



Predator management for wildlife conservation

National Advice Hub
T: 0300 323 0161
E: advice@fas.scot
W: www.fas.scot

Summary

- **Predator management is often a necessary part of efforts to protect some species of conservation concern, particularly ground-nesting birds.**
- **Habitat management and other measures can help to reduce the impact of predators and the need for predator management.**
- **Active predator management can be labour intensive and must therefore be efficiently and accurately targeted.**
- **Lethal control has traditionally been used to remove predators and remains an option for some species.**
- **Increasing impacts from protected predators and increased regulation of lethal predator control means that there is growing interest in non-lethal methods such as fencing and diversionary feeding.**
- **It is essential that all predator control complies with the relevant wildlife conservation and animal welfare legislation.**

Introduction

Predator control is a long-established part of rural land management in Scotland, but it can be controversial with the wider public, particularly in the case of lethal control. Nonetheless there is considerable scientific evidence that predation is a problem for some of our most vulnerable wildlife such as ground-nesting birds and that management solutions are required in many cases. This technical note sets out the scenarios where predator management may be required, the legal framework within which any predator management (particularly lethal control) must take place and the options that may be used, including novel and non-lethal methods.

Isles since the last ice-age without predator control until relatively recently and that predators and prey still coexist without human interference in many other parts of the world.

It is true that native predator and prey species have co-evolved in an evolutionary arms race and that prey species have evolved strategies to mitigate the impacts of predation. This includes the selection of concealed or inaccessible breeding sites, communal living (safety in numbers) and production of large numbers of young to offset any predation.

Why is predator management necessary?

Critics of predator management point to the fact that native predators and prey have co-existed in the British

However, there are several, generally human-induced, factors that can change the balance in predator-prey relationships and make prey species of conservation importance more vulnerable:

Habitat degradation

The deterioration of habitats can result from many causes including over-grazing or under-grazing, pollution, nutrient enrichment, drainage, soil disturbance and non-native invasive plant species. These may result in reduced food availability, loss of safe breeding sites and increased disturbance, all of which may cause population declines of some species and make them more vulnerable to the impacts of predation.

Habitat fragmentation

Many formerly extensive habitats such as forests and wetlands have become fragmented. This can have a two-fold impact on the predator-prey balance. Firstly, prey species that are adapted to large, unbroken areas of one habitat tend to be quite specialised in their requirements and may struggle to find all their needs within a smaller area and may become isolated from other populations of the same species, making them more vulnerable to the impacts of predation. Secondly, nowhere is very far from the edge of a fragmented habitat and predator 'edge effects' become more significant.

Edge Effects

An edge effect in wildlife ecology is where certain species are found in greater abundance at the boundary between two contrasting habitats. The combination of cover for breeding and resting in woodland, hedges and scrub alongside abundant food resources in adjoining productive farmland can result in high populations of generalist predators (e.g. crows, raptors, foxes and badgers) and prey (e.g. rabbits, hares, woodpigeons). The enhanced predator populations can then have a significantly greater impact on any more specialised species (e.g. wading birds, capercaillie) that occur in either of the adjoining habitats and which don't benefit from the edge effect themselves.

Spillover predation

Spillover predation occurs as a result of edge effects, but can also occur in other situations where there is an abundant, readily available supply of food and the increased predator population then impacts disproportionately on rarer species at other times of the year. Examples of food sources that can subsidise and increase predator populations include large-scale releases of pheasants and partridges, deer grallochs that are left behind after culling, high rabbit densities (a non-native species, which only started to spread in the wild from the 18th century onwards), and voles, which can become abundant in clear-felled or new woodland. The numbers of omnivorous predators such as badgers and crows may also be boosted by abundant grain or other crops on farmland. It is even possible that garden peanut feeders could have the same effect on pine martens in some areas.

Loss of apex predators

Most terrestrial mammalian predators in Scotland are small or medium sized (referred to as mesopredators). Even the largest species (fox and badger) are small relative to native apex predators that have been hunted to extinction such as bear, wolf and lynx. The theory of mesopredator release is supported by evidence from throughout the world (Prugh et al, 2009), and suggests that large apex predators suppress mesopredator populations through competition and direct predation. Where apex predators have been lost, mesopredators, which are often more efficient predators of small prey, become more abundant than they would be otherwise and have an increased impact on their prey species.

Among birds, the populations of apex species (e.g. eagles and goshawk) have increased in recent decades, possibly reducing the impacts of mesopredator release in some cases. Goshawks are known to reduce buzzard density and breeding success as well as preying on corvids (Sergio and Hiraldo 2008), while it has been suggested that the golden eagle could naturally limit hen harrier numbers on grouse moors (Fielding et al. 2003) and that the White-tailed eagle could have a controlling effect on American mink (Salo et al. 2008). Golden Eagles have also been recorded preying on foxes and badgers in Scotland.

Introduction of non-native predators

While our native predators and prey have co-evolved for millennia, the same is not the true of non-native predators. The best-known example is the American mink, which has been implicated as one of the main drivers of decline in the native water vole. Mink can hunt water voles on land, in the water and even in their burrows, whereas native predators can only hunt them in one or two of those situations and are therefore less efficient at catching voles. Brown and black rats are also non-native species that have been implicated in the decline of seabirds on some islands where they have been introduced.

It is also important to remember that some predators that are native to mainland Scotland are not native to many surrounding islands, so where hedgehogs and stoats have become established in the western and northern isles, they are non-native species which can suppress populations of ground-nesting birds that previously thrived in the absence of mammalian predators.

How to plan for predator management

Predator management can be labour-intensive, so the first step is to decide whether it is strictly necessary and to consider alternatives. Addressing some of the factors that have changed the balance in predator-prey relationships could reduce or even eliminate the need for active predator management altogether. Reversing habitat fragmentation by expanding and connecting large areas of woodland or by removing forestry plantations adjacent to wetlands can reduce edge effects and provide a more resilient habitat for species such as capercaillie or curlew. Improving habitat quality can also help to mitigate the effects of predation and taking action to reduce the abundance of artificially inflated supplementary food sources where these are subsidising predator populations can also help.



This type of approach works best on a landscape scale and is central to many large-scale rewilding projects in upland areas such as [Cairngorms Connect](#). However, in many areas (and particularly at farm-scale and in the case of introduced non-native predators), active control measures are likely to be required, taking into account the following factors:

Accurate targeting

There is little evidence that predation has a major impact on songbird populations (Gibbons et al. 2007), but there is considerable scientific evidence that predation is an important factor in the decline of many ground-nesting game and wading birds, such as black grouse, capercaillie, grey partridge, curlew and lapwing, as well as water voles and some seabirds where non-native predators have been introduced. Areas where these vulnerable species occur are where predator management for conservation is likely to be most valuable.

Most predators that are implicated in declines of these species are either mammals or birds, but the species that have the greatest impact may vary between sites and over time. It is therefore important not to jump to conclusions about which predators are having an impact as it may not always be the obvious culprit. Remote monitoring using technology such as trail cameras may help determine which predator species are having the greatest impact and help to inform management planning.

Intensity and timing

Unlike predator control for game management, which can be very intensive, predator management for conservation only needs to ensure that the adult mortality and reproductive success of the species being conserved are in balance (although surplus productivity of young may be useful where the aim is population recovery from low levels). The overall aim should therefore be to reduce the impact of predators to a sustainable level, not to eliminate predators entirely from large areas (except in the case of non-native predators).

However, there will be situations where short periods of intensive predator management are required. For example, a single fox can devour multiple wader nests over a short period and in these cases relatively intensive predator management during the most vulnerable times of the year (typically the nesting season in ground-nesting birds) will be more effective than sporadic predator control throughout the year.

It is also important to remember that removing predators from an area of land may create a 'vacuum' effect that can draw in more predators from surrounding areas meaning that predator management is a long-term commitment.



Lethal versus non-lethal control

Traditionally, predator control has meant killing predators and this remains an option for certain species, albeit with increasing levels of regulation. However, the legal protection now afforded to many predatory species and their subsequent population recoveries means that there is a range of relatively widespread predators (including badger, pine marten and several species of raptor) where lethal control is not a realistic option. Changes to the law are unlikely due to public opinion and so there is increasing interest in non-lethal methods to reduce the impacts of these species. Some of these methods are considered later in this guidance.

Legislation

It is important to ensure that all predator control is carried out in strict accordance with the law, particularly where lethal control is being considered. However, even non-lethal control has the potential to run into legal complications such as the risk of disturbance of nesting schedule 1 birds or interference with a protected mammal's place of shelter. The Wildlife and Natural Environment (Scotland) Act 2011 introduced the offence of vicarious liability, which means that land owners and managers can be held responsible for certain crimes committed against wild birds on their land by their employees, contractors or agents unless they can demonstrate that they did not know the offence was being committed and took all reasonable steps and due diligence to prevent it. The following sections detail the legislation that governs the lethal control of predatory birds and mammals.

Lethal control of predatory birds

The default position for all wild birds, is that their nests and eggs are protected by law under the Wildlife and Countryside Act 1981 (as amended) and it is an offence to intentionally or recklessly kill, injure or take any wild bird (apart from Schedule 2 species outside the close season) or to take, damage, destroy or otherwise interfere with the nest of any wild bird while it is in use, unless licensed to do so by NatureScot (formerly Scottish Natural Heritage), as the statutory nature conservation agency.

General Licence

NatureScot issues general licences each year which allow any authorised person to kill or take certain bird species for a specific purpose, without having to apply for an individual licence. The relevant general license for predator control is General Licence 01: to kill or take certain birds for the conservation of wild birds.

The general licence may be used by the owner or occupier of the land, or any person nominated by the owner or occupier of that land, but not by anyone with an unspent conviction for wildlife crime. NatureScot can also withdraw the right to use general licences from specific individuals and/or areas of land where there is evidence of wildlife crime.

The general licence is renewed on the 1st January each year and should be checked for changes in the species or methods that are permitted. Currently only the five corvid species listed in table 1 can be controlled due to their impact on other wild birds. Note that this list does not include the Rook, which can only be killed under General Licence 02 for the prevention of serious damage to crops.

Table 1. Predatory bird species that can currently be controlled under General License 01 for the conservation of wild birds

Common Name	Scientific Name
Magpie	<i>Pica pica</i>
Carrion Crow	<i>Corvus corone</i>
Hooded Crow	<i>Corvus cornix</i>
Jackdaw	<i>Corvus monedula</i>
Jay	<i>Garrulus glandarius</i>

At sites within 500 metres of certain designated sites for birds (Special Protection Areas) the general licence can only be used if specific standing conditions for those sites are met (these are primarily measures to avoid disturbance to the birds for which the sites are designated). The list of designated sites and standing conditions is available on the [NatureScot website](#).

Lethal control methods permitted under General Licence 01

The control methods which are permitted under the general licence are (in increasing order of potential welfare impact):

- Pricking of eggs
- Oiling of eggs
- Destruction of eggs and nests
- By hand
- Targeted falconry
- Shooting with any firearm, including semi-automatic firearms, shotguns or air weapons
- A multi-catch cage trap
- A Larsen mate trap
- A Larsen pod trap
- A Larsen trap

Corvid control should concentrate on the spring and summer period (March-July) as this is when they are most likely to affect prey species through nest predation. Territorial breeding pairs of crows are likely to be the greatest threat to other nesting birds, so these should be targeted rather than groups of nonbreeding crows which tend to roam over much larger areas. Shooting crows at the nest must be done with great care as some protected bird species (such as kestrels or long-eared owls) sometimes make use of old crow nests.

Using traps for birds

Anyone using a trap must be registered with NatureScot and the individual's registration number must be displayed on the trap. Under the Wildlife Management and Muirburn (Scotland) Act 2024 it will become a requirement for operators to have a wildlife trap licence from 2025 onwards and a condition of this will be that operators have undertaken an approved training course.

The use of all types of trap must comply with the Animal Health and Welfare (Scotland) Act 2006. Live decoy birds must be provided with food, water, a suitable perch and shelter from the prevailing wind and rain. All traps must be inspected at least once every 24 hours, so it is important not to set more traps than can be easily checked every day. Any non-target species must be released immediately and any target birds to be killed should be dispatched humanely. Any dead or sick decoy birds must be removed immediately. It is illegal to trade in decoy birds, so these must be acquired by initially baiting traps, or by asking another crow trapper to donate one that they have caught.

When a trap is not being used it must be rendered incapable of being used or easily re-activated by anyone else (for example by removing the trap or one of its panels or padlocking the door open).

Types of trap for birds

A Larsen trap is a small portable cage with a spring activated trap door at the top or side that will close behind any bird heavy enough that enters the trap. Either bait or a live decoy bird can be used to attract target birds into the trap, with decoy birds often greatly increasing the effectiveness of the trap. Only a single live decoy can be used and it must be in a separate closed compartment within the cage. Only Carrion Crows, Hooded Crows or Magpies are permitted as decoy birds in Larsen traps that are set under the general licence for the conservation of wild birds. The use of any other species as a decoy (e.g. a pigeon) is an offence.

Larsen mate and Larsen pod traps are types of cage trap where the two halves or doors of the cage close over a bird if it lands on a baited perch in the middle of the trap. Due to concerns that such traps could injure larger non-target species such as raptors that attempt to reach the bait, there is an additional requirement to register if using meat-based baits in these traps and to annually report any non-target species caught and released. Larsen traps and Larsen mate and pod traps must be securely pegged or staked to the ground.

Multi-catch cage traps are much larger and typically have a narrow ladder or funnel in the top which birds can easily drop through but are unable to fly back through. Only Carrion Crow, Hooded Crow, Jackdaw and Magpie may be used as a decoy in a multi-catch cage trap.

Individual specific licences

It is possible to apply to NatureScot for individual licences to control predatory birds not listed on the general licence. These will only be issued where there is strong evidence that the predator is responsible for significant declines in the species of conservation concern and that there is no satisfactory alternative to lethal control. In practice it is very rare for such licences to be granted.

Lethal control of predatory mammals

The legislation surrounding the protection of mammals is more complex than that for birds. There is no default protection for all mammals, but certain mammal species are legally protected from being deliberately or recklessly killed, captured or disturbed in a place of shelter under three different pieces of legislation. Their places of shelter or are also protected from damage or obstruction – for European Protected Species this is an offence of strict liability (i.e. it is an offence even if not deliberate or reckless).

- Wildlife and Countryside Act 1981 (as amended) – Schedule 5 species
- Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) - European Protected Species
- Protection of Badgers Act 1992 (as amended) – badgers

Legal protection of mammals

Table 2: Protected predatory mammals that it is a criminal offence to deliberately or recklessly kill

Badger	<i>Meles meles</i>	Protection of Badgers Act
Otter	<i>Lutra lutra</i>	European Protected Species
Pine Marten	<i>Martes martes</i>	Schedule 5 Species
Wildcat	<i>Felis silvestris</i>	European Protected Species
Red Squirrel	<i>Sciurus vulgaris</i>	Schedule 5 Species

Although it is theoretically possible to apply for an individual licence to control these species, there would need to be strong evidence that the particular species is responsible for significant declines in a species of conservation concern and that there is no satisfactory alternative to lethal control. In practice, lethal predator control will generally focus on some of those species listed in table 3, which are not legally protected (although there are restrictions on methods that can be used to kill or take them)

Table 3: Predatory mammal species that are not legally protected from being killed or taken

Hedgehog	<i>Erinaceus europaeus</i>
Red Fox	<i>Vulpes vulpes</i>
Stoat	<i>Mustela erminea</i>
Weasel	<i>Mustela Nivalis</i>
American Mink	<i>Mustela vison</i>
Feral Ferret/Polecat	<i>Mustela furo/putorius</i>
Feral Cat	<i>Felis catus</i>
Grey Squirrel	<i>Sciurus carolinensis</i>
Brown Rat	<i>Rattus norvegicus</i>



Control methods for predatory mammals

There are strict rules on the methods that can be used for control of predatory mammals. The use of snares has been banned by the passing of the Wildlife Management and Muirburn (Scotland) Act 2024, the use of dogs to kill wild mammals is prohibited under the Hunting with Dogs (Scotland) Act 2023 and under the Control of Pesticides Regulations 1986 (as amended), the only poisons approved for mammals are rodenticides for mice and rats that must only be used where they cannot be accessed by children, pets and non-target species. This leaves shooting, spring traps and cage traps as the main options for control (falconry is also an option but not commonly used on predatory mammals).

Shooting

Shotguns, rifles and air weapons may all be used for predator control. The possession and use of firearms is strictly controlled by the Firearms Act 1968 (as amended) while the possession and use of air guns is controlled by the Air Weapons and Licensing (Scotland) Act 2015.

The British Association for Shooting and Conservation (BASC) provides [best practice guidance for predator control](#) including advice on appropriate types of weapon for different target species to ensure that lethal control is carried out humanely. For foxes a .22 rifle should be used, but at close range (<30m) a shotgun with cartridges containing at least 36g of large shot (No.1 or No.3) is an alternative. Air weapons must never be used for fox control but may be acceptable for killing small species at close range (e.g. humane and safe dispatch of mink, stoat or grey squirrel in a cage trap).

As shooting of predatory mammals often takes care at night, guidance on night shooting is available to ensure high standards of safety and to ensure that target species are correctly identified.

The Wildlife and Countryside Act 1981 (as amended) prohibits the use of bows or cross-bows for shooting birds or mammals as well as the use of any live mammal or bird as a decoy to lure in target species or the use of a vehicle to immediately pursue or drive any animals or birds while shooting.

Although hunting with dogs is banned, it is permitted to use one dog to search for or flush foxes below ground or to use up to two dogs to search for, stalk or flush a wild mammal from cover above ground. In both cases, the dogs must be under control and the target mammal must be shot (or killed by a bird of prey) as soon as possible after it is flushed. A NatureScot licence under the Hunting with Dogs (Scotland) Act 2023 is required if more than two dogs are to be used above ground for this purpose.

Spring Traps

Spring traps incorporate a pair of jaws that snap shut around the target species, killing it immediately, when it steps on a trigger plate. These can only be used to kill stoats, weasels, mink, rats and grey squirrels, but only specific makes of trap listed in the Spring Traps Approval (Scotland) Order 2020 may be used. The order also lists which target species each model is approved for.

Under the Wildlife Management and Muirburn (Scotland) Act 2024 it will become a requirement for operators of spring traps to have a wildlife trap licence from 2025 onwards and a condition of this will be that operators have undertaken an approved training course.

As the stoat is listed on Schedule 6ZA of the Wildlife and Countryside Act 1981 it may not normally be killed by trapping. Consequently, the use of spring traps for stoats can only be carried out under the terms of General License 14: to use certain traps to kill stoats for the conservation of wild birds or for prevention of serious damage to livestock. As with the general licence for birds, this licence can only be used by the owner or occupier of the land or a person nominated by them and may not be used by someone with an unspent wildlife crime conviction. The licence runs for one calendar year at a time, so it is important to check that it has been renewed and that there are no changes each January.

Spring traps must by law be set in a natural or artificial tunnel which is suitable for minimising the chances of capturing, killing or injuring non-target species whilst not compromising the killing of target species. This means that the entrances to the tunnel must be constricted sufficiently to prevent a larger non-target species (e.g. otter, pine marten, fox, raptor) to enter. Certain traps may require internal baffles within the tunnel to further minimise the risk. Spring traps must be securely anchored to prevent an injured animal from dragging the trap away and should be inspected at least once every day between sunrise and sunset. Any injured animal should be dispatched humanely.

Cage Traps

Live-capture cage traps may be used to catch any non-protected mammal listed in Table 3, except for hedgehog and stoat, due to their listing on Schedule 6 and 6ZA of the Wildlife and Countryside Act 1981 respectively, which protects them from trapping. General Licence 14 can be used to permit cage trapping of stoats, but only one type of cage trap (Perdix Mink cage trap) is approved for stoat trapping.

Cage traps should be placed to minimise the risk of capturing protected species. Baits can be used to attract target animals into the trap but it is illegal to use live decoys. Different sizes and shapes of trap are available depending on the target animal with the trap door usually being triggered by a foot plate or a hook from which bait is suspended. Cage traps should be checked at least once a day as failure to do so could constitute an offence under the Animal Welfare Act 2006. Any non-target or protected species must be released and any target species must be humanely dispatched, usually by shooting. Note that where cage traps are used to catch grey squirrels or American mink, it is an offence under the Wildlife and Countryside Act 1981 (as amended) to release these species back into the wild as they are non-native species, listed on Schedule 9 of the act.

The requirement to check cage traps every day means that they can be labour intensive to operate, particularly in remote areas, so methods have been developed to more effectively target effort, including:

- 'Mink rafts' developed by the Game and Wildlife Conservation Trust (GWCT). These are floating plywood platforms with a tunnel on top that are tethered at the edge of a watercourse. Within the tunnel is a wet clay pad which records the footprints of animals that explore the tunnel. As the raft is not operating as a trap at this stage, it does not need to be checked every day, and several sites can be monitored with an inspection frequency of one or two weeks. If mink footprints are found on a raft, a cage trap can be set in the tunnel and inspected daily with a much higher likelihood of catching a mink within a short time. It is important that the cage trap is secure within the tunnel so that there is no risk of the trap being dislodged and resulting in a captured animal drowning.
- Remotely activated cameras (often known as camera traps, trail cameras or game cameras) provide another method of monitoring potential trapping sites prior to the deployment of an active cage trap that requires regular checking. These cameras are triggered by the movement of an animal and can be checked weekly and have a wider application than the mink raft (e.g. monitoring squirrel feeders for the appearance of grey squirrels).
- Remote trap monitoring using the mobile phone network. There are now several trap monitoring systems that can transmit a message by text or email when the door of a cage trap is triggered. Some systems can also use cameras connected to the mobile network to allow remote viewing of the traps. These systems have the potential to reduce the frequency with which remote traps need to be checked. However, it will only work where there is a mobile phone signal sufficient to allow a message to be sent.

Non-lethal predator management and control

There is growing interest in non-lethal predator control as a way of addressing situations where species of conservation interest are being impacted by legally protected predators. They can also be used to manage other species where there are sensitivities about lethal control. Three main methods of non-lethal predator management are highlighted here.

Creation of cover and refuges

Interactions between predation and habitat quality mean that it is sometimes possible to use habitat management to reduce predation to sustainable levels. One of the most obvious and successful methods is the creation of areas of cover or other refuges where predators are less likely to detect their prey. Examples include:

- Provision of wild bird cover crops that are more than 30cm tall in late winter and early spring to reduce sparrowhawk predation on grey partridge in otherwise open landscapes (Watson 2004).
- Providing tall ground cover of shrubs, young trees or piles of brash to protect capercaillie in their forest habitat (Kortland 2006).
- Creation of island refuges in reedbeds and other wetlands to allow water voles to avoid mink which more typically hunt along linear features such as ditches and river banks (Carter & Bright 2003).
- Maintaining a high water table throughout the breeding season in important nesting areas for wading birds to discourage predation by foxes (Bellebaum & Bock 2009).

Anti-predator Fencing

Fencing has been used to protect colonial ground-nesting birds such as terns at nature reserves from mammalian egg and chick predators for many years. More recently, fencing has been used on nature reserves with ground-nesting wading birds. Areas of up to 50 hectares have been enclosed with fencing and this was found to increase lapwing breeding productivity from 0.23 to 0.79 fledged young per pair. At least 0.6 fledged young per pair is necessary to maintain a stable population so the fencing prevented lapwing population decline (Malpas et al. 2013).

Fencing has also been used in recent years on a smaller scale to protect individual nests of another wading bird, the curlew. Temporary enclosures extending 10 metres around the nest reduce the risk of fox and badger predation. These

are put up after egg laying is complete to reduce the risk of desertion but finding nests can be a time-consuming process. Recently, trials using thermal imaging drones have been used successfully to locate nests more quickly.

Anti-predator fencing can take the form of simple stranded electric fences with wires at intervals of 5-20cm, which are best suited for temporary enclosures. For more permanent fencing (e.g enclosing larger areas with high densities of nesting birds), fences should be at least 1 metre high with 8cm square mesh at the base, extending 30cm outwards under the ground, with an outward facing overhang at the top and/or three or four offset electric wires on the outer face.

The disadvantages of anti-predator fencing are the costs of installation, the requirement for maintenance (checking batteries and strimming vegetation) and the fact that they generally only protect against mammalian predators, not birds. Very large areas enclosed by fencing may also require some additional fox control, as the fences are not always 100% effective.

Diversionsary feeding

Earlier in this guidance we noted that an abundance of some food can subsidise predator populations and keep them higher than they would be otherwise. However, the provision of supplementary food for a short period at specific times of year when predators have the greatest impact has the potential to divert predators from impacting on species of conservation concern, without increasing predator numbers.

This type of diversionsary feeding has been demonstrated successfully in several high-profile conservation conflicts:

Provision of small items of meat at feeding stations located on the flightpath between Red Kite nests and wader nesting areas in Oxfordshire from mid-May to late June reduced predation of Lapwing chicks to a sustainable level (Mason et al. 2021).

Provision of 10kg of deer meat every 2 weeks from late April to the end of June per 1.5km² of capercaillie habitat in Scotland reduced Pine Marten and Badger predation of artificial nests by almost a half (Bamber et al. 2024).

Diversionsary feeding has significant potential for predator management but as with lethal control it is relatively labour intensive and therefore requires time and money to deliver.

References & further information

Bamber, J. A., Kortland, K., Sutherland, C., Payo-Payo, A., & Lambin, X. (2024). Evaluating diversionsary feeding as a method to resolve conservation conflicts in a recovering ecosystem. *Journal of Applied Ecology*, 61, 1968–1978. <https://doi.org/10.1111/1365-2664.14693>

Bellebaum, J. Bock, C. (2009). Influence of ground predators and water levels on Lapwing *Vanellus vanellus* breeding success in two continental wetlands *J Ornithol* 150:221–230

Carter, S.P. & Bright, P.W. (2003). Reedbeds as refuges for water voles (*Arvicola terrestris*) from predation by introduced mink (*Mustela vison*). *Biological Conservation*, Volume 111, Number 3, pp. 371-376

Fielding, A.H., Haworth, P.F., Morgan, D.H., Thompson, D.B.A. and Whitfield, D.P. (2003). The impact of golden eagles on a diverse bird of prey assemblage. In Thompson, D.B.A., Redpath, S.M., Fielding, A.H., Marquiss, M., Galbraith, C.A. (Eds.). *Birds of Prey in a Changing Environment*. The Stationery Office, Edinburgh. Pp. 221-244

Gibbons DW, Amar A, Anderson GQA, Bolton M, Bradbury RB, Eaton MA, Evans AD, Grant MC, Gregory RD, Hilton GM, Hirons GJM, Hughes J, Johnstone I, Newbery P, Peach WJ, Ratcliffe N, Smith KW, Summers RW, Walton P and Wilson JD (2007). The predation of wild birds in the UK: a review of its conservation impact and management. RSPB Research Report no 23. RSPB, Sandy. (Available online at www.rspb.org.uk)

Kortland, K., (2006). Forest management for capercaillie: an illustrated guide for forest managers. Capercaillie biodiversity action plan steering group.

Malpas, L.R., Kennerley, R.J., Hirons, G.J.M., Sheldon, R.D., Ausden, M., Gilbert, J.C., Smart, J. (2013) The use of predator exclusion fencing as a management tool improves the breeding success of waders on lowland wet grassland. *Journal for Nature Conservation* 21 (2013) 37– 47

Mason, L., Green, R., Hirons, G., Skinner, A., Peault, S., Upcott, E.V., Wells, E., Wilding, D.J., Smart, J. (2021). Experimental diversionsary feeding of red kites *Milvus milvus* reduces chick predation and enhances breeding productivity of northern lapwings *Vanellus vanellus*. *Journal for Nature Conservation*, Volume 64. Elsevier BV.

Prugh, L.R., Stoner, C.J., Epps, C.W., Bean, W.T., Ripple, W.J., Laliberte, A.S., Brashares, J.S. (2009). The Rise of the Mesopredator. *BioScience* 59: 779–791. Salo P, Nordström M, Thomson RL, Korpimäki E. (2008). Risk induced by a native top predator reduces alien mink movements. *J Anim Ecol.* 77(6):1092-8

Sergio, F. & Hiraldo, F. (2008) Intraguild predation in raptor assemblages: a review. *Ibis* 150 (Suppl. 1), 132–145

Watson, M. (2004). The Effects of Raptor Predation on Grey Partridges *Perdix perdix*. Unpublished D.Phil. thesis. Linacre College, Oxford.

Further information on legislation and licencing can be found on the [NatureScot website](#).

[Scotland's National Priority Species \(Farm Advisory Service\)](#)

[How to Provide for Wading Birds \(Farm Advisory Service\)](#)

[Managing Predators \(Farm Advisory Service\)](#)

Author:

Paul Chapman, SAC Consulting