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LEAGUE AGAINST CRUEL SPORTS

The Problems of Snaring in the UK, and its alternatives

CONTENTS

Introduction

The use of snares to trap or kill wildlife has been practiced for many years, but it has also been abandoned or banned by many countries due to the problems it causes. The League Against Cruel Sports has been calling for a ban on the manufacture, possession and use of snares all over the UK because all such problems. Although there have been many reports documenting snares, this report goes through everything in detail and gives the latest updated information, so that politicians and decision makers debating about the issue of snaring can be properly informed.

Specifically this report discusses the animal welfare, conservation, necessity, and legality of snaring, showing how problematic it is in all these areas.

Particularly useful for those that know already this subject may be the table in the “necessity” chapter that ranks from best to worst the different methods of wildlife control, showing how poorly snaring scores and how many viable better alternatives do exist and are used in many other countries.

The use of snares in the UK

What are snares?

A snare is a thin wire noose set to trap animals either because some people view them as being a pest or threat that needs to be removed from the countryside, or to kill them for human consumption (for food or for their fur). In the UK, most snares are used for the former purpose against foxes or rabbits. They are intended to catch the animals around the neck like a lasso.

They are usually made of steel wire, but can also be made from brass. Snares are set in a variety of circumstances, but are usually placed along runs or pathways thought to be used by the target species. They are sometimes also placed over the entrances to rabbit burrows or fox earths (LACS, 2003).

In some countries where snaring is still legal the traps are not supposed to kill the animal, but meant to tighten around an animal and hold it quietly until the gamekeeper comes to kill it. But the reality is that in their desperate struggle to escape, animals may be strangled, or may suffer horrible and sometimes life-threatening injuries, or a lingering death.

Even if the snare doesn't kill the animal, they may still die at the hands of a predator, dehydration or exposure to the elements.

Like landmines, snares are indiscriminate, because these wire traps can't tell the difference between a fox, your family pet or a protected species.

Snares can capture any animal that happens to step into them. In 2012 a UK government study (Anonymous, 2012) found that only around a quarter of the animals trapped in snares were the intended targets (normally foxes). The remaining three quarters of the animals caught, severely injured or killed in these nooses included hares, badgers, family cats and dogs, deer and even otters. Based on the government's 2012 research published in the report 'Determining the extent of use and humaneness of snares in England and Wales' (Anonymous, 2012) – the only one that has provided data so far that makes any meaningful estimations - we estimate that snares have the potential to trap up to 1,700,000 animals every year in the UK, although in reality they may end up catching fewer than that.

Snares in Wales

There has not been any recent study in Wales about who currently uses snares, but Defra's 2012 survey found that, among landholdings in Wales, only "game" bird shooting interest was a significant factor determining the use of snares. This is likely to still be true today. Shooting estates use snares to kill predators like foxes because they predate on the birds they sell to be shot. They are also used to a lesser extent by farmers and landowners to control rabbits.

The proportion of landholdings on which snares were

used in 2012 was 17% where there was a game-bird shooting interest compared with 5% where there was no game-bird shooting interest. Clearly, snares are being predominantly used on shooting estates rather than on farms in Wales. The degree of engagement of bodies representing shooting interests with the issue of snare use, compared with the lesser engagement of bodies representing farming interests. For example, the Game and Wildlife Conservation Trust website article 'We must all abide by Welsh Government's snaring' [sic.] (Game and Wildlife Conservation Trust, 2016a), the British Association for Shooting and Conservation website article 'The Welsh Code-compliant Fox Snare' (British Association for Shooting and Conservation, 2016a), the Countryside Alliance website article 'Workshop generates huge interest in Welsh fox snaring code', referring to the chairing of the meeting by the National Gamekeepers' Organisation North Wales Chairman and speakers from the Game and Wildlife Conservation Trust and Countryside Alliance (Countryside Alliance, 2016a) and the degree of engagement of the Game and Wildlife Conservation Trust with Defra over the issue of snaring revealed by the League Against Cruel Sports' Freedom of Information Request RFI6051 (Anonymous, 2013) reinforces the relatively greater interest of shooting interests in the use of snares. This interest is also illustrated by the research of Short, Weldon, Richardson, & Reynolds (2012) into the breakaway snare; all authors were affiliated with the Game and Wildlife Conservation Trust, and the field trials involved game managers, not farmers.

According to the Defra report, Carmarthenshire and Swansea and the Gower peninsula have the greatest density of snare use, followed by regions of west Wales and southern Powys. In terms of numbers, the Defra report extrapolates the total number of Welsh landholdings using fox snares to 1288 and rabbit snares 115. This further extrapolates to between 17,200 and 51,600 fox snares in use in Wales at any given time, depending on season (Anonymous, 2012).

Snares in England

Again, there are no recent studies abut snare use in England, but in the survey from the 2012 Defra report, among landholdings in England, snare use was more likely on landholdings of all types (arable, pastoral and upland) where there was a game-bird shooting interest and was highest in arable and upland land types (see Table 1).

Table 1. The influence of land class and game-bird shooting interest on the percentage of landholdings in England on which snares were used (modified from Anonymous, 2012).

Land Class	No game-bird shooting on land	Game-bird shooting on land
Arable a	2%	19%
Arable b	1%	16%
Arable c	3%	15%
Pastoral d	3%	9%
Pastoral e	1%	10%
Marginal upland	4%	11%
Upland	0.1%	27%

In upland in particular, it is very clear that snares are virtually only used where there is a game-bird shooting interest. Overall, snare use is very clearly associated with game-bird shooting rather than general farming activities. The degree of engagement of bodies representing shooting interests with the issue of snare use, compared with the lesser engagement of bodies representing farming interests. For instance, the Countryside Alliance website article 'Countryside Alliance welcomes Defra Minister Therese Coffey's support for a new snaring Code of Practice' which quotes their Head of Shooting Campaigns (Countryside Alliance, 2016b), the British Association for Shooting and Conservation's guidance on fox snaring, including a video on how to set fox snares (British Association for Shooting and Conservation, 2016b) and Game and Wildlife Conservation Trust recommendations on snaring (Game and Wildlife Conservation Trust, 2016b) also reinforces the relatively greater interest of shooting interests in the use of snares.

According to the Defra report, Norfolk has the greatest density of snare use, followed by Suffolk, Essex, Northumberland, south-west Yorkshire and Hampshire, all having similar densities. In terms of numbers, the Defra report extrapolates the total number of English landholdings using fox snares to 4695 and rabbit snares 1567. This further extrapolates to between 62,823 and 188,283 fox snares in use in England at any given time, depending on season (Anonymous, 2012a).

Snares in Scotland

As the issue of snaring is a devolved matter the Defra report did not cover Scotland, so similarly reliable statistics such as those presented on the prevalence

and use of snares in England and Wales are unfortunately not available for Scotland. Despite this lack of data, phrases like *"Fox and rabbit control in Scotland is necessary to ensure that damage to crops, livestock, trees, game and other wildlife and their habitats can be reduced to acceptable levels. Snaring is a vital tool to achieve these ends in Scotland due to diverse landscape and types of cover"* appear both on the Police Scotland website (Police Scotland, 2016) and on resources hosted on the Scottish Government website (Anonymous, 2012b). Snare use is more tightly regulated in Scotland than in England and Wales. For example, under the Wildlife and Natural Environment Act (Scotland) 2011 any person who sets a snare in position must have an identification number, which can only be obtained from a police station on the production of a certificate indicating they have received approved training from an authorised provider and that they have shown competence to use snares. Any person who sets in position a snare must ensure that a tag is fitted on the snare in such a manner that it is not capable of being easily removed from the snare; that there is displayed on the tag the identification number of the person who set the snare in position; and that where the snare is intended to catch brown hares, rabbits or foxes there is displayed on the tag a statement that it is intended to catch the type of animal in question (Police Scotland, 2016). The League Against Cruel Sports & OneKind report the number of accredited snare operators in Scotland as 1438, considerably lower than the 5000 users estimated by the shooting industry when the 2011 legislation was being developed. Since 2013, the Scottish SPCA has received 63 complaints of snaring offences requiring investigation (LACS & OneKind, 2016).

Many of Scotland's most important land-owning conservation organisations manage land without using snares. Although it does not have a policy against snaring, Scottish Natural Heritage does not use snares on its National Nature Reserves because it does not manage land for game shooting and so does not carry out predator control. RSPB Scotland has a policy to not use snaring as a method of managing animals on its land. Forestry Commission Scotland's operational practice is to not use snaring in the National Forest Estate. The Scottish Wildlife Trust does not use snares on its reserves and its policy is that snares should not be used. The John Muir Trust does not use snaring on the land it manages. The Woodland Trust has a long-standing policy of opposing the use of snares. Plantlife Scotland does not use snares on its reserve, and has a policy to not use snares (Turner, 2010). A survey of Scottish local authorities in 2008 found that no councils used snares for management purposes at that time (LACS & OneKind, 2016).

It appears that in Scotland, as in England in Wales, snaring is predominantly associated with game-bird shooting interests. This is demonstrated, as in England and Wales, by the degree of engagement of shooting interests with the snaring issue. For example, The British Association for Shooting and Conservation provide guidance on snaring in Scotland (British Association for Shooting and Conservation, 2016c) and along with the Game and Wildlife Conservation Trust and the Scottish Gamekeepers Association are named as publishers of the guidance leaflet 'Snaring in Scotland: A practitioner's guide' (Anonymous, 2012b). The Game and Wildlife Conservation Trust provide guidance on 'legal and humane snare use in Scotland' on their website; the page also states that they host snare best practice training days (Game and Wildlife Conservation Trust, 2016c). The Scottish Gamekeepers Association also offered a snaring course in May 2014 (The Scottish Gamekeepers Association, 2014). Scotland's snaring legislation was imposed by the Wildlife and Natural Environment Act (Scotland) 2011 which commits the Government to reviewing snare use every 5 years, so the 2016 review took place and some minor recommendations were made, such as changing the size of snares, which are currently being considered by a technical group.

Cost of snaring

Snares are relatively inexpensive compared with many alternatives methods of wildlife management (about £2 per snare plus the labour time to set and inspect them), which may explain why they are used more than more humane methods. Some may argue that banning of snares would have a significant negative impact on the shooting industry through the cost of implementing better alternatives. However, it is reasonable to ask whether shooting interests can afford to change. It is claimed that shooters spend billions annually on goods and services. Companies involved in supporting the industry expect growth in the sector – annual double-digit growth according to a clothing, guns and accessories retailer, and 80% increase in shooting visitors over the next 4 years according to an hotelier servicing shoots. Participants come not only from UK but Belgium, Switzerland, Germany and France. Shooting states are also upgrading facilities in anticipation of increased numbers of visitors (Public and Corporate Economic Consultants, 2014). The cost of a day's shooting to an individual shooter can range from around £400 per day (Henton, 2009), £1000 per day (Western Morning News, 2014) or even £3000 per day (H.D., 2011). It is not unreasonable to argue that shooting interests can afford to abandon cheap but inhumane snares for more humane and effective alternatives.

Animal welfare

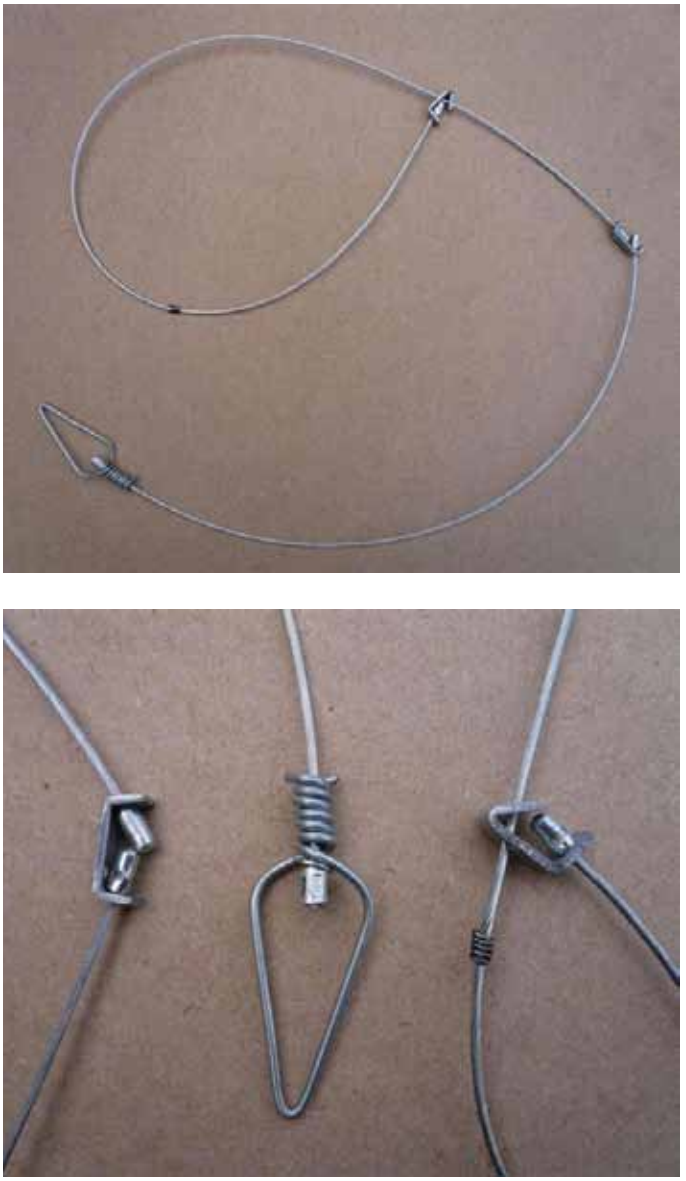
This chapter deals with the impact snaring has on the animal welfare of foxes and non-target species. In addition to theoretical considerations there have indeed being studies undertaken with the aim to assess such impact, and we will start with them.

Field Trials of Fox Snares

Two field trials were carried out by Defra in 2012 (Anonymous, 2012). The snares were set in accordance with the Defra Code of Practice at the time (Defra, 2005) by an operator considered to have a high level of competence and, where possible, in field sites familiar to the operator.

The first trial used a type of snare they called type A. This was a commercially available fox snare claimed to be Code of Practice compliant by the manufacturer and similar to that used by the majority of operators in the field.

- Over a period of 10 days, representing 211 snare nights (the number of snares set multiplied by the number of nights for which they were set) 18 captures took place. 13 hares, 2 badgers and 3 foxes were captured; of these 8 hares and 2 foxes were held until the snares were inspected.
- Both of the 2 captured and held foxes were alive at the time of inspection; 3 of the 8 captured and held hares were found dead at the time of inspection and can be considered as having been killed as a result of snaring.
- One badger escaped due to failure of the middle and anchor swivels of one snare, allowing the cable to be broken between the middle swivel and the noose. As the broken cable was frayed it is unlikely that the snare noose would have dropped off this animal, likely resulting in poor welfare. This badger was not recovered.
- Five captured hares had indicators of poor welfare. One had a severe injury to its eye and another was immobile but conscious, in a moribund state. Both these hares were euthanised. A third was dead with no indication of predation injury. Two were found dead with evidence of predation, a recognised if unquantified welfare cost to capture in a snare. The Defra study excluded these two animals 'to avoid ambiguity', but in the author's opinion it is not unreasonable to assume these animals experienced poor welfare before death due to predation. Three were released apparently unharmed (Anonymous, 2012).



Snares Type A in DEFRA 2012 study (© Crown)

The severe injuries and cable break found in the first trial with snare type A were thought to be caused by poor quality and design of the commercially available snare. After mechanical testing, another commercially available fox snare design (type C) was found to be complying with the Defra Code of Practice and continuing to work properly under test conditions; this had two swivels with one at the anchor as standard and a breakaway device resulting in the weakest point of the snare being at the eye of the noose.

It is noteworthy that the distance between the stop and eye was approximately 27.5 cm in snare type D, longer than that in snare type A (23 cm) due to presence of the breakaway device. The Defra Code of Practice at the time stated that in fox snares the stop should be permanently fixed at 23cm from the eye of the snare (Defra, 2005). The Defra 2012 report mentions this difference between

the snares and divergence from the Code of Practice briefly in the discussion of this field trial, but a lack of more thorough analysis of the influence of the difference in stop-to-eye distance across the two snare types on their relative performance introduces a source of ambiguity in interpretation of the results of this part of the report. In other words, is the difference in performance reported on below due to the breakaway device alone or is there a contribution of the increased stop to eye distance? Following are more results from the study:

- Over 1704 snare nights (the number of snares set multiplied by the number of nights for which they were set) 44 captures took place. 14 foxes, 14 badgers, 7 hares and 9 other species were captured. Of these, no foxes, 9 badgers, 5 hares, 3 deer, one pheasant and 3 unidentified other species escaped. Thus 14 foxes, 5 badgers and 2 hares were caught and held until snare inspection. The two 'other species' caught and held were one pheasant and one dog. Activation of the breakaway device contributed to the escape of two badgers, one hare and one deer.
- All of the 14 foxes, 5 badgers and 2 hares caught and held were alive at the time of inspection, as was the pheasant. The dog was found alive and released by its owner approximately five minutes after capture.
- Snare-related injuries identified at necropsy in the 14 caught and held foxes included 10 instances of oedema associated with the location of the snare on the body. One fox had haemorrhage in a muscle attributed to the snare and two had lung oedema. One fox had a skin perforation due to the snare; skin or muscle indentation without laceration was seen in two foxes.
- Both caught and held hares were subject to necropsy. One hare had significant hair loss on the abdomen at the position of the snare wire. Haemorrhage was found in the left ventral abdominal wall extending to the medial aspect of the left hind leg. This haemorrhage extended through the depth of the abdominal wall. The other hare had five areas of fur loss and skin reddening in the vicinity of the snare wire. It had 'teeth like' perforations in the skin of one shoulder, also in the vicinity of the snare wire. The Defra report mentions this without attributing cause; one might speculate this was due to the animal attempting to free itself from the snare. In addition, this hare had extensive mild to moderate haemorrhagic oedema around the neck and shoulder. (Anonymous, 2012)

The amount of disturbance to the capture site is likely to indicate the animal's motivation to escape and associated activity. This was scored 0-3, with 3 being a high level of disturbance to the site. Sites where animals had escaped had significantly lower disturbance scores than those where the captive animal was held until snare inspection. 13 of 14 held foxes caused disturbance scored 2 or 3; of the five held badgers four caused disturbance scored as 3 and one 2.

Disturbance created by a fox caught in a snare (©Crown)

In summary, Defra (Anonymous, 2012) states that fox snares made with high quality components and of a design compliant with the Defra Code of Practice and used as recommended in the Code of Practice met the standard required by the Agreement on International Humane Trapping Standards (AIHTS, see below for a critique) for a restraining trap. They go on to say, however, that this is not what was observed during their survey of commonplace practice among users of fox snares. Most snares in use were not CoP-compliant. The fox snare most similar to that used by operators in the field, snare type A, did not meet the AIHTS standards in the field trials. Snares were frequently set at sites where entanglement leading to poor welfare was a risk. Hence it can be concluded that common practice of fox snare use in the UK does not meet the Agreement on International Humane Trapping Standards.

Defra also note that despite 'careful adherence to the CoP by a competent and conscientious operator' non-target species were also captured. As can be observed from the field trial figures above the majority of animals caught were not foxes, the target species, indicating the extremely indiscrimate nature of these trapping devices and their use, irrespective of compliance with the Code of Practice or otherwise.

A study by Short, Weldon, Richardson, & Reynolds (2012) provides some further data on the proportion of captured animals found dead on snare inspection. Over the period

2007–2009, field trials were conducted comparing an experimental 'breakaway' snare type with exisiting snare types already in use by full-time game managers at 34 different sites in the United Kingdom. Over 90,798 snare-days, across all types of snares, 1,296 animals were captured, including those which were captured but subsequently escaped. Although foxes were the target species, brown hares made up the largest percentage of animals captured (54%) and held (52%) in snares. The target species, foxes, were the second most numerous species captured (28%) and held (35%). Badgers represented 9%

of captures, and deer 4%. Of 315 foxes caught and held whose condition was reported, 17 were found dead at inspection (5%). Of 457 hares caught and held whose condition was reported, 105 (23%) were found dead at inspection. Of 67% of badgers caught and held, 16% (11) were found dead at inspection. A further trial reported in the same paper compares a second type of experimental snare, in which the minimum snare loop size was increased to 26 cm circumference, with conventional snares over 28,626 snare-days. Of 181 hares retained in either snare type in this study, 23 (13%) were dead on inspection. Of 64 foxes retained in the version 2 experimental snare, 3 were dead on inspection.

A critique of the Agreement on International Humane Trapping Standards

The Defra study 'Determining the extent of use and humaneness of snares in England and Wales' uses the Agreement on International Humane Trapping Standards as a benchmark against which to evalute the humaneness of the use of snares (Anonymous, 2012). It can be argued, however, that the indicators of welfare included in these standards are limited in scope and number.

The AIHTS was negotiated and concluded in 1998 between the European Community, Canada and the Russian Federation (European Federation of Associations for Hunting and Conservation, n.d.). The objectives of the agreement were to 'establish standards on humane trapping methods, to improve communication and cooperation between the parties for the implementation and development of these standards and to facilitate trade between the parties' (Anonymous, 1998).

The behavioural indicators of poor welfare in trapped animals include:

- Self-directed biting leading to severe injury (self-mutilation)
- Excessive immobility and unresponsiveness

Injuries recognised as indicators of poor welfare in trapped animals include (Anonymous, 1998):

- Fracture (bone)
- Joint luxation proximal to the carpus or tarsus
- Severance of a tendon or ligament
- Major perisoteal abrasion
- Severe external haemeorrhage or haemeorrhage into an internal cavity
- Major skeletal muscle degeneration
- Limb ischemia
- Fracture of a permant tooth exposing pulp cavity
- Ocular damage including corneal laceration
- Spinal cord injury
- Severe internal organ damage
- Myocardial degeneration
- Amputation
- Death

Although it is clear that the indicators included do indicate poor welfare, they could be argued to be associated with suffering at the extreme end of the sliding scale of animal welfare. Physical injuries not on this list, for example penetrating or slicing tissue wounds, claw loss and muscular, ligament and tendon damage short of severance are widely recognised by the veterinary profession as resulting in pain requiring treatment in domestic animals. The two behavioural indicators of poor welfare are also extreme; many other behavioural indicators of poor welfare have been used in studies of domestic animal welfare, for example vocalisation (Weary, 1998) and attempts to escape from unpleasant enviornments (Hersken, 2000). Modern animal welfare science has progressed far beyond the assessment of animal welfare solely on extremes of behaviour and physical injury. The World Organisation for Animal Health (OIE) recognise this, stating that 'the scientific assessment of animal welfare has progressed rapidly in recent years', and that this progress underpins the recommendations on animal welfare in the OIE Terrestial Animal Health Code. The OIE states that measures of animal welfare include assessment of affective (emotional) states of animals such as hunger, pain and fear (OIE, 2016a).

Indeed, although wild animals living in a wild state are not protected under the Animal Welfare Act 2006, this

England and Wales legislation makes it an offence not to ensure the needs of animals which are protected are catered for including their 'need to be protected from pain, suffering, injury and disease' (Anonymous, n.d.). These needs are derived from the Five Freedoms first established in the report of the Brambell Committee in 1965 and refined over the following decades. The Five Freedoms have achieved worldwide public recognition and can be found within national legislation. They are recognised as providing valuable guidance in animal welfare by the OIE in their Terrestrial Animal Health Code (OIE, 2016a). Within Great Britain they are the cornerstone of government and industry policy and codes of recommendations for the welfare of livestock (Farm Animal Welfare Council, 2009). As mentioned above, they are also at the core of the Animal Welfare Act 2006. Modern advances in animal welfare science are such that the Farm Animal Welfare Committee now argue that although the Five Freedoms form a logical and comprehensive framework for analysis of animal welfare, their position is now that all farm animals should have a life worth living, from their point of view, and that an increasing proportion should have a good life (Farm Animal Welfare Committtee, n.d.). In summary, both assessment and acceptable standards of animal welfare have progressed far beyond the rudimentary indicators and standards in the Agreement on International Humane Trapping Standards.

Some might argue, of course, that the AIHTS standards were devised for application to the trapping of wild animals, and that most of the recent advances in animal welfare science and improved standards of welfare refer to domestic, not wild, animal welfare. The UK Animal Welfare Act 2006, for example, does not include wild animals living in a wild state as protected animals. The OIE Terrestrial Animal Health Code, however, in setting standards for safe international trade in terrestrial animals and their products, does not exclude wild species farmed for their fur (OIE, 2016b). Furthermore, the welfare of an animal is a measurable property of an animal, not something given to it (Broom, 1991). If animal welfare is the property of an animal, it is illogical to assume that wild animals cannot have poor or good welfare just like domestic animals, or that modern measures of animal welfare that are used in domestic animals cannot be applied to wild animals. Hence the assessment of the welfare of animals interacting with snares against the outdated and rudimentary indicators of welfare in the AIHTS significantly calls into question the conclusions of the Defra report as regards the animal welfare impact of these devices.

Animal suffering caused by snares

Numerous investigations by the League Against Cruel Sports have documented the suffering

caused by legal free-running snares (LACS 2003, 2009, 2009b, 2010, 2010b, 2015, 2015b).

Animals have been found that were snared around a leg with the wire cutting through to the bone; some have had snares tighten around their abdomen almost cutting them in half; many have been found dead in snares meant to simply restrain them – most died of strangulation but others from predation, exposure to the elements or dehydration.

The places where animals have been caught in snares may show signs of extreme disturbance to the surrounding ground and vegetation – known as a "doughnut"– where the animal has tried to run, jump or scrabble its way out of the trap, often for several hours or more. Some animals attempt to gnaw through the wire, causing it to fray so that it cannot run freely enough to slacken and release the pressure - this can cause very painful damage to the teeth and jaw. Inevitably, mental and behavioural stress accompanies these frantic attempts to escape (LACS & One Kind, 2016).

The 2005 report of the Independent Working Group on Snaring identified the following animal welfare impacts associated with snare use in the UK: stress of restraint, fear of predation or capture, painful injuries inflicted by the snare, thirst, hunger and exposure, infections arising from injuries, and the pain and injury associated with killing by the snare operator (Kirkwood et al. 2005).

The League's findings over many years are corroborated by testimony from experts in veterinary medicine and animal welfare science (LACS, 2015). For instance, **Prof Ranald Munro BVMS, MSc DVM, Dip Forensic Med. MRCVS**, states the following: *"Most deaths by snaring are preceded by an extended, distressing experience. The windpipe is partially or completely occluded and the jugular veins are compressed but, crucially, the carotid arteries remain patent resulting in the maintenance of consciousness for some time in the ensnared animal. Not all animals are trapped by the neck. Some are caught by the noose around the chest or abdomen and in these animals the outcome is also hugely distressing. The wire snare causes serious skin and body wall injury. This may progress to rupture of the abdominal wall with escape of the intestines or breach of the chest cavity with subsequent asphyxiation associated with collapse of the lungs. Serious leg and foot injuries, caused by snares, in dogs and cats are treated in veterinary practices throughout the country every year. Clinical and post mortem evidence makes it abundantly clear that snaring causes profound distress and pain. Snaring is an inhumane practice which runs completely contrary to the aims and ethics of our profession."*

Andrew Knight, DipECAWBM (AWSEL), PhD, MRCVS, SFHEA, Professor of Animal Welfare and Ethics & Director of the Centre for Animal Welfare, University of Winchester, states the following *"Snares are primitive, indiscriminate traps which inflict severe – and in some cases, extreme – suffering on any animals unlucky enough to be caught in them. Given that non-target species commonly represent two thirds or more of the caught, these can include a wide range of animals – including domestic cats and dogs. Snares are not often checked, and trapped animals can suffer for hours or days. Many die as a result. These cruel and primitive devices have no place in a civilised society. They should be consigned to the dustbin of history."*

Marc Abrahams BVM&S MRCVS, Winner 'Vet of the Year' CEVA Animal Welfare Awards 2014, stated the following: *"The many negative animal welfare impacts associated with snares include stress of restraint, fear of predation or capture, painful injuries and infections inflicted by the snare, thirst, hunger and exposure, as well as intense pain and horrific injuries associated with killing by the snare operator. This obvious cruelty is exacerbated by the indiscriminate nature of snares, with many unintended victims - including our beloved cats and dogs – greatly suffering in snares set to catch foxes. Therefore a UK ban on the sale, manufacture, and use of snares is long overdue".*

Conservation

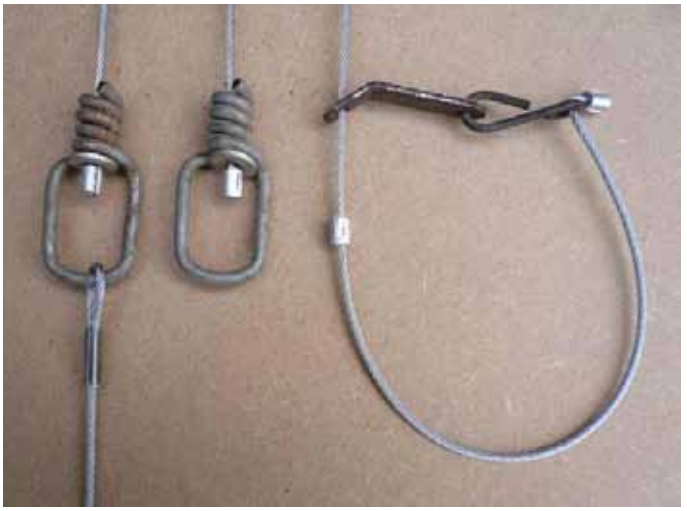
Because of their indiscriminate nature, snares present a significant risk to protected species throughout the UK. This is one of the main reasons it is banned in many EU counties, because they follow the general principle that any device that could accidentally catch and injure an animal which is protected by law from injury and disturbance, cannot be made lawful. And if the device can be modified to the extent that it reduces the number of catches of protected animals, the device should remain unlawful if this number is still above zero. This is because a person can be convicted for disturbing just one individual of a protected species, so if the device can disturb just one of such animals, it would not be legally consistent to allow it.

Following are some examples of protected species caught by snares in the UK:

Badgers

Badgers are protected in England and Wales by specific legislation, the Protection of Badgers Act 1992 (Joint Nature Conservation Committee, 2005) and in Scotland by the Protection of Badgers Act 1992 as amended by the Wildlife and Natural Environment (Scotland) Act 2011 (Scottish Natural Heritage, 2016d). Taken together, this legislation prohibits the taking, injuring, selling, possessing, killing and ill-treatment of badgers in England, Wales and Scotland (Joint Nature Conservation Committee, 2005). This specific legislative protection is due to badgers having been subject to a history of persecution (Scottish Natural Heritage, 2016d).

The practice of snaring is a clear risk to badgers. As reported by Anonymous (2012), in their first field trial which used conventional snares similar to those used by the majority of operators, one captured badger escaped, probably with the snare noose in situ, likely resulting in poor welfare. This badger was not recovered. In the second field trail using snare type D with the breakaway device, 5 badgers were caught and held. 9% of captures by both experimental and conventional snares in field trails by Short, Weldon, Richardson, & Reynolds (2012) were badgers, 67 being caught and held. 11 were found dead at inspection and 7 were killed by the snare operator due to the extent of their visible injuires.



Snares Type D in DEFRA 2012 study (© Crown)

The Badger Trust believe that only a minority of snaring incidents involving badgers are reported. In the period 1st January 2014- 31st December 2015 they report 47 snaring incidents involving badgers across the United Kingdom. They state that a number of these incidents related to badgers found dead in snares and snares deliberately set at badger setts (Hutchison, 2016). Turner (2010) cites a Scottish SPCA survey which reports 99

snaring incidents involving badgers, 58 of which were fatal. She goes on to note that badgers were the most common species reported to the SSPCA snaring survey and that badgers are frequently caught in snares in Scotland. Furthermore, she reports that OneKind were made aware of five incidents of badger snaring between March and August 2010 and that in an incident in England, on a Hampshire shooting estate, animal protection investigators found snares re-set in the same location where badgers had been killed previously. Turner (2010) notes that this observation suggests that in this case the badgers were illegally targeted.

Brown Hares

The brown hare is a UK Biodiversity Action Plan (BAP) priority species for being identified as being most threatened and requiring conservation action. As a result of devolution and new country-level and international drivers and requirements, much of the work previously carried out by the UK BAP is now focussed at country level, and in July 2012 the UK BAP was succeeded by the 'UK Post-2010 Biodiversity Framework'. The UK list of priority species remains an important reference source and has been used to help draw up statutory lists of priority species in England, Scotland and Wales (Joint Nature Conservation Committee, 2016). The Brown hare therefore appears on the Species of Principal Importance in England list, the Scottish Biodiversity List and the Welsh Section 7 list of the living organisms of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales.

Despite this recognition of the importance of the Brown hare for biodiversity, it has little legal protection as it is considered a game animal managed by farmers and landowners (The Mammal Society, 2016). In England and Wales, it can be shot throughout the year on enclosed land, while on moorland or unenclosed non-arable land, it can be shot between 11 December and 31 March (Game and Wildlife Conservation Trust, 2016). In Scotland, the Wildlife and Natural Environment (Scotland) Act 2011 introduced closed seasons for the killing or taking of wild hares. As a result, under the amendments made to the Wildlife and Countryside Act 1981 (as amended), it is an offence to intentionally or recklessly kill, injure or take a brown hare in the close season, 1 February to 30 September. In England, Wales and Scotland, the Hares Preservation Act 1892 prohibts the sale of any hare or leveret between March-July inclusive. Hare must not be on the menu in restaurants during this period. The legislation only applies to British hares (Hare Preservation Trust, 2016).

Snaring presents a very significant risk to Brown hares. As reported by Anonymous (2012), in their first field trial which used conventional snares similar to those used by the majority of operators, of the 18 captures which took place, 13 were hares and 3 were the target species, foxes. Of these 8 hares and 2 foxes were held until the snares were inspected. Thus in conventional snares, many more hares were caught and held than target species. Of the 8 held hares, 5 had indicators of poor welfare. One had a severe injury to its eye and another was immobile but conscious, in a moribund state. A third was dead with no indication of predation injury. Two were found dead with evidence of predation. In the second field trail using snare type D with the breakaway device, 44 captures took place, of which seven were hares. Five hares escaped, thus two hares were caught and held until snare inspection. Both of these had injuries observed at necropsy. One hare had

significant hair loss on the abdomen at the position of the snare wire and haemorrhage was found in the left ventral abdominal wall extending to the medial aspect of the left hind leg. This haemorrhage extended through the depth of the abdominal wall. The other hare had five areas of fur loss and skin reddening in the vicinity of the snare wire. It had 'teeth like' perforations in the skin of one shoulder, also in the vicinity of the snare wire, possibly due to the animal attempting to free itself from the snare. In addition, this hare had extensive mild to moderate haemorrhagic oedema around the neck and shoulder.

Brown hares formed by far the largest percentage of identified captures (54%) and of animals retained in snares (52%) in field trials using experimental and conventional snares by Short, Weldon, Richardson, & Reynolds (2012). Foxes, the target species, were the second most numerous species (28% of identified captures; 35% of those held). Of 457 hares caught and held whose condition was reported, 105 (23%) were found dead at inspection and 50 (11%) had externally visible injuries. In the follow up study comparing a second type of experimental snare, in which the minimum snare loop size was increased to 26cm circumference, with conventional snares, of 181 hares retained in either snare type, 23 (13%) were dead on inspection. 21 (12%) were alive and exhibited visible injury. Turner (2010) cites a Scottish SPCA survey which reports 28 snaring incidents involving hares, the vast majority of which, 22, were fatal.

Pine Martens

The Vincent Wildlife Trust state that the Pine Marten is in danger of extinction in England and Wales. Their Pine Marten Recovery Project aims to restore viable populations of pine martens to Wales and England. The first translocation of pine martens from Scotland to mid-Wales took place in autumn 2015 (Vincent Wildlife Trust, 2016a). Regarding England, due to the recovery and expansion of the pine marten population in Scotland, the animals now being found in close proximity to the English border, it is very likely they will spread over the border and re-colonise areas of Cumbria and Northumberland in the near future (Vincent Wildlife Trust, 2016b). Northumberland in particular is a an area of dense snare use, meaning it is likely naturally repopulating pine marten will encounter snares. The Vincent Wildlife Trust believe that pine martens are unlikely to recolonise central and southern England naturally, therefore they have identified areas that have suitable habitat for pine martens and are undertaking further assessment of these sites with a view to a possible future reintroduction programme (Vincent Wildlife Trust, 2016b).

In the Pine Marten Survey of England and Wales 1987-1988, Strachan, Jeffries, & Chanin (1996) report a very low historical incidence of snaring as a cause of death of pine martens, but state that this is likely to be 'greatly under-represented as a percentage of the total' mortality. The concept that snares may present a significant danger to re-introduced pine marten is further supported by 2007 Scottish SPCA survey data indicating fatal snaring of two pine martens in Scotland (Turner, 2010). In a study in Eastern Canada, where snares are set for snow-shoe hares, most of the pine martens reported dead were captured in snares set for hares, including 6 percent of animals marked in a recent study. At Terra Nova National Park on the east coast of Newfoundland three of eight marten released in the park were caught in snares (Thompson, 1991).

Otters

The otter is a European Protected Species, because it has declined throughout Europe during recent decades. In England and Wales it is protected under the Conservation of Habitats and Species Regulations 2010 (as amended) and in Scotland under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). Under these regulations in both jurisdictions it is an offence to deliberately capture, injure or kill an otter (Natural Resources Wales, 2016) (Scottish Natural Heritage, 2016a). Interestingly, Scottish Natural Heritage also cites the offence of reckless capture, injury and killing.

The Otter Survey of Wales 2009-2010 reports otters at 996 sites out of a total of 1108, giving an incidence of 89.89%. Compared with the first survey of 1977-1978 providing an incidence of 20%, there has been an impressive increase in otter numbers. West Wales shows a high percentage of occupation of sampled sites in the Cleddau, Teifi, Tywi and Loughor and it is likely that these catchments have reached close to environmental carrying capacity. In North Wales the otter is now widespread in Glaslyn/Lleyn, Conwy/Clwyd, Dee and Anglesey. In South-east Wales the Usk, Taff and Mid Glamorgan rivers otter populations have improved significantly since the previous survey in 2002. Otters can now be found in many of the rivers of the valleys, even where disturbed by human activity. On the River Taff and River Ely, otters can now be found in the middle of Cardiff (Strachan, 2015).

This very impressive recovery in Wales, due to natural expansion from the remnant populations without the need for reintroductions, has been in response to three main factors: the ban on pesticides that caused extinction of otters from many parts of England and Wales in the 1960s and early 1970s, legal protection for the otter and significant improvement in water quality in Welsh rivers since the 1970s.The prospect for full recovery of the otter population across Wales is very probable within the next decade (Strachan, 2015).

This significant increase in the population of otters in Wales, together with the observation that at least some are willing to tolerate high levels of human disturbance (Strachan, 2015), increases the likelihood of the interaction of this protected species with snares.

The fifth national otter survey of England 2009-2010 reports signs of otters at 1874 (56%) of sites in the main survey. Direct comparison of positive records from 2940 sites used in all five English otter surveys reveals the recovery of otters from virtual extinction in most of England during the early 1970s. Recovery has occurred everywhere apart from south-east England where no signs were found in Kent or most of Sussex. Re-colonisation from otter strongholds in south-west and northern England and Wales has consolidated across much of the country and continues to drive recovery; however the pattern of recovery differs by region. The Thames region shows the biggest increase in positive signs since 2000-02. In the South-West and River Wye catchments otter populations may have reached carrying capacity, while those in Northumbria, Cumbria, Wessex and the upper Severn may be close to it. Re-introduction programmes of captive bred and re-habilitated otters are likely to have speeded up recovery locally in East Anglia, Yorkshire and the upper Thames; the majority of the recovery however has been the result of natural expansion from remnant populations. The prospects are for full recovery across England probably within the next two decades or so (Crawford, 2010). The drivers for recovery, pesticide bans, protection and improved water quality are the same as for Wales, however it is clear the recovery in England has been slower than in Wales and projected timescale for full recovery is twice that for Wales.

As for Wales, the recovery of otter populations in England increases the likelihood of the interaction of this protected species with snares.

In Scotland, the last full national otter survey concerned the years 2003–04. It found otters in 1267 of 1376 survey

sites, hence 92% occupancy. The survey revealed otter signs within large urban areas such as Glasgow, Edinburgh and Dundee. It would appear that the otter's return reflects the improvement in water quality and the consequent increase in fish stocks in urban rivers. The survey confirmed that the species had continued to increase its population and range throughout the area and can now be considered ubiquitous in Scotland, occupying sites in urban areas and highly disturbed waterways where it seems unaffected by human activity (Strachan, 2007). This observation, in association with its increased general abundance, increases the likelihood of the interaction of this protected species with snares.

Otters can be caught in snares. Turner (2010) cites a 2007 Scottish SPCA survey which reports the non-fatal capture of an otter in a snare. The Cardiff University Otter Project which 'runs a long term environmental surveillance scheme, using otters found dead to investigate contaminants, disease, and population biology across the UK', reports dead snared otters in 2004, 2006 and 2016 (Cardiff University Otter Project, pers. comm. to Mark Kennedy). Other instances of otter captures in the UK include an otter dying 48hrs after capture by a snare in Somerset (Anonymous, 2015), two dead snared otters dumped in Lincolnshire after removal from an unknown snaring location (Anonymous, 2016) and an otter killed in a snare in Cornwall (Anonymous, 2005).

Between 1986 and 1991, 159 northern river otters were reintroduced into Nebraska by the Nebraska Game and Parks Commission with the objective to restore this species to the state. Each year since 1987, northern river otters were captured accidentally by trappers or found dead and submitted to the Nebraska Game and Parks Commission. Between May 1987 and March 2001 a total of 104 northern river otter mortalities were confirmed. Nine of these were caught and killed in snares (Bischof, 2003). The South Dakota river otter management plan (South Dakota Department of Game, Fish and Parks, 2012) indicates that of 66 river otters incidentally caught in South Dakota from 1979-2011 during trapping for other species, 12 were caught in snares.

Scottish Wildcat

The Scottish wildcat is a European protected species (Scottish Natural Heritage, 2016b); hence reckless capture, injury and killing is an offence. These animals are so endangered that the Scottish Wildcat Survey 2006-2008 does not estimate the absolute number of wildcats in Scotland; instead it cites a previous 1995 survey suggesting 3500 based on distribution and radio-tracking data, and notes that compared with previous strongholds in the Cairngorms, The Black Isle, Aberdeenshire and Ardnamurchan identified in a 1983–87 survey there is now a similar but less widely distributed population with isolated populations in the west of the country (Davis & Gray, 2010). There is, however, much debate over the true remaining population; Scottish Wildcat Action noting that figures of 35 and 400 in the press are speculative (Scottish Wildcat Action, 2015a) and Save the Scottish Wildcat citing the same figures, from an Oxford University Wildlife Conservation Research Unit estimate in 2004 of 400 and Scottish Wildcat Association estimate of 35 in 2012 (Save the Scottish Wildcat, 2014).

Both Scottish Natural Heritage (2016b) and Scottish Wildcat Action (2015b) state hybridisation with feral cats, domestic cats and existing hybrids as the main threat to survival of the species; however Scottish Natural Heritage (2016b) state 'incidental harm from predator control activities' as a risk and Save the Scottish Wildcat (2014) name snares as a means of 'accidental' persecution. Save the Scottish Wildcat (pers. comm.) believe wildcats do get captured by snares, stating that sometimes walkers come across snared wildcats and will take a photo, but that there is unfortunately no reliable data, as anyone catching one immediately disposes of the body and doesn't report it. They state that wildcat carcasses have been found in stink pits. Davis & Gray (2010) state that snaring accounted for 58% of recorded wildcat mortality in one estate in 1979 and conclude that despite little current information on incidental wildcat capture rates, the use of snaring may continue to present a problem. Anonymous (2012b) 'Snaring in Scotland: A practicioner's guide', states 'Always consider the possibility of wildcats in Highland Scotland'.

Capercaillies

All wild birds in the UK are protected under the Wildlife and Countryside Act 1981 (as amended) (Scottish Natural Heritage, 2016c); the capercaillie is further protected by special penalties as it is listed on schedule 1 part 1 of the legislation (Scottish Natural Heritage, undated). Turner (2010) cites RSPB Scotland evidence presented to the Scottish Parliament's Rural Affairs and Environment Committee that 'there are unfortunate examples of capercaillies being caught' [by snares] and that a 'main concern with snaring was related to the bycatch of capercaillies in snares that have been poorly set or set in the wrong place'. They note that 'improved regulations have helped to address that problem, but bycatch is the one conservation issue that must be addressed'.

Necessity

Is the use of snares the only method available to manage foxes or rabbits? No, it is not, and there is no need to use snares if there is a need to control these species. For millennia, humans have used a varied array of methods to control wildlife perceived to be dangerous to people or causing agricultural damage, and snares is just one of many. Some of these methods are now banned in many countries, others not practiced as often as they used to (but they could be promoted again), and others are relatively new and still in development.

Even in countries where snares are allowed, they are not essential tools for wildlife management. More than 95% of large landholdings in England and Wales do not use them (Anonymous, 2012), including major conservations bodies such as the RSPB, the Wildlife Trusts and the Woodland Trust. To prevent fox predation these organisations prioritise non-lethal methods such as electric fencing and diversionary feeding, recognising that killing foxes does not control fox numbers.

In 2015 the League commissioned a survey of major landowners in England and Wales to find out which types of wildlife management they carry out. 94% percent of respondents said they do not allow any snaring on land they own or manage.

This included twenty-one utilities companies; thirty-four Wildlife Trusts; and official bodies such as Network Rail, Natural England, Forestry Commission England and the Highways Agency. Nearly half of the respondents (44%) use only non-lethal wildlife management methods, recognising the futility of killing foxes and instead choosing long-term solutions to any conflicts. More than 250 municipal authorities in England and Wales do not allow the use of snares on their land with some, such as Worcester City Council, even petitioning the Secretary of State for a UK-wide ban (LACS, 2015).

It is not surprising that many landowners do not use snaring because in fact there are many alternatives to snaring. Following is the description of some of the wildlife control methods (including those that are now banned) that could be applied to control the animals that have been controlled by snares in the UK:

No control

There is powerful evidence to show that in many cases any attempt to control fox populations to solve a human-fox conflict may not have the desired effect and not applying any control method may be more effective. This may be explained by the fact that fox populations may self-regulate by virtue of food abundance and territoriality, and when foxes are removed they are often quickly replaced by new ones.

In Australia, red foxes are blamed for lamb deaths, but there is limited experimental data on the effectiveness of predator control on lamb mortality through fox predation. Fox control using poisoning with sodium monofluoroacetate, either once per year or on three occasions per year, demonstrated no effect on overall lamb production. Fox control did significantly reduce the minimum percentage of lamb carcasses classified as killed by foxes from 1.50% (no fox control) to 0.90% (fox control once per year) or 0.25% (fox control three times per year) and the maximum percentage of lamb carcasses classified as killed by foxes from 10.25% (no fox control)

to 6.50% (fox control once per year) or 3.75% (fox control three times per year). So, although fox control did reduce the number of lambs killed by foxes in absolute terms, the impact was not significant on overall lamb production, possibly because death of some individuals in a prey population may be associated with compensatory changes in survival of the remaining individuals. Furthermore, the authors suggest that insufficient foxes were killed to show a detectable increase in lamb production, as lambs die from many causes. Poisoning did not demonstrate any impact on fox abundance in the spring. Thus fox control using this method may be, in the authors' terminology, 'wasted'. Another interpretation may be that the cost, in terms of resources and suffering to the foxes, may not be justified by the benefit in terms of lamb survival (Greentree, Saunders, McLeod, & Hone, 2000).

A study of actual losses of lambs to fox predation on two Scottish hill farms calculated loses equivalent to 0.2-1.5% of total potential revenue for farm production (White et al., 2000). All confirmed cases of fox predation accounted for a maximum of 6% of all lamb losses.

In a study in Scotland, heather moorland managed for grouse shooting had half the density of occupied breeding dens of agricultural land. Hill country managed for shooting red deer had a third of the density of breeding dens of agricultural land (Hewson, 1986). This is probably due to differences in the relative availability of food in these types of land. In Scotland, the main effort of fox culling away from the dens takes place between October and the end of March. If culling as a method of fox population control was effective, one would expect that there would be a negative correlation between the number of foxes killed and the number of breeding dens the following spring. In other words, the more foxes killed, the fewer breeding dens there would be, and the population would decline. The study found, however, that there was an overall positive (though not statistically significant) correlation between the number of foxes killed in winter and the number of breeding dens. Greater culling results in a greater number of breeding dens. Furthermore, despite no measurable change in culling effort, the number of foxes killed increased over the five winters of the study. Hence culling was ineffective in reducing the breeding population in this study and in fact (although not noted by the author) may have been counterproductive. Killing breeding vixens in winter may just result in replacement of the breeding vixen with another, hence breeding rates remain constant. If there are surplus non-breeding foxes, eradication of a breeding animal will merely result in its replacement by a previously non-breeding animal, hence reproductive output of the population remains constant despite culling (Hewson, 1986).

Forest within agricultural areas can represent safe refuge for species which conflict with neighbouring landowners' interests, such as foxes. The agency responsible for forest management in upland Wales permitted killing of foxes as a 'good neighbour' policy, aimed at reducing fox numbers in these refuges. Two of the culling methods used involved mounted foxhunts that used hounds to chase and kill foxes above ground and the use of multiple hounds and terriers to drive foxes from cover towards shooting enthusiasts and farmers who

would shoot the foxes. The Hunting Act (2004) banned the former and curtailed the latter, in that no more than two dogs can be used to flush foxes. Other methods, such as the shooting of foxes by forest rangers with rifles with the aid of a spotlight were unaffected by the legislation. A 2006 study by Baker & Harris aimed to establish whether culling of foxes using these methods had an impact on fox density, estimated by measuring density of fox faeces as a measure of fox populations in 29 commercial forest sites over autumn 2003 and spring 2004 (prior to the legislative change). The study showed that over-winter change in faecal density was not significantly associated with culling pressure. Faecal density reduced from autumn to spring in areas of low culling pressure, and increased in areas of high culling pressure. Spring faecal density was positively correlated with culling pressure exerted by fox control societies, mounted fox hunts and shooting by forest rangers. This implies more foxes were killed where more foxes were present. Therefore, there doesn't seem to be much evidence to suggest that culling in these forests exerted a significant negative effect on fox numbers. It has been proposed that 60–80% of a fox population would need to be removed annually to achieve an effective limitation of population growth, as 60-80% is roughly equivalent to annual population productivity in foxes. In the study reported here, the culling programme was removing roughly double the size of the maximum pre-culling population, an average of 56 foxes being killed in each forest, from an autumn population of 32 foxes. Yet this resulted in a negligible change in fox density. Thus the culling undertaken appears to have no value with respect to reducing fox numbers (Baker & Harris, 2006).

The most likely explanation for this failure to reduce the size of the fox population is immigration from neighbouring areas. In Britain the level of culling is dictated by individual landowners so that any landscape consists of a mixture of different culling intensities. Hence areas of low or no culling act as sources of recolonizing individuals for heavily culled areas. Over-winter culling of foxes is likely to be particularly ineffective, as this time coincides with the main period of dispersal, and dispersing foxes can move considerable distances so recolonization is likely to be rapid and occur over a large area. Hence it is probable that the study forests represent a 'sink' for foxes from neighbouring areas rather than a source for populations in the wider agricultural landscape (Baker & Harris, 2006).

A recent analysis showed that the survival and breeding success of female hen harriers were much lower on grouse moors than on other upland land management classes in Scotland: a difference attributed to persecution of hen harriers by humans on grouse moors. That study, however, did not look for possible beneficial effects of gamekeeper control of other predators, particularly red foxes, on hen harrier breeding success. These and other recently published data were re-examined to see whether there was regional variation in hen harrier nest success associated with the presence or absence of foxes and the control of foxes and other predators by gamekeepers. Nest success within a particular land management class (grouse moor, unmanaged moorland or young conifer forest) was not significantly different inside and outside the range of the red fox. Although the fox is known to be a predator of hen harrier eggs and chicks, the data presented gave no indication that it has a large influence on hen harrier nest success and productivity. No clear evidence was obtained for a beneficial effect of the control of foxes and other predators by moorland gamekeepers on hen harrier nest success. Even a generous assessment of the magnitude of such an effect, consistent with the available data, indicates that its effect on hen harrier population growth would be small relative to that of persecution of hen harriers on grouse moors (Green & Etheridge, 1999).

Hen Harrier

There is also the issue of perceived animal-human conflict that turns out not to be real, and therefore there is no need for control. For instance, it is often said that the population of foxes is increasing in the UK to the point that it needs to be reduced, but there is no evidence of such increase. A number of schemes have been introduced to monitor changes in the numbers of several

species of mammals, including foxes. The British Trust for Ornithology monitors population changes of several species of mammals seen during their annual breeding bird survey. This shows that, across the UK, the red fox population declined by 29% between 1995 and 2014. Looking at the details, the fox population declined from 1995 until 2004, fluctuated between 2004 and 2013, although the general trend remained relatively stable, and then declined further in 2014 (Harris et al. 2015).

This general pattern is supported by two other studies. The first compared fox faecal counts, a measure of fox abundance (Kolb & Hewson 1980; Sadlier et al. 2004; Webbon et al. 2004), and the second was organised by the People's Trust for Endangered Species (Anon. 2013).

The hypothesis that foxes population self-regulate was supported by studies that were made during the foot-and-mouth crises in the UK. Hunting with hounds was banned from 23rd February to 17th December 2001 due to foot-and-mouth disease in cattle, and other fox control methods were also affected because of the restriction of movement in the countryside. There should have been a detectable population increase if hunting played any role in fox population control, so fox faecal counts were used to compare fox numbers in the same 1-km squares in late winter 1999 and 2000 (immediately before the outbreak of foot-and-mouth) and late winter 2002 (immediately after foot-and-mouth). In the absence of hunting, fox numbers across Britain as a whole did not increase but actually declined by 4.7% (Baker et al. 2002).

Shepherding

A shepherd is a person who tends, herds, feeds, or guards herds of sheep or goats, and the term which amalgamates all these activities is known as shepherding. Ross & Harris (2010) suggest that close shepherding at lambing time is the most effective deterrent against fox predation, and that this allows early identification of problems so that immediate action can be taken to reduce the risk to new born lambs. Taking lambs inside at night, or when there are risks of any type identified and keeping them in a fox-proof shelter is a widely-used practice. Similar careful management and use of fox-proof enclosures could be applied to any supsecptible species, such as game birds, the majority of any extra cost incurred being labour. In addition to protection from fox predation, additional benefits such as enhanced care of animals reducing losses from non-fox related sources such as poor health and mis-mothering would accrue (DEFRA, 2005b).

Modern shepherding can be used as a method of enviromental protection. For instance, since the National Trust purchased Hafod y Llan in the year 2000, sheep numbers were halved from the original 4000, and a herd of Welsh Black cattle was introduced to graze the mountain and woods in the summer. By 2010, habitats were showing good signs of recovery with vegetation growing taller and finally having the chance to bloom and set seed (National Trust. n.d.). In the same way the environment protection was factored in developping modern methods of shepherding there, animal protection (both for domestic animals and wildlife) could be factored as well, incorporating close shepherding during lambing as a routine activity.

Tree Guards

Tree guards can be used to protect young trees and shrubs from rabbit browsing and bark stripping where it is impractical to enclose the whole area with fencing. There are many types available; plastic net guards, split plastic tubes, spiral plastic sleeves and welded mesh cylinders. Spiral plastic sleeves are perhaps the least successful because they tend to be displaced by wind or animals; split plastic sleeves and net guards are more robust. To reduce rabbit damage, tree guards should be at least 2 feet high (Ross & Harris, 2010).

Deer are also seen as a threat to trees so there are several tree guard methods designed for them (Pepper et al., 1985; Pepper, 1987; Hodge and Pepper, 1998; Potter, 1991). Hodge and Pepper (1998) provide a comparison of the cost of using fencing and tree guards for different sizes and shapes of woodland.

Novel Disturbances

Novel objects, such as flashing lights or rotating beacons, may provide temporary protection against fox predation in livestock or bird enclosures. Combinations of frightening devices, such as the novel objects above and simulated gun shots, used at irregular intervals, provide better protection than the use of a single device because animals have more difficulty in adapting to multiple stimuli (Ross & Harris, 2010). Defra itself advises that "on occasions when livestock only need protecting for a short time, novel objects in an area (e.g. flashing lights in lambing fields) are claimed to be effective deterrents of foxes" (Defra, 2005). There is also evidence that rabbits too avoid novel objects (Sunnucks, 1998).

There are a variety of automated lighting devices aimed at guarding against predators which range from motion-sensitive lights to infrared light emitters. As with any device or method, exposing predators to lighting devices too frequently can cause habituation and diminish or eliminate the desired response, but a new device developed in the US called the "Foxlight" avoids easily detectable patterns so that night predators do not quickly become accustomed to it (Stone, 2016).

Novel disturbances may come in the form of novel scents, sometimes referred as repellants. Cintronella-scented jelly granumes are particularly useful in dissuading foxes from digging holes (Williams & Bryant, 2003).

Guard Animals

Around the world livestock producers have long relied on dogs to protect livestock from predators such as wolves, bears and lions. In some instances, the mere presence of livestock guardian dogs (LGD) helps keep wolves away from livestock. In other cases, dogs play a more active role by alerting people to the presence of wolves and other predators in the area. Researchers at Hampshire College in Amherst, Massachusetts, the U.S. Fish and Wildlife Service's National Wildlife Research Center in Colorado and the U.S. Sheep Experiment Station in Idaho studdied the issue of the effectivenes of these dogs by placing LGDs on farms and ranches throughout the United States, and the result was fewer livestock losses from predators. Most of the cases studied focused on

Llama used as guard animals

coyote attacks on sheep and goats, although other predators such as domestic dogs, mountain lions and wolves were included (Stone, 2016). If these dogs are effective deterrent against big predators, they are likely to be effective against smaller ones, like foxes. Dogs used as LGD are of different breeds of those used for hunting, or herding flogs of sheep, and would not chase and kill the predators, but just scare them away. Great Pyrenees, Anatolian shepherds, Akbash, and Mastiffs are breeds commonly used as LGD (Hancock, 2014), but any relatively big dog could be used for such roles if trained from puppies.

Ross & Harris (2010) note that in the United States llamas have been used to guard livestock, particularly sheep, from predators for some time. Their use for this purpose is uncommon in the UK, but a number of users claim it is a successful method of reducing predation by foxes on lambs and poultry (Garner, 2010) and ground nesting birds (RSPB, 2010). In particular, this method is particularly suited to hill farming, as llamas can be kept as part of the flock, they are hardy animals requiring little extra management and they produce quality wool as a by-product (Ross & Harris, 2010). Even donkeys have been used for simmilar purposes (Dohner, 2007).

Habitat management

Ross & Harris (2010) suggest that managment of food availability will theoretically reduce the carrying capacity of fox habitats and hence reduce populations; in particular removal of sheep carrion in areas of upland sheep production could be a useful and practical strategy. Reduction of rabbit populations could also have some impact on fox population, but this would depend on the availability of alternative food sources. The removal of carrion and rabbits throughout the year has been proposed as one mechanism to reduce the overall carrying capacity of predators in agricultural systems in Australia (Catling, 1988), and it has been suggested that could also work in Scotland as foxes eat sheep carrion (Hewson 1984). Ross & Harris (2010) note that some have discussed provision of alternative food sources as a means of reducing fox predation; however in order to ensure foxes feed on the provided resource it would need to be a preferred food item of foxes, and if this was a prey species, it should be more vulnerable than the species to be protected.

Removal of parts of the physical habitat that attract the wildlife to be controlled can be another method. For instance, accesible compost heaps attract foxes as they can dig for grubs and worms or use them as a source of heat, so a solution may be remove the compost altogether or build a timber and wire-meshed compost box with a lid (Williams & Bryant, 2003). The same applies for bird feeding, fallen fruit, rubbish, etc.

As far as rabbit control is concerned, the habitat quality for rabbits is affected by availability of food, type of soil, vegetation cover and predator pressure (Parker et al. 1976; Rogers & Myers 1979). Low availability of food and refuge appear to reduce rabbit populations (Lombardi et al. 2003). Red foxes and birds of prey are the main predators of rabbits; reducing fox control in the area and creating habitats for birds of prey is therefore a viable option for rabbit control. Removing thick bushes, piles of brush, stones and wood which rabbits use as hiding places reduces the level of security of foraging rabbits and will limit crop and pasture damage. Blocking of burrow entrances after some other form of population control is extremely effective, as it deprives rabbits of shelter from weather and predators. Rabbits do not readily dig new warrens, therefore rabbit populations do not persist in areas where warrens are effectively destroyed (McPhee & Butler 2010). If the burrow is not first emptied by some other form of control prior to this, rabbits and other wildlife could be trapped and subsequently starve or suffocate to death over a long period of time, resulting in an extended period of very poor welfare (Ross & Harris, 2010).

In the cases of wildlife damaging trees, successful natural regeneration might be achieved by increasing the density of young trees rather than by decreasing the

rate of browsing, so in woodland some thinning of adult trees may achieve this. Where there is dense ground vegetation, grazing animals can help break this up and so create additional germination sites (Mayle, 1999).

Diversionary feeding can reduce the attractiveness of trees to deer. In theory, if deer are being attracted to a site for either shelter or feed, the provision of a better alternative may divert them. Diversionary feeding has been used successfully in some countries (Gill, 1992).

Exclusion fencing

In a 2006 study run by the Australian Government six designs of exclusion fences were tested by placing individual animals (18 feral cats and 18 foxes) in 20 metre × 20 metre pens and recording their responses to the various fence components. The fence designs varied in height, presence and shape of overhang, presence or otherwise of electrified strands and number of strands. One fox successfully breached a 1.2 metre high fence by jumping onto the overhang and climbing over; no foxes (or cats) were able to scale a 1.8 metre fence regardless of the position or absence of electric wire. Four foxes excavated holes underneath the fence and one chewed through the mesh. Results from this work indicate that a fence 1.8 metre high, having an overhang that is at least 600 mm in circumference curved or shaped in such a way that prevents animals climbing over from underneath, and which has an apron with a mesh hard enough to prevent foxes chewing through should be effective in excluding foxes. Such exclusion fences do not require electric wires or any of the associated equipment; this will provide significant savings in building and maintenance costs for such fencing (Robley, et al., 2007).

In northern South Australia, the effectiveness and cost-efficiency of wire netting and electric fence designs as barriers to feral cats, foxes and rabbits was tested in pen and field trials. A 1.8 metre high wire netting fence with foot apron and a curved non-rigid overhang, without electric wires, effectively contained most rabbits, feral cats and foxes during pen trials and a 27 km perimeter fence of similar design proved effective in excluding these species from a nature reserve. The foot apron consisted of wire netting clipped to the bottom wire, extended out along the ground for 30 cm inside the pen and buried. The overhang was supported by fencing wire cut to lengths of 90 cm, vertically woven into the uppermost 60 cm of the netting and bent to form a curved, non-rigid overhang. A reduced height version of this fence, 1.15 metres in height, was similarly effective during testing but has not been trialled on the scale of the reserve exclusion fence. It was recommended that 30mm hexagonal netting should be used in the construction of such fences because conventional 40 mm diameter hexagonal "rabbit netting" was not an effective barrier against young rabbits. A 60 cm wide external netting overhang, curved in an arc and supported by heavy gauge wire, effectively precluded more feral cats and foxes than a 30 cm wide overhang angled upwards. Posts, particularly at corners, were targeted by feral cats and foxes and the effectiveness of the fence was improved by using steel posts which are more resistant to attack than timber posts (Moseby & Read, 2006).

Williams & Bryant (2003) suggest that the most effective wooden fence for reducing fox activity is two metre high closeboard fencing with vertical boards. They claim that adding another 30 cms or more to the effective height of the fence by fixing trellis is often enough to deter foxes, although the holes in the trellis should not be bigger than 8 cm. And the use of overhangs and underhungs (40 cm or so on either side), would make such fences completely fox proof.

Fences can also be used to protect trees from deer (Pepper, 1992; Pepper et al., 1992; Pepper, 1999). In addition to permanent fences cheaper temporary and reusable fencing has also been developed (Pepper, 1999). Electric fences have been found to be of limited use against roe deer (Pepper et al., 2001) but they may be more effective against red deer if the fence can be checked daily and there is a reliable electricity supply.

Control of reproduction

Cabergoline is a dopamine agonist that induces abortion in cats and dogs. It is palatable to foxes and is easily incorporated into a non-toxic bait. In an Australian study, 51 dens active for three consecutive years were chosen for study. 30 treatment dens were randomly selected and each treated once during August and again during September 1994 with eight non-toxic *'Foxoff"* baits containing 170 micrograms of *cabergoline*. The remaining 21 dens were used as un-baited controls. Baits were randomly placed by burial within a 50 metre radius of the den. Bait uptake was >88% overall for the treatment dens. The incidence of cubs was significantly lower in the treatment dens than in the controls, demonstrating a significant effect of *cabergoline* baiting on fox reproduction. The paper notes, however, that the prolactin-inhibiting action of *cabergoline* may result in cessation of lactation. If cubs are born and suffer starvation due to this effect, this technique of reproductive control may not be as humane as it initially appears (Marks, Nijk, Gigiotti, Busana, & Short, 1996).

Recent research in reproductive control of fertility on foxes has been on the development of an antifertility

An example of a tunnel trap but with the addition of an inhumane leghold trap

vaccine for use on foxes that relies on a process termed 'immunocontraception'. This would have a more long lasting effect than strategies such as that discussed above, which induce a one-off abortion. Indeed, permanent infertility in targets has been suggested as achievable. A variety of sperm and oocyte protein antigens, together with different delivery vectors such as *Salmonella typhimurium*, vaccinia virus and canine herpesvirus, have been experimentally assessed for their ability to induce immunocontraceptive responses in foxes. Unfortunately, suppression of fertility has yet to be achieved with any combination of antigen and delivery vector. The fox is not well known as an experimental animal and the logistics of dealing with this difficult-to-handle species have proved to be a major challenge when compared with other species. Nevertheless, research on fox immunocontraception, regardless of whether it could be considered ethical, has generated insights into the reproductive biology, husbandry, and basic immunology of viral vectors in European red foxes and this information represents a knowledge base should antifertility vaccination for foxes be revisited in the future (Strive, Hardy, & Reubel, 2007).

Cage traps

A common method for capturing small mammals is the baited cage trap, a device which contains bait as a lure for the animal, and a restraining cage which holds the animal captive until release. Animals trapped once, however, quickly develop trap avoidance behaviour, making repeat capture difficult. Furthermore, as the cage trap requires animals to voluntarily enter, success rates in trapping can be low, for example, 6% success rate over 1040 nights in capture of swift foxes and 5% over 770 nights in kit foxes reported in two studies (Kozlowksi, Bennett, Gese, & Arjo, 2003). Ross & Harris (2010) note that rural foxes tend to be wary and difficult to catch in cage traps, but state that where foxes are using human habitats and are thus more accustomed to human infrastructure, unfamiliarity will be less of an issue and cage traps will prove extremely effective. They state that cage trapping can be useful adjacent to poultry runs, game bird release pens, near barns, farms or houses. Covering the trap with vegetation or a blanket so that it is shaded and sprinkling earth over the mesh floor help to make the trap less conspicuous; leaving an unset trap in-situ before commencing trapping can also help familiarise foxes with the device. Placing meat bait, fox urine and fox droppings in the trap encourage entry.

The production of a tunnel trap, which included a malleable chicken wire mesh which could be moulded around den entrances attached to the entrance of the cage trap, resulted in an 83% success rate in capturing kit foxes, i.e. capture of 0.6 foxes per trap night. The modified trap effectively captured kit foxes of different age classes in a variety of terrains and seasons, and was so successful that baiting could be dispensed with (Kozlowksi, Bennett, Gese, & Arjo, 2003).

The behavioural and physiological responses of captive-raised red foxes to capture in cage traps through an eight-hour restraint period was recorded. These responses were compared with the responses reported in other studies for un-trapped foxes and foxes caught in padded- and unpadded-jaw foothold traps. Heart rate and body

temperature increased after foxes were caught in cage traps, but these never significantly exceeded mean pre-trapped levels. Foxes caught in cage traps were physically active for 35.7% of the restraint period, the majority of this activity consisting of pacing in the trap. Foxes caught in cage traps had significantly higher adrenocorticotrophin and cortisol values than un-trapped foxes, and significantly lower ß-endorphin and cortisol levels than foxes caught in foothold traps. Bilirubin, alkaline phosphatase, lactate dehydrogenase, and aspartate aminotransferase levels for foxes caught in cage traps were significantly elevated above levels of un-trapped foxes. Foxes caught in cage traps had significantly lower alkaline phosphatase, lactate dehydrogenase, creatine kinase, and aspartate aminotransferase levels than foxes caught in foothold traps. Foxes caught in cage traps had significantly higher incidences of adrenal and renal congestion and lung haemmorhage than un-trapped foxes. The authors conclude that factors associated with limb restraint directly contribute to the trauma experienced by trapped red foxes and, therefore, foxes caught in cage traps undergo less trauma than foxes that are restrained by a limb in a padded- or unpadded-jaw foothold trap. It is also possible to conclude that the process of cage trapping is also traumatic, though less so than foothold trapping (White, Kreeger, Seal, & Tester, 1991).

Ross & Harris (2010) state that foxes caught in cage traps can injure teeth and claws in efforts to escape, but such injuries can be minimised by having the trap made of small mesh harder for the fox to chew. They report that in trapping several thousand foxes in cage traps in Bristol incidents have been isolated to superficial rubbing of fur from the nose or forelegs as foxes have tried to dig out of the trap.

Shooting

Shooting is a common method use for wildlife control, and it may take different forms depending on the type of gun used (shotguns, rifles, etc.), or the method used (flushing to guns, lamping, etc.). One of the key issues regarding this method is that good shooting skills are needed to minimise the animal's suffering, as only wounding an animal could not be considered humane. Therefore, the humaneness of this method very much depends on the proficiency of the shooters and on strictly following the rules and procedures set up to avoid animals suffering. If the animal dies instantly when shot and it was not even aware that it was in danger before it was shot, this method can be considered humane (if its death is not affecting any other animal that was present or which depends on the animal killed),

but if the animal is stressed because shots have been fired and missed, and then one of the shots wounds it but it runs away and dies a long time later either because of the wounds or because it becomes incapacitated so it can no longer provide for itself, this method can then be considered very inhumane.

Shooting skills and proficiency can be tested. For instance, 199 shooters in England, Wales and Scotland shot at life-sized fox-shaped paper targets with 35 different shotgun bores and pellet-sizes including .410 and 12 bore using No 6, BB or AAA shot sizes at 25, 40 or 60 yards, with open and full-choke barrels. A further 16 tests used rimfire rifles at 50 yards, both supported using a gun rest and unsupported, and centrefire rifles at 100 and 150 yards, by day and by night. The shooters included a range of skilled, semi-skilled or unskilled shooters. For shotgun trials, the targets were moved across a gap, allowing the shooters 3 or 3.5 seconds to take aim and fire. For rifle trials, the static targets were raised up for 4 seconds and then lowered. The paper targets were mapped with internal anatomy, allowing assessment of the potential effect of hits on real animals. On this basis, a total of 1085 shotgun shots and 885 rifle shots at the targets were scored as 'killed', 'seriously wounded', 'lightly wounded' or 'missed'. As shooters' skill level increased, the 'kill' rate increased, the 'miss' rate decreased but the 'wounding' rates stayed much the same. Number -6 shot 'wounded' because of poor target penetration (measured through comparative card penetration tests). AAA had poor shot pattern density at ranges beyond 40 yards. At ranges of up to 40 yards, both AAA and BB shot performed well, BB being the optimum. .410 shotguns with No 6 shot 'wounded' but seldom 'killed'. Rifles 'killed' better than shotguns and 'wounded' less. Importantly, there was no gun/ammunition combination that had zero probability of 'wounding'. Wounding varied dramatically across the trials with the combinations of different types of gun, ammunition and shooters' skill level. The

fact that no combination presented zero probability of wounding challenges the assertion that shooting of foxes can be guaranteed as humane, however variables such as gun and ammunition type clearly influence wounding rates. It is also worthy of note that rates of wounding were similar irrespective of the skill level of the shooters when this is considered in isolation, again challenging the common assertion that skilled shooters kill rather than wound (Fox, Blay, Greenwood, Wise, & Potapov, 2005)

The use of shotguns inevitably results in the wounding of some animals that are not killed by the shot, a clear welfare cost to the individuals concerned. In order to reduce wounding of legally-hunted game species including the red fox, an action plan was implemented in Denmark. The action plan aimed at identifying factors contributing to high wounding rates (e.g. hunting method, time of day, range, shell quality and pellet size) and to disseminate the results to hunters to improve hunting efficiency and decrease the risk of wounding game. The initial main action of the plan was to require compliance with maximum shooting ranges for the different species, including 25 metres for red fox as recommended by the authorities, hunting and other nature organizations. Restrictions in hunting opportunities and protection of species were proposed as ultimate measures to reduce infliction rates if improvements were not achieved on a voluntary basis by the hunters. The action plan was endorsed before the 1997–1998 hunting season. A monitoring programme for selected game species was set up to investigate the effects of the action plan. Red foxes were sampled in rural districts. A total of 1,749 red fox carcasses from 1999 to 2010 were examined for embedded shotgun pellets with standard veterinary X-ray units. Numbers and sizes of embedded pellets were assessed from the X-ray images. The prevalence of embedded shotgun pellets in red foxes in 1999 was 24.9%; hence a quarter of foxes sampled had been previously wounded and not killed by shooting. This declined to 8.5% in 2010, presumably as a result of hunters changing their hunting methods over this time. The mean number of embedded pellets in the wounded red foxes over the entire period was 6.3; the highest number recorded was 69 embedded in a single animal. The existence of shotgun pellets in foxes surviving this initial injury in a significant proportion of animals indicates the prevalence of wounding as a welfare concern associated with shooting as a means of population control (Elmeros, Holm, Haugaard, & Madsen, 2012).

Two key factors used in the ranking of welfare outcomes for killing methods are the duration and intensity of suffering experienced by animals. Although measuring the intensity of suffering is challenging and arguably subjective, the average duration of suffering for killing methods has been defined as the time from the onset of painful or stressful stimuli or insult to permanent insensibility. Three critical animal welfare parameters, apparent time to death, instantaneous death rate and wounding rate were used to assess the welfare outcomes of a European rabbit shooting programme in south-eastern Australia. Apparent time to death was the number of seconds elapsed between the first shot to hit the animal and the moment the animal collapsed and did not move. Instantaneous death rate was the proportion of killed animals for which apparent time to death was zero. Wounding rate was the proportion of animals that were hit and not recovered. A total of 141 rabbits were shot at during the four nights of the study. The shooter was an experienced marksman equipped with a .22 calibre rifle fitted with a 3–9 ×40 telescopic sight. The mean shooting distance was 28 metres, with the longest shot being 64 metres. The mean number of shots fired at each rabbit was 1.5, but 76% of rabbits were killed with one shot. Mean instantaneous death rate was 60%, mean apparent time to death was 12 seconds and wounding rate was 12%, i.e. 12% of animals were hit but were not recovered. The wounding of animals is an almost inevitable outcome of a shooting programme conducted in field conditions. From an animal welfare perspective, the escape of a wounded animal is the worst of all possible outcomes because it involves a potentially protracted duration of suffering. In this study, the proportion of rabbits wounded and missed significantly increased with shooting distance. Hence reducing shooting distances would increase the humaneness of shooting programmes. Although this study concerned the shooting of rabbits rather than foxes, and foxes represent a somewhat larger target than rabbits, the general principles apply to both species, including the effect of shooting distance on wounding rate (Hampton, Forsyth, Mackenzie, & Stuart, 2015).

Hunting with dogs

Hunting foxes, hare, deer and mink with dogs is a common practice in the UK undertaken by organised hunts as a field sport (sometimes justified as a wildlife control method), although it is currently banned in most of its forms in Scotland, England and Wales. Traditional hunting with dogs as sport is a seasonal activity which takes place in the coldest months of the year because scents evaporate faster in hot weather than in cold weather. The dogs used belong to several breeds: staghounds, foxhounds, harriers, otterhounds, bassets, beagles, terriers and lurchers. In all forms of hunting with dogs the quarry would be chased by the dogs either directly or by chasing the scent, and in the end it would be killed by the dogs or it would be shot. In fox hunting, after a chase that may last for some time the fox may often seek refuge underground, which would prompt the hunt to call for the service of a "terrierman", who will use terriers to bolt the fox out so the chase can continue, or who would shoot the fox after digging it out if it is reluctant to bolt. Terriers may also fight with the fox and kill it.

Hares are normally hunted with packs of smaller breeds of dogs (bassets, beagles or harriers), or with lurchers that are used in pairs to compete with each other in a sport called "hare coursing" (also banned in Great Britain). Stag hunting involves long chases of red deer that normally last for several hours, and end with the deer being shot.

The Protection of Wild Mammals (Scotland) Act 2002 and the Hunting Act 2004 banned hunting wild mammals with dogs in Scotland and south of the border respectively, but some exempt hunting is allowed as long as some conditions are fulfilled. Under the Hunting Act "flushing to guns" is one of the exempt hunting forms, but only two dogs can be used, and the mammal should be shot as soon as flushed out of cover (so, there cannot be any chase as in traditional hunting, and the fox cannot be attacked by the hounds). Other exemptions allow the use of dogs to flush a mammal to a hunting bird of prey, but again there cannot be any chase by the dogs. Hunts in England and Wales claim that they currently undertake "trail hunting" instead hunting, in which an artificial scent is supposed to be followed instead, but many believe this is just a deceit to cover up illegal hunting (Casamitjana, 2015).

The banning of hunting with dogs was based in the acceptance that the prolonged chase of a hunted animal by dogs already causes suffering to the animal, and that a dog or a pack of dogs attacking a fox, a hare, deer, badgers, otter or mink is an inhumane way of controlling wildlife (Burns, 2000).

Hunting with dogs can also affect non-target species, as hounds may sometimes attack other animals, including pets. There are numerous reports of packs of hounds out of control trespassing into people's land and causing all sort of havoc (Anon., n.d.2).

Ferreting

Another potential method of control of rabbits is ferreting, which involves the introduction of ferrets into burrows, driving rabbits into nets placed over the burrow entrances or towards waiting guns that shoot them as they escape from tunnel entrances. Ferreting is most successful in winter, as it avoids high numbers of juveniles and more effectively targets female rabbits, limiting potential overall reproductive output of the population.

In modern rabbiting, ferrets may wear a locator collar, and the hunter will use a device that clicks faster the closer it is to the ferret's collar (Anon., n.d.).

Ferreting could involve an unquantified amount of pain and injury before death, depending on the ferret-rabbit interaction before bolting from the burrow (Ross & Harris, 2010) along with considerable fear, and for this reason cannot be considered a particularly humane control method.

Chemical methods (poisons)

The most common chemical method used in animal control is poison. In addition to using poison to control rats and mice, different types of poison, and different methods to administer it, have been used for other wildlife control in several countries, although they are banned in many. Often laying poisoned baits in the open countryside is illegal, but in some countries methods to administer poison to wild animals without laying them in the open have been developed.

In the US avicides, or bird poisons, such as *Avitrol, DRC-1339*, and others have been used to "control" bird populations (often pigeons). Avicides like *Avitrol* are acutely toxic and cause birds and other animals a great deal of suffering. Avitrol attacks and impairs birds' nervous systems, causing birds that ingest the poison to become disoriented, exhibit erratic flight and tremors, and suffer violent convulsions for hours before they finally succumb to the effects of the toxin (PETA, n.d.).

In the UK the use of strychnine poison was legal to control wildlife but the Animals (Cruel Poisons) Regulations 1963 banned it for all animals but moles, and in 2006 it was banned altogether for any animal due to new EU regulations (Clover, 2007).

In Australia the most common means of fox control involves poison baits using sodium monofluoroacetate. The humaneness of this poison is, however, controversial. There is a latent period of about four hours between ingestion and behavioural symptoms, which last about 90 minutes. These behavioural symptoms involve running and retching and it is likely suffering occurs at this stage; later convulsions and tetanic spasms occur before death. During this later severe nervous system disruption, it is debatable whether suffering is perceived, but suffering during convulsions and tetany cannot be ruled out. Para-aminopropiophenone is a methaemoglobin-forming compound. Methaemoglobin cannot carry oxygen, so sufficient concentrations cause anoxia and death. The M-44 ejector is a spring loaded device which uses a lure to attract targets, and then ejects a toxic load directly into the target's mouth. According to the authors, this device excludes many mammalian species from the toxic load; however it is difficult to see how this could be the case in other carnivorous and omnivorous species including those endemic in the UK (e.g. badgers) and, of course, the domestic dog. In this study, M44 ejectors were loaded with a formulation of para-aminopropiophenone, dimethly-sulphoxide and condensed milk, and set in a pen, baited with fried liver. Five foxes were placed individually in the pen; all five voluntarily triggered the ejector. All became progressively more lethargic after triggering the injector; after 14-25 minutes either lying prostrate or collapsed and death was confirmed after a mean of 43 minutes. In a clinical comparison of para-aminopropiophenone toxicosis with that of 15 cases of lethal sodium monofluoroacetate poisoning using a dose of 0.5 mg per kg bodyweight, para-aminopropiophenone produced a mean time to death 7.7 times faster, the onset of first symptoms being 15 times faster. There was much less activity prior to death, and paddling, spasms and convulsions were not observed with para-aminopropiophenone, whereas these are commonly associated with sodium monofluoroacetate poisoning. Although this study involved only five individuals, the authors concluded that para-aminopropiophenone used with M44 ejectors may be a rapidly-acting and apparently humane lethal control agent for foxes (Marks, Gigliotti, Busana, Johnston, & Lindeman, 2004).

An Australian study compared the effectiveness of the use of M-44 ejectors loaded with quick-acting sodium cyanide against other fox control techniques, including spotlight shooting, treadle snares and shooting foxes as they are flushed from cover by fox hounds. Treadle snares were not described in the study beyond declaring them a 'humane leg-hold trap'. They appear to be more sophisticated devices than UK snares which, when triggered by an animal passing over them, mechanically encircle some part of the animal in a noose, hardly meriting the term 'humane'. Sodium cyanide was used as the poison in the M-44 devices as it kills quickly, allowing collection of dead animals. In the specific conditions of the study, which took place on Phillip Island, Victoria, a fox was killed on 76.8% of occasions when an M-44 was triggered, and no non-target species triggered the devices. Rodents and birds occasionally ate the non-toxic ox liver bait. M-44 devices with sodium

cyanide caught seven foxes per 1000 person-hours, a measure of catch per unit of effort, hence the efficiency of a given control technique. Hunting using foxhounds to flush foxes from cover for shooting accounted for 12 foxes per 1000 person-hours, treadle snaring accounted for 15 foxes per 1000 person-hours, and the most efficient technique was spotlight shooting, accounting for 30 foxes per 1000 person-hours. If sodium monofluoroacetate (a poison commonly used in Australia but not necessarily humane, see below for an alternative) were used in the M-44 devices, significantly fewer person-hours would be required to manage the devices. Sodium cyanide was only used in this research trial so that dead animals could be recovered. Using sodium monofluoroacetate was estimated to require less than one-sixth of the time required to manage the devices loaded with sodium cyanide due to the greater health and safety requirements of working with the latter. Hence it is estimated that use of M-44 devices loaded with sodium monofluoroacetate would provide the most efficient means of fox control, accounting for 42 foxes per 1000 person-hours (van Polanen Petel, Kirkwood, Gigliotti, & Marks, 2004).

There are also other chemical methods that are not lethal but cause a negative reaction in the animal. Conditioned Taste Aversion (CTA) occurs when negative reinforcement by illness induces a learned association in an animal that causes it to avoid subsequent consumption of a particular food (Gentle et al. 2004). CTA-inducing agents must be odourless and tasteless to prevent detection by the predator, and must cause negative post-ingestion effects such as nausea or vomiting (Gill et al. 2000; Shivik et al. 2003). CTA has been used succesfully to reduce predation of eggs by foxes (Maguire et al. 2009).

Grey squirrels can be poisoned in some parts of the UK using ready-mixed warfarin on wheat. Warfarin poison may only be deployed outdoors against grey squirrels for tree protection between 15th March and 15th August. The use of Warfarin poison has been favoured in most commercial woodland situations because it is less time consuming and hence a less expensive operation while being at least as effective as trapping (Anon., 2011).

One effective and approved chemical repellent to protect trees is Aaprotect (Pepper et al., 1996). This protects against winter browsing by rabbits as well as deer, but can only be used during the dormant season as it is phytotoxic (Armstrong et al. 2014).

Chemical methods (gassing)

In the UK aluminium phosphide can legally be used to gas rats, moles or rabbits. The only commercially available fumigants are formulations that generate phosphine gas on contact with moisture. These are available either in tablet or pellet form (DEFRA, 2011). Other gasses have been tested to assess their effectiveness, such as hydrogen cyanide (HCN) and the other phosphine (PH3). Ross (1986) compared them in paired field trials using the spoon-gassing technique, and he concluded the formulations were equally effective in reducing rabbit numbers seen in spotlight counts. However, hydrogen cyanide was eventually considered too inhumane and Cymag, the commercial brand used in the past to deliver it, was eventually withdrawn as a vertebrate control agent. Of the alternative fumigants which have been considered in the past as alternatives to CO2, CS2 and SO2 are considered insufficiently toxic, and chloropicrin and engine exhaust are considered to be inhumane (Ross, 1986).

Disregarding the humanness of the method, gassing is the most effective method of reducing rabbit numbers where burrows are accessible. Under the right conditions, gassing can reduce the rabbit population by up to 80%. Effectiveness of gassing decreases in porous soils, when soil moisture is low and when air temperatures fall below 5oC. It is essential to drive rabbits to ground before gassing and to find and treat every entrance to the warren. Following gassing, holes should be blocked to slow future rabbit colonisation. The commercially available fumigants are Phostoxin and Talunix, which generate phosphine gas on contact with moisture. All moisture-activated gassing compounds are classified as very toxic chemicals and expose operators to health risks; for this reason, gassing should only be undertaken by trained persons (Ross & Harris, 2010). Phosphine gas poisoning in humans produces nausea, abdominal pain, headache, convulsions and coma. Rabbits poisoned with phosphine gas appeared increasingly agitated compared with control animals; collapse, convulsions and death occurred nearly four hours after exposure (Gigliotti, Marks, & Busana, 2009), suggesting that this toxin cannot be considered as being humane in action.

Ranking of methods of wildlife control

We asked Dr Mark Kennedy, Director of Kennedy Animal Welfare Consultancy, a leading expert in the field of animal welfare science, to study these methods of wildlife control above and to rank them from best to worst, using several variables. The table below shows the ranking he came up with, based on the combination each method presents on the following factors: efficiency, humaneness, safety, estimated cost and conservation implications. The 'best' alternatives, assessed on the combination of these factors, appear at the top of the table, the 'worst' at the bottom. We consulted other animal welfare experts who also agree with the ranking of this table.

Table 2. Overall ranking of methods of wildlife control for animals targeted by snares in the UK.

CONTROL METHOD	EFFICIENCY	HUMANENESS	SAFETY	ESTIMATED COST	CONSERVATION IMPLICATIONS
1. Shepherding	Highly effective, accrues additional benefit from improved care and reduced losses	Humane	Safe	Medium- mainly labour	None
2. Tree guards	Effective	Humane	Safe	Medium- cost of guards and installation and maintenance	None, except impact on visual utility of landscape
3. Novel disturbances	Effective on a temporary basis	Humane	Safe	Medium- low mainly labour and equipment	May have temporary impact on non-target species
4. Guard Animals	Reasonably effective with correct selection of individual guard	Humane	Safe	Cost of purchase and care of guard, any impact of guard on resources eg grazing, disturbance	Consider impact of guard on ecology; likely low
5. Habitat management	Reasonably efficient	Humane- but for rabbits burrows must be empty before blocking, also impact of expansion of predator population/ reduction of resources for target	Safe	Medium- mainly labour	Consider impact on ecology of manipulating resources and populations
6. No control	Reasonably efficient, considering that no control involves no effort	Humane- but consider impact on individuals if species exceed environmental carrying capacity	Safe	Losses resulting from species activity	Consider impact on prey and competitor species
7. Exclusion fencing	Very efficient- almost complete exclusion is possible	Humane if impact of exclusion from food, water and shelter and disturbance of seasonal movement are appropriately addressed	Safe	High initial cost of install, ongoing maintenance required.	Consider impact on ecology of exclusion of target and other species
8. Reproductive control	Efficient if abortigen, if long-lasting immunosterilisation achieved, highly efficient	Humane if immunosterilisation, arguably less so if abortigen used, inhumane if targeting lactation starves offspring.	Safe	No immunosterilisation agent available yet. High research cost.	Consider impact on ecology of population crash of target if widespread immunosterilisation achieved.
9. Cage traps	Not particularly efficient, tunnel trap design may enhance efficiency	Reasonably humane if carefully designed to avoid injury, checked frequently and means of killing or release is humane	Safe	Medium-high, cost of equipment and labour.	Low if non-targets released in good condition

CONTROL METHOD	EFFICIENCY	HUMANENESS	SAFETY	ESTIMATED COST	CONSERVATION IMPLICATIONS
10. Shooting	Efficiency varies with skill level of shooter	Reasonably humane, but wounding is a risk. Affected by range to target and % instantaneous death shots	Risk to staff and passers-by, risk to non-target wildlife and domestic animals (higher at night)	Medium- labour, unless sports shooting	Low if non-target species avoided
11. Hunting with dogs post 2004 Hunting Act (only applicable in England and Wales), no more than two dogs to flush target from cover to guns	Efficiency varies with skill level of shooter, target may escape	Reasonably humane if flushing of short duration and dogs closely controlled. Wounding by dogs and shot is a risk. Latter is affected by range to target and % instantaneous death shots	Risk to staff, dogs used for flushing and passers-by as involves shooting	Medium- labour, maintenance of dogs	Risk of disturbance to non-target wildlife
12. Ferreting	Reasonably efficient but time consuming	Inhumane	Risk to staff and passers-by as involves shooting	Medium- labour	Low if non-target species avoided
13. Poison M44 Ejectors, para-aminopro-piophenone toxin	Fairly efficient	Inhumane, but more humane than Sodium Monofluor-oacetate toxin	Risk of handling poison	Medium- cost of ejectors, toxin and labour	Risk to other wildlife species (carnivores, omnivores, also to dogs)
14. Poison M44 Ejectors, Sodium Monofluoroac-etate toxin	Fairly efficient	Inhumane	Risk of handling poison	Medium- cost of ejectors, toxin and labour	Risk to other wildlife species (carnivores, omnivores, also to dogs)
15. Gassing	Efficient	Inhumane	Very dangerous, trained personell required	Medium- cost of hiring operators	Risk to species co-habiting burrows, eg hedgehogs, mustelids.
16. Snares with breakaway device (e.g. Type D in Defra 2012 report)	Inefficient. High deployment to capture ratio	Inhumane	Safe for humans, less so for domestic animals, cats in particular	Relatively inexpensive, labour is main cost	High negative impact on non-target species, some with protected status. Break-away may mitigate in some species
17. Snares without breakaway device (e.g. Type A in Defra 2012 report)	Inefficient. High deployment to capture ratio	Inhumane	Safe for humans, less so for domestic animals, cats in particular	Relatively inexpensive, labour is main cost	Very high negative impact on non-target species, some with protected status
18. Hunting (pre 2004 Act, using pack of hounds chasing and killing target)	Inefficient. Targets may not be encountered, frequently escape	Extremely inhumane (duration of chase, uncontrolled killing of target by hounds)	Significant risk of injury to humans, horses and hounds. Risk to domestic cats from hounds. Risk to horses and livestock (through disturbance)	Expensive maintenance of horses, hounds, staff labour	Disturbance to non-target wildlife, damage to ground and vegetation

We consider that the methods in green in the table above should be promoted, and the worst methods should be banned. This means that there are seven non-lethal alternative methods to snaring that could be used in the UK in a variety of scenarios.

Legality

The making, keeping and using of snares is regulated under different laws and regulations in different countries, which range from completely banning them to allowing them with very few restrictions. The following is a summary of some of these regulations:

Legal status in the UK

The use of snares is not banned in the UK, but there are several pieces of legislation that regulate and limit their use.

Although "self-locking" snares are banned by the Wildlife and Countryside Act 1981 and the Wildlife Order (Northern Ireland) 1985, it is still legal to set 'free-running' neck snares to catch foxes and rabbits. These types of snares are supposed to hold the trapped animal alive until the snare operator returns and kills it. However, these can become kinked or rusty, and therefore still lethal. The animals' panicked struggles just exacerbate the potential for terrible injuries and death. Legal snares can also be set in the wrong way or the wrong place, increasing their potential to cause more suffering and catch non-targeted animals. And self-locking illegal snares, which are designed to kill all the animals they catch, are still illegally used, and their manufacture and possession are not banned so they can be easily obtained.

In England, Wales or Scotland snares cannot be used to catch certain specified animals including badger, wild cat, hedgehog, pine marten, otter or red squirrel. In Northern Ireland the wild cat is not included on this list, but the Irish hare, brown hare, fallow deer, red deer and sika deer are listed (Onekind, 2011).

Under the Deer Act 1991 it is also illegal to set in position any trap or snare calculated to cause bodily injury to any deer coming into contact with it.

The Wildlife and Countryside Act 1981 in Scotland goes further since it was amended by the Wildlife & Natural Environment (Scotland) Act 2011, as it also makes it an offence to set a snare and not to inspect it at least once every day at intervals of no more than 24 hours, and it also states that any person who sets a snare in position must have being officially trained and have an identification number (the snares set for foxes, rabbits or brown hares must be fitted with a tag with such number that tells them apart), and record keeping is a legal requirement. The WANE provisions intended to improve welfare include the following:

- All snares used in Scotland must have a stop on them, so that the noose cannot close to a circumference less than 23 centimetres for a fox snare, or 13 centimetres for any other animal. Snares must be fixed to the ground, so drag snares, where the snare is attached to a heavy object that the animal can pull away from its original position, are prohibited.
- Snares must not be set where the animal is likely to become suspended (for example, by jumping over an adjacent fence and being left to hang there), or close to water where it is likely to drown.
- Anyone setting a snare in Scotland must inspect it (or cause it to be inspected), at least once every day at intervals of no more than 24 hours to see whether an animal is caught in it and to see whether it is free-running. If it is not free-running, it must be removed or repaired.
- Any captured animal must be released or removed, regardless of whether it is alive or dead.
- Snares may only be set with the landowner's or occupier's permission

The Wildlife and Natural Environment (Scotland) Act 2011 contains a number of amendments to the WCA with relevance to hares. Section 6 set close seasons for both species: 1st March to 31st July inclusive for mountain hares, and 1st February to 30th September inclusive for brown hares. Section7 specifies no poaching of hares and rabbits. On snaring, section13 includes a requirement for the ID tag to state whether the snare is set for (i) brown hares or rabbits or (ii) foxes. Scottish Natural Heritage (SNH) is the authority which gives licences for snaring mountain hares. In the last couple of years they have declined to give any and this was partly clarified in the SNH review of snaring for the Scottish Government published in March 2017 (Anonymous, 2017). SNH has sought clarification in the report on whether the WANE Act is intended to ban snaring MH, and it took the view that Reg 41 does apply. It concluded that, due to welfare concerns and lack of guidance to avoid killing or injury, SNH "will not be minded" to issue licences unless the contrary can be evidenced.

The Animal Welfare Act 2006 also affects snaring as it makes it an offence for a person to cause unnecessary suffering to an animal under their control, and once animals are trapped in a snare this qualifies as "under a person's control".

Scotland, Wales and England also have separate voluntary codes of practice for the use of snares. The codes specify how often the snares that are set should to be checked, which types of snares should be used, where they should be set, etc. The first code was created by Defra in 2005 (Anonymous, 2005), but after Wales created a more modern version, in 2016 Defra updated its own for England making it almost identical to the Welsh one. Although the existence of such codes are mentioned in the law and from that point of view they could be considered "statutory", they are still voluntary codes and a snare operator that breaches any of its points but is not in breach of the Wildlife and Countryside Act 1981 cannot be prosecuted only on the basis of such code breach. Following are the different official voluntary codes:

Wales Code of Practice (Anonymous, 2015):

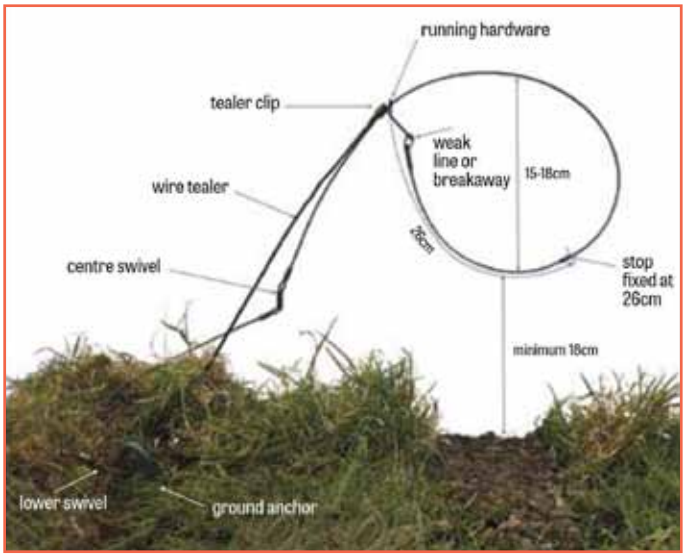
Snaring for foxes

- If you follow the advice in this Code you should be operating within the law regarding animal welfare and avoiding non-target species.
- The legal requirements are set out on pages 6 and 7 of the Code. However, for legal purposes direct reference should always be made to the provisions of the Wildlife and Countryside Act 1981, Deer Act 1991 and the Animal Welfare Act 2006.
- This Code is not intended to be a training manual. Snare users must be competent before using snares for fox control, therefore training is strongly recommended. For further details on training in the use of snares please contact either the Game and Wildlife Conservation Trust on **01425 651013** email **info@gwct.org.uk**, the British Association for Shooting and Conservation on **01244 573019** email **game.deer@basc.org.uk**, or the National Gamekeepers Organisation on **01833 660869** email **info@nationalgamekeepers.org.uk**.

Setting fox snares

- Quality, not quantity: the aim of any snaring programme should be to set fewer snares efficiently rather than large numbers indiscriminately. The efficiency of snaring is dependent on how well you can set a snare.
- You must not set a snare without the permission of the owner or occupier of the land.
- To hold, not kill: snares must only be used as a restraining (holding) device. The purpose of the snare is to hold the fox and avoid causing unnecessary suffering whilst the fox is held, until it can be killed humanely. Shooting with an appropriate firearm is a recognised method of humanely dispatching foxes.
- You must only use a free-running snare which is defined, for the purpose of this Code, as a wire loop that relaxes when the fox stops pulling.
- Welsh Government considers a self-locking snare to be a wire loop that does not relax when the fox stops pulling. You must never set a self-locking snare as this is illegal.
- Snares must be attached to a firmly fixed anchor, designed not to entangle the snare or to harm any animals caught. Drag snares must not be used.
- You must never set snares on runs where there is evidence of regular recent use by non-target species such as badgers, deer, otters, farm livestock and domestic animals, as they may be caught or injured by the snare.
- Knowledge of the tracks, trails and signs of both target and non-target species is essential. If you are not competent in identifying the tracks, trails and signs of non-target species, you must not set snares.
- Never set snares:
  - Under or near fences or other obstructions, like saplings, hedges, walls or gates that could cause entanglement.
  - Where livestock could be caught.
  - In areas regularly and legitimately used for the exercise of domestic animals, near public footpaths or housing.
  - On or near to an active badger sett, or on the runs radiating from it.
  - On footbridges, or on fallen trees or logs spanning watercourses.
  - In such a way that the restrained animal could become fully or partially suspended, entangled, drowned or strangled.
  - If forecasted weather conditions are likely to cause poor welfare or prevent daily inspection. Excess heat as well as cold/wind/rain/snow etc. must be considered.
- Always use a Code compliant snare, as illustrated and described on pages 8 and 9.
- By law snares must be inspected at least once every day, however this Code recommends that snares are inspected twice daily. As most captures are made at night it is recommended that you inspect your snares as soon after sunrise as is practicable. A further inspection should be carried out later in the day to ensure that your snares are in position for the night, and that any daytime captures are dealt with promptly.

- You must be competent and equipped to deal humanely with any foxes or other animals that can reasonably be expected to be caught.
- Under the Animal Welfare Act 2006 you are responsible for taking reasonable steps to ensure that the welfare needs of all animals under your control (including those caught in a snare) are met, to the extent required by good practice. In this context, that the animal is protected from pain and suffering.
- If you are unsure of your legal obligations do not set a snare.
- At each snare inspection the following must be done:
  - Dispatch foxes quickly and humanely. Shooting with an appropriate firearm is a recognised method of humanely dispatching foxes.
  - Release non-target captures immediately on discovery, unless the animal is injured and has to be killed on humane grounds. N.B. Under section 14 of the Wildlife and Countryside Act 1981 it is an offence to release or allow to escape into the wild certain non-native animals, including those listed in Part 1 of Schedule 9 to the 1981 Act
  - As soon as is practically possible, remove and dispose of all carcasses appropriately in accordance with legislative requirements.
  - Look for any new signs of non-target animal presence.
  - Inspect the condition of the snare. Never use a frayed, kinked, rusty or damaged snare – snares in such condition must be disposed of safely.
  - Check that your snares are set and positioned as intended.
  - Render the snare inoperable if forecasted weather conditions are likely to cause poor welfare or prevent daily inspection.
- You must only use snares which have all the components listed below.
  - **WIRE**. The wire cable must have a breaking strain of at least 208 kg (460 lbs). Fox snares are typically made of 2 mm wire cable. The wire must not be rusty, frayed, kinked or damaged in any way.
  - **NON-MOVEABLE ANCHOR**. Snares must be anchored so animals cannot escape and take the snare away with them. Anchors must be secure enough to prevent non-target animals, which may be stronger than foxes, from moving the anchor. The top of the anchor should be flush with the ground to prevent the animal winding the snare around it. Drag anchors must never be used.
  - **TWO SWIVELS**. Swivels allow the wire to rotate freely along its length and prevent the threads of the wire becoming either unwound or over-wound. Wire becomes weaker when unwound/over-wound and is easier for the animal to break, damage and escape. Swivels should be present at both the anchor point and between the anchor swivel and the eye.
  - **FREE-RUNNING EYE**. The running eye of the snare must move easily in both directions at the time the snare is set and must remain in this condition throughout use.
  - **STOP**. The snare must have a fixed stop to limit closure of the loop. For foxes, this must be fixed 26 cm from the running eye (see picture on page 8).
  - **BREAK-AWAY**. The snare must incorporate at the eye as its weakest point a 'break-away' of appropriate strength to allow the self-release of stronger non-target animals



An example of a Welsh Government Code Compliant Snare

Scotland Code of Practice (Anonymous, 2015):

Setting rabbit snares

1. You must not set any snare without the permission of the land owner or occupier.
2. Rabbit snares should not be set where there is evidence of regular use by non-target species.
3. Rabbit snares should be set on well-used rabbit runs, usually in short vegetation. They should not be set in areas cluttered with obstacles such as saplings, hedges, fences or gates.
4. Snares must be free running (not self-locking) and must contain a safety stop fixed at least 13cm (5") from the running end of the snare. Snares that are frayed or damaged should not be used.
5. It is a legal requirement to inspect every snare when set and ensure they are free running at least once a day at intervals of no more than 24 hours. If any snare is found not to be free running it must be removed or repaired.
6. Rabbit snares should be constructed with 3 or 4 stranded brass wire (doubled so that whilst there are 3-4 strands round the eye, there are 6-8 strands round the noose), ideally creating a loop of 18cm (7") across and 13cm (5") deep for the head of the rabbit.
7. Snares should be supported by a suitable "tealer" or set-stick and set firmly in the ground. The bottom of the loop of a rabbit snare should ideally be positioned at least 8cm (3") above the ground; up to 15cm (6") can improve capture success.
8. Snares should be securely tethered by a strong, rot-proof cord (e.g. baler twine) attached to a peg driven firmly into the ground.
9. It is an offence to set a snare where the animal is likely to become fully or partially suspended or drown. Do not set snares under or near to fences where there is a risk of entanglement. Snares should be set away from cover and in short vegetation, where rabbits are likely to be moving relatively fast.
10. It is an offence to fail to release or remove an animal, whether alive or dead, from a snare during the course of the inspection. During inspection you should make a detailed note of any snares that have been damaged or removed since the last inspection. You should inform your local WCO if you suspect an offence of interference or tampering.
11. Rabbits restrained by a snare should be dispatched quickly and humanely. Wherever possible non-target species must be released unharmed. In the rare circumstances that a protected species is found dead or has to be humanely dispatched your local WCO should be informed. You must ensure that the snare is still free running and free of kinks before resetting; replace if not.
12. Records of snaring activity, including the date each snare was set or removed and capture details, must be kept. Records must include an accurate location description or a map or GPS record showing the location of snares, which should be copied to the land manager. A daily diary should record the success of individual snares along with other information, such as mis-catches, problems from interference and general observations. See record keeping in Snaring Legislation section.

Setting fox snares

1. You must not set any snare without the permission of the land owner or occupier.
2. Fox snares should not be set where there is evidence of regular use by non-target species.
3. The presence of foxes can be indicated by tracks, long reddish-brown hairs caught on brambles, twigs or wire, by a strong, musty smell, scats, sightings and kills.
4. Snares must be free running (not self-locking) and must contain a safety stop fixed at a minimum of 23cm (9") from the running end of the snare. Check the action of each snare to ensure that it is free running and free of kinks. Snares that are frayed or damaged should not be used. It is a legal requirement to inspect the snare and ensure that is free running at least once a day at intervals of no more than 24 hours. If the snare is not free running it must be removed.
5. Use good quality snares that incorporate at least one strong swivel. All components should withstand 208 kilos (460lbs) breaking strain.
6. Snares should be held over the selected run by loose attachment to one or more supports known as tealers which are placed firmly in the ground. Tealers made from fence wire or wooden sticks are easy to make, set and conceal.
7. Snares should be set so that the bottom of the loop is at least 18cm (7") above the ground. Increasing the height to 25cm (10") can reduce the risk of badger and hare capture. The loop of the snare should be 15-18cm (6-7") at its deepest point.

8. Snares must be firmly staked to the ground or attached to an object in a manner which will prevent the snare being dragged by an animal caught by it.
9. It is an offence to set a snare where the animal is likely to become fully or partially suspended or drown. Beware of setting snares parallel or near to fences where deer are known to travel. Ensure there is no risk of a restrained animal becoming entangled or suspended. Beware of setting snares close to or amongst scrub 'clutter', in forestry, alongside water courses or on some steep banks.
10. Snares must be inspected at least once every day at intervals of no more than 24 hours. It is an offence to fail to release or remove an animal, whether alive or dead, from a snare during the course of the inspection. During inspection you should make a detailed note of any snares that have been damaged or removed since the last inspection. You should inform your local WCO if you suspect an offence of interference or tampering.
11. Snares not being checked daily should be uplifted to remove any risk of accidental capture or malicious use.
12. Foxes restrained by a snare should be dispatched quickly and humanely. The body should be disposed of responsibly. Wherever possible, non-target species must be released unharmed. In the rare circumstances that a protected species is found dead or has to be humanely dispatched your local WCO should be informed. Remember, you must ensure that the snare is still free running and free of kinks before resetting; replace if not.
13. Records of snaring activity, including the date each snare was set or removed and capture details, must be kept. Records must include an accurate location description or a map or GPS record showing the location of snares, which should be copied to the land manager. A daily diary should record the success of individual snares along with other information, such as mis-catches, problems from interference and general observations. See record keeping in Snaring Legislation section

In Northern Ireland, the Wildlife Order (Northern Ireland) 1985 was amended by the Wildlife and Natural Environment Act (NI) 2011, which introduced new controls over the use of snares. The Northern Ireland Assembly decided to retain snaring but to increase statutory standards by way of an Order. In March 2013, the Department of Environment issued a public consultation on a proposed Draft Snares Order (Northern Ireland) 2013 and a Code of Practice. However, at present there is no official code of practice yet, although BASC has issued an unofficial one very similar to the English one.

Despites all these codes, there is evidence that the problems of snaring are not solved by them, especially as they are essentially voluntary. During the UK Government's own 2012 report into snaring, not a single fox snare operator visited was fully compliant with the Code of Practice that was valid at that time, a full seven years after it was introduced. Although there are now new codes of best practice in Scotland, England and Wales, none of them are likely to prevent non-target animals from being caught, or to reduce suffering to acceptable levels, even if they are fully complied with. And it is simply impossible to enforce regulations for a practice that occurs primarily on private land in remote locations.

Because most snares are placed in private land inaccessible to anyone other than the snare operators and their employers, it is difficult to ascertain if these codes are obeyed. When the League participated in a stakeholders meeting in Wales in 2016 organised by the Welsh Government to assess how effective the new code had been a year after it had been issue, it was clear that nobody could provide any data about compliance (or even use) as most snares are deployed in private land and there is no independent monitoring happening. This inability to monitor snaring properly, added to the fact that the code is voluntary at the point of use (which essentially means "self-reregulation"), puts into question whether such codes are worth the paper they are written on.

In fact, most UK people are in favour of banning snaring. In a 2014 Ipsos poll 77% of the British public responded saying that snares should be illegal. Also, in a 2015 Dods poll 68% of MPs supported a ban on snares.

In England, MPs debated snaring in the House of Commons in July 2016, and voted for a ban. However, the government ignored the vote and instead have pushed ahead with a new Code of Practice – which was drawn up by the shooting industry, the very people who use snares the most.

The ban on snaring in European countries

In the EU 75% of the countries have banned the use of snaring for quite some years. There are only seven countries we know of that have not banned snaring entirely and snaring takes place in some of their territory: Belgium, Finland, France, Ireland, Spain, Sweden and the UK. Some of the countries that allow snaring have been banned it regionally, as in the case of Belgium where in is banned in the Flemish territory.

The following table show the legal status of snaring in all EU countries (in red countries where snaring is practiced and is allowed):

Table 3: Legal status of snaring in EU nations, alphabetically ordered

NATION	HAS SNARING	BANNED SNARING	LEGISLATION	ENFORCEMENT
Austria	NO	YES	Separate laws in each state. § 5 (prohibition of animal cruelty), Paragraph 16 of the Animal Welfare Act (BGBl.I Nr.118 / 2004, as amended).	UNKNOWN
Belgium	YES	NO	Allowed for foxes and feral cats in Wallonia only	UNKNOWN
Bulgaria	YES	YES	Biological Diversity Act and Hunting and Game Protection Act	POOR
Croatia	NO	YES	Hunting Act (Official Gazette no. 10/94)	UNKNOWN
Cyprus	YES	YES	Legislation no. 152 (I) / 2003 (Law for the protection of Wild Birds and Game Species)	GOOD
Czech Republic	YES	YES	Law no. 225/1947, law on hunting - Zákon č. 225/1947 Sb., *zákon o myslivosti* Currently Law no. 449/2001, law on hunting - Zákon č. 449/2001	MIXED
Denmark	NO	YES	Act on Hunting and Game Management 2013.	GOOD
Estonia	NO	YES	They have been banned since the beginning of the Second Republic (1991) and were banned also during the Soviet time	UNKNOWN
Finland	YES	NO	It's allowable to use them for catching foxes in the winter, when the snow has covered the ground. Also snares may be used in the capturing of willow grouse and ptarmigan in the three municipalities in Lapland (Enontekiö, Inari and Utsjoki)	UNKNOWN
France	YES	NO	Ministerial Order of 29 January 2007 laid down provisions for the trapping of animals classified as harmful pursuant to Article L. 427-8 of the Environmental Code, Amended by By-Law of June 29, 2011 - Art. 1, which allows the use of snares	N/A
Germany	YES	YES	The capture of animals with snares is a violation of the hunting law (illegal hunting method, or offense of poaching), breach of the Federal Nature Conservation Act (if protected species of animals are concerned) and breach of the animal welfare legislation (if animals are actually injured or killed by the snares).	MIXED
Greece	NO	YES	Law 1335/83 "Ratification of an International Convention for the Conservation of the Wildlife and Natural Environment of Europe")	UNKNOWN
Hungary	NO	YES	Law LV 1996	UNKNOWN
Ireland	YES	NO	Section 34 of the Wildlife Act prohibits the use of traps or snares to hunt or capture protected wild animals. However, rabbits are not a protected species and can be snared.	UNKNOWN

NATION	HAS SNARING	BANNED SNARING	LEGISLATION	ENFORCEMENT
Italy	YES	YES	Law 11th Feb 1992, n.157	POOR
Latvia	UNKNOWN	YES	Hunting Act 2003	UNKNOWN
Lithuania	YES	YES	Regulation on Hunting (issued by the Order of the Minister of Environment). Administrative Code (adopted by Parliament)	GOOD
Luxembourg	NO	YES	*Loi du 19 janvier 2004, Art. 27; Loi du 25 mai 2011, Art.10*	UNKNOWN
Malta	NO	YES	Flora, Fauna and Natural Habitats Protection Regulations (SL 549.44) and the Conservation of Wild Birds Regulations (SL 549.42)	GOOD
Netherlands	UNKNOWN	YES	Nature Conservation Act 2017	UNKNOWN
Poland	UNKNOWN	YES	Environmental Protection Act 2001	UNKNOWN
Portugal	YES	YES	Hunting Act 1999 (*Lei da Caça, n.º 173/99,* de 21 de September,)	UNKNOWN
Romania	NO	YES	GEO 57/2007	UNKNOWN
Slovakia	NO	YES	Act on hunting no. 274/2009 Coll. Art 65	UNKNOWN
Slovenia	NO	YES	Law on the protection, breeding and hunting wild game and Management of Hunting Grounds (Official Gazette, Nos. 25/76, 29/86, Official Gazette of RS, no. 29/95 - pdf, 89/99 and 16/04 - ZDLov-1; hereinafter ZVGLD). Act on Game and Hunting (Official Gazette of RS, Nos. 16/04, 120/06 - dec. US, 17/08 and 46/14 - ZON-C below: ZD-Lov) did in 2004 repealed ZVGLD,	GOOD
Spain	YES	NO	*Ley 8/2003, de 28 de octubre, de la flora y la fauna silvestres* bans the use of snares to capture birds, but not for mammals	UNKNOWN
Sweden	YES	NO	Allowed for foxes and Ptarmigan	UNKNOWN
UK	YES	NO	Allowed for foxes, hares and rabbits	UNKNOWN

Switzerland also has a complete ban of the use of snares.

They have been legal challenges at EU Courts against countries that allow snaring for breaching the EU Habitats Directive, which requires member states to create a general prohibition of all indiscriminate means of capture or killing capable of causing the local disappearance of, or serious disturbance to, certain species of wild fauna.

In 2005, following a complaint against the UK by the European Commission (EC), the European Court of Justice (ECJ) held that the UK's Conservation (Natural Habitats &c) Regulations 1994 (the Habitats Regulations) did not transpose certain Articles correctly. With regard to Article 15, the UK Regulations failed to include the general prohibition of indiscriminate methods (which theoretically would allow snaring), and the Court demanded that the UK Government should change this.

It is not clear whether the UK Government addressed this issue properly when it created the Conservation of Habitats and Species Regulations 2010, so we believe that this matter is not yet closed.

Another ECJ case concerned the use of stopped snares for the hunting of foxes in certain regions of Spain, based on the legality of permits issued to set snares that may put otters at risk. he ECJ concluded that it was unlikely that otters would be found in the area covered by the permits, and the case was decided in favour of Spain.

Regarding the enforcement of the bans, we contacted over 200 NGOs and Government officials of all the 28 EU countries and most have not reported anything that suggests that these bans are not working, or are causing significant problems. We only received reports of poor enforcement of such bans in Bulgaria and Italy.

Conclusions

This report shows that there is plenty of evidence of snaring causing many significant animal welfare and conservation problems, each of them serious enough to justify the banning of the use of snares.

The report also shows that snaring is not needed because there are many better alternatives, at least 11 (seven that should be promoted).

There is also evidence that any regulation that falls short of banning snaring, such as banning particular types of snaring and using snares under a voluntary code of practice, is insufficient to completely solve the animal welfare and conservation problems that snaring causes.

Because of all this, snaring has been entirely banned in most European nations, and such bans do not seem to have caused any significant problems. There are even questions about whether the UK is fully in compliance with EU law if it does not ban snaring, especially because of the indiscriminate nature of snares, and also questions about whether the claim that legal snares in the UK may be in compliance with the International Humane Trapping Standards is a guarantee that snares are humane.

Therefore, this report supports the long standing belief of the League Against Cruel Sports that snaring should be banned everywhere in the world, and therefore that the Welsh, Scottish, Northern Irish and Westminster Government should ban the use, manufacture, and trade of all type of snares.

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