

Live Trapping of Terrestrial Wild Mammals and Wild Birds for Lethal Control in the United Kingdom WAWC Position Paper No.2



Wild Animal Welfare
Committee

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Executive summary

Live traps are routinely and widely deployed to capture and confine or restrain wild mammals and birds around the UK, for a variety of purposes including the protection of livestock, crops and game, and for public health reasons including the prevention of disease. Given that all traps may adversely affect animal welfare, the Wild Animal Welfare Committee (WAWC) believes they should only be used in accordance with an ethical framework. The traps included in this paper include snares, glue traps, box/cage traps for mammals, and bird traps. In most cases, the intention is to kill the animal after capture, although in some instances the animal may die before the trap is inspected. This Position Paper does not cover the subsequent killing of the trapped animal. WAWC believes that evidence shows that the current legal controls on the use of live traps are insufficient to prevent suffering in wild animals and that a comprehensive review of the live trapping of terrestrial wild mammals and wild birds is necessary. This should encompass both the need for trapping as well as the welfare impact of the trapping process itself. Specific welfare-related requirements should be provided by legislation for all traps, rather than relying on general animal welfare legislation which is largely retrospective. Regulations should aim to prevent welfare harms from occurring in the first place. Wildlife control should be made subject to ethical principles, such as the international consensus principles for ethical wildlife control.

This WAWC Position Paper complements the Position Paper: Lethal traps for terrestrial mammals, published in November 2020 ¹.

¹ WAWC Position Paper No. 1 Lethal traps for terrestrial mammals, November 2020
<https://www.wawcommittee.org/resources>

Summary of recommendations

WAWC believes that a comprehensive review of the live trapping of terrestrial wild mammals and wild birds is necessary, and that this should encompass both the need for trapping as well as the welfare impact of the trapping process itself.

Specific welfare-related requirements should be provided by legislation for all traps, rather than relying on general animal welfare legislation which is largely retrospective and depends on penalties for causing unnecessary suffering or breaching the duty of care to an animal under control of a responsible person. Regulations should aim to prevent welfare harms from occurring in the first place.

Wildlife control should be made subject to ethical principles, such as the international consensus principles for ethical wildlife control ². These state that human behaviours should first be modified and then if wildlife control is considered necessary it should be justified with evidence that substantial harm is being caused to people, property, livelihoods, ecosystems, and/or other animals. Where control, lethal or non-lethal, is still considered to be needed, it must be carried out using recognised methods with the lowest overall welfare impact.

With regard to specific types of traps, the WAWC supports:

- A ban on the sale of snares and their use by both public and industry.
- A full and immediate ban on the sale of glue traps and their use by both public and industry.
- Further research into alternative methods for the deterrence of rodents and where necessary, more humane methods of killing
- Additional regulation of cage and box traps for both mammals and wild birds, initially by the introduction of a licensing regime with conditions that incorporate ethical principles identical or similar to the international consensus principles for ethical wildlife control ³.
- A total ban on the use of all decoy animals in traps, unless under specific licence in exceptional and justifiable circumstances directly related to conservation or welfare.

These recommendations are applicable to all UK administrations.

For further information please see the full recommendations on pages 20 and 21.

² Dubois S, Fenwick N, Ryan E, Baker L, Baker S, Beausoleil N, Carter S, Cartwright B, Costa F, Draper C, Griffin J, Grogan A, Howald G, Jones B, Littin K, Lombard A, Mellor D, Ramp D, Schuppli C and Fraser D, 2017. International consensus principles for ethical wildlife control. *Conservation Biology* 31: 753-760.

³ Dubois S, Fenwick N, Ryan E, Baker L, Baker S, Beausoleil N, Carter S, Cartwright B, Costa F, Draper C, Griffin J, Grogan A, Howald G, Jones B, Littin K, Lombard A, Mellor D, Ramp D, Schuppli C and Fraser D, 2017. International consensus principles for ethical wildlife control. *Conservation Biology* 31: 753-760.

1. Introduction

Live traps are routinely and widely deployed to capture and confine or restrain wild mammals and birds around the UK, for a variety of purposes including the protection of livestock, crops and game, and for public health reasons including the prevention of disease. In most cases, the intention is to kill the animal after capture, although in some instances the animal may die before the trap is inspected.

Animal traps are deployed in a variety of locations and circumstances but generally because the landowner, business owner or householder considers that the presence of one or more of a particular species represents a threat to their interests. There may be a need, or at least perceived need, or in some cases a legal requirement, to control free-ranging wild animals because of their potentially negative impacts upon human and animal health, food, agriculture, property and the environment.

Given that all traps may adversely affect animal welfare, the Wild Animal Welfare Committee (WAWC) believes they should only be used in accordance with an ethical framework, such as the international consensus principles for ethical wildlife control^{4 5}. These provide that wildlife control, both lethal and non-lethal, should be considered only after other methods of control, such as modifying human behaviours, have been used and then only with appropriate planning, monitoring and due regard for animal welfare.

Certain live traps such as snares, and cage traps for wild birds, are subject to a wider range of regulatory requirements than lethal traps (see WAWC Position Paper No. 1 Lethal traps for terrestrial mammals⁶). Live traps are, however, easily obtained and widely used, often under the auspices of general licences, without any requirement for operator training or monitoring of competence. Even when deployed in accordance with current legislation and guidance, live traps represent a substantial risk to animal welfare since the target animal is held in a device that may, of itself, cause injury and stress, as well as significant behavioural restriction. Captured animals are also exposed to other factors such as hunger, thirst, high and low temperatures and the risk of predation.

Many live traps are indiscriminate, causing suffering to non-target species or to vulnerable individuals, such as juveniles, within the target species. Certain live traps such as snares or glue traps are widely considered to inflict an unacceptably high level of suffering on both target and non-target animals. Alternative methods of control with fewer negative welfare impacts are available (although even less restrictive traps must be used with care).

⁴ Dubois S, Fenwick N, Ryan E, Baker L, Baker S, Beausoleil N, Carter S, Cartwright B, Costa F, Draper C, Griffin J, Grogan A, Howald G, Jones B, Littin K, Lombard A, Mellor D, Ramp D, Schuppli C and Fraser D, 2017. International consensus principles for ethical wildlife control. *Conservation Biology* 31: 753-760.

⁵ BVZS Position statement on the control of free-ranging wildlife. <https://www.bvzs.co.uk/wp-content/uploads/2022/08/BVZS-Position-Statement-on-the-control-of-Free-ranging-Wildlife-Final-Feb-2021.pdf>

⁶ WAWC Position Paper No. 1 Lethal traps for terrestrial mammals, November 2020 <https://www.wawcommittee.org/resources>

Live traps are also used in the translocation and release of a variety of species, often associated with wildlife research. This can range from widely-used 'humane' mouse traps to the translocation of beavers under specialist licence, or trapping and marking small mammals. No trap use is exempt from welfare concerns, but this Position Paper focuses solely on those live traps that are used as part of lethal control operations to capture, confine, or restrain animals with the intention that they will be killed by the operator; it does not evaluate how the target species is killed thereafter, although that is relevant to any comprehensive welfare assessment of trap use.

2. Types of live traps

(i) Snares



Free-running snare with stop © OneKind

A snare is a loop or noose, usually made of flexible metal cable or wire, used to catch animals around the neck and hold them until they can be released or more commonly killed by other means. Snares are traditionally (and currently legally) used to catch foxes, rabbits, and brown hares. They can also be used to catch other animals such as mink, grey squirrels, or rats, although alternative methods of control are usually used for these species.

The UK is one of the few remaining European countries that permits the use of neck snares for mammals.

The use of snares is regulated in all four UK administrations by provisions under the Wildlife and Countryside Act 1981 (WCA) and the Wildlife Order (Northern Ireland) 1985. In Scotland, England and Wales, the use of any trap or snare for the purposes of killing or taking or restraining any wild animal listed at Schedule 6 or 6ZA (including badgers,

wildcats, and red squirrels) is prohibited. It is also an offence to set in position a snare such that it is calculated to cause bodily injury to any wild animal included in the Schedules (England and Wales) or likely to cause bodily injury to any such wild animal (Scotland).

Section 11 of the WCA includes provisions specific to snaring, including a prohibition on self-locking snares (which tighten progressively as the captive animal struggles) that applies in all three administrations. Section 11 has been extensively amended with regard to Scotland, including a prohibition on drag snares with non-fixed anchors, requirements for user training and registration, mandatory record keeping, landowner permission to use snares, identification tags on all snares, the use of stops to prevent the snare tightening beyond a certain point, and provision for regular reviews of the legislation. In England and Wales, snares must be inspected 'at least once every day', while in Scotland inspections must take place 'at least once every day at intervals of no more than 24 hours'. The Scottish legislation also requires the inspection process to include a check on whether the snare is 'free-running'.

Industry guidance and codes of practice vary across the administrations but generally go beyond current legislative requirements. For example, all codes recommend the incorporation of one or more swivels in the snare design, and the England and Wales code recommends two inspections each day, but these measures are currently voluntary. A comparison of legislation and codes in England, Scotland and Wales is published by the Game and Wildlife Conservation Trust (GWCT).⁷

Impacts of snares on animal welfare

Snares have the potential to compromise animal welfare in several ways. Based on the Five Domains model for assessing the welfare of individual animals^{8,9}, welfare harms may include:

- Domain 1 (Nutritional impacts): being caught in a snare prevents the animal eating and drinking normally. This may lead to dehydration and starvation.
- Domain 2 (Environmental impacts): depending on where the snare is positioned, and the weather conditions, the trapped animal may experience exposure to the elements.
- Domain 3 (Physical impacts): trapped animals suffer a variety of external and internal injuries¹⁰. Struggling to escape the snare may result in exertional or

⁷ <https://www.gwct.org.uk/advisory/guides/fox-snaring-guidelines/what-snares-to-use/>

⁸ Mellor, D.J. Operational details of the Five Domains Model and its key applications to the assessment and management of animal welfare. *Animals*. 2017, 7, 60.

⁹ Mellor DJ, Beausoleil NJ, Littlewood KE, McLean AN, McGreevy PD, Jones B, Wilkins C. The 2020 Five Domains Model: Including Human–Animal Interactions in Assessments of Animal Welfare. *Animals*. 2020; 10(10):1870. <https://doi.org/10.3390/ani10101870>

¹⁰ <http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=14689>

capture myopathy^{11 12 13}. Escape behaviour may also include self-mutilation and, in rabbits, tonic immobility¹⁴. Oral and dental injuries may arise as a result of trying to chew free from the snare¹⁵. Predation or injury of the trapped animal may occur¹⁶. Death may result from exhaustion or from asphyxiation as a result of strangulation¹⁷. The size and conformation of non-target species caught in a snare can influence the injuries sustained¹⁸, this includes target species trapped in the wrong size of snare (for example a fox caught in a rabbit snare and vice versa).

- Domain 4 (Behavioural impacts): normal behaviours are restricted or cannot be performed: these may include feeding, moving, lying down, caring for dependent young, escaping from predators. Attempts to escape can lead to self-trauma. Sites where animals have been caught in snares may show signs of extreme disturbance to the surrounding ground and vegetation (a 'doughnut') where the animal has tried to run, jump or scabble its way out of the trap, often for several hours or more¹⁹. The behaviour of different species caught in a snare can be varied and influence the range of injuries sustained.
- Domain 5 (Mental impacts): these can include fear and distress²⁰, anxiety, pain, hunger and thirst, breathlessness and stress associated with trying to escape from the snare.

The speed at which welfare begins to be impacted is rapid (seconds from the moment of restraint) and suffering can be prolonged due to the lengthy intervals between inspections. The Code of Best Practice for the use of snares for fox control in England and Wales²¹ recommends that snares are inspected twice daily, although the law only requires inspection once every day. Some animals die in snares, but the expectation is that the

¹¹ <https://pubmed.ncbi.nlm.nih.gov/18957653/>

¹² Breed D, Meyer LCR, Stey JCA, Goddard A, Burroughs R, Kohn TA (2019) Conserving wildlife in a changing world: Understanding capture myopathy—a malignant outcome of stress during capture and translocation. *Conserv Physiol* 7(1): coz027; doi:10.1093/conphys/coz027

¹³ <https://www.ijcmas.com/9-4-2020/M.%20Dinesh,%20et%20al.pdf>

¹⁴ McBride, E.A., Day, S., McAdie, T., Meredith, A., Barley, J., Hickman, J. and Lawes, L. (2006) Trancing rabbits: Relaxed hypnosis or a state of fear? <https://eprints.soton.ac.uk/54860/>

¹⁵ BVZS Position statement on the control of free-ranging wildlife. Available at: <https://www.bvzs.org.uk/wp-content/uploads/2021/03/BVZS-Position-Statement-on-the-control-of-Free-ranging-Wildlife-Final-Feb-2021.pdf>

¹⁶ <http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=14689>

¹⁷ <http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=14689>

¹⁸ Murphy D, 2009. An assessment of injury to European badgers (meles meles) due to capture in stopped restraints. <https://pubmed.ncbi.nlm.nih.gov/19395757/>

¹⁹ <https://onekind.scot.archived.website/uploads/publications/OneKind-and-LACS-report-on-snaring.pdf>

²⁰ <http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=14689>

²¹ <https://www.gwct.org.uk/media/680075/Snaring-Best-Practice-Booklet.pdf>

animal remains alive until the snare is inspected, at which point they should be humanely killed, or released unharmed if a non-target species.

Snares may also capture non-target species and may result in their death and/or significant injury²². The proportion of non-target species caught in snares set for foxes has been estimated as ranging from 21% to 69%²³. Recorded non-target species include cats, dogs, sheep, and protected wildlife such as badgers, mountain hare, pine marten, hedgehog, birds, otters and deer²⁴. The release of apparently uninjured non-target animals from snares is not without welfare concerns as they may have sustained muscle damage (exertional rhabdomyolysis) and/or pressure damage (ischaemic necrosis) of tissue, which may not be obvious for several days and require medical care^{25 26}.

Methods of killing may also result in welfare harm - for example, blunt force trauma may be attempted by those who are neither confident nor competent in such methods and becomes more challenging as the size of the animal increases.

The use of stops on snares is intended to reduce the severity of injuries and prevent snared animals from strangling themselves. Snare loops vary in minimum size depending on the species targeted and in some instances the stop can prove ineffective²⁷, depending on the size and body conformation of the animal trapped, resulting in increased injury and possible death by strangulation. In non-target animals the snare may 'hold' and significantly injure the animal around body parts other than the neck resulting in a range of traumatic injuries²⁸. A free-running snare may also easily become self-locking due to rusting or twisting, causing injury or death by strangulation before the trap is inspected. Where injuries were caused to badgers caught in stopped restraints, 62% of restraints had some degree of twisting, unravelling or fraying after use, and that damage was associated with an increased risk of injury²⁹.

Although a swivel is thought to mitigate the risk of a free-running snare from locking, in practice swivels near the anchor can become tangled with vegetation. The Game and Wildlife Conservation Trust recommends the inclusion of another 'in-line' swivel fitted

²² Harris, S. and Thain, B. (2020) *Hanged by the Feet Until Dead: an Analysis of Snaring and Trapping on Scottish Grouse Moors*. A report commissioned by the Director of the League Against Cruel Sports Scotland <https://revive.scot/publication/hanged-by-the-feet-until-dead-an-analysis-of-snaring-and-trapping-on-scottish-grouse-moors/>

²³ <http://www.snarewatch.org/>

²⁴ <http://www.snarewatch.org/>

²⁵ Mullineaux E. 'Badgers' in BSAVA Manual of Wildlife Casualties

²⁶ Iossa G, Soulsbury CD, Harris S, 2007. Mammal trapping: a review of animal welfare standards of killing and restraining traps

²⁷ Frey N, Conover M, Cook G, 2007. Successful Use of Neck Snares to Live-Capture Red Foxes

²⁸ Murphy D, 2009. An assessment of injury to European badgers (meles meles) due to capture in stopped restraints. <https://pubmed.ncbi.nlm.nih.gov/19395757/>

²⁹ Murphy D, 2009. An assessment of injury to European badgers (meles meles) due to capture in stopped restraints. <https://pubmed.ncbi.nlm.nih.gov/19395757/>

midway along the snare, thus ensuring the snare always includes at least one functional swivel and the cable does not unravel or become over-wound ³⁰.

Amendments to the law, particularly in Scotland, have been enacted to improve animal welfare via the introduction of compulsory training and more rigorous control of the use of snares ^{31 32 33}. Anecdotally, it is believed that the extent of snare use has reduced in Scotland, but snares still have the capacity to cause severe welfare harms to affected individuals.

Alternatives to using snares for fox control include good management techniques to prevent/exclude access to livestock, including removing fallen stock promptly to avoid attracting foxes, baited live cage traps (followed by shooting), or accurate free shooting (known as lamping if carried out at night) by competent operators. For rabbits, Government-suggested alternatives to snaring include non-lethal methods such as fencing. Alternative lethal methods include gassing, trapping, ferreting, and shooting, although all of these can negatively impact welfare.

(ii) Glue traps

Glue traps (sticky boards, glue boards) use strong adhesive applied to a surface to catch and hold any part of an animal's body that comes into contact with it. They are intended to act as a live trap, holding the animal until it is killed by other means. They are most commonly used to catch small rodents (rats and mice). They are currently available to the general public and commercial operators and relatively inexpensive.

There may be a need ^{34 35}, and a legal requirement in some situations, to control rodents because of their potentially negative impacts upon human and animal health, food, agriculture, property and the environment. Integrated pest management including prevention (exclusion of rodents, environmental management to discourage rodents), monitoring (to assist with decision making) and where necessary killing ^{36 37}, should be

³⁰ <https://www.gwct.org.uk/advisory/guides/fox-snaring-guidelines/parts-of-the-snare/>

³¹ <https://www.legislation.gov.uk/ssi/2015/377/made>

³² Review of snaring for Scottish Government 2015, Annex 3 Technical Assessment Group <https://www.gov.scot/publications/review-snaring-scottish-government-prepared-snh/pages/10/>

³³ Snaring in Scotland: A Practitioners' Guide 2012 https://www.gwct.org.uk/media/208730/snaring_in_scotland.pdf

³⁴ Meerburg BG, Brom FWA and Kijlstra A, 2008. The ethics of rodent control. *Pest Management Science*, 64, 1205–1211.

³⁵ Prevention of Damage by Pests Act 1949 <https://www.legislation.gov.uk/ukpga/Geo6/12-13-14/55/contents>

³⁶ Traweger, D., Travnitzky, R., Moser, C., Walzer, C. & Bernatzky, G. 2006. Habitat preferences and distribution of the brown rat (*Rattus norvegicus* Berk.) in the city of Salzburg (Austria): implications for an urban rat management. *Journal of Pest Science*, 79, 113–125.

³⁷ Meerburg BG, Brom FWA and Kijlstra A (2008). The ethics of rodent control. *Pest Management Science*, 64, 1205–1211.

applied, based on the international consensus principles of ethical wildlife control^{38 39 40}. Where lethal control is considered to be required, methods that minimise welfare harms should be selected. Although no method of capture and killing of rodents is without some potential welfare harms, glue traps are considered to significantly compromise welfare (as described below) and well-designed snap traps or live cage trapping (see later in the Position Paper) followed by rapid and competent concussive killing, offer a preferable alternative⁴¹.

Animals caught in glue traps suffer severe and immediate welfare harms which may last for many hours^{42 43}. There may also be considerable welfare harm associated with both poor dispatch techniques or the animal being left to die in the trap.

Glue traps are indiscriminate and are known to catch non-target species such as birds, other rodents and pets. Some of the non-target species may be captured while attempting to predate the animal stuck in the trap. Between 2015 and 2019 the RSPCA received 243 reports of glue trap incidents of which over 73% involved pets and non-target wildlife⁴⁴.

Impacts of glue traps on animal welfare

Due to the nature of glue traps and the length of time animals may be trapped, the potential negative animal welfare impacts are significant. Based on the Five Domains⁴⁵, welfare harms may include⁴⁶:

³⁸ Dubois S, Fenwick N, Ryan E, Baker L, Baker S, Beausoleil N, Carter S, Cartwright B, Costa F, Draper C, Griffin J, Grogan A, Howald G, Jones B, Littin K, Lombard A, Mellor D, Ramp D, Schuppli C and Fraser D, 2017. International consensus principles for ethical wildlife control. *Conservation Biology* 31: 753-760.

³⁹ BVZS Position statement on the control of free-ranging wildlife. Available at: <https://www.bvzs.org.uk/wp-content/uploads/2021/03/BVZS-Position-Statement-on-the-control-of-Free-ranging-Wildlife-Final-Feb-2021.pdf>

⁴⁰ <https://www.ufaw.org.uk/rodent-control/humane-rodent-control-detailed-advice>

⁴¹ Baker, S.E., Ayers, M., Beausoleil, N.J., Belmain, S.R., Berdoy, M., Buckle, A., Cagienard, C., Cowan, D., Fearn-Daglish, J., Goddard, P., Golledge, H.D.R., Mullineaux, E., Sharp, T., Simmons, A., Schmolz, E. (2022) An assessment of animal welfare impacts in wild Norway rat (*Rattus norvegicus*) management. *Animal Welfare*, 31: 51-68.

⁴² Fenwick, N., 2013. Evaluation of the humaneness of rodent capture using glue traps, prepared for the Canadian Association of Humane Trapping, 31 July 2013. Available at: <http://www.caht.ca/evaluation-of-the-humaneness-of-rodent-capture-using-glue-traps/>

⁴³ Baker, S.E., Ayers, M., Beausoleil, N.J., Belmain, S.R., Berdoy, M., Buckle, A., Cagienard, C., Cowan, D., Fearn-Daglish, J., Goddard, P., Golledge, H.D.R., Mullineaux, E., Sharp, T., Simmons, A., Schmolz, E. (2022) An assessment of animal welfare impacts in wild Norway rat (*Rattus norvegicus*) management. *Animal Welfare*, 31: 51-68.

⁴⁴ RSPCA, 2020. We're caring for a feral kitten rescued from a glue trap <https://www.rspca.org.uk/-/kitten-in-glue-trap>

⁴⁵ Mellor DJ (2017). Operational Details of the Five Domains Model and Its Key Applications to the Assessment and Management of Animal Welfare. *Animals*, 7, 60

⁴⁶ Baker, S.E., Ayers, M., Beausoleil, N.J., Belmain, S.R., Berdoy, M., Buckle, A., Cagienard, C., Cowan, D., Fearn-Daglish, J., Goddard, P., Golledge, H.D.R., Mullineaux, E., Sharp, T., Simmons, A., Schmolz, E. (2022) An assessment of animal welfare impacts in wild Norway rat (*Rattus norvegicus*) management. *Animal Welfare*,

- Domain 1 (Nutritional impacts): high metabolic rates and high levels of exertion may rapidly lead to starvation and dehydration.
- Domain 2 (Environmental impacts): the location of the glue trap may subject the animal to extremes of temperature. Becoming wet due to the glue, urine and faeces will compromise homeostatic mechanisms to maintain body temperature.
- Domain 3 (Physical impacts): trapped animals stuck to glue may tear skin, break bones or chew through their own limbs; the more they struggle to escape the worse these impacts may become, as more of their body is trapped by the glue ⁴⁷. The animals' eyes and mouths may become glued shut ⁴⁸. Animals may defaecate and urinate excessively ⁴⁹ and become covered in faeces and urine ⁵⁰. Death may result from exhaustion or from suffocation ⁵¹.
- Domain 4 (Behavioural impacts): normal behaviours are restricted or cannot be performed, these include foraging, moving, caring for dependent neonates, escaping from predators, cannibalism by other trapped animals, self-mutilation in an attempt to escape ⁵².
- Domain 5 (Mental impacts): may include anxiety, fear, pain, hunger and thirst ⁵³, stress associated with trying to escape ⁵⁴ and potentially breathlessness associated with suffocation ⁵⁵.

The speed at which welfare is affected in a struggling rodent is rapid (minutes) and yet suffering and death can be prolonged (3-24 hours) ⁵⁶. In many instances, animals remain

31: 51-68.

⁴⁷ Frantz SC and Padula, CM, 1983. A laboratory test method for evaluating the efficacy of glueboards for trapping house mice. In: Vertebrate Pest Control and Management Materials: Fourth Symposium, (Ed. by D. E. Kaukeinen), pp. 209–225. Philadelphia, PA: American Society for Testing and Materials.

⁴⁸ Fenwick, N., 2013. Evaluation of the humaneness of rodent capture using glue traps, prepared for the Canadian Association of Humane Trapping, 31 July 2013. Available at: <http://www.caht.ca/evaluation-of-the-humaneness-of-rodent-capture-using-glue-traps/>

⁴⁹ MAF 2008 *Proposal to prohibit the sale and use of rodent glueboard traps*. Ministry of Agriculture and Forestry Biosecurity, New Zealand

⁵⁰ Frantz SC and Padula, CM, 1983. A laboratory test method for evaluating the efficacy of glueboards for trapping house mice. In: Vertebrate Pest Control and Management Materials: Fourth Symposium, (Ed. by D. E. Kaukeinen), pp. 209–225. Philadelphia, PA: American Society for Testing and Materials.

⁵¹ Mason G and Littin K, 2003. The Humaneness of Rodent Pest Control, *Animal Welfare*, 12, 1-3

⁵² Mason G and Littin K, 2003. The Humaneness of Rodent Pest Control, *Animal Welfare*, 12, 1-3

⁵³ Mason G and Littin K, 2003. The Humaneness of Rodent Pest Control, *Animal Welfare*, 12, 1-3

⁵⁴ MAF 2008 *Proposal to prohibit the sale and use of rodent glueboard traps*. Ministry of Agriculture and Forestry Biosecurity, New Zealand

⁵⁵ Baker, S.E., Ayers, M., Beausoleil, N.J., Belmain, S.R., Berdoy, M., Buckle, A., Cagienard, C., Cowan, D., Fearn-Daglish, J., Goddard, P., Gollodge, H.D.R., Mullineaux, E., Sharp, T., Simmons, A., Schmolz, E. (2022) An assessment of animal welfare impacts in wild Norway rat (*Rattus norvegicus*) management. *Animal Welfare*, 31: 51-68.

⁵⁶ Fenwick N., 2013. Evaluation of the humaneness of rodent capture using glue traps, prepared for the Canadian Association of Humane Trapping, 31 July 2013. <http://www.caht.ca/evaluation-of-the-humaneness-of-rodent-capture-using-glue-traps/>

alive for more than 24 hours after capture⁵⁷. The Pest Management Alliance voluntary Code of Practice on the Use of Glue Boards recommends the traps are checked only every 12 hours⁵⁸. Use of close direct or remote observation (for example via CCTV or trail cameras), or the use of pressure sensors relaying messages to pest controllers, could limit the time an animal spends on a glue trap, speeding their killing and helping limit the extent and duration of welfare harms.

Members of the public faced with an animal trapped on a glue board are often unable, or unwilling, to kill it rapidly and humanely, or kill it at all^{59 60}.

Glue traps are currently available for use by the general public in domestic settings, without any training or licensing requirement, although use by the public is expected to be restricted or prohibited by forthcoming legislation across the UK administrations. For example, the Glue Traps (Offences) Act was passed at Westminster in April 2022, prohibiting the use of glue traps by domestic users and permitting pest controllers only to use them under licence, with a two-year transition period⁶¹. Consultation is currently underway as to the conditions under which licences will be issued. The Scottish Government and Welsh Governments have both announced their intention to ban the use of glue traps outright. Limiting the sale and use of glue traps to pest control operators only would potentially limit the welfare harms by prohibiting the use of traps by the general public. However, even in the hands of trained personnel, and used according to best practice guidance⁶², glue traps have the ability to cause significant welfare harms and alternative methods of trapping and killing are available.

⁵⁷ Frantz SC and Padula, CM, 1983. A laboratory test method for evaluating the efficacy of glueboards for trapping house mice. In: Vertebrate Pest Control and Management Materials: Fourth Symposium, (Ed. by D. E. Kaukeinen), pp. 209–225. Philadelphia, PA: American Society for Testing and Materials.

⁵⁸ Pest Management Alliance voluntary Code of Practice on the Use of Glue Boards: https://bpca.org.uk/write/MediaUploads/Documents/Codes%20of%20Best%20Practice/CoBP_Pest_Management_Alliance_Humane_Rodent_Glue_Boards.pdf

⁵⁹ HSI, 2015. Inhumane, Indiscriminate, Indefensible: The case for a UK ban on rodent glue traps. Available at: <https://www.hsi.org/wp-content/uploads/assets/pdfs/hsi-glue-trap-report.pdf>

⁶⁰ Scottish Animal Welfare Commission, 2021. Report on the use of glue traps in Scotland. <https://www.gov.scot/publications/scottish-animal-welfare-commission-report-use-rodent-glue-traps-scotland/pages/6/>

⁶¹ Glue Traps (Offences) Act 2022 <https://www.legislation.gov.uk/ukpga/2022/26/contents/enacted>

⁶² Pest Management Alliance voluntary Code of Practice on the Use of Glue Boards: https://bpca.org.uk/write/MediaUploads/Documents/Codes%20of%20Best%20Practice/CoBP_Pest_Management_Alliance_Humane_Rodent_Glue_Boards.pdf

(iii) Box/cage traps for mammals



Pine marten caught in box trap © OneKind

Box traps and cages are commonly used to trap foxes, badgers, mink, rabbits and grey squirrels. In most respects, they are similar and work on the same principle. Box traps have solid walls, while cage traps have wire or mesh walls and vary in size according to the intended target animal. The animal enters the trap, usually attracted by bait, and steps on a treadle or trigger that causes the door to close and lock behind it⁶³. Occasionally box traps and multi-catch drop traps are used, made of wood or metal with a trapdoor to capture rabbits, stoats, weasels, rats and mice. Trap design can be made species-specific and avoid the capture of non-target species, for example Longworth traps, used in scientific research, have holes in them that allow smaller mammals with high metabolic rates to escape and avoid starvation. Provision of food and bedding in the trap helps mitigate the potential animal welfare harms.

There is no specific requirement under the Wildlife & Countryside Act 1981 to check live capture cage traps. General animal welfare legislation⁶⁴ applies to trapped animals, with the person setting the trap becoming 'responsible' for the animal⁶⁵, so that leaving it in a cage trap without food, water or shelter and causing it to suffer unnecessarily, may be an offence. Enforcement is hampered, however, by the remote location of many mammal

⁶³ <https://basc.org.uk/game-and-gamekeeping/trapping-of-pest-mammals/>

⁶⁴ Animal Welfare Act 2006, Animal Health and Welfare (Scotland) 2006 and Welfare of Animals Act (Northern Ireland) 2011

⁶⁵ Natural England. (2010). The Animal Welfare Act 2006: what it means for wildlife; Technical Information Note TIN072.
<http://webarchive.nationalarchives.gov.uk/20160930000001/http://publications.naturalengland.org.uk/publication/23021>

traps and the need to gather evidence that an animal has suffered unnecessarily before a prosecution can proceed.

Impacts of mammal box/cage traps on animal welfare

The expectation is that an animal captured in a box or cage trap will suffer fewer welfare harms than those physically restrained by a part or parts of their bodies, as with snares and glue traps. They are also favoured on the assumption that non-target species can be released unharmed, for example when an otter is trapped in a cage trap set for mink, and indeed they are often used in non-lethal operations such as research or translocation. As with snares, however, any captured animal may suffer due to hunger, thirst, exposure to extreme temperatures, fear, stress and disturbance by predators⁶⁶. Drop traps, such as rabbit drop boxes dug into the ground adjacent to rabbit proof fences so that rabbits fall into a holding area via a trap door, depend on very regular inspection and removal of captured animals to avoid poor welfare. Based on the Five Domains⁶⁷, welfare harms associated with mammal box/cage traps may include:

- Domain 1 (Nutritional impacts): being caught in a box or cage trap, will stop the animal eating and drinking normally. Even if food and water are provided these may be of a type and presentation that is not readily accepted by a wild animal. This may lead to dehydration and starvation.
- Domain 2 (Environmental impacts): depending on where the trap is positioned, and the weather conditions, the trapped animal may experience exposure to the elements. Specific guidance to mitigate these risks is given in DEFRA guidance on cage-trapping badgers (see below)
- Domain 3 (Physical impacts): both target and non-target animals can injure themselves in an effort to escape, for example damaging their muzzles or teeth⁶⁸ on the wire mesh. Trap design is very important to avoid traumatic injuries in target species⁶⁹.
- Domain 4 (Behavioural impacts): normal behaviours are restricted or cannot be performed, these include foraging, moving, caring for dependent neonates, escaping from predators, self-trauma in attempts to escape from the trap. The use of a 'closed season' can help mitigate the direct risks to neonates and behavioural impacts associated with neonate care (see example in badgers below).
- Domain 5 (Mental impacts): may include anxiety, fear, pain, hunger and thirst stress associated with trying to escape

⁶⁶ Baker, S.E., Ayers, M., Beausoleil, N.J., Belmain, S.R., Berdoy, M., Buckle, A., Cagienard, C., Cowan, D., Fearn-Daglish, J., Goddard, P., Gollidge, H.D.R., Mullineaux, E., Sharp, T., Simmons, A., Schmolz, E. (2022) An assessment of animal welfare impacts in wild Norway rat (*Rattus norvegicus*) management. *Animal Welfare*, 31: 51-68.

⁶⁷ Mellor DJ (2017). Operational Details of the Five Domains Model and Its Key Applications to the Assessment and Management of Animal Welfare. *Animals*, 7, 60

⁶⁸ Roger A. Powell, Gilbert Proulx, Trapping and Marking Terrestrial Mammals for Research: Integrating Ethics, Performance Criteria, Techniques, and Common Sense, *ILAR Journal*, Volume 44, Issue 4, 2003, Pages 259–276, <https://doi.org/10.1093/ilar.44.4.259>

⁶⁹[https://www.researchgate.net/publication/233595470 Welfare of badgers Meles meles subjected to culling Patterns of trap-related injury](https://www.researchgate.net/publication/233595470_Welfare_of_badgers_Meles_meles_subjected_to_culling_Patterns_of_trap-related_injury)

In parts of England, cage traps are used by contractors licensed under the Protection of Badgers Act 1992 to capture and kill badgers, as part of the UK government programme aimed at preventing the spread of bovine TB in cattle ⁷⁰. Natural England is tasked with undertaking monitoring visits to selected contractors to observe firearms handling and safety, dispatch of badgers and safe handling of carcasses. Certain welfare risks inherent in trapping badgers are implicitly acknowledged in DEFRA guidance, which notes that no trapping will be permitted in a 'closed season' between 31 December and 31 May, to 'reduce the risks of trapped badgers suffering exposure due to severe weather or of leaving dependent cubs underground to suffer starvation as a result of nursing females being culled.' ⁷¹ DEFRA also acknowledges environmental risks to badgers and Best Practice Guidance suggests 'Traps should be positioned to take advantage of any natural cover available to give trapped animals shelter from the elements (including exposure to wind/rain/low temperature and over-heating from the sun)...'.

(iv) Bird traps

The taking and killing of wild birds is prohibited in the UK by the Wildlife and Countryside Act 1981, but the control of certain species is permitted under general licences issued by the devolved national authorities. The purposes for the licences vary slightly across the administrations, but they are broadly similar. The three most commonly used licences issued in England allow users to:

- kill or take wild birds for conservation purposes (GL40)
- kill or take wild birds for public health or safety (GL41)
- kill or take wild birds to prevent serious damage (GL42)

Each licence lists the species that may be trapped and the permitted methods for doing so. It is not necessary to apply for a general licence, but anyone relying on one must abide by its conditions ⁷². Guidance for the use of traps in England is provided in standard licence conditions (GL33) ⁷³. This outlines the type of trap design and construction that should be used.

Permitted types of traps include:

⁷⁰ DEFRA, 2021. Cage-trapping and dispatch of badgers under licence to prevent the spread of bovine TB in cattle: Best practice guide

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/987005/cage-trapping-dispatch-of-badgers.pdf

⁷¹ DEFRA, 2021. Cage-trapping and dispatch of badgers under licence to prevent the spread of bovine TB in cattle: Best practice guide

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/987005/cage-trapping-dispatch-of-badgers.pdf

⁷² e.g. <https://www.gov.uk/government/publications/wild-birds-licence-to-kill-or-take-to-prevent-serious-damage-gl42/gl42-general-licence-to-kill-or-take-certain-species-of-wild-birds-to-prevent-serious-damage>

⁷³ <https://www.gov.uk/government/publications/standard-licence-conditions-for-trapping-wild-birds-and-using-decoys-gl33/valid-from-1-january-trapping-wild-birds-standard-licence-conditions-wml-gl33>

Walk in multi-catch cage traps (crow cage traps, ladder traps, letterbox, funnel traps) - large, usually permanent, structures placed to catch the flocking corvid species such as jackdaws and rooks. Birds are attracted by food or the presence of other birds of the same species already caught in the trap or placed as decoys. The birds find the 'ladder', 'letterbox', or funnel and drop into the trap and are then unable to fly back out. On inspection, the operator should kill any captured birds (although some may be retained to act as decoys) and release unharmed any non-target species



Crow cage trap on Scottish estate © OneKind

- Larsen traps - usually portable traps used by gamekeepers and pest controllers primarily to capture territorial corvids, mostly magpies but also crows. Larsen traps use a single decoy bird to attract birds of the same species. The trap has at least one capture compartment, with spring or gravity activated trap doors on the top or side (capture compartments should not be mounted above the decoy compartment). Trapped birds should be humanely dispatched.



Magpies in Larsen trap © OneKind

- Larsen Mate traps (clam traps) - portable, single-compartment, spring-operated, baited cage traps. Two trap sections are held apart by a rod/perch that causes the trap to snap shut when a bird lands on it. The size and mechanism of closure of the trap should be such that birds are captured without injury.
- Larsen pod trap - portable, single compartment, spring or gravity-operated cage traps.
- Pigeon traps - portable, baited, multi-catch traps in which birds enter via bob wires (one-way entrances).

The licence conditions include some provisions that attempt to avoid welfare harms, these include:

- Traps should be set in a location that avoid damage by and to the trap from non-target species
- Meat baits should be avoided (as these are likely to attract non-target species)
- Traps must be inspected every 25 hours
- Trapped animals must be released or killed as soon as they are found (unless they are kept as decoy birds) - licence conditions apply to protected and non-native animals
- Decoy birds must be provided with adequate food and water, appropriate shelter, and a suitable perch

General licences in Scotland and Wales are currently subject to conditions broadly similar to those in England, although Natural Resources Wales has undertaken a wider

assessment of its approach to the licensing of shooting and trapping wild birds in Wales⁷⁴.

Impacts of bird traps on animal welfare

As with any trapped animal, welfare harms to trapped birds include hunger, thirst, exposure to extreme temperatures, fear, stress and trap related trauma. Based on the Five Domains⁷⁵, specific welfare harms may include:

- Domain 1 (Nutritional impacts): being caught in a trap, will impact on the bird's normal eating and drinking patterns. Where food and water are provided these may not necessarily be readily accepted by a wild trapped bird. This may lead to dehydration and starvation.
- Domain 2 (Environmental impacts): depending on where the trap is positioned, and the weather conditions, the trapped animal may experience exposure to the elements. Shelter provided in the trap may not be adequate in extremes of weather.
- Domain 3 (Physical impacts): trapped birds may suffer a variety of external and internal injuries according to the design of the trap.
- Domain 4 (Behavioural impacts): normal behaviours are restricted or cannot be performed, these include foraging, moving, caring for dependent neonates, escaping from predators and damage in an attempt to escape. Where decoy birds are used, stress and trauma from territorial conspecifics or predators is greatly exacerbated by the close proximity of the individuals involved, as well as any free wild animals.
- Domain 5 (Mental impacts): may include anxiety, fear, pain, hunger and thirst, stress associated with trying to escape and from the close proximity of other animals.

In 2019, the WAWC reviewed the animal welfare implications of killing and taking birds under the Wildlife and Countryside Act 1981⁷⁶. The review noted that there are licence conditions designed to protect the welfare of the decoy bird, as described above, but that these requirements do not extend to the captured birds. Although provision is made for the decoy bird to protect it from 'pain suffering injury and disease'⁷⁷, no account is taken of its behavioural needs. Both decoy and captured birds suffer the stress of confinement and forced close and protracted proximity with conspecifics and other species, including predators. Anecdotally, carrion crows in cage traps often display what appears to be stereotypical behaviour.

⁷⁴ <https://naturalresources.wales/permits-and-permissions/species-licensing/list-of-protected-species/wild-bird-review/?lang=en>

⁷⁵ Mellor DJ (2017). Operational Details of the Five Domains Model and Its Key Applications to the Assessment and Management of Animal Welfare. *Animals*, 7, 60

⁷⁶ https://static1.squarespace.com/static/5edf4fd72d25275e3acc8c4a/t/5f4f9b861c1cad15afc109d5/1599052681811/GLs_-Shooting_and_Trapping_evidence_review.pdf

⁷⁷ <https://www.gov.uk/government/publications/standard-licence-conditions-for-trapping-wild-birds-and-using-decoys-gl33/valid-from-1-january-trapping-wild-birds-standard-licence-conditions-wml-gl33>

An assessment of the welfare impacts of Larsen and similar types of trap ⁷⁸ found few serious physical problems associated with the use of the traps (although a number of superficial injuries were recorded). Behavioural impacts however are likely to be significant: corvids caught in one type of trap show such avoidance behaviour towards that trap type that they are not caught in it again ⁷⁹.

Humane killing of captured birds depends entirely on the competence of the trap operator. DEFRA advice is to remove birds from the trap and dispatch using a 'humane method' such as a sharp blow to the back of the head using a suitable stick or dedicated priest or equivalent. Such a method is unlikely to result in effective rapid death in the hands of operators that lack confidence or competence. Operators are also advised, as far as is practicable, to avoid members of the public seeing the dispatch ⁸⁰.

Baker & others (2016) ⁸¹ compared cage trapping of crows with shooting and scaring. A desk-based welfare assessment model concluded that cage trapping with cervical dislocation had the greatest impact because trapped birds may suffer distress, injury or panic during confinement in the trap, while birds being killed will be distressed by handling and the response of the decoy bird to the handler, and can experience hypoxia following cervical dislocation. In addition, non-target species including protected species such as birds of prey are also caught and, even if released alive, may suffer and potentially die as a result of entrapment. As for decoy birds, their welfare is adversely affected by captivity and the inability to behave naturally, or avoid predators, especially in ground-level traps, such as Larsen traps.

3. Discussion

Wild mammals and birds are known to be sentient and capable of experiencing pain and other negative sensations: any traps that do not instantly kill or render them irreversibly unconscious are likely to impact their welfare. Live traps for lethal control of terrestrial mammals and birds therefore raise significant welfare concerns. Non-target species caught in traps will also suffer and may die, often very slowly. Neonates and juveniles may starve to death if traps catch an adult on which they are dependent within their breeding season.

WAWC believes that evidence shows that the current legal controls on the use of live traps are insufficient to prevent suffering in wild animals. The lack of regulations specific to different trap types, competence requirements for operators and supervision means that there is considerable risk to animal welfare. A lack of recording and reporting of the

⁷⁸ Campbell S, G Hartley and Z Fang. (2016). Assessing the nature and use of corvid cage traps in Scotland: Part 3 of 4 Trap operation and welfare. Scottish Natural Heritage

⁷⁹ Kövér, László, et al. Corvid control in urban environments: a comparison of trap types. *North-Western Journal of Zoology* 14.1 (2018): 85-90.

⁸⁰ <https://www.gov.uk/government/publications/standard-licence-conditions-for-trapping-wild-birds-and-using-decoys-gl33/valid-from-1-january-trapping-wild-birds-standard-licence-conditions-wml-gl33>

⁸¹ Baker SE, TM Sharp and DW Macdonald (2016). Assessing Animal Welfare Impacts in the Management of European Rabbits (*Oryctolagus cuniculus*), European Moles (*Talpa europaea*) and Carrion Crows (*Corvus corone*). *PLoS ONE*, 11(1): e0146298. doi:10.1371/journal.pone.0146298.

number of animals captured, and either killed or released without further monitoring, means that the impact on populations cannot be properly determined. Similar concerns apply to the impact of 'by-catch' of non-target animals, where scarce and protected species are at risk of being trapped. In any case, whether protected or not, animals in live traps often experience negative and, potentially severely negative⁸², welfare impacts.

4. Recommendations

WAWC believes that a comprehensive review of the live trapping of terrestrial wild mammals and wild birds is necessary, and that this should encompass both the need for trapping as well as the welfare impact of the trapping process itself.

Specific welfare-related requirements should be provided by legislation for all traps, rather than relying on general animal welfare legislation which is largely retrospective and depends on penalties for causing unnecessary suffering or breaching the duty of care to an animal under control of a responsible person. Regulations should aim to prevent welfare harms from occurring in the first place.

Wildlife control should be made subject to ethical principles, such as the international consensus principles for ethical wildlife control⁸³. These state that human behaviours should first be modified and then if wildlife control is considered necessary it should be justified with evidence that substantial harm is being caused to people, property, livelihoods, ecosystems, and/or other animals. Where control, lethal or non-lethal, is still considered to be needed, it must be carried out using recognised methods with the lowest overall welfare impact.

A summary of WAWC's conclusions in relation to specific types of traps follows:

Snares

Snares cause significant welfare harms to members of both target and non-target species and alternative methods of control are available. The WAWC therefore recommends that the sale of snares, and their use by both public and industry is banned in all UK administrations.

Glue traps

Glue traps are a method of rodent control that has the potential to cause severe compromise to animal welfare⁸⁴. The WAWC therefore supports a full and immediate ban

⁸² Baker SE, TM Sharp and DW Macdonald (2016). Assessing Animal Welfare Impacts in the Management of European Rabbits (*Oryctolagus cuniculus*), European Moles (*Talpa europaea*) and Carrion Crows (*Corvus corone*). PLoS ONE, 11(1): e0146298. doi:10.1371/journal.pone.0146298.

⁸³ Dubois S, Fenwick N, Ryan E, Baker L, Baker S, Beausoleil N, Carter S, Cartwright B, Costa F, Draper C, Griffin J, Grogan A, Howald G, Jones B, Littin K, Lombard A, Mellor D, Ramp D, Schuppli C and Fraser D, 2017. International consensus principles for ethical wildlife control. *Conservation Biology* 31: 753-760.

⁸⁴ Baker, S.E., Ayers, M., Beausoleil, N.J., Belmain, S.R., Berdoy, M., Buckle, A., Cagienard, C., Cowan, D., Fearn-Daglish, J., Goddard, P., Gollidge, H.D.R., Mullineaux, E., Sharp, T., Simmons, A., Schmolz, E. (2022) An

on the sale of glue traps and their use by both public and industry, in all UK administrations.

If the use of glue traps by licensed pest controllers is permitted to continue in specific, exceptional high-risk situations where public health is significantly compromised, this must be granted on a case-by-case basis, for a limited period only, and extremely carefully regulated in order to minimise welfare harms. The ultimate aim should be a full ban as soon as possible. WAWC supports further research into alternative methods for the deterrence of rodents and where necessary, more humane methods of killing, such as well-designed and regulated snap traps, should be supported.

Mammal cage/box traps

The welfare harms of cage/box traps are variable according to design, the amount of time the animal is left in them, and the method of dispatch used once the animal is caught. WAWC believes that the use of such traps must be carefully regulated to best protect animal welfare, initially by the introduction of a licensing regime with conditions that incorporate ethical principles identical or similar to the international consensus principles for ethical wildlife control⁸⁵. Any licensing scheme should ensure that these traps are only used where a clear need has been demonstrated and other methods of control have been used and shown to have failed. Where traps are used, they must be carefully designed to minimise welfare harms. Licensed operators must be fully trained and competent in their use and in humane methods of killing of the animals trapped. Traps must be frequently checked at intervals commensurate with the needs and behaviour of the species involved, with a maximum of 12 hours between inspections. WAWC supports the development of technology to alert operators as soon as animals are trapped.

Bird traps

The welfare harms experienced by wild birds captured in traps are similar to those of mammals in cage/box traps. WAWC therefore recommends that bird traps should be subject to the same controls and ethical approach as mammal traps, as described above.

The use of decoy birds in traps creates additional negative welfare impacts for both the decoy bird and any trapped birds. WAWC supports a total ban on the use of all decoy animals in traps, unless under specific licence in exceptional and justifiable circumstances directly related to conservation or welfare, rather than the control of bird numbers.

assessment of animal welfare impacts in wild Norway rat (*Rattus norvegicus*) management. *Animal Welfare*, 31: 51-68.

⁸⁵ Dubois S, Fenwick N, Ryan E, Baker L, Baker S, Beausoleil N, Carter S, Cartwright B, Costa F, Draper C, Griffin J, Grogan A, Howald G, Jones B, Littin K, Lombard A, Mellor D, Ramp D, Schuppli C and Fraser D, 2017. International consensus principles for ethical wildlife control. *Conservation Biology* 31: 753-760.

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