this work no longer exist.

2.3.2.2 The Game Conservancy Trust Gamekeeper Fox Culling Methods Survey, 1992-93 (FCMS)

The purpose of this survey was to identify the extent to which gamekeepers used different methods to cull foxes. The culls themselves were already well documented through the National Game-Bag Census (Tapper, 1992). The aim was to recruit a

sample of approximately 100 gamekeepers from around the UK to keep a daily record for 12 months of the effort and success of each culling method used. Recruitment effort was crudely stratified by region, in that regional advisors of Game Conservancy Ltd were asked to identify likely participants and estates that were either typical of the region or, conversely, unusual and of particular interest. Based on these recommendations, 83 estates were approached, and keepers on 47 of these agreed to take part. Head-keepers also involved a further 58 beat-keepers. After 12 months of recording, 65 record books were ultimately returned of which four were incorrectly filled out and were therefore unusable. The final sample therefore consisted of 61 gamekeepers from 36 shooting estates. Each participant was interviewed by telephone following return of the completed record books. Snaring data, recorded on a daily basis, comprised the number of snares in use, the number of captures made, and the species captured. The number of foxes killed by other methods was likewise recorded daily.

2.3.2.3 The Game Conservancy Trust Fox Monitoring Scheme, 1994-2000 (FMS)

The FCMS study (outlined above) suggested a way of monitoring relative fox numbers regionally over a long time period, and it was continued on a simplified basis in six successive years as the FMS. 73 self-selecting gamekeepers and amateur or professional fox controllers contributed records in a *pro forma* daily diary. Only those who regularly practised lamping with a rifle were enlisted. Individual participants dropped out or enrolled during the six years, so that the annual sample varied between 40 and 60 participants, with corresponding shifts in geographical origin, demanding careful interpretation. In this study, the data collected consisted solely of the number of foxes taken using snares each day.

2.3.2.4 British Association for Shooting and Conservation/Game Conservancy Trust Joint Snares Trial, 1994-1995 (JST)

This study was designed as an experimental comparison between a new type of neck snare (the 'Waters Rocking-Eye Snare', with a softer wire, a novel eye design claimed to be more efficient, and a slightly different mode of use) and existing snaring practice. Sixty-four gamekeepers were recruited to record their snaring effort and success in a *pro forma* daily diary. Participants were not selected as a random sample, but as a self-selecting sample of gamekeepers who said they already used

snares to an appreciable extent in their work. Each snare location was described in detail, and the period for which the snare was set was recorded. At each daily inspection, any captures (foxes or non-target species) were recorded, also whether captives were alive or dead. Minor differences between the two categories of snare occurred in the ease with which the Waters snare could be knocked out of position without making a capture, and the fact that 18% of captured foxes escaped from the Waters snare, compared 6% from other snares. Nevertheless, in respect of capture of target and non-target species, the new variety of snare under trial was not significantly different from those normally used by the participants. The overall conclusion of this experiment was that the new variety of snare under trial performed no differently from those normally used by the participants. Consequently, data from these snare types may reasonably be combined and used, with caution, as a single source of information on snaring.

2.3.2.5 Data from the Royal Society for the Prevention of Cruelty to Animals and the National Federation of Badger Groups

The RSPCA's evidence to the Inquiry on Hunting with Dogs and the NFBG's (2002) report consist, in the main, of snaring incidents reported by members of the public and often recorded by RSPCA inspectors.

2.3.3 Are the available data reliable and representative?

The GCT and BASC data sets may be prone to reporting and recording inaccuracies similar to those detected by Heydon & Reynolds (2000). However, in each case the recruitment of participants was designed to minimise the risk of falsification. First, it was made clear that the task of recording data would be quite tedious; hence only those who were enthusiastic to help with research would take part. Second, absolute confidentiality was assured for each gamekeeper; data would not be revealed to his employer, his neighbours, the local hunt, etc., thereby removing any temptation to falsify records to 'keep up appearances'. Third, because of the involved nature of the *pro-forma* diaries, falsification would have been difficult to achieve convincingly. Fourth, because data were recorded daily, there was no risk of memory lapses. Finally, in the case of the FMS, a proportion of participants were willing to save body

parts of foxes (lower jaw, uterus) for later analysis, verifying at least the majority of foxes killed by these people.

Nevertheless because of the ways in which participants were recruited, none of these surveys is representative of farmers, shooting estates or gamekeepers in the UK as a whole. In particular, despite obvious regional variation in fox abundance, non-target abundance, terrain and other environmental circumstances, samples were not stratified by region. The FMS set out to involve people who would were interested enough to contribute data over a long time, and is biased towards operators who primarily use lamping to cull foxes. The JST sought contributors who by their own description normally operated snares for foxes. In all three studies, because the sample size is always the number of operators, not the number of captures or snares, statistical power is limited.

The RSPCA and NFBG data are focussed towards snares discovered by members of the public, and are therefore perhaps more likely to reflect instances where snares have made a non-target capture, have been set close to human settlements, or have not been regularly checked.

2.3.4 The scale of snare use among gamekeepers

According to large-scale membership surveys by BASC (1995) and the NGO (submission to the Burns Inquiry, 2000), a high proportion (81-86%) of gamekeepers (professional and part-time) use snares. The FCMS found that 82% (51/62) of contributing gamekeepers used snares. The FMS deliberately enlisted gamekeepers who specialised in lamping (see section 2.4.1.1) with a rifle, but found, nonetheless, that 70% (51/73) of these also used snares. In a comparative study of three regions across Wales and England, Heydon & Reynolds (2000) found that the prevalence of snare use on farms of less than 200 ha was 7%, 10% and 20% of farm properties, in mid Wales, east Midlands and west Norfolk respectively. On farms larger than 200 ha, the same regional trend was observed (3%, 22%, and 41% respectively). On these larger farms snare use was positively associated with a game-shooting interest and especially with the employment of a gamekeeper. The use of rifles in fox control followed a very similar pattern; indicating that both snares and rifles were used as

complementary methods by professional gamekeepers and that the use of rifles did not substitute for snares.

The eleven non-users of snares interviewed in the FCMS survey gave the following reasons for not using snares (some gave more than one reason).

Employer forbids use	1
Unsuitable ground/insufficient cover	2
Inhumane	1
Sheep	5
Too many non-targets (wildlife) at risk	3
High public access	2
Participant is head-keeper, not attached to a single beat	1
Not necessary	1

This indicates that most of these keepers avoided the use of snares primarily so as not to catch non-target wildlife, livestock or domestic animals.

2.3.5 The contribution of snares to fox culls

The results of the FCMS survey indicated that about one in five (21%) of 1,621 foxes killed by 61 gamekeepers were taken by snares, a further 25% were killed at cubbing earths (the method was not specified) and 38% by lamping. This sample of gamekeepers included individuals employed in a range of gamekeeping posts. The other sources of data on the use of snares involved less diverse groups. In the FMS, where participants were specialists in lamping rather than snaring, snares were used on 48 of 101 beats (management units). Of the 7,880 culled foxes recorded in this dataset 11% were taken by snares, with variation between beats from 0% to 100%. The beats in which 100% of foxes culled were snared had very small culls. In the beats with the two highest culls in the study the percentages snared were 30% and 31%. Analysis of fox cull records from a large estate in East Anglia from August 2001 to March 2005 revealed that, of a total cull of 307 adult foxes, 46% were taken using snares, and 49% by shooting (mostly by lamping). Because of regional variation in snaring effort (see section 2.3.4), the contributions of snares to the total fox cull varied regionally and were found to be 3%, 13% and 9% in mid Wales, east Midlands and west Norfolk respectively (Heydon & Reynolds, 2000).

The FCMS survey showed that the relative contribution of different methods to the total fox cull varies seasonally. Figure 4 shows how culling (the method was not specified) at the breeding earth peaks in April/May, and lamping culls peaked after harvest in August/September. Whilst marked seasonal patterns in effort and efficiency were observed in the use of snares (see sections 2.3.7, 2.3.8), these variations were very much less than those seen for lamping and control at breeding earths. (Note that Figure 4 illustrates cause of death of all 1,621 foxes killed by 61 gamekeepers in the FCMS survey, and does not reflect the large variation among different gamekeepers, each of whom will have had his or her own strategy suited to specific aims and conditions.)

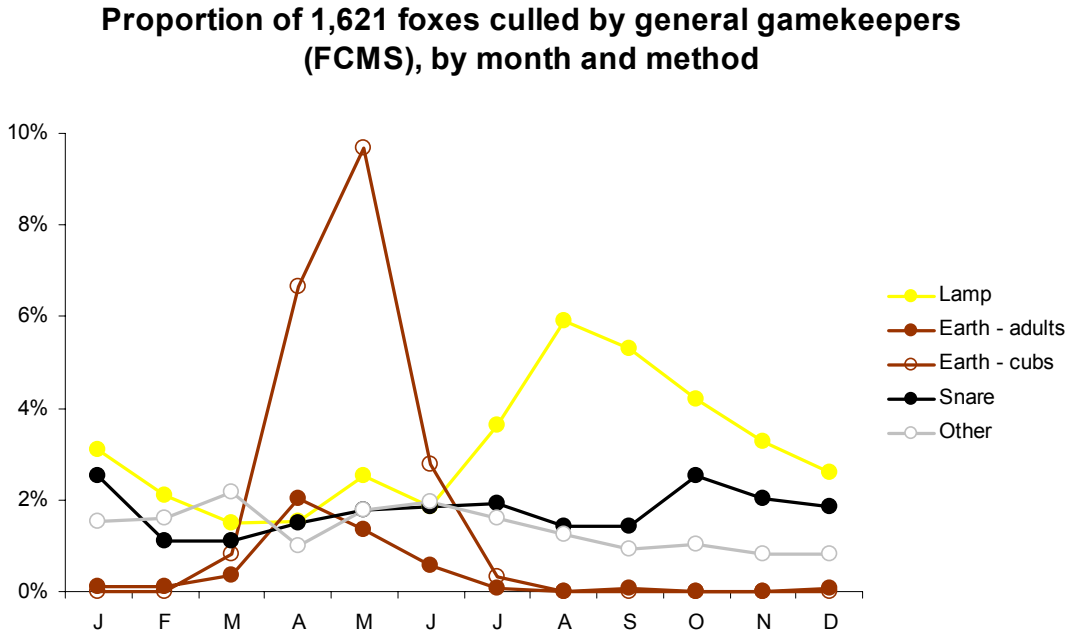

Figure 4: Seasonal changes in the proportion of foxes culled by gamekeepers (FCMS).

2.3.6 Snaring effort among gamekeepers

In the FCMS, snaring effort was measured in 'snare-days' (one snare day = one snare operating for 24 hours). The median number of snare-days per annum achieved by the 61 keepers in this survey was 2,105 snare-days. This is the median value, meaning that half the contributors put in more snaring effort than this, the other half put in less. 2,105 snare-days are roughly equivalent to running 6 snares continuously for the

entire year. The maximum snaring effort by any one keeper was ten times this, at 21,505 snare days (equivalent to running 59 snares continuously).

2.3.7 Seasonal variation in snaring effort

The pooled monthly snaring effort (snare-days per month) of all 51 snare users in the JST varied almost two-fold from a maximum in spring to a minimum in mid-winter (see figure 5). This emphasis on spring/summer use does not correspond with seasonal variation in success rate (see section 2.3.8).

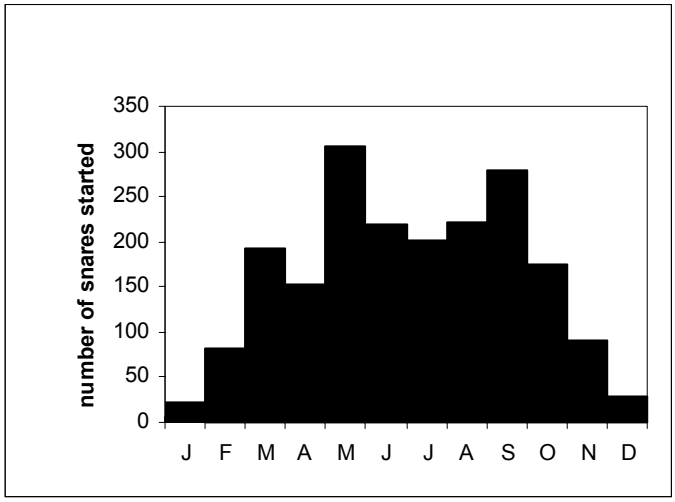

Figure 5. Seasonal variation in snaring effort. The bars show the number of snares newly deployed in each month of the year among 61 gamekeepers contributing to the JST.

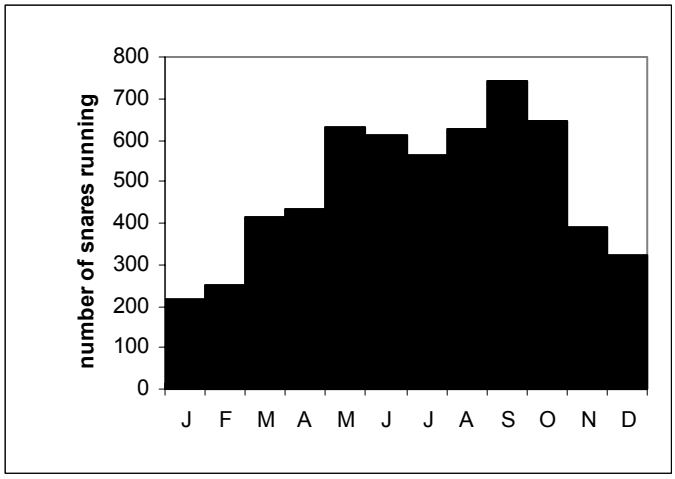

Figure 6. Seasonal variation in snaring effort. The bars show the number of snares in use in each month of the year among 61 gamekeepers contributing data to the JST. (Because deployment times were on average 66 days, the number of snares in use lags behind the new placements shown in Figure 5.)

2.3.8 Snaring success

Snaring success is of course variable between individual snare placements (for comparison Perry *et al*. (1977) describe 50 site-specific variables affecting the success of traps for grey squirrels), but also between operators, reflecting both skill and opportunity (e.g. Guthery & Beasom, 1978). In the JST, which involved snaring specialists, average capture rate (calculated per snare, pooled among operators) was 3.5 foxes per 1,000 snare-days (n = 1,794). In the FCMS, the median capture rate among operators was 1.1 fox per 1,000 snare-days (with a range from 0 to 609). Again this is a median value, so that half the operators had higher capture rates than this, half lower. The very high figures typically represented operators who deployed only a few snares for short periods of time, for instance to protect gamebird release pens. Nevertheless, higher capture rates over longer periods can certainly be achieved by skilled operators. For instance, in a recent unpublished study two wildlife biologists caught 26 foxes in 940 snare-days (i.e. 27.5 per 1000 snare-days, or 36 snare-days per fox; GCT data, unpubl.). Of course, because capture success reflects fox density and replacement rate as well as the effectiveness of the snare as a capture method (Reynolds, 2000).

There is no apparent selectivity of snares for age and experience in foxes. In a sample of 768 foxes killed by lamping and 261 taken in snares there was no significant difference in capture rate between juveniles (<1 year) and adults (>1 year) aged on the basis of occlusion of the tooth pulp cavity or in sex ratio between the two culling methods.

2.3.9 Seasonal variation in snaring success

Both the FCMS and the JST showed a marked seasonal pattern in fox captures per snare day. Thus in the FCMS, this rose from a minimum at *ca*. 0.5 foxes per 1,000 snare-days in February, to a maximum of *ca*. 1.5 foxes per 1,000 snare-days in June/July (when young foxes are starting to move away from the cubbing earth). There was a second minimum of about 1 fox per thousand snare-days in August/September (when harvest drastically reduces the number of available snare sites), rising steadily to an annual maximum of 2.2 per 1,000 snare-days in January.

2.3.10 Redundancy in snare use

It is apparent from the low capture rates listed above that many snares are unsuccessful and therefore redundant. Redundancy is an important issue in all trapping because redundant traps both increase trapping effort and increase non-target problems. In the JST, 1,974 snare placements were recorded, running on average for 42 days each (median value; range 1 to 428 days). Of these, 77% caught nothing; 15% caught one or more foxes but no non-targets; and 13% caught one or more non-target but no fox. (The latter groups were largely exclusive because after a capture the location is usually spoilt for snaring in the immediate future through flattening of the vegetation by any captured animal. Consequently, operation of a snare is usually terminated on capture, whatever the captured species. Fewer than 1% of the snare placements caught both fox and non-target.) This level of redundancy is, we suggest, not unusual in trapping and can be ascribed to two factors: either the trap (snare) is in the wrong place (reflecting both target density and operator skills); or the target animal that the snare might have caught has already been eliminated elsewhere. These two causes cannot normally be distinguished, and their relative importance is likely to vary with the density of target animals. Hence authorities have found it difficult to

give advice on the number of snares to set in order to maximise the capture of target species whilst minimising the capture of non-targets.

For comparison, one can consider a study of mink trapping, using cage and spring traps (Reynolds *et al.* in prep), in which trap redundancy was specifically measured. Mink trapping is a little unusual in that one can easily define the habitat (riparian corridor) along which most females can be found. In the study cited, 40% of potential trap sites in this habitat were shown to be redundant simply because there were no mink present and using the site. (This proportion depends on both mink and trap density: if four times as many traps had been set, for the same mink density, 70% of the traps would have been redundant. In this example, trapping was in fact focussed only on those sites with mink. Despite this focused use of traps, 68% of traps set (i.e. 40% of all potential trap sites) caught no mink, because the mink relevant to those sites were actually caught in the other 32% of traps set (20% of all potential trap sites). Thus we can estimate that if traps had been set speculatively at all the sites originally considered (a moderate density of 1 site per km of river), 80% would have caught no mink. This level of redundancy for conventional mink trapping is closely comparable with that for fox snares.

2.3.11 Deployment time

Consideration of redundancy begs the question of how long individual snares should be deployed. In the highly focussed mink trapping strategy discussed above, traps were set only in response to recent evidence of mink presence, and captures were typically made within 10 days. Replacement by immigration of mink from outside the removal area was relatively slow so, as a rule-of-thumb, traps were deployed for 10 days only, after which fresh evidence was sought that a mink was still present. The two components of this strategy, (i) weeding out irrelevant trap sites, and (ii) limiting deployment time, significantly reduced the risk to non-target species (Reynolds *et al*., in prep).

In the case of foxes, replacement through immigration can be extremely rapid (Reynolds 2000) so that in many regions of the UK no piece of ground is outside the home-range of a fox for long. This is not an argument for always re-setting a snare

promptly after a capture however, as the ideal is to limit the time for which snares are deployed and the deployment of those destined never to catch foxes in order to minimise the risk to non-targets. Unfortunately, in contrast to experiences with mink (see above), the pattern of captures does not suggest a strategy that will achieve this. The difference is possibly related to the fact that whereas foxes enter snares by chance, mink may be motivated by curiosity to enter a trap (Reynolds pers. comm.). The data from the JST shows that although the proportion of snares catching foxes is highest (4.2 per 1,000 snare-days; n=70 foxes, 18,479 snare-days) in the first 10 days after deployment, a fairly steady level of around 2.0 per 1,000 snare-days is maintained thereafter up to about 80 days (n = 1,974). Between 80 and 450 days after deployment, capture rate was 1.03 per 1,000 snare-days (n=48 foxes, 48,641 snare-days). About 25% of captured foxes were caught within 10 days of snare deployment, 50% within 30 days, 75% within 70 days, and 25% more than 70 days after deployment. In a few cases, foxes were captured in snares more than a year after they were deployed, but relatively few snares were deployed for so long. Target:non-target capture ratios did not alter significantly during deployment.

2.3.12 Effect of location type

The JST showed no difference in fox capture rate or non-target capture rate between the two classes of snare being contrasted (i.e. traditional neck snare and the Waters Rocking-eye snare). Estimated across both types together, and with operator effects removed, capture rates were compared across 13 location types. Fox capture rates were significantly higher for snares set along field edges, and for those set in tram-lines (tractor wheelings) in crops (see table 2). These two location types together had a fox capture rate eleven times higher than other location types (39.6 foxes/1000 snare-days, as opposed to 3.6 foxes/1000 snare-days, respectively). The capture rate of non-targets was also greater in these locations (6.6/1000 snare-days, as opposed to 3.5/1000 snare-days in other locations), but only by a factor of two. Hence the target/non-target capture ratio was considerably more favourable in these snare locations than in others (6:1 as opposed to 1:1). (These two location types are especially characteristic of arable farmland. The common upland practice of using a midden, a special snaring enclosure around carrion bait, was poorly represented in this study).

	Foxes per1000 snare-days	
Run through/under fence, wall, etc.	4.4	n.s.
Run alongside fence, wall, hedge, etc.	12.6	n.s.
Gap in hedge	0.0	n.s.
Woodland - open, no ground cover	2.6	n.s.
Woodland - with ground cover	2.3	n.s.
Hazel coppice	10.7	n.s.
Scrub, bushes, brambles, etc.	3.9	n.s.
Field edge	47.5	$p<0.05$
Farm track/path	4.3	n.s.
Tramline within crop	39.0	n.s.
Bridge or log over ditch/stream	4.4	n.s.
Run in open moor or rough grazing	1.9	n.s.
Other	6.9	n.s.

Table 2. Location-specific fox capture rates for snare, derived from an analysis of variance with the effects of operator and snare type removed.

2.3.13 Conclusions

The evidence reviewed here indicates that snares are widely used in the control of foxes (e.g. that they may account for about 3-13% of regional total culls and more on some estates); that typical capture rates are about 1 to 3.5 foxes per 1000 snare-days (with some variation associated with season, location of setting, and operator factors); and that in one survey it was found that the mean number of snares managed daily throughout the year was 6 (but up to 59).

In modern use, snares are set to capture and restrain so that target animals can then be humanely despatched (and any non-targets can be released). In so much as they are devices made of flexible material to capture and restrain wild animals, they have similarities with gill nets used for the capture of sea fish and with mist nets used in the capture of wild birds for ringing.

2.4 Possible alternatives to snaring

The subject of snaring cannot be reviewed without some consideration of alternative methods. The ideal wildlife capture method would, whilst being highly effective in achieving its objective, present no risks to welfare and would be entirely specific for the target species. Were such an ideal available then it would be straightforward here simply to recommend that it should always be used. No method available at present meets this ideal. The efficacy and humaneness of snares need to be assessed in comparison with other methods. Although it is not possible here to review exhaustively all the possible legal alternative wildlife management techniques, we include a brief overview of the main alternatives (see also NFBG, 2003). As snaring is predominately used in the UK to control foxes and rabbits, alternative control measures for these species only are included; more options are available for the control of rabbits than for the control of foxes.

2.4.1 Alternative methods of fox control.

2.4.1.1 Shooting. Shooting is a widely used method of culling foxes. However, it is not a single, standard technique; there are many factors that can vary such as type of weapon (rifle or shotgun), calibre, choke, size and number of shot and load, range, ability of the shooter, movement and direction of the fox, exposure time, terrain and weather (Fox *et al*., 2005).

Most commonly shooting is carried out at night from vehicles using powerful spotlights to detect the fox by the reflection from its eyes ('lamping'). Lamping can generally only be undertaken in terrain that permits free movement of vehicles, and it is not practicable for some hilly areas or where there is a lot of cover (Reynolds, 2000). For example, Heydon & Reynolds (2000) found that lamping was the principle method of culling foxes in Norfolk but was not commonly used in mid-Wales where terrain and land-ownership patterns were unsuitable, and where effective regional control could be achieved by other means. Lamping is especially associated with professional gamekeepers (Heydon & Reynolds, 2000), in part

reflecting the fact that licences for rifles are less readily obtained than those for shotguns.

The practice of 'calling' is used by some operators to attract foxes within shooting range by making squeaking or squealing noises, with or without mechanical or electronic aids. Calling can be done by day, and by night with the aid of a lamp. Either rifles or shotguns are used, but to ensure a clean kill using a shotgun requires the fox to be attracted to within 30m. Juvenile foxes are considerably easier to call than adults, which appear far more aware of the non-auditory cues associated with humans. It is said that inexpert use of calling quickly (within a season) results in a residue of 'educated' foxes that will not respond to this technique.

Foxes may also be driven from cover by dogs or beaters towards a line of people with shotguns. This is a day-time activity that requires relatively large numbers of people, and is primarily used in areas with large blocks of woodland or forest. The success of driving, as a culling method, is limited by opportunities for the fox to go to ground and is related also to length and density of the line of shooters, as well as their competency and other factors.

'Sit and wait' shooting is generally not a viable method because foxes hold large territories (up to 10 km^2 in the UK) with few obvious focal points for activity. The breeding den does offer one such focal point, and where visibility is good (mainly in hill country), shooting at the breeding den can be a high-impact strategy for population control, but is labour intensive and there are obvious welfare risks to cubs if a lactating vixen is shot. A number of foxes are shot from high seats during deer culling operations, but this is inefficient and is not an important means of fox population control.

Shooting is widely considered a humane way to kill animals when appropriate firearms and ammunition are used and when shots are on target causing immediate loss of consciousness and death. But even when undertaken by competent persons, it is hard to avoid the possibility of a proportion of animals being injured and escaping to suffer a lingering death (Fox *et al.*, 2005). All forms of shooting are of limited efficiency in summer months when vegetative cover is high (Reynolds 2000).

Possession and use of shotguns requires a shotgun certificate, while possession and use of rifles requires a firearms licence.

2.4.1.2 Hunting with dogs. It is now illegal in England and Wales to hunt foxes with a pack of hounds and the use of terriers in digging out foxes is severely restricted. The use of no more than two dogs to trail foxes is still permissible and is said to be an important method of control in large upland blocks of forestry.

2.4.1.3 Cage traps. In rural areas foxes are generally difficult to catch in live-capture traps (Harris, 1985; Macdonald, 1987; Reynolds, pers. comm.). Among professional gamekeepers, live-capture traps account for just 1% of all foxes taken (GCT, unpublished data – FCMS see section 1.4.1.2). Foxes caught in cage traps may injure their teeth and claws in efforts to escape. As far as we are aware, there are no published data on the incidence of such injuries in foxes but there are some data on badgers caught in cage traps (Woodroffe *at al*., 2005). Frequent inspection of the traps with the release of non-target species and the quick despatch of captured foxes minimises adverse welfare or species conservation impacts. The major problem with cage trapping is its low capture rate when used in rural situations (Reynolds pers. comm.); it is, said to be, far more efficient in urban settings where foxes are more familiar with man-made articles.

There are no other legal methods currently available in the UK for killing foxes.

2.4.1.4 Gassing. Studies have been undertaken in Australia into the use of carbon monoxide generating pyrotechnic cartridges for the human killing of foxes in natal dens (Hart *et al*., 1996).

2.4.1.5 The use of toxic baits. In Australia, fluoroacetic acid (1080) is frequently used to poison red foxes, which as an introduced species is a threat to indigenous fauna of that country. Aspects of its humaneness are discussed by Marks *et al*. (2000).

2.4.1.6 Exclusion methods. Predation by foxes can, of course, be prevented or reduced in some circumstances by other methods, eg by fox-proof enclosures.

2.4.2 Alternative methods of rabbit control.

Some methods of rabbit control are outlined below.

2.4.2.1 Gassing. The fumigation of rabbit warrens can be a very effective method of rabbit control. Gassing can reduce rabbit populations by up to 80% (Defra, 2004a) although its effectiveness decreases in porous soils, when soil moisture is low and when air temperatures fall below 5^{o}C. Since the withdrawal of Cymag, (a formulation that generates hydrogen cyanide) the only commercially available fumigants are formulations (Phostoxin and Talunix) that generate phosphine gas on contact with moisture. Phosphine is potentially very hazardous to the operator and hence the fumigation must be conducted with extreme care. Rabbit control by cyanide poisoning is more humane, in so far as it is quicker, than is death by phosphine poisoning, but both are associated with risks to the welfare of rabbits against which they are used (Mason & Littin, 2003) as well as risks to other species that may use rabbit warrens (e.g. polecat).

There has been research in Australia into the humaneness of carbon monoxide fumigation for rabbit control (e.g. Marks, 2003). Carbon monoxide is not currently approved as a vertebrate pesticide for use in the UK.

2.4.2.2 Shooting. The efficiency of shooting as a means of rabbit control varies markedly depending on the method used and the skill of the operator. Single shooting operations reduce rabbit numbers by only about 30% and tend to target large adult males (Defra 2004a). The Ground Game Act 1880 gives an occupier the right to shoot rabbits on his/her land and to authorise other persons to do so (and as noted above in Section 2.3 an Order made under Section 1 of the Pests Act 1954 obliges occupiers of land to destroy rabbits or to prevent damage by them). As noted in the section on shooting foxes (see section 2.4.1.1) shooting can be a very humane killing method when appropriate firearms are used and when shots are on target causing immediate loss of consciousness and death. However, the same very important caveats apply here as are listed in the section on foxes.

2.4.2.3 Live trapping. There are two types of live-capture traps for rabbits and both can be cost effective control methods. Cage traps are positioned above ground and are

baited with food (usually carrot, apple or parsnip). Drop traps, which are multi-capture traps, are dug into the ground within a gap in a wall or fence, so that rabbits moving through the gap fall into the holding box. The rate of capture during the first few days of trapping can be used as a practical indicator of likely overall success. Where over half the rabbits initially counted are caught within 10 days, a very good level of control usually follows (Defra, 2004b). Frequent inspection of the traps with the release of any non-target species and the quick despatch of captured rabbits reduces welfare and conservation concerns. The humaneness of cage trapping compares favourably with other methods such as gassing, the use of killing traps, and snaring. In Defra trials (Defra, 2004b) less than 4% of rabbits suffered injury and less than 1% were found dead in the cage traps (these animals were juveniles found with their heads stuck between the door and the side of the cage).

2.4.2.4 Killing traps. A number of spring traps (i.e. BMI Magnum 116, Victor Conibear 120-2, Fenn VI, Fenn Rabbit Mk 1, Springer 6, Imbra Mk I & II, Juby) are licensed for use in the UK under the Spring Traps Approval Order (1995) for the control of rabbits and all have to be used within real or artificial burrows. There are no good data on their relative cost effectiveness. The types of trap differ in the speed with which they kill rabbits. Like snares, they can catch other animals, but unlike snares non-target animals cannot be released. Under the Protection of Animals Act 1911 as amended, spring traps used for rabbits must be inspected at least once a day.

2.4.2.5 Ferreting. Ferrets are used to bolt rabbits from their warrens into nets. Ferreting at large rabbit warrens is considered to be a less cost effective method of control than fumigation but may be more cost effective for the management of rabbit populations occupying a high proportion of small warrens, for instance those on light soils such as sand dune systems (Cowan, 1984). The rabbits can be quickly and humanely despatched once caught. Ferreting is most successful outside of the breeding season and, having the advantage of capturing more females than males, may serve as a valuable technique for dealing with intransigent populations (Defra, 2004a).

2.4.2.6 Long netting. Long netting has a limited application but it can be useful to surround an isolated warren that is being ferreted, or placed between a warren and

ground where rabbits are feeding at night. Long nets are usually between 50 and 150m long, 90 cm high with a mesh size between 25 and 40 mm. Rabbits bolted from the warren by the action of the ferrets, or from their feeding grounds at night, become entangled in the net from which they can be removed and humanely despatched.

2.4.2.7 Rabbit proof fencing. Fencing can be an effective method of protecting crops from rabbits but it can also be expensive to install. Fences are erected along the boundary between the field to be protected and the infested harbourage. Both traditional wire-mesh netting and electric fencing can be used to exclude rabbits. There are two types of electric fence in common use: electric netting and electric strained wire (a scaled-down version of the kind more commonly used to manage sheep). In Defra trials both wire-mesh netting and electric fences were erected along the boundary of the field adjacent to the rabbit harbourage and extended by 150m at each end after the crop had been planted. Both types of fence resulted in an 80% reduction in the number of rabbits counted in the protected fields (Defra, 2004c).

2.4.2.8 Tree guards. Individual tree guards can be used to protect young trees and shrubs from rabbit browsing and bark stripping where it is impractical or uneconomic to enclose whole areas with fencing. There are several types and to be effective they should be at least 60 cm high.

2.5 Principles of humane pest control

We suggest that there are two important principles in the humane control of vertebrate pest species. The first is that, when deciding whether and how to proceed, the expected benefits of proposed management procedures should be 'weighed' carefully against the possible costs in terms of harm to the welfare of the animals involved or to populations of non-target species. Procedures that have the potential to harm the welfare of animals should not be used unless there is a good reason to do so that 'outweighs' the welfare cost. The second is that, where it is decided that a certain procedure should be used, steps should be taken to, as far as practicable, minimise the risks of adverse welfare impacts.

Cost/benefit analysis is a procedure for deciding whether or not to proceed with some course of action, based on 'weighing' the likely benefits against the likely welfare and in the next section we outline the thought processes and protocols involved in such cost/benefit analysis.

2.5.1 Cost/benefit assessment

Cost/benefit analysis is an important process because it:

- Provides a mechanism through which the interests of the animals can be represented.
- Provides a mechanism for consideration of measures to minimise any adverse welfare impact, including refinements to minimise welfare risks and estimation of the minimum number of animals that need to be caught in order to achieve the objective;
- Provides a mechanism for checking that proposals are in line with all relevant current legislation and best practice guidance;
- Provides a mechanism through which the concerns of wider communities can be considered and addressed. Society's attitudes to animals are not static and it is important that wildlife management practices remain abreast of evolving ethical considerations in society (for example, with changes in perspectives based on new scientific discoveries of animals' psychological and physical needs).

In cost/benefit analyses it is important to try to consider all the likely and possible types of costs and benefits. Examples of the sorts of costs and benefits that are likely to be considered are:

Possible costs:

- injury and pain associated with capture and restraint by the snare
- distress associated with restraint
- risk of cold and heat exposure associated with restraint
- thirst and hunger associated with restraint
- fear associated with presence of humans or predators whilst restrained
- possible failure to despatch the restrained animal humanely
- prevalence and severity of injuries amongst escapees
- prevalence of non-target species capture

Possible benefits:

- Social benefits from control of individual animals or population numbers in the following situations:
    - control of unwanted or excess number of animals
    - control of unwanted predators
    - disease control
    - control of animals that can compete with humans for food resources
    - control of animals that can cause damage to property
    - control of animals that are can be a human safety hazard
    - control of animals that can create social disturbance or nuisance

- national benefits in terms of:
    - support for the agriculture, forestry, aquaculture and horticulture industries
    - biodiversity /conservation of species
    - heritage or maintaining traditional pastimes
    - trade access, tourism and rural economy through disease or pest control

- recreation

- economic benefits
- employment opportunities

Some people have advocated using scoring systems to aid in the process of weighing welfare costs against proposed benefits. However, it is important to be clear that cost/benefit analysis is not a mathematical procedure but a process through which a reasoned and ethically-defensible judgment is reached.

2.5.2 When should cost/benefit analyses be carried out?

Where a programme that involves capture or culling of wild animals using snares is being considered both the potential impact on the welfare of the snared animals and the merits of the proposed programme should be evaluated as outlined above.

2.5.3 Who should carry out the cost / benefit analysis?

The greater the scale of possible adverse impacts on animal welfare, the greater the need for formality and rigor in cost/benefit analysis. For a research or wildlife control programme at the national level we suggest it would be important that these matters are considered by a group and that soundly-reasoned, ethically-defensible decisions are reached collectively. For smaller, local issues such as rabbit control on a farm or other land, individual farmers or land managers are responsible for carefully considering the balance of possible welfare costs against benefits themselves but may often wish to discuss this with others.

2.5.4 Examples of cost / benefit analyses.

To facilitate understanding of the cost/benefit approach outlined above and as to how it might be applied in a variety of cases, some examples are outlinedin the Appendix.

2.6 The welfare impact of snaring

It would be very helpful in the cost/benefit process and for the selection of appropriate pest control methods if there was reliable information on the welfare and non-target species impacts of snaring and on how these compare with other wildlife control methods. Unfortunately, as outlined below such information is sparse or lacking.

There have been no controlled scientific experiments to assess the welfare impact of snaring of the type that have been conducted to assess the humaneness of killing traps (e.g. Nutman *et al*., 1998; Warburton *et al*., 2000: under the Agreement on International Humane Trapping Standards guideline protocols are specified whereby the humaneness of killing traps are assessed by measuring time to unconsciousness, time to death, and degree of suffering prior to unconsciousness as indicated by a range of behavioural and physiological indices). There is a need to gather data that enable an objective comparison to be made between the welfare effects of snaring as compared to those associated with other control techniques, such as killing traps. Kirkwood *et al*., (1994) outlined a methodology for making such comparisons of welfare impact taking into account numbers of animals affected, the nature of the injuries sustained and their inferred impact on the animal's feelings, and the duration of the period of the welfare insults. Such an objective comparison should consider the range of welfare impacts that may occur as a result of the various methods both when they work correctly as intended and when, through accident or unforeseen circumstances, they do not. We lack data from which to judge the welfare impact of snares in comparison with other capture or killing methods.

It is clear that snares are capable of a range of impacts on animals caught in them. Thus, at one extreme, snares have been the preferred method of biologists for the capture of foxes for radio-tagging in every UK study in a rural area (Lloyd, 1980; Macdonald, 1987; Hewson, 1990; Reynolds & Tapper, 1995) and Broom (1999) reported that well-designed stopped snares can hold an animal without exerting painful pressure on it (although noting that 'the fear associated with being trapped and the lack of control over interactions with the environment, e.g. cold conditions or

predators, are a problem for snared animals.'). While few data have been published on trapping statistics, anecdotal study of the behaviour of radio-tagged animals before and after capture has led to the consensus that any impact of capture is short-lived. However, these findings about the use of snares by research biologists may not generally be representative for the use of snares by other users because of more frequent snare inspection periods.

There is no doubt that in some cases snares can cause severe injuries (e.g. NFBG, 2002; http://www.nfbg.org.uk; http://www.antisnaring.org.uk/links.htm). Several photographs of animals (including badgers and an otter) found to have been extremely severely injured by snares were submitted to the Working Group. In some cases, snares have cut deeply into skin and underlying tissues causing wounds whose welfare effects can be conservatively inferred to be extremely severe, in that they were consistent with causing severe pain of prolonged duration (days in some cases), with no alleviation.

The adverse welfare impacts on snared animals may include the following:

- the stress of restraint, which could include frustration, anxiety and rage;
- fear of predation or capture whilst held by the snare;
- friction, penetration and self-inflicted skin injuries whilst struggling against or fighting the tether;
- pain associated with dislocations and amputations especially with un-stopped snares;
- ischaemic pain (pain due to lack of blood supply) associated with ligation of body parts;
- compression or injuries in muscles, nerves and joints associated with violent movements against restraint;
- thirst, hunger and exposure when restrained for long periods;
- inflammatory pain and pain from contusions associated with injuries during restraint, and in some cases persisting following escape;
- pain and malaise associated with infections arising from injuries, in escapees;
- neuropathic pain in those escapees that experience nerve injuries; reduced ability of injured escapees to forage, move and hence survive ;

- stress of capture and handling before despatch by the snare operator;
- pain and injury associated with killing by the snare operator if unconsciousness is not immediate;

The duration of many of the above will be dependent on the period from when the injury occurs until the animal is despatched or, in cases where it escapes, until it dies (or recovers, although recovery in animals that escape but remain ensnared is very unlikely). The range of welfare impacts in foxes can, therefore, apparently range from mild (as reported by scientists using snares to capture foxes for research purposes) to extremely severe.

We are not aware of any published work on investigations of the range of impacts under typical field conditions. However, Lloyd (1980) reported that: "*In a series of field investigations by the Humane Traps Panel on the humanitarian aspects of snaring (comparing free-running with locking snares) clocks attached to snares permitted the time when the fox entered the snare to be determined. Veterinarians examined the snared foxes, most of which were alive (irrespective of the type of snare), and surprisingly found that bodily injury or mutilation was slight. Those held in locking snares were in a semi-moribund condition because their breathing was restricted. However, these snares were set in forest rides, where there was more freedom of movement for the snared fox and little chance of the sort of self-inflicted damage which occurs when foxes are caught in fences or hedges. It seems that careful siting of snares can reduce injury, but few people setting snares are aware of this aspect, their concern is to set snares in places where foxes are most likely to be caught.*" According to Lloyd (pers. comm. to J. Reynolds, 1997) the Humane Traps Panel, which was formed in 1953 and ran for about 5 years, was composed of influential MAFF figures who were also country landowners, some trap manufacturers, and one veterinary surgeon. The above study took place largely in Scotland, mostly on open runs in forest plantations. It involved the capture of *ca*. 100 foxes, some of which were submitted to local Ministry vets for *post mortem* examination. The study was never published in full and the data can no longer be found.

In the JST, 73% of foxes held in snares (n = 284) were alive and without externally obvious injury, while 27% were dead. For badgers (n = 32), 75% were alive and uninjured, 3% alive and injured, 22% dead. For brown hares (*n*=76), 46% were alive and uninjured, 5% alive and injured, 49% dead. Samples of other species were too small to give a reliable picture. When the JST was conducted more than a decade ago, general practice mirrored that described 25 years ago by Lloyd in the quotation above. There were differences of opinion among operators as to whether snares should be used to kill or merely to restrain foxes. No advice was given to avoid sites cluttered by obstacles, and some operators at that time routinely set snares near obstacles or used 'kill sticks' to cause strangulation. It was in response to the FCMS and JST that current advice and training on how to set the fox snare as a restraining device was developed. These data from the Humane Traps Panel and from the JST cannot therefore be taken as representative of current practice. As discussed above (section 2.3.2.4), the JST was in any case not designed to systematically sample snaring practice in 1994.

We lack information also on the welfare impact of snaring in rabbits. We have received divergent opinions about the effects of snaring in rabbits during the course of this investigation. Some operators have reported that snared rabbits are typically found alive and apparently largely unharmed, others that they are typically found dead. This may reflect differences in snaring techniques and locations (which may act through variations in the speed the rabbits are travelling when snared). There appears to be a widespread assumption that snared rabbits tend to break their necks and die rapidly as a result. We are not aware of any studies of the clinical or pathological effects of snaring in rabbits and are unable to comment on whether this supposition about neck dislocation is soundly based or not.

2.6.2 Conclusion

The welfare impact of snaring ranges from apparently mild (e.g. as reported when foxes are snared for scientific research purposes) to extremely severe (where animals suffer lingering deaths with severe injuries after breaking free whilst still encircled by the snare). There has been no detailed or recent survey of the welfare impact of snares

used under typical field conditions so it is not possible to judge how commonly the outcome is very mild or very severe or from which to judge the usual welfare impact.

2.7 The impact of snares on non-target animals

In considering the impact of snares on non-target animals both the impact on individual animal welfare and the possibility of adversely affecting the local population viability need to be taken into account. The potential welfare impacts to non-target individuals are the same as those discussed for target species (see section 2.6.1).

Some degree of target selection may be introduced by careful and expert setting but, in common with live-capture traps, snares have the potential to capture non-target animals. Some data are available on the relative frequency of snaring target and non-target species. These were reviewed (by Reynolds) in Macdonald *et al*. (2000) from which the following account derives. Macdonald *et al*. (2000) reported unpublished observations in which they discussed the unintentional capture of hares in snares that were used to catch foxes for radio-tagging. They stated that "Brown hares were caught about as frequently as foxes; about half of these were released without detectable injury, the others were injured in the hind legs by the snare wire and were dispatched". In this work, snares were checked at intervals of 6 hours, day and night, and captured animals should therefore have been in better condition than in normal snare operations. The injuries caused to hares were almost certainly due to the use of 1.65 mm 7 x 7 cable (Reynolds pers. comm.), which increased capture success but was more prone to entangle with the hind-legs of hares. Subsequently, use of the more standard 2mm cable and of stops set at 9" has prevented most of the problems with entanglement of the hind legs (Reynolds pers. comm.).

Table 3 presents data on non-target capture (taken from Macdonald *et al*., 2000) gathered, in separate studies, by RSPCA inspectors, professional gamekeepers (data collected in two projects by GCT, and jointly by BASC and the GCT), and MAFF staff. The combined GCT/BASC gamekeeper snaring data have a significantly different species composition to the RSPCA figures ($\chi^2_{[6]} = 117.9$, $P<0.001$). To explain these differences, Macdonald *et al*. (2000) pointed out that, because RSPCA inspectors are called by members of the public to investigate snaring incidents, the RSPCA data could be expected to reflect a bias towards town/village fringes,

domestic animals and larger wildlife species, and towards snares that have been misused or neglected. They also argued from these data that snares placed by skilled trappers to catch foxes are genuinely selective for foxes, because "of the chief non-target species, badgers are nationally about as common as foxes, roe deer about twice as common, while hares are about three and a half as common". As fox snares are mechanically capable of catching all these species, the observed selectivity was argued to be the result of field-craft in the way they were used. Nonetheless, even the BASC/GCT data indicate that across all participants 40-48% of captured animals reported were of non-target species.

Taken together, these results suggest that, whilst the capture rate of non-targets can be reduced through good field-craft (and thus training and careful attention to good practice), it may be very difficult, when using snares to catch foxes in some environments, to reduce the overall proportion of non-target animals caught to below about 40%.

The best practice aim in the use of snares is for all non-target animals to be released unharmed. Although there are documented cases where it has proved necessary to despatch snared brown hares (see section 2.6.1), it has been argued that the ecological consequences for hare populations are likely to be small. Brown hares are an important prey of the fox, and their numbers have been found to benefit from fox control even when this includes snaring (Reynolds & Tapper, 1995b, 1996; Heydon, Reynolds & Short, 2000).

It is relevant to consider the scale of non-target issues, for example, from an ecological perspective and against other human influences liable to cause suffering. For instance, taking a snapshot in the mid-1990s, if we assume that there were 2,500 full-time gamekeepers in the UK, that 80% used fox snares, and that each had the same experience of catching targets and non-targets as those in the FCMS (see section 2.3.2.2), then potentially 1,300-2,300 badgers may have been caught in fox snares annually in the UK, which would be equivalent to about 0.5-1% of the adult population. 75% of these would have been alive and uninjured, and existing legislation required that they should be released. These estimates suggest that up to 575 badgers may have been killed in snares at that time in the UK. Contemporary

estimates put the number of badgers killed annually on the roads in the UK at 50,000 and the number of cubs produced at 172,000 (Harris *et al*., 1995). Although based on necessarily crude – and now dated – figures these estimates provide a perspective on the ecological consequences for badgers of fox snaring.

We are not aware of any information on the incidence of capture of non-targets associated with the use of snares for the capture of rabbits. Because of the smaller noose sizes used and the locations used for rabbit snares, it seems likely that the proportion of non-targets caught, will be less than with fox snares, but this is speculation only.

Table 3. Species caught in fox snares: a comparison of studies. GCT, 1992-3, unpublished; BASC/GCT, 1994-5, unpublished; MAFF, 1968, cited in Chadwick *et al.*, 1997; RSPCA submission to the Burns Inquiry.

	Professional gamekeepers:		MAFF studies:		RSPCA inspectors:
	GCT 1992-3	BASC/GCT 1994-5.	Lloyd 1980	MAFF 1968	RSPCA 2000
% of captures:					
Foxes	43	55	79	54	31
Cats	2	1	0	0	42
Dogs	1	3	1	0	8
Badgers	5	6	21	0	14
Deer (roe/muntjac)	6	9	0	0	0
Rabbit	9	5	0	0	0
Hare (brown/mountain)	29	16	0	0	0
Unclassified/other	5	6	0	46	5
Sample size (n captures)	739	516	136	287	360
Sample size (n operators)	61	64	unknown	unknown	Unknown

2.7.1 Conclusions

The proportion of non-target species caught in snares set for foxes is often quite high (the results of various surveys reviewed here ranged from 21-69%). Whilst the capture rate of non-targets can be reduced through good field-craft (and thus training and careful attention to best practice), it may be very difficult, in using snares to catch foxes, to reduce the overall proportion of non-target animals caught to below about 40%. There appear to be no data on the rate of capture of non-target species associated with setting snares for rabbits.

2.8 The Law and associated issues

2.8.1 Legislation in England and Wales.

The following pieces of UK legislation impinge upon various aspects of the use of snares in England and Wales: the Protection of Animals Act 1911, the Wildlife and Countryside Act 1981, the Deer Act 1991, the Spring Traps Approval Order 1995 (which covers the Aldrich Spring-Activated Animal Snare), and the Wild Mammals (Protection) Act 1996. The main legislative framework for the use of snares is set out in Section 11 of the Wildlife and Countryside Act 1981. (For a summary of the main legislation see DoE 1996). The penalties for offences under this Section include fines of up to £5000 and/or a custodial sentence of up to six months for each offence.

In contrast to the situation for spring traps, there is no statutory requirement for approval of the design of snares (which are not spring traps) in the UK prior to their manufacture, sale or use. It is possible that their use for some species may, in future, become covered by EU legislation (see section 2.8.3).

2.8.1.1 The use of snares

Section 11(1) of the Wildlife and Countryside Act 1981 states that it is an offence to kill or take, or to knowingly cause or permit the killing or taking of any wild animal using a self-locking snare. (It has been suggested that because this legislation specifically protects wild animals, no offence would be committed under the Wildlife and Countryside Act 1981 where the accused successfully claimed that they set a self-locking snare to catch a domestic animal (e.g. a cat). However, such an act would be an offence under the Protection of Animals Act 1911 Section 1(1)). Under Section 11(2) of the Wildlife and Countryside Act 1981 it is also an offence to set any type of snare (i.e. “any article”) “calculated to cause bodily injury to any wild animal in Schedule 6”, which includes, among others, badger, otter, red squirrel and hedgehog. Similarly Section 5(1) of the Wildlife and Countryside Act 1981 states that it is an offence to set any snare (i.e. “any article”) “calculated to cause bodily injury to any wild bird coming into contact therewith.” Likewise under Section 4(1) of the Deer

Act 1991 it is an offence to set any snare "calculated to cause bodily injury to any deer". The term "calculated", in the phrase "calculated to cause bodily injury", may, we understand, be interpreted as *intended* to cause such injury.

2.8.1.2 Persons allowed to use snares

The Wildlife and Countryside Act 1981 refers to "authorised persons" being entitled to kill or take certain animals. In Section 27(1) an 'authorised person' is defined as including a) the owner or occupier of the land, b) any person authorised by the owner or occupier, or c) any person authorised in writing by the Local Authority for the area within which the action authorised is taken. However, current legislation does not require the users of snares to be registered or for their snares to be traceable to them, hence unless a snare is observed being set or checked, it may be impossible to identify the person responsible for placing the snare. It has been suggested that the enforcement of the legislation might be improved if snares were individually identified and registered to their owner. However, it has also been argued that whilst such a system might assist the defence of operators wrongly accused of illegal snaring practices it is unlikely to deter those intent upon the illegal use of snares. In this context, we note with interest the consideration of trialling in Scotland the use of labelling systems for snares.

2.8.1.3 Inspection times

Section 11(3) of the Wildlife and Countryside Act 1981 states that it is an offence if, whilst a snare is in position, the trapper "fails, without reasonable excuse, to inspect it, or cause it to be inspected, at least once every day". This means that if inspected before dawn one day and after dusk the next there could be a period of approaching 48 hours between inspections. It has been proposed, in Defra's consultation about revision of the Wildlife and Countryside Act 1981, that section 11(3)(b) of the Wildlife and Countryside Act 1981 be amended to make it "an offence whilst any snare or trap remains set in position, to fail without reasonable excuse to inspect it, or cause it to be inspected, at least once every day at intervals of no more than 24 hours, taking into account the stress tolerance of the target animal, its vulnerability to the prevailing weather, and access by predators." (We gather that, as far as practitioners

are concerned, making the inspection regimes for snares, spring traps and live-capture traps the same in this way, would be helpful). Similarly the new Nature Conservation (Scotland) Act 2004 (see section 2.8.2) provides tighter constraint with the wording "at least once every 24 hours". However it has been argued by some that this requirement could cause problems for the snaring practitioner in that it might not be possible to maintain a regular inspection round without running the risk of breaking the law by failing to maintain the timetable to the minute; an inspection round might have to begin earlier and earlier each day. Various organisations have suggested more flexible alternative wordings: for example that snares should be inspected "once each day before 12 noon" (CA and NGO), or "at least twice a day and as soon after dawn as is practical" (BASC and UCSW).

To minimise the risk of adverse welfare consequences, animals should be dealt with as soon as possible after they are caught. The Code of Good Practice states that: "*It is desirable that animals are dealt with as soon as possible after they are caught. During winter snares must be inspected as soon after sunrise as is practicable, and should again be inspected near dusk. In summer snares must be inspected before 9 am, and a further inspection should be conducted in the evening".*

The Working Group agreed that the wording concerning inspection intervals in the Wildlife and Countryside Act 1981 needs to be amended because, at present, it allows for the possibility that animals could be held in snares for unacceptable periods. However, we regret it has not been possible in the time available to agree a form of words for recommendation to Defra.

2.8.1.4 Removal of snared animals from snares

Currently there is no legal requirement for animals, whether found dead or alive, to be removed from snares when they are inspected. It is therefore difficult to enforce any legislation on inspection times because, for example, if challenged about a decomposing body in a snare the trapper can always claim the snare had in fact been inspected as legally required but that he or she had decided not to remove it. Under Scottish law (see below) there is now a requirement that any animal caught in a snare, whether alive or dead, must be removed when the snare is inspected. It has been

proposed, in Defra's consultation about revision of the Wildlife and Countryside Act 1981, that an additional sub-clause be inserted into section 11(3)(b) to make it an offence for "any person who, while carrying out such an inspection, finds an animal caught by the snare or trap being inspected, fails to release or remove the animal whether alive or dead." We recommend that amendment be made requiring live animals to be released or despatched when found and for their carcases to be removed as soon as practicable and on the same day (the latter allows for snare rounds to be completed before returning to remove despatched carcases).

2.8.1.4 Disposal of carcases

The disposal of the carcases of wild animals is not covered by the Animals (By-Products) Regulations 2003. Carcases should be disposed of responsibly and, where necessary, advice about this should be sought from the Local Authority.

2.8.2 Legislation in Scotland.

In the Nature Conservation (Scotland) Act 2004 a number of amendments were made to the snaring provisions of the Wildlife and Countryside Act 1981 in Scotland. The key changes were:

- a new power for the Scottish Ministers to ban any type of snare (in addition to self-locking snares which are already illegal) by order. This allows the flexibility to ban snares which may not be readily defined as free-running or self-locking;
- a new offence of setting in position or otherwise using any snare which is, on the basis of its design and/or the manner in which it used, calculated to cause unnecessary suffering;
- a change to the wording of the offence, in section 11(2)(a), of setting in position any snare, trap, electrical device or poison which is likely to cause injury to animals listed in Schedule 6 to the 1981 Act (previously the wording was '…which is calculated to cause injury…');

- a change to the requirement to inspect all snares at least once every day to the requirements that no more than 24 hours may pass between any two sequential inspections;
- a new requirement, when carrying out such an inspection, to release or remove any animal caught in the snare, whether it is alive or dead. Failure to remove an animal is an offence in its own right, but the presence of a dead animal in any snare, if it is clear that the animal has been there for more than 24 hours, may also constitute evidence of an offence under section 11(3);
- a new offence of possessing a self-locking snare, without reasonable excuse. (A reasonable excuse in this context may be, for example, if a gamekeeper or police officer found a self-locking snare and removed it, either for destruction or to preserve it as evidence. In such circumstances the possession of a self-locking snare should not constitute an offence, so long as the illegal snare was destroyed as soon as reasonably practicable.) Any person who wishes to possess self-locking snares (for example, as exhibits or for educational purposes) can apply for a licence under section 16(3) of the 1981 Act;
- a new offence of selling, or offering or exposing for sale, any self-locking snare (or any other type of snare which has been banned by the Scottish Ministers). "Sale" is defined in section 27 of the 1981 Act as including hire, barter or exchange. There is no reasonable excuse defence for the sale of an illegal snare;
- two new offences of (i) being in possession of a snare on any land, and (ii) of setting a snare on any land, where the permission of the owner or occupier of that land has not been obtained. In this case, provision is made for reasonable excuse in defence. These new provisions allow the owner or occupier of any land to determine his or her own policy in relation to snares. It will be possible, for example, for the owner or occupier to restrict the use of snares and to allow only named, trusted persons to make use of snares. It also enables the owner or occupier to ban the use of snares entirely on their land. Prior to these new provisions it was not been illegal to set snares on another person's land in order to control foxes or other pest species;

- a new offence of using a snare otherwise than in accordance with any procedures or requirements specified by the Scottish Ministers in an order, or of knowingly causing or permitting any other person to do so.

2.8.3 The proposed Animal Welfare Bill

The proposed Animal Welfare Bill makes provisions to protect the welfare of animals 'under the control of man'. The Government has indicated, in response to concerns raised in the EFRA Committee's report on the proposed Bill (EFRA Committee, 2004) that it will make explicit provision in the Bill to exclude anything done in the normal course of fishing. The EFRA Committee's concern was that, as the Bill was drafted, 'there is a strong argument that a person catching a fish…could be liable to prosecution under clause cruelty offence…. and that a prosecution could be brought under the clause 3 welfare offence'.

In its reply to the EFRA Committee's Report (House of Commons, 2005), the Government addressed the issue regarding the extent to which wild animals would be covered by the Bill, as follows. 'Animals living in the wild do not fall within the definition of 'protected animal', so to that extent they are exempted. But we agree that the definitions become less clear when a wild animal is, for example, stranded, or trapped, or injured as in a road accident. Our approach is that once the animal is under the control of man, it is incumbent on man not to cause it, or permit it to be caused unnecessary suffering. We do not believe wild animals in these circumstances should be exempted. We have been advised against attempting a definition of "under the control of man" by Parliamentary Counsel since it is thought more likely to confuse than aid interpretation. Listing or categorising every scenario that may cause an animal to come under the control of man is not possible and in most cases the meaning of 'under the control of man' will be clear. In borderline cases, our view is the term should be open to interpretation by the courts.'

It would seem from this that a snared animal would be 'under the control of man' and thus protected under the Bill. However it is also stated in the Government's Response that 'The Bill will not affect lawful pest control activities'. We understand that this is because the legitimacy of the purpose for which a snare is used, and the lawfulness of

the activity (e.g. pest control) must be taken into account by the courts in determining whether an offence has been committed.

2.8.4 International legislation.

The Agreement on International Humane Trapping Standards, as incorporated into the draft EU Humane Trapping Standards Directive (COM (2004) 532), imposes a legal requirement to assess the humaneness of those killing and restraining 'mechanical' traps that are used to kill or capture the 16 species listed in the Agreement. It appears that, although snares are covered by the Agreement, and also the draft Directive, this legislation may have relatively little impact in the UK. Of the four species present in the UK (badger, otter, pine marten, and stoat) that are listed in the Agreement only the stoat can be caught without a licence, and stoats are not commonly snared. If the Directive does come into force then, in the unlikely event that snares were in prospect to be used for the capture of any of the these four species, the humaneness of the snares would have to be formally assessed.

The Bern Convention of the Council of Europe is a binding international legal instrument in the field of nature conservation, which covers the whole of the natural heritage of the European continent and extends to some African states. Its aims are to conserve wild flora and fauna and their natural habitats and to promote European co-operation in that field. Snares are included in Appendix IV of this Convention which lists prohibited means and methods of killing, capture and other forms of exploitation). Under this Convention, amongst other things, Contracting Parties are required to prohibit the use of Appendix IV methods in relation to species listed in Appendix III. However, reservations placed by the UK on its adoption of the Convention in effect allows the continued use in the UK of free-running snares for the capture of brown hares, stoats and weasels.

Article 15 of Council Directive on the Conservation of natural habitats and of wild flora and fauna (Directive 92/43/EEC 1992, "the Habitats Directive") reflects Article 8 of the Bern Convention. This is by requiring the prohibition (subject to certain exceptions) of indiscriminate means of killing or taking of listed wild fauna, such as by the use of tape recorders or by explosives. The Habitats Directive is implemented

in Great Britain by the Conservation (Natural Habitats & c) Regulations 1994. Under Regulation 41(2)(a) of those Regulations, it is an offence to use any of the means listed in Regulation 41(3) (including "Traps which are non-selective according to their principle or their conditions of use.") to kill or take certain wild mammals (which are listed in Schedules 2 and 3 of the Regulations, and which include wild cat, dormouse, otter, mountain hare, pine martin and polecat).

2.9 Discussion

Although they are sometimes used as the method of choice for live capture of foxes for research purposes because they have been found to be efficient and apparently humane for this purpose, snares are mainly used in the UK for the capture of foxes and rabbits in a pest control context. The humane ideal for vertebrate pest control is to kill targeted species only and without causing any fear or pain. As we have seen, in the sections above, used in the way they are in the UK to capture and restrain animals until they can be despatched, snares fall short of this ideal (both because they can capture non-target species and because they can have an adverse welfare impact). However, it is not easy to conclude that other methods should therefore be used instead because (i) it is not always practicable to use other methods and (ii) none of the other methods available consistently meet the humane ideal either. Shooting is, arguably, the most humane method when appropriate firearms and ammunition are used and when the first shot causes immediate irreversible loss of consciousness followed by death. However, it is certainly not 100% reliable, and there can be no doubt that a proportion of shot animals escape wounded to die lingering deaths.

Society's stance on the acceptability of killing methods varies somewhat unpredictably and is often not based solely on humaneness. For example, whilst the slaughter and killing of farmed animals for food is very strictly controlled to minimise the risk of suffering (EC Directive 93/119/EC on the protection of animals at the time of slaughter or killing requires that 'animals shall be spared any avoidable excitement, pain or suffering during movement, lairaging, restraint, stunning, slaughter or killing' and the Welfare of Animals (Slaughter or Killing) Order, 1995 prohibits causing any avoidable excitement, pain or suffering at slaughter or killing), and a great deal of research an effort has been and continues to be put into the development and maintenance of high standards in this field, until very recently strychnine was licensed, sold and extensively used for killing moles, although it is widely known to be a cruel poison, death from which is associated with severe pain. Likewise, anticoagulant rodenticides are licensed and very widely used for killing mice and rats despite serious welfare concerns raised by a PSD report (MAFF, 1997) because these agents are likely to cause bleeding into the joints. The PSD report

stated: “On the basis that the mode of toxicity from these compounds may be expected to cause prolonged toxicity and often severe discomfort, with the duration of severe discomfort ranging from one to several days, the anticoagulant rodenticides are often markedly inhumane. Human experience is consistent with the view that considerable discomfort may be incurred.” The PSD report concluded that although “all anticoagulant rodenticides can be considered to be markedly inhumane”, nevertheless, “As there are no suitable alternatives available, it is recommended that the use of anticoagulant compounds be allowed to continue.”

There are often very diverse views about the acceptability of killing methods and attitudes are probably influenced by a number of factors amongst which may often be the popularity of the animal (e.g. badger versus rat) and the perceived value of the purpose for which the animal is being killed (e.g. to give an extreme example, to prevent rat borne diseases versus for sadistic pleasure). It is not possible to review wildlife capture methods here but it is appropriate to note that a wide variety of methods are commonly used. These include the capture of sea fish for food in gill nets (a method which has many similarities to snaring), the use of ‘sticky board’ traps to catch mice, and the capture of animals in various forms of live traps (e.g. of pest birds in Larsen traps, and of small mammals in Longworth or pitfall traps for research).

Generally, there is a widely-held view that animals should be killed or slaughtered by the most humane methods practicable (For example, there is a strong convention amongst sports shooters that animals injured but not killed by a first shot must be despatched as soon as possible with a second or, in the case of birds, recovered by dogs and despatched by other means) However, opinions not infrequently differ about what the most humane methods are; as exemplified by the debate about the humaneness of livestock slaughter (cutting the major blood vessels of the neck) without pre-stunning as is done in some religious slaughter methods. In the large-scale netting of sea fish, no method is judged to be practicable for humane killing and no attempts are made to undertake this, with the result that the fish gradually die from lack of oxygen after removal from the water.

In judging the acceptability of killing methods it is usual to take into account both the humaneness of the procedures when they are operating normally and also the likelihood and frequency of problems and the severity of the consequences of these problems to the welfare of the animals involved. Providing they are used appropriately, snares can have some potential advantages as outlined above. On the other hand we know that the welfare consequences of snaring can, at worst, be extremely severe. However, without having any information about the frequency with which this has occurred, without information about the 'usual' welfare impact of snares, and without comparable data for other methods, we lack a basis from which to form a sound assessment about their relative merits and drawbacks.

2.10 Recommendations for research

As we have discussed above, there are some major gaps in knowledge about the use and potential adverse impacts of snares. The major areas are listed below.

(i) Although there is evidence that snares are widely used to capture foxes and rabbits for the purposes of pest control and that they are also used for the capture of these animals and others in other contexts, reliable information on the range of purposes and the scale of snare use is, at best, scant. In particular there appears to be a complete absence of information on the scale of the use of snares for capture of rabbits and on their welfare consequences and on associated capture (if any) of non-targets.

(ii) Whilst the welfare impacts of snaring can vary from apparently very minor to extremely severe, information is lacking on welfare impacts in routine use and this makes it very difficult for firm conclusions to be drawn about the humaneness of the use of snares in comparison with other methods.

(iii) There has been little research into the optimum design and use of neck snares to minimise welfare impacts and risks to non-targets, and very little investigation into the potential use of foot snares in the UK.

There is a need for research in all these subjects and we expand on these themes in the sections below.

2.10.1 Survey of the use of snares in the UK

In this review we have assembled some data on the nature and scale of the use of fox snares for pest control purposes. We recommend that further surveys should be undertaken, if feasible, to estimate the scale of snare use for the control of rabbits and

other species, and also for other purposes. Such surveys could also gather information on the range of situations in which snares are set which may enable guidelines to be developed on site selection (e.g. the use of middens).

2.10.2 Humaneness assessment of snares

Snares can cause serious injury in some cases to both target and non-target species. However, other methods of capture and control can also cause serious welfare problems on occasions. As data are lacking on the range of welfare consequences that can occur and on their prevalence, it is not easy (see section 2.6.1) to judge the humaneness of snares in relation to other control methods. There is, therefore, a need to gather such data.

What is required is a detailed study to investigate the physical (clinical and pathological), physiological and behavioural effects of and responses to being snared, taking into account that animals may not be despatched or released for several hours after capture. This study should be focused particularly on foxes and rabbits as these are the species most commonly snared. However, the welfare impact on commonly caught non-target species should also be covered.

In pursuit of these data, it may be possible to avoid extensive research on live animals by working with those involved with snaring in the field to enable the collection of observations, samples and carcases (and this is probably the only feasible approach for collecting data relevant to assessment of the welfare impact on non-target species). We envisage, however, that it is likely to be necessary to conduct both field studies and studies on captive animals to evaluate their humaneness. This approach would be in line with requirements to assess the humaneness of mechanical killing and restraining traps, including snares, under the Agreement on International Humane Trapping Standards.

2.10.3 The potential use of foot snares

We recommend that research be undertaken into the use of padded foot snares as alternatives to neck snares for fox control. Foot snares have been used for many years

in North America (see Section 2.2.1) and the use of padded foot snares has been advocated by animal welfare groups in both North America and Scandinavia as a more humane alternative to neck snaring for live capture. It may be possible to develop a truly padded foot snare based on the Fremont design by replacing the wire noose by a non-metal alternative, such as Kevlar, that would reduce the risk of tooth damage and leg abrasion.

As noted in Section 2.2.1 research on the Rose Leg Cuff suggests that it could provide a more-humane alternative to neck snares. However, preliminary results from small-scale field trials indicate that improvements may need to be made to the trigger mechanism of the Rose Leg Cuff to increase its efficacy.

2.10.4 Technical improvements to the traditional neck snare and its deployment.

There has been little incentive to develop or use anything but a very basic form of neck snare in the UK and hence design concepts tried elsewhere (e.g. North America) have not been explored for use here. It seems likely that considerable improvements could be made to snares to reduce the risk of serious welfare consequences and to reduce the risk of impacts on non-target species.

Some possible candidate refinements for neck snare design are:

(a) Noose design. The risk of damage to neck tissues would be likely to be reduced if the material used for the noose was of greater diameter to spread the load more widely when the animal pulls against it (thin wire is more likely to cut into tissues) and made of, or coated with, softer material: for example, Frisk (1981) describes a rope snare for humanely restraining cats. Although the noose is currently just a part of the snare cable, the noose and tether parts of the cable perform different functions and there may be advantages in their being of different materials. As far as we are aware, there has been no research aimed at improving noose design in this way. Threading plastic tubing over the cable at the noose (between the eye and the stop) might be one approach. Englund (1982), in a comparison of injuries to leg-hold trapped and foot snared foxes, noted that "all physical injuries… can be virtually eliminated through

the use of a plastic covered foot snare." Research is needed into improved noose design and to investigate any associated effects on capture efficiency.

(b) Design and positioning of stops. As discussed, there is a need for all snares to be fitted with a mandatory crimped 'stop' because this can significantly reduce the likelihood of capturing some non-target species (e.g. deer) and it also reduces the risk of causing injury or strangulation. Research is needed to establish suitable stop design and position (distance from stop to eye) in order to provide a basis for clear guidance.

(c) Breakaway devices. A snare that is designed to break at the eye in the event of excessive pressure being applied to it might be effective in reducing the capture in fox snares of certain non-target species (e.g. badgers) although not others (e.g. hares) and it would seem likely that snares designed in such a way that the weakest link is at the eye, would greatly reduce the risk of any animals escaping whilst still encircled by the noose. Several snares of this type are used in North America; although none have been rigorously field tested in the UK, the GCT has conducted small-scale pilot trials of one design.

(d) Cushioning springs. Although cushioning springs are incorporated into a number of designs of leg snares this technology, which may help reduce the risks of injury, does not appear to have been applied to neck snares. Prototype snares with cushioning springs have been constructed by the GCT, and these are awaiting field trials.

(e) Monitoring devices to signal when an animal has been caught. The humaneness of snares (and other traps) could potentially be greatly improved by some form of electronic surveillance system (e.g. Halstead *et al*., 1996) that immediately alerts the operator of a capture (e.g. via a mobile phone or pager). Such a system would allow the operator to make an immediate inspection thereby greatly reducing the time any animal is held before despatch or release. One such system is already on the market (see www.britishmoorlands.com). It is obviously important that the additional electronics are sufficiently small and unobtrusive that they do not markedly reduce capture rate, and that the system is cheap enough to be commercially viable. We understand that current legal opinion is that the inspection requirements in both the Wildlife and Countryside Act 1981 (section 11 (3)) and the Protection of Animals

Act 1911 (section 10) necessitate physical inspection of the trap or snare. Thus electronic checking could be an addition to physical checking but not an alternative to physical checking.

(f) Deployment of snares. The details of deployment of snares, for example regarding how they are set and the locations at which they are set (see Section 2.2.8) can influence their welfare consequences and the risks of capture of non-targets. In pursuit of the technical advances listed above, work should also be undertaken to guide deployment methods (including, for example, the use of middens) for future refinements to best practice.

2.10.5 Research into novel humane control methods

As we have seen in this report, snaring is not an ideal capture/control method because it carries risks of poor welfare and of non-target captures. The review would be incomplete without reference to the possibility of (i) refining existing other methods that might be used instead of snares and/or (ii) developing novel and better methods of pest control. It is outside the scope of this inquiry to pursue these lines of thought but we recommend, in addition to the research areas listed above, that Defra encourages and is open to applications for support for novel approaches (e.g. using toxic agents that humanely kill or prevent reproduction). Pest control is undertaken mostly for human benefit and society has therefore an obligation to seek humane methods where existing methods fall short of the ideal.

2.11 Recommendations for the Code of Good Practice and legislation.

Having undertaken this review of snaring with a view to gaining an overview of what is known and what is not known about the use and results of using snares in the UK, we have, as requested by Defra, worked to produce a Code of Good Practice. Although it is presented here as Part 3 of this report, it has been designed to be published for dissemination as a 'stand alone' document. However, because there are many gaps in our knowledge this can only be an interim code. We hope that it will, nevertheless, be found to be helpful in providing information about the use of snares and that its adoption will help eliminate, or significantly reduce, the risks of serious welfare problems and of the capture of non-target species.

2.11.1 Recommendations concerning the Code of Good Practice

(i) We recommend that Defra endorses and publishes this Report and the Code of Good Practice, and helps promote the widespread voluntary uptake and use of the Code to improve standards and to test its practicability.

(ii) We recommend that research be undertaken to monitor the voluntary uptake of the Code, its practical application and impact.

(iii) We recommend that Defra review the Code three years from its publication in the light of research findings and of its impact on snaring practices and results.

(iv) We recommend that, following the review of the Code, Defra consider giving it a higher legal status if appropriate.

2.11.2 Summary of recommendations regarding legislation

(i) We recommend that there should be a legal requirement for all snares to be fitted with fixed stops to eliminate or minimise any risk of causing suffering through constriction (Section 2.2.5).

(ii) We recommend that the Wildlife and Countryside Act 1981 be amended to make it an offence for any person who, while carrying out such an inspection, finds an animal caught by the snare being inspected, fails to release or despatch it and to remove the carcase the same day. (See Section 2.8.1.4).

(iii) We recommend that the wording concerning inspection intervals in the Wildlife and Countryside Act 1981 be amended as soon as possible because, at present, it allows for the possibility that animals could be held in snares for unacceptable periods. Unfortunately it has not been possible in the time available for the Working Group to agree an exact form of words to recommend to Defra.

(iv) We suggest that those involved in snaring might wish to seek advice from the Government clarifying whether or not the purpose for which a snare was used (e.g. pest control versus to capture an animal for food) might be a factor in judging whether or not a snared animal was covered by the proposed Animal Welfare Bill (section 2.8.3).

(v) We recommend that developments in Scotland be monitored on the labelling of snares (Section 2.8.1.2) and regarding the amendments included in the Nature Conservation (Scotland) Act 2004 (section 2.8.2).

2.12 References

BASC (1995) Gamekeepers, Gamekeeping and the Future. Unpubl. BASC Report.

Berchielli, L.T. & Tullar, B.F. (1980) A comparison of a leg snare with a standard leg-gripping trap. New York Fish & Game Journal, 27: 63-71.

Brooke, R.H. (1972) A live snare for trap shy snowshoe hares. Journal of Wildlife Management 36: 988-991.

Broom, D.M. (1999) The welfare of vertebrate pests in relation to their management. In P.D. Cowan & C.J. Feare (eds) Advances in Vertebrate Pest Management. Filander Verlag, Fürth. Pp 309-329.

Chadwick A.H., Hodge, S.J., & Ratcliffe, P.R. (1997) Foxes and Forestry. Forestry Commission Technical Paper 23.

Cowan D. P. (1984) The use of ferrets (*Mustela furo*) in the study and management of the European wild rabbit (*Oryctolagus cuniculus*). Journal of Zoology 203: 570-574.

DoE (1996) *Wildlife Crime: A Guide to Wildlife Law Enforcement in the UK.* The Stationaery Office, London.

Defra (2004a) *Rabbits* Rural Development Service Technical Note 01. Defra, London.

Defra (2004b) *Rabbits: Use of cage-trapping to prevent agricultural damage.* Rural Development Service Technical Note 17. Defra, London.

Defra (2004c) *Rabbits: Use of fencing to prevent agricultural damage.* Rural Development Service Technical Note 16. Defra, London.

EFRA Committee (2004) Report on the Draft Animal Welfare Bill. First Report of Session 2004-2005. HC 52-I. The Staionery Office Ltd, London.

Englund, J. (1982) A comparison of injuries to leg-hold trapped and foot snared red foxes. Journal of Wildlife Management, 46: 1113-1117.

Fox, N.C., Blay, N., Greenwood, A.G., Wise, D. & Potapov, E. (2005) Wounding rates in shooting foxes (*Vulpes vulpes*). Animal Welfare 14: 93-102.

Frisk, S.F. (1981) A simple snare for restraining cats. Laboratory Animal Science 31: 721-722.

Guthery, F. S. & Beasom, S. L. (1978). Effectiveness and selectivity of neck snares in predator control. Journal of Wildlife Management 42: 457-458.

Halstead, T. D., Gruver, K. S., Phillips, R. l., & Johnson, R. E. Using telemetry equipment for monitoring traps and snares. Masters, R. E. and Huggins, J. G. Twelth Great Plains Wildl. Damage Control Workshop Proc., 121-123. 1996. Ardmore, Oklahoma, Noble Foundation.

Harris, S. (1985). Humane control of foxes. In *Humane Control of Land Mammals and Birds*: 63-74. Britt, D. P. (Ed.). Potters Bar: The Universities Federation for Animal Welfare.

Harris, S., Morris, P., Wray, S. & Yalden, D. (1995) *A review of British mammalspopulation estimates and conservation status of British mammals other than Cetaceans.* Joint Nature Conservation Committee, Peterborough, UK.

Hart, S., Marks, C.A. & Staples, L. (1996) Den-CO-Fume – Humane control of foxes in natal dens. Humaneness and Vertebrate Pest Control – Proceedings of the Seminar held on March 27th 1996, VPRU Report Series Number 2, 58-61.

Hewson, R. (1990) Victim of Myth. Predation upon lambs by foxes in the absence of control. League Against Cruel Sports, London.

Heydon, M.J. & Reynolds, J.C. (2000). Fox (*Vulpes vulpes*) management in three contrasting regions of Britain, in relation to agricultural and sporting interests. Journal of Zoology 251: 237-252.

Heydon, M.J., Reynolds, J.C. & Short, M.J. (2000). Variation in abundance of foxes (*Vulpes vulpes*) between three regions of rural Britain, in relation to landscape and other variables. Journal of Zoology 251: 253-264.

House of Commons (2005) House of Commons Environment, Food and Rural Affairs Committee. The Draft Animal Welfare Bill: Government Reply to the Committee's Report. Fourth Special Report of Session 2004-2005. HC 385, The Stationery Office Ltd, London.

Kirkwood, J.K., Sainsbury, A.W. & Bennett, P.M. (1994) The welfare of free-living wild animals: methods of assessment. Animal Welfare 3, 257-373.

Lloyd, G. (1980) *The red fox.* Batsford, London.

Macdonald D. W. (1987) *Running with the fox.* Unwin Hyman, London.

Macdonald, D.W., Tattersall, F.H., Johnson, P.J., Carbonne, C., Reynolds, J.C., Langbein, J., Rushton, S.P. & Shirley, M.D.F. (2000) Managing British mammals: case studies from the hunting debate. Wildlife Conservation Research Unit, University of Oxford, 165pp.

MAFF (1997) Assessment of Humaneness of Vertebrate Control Agents. Evaluation of Fully Approved or Provisionally Approved Products under the Control of Pesticides Regulations 1986. Pesticide Safety Directorate, MAFF, London.

Marchington J. (1987) *Pugs and drummers. Ferrets and rabbits in Britain.* Faber & Faber, London.

Marks, C.M. (2003) What is possible to ensure that existing control methods are more humane? Solutions for achieving humane vertebrate pest control – Proceedings of the RSPCA Australian Scientific Seminar, Canberra, 2003. Pp 85-94.

Marks, C.M., Hackman, C., Busana, F. & Gigliotti, F. (2000) Assuring that 1080 toxicosis in the red fox (Vulpes vuples) is humane: fluoroacetic acid (1080) and drug combinations. Wildlife Research 27, 483-494.

Mason, G.I. & Littin, K.E. (2003) The humaneness of rodent pest control. Animal Welfare 12: 1-37.

NFBG (2002) The case for a ban on snares. A report by the National Federation of Badger Groups

NFBG (2003) Alternatives to snares. A review of alternative methods for controlling foxes and rabbits, and of the welfare and conservation concerns arising from their use. National Federation of Badger Groups

Novak, M. (1979) The new foot-snare live trap and the leg-hold trap – a comparison. Ontario Fish & Wildlife Review 18: 11-22.

Novak M. (1981) The foot-snare and leg-hold traps: a comparison. Proceedings of the Worldwide Furbearer Conference 1: 1671-1685.

Nutman, A.W., Gregory, N.G. & Warburton, B. (1998) A comparison of the effectiveness of three neck-hold killing traps in occluding carotid arteries in the neck of the brushtail possum. New Zealand Veterinary Journal 46: 177-181.

Perry, H.R., Pardue, G.G., Barkalow, F.S. & Monroe, R.J. (1977) Factors affecting trap responses of the gray squirrel. Journal of Wildlife Management 41: 135-143.

Reynolds, J.C. (2000) *Fox Control in the Countryside*, The Game Conservancy Trust, Fordingbridge, Hants, UK.

Reynolds, J.C. & Tapper, S.C. (1995a) The ecology of the red fox (*Vulpes vulpes*) in relation to small game in rural southern England. Wildlife Biology 1 (2):105-119.

Reynolds, J.C. & Tapper, S.C. (1995b). Predation by foxes *Vulpes vulpes* on brown hares *Lepus europaeus* in central southern England, and its potential impact on population growth. Wildlife Biology 1: 145-158.

Reynolds, J.C. & Tapper, S.C. (1996). Control of mammalian predators in game management and conservation. Mammal Review 26: 127- 156.

Skinner, D. L. & Todd, A. W. (1990). Evaluating efficiency of footholding devices for coyote capture. Wildlife Society Bulletin 18: 166-175.

Tapper, S.C. (1992) *Game Heritage. An Ecological Review from Shooting and Gamekeeping Records*. The Game Conservancy, Fordingbridge, Hants, UK.

Warburton, B., Gregory, N.G. & Morriss, G. (2000) Effect of jaw shape in kill-traps on time to loss of palpebral reflexes in brushtail possums. Journal of Wildlife Diseases 36: 92-96.

White, P.C.L., Newton-Cross, G.A., Moberly, R.L., Smart, J.C.R., Baker, P.J. & Harris, S. (2003) The current and future of wild mammals hunted with dogs in England and Wales. Journal of Environmental Management 67: 187-197.

Woodroffe, R., Bourne, F.J., Cox, D.R., Donnelly, C.A., Gettinby, G., McInerney, J.P. & Morrison, W.I. (2005) Welfare of badgers (*Meles meles*) subjected to culling: patterns of trap-related injury. Animal Welfare 14: 11-17.

2.13 Acronyms used in the text

BASC	British Association for Shooting and Conservation
CA	Countryside Alliance
CSL	Central Science Laboratory
DoE	Department of the Environment
Defra	Department for Environment, Food and Rural Affairs
FCMS	Fox culling methods survey
FMS	Fox Monitoring Scheme
GCT	Game Conservancy Trust
JST	Joint Snares Trial
MAFF	Ministry of Agriculture, Fisheries and Food (now Defra)
NFBG	National Federation of Badger Groups
NGO	National Gamekeepers Organisation
PSD	Pesticide Safety Directorate
RSPCA	Royal Society for the Prevention of Cruelty to Animals
SSPCA	Scottish Society for the Prevention of Cruelty to Animals

3. Code of Good Practice on the Use of Snares

This Code of Good Practice on the use of snares was developed in 2005 by the Independent Working Group on Snares (IWGS) – a body formed for this purpose at Defra's request. Details about the IWGS, the background to its work, and the review of snaring it undertook in the development of this document are available in the Report of the Independent Working Group on Snares (2005) (see Section on Further Information).

The use of snares

Snares are used most commonly in fox and rabbit control but are also set for a variety of other purposes including, for example, to capture rabbits for food and foxes in research programmes. In addition to fox and rabbit other target species that can legally be snared include rats, grey squirrels and mink.

Snaring is subject to legal restrictions and when properly practised is an effective and relatively humane form of control. Snaring can, however, cause welfare problems when used incorrectly by creating distress and injury both to the animals for which the snare is set and through the accidental capture of non-target species. It is the responsibility of all involved in pest and predator control to ensure their methods are legal, humane, and carried out with sensitivity and respect for other countryside users.

The use of snares for fox or rabbit control is only one method available to land managers to minimise damage to game, wildlife, livestock or crops. Predation by foxes can be reduced, in some cases, by fox-proofing methods, and fox numbers reduced by shooting and cage trapping. Likewise, rabbit damage may be reduced, in some cases, by rabbit-proof fencing and tree guards, and rabbit numbers reduced by gassing, shooting, killing traps, live-capture traps and ferreting.

Before using snares or other capture/control methods, an assessment should be made to determine whether the need (eg regarding damage or the threat of damage) is sufficient to warrant action being taken, taking into account the welfare impact on

target animals and any risks to non-target species. Where capture/control is deemed to be necessary then an assessment should also be made of the most appropriate method to use, again taking into account the welfare impact on target animals and any risks to non-target species, and steps should be taken to minimise these risks.

If snares are to be used to capture foxes or rabbits or other species for control or other reasons then this should be done to achieve 'good practice'. Adherence to this Code of Good Practice will ensure that snares are used to high standards and within the law. Advice is provided at several levels:

- Advice that **must** be followed (including but not limited to legal obligations),
- Advice that **should** be followed in order to achieve Good Practice, any deviation from which would need strong justification.
- Advice which **may** be of practical help to you.

Sources for further information on control methods are provided at the end of this leaflet.

Legal obligations for snare users in England and Wales

Snares cannot be set by just anyone; the law in England and Wales requires anyone setting a snare to be an 'authorised person'. The Wildlife and Countryside Act 1981 defines an authorised person as (a) the owner or occupier of the land, (b) any person authorised by the owner or occupier, or (c) any person authorised in writing by the Local Authority for the area within which the action authorised is taken.

It is the person setting the snare who is responsible for complying with legislation relating to the use of snares, not the landowner, employer or snare manufacturer. As a snare user it is you who are open to prosecution for malpractice, and the penalties for offences include fines up to £5000 and/or a custodial sentence of up to six months for each offence.

Under the Wildlife and Countryside Act 1981 it is illegal to set in position any trap or snare calculated (intended) to cause bodily injury to any wild animal included in Schedule 6 of that Act; relevant species listed in Schedule 6 include badger, polecat, otter, red squirrel, hedgehog and pine marten.

The Deer Act 1991 makes it illegal to set in position any trap or snare calculated to cause bodily injury to any deer coming in contact with it, and setting a trap or snare to catch a domestic animal is an offence under the Protection of Animals Act 1911.

Under the Wildlife and Countryside Act 1981 it is illegal to use a 'self-locking' snare; only free-running snares can legally be set. The term self-locking is not defined in the Act and there has been no successful prosecution within a court high enough to clarify the law by legal precedent.

A free-running snare is a wire loop that relaxes when the animal stops pulling, whilst a self-locking snare is a wire loop that continues to tighten by a ratchet action as the animal struggles. However, as there is no clear legal definition of either term, whether a snare is self-locking essentially becomes a question of fact. There are snares that could act as either free-running or self-locking depending upon how they are set and a free-running snare may in practice act as self-locking snare if, for example, it becomes rusty or is twisted and kinked by the movements of the trapped animal. It is up to the person setting the snare to ensure that the snare they use complies with the law.

Snaring foxes

Snares must be set only at sites likely to be used by foxes. This will maximise the chances of capture and minimise the risk to non-target species. Snares must not be set where there is evidence of regular usage by non-target species. Close physical inspection of the site and field-craft will help determine whether non-targets are also using the site (see below).

As well as the actual sighting of a fox, signs that indicate their presence include:

- Fox tracks (footprints)

- Long reddish brown hairs caught on bramble, twigs or wire
- Strong musty smell on prominent objects such as stones, protruding twigs etc., the smell is most noticeable in warm conditions and especially in late winter/early spring
- Droppings ('scats'), with a musty odour and usually in prominent places but never in pits, latrines or dung scrapes
- Food remains, portions of food may be lightly buried and carry a strong smell of fox urine, remains of birds include quills of larger feathers characteristically sheared off as though cut with a knife.

Snares must only be used as a restraining rather than a killing device. Snares should be set in open sites such as field edges, tramlines, along runs, trails or tracks, such as vehicle tracks, where foxes are likely to travel through quite fast. They must not be set in sites cluttered by obstacles such as saplings, hedges, walls, fences or gates, which increase the risk of injury as a result of the snares becoming entangled.

Preparing snares for use

Maximising the efficacy of snares will mean fewer snares will need to be set and this will also help to minimise the risk to non-target species. To this end, efforts should be made to reduce the chances of their detection by target species.

Some have recommended the following procedures to minimise chances of snare detection:

That the manufacturer's lubricant, the scent of the lubricant and the shine of new snares are removed by placing new snares in a large pan with boiling water and a small amount of automatic (low froth) washing powder for one hour, removing any residue on the surface. After one hour the snares should be boiled for another hour in a pan of boiling water with chips of oak bark, oak leaves and tea (bags or leaves) and be left to stand in the cooling water for 24 hours. This will stain the snares and disguise them making them less detectable to foxes and rabbits.

That to re-wax snares paraffin wax, which has very little odour, should be used after the boiling process. Mineral oil or aerosol lubricant should not be used. Snares handled regularly for resetting should be re-boiled regularly to remove the scent of humans. Once snares are prepared for use they should be handled as little as possible and kept away from sources of strong scents.

That new snares should be given a week or so to capture before re-boiling and re-locating at another site. If there is evidence of a near miss, such as the snare being knocked or drawn up and fur left behind, then the snare should be replaced with a fresh, scent free one a few metres along the trail.

The greater the number of snares in operation the greater the chances of capturing foxes but this should be weighed against the greater time necessary to inspect, maintain and set the snares, and the increased risk of non-target captures. For this reason the use of snares is usually concentrated in periods when alternative methods are not viable (e.g. when vegetation cover prevents shooting) and when the benefits of fox removal are greatest, such as at nesting time and when poults are released.

How to set snares to capture foxes

1. Free running snares must be used, and these must have a 'permanent stop' fixed approximately 9" (23cm) from the eye of the snare.

2. The bottom of the loop should be at least 7-7.5" (15/18cm) above level ground and up to 12” (30cm) in open ground. On banks the height of the loop can be increased up to 9" (22 cm). In other situations the height may be modified to reduce non-target captures.

3. Good quality snares must be used. Snares should incorporate a strong swivel near the anchor point and also at a position closer to the noose. The wire must not be less than 460lbs (208 kilos) breaking strain. To avoid animals escaping while still entangled in the snare, with potentially serious welfare consequences, the fastenings should be designed so that the weakest point is at the eye.

4. Snares should be supported by a suitable 'tealer' or set-stick pushed firmly into the ground. Tealers made from stiff wire are easy to conceal, set and make.

5. Snares must be firmly anchored so that they can on no account become free (because of the great risk to welfare that this would cause). Drags should not be used.

6. You must ensure that snares are free running at the time they are set and remain so during their use. Snares that are frayed or damaged must be safely disposed of.

7. Avoid leaving scent on the snare and the area around the snare by rubbing your hands with soil and wearing clean rubber boots. Set the snare whilst standing or crouching rather than kneeling down.

8. Try not to disturb the run and try not to broaden it.

9. You must adapt your procedures for setting snares in the light of experience, particularly to minimise the risks to non-target species (see below).

Snaring rabbits

Snares must be set at the time and place that maximises the chances of catching a rabbit and minimises risks to non-target species. Snares must not be set where there is evidence of regular usage by non-target species. Close physical inspection of the site and field-craft will help determine whether non-targets are also using the site (see below).

As well as the actual sighting of rabbits, signs that indicate their presence include:

- Burrows
- Rabbit sized holes in fencing

- Clearly defined rabbit sized runs
- Latrines of rabbit droppings

Rabbit snares should be set on well-used rabbit runs, in short vegetation, close to the harbourage from which rabbits gain access to crops. They must not be set in sites cluttered by obstacles such as saplings, hedges, walls, fences or gates, which increase the risk of injury. Sites that pose the risk of fatal entanglement should be avoided.

How to set snares to capture rabbits

1. Rabbit snares should be constructed with 3 or 4 -stranded brass wire (doubled so that whilst there are 3-4 strands around the eye, there are 6-8 in the noose) with a loop of 4" (10 cm) diameter for the head of the rabbit. The snare must have a fixed stop about 5" (14 cm) from the 'eye' of the snare.

2. You must ensure that snares are free running at the time they are set and remain so during their use. Snares that are frayed or damaged must be safely disposed off.

3. The loop should be positioned 3" (9cm) above the ground using a short notched stick, the 'tealer'.

4. The free end of the wire must be securely tethered by a strong, rot-proof cord attached to a peg that is driven firmly into the ground. It must not be possible for the snare to become free because of the serious welfare consequences that could ensue.

5. Avoid leaving scent on the snare and the area around the snare by rubbing your hands with soil and wearing clean rubber boots. Set the snare whilst standing or crouching rather than kneeling down.

6. Try not to disturb the run and try not to broaden it.

7. You must adapt your procedures for setting snares in the light of experience, particularly to minimise the risks to non-target species (see below).

How to avoid capture of non-target animals

When setting snares every effort must be made to avoid the capture of non-target and protected species. A knowledge of the tracks, trails and signs of both target and non-target species is essential. If there is evidence of other species regularly using a site then snares must not be set. Pay particular attention to the following:

Badgers:

Signs that indicate the regular and frequent use of paths by badgers include:

- Well worn paths
- Badger tracks (footprints)
- Coarse grey hairs with black tips, caught on bramble, twigs or wire

Snares must not be set on or near to a badger sett, or on the runs radiating from a sett. These can be identified by:

- Signs of excavation linked by well-defined paths
- Signs of bedding near the sett entrance
- The presence of dung pits.

Domestic pets:

Snares must not be set on or near public footpaths, rights of way, near housing and areas regularly used for exercising domestic animals to avoid capturing pets.

Deer:

Signs of the presence of deer include:

- Deer slots (tracks).
- Droppings.
- Signs of browsing or frayed saplings.

Snares should not be set in holes through or under fence lines, in gaps through hedges or under gateways, particularly where roe or muntjac are present.

Snares should not be set along-side fence lines, particularly when they pass through woodland, where deer may travel alongside them.
Snares should not be attached to fences, as this increases the risk of entanglement and injury.

Livestock:
Snares must not be set where livestock are grazing.
Snares should not be set along side fence lines because cattle and other livestock often lean over or push through to graze the grass on the opposite side.
You should inform farmers and landowners when and where snares are set to avoid contact with livestock and horses.

Otters:
Signs of otter activity include:

- Otter tracks (footprints).
- A regular feeding place such as a rock in midstream, which may be recognised by assorted food remains such as fish bones.
- Latrines of droppings (spraints).

Snares should not be set on tracks along the side of watercourses of any size.
Snares should not be set on footbridges, fallen trees or logs spanning watercourses. Where snares are used for mink control particular care should be taken and, if necessary, other methods used.

Hares:
Where hares are present particular attention should be given to site selection and, if necessary, other methods of fox control used.

Inspection of snares

It is desirable that animals are dealt with as soon as possible after they are caught. During winter snares must be inspected as soon after sunrise as is practicable, and should again be inspected near dusk. In summer snares must be inspected before 9 am, and a further inspection should be conducted in the evening.

Humane despatch of foxes

Foxes must be despatched quickly and humanely by a shot at close range from a rifle, shotgun or pistol and the body disposed of responsibly, e.g. by deep burying (more than a metre). A .22 rim fire rifle or a shotgun is suitable. Air weapons must not be used, as they are not sufficiently powerful. The shot should be aimed to the head because this maximises the chance of immediate and irreversible loss of consciousness. Due care must be taken to avoid the risk of ricochet. However if the animal is constantly moving it may be necessary to aim for the heart and immediately follow this up with a shot to the head. Insensibility and death should be confirmed by absence of corneal reflex (failure to blink when the surface of the eye is touched), and absence of breathing.

Humane despatch of rabbits

Once removed from the snare, a rabbit may be humanely killed by holding it firmly and giving a strong blow to the head with a heavy stick. This must always be followed by a second blow and death confirmed by the absence of breathing and/or the eye-blink reflex. Breaking the neck is also a suitable method but is an acquired skill. After the neck has been broken to ensure that dislocation is complete feel the spinal cord between the dislocated vertebrae; pinching the spinal cord will ensure that any reflex kicking subsides quickly.

Release of non-targets from snares

If, despite following the advice given previously, a non-target animal is caught, the most appropriate course of action needs to be considered. Unless the animal is badly injured and has to be killed on humane grounds, it must be released immediately. It should be remembered that if humane despatch is deemed to be appropriate then the snare user may be called upon to justify their actions in a court of law.

Releasing non-target animals from snares can be difficult but the following course of action should be followed. The animal's struggles should be limited by shortening the wire so that it can then be cut at the noose in order to ensure that no part of the snare remains on the animal. The wire must never be cut anywhere else in the hope that the noose will fall off later.

Non-target animals (e.g. badger, dog, cat) caught by the neck and likely to bite can be released with the help of a garden fork. This can be achieved in the following way. Take the fork and walk to the snare's anchor point. Put the fork tines over the wire and run them out along the wire close to the animal's head. Then push the fork into the ground (without using a foot to avoid the risk of being bitten). This pins the animal by the neck. A blunt hook can be slipped under the wire enabling it to be raised from the neck and then to be cut with wire cutters.

Great care must be taken to avoid injuring the animal and to avoid being bitten. Badgers, dogs or cats caught around the body, rather than the neck, are far more difficult to control. Offering such animals a stick to bite may keep them occupied long enough to cut the noose. If the captured animal has been seriously injured it must be humanely despatch using a firearm, as described above.

Further development of knowledge and skills

All those using snares should maintain awareness (by reading, attending training courses etc.) of developments in the field, for example of any improvements in snare design and/or methods of use.

Further information

IWGS (2005) Report of the Independent Working Group on Snares.
Available from: Defra Publications, Admail 6000, London Sw1A 2XX, or the Defra website www.defra.gov.uk .

Preben Bang and Preben Dahlstrom (2001) Animal Tracks and Signs. OUP Pocket Guide Series, 264 pp., Oxford University Press. ISBN: 0198507968

Simone Bullion (2001) A Guide to British Mammal Tracks and Signs. Field Studies Council Occasional Publication 66. 8 pp. Field Studies Council. ISBN: 1851538763

4. Appendix: Examples of cost/benefit considerations

Section 2.5 of this report discusses the need for careful 'weighing' of the possible costs of snaring, in terms of welfare impact to animals snared and other possible impacts on non-target populations, against the proposed benefits. In order to help explain this cost/benefit assessment process we have included here some examples. They are not intended as models that can be applied in real situations - cases have to be judged on their own merits - but only to illustrate the kinds of issues that are likely to be considered.

A.1 Rabbit control example.

A Municipal Council has been receiving persistent lobbying from allotment holders to 'do something about the rabbits' that are spoiling the tenants' vegetables. Three weeks ago a petition signed by 143 of the 151 tenants was submitted to the Council calling for the Council to either exclude or control the rabbits. The Council met two days ago and the following points were raised:

- Rabbit exclusion is impractical as there are rights of way across the 2 hectare property, and effective boundary fences would impact on amenity of the neighbourhood. Shooting by shotgun would be inadvisable because of the risk to people and property on adjoining ground. Shooting by rifle with noise suppressor might be possible, but public would have to be excluded during shooting periods. Cage trapping, using baited traps, might be possible also. Controlling the rabbits at their warrens in nearby scrubland and the disused quarry might form part of a useful strategy.
- Snares in the hedges surrounding the allotments might be feasible, but the Council felt they need a Cost/Benefit Analysis of the potential complications and effectiveness of this approach.

The Council concluded that four methods of control could be considered for this situation. They are ferreting at the warrens, shooting, cage trapping and snaring. The Council does not own the neighbouring scrubland and disused quarry, but it has

permission to access the warrens for rabbit control purposes provided it covers its own costs. The methods are not mutually exclusive.

A Cost-Benefit Analysis for snaring compared with the other three methods may show the following:

Likely Costs:

- *Non-target species*. The rabbits visit the allotments around dawn. This is the period when they can be caught or killed at the allotments. If snares are used at this time at the allotments, there is a risk of snaring domestic cats. The snares would need to be set the previous evening and removed shortly after dawn (08.30). Shooting during the dawn period would pose less risk for cats. With ferreting, the main risk to other animals would occur when a ferret escapes or has to be abandoned because it cannot be retrieved from a burrow. In this situation, snares pose the higher risk to non-target species.
- *Injury and* pain. Shooting would likely cause the least overall injury and pain to the rabbits (but may be severe if animals escape injured). Snaring and ferreting would involve some pain and injury before death, but it is not easy to decide which of these two is better.
- *Stress of capture or restraint*. Shooting would not cause stress of capture or restraint. Snaring and cage trapping would impose about three hours restraint stress if a rabbit was caught at dawn (05.30) and the snares or cages were inspected at 08.30. Rabbit control would be needed particularly during the spring and early summer, to protect young crops on the allotment. At this time of year, climatic conditions should not compound the stress associated with snare or trap restraint.
- *Thirst.* Snaring can introduce a risk of thirst if the animal is held for long periods. However, this would not occur with the 05.30 catch and 08.30 inspection schedule. There is no risk of thirst with ferreting or shooting.
- *Fear* associated with presence of humans or predators whilst confined or restrained would be very strong in the case of ferreting and non-lethal snaring. It would be minimal with shooting.
- *Rabbits escaping with injuries* could occur with snaring and shooting, and is less likely with ferreting.

- *Effectiveness*. Rabbits are strongly territorial. If exclusion from the allotments is not used, all the three control methods will be temporary in terms of effectiveness. Rabbits from neighbouring districts will eventually replace an entire community that is culled. Occasional reduction of the existing community, and the reliance on remaining residents to repel intruders might be an effective approach. This situation applies to all three methods, but the fluctuation in numbers of the resident population is likely to be greater with ferreting. Whether this is a good or bad thing depends on the rate of population overflow from neighbouring districts. It would be useful to establish the likely rate of ingress and include this in the decision making process.
- *Impact on other species*. The rabbits are a source of food for the growing numbers of foxes in the neighbourhood. If the rabbit numbers were reduced, more problems may be experienced with urban foxes.
- *Public Opinion.* It would be helpful to assess local community attitudes to the three methods, and incorporate this into the decision-making. If there is no clearly preferred method arising from this Cost Benefit Analysis, it might be appropriate to invite members of the local community to help decide.

Likely Benefits:

- *Solving the problem.* The rabbits visit the allotments around dawn, and the hedge around the allotments is in good condition with specific runs that the rabbits use. If, on average, a line of five snares caught one rabbit every third morning, the population of rabbits could be reduced by seven during a three-week snaring period. If the rabbit problem could be reduced by this amount twice yearly, the tenants will probably be satisfied and they will be able to make more effective use of the allotments in growing their own food.
- *Site shyness.* If a snaring or shooting program is used at the allotments, after a time, the rabbits will go elsewhere to feed. The rabbits will become shy of the runs in the allotment hedge if snares are used, and they will become shy of the allotment if shooting is used. Catch rate will go down, and shyness may act as a temporary deterrent at critical times of the year when control is most needed.
- *Recreation.* There is no ferreting expertise in this town, but it could be recruited from a town 12 miles away. This will provide an interest and a pastime for those involved.

- *Employment opportunities.* Shooting, trapping and snaring would provide employment, but at a cost to the Council and ratepayers.
- *Miscellaneous.* Since the rabbits have a routine time of day when they visit the allotments, it should be feasible to concentrate shooting or snaring effort to a limited time of the day. This will help control cost whilst optimising effectiveness.

The above considerations illustrate the kind of factors that may be taken into account in a Cost Benefit Analysis to assist the Council in reaching the most appropriate decision for the current situation.

A.2 Rabbit control example.

A Statutory Agency received complaints from a local farmer managing an area designated as a Site of Special Scientific interest (SSSI), for its calcareous grasslands, they were asked to 'do something about the rabbits from his neighbour's land' that are damaging the site. The Agency own and run both neighbouring sites, which have been let under farm management leases.

Legal Status:
All occupiers have statutory obligations regarding wild rabbits that are harbouring on their land. An Order has been made under Section One of the Pests Act 1954 by which England and Wales (except for the City of London, the Isles of Scilly and Skokholm Island) have been declared a Rabbit Clearance Area. In this area, every occupier of land is responsible for destroying wild rabbits on his/her land or for taking steps to prevent them causing damage. This is a continuing obligation.

The Agency considered the following points:
- Rabbit exclusion through fencing is impractical as there are rights of way across the property.
- The neighbour's land, and the source of the problem, is heavily covered with gorse, making the shooting, gassing or the use of ferrets and nets impracticable.
- Shooting by rifle would be inadvisable because of the risk to people, livestock and property on adjoining ground.

- Shooting by shotgun might be possible, but public would have to be excluded during shooting periods.
- Controlling the rabbits at their warrens in gorse scrubland through the use of gas, is unlikely to succeed as the soil is light sand and the rabbit warren is almost exclusively covered with gorse.
- Snares in the runs surrounding the site might be feasible, but the agency felt they needed a Cost-Benefit Analysis of the potential complications and effectiveness of this approach.

The Agency concluded that three methods of control could be considered for this situation. They are ferreting at the warrens, shooting and snaring.

A Cost-Benefit Analysis for snaring compared with the other two methods may show the following:

Likely Costs:

- *Non-target species*. The rabbits visit the fields around dusk and dawn. This is the period when they can be caught or killed in the sites. If snares are used at this time at the site, there is a risk of snaring domestic cats. The snares would need to be set the previous evening and removed shortly after dawn (08.30). Shooting during the dawn period would pose less risk for cats. With ferreting, the main risk to other animals would occur when a ferret escapes or has to be abandoned because it cannot be retrieved from a burrow. In this situation, snares pose the higher risk to non-target species.
- *Injury and pain*. Shooting would likely cause the least overall injury and pain to the rabbits. Snaring and ferreting would involve some pain and injury before death.
- *Stress of capture or restraint*. Shooting would not cause stress of capture or restraint.
- *Fear*. Fear associated with presence of humans or predators whilst confined or restrained would be very strong in the case of ferreting and snaring. It would be insubstantial with shooting
- *Injuries*. Rabbits escaping with injuries could occur with all three methods.
- *Effectiveness*. Rabbits are strongly territorial. If exclusion from the site is not used, all three-control methods will be temporary in terms of effectiveness. Rabbits

from neighbouring districts will eventually replace an entire community that is culled. Occasional thinning of the existing community, and relying on remaining residents to repel intruders might be an effective approach. This situation applies to all three methods, but the fluctuation in numbers of the resident population is likely to be greater with ferreting. Whether this is a good or bad thing depends on the rate of population overflow from neighbouring districts. It would be useful to establish the likely rate of ingress and include this in the decision making process.

Likely Benefits:

- *Solving the problem.* The site has runs that the rabbits use. Estimates of capture rates using snares indicate that the population could probably be reduced, using this method, twice yearly, to a level that is likely to satisfy the complainant. However, some doubt remains about the efficacy of this method.

Site shyness. If a snaring or shooting program is used, after a time, the rabbits will go elsewhere to feed. The rabbits will become shy of the runs, and they will become shy if shooting is used. Catch rate will go down, and shyness may act as a temporary deterrent at critical times of the year when control is most needed.

- *Employment opportunities.* Shooting and snaring would provide employment, but at a cost to the taxpayer.

The above Cost Benefit Analysis can be used in reaching the most appropriate decision for the current situation.

A.3 Fox control example.

A local estate manager/shoot manager received complaints from a tenant farmer who is unhappy at the level of fox predation on his lambs. The estate employs one part time gamekeeper to run a syndicate pheasant shoot and manage predators. Fox control is necessary in order to ensure that damage to game, wildlife and livestock by fox predation is kept to acceptable levels, particularly at vulnerable times of the year e.g. nesting and lambing time.

Legal Status

The Estate management considers the legal requirements for snaring. There are no specific legal restrictions on the day or night shooting of foxes. Authorised persons may legally carry out this form of fox control providing they use only the appropriate firearms and ammunition in accordance with the conditions of their Firearms Certificate.

The Estate considered the following points:

- Lamping is impractical on this location during the critical months due to the height of the cover. Hunting has been banned and terriers are unavailable. There is no gas approved for controlling foxes.
- Live capture cage traps have been tried and found totally ineffective.
- Shooting by rifle with a sound moderator might be possible, but there may be some risk to people, livestock and property on adjoining ground, public may have to be excluded during shooting periods.
- Snares in the runs surrounding the farm might be feasible, but the estate felt they needed a Cost-Benefit Analysis of the potential complications and effectiveness of this approach.
- Snares could be used during March to June to reduce the adult fox population at the time when it is the greatest threat to lambs and ground nesting birds.

The Estate concluded that two methods of control could be considered for this situation. They are night or day, shooting and snaring. A Cost-Benefit Analysis for snaring compared with the other method may show the following:

Likely Cost:

1) Snares pose a risk to non-target species.
2) Snaring would involve some stress and possible injury before death.
3) Snaring could impose 23 hours restraint stress if a fox was caught one hour after setting whilst shooting would not cause stress of capture or restraint.

4) A fox escaping with injuries could occur with both methods but is perhaps less likely with snaring.

Likely Benefits:

Solving the problem. The estate has specific runs that foxes use. If the part time keeper set's as many snares as he could comfortable check in the legal time allotted, he could significantly reduce the resident fox population. In view of public sensitivity, snares should not be set near roads or footpaths. Snares will not be set on private tracks used by farm staff, walkers and riders. In view of badger presence, snares should be set high and not close to recognised badger tracks or setts. Shooting and snaring would provide extra employment, and this could see the need to employ the keeper on a full time basis. The policy will be reviewed regularly in the light of its primary objectives.

A.4 A wild bird shoot example.

Is there a problem?

Yes – foxes are present. Foxes are predating gamebirds.

Is the problem significant?

Yes – wild gamebird production on the estate is low despite good habitat and other correct management.

Is there a non-lethal option?

Not one that has not already been tried. Habitat and escape cover are good. Live capture cage traps have been tried and found totally ineffective.

What lethal options are available?

Lamping is impractical on this location during the critical nesting months of May and June due to the height of the crops. Hunting has been banned and terriers are unavailable. There is no gas approved for controlling foxes. Snaring is a practicable option.

What will be the aim of the snaring campaign?

Snares will be used during April to June to reduce the adult fox population at the time when it is the greatest threat to ground nesting birds.

Cost/benefit analysis

The potential benefit of the use of snares in fox control in this case is increased game bird production. The potential costs, to be weighed against this, are (i) risks to the welfare of snared foxes and to any non-target animals that may be caught and (ii) risks to the viability of local populations of species of non-target animals that may be caught.

The risks to the welfare of foxes snared are those associated with being held for upto several hours between being snared and being despatched. Whilst it is expected that this will cause some stress and discomfort, it is not expected, from the operator's past experience, that it will be associated with any significant injuries. Snared foxes will be humanely despatched with a shotgun and, again from past experience, it is not expected that there will be any problems associated with this. The operator is skilled and experienced and is highly likely to kill swiftly and with the first shot.

The risks to local populations of possible non-target species are judged to be low as there are no hares in the area and very few badgers in the area and none nearby.

What constraints will apply?

a) The Codes of Good Practice will be followed

d) In view of possible badger presence, snares will be set high well away from setts and paths radiating from them.

e) No more snares will be set than can be checked daily soon after dawn.

g) Good records will be kept of snares set and target and non-target captures.

The policy will be reviewed regularly in the light of its primary objective.