Our ref: NRWWBCFE2021

BASC
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Wild Bird Review Call for Evidence,
Natural Resources Wales,
Maes y Ffynnon,
Bangor,
LL57 2DW.

By email to Wildbird.Review@cyfoethnaturiolcymru.gov.uk

British Association for Shooting and Conservation (BASC) response to Natural Resource Wales (NRW) Wild Bird Review Call for Evidence

Introduction

The British Association for Shooting and Conservation (BASC) is the UK's largest representative body for shooting, with approximately 150,000 members. Our members and other managers of wildlife rely upon appropriate, clear and workable general licences to enable necessary control of birds to prevent damage to livelihoods, wildlife and the environment and people's health and safety.

We have chosen to respond by letter to this Call for Evidence because it enables us to clearly communicate our findings and recommendations. BASC has encouraged its members to provide responses directly to this survey to provide further evidence and information from practitioners.

Therefore, this is BASC's organisational response alone. Where we have presented information from surveys relevant to Wales alone or wider surveys, we have made this clear.

Below is our detailed response which is structured in line with the questionnaire provided.

If we can be of assistance, please do not hesitate to contact us.

Yours sincerely,

Steve Griffiths
Director Wales

About you

1. What is your name?

Steve Griffiths

2.It would be helpful if you could provide us with an email address, in case we need to contact you in relation to any evidence you have submitted

steve.griffiths@basc.org.uk

3. If you are responding on behalf of an organisation, please tell us which one
Your organisation (if applicable)

British Association for Shooting and Conservation (BASC)

4. If you are based in the UK, what is the first part of your postcode (for example "LL57")? If you are based outside UK, please tell us where
Where are you based?

LL12

5. What is the reason for your interest in the shooting and trapping of wild birds in Wales or destruction of eggs and nests? (please tick all those that apply to you)

BASC has a membership of approximately 150,000 and its head office is based in Wales. BASC's mission is to promote and protect sporting shooting and advocate its conservation role throughout the UK. BASC's role is to represent members' interests by providing an effective and unified voice for sustainable shooting sports; to benefit the community by providing education, promoting scientific research and advocating best practice in firearms licensing, habitat conservation, and wildlife and game management; and to promote the benefits of game as food.

BASC has 143 staff and its expertise in shooting matters is enhanced by its elected Council of members and extensive network of honorary representatives and volunteers.

BASC members and other managers of wildlife rely upon appropriate, clear and workable general licences to enable necessary control of birds to prevent damage to livelihoods, wildlife and the environment and people's health and safety.

The areas listed in the call for evidence which are of interest to BASC are as follows.

Academic/scientific/research
Farming - arable
Farming - livestock
Gamebirds
Pest control
Recreation
Wildfowling
Wildlife conservation

6. Would you like us to contact you directly when we publish information or make any announcements about the review?

Yes

7. Do you have any evidence of particular species of wild birds in Wales causing problems, such as damaging crops, livestock or fisheries, posing a risk to public health or safety, or harming the conservation of other species?

In response to NRW's review of general licences in Wales, BASC ran a survey in July 2019 to gather practitioner evidence to inform its response. The survey collected responses from nearly 1,000 individuals who controlled pest birds in Wales – shooters, pest controllers, conservationists, farmers, gamekeepers, landowners, land managers, fisheries owners or managers, and others.

Respondents were asked which species they controlled under GLs in Wales, and for which purpose(s). In total, 3,859 uses of GL001 were reported, compared to 2,848 uses of GL002 and 1,114 uses of GL004.

Respondents were asked about the anticipated impacts to land, wildlife or human interests if pest birds could no longer be controlled in Wales. Most commonly, the comments of respondents highlighted agricultural damage as an issue for pigeons, jackdaw, rook and Canada goose. The impacts of carrion crow and all three gull species were most commonly reported as varied and therefore split into multiple categories. Impacts reported for jay and magpie most commonly fell into the conservation category.

77% of respondents believed financial damage would occur if they could no longer control pest birds. The species most often anticipated to cause financial damage were woodpigeon (89%), rook (84%) and Canada goose (84%). When asked to estimate the financial damage that would occur if pest birds could no longer be controlled in Wales under GL, the highest median estimates were given for woodpigeon at £2,000, followed by Canada goose at £1,500. Across all species, economic damage estimates totalled £2.7 million with a median of £6,240.

BASC also submitted evidence to the Defra call for evidence which is available here.

We would highlight that Defra has since renewed the general licences it issues. A number of species are included in these English ‘updated’ general licences which are currently not included under the equivalent Welsh licences.

8. Do you have any evidence about the effectiveness of lethal methods of controlling wild birds (through shooting, trapping or destruction of eggs/nests) as a way to prevent damage to crops or livestock or for protecting public health or safety?”

For control measures to be effective in the long term they need to represent an actual, rather than perceived, threat. Without any actual threat to the birds they will quickly habituate and resume causing damage.

Lethal control, through shooting, is an essential part of an overall control strategy and in fact it helps to reinforce the effectiveness of non-lethal methods by providing a degree of threat to the birds. Our response to question 11 should be read in tandem as it lays out evidence of specific non-lethal options many audio and visual deterrent’s effectiveness is enhanced alongside lethal control. For information the current English general licences recommend

shooting to scare and lethal control to improve the effectiveness of non-lethal options such as scarecrows.

Based on a survey BASC sent to its members that act under the General Licences, the addition of lethal control (mainly shooting) alongside each non-lethal method roughly doubled its effectiveness.

9. Do you have any evidence that lethal control of corvid species (the 'crow family', which includes carrion crow, magpie, jay and jackdaw) leads to increases in populations of other species of birds?

Carrion crow - *Corvus corone*

Carrion crows are known nest predators and a number of studies have shown the negative impacts they have on nest success and bird populations, with Madden, Arroyo, & Amar, (2015)[1] showing them to have a 60% probability of negative effects on prey species productivity. Red Foxes and Carrion Crows are considered to be amongst the most important predators of wader eggs in Britain[2], particularly curlew[3] and corvids, including Carrion Crow, were the second most important nest predators of skylarks in the Netherlands[4]. Lethal control which limits predator abundance is shown to help the nest success and recovery of passerine and wader populations that are declining locally[5],[6]. Lethal control of Carrion Crows and Red Foxes has led to a greater than threefold increase in Curlew breeding success, and annual increases in breeding numbers and where no predator control occurred, only 15% of Curlew pairs produced young (Brown et al. 2015)[3].

Our survey results showed that an average of 82% of respondents carry out control on carrion crows and spent an average annual total of 60,107 days carrying out such control, but populations continue to rise. When asked about the importance of controlling each species under the general licence, an average of 85% of respondent thought that the control of carrion crows was 'very important'. Without this vital control the carrion crow population could rise drastically and cause severe consequences for other bird populations. The averages (means) were taken from our survey results from Scotland and Wales.

[1] Madden C.F., Arroyo B.E. & Amar, A. (2015) A review of the impacts of corvids on bird productivity and abundance. Ibis, 157(1).
[2] Seymour, A.S., Harris, S., Ralston, C., & White, P.C.L. (2003). Factors influencing the nesting success of Lapwings (*Vanellus vanellus*) and behaviour of Red Fox (*Vulpes vulpes*) in Lapwing nesting sites. Bird Study, 50, 39 - 46.
[3] Brown, D. et al. (2015) 'The Eurasian Curlew-the most pressing bird conservation priority in the UK?', British Birds, 108(11), pp. 660–668.
[4] Praus, L. et al. (2014) 'Predators and Predation Rates of Skylark Alauda arvensis and Woodlark Lullula arborea Nests in a Semi-Natural Area in the Netherlands', Ardea. Netherlands Ornithologists' Union, 102(1), pp. 87–94. doi: 10.5253/078.102.0112.
[5] Fletcher, K. et al. (2010) 'Changes in breeding success and abundance of ground-nesting moorland birds in relation to the experimental deployment of legal predator control', Journal of Applied Ecology, 47(2), pp. 263–272. doi: 10.1111/j.1365-2664.2010.01793.x.
[6] Sage, R. B. and Aebischer, N. J. (2017) 'Does best-practice crow Corvus corone and magpie Pica pica control on UK farmland improve nest success in hedgerow-nesting songbirds? A field experiment', Wildlife Biology. Wildlife Biology, 2017(1), p. wlb.00375. doi: 10.2981/wlb.00375.

Jackdaw - *Corvis monedula*

Jackdaws are also known nest predators and have the potential to cause serious damage to birds and impact nest success. Jackdaws, magpies, and rooks are the main nest predators on yellowhammers, a rapidly declining, red-listed species in the UK[7] (Dunn, Hamer, & Benton, 2010). Jackdaws have featured in several other studies; they have been documented removing spotted flycatcher eggs from the nest one at a time and carrying them away[8] (, they also have the capacity to dominate nest boxes during spring months which can have an impact on nesting birds such as Great Tit[9]. Jackdaw have been recorded depredating Tufted Duck nests in Scotland[10], Sky Lark nests in the Czech Republic[11] and were seen to predate on lapwing chicks in a study by Teunissen, Schekkerman, Willems, & Majoor, (2008)[12].

Jackdaws have been reported predating nests of bird species such as lapwing, black-tailed godwit, swift and skylark. Jackdaws can dominate nest boxes, preventing their use as nesting and breeding sites by species of conservation interest such as red squirrels[13].

Our survey results showed that an average of 62.5% of respondents carry out control on jackdaws and spent an average annual total of 46,172.5 days carrying out such control. When asked about the importance of controlling each species under the general licence, an average of 71% of respondent thought that the control of jackdaws was 'very important'. Without this vital control the jackdaw population could rise drastically and cause severe consequences for other bird populations. The averages (means) were taken from our survey results from Scotland and Wales.

Jay - *Garrulus glandarius*

Jays are well known predators specialising in woodland and patchy woodland and farmland habitats. There are a number of studies highlighting jays as important nest predators of songbirds and jays are responsible for 29% of studied predation events on open songbird nests in Europe[14]. In a study by Schaefer (2004)[15] jays were the most common nest predator

[7] Dunn, J. C., Hamer, K. C. and Benton, T. G. (2010) 'Fear for the family has negative consequences: Indirect effects of nest predators on chick growth in a farmland bird', Journal of Applied Ecology, 47(5), pp. 994–1002. doi: 10.1111/j.1365-2664.2010.01856.x.
[8] Stevens, D. K. et al. (2008) 'Predators of Spotted Flycatcher Muscicapa striata nests in southern England as determined by digital nest-cameras', Bird Study, 55(2), pp. 179–187. doi: 10.1080/00063650809461520.
[9] Shuttleworth, C. M. (2001) 'Interactions between the red squirrel (Sciurus vulgaris), great tit (Parus major) and jackdaw (Corvus monedula) whilst using nest boxes', Journal of Zoology, 255(2), pp. 269–272. doi: 10.1017/S0952836901001339.
[10] Liordos, V. and Lauder, A. W. (2015) 'Factors Affecting Nest Success of Tufted Ducks (Aythya fuligula) Nesting in Association with Black-Headed Gulls (Larus ridibundus) at Loch Leven, Scotland', Waterbirds, 38(2), pp. 208–213. doi: 10.1675/063.038.0211.
[11] Praus, L. and Weidinger, K. (2010) 'Predators and nest success of Sky Larks Alauda arvensis in large arable fields in the Czech Republic', Bird Study, 57(4), pp. 525–530. doi: 10.1080/00063657.2010.506208.
[12] Teunissen, W. et al. (2008) 'Identifying predators of eggs and chicks of Lapwing Vanellus vanellus and Black-tailed Godwit Limosa limosa in the Netherlands and the importance of predation on wader reproductive output', Ibis, 150(SUPPL.1), pp. 74–85. doi: 10.1111/j.1474-919X.2008.00861.x.
[13] Shuttleworth, C. M. (2001) 'Interactions between the red squirrel (Sciurus vulgaris), great tit (Parus major) and jackdaw (Corvus monedula) whilst using nest boxes', Journal of Zoology, 255(2), pp. 269–272. doi: 10.1017/S0952836901001339.
[14] Weidinger, K. (2009) 'Nest predators of woodland open-nesting songbirds in central Europe', Ibis, 151(2), pp. 352–360. doi: 10.1111/j.1474-919X.2009.00907.x.
[15] Schaefer, T. (2004) 'Video monitoring of shrub-nests reveals nest predators', Bird Study, 51(2), pp. 170–177. doi: 10.1080/00063650409461349.

of blackcaps and were responsible for 46% of nest losses. Jays were also found to be the most common nest predator of spotted flycatcher, a red listed and biodiversity action plan species and were responsible for 60% of all predation events in which they predated on both eggs and chicks[16],[17]. Jays and magpies were identified as the most important nest predators of blackbird and song thrush. Nest failure rate was higher where corvids were more abundant and this effect was strongly significant for blackbird[18].

Our survey results showed that an average of 44.5% of respondents carry out control on jays and spent an average annual total of 30,842.5 days carrying out such control. When asked about the importance of controlling each species under the general licence, an average of 65.5% of respondent thought that the control of jays was 'very important'. The averages (means) were taken from our survey results from Scotland and Wales.

Magpie - *Pica pica*

Magpies are known nest predators and can cause serious damage to songbirds, waders and game birds. In a study by Dunn et al., (2010)[19] magpies were found to cause behaviour changes in songbirds which have negative impact on chick growth, condition and subsequent survival rates. The majority of nest failures in this study were due to corvids, namely, magpies, jackdaws and rooks. Groom, (1993)[20] found that just 5% of blackbird nests produced fledged young in an urban environment with high densities of magpies. The majority of identifiable predation events were attributed to magpies in this study. Again, the control of this species has shown to increase the nest success of many species and subsequent population recovery of vulnerable species. See here and here for examples of magpies taking wild birds. Further research into the extent of damage by this species is required.

Research has shown that removing carrion crows and magpies affected the nest success of hedgerow-nesting songbirds, with songbird nest success was down by 10-16% in non-removal sites on average than at removal sites[21].

Our survey results showed that an average of 77.5% of respondents carry out control on magpies and spent an average annual total of 56,959.5 days carrying out such control. When asked about the importance of controlling each species under the general licence, an average of 83.5% of respondents thought that the control of magpies was 'very important'. The averages (means) were taken from our survey results from Scotland and Wales.

[16] Bolton, M. et al. (2007) 'Remote monitoring of nests using digital camera technology', Journal of Field Ornithology, 78(2), pp. 213–220. doi: 10.1111/j.1557-9263.2007.00104.x.
[17] Stevens, D. K. et al. (2008) 'Predators of Spotted Flycatcher Muscicapa striata nests in southern England as determined by digital nest-cameras', Bird Study, 55(2), pp. 179–187. doi: 10.1080/00063650809461520.
[18] Paradis, E. et al. (2000) 'Large-scale spatial variation in the breeding performance of song thrushes Turdus philomelos and blackbirds T. merula in Britain', Journal of Applied Ecology, 37(SUPPL. 1), pp. 73–87. doi: 10.1046/j.1365-2664.2000.00547.x.
[19] Dunn, J. C., Hamer, K. C. and Benton, T. G. (2010) 'Fear for the family has negative consequences: Indirect effects of nest predators on chick growth in a farmland bird', Journal of Applied Ecology, 47(5), pp. 994–1002. doi: 10.1111/j.1365-2664.2010.01856.x.
[20] Groom, D. W. (1993) 'Magpie pica pica predation on blackbird turdus merula nests in urban areas', Bird Study, 40(1), pp. 55–62. doi: 10.1080/00063659309477129.
[21] Sage, R. B. and Aebischer, N. J. (2017) 'Does best-practice crow Corvus corone and magpie Pica pica control on UK farmland improve nest success in hedgerow-nesting songbirds? A field experiment', Wildlife Biology. Wildlife Biology, 2017(1), p. wlb.00375. doi: 10.2981/wlb.00375.

Rook - *Corvus frugilegus*

Rooks are cited as being key nest predators in a number of papers[22],[23]. They are also known predators of bats however the impact they have on bat populations is unknown[24]. Further research is needed in this area to investigate the scale of damage caused by this species before it is removed from the general licence to prevent any potential damage occurring. Although the current population trend shows a decline in this species it remains green listed due to the large population and therefore is likely to still be causing large amounts of damage.

Our survey results showed that an average of 49.5% of respondents carry out control on rooks and spent an average annual total of 37,026.5 days carrying out such control. When asked about the importance of controlling each species under the general licence, an average of 83.5% of respondents thought that the control of rooks was 'very important'. The averages (means) were taken from our survey results from Scotland and Wales.

BASC evidence submitted to Natural Resources Wales' call for evidence on a review of firearms policy outlined the following:

- Predator control, in combination with habitat management, has been found to reverse the local declines of farmland bird species such as song thrush, whitethroat, dunnock and blackbird[25].
- Corvids are one of the most important groups of avian nest predators[26],[27], and management for shooting, which includes the removal of corvids, can lead to significant increases in passerine breeding success [25]. Furthermore, jays can be responsible for up to 40 per cent of all nest predation in blackcaps[28]. Research has found that the most effective control is where mammalian and avian predators are both removed[29],[30].

[22] Dunn, J. C., Hamer, K. C. and Benton, T. G. (2010) 'Fear for the family has negative consequences: Indirect effects of nest predators on chick growth in a farmland bird', Journal of Applied Ecology, 47(5), pp. 994–1002. doi: 10.1111/j.1365-2664.2010.01856.x

[23] Roos, S. et al. (2018) 'A review of predation as a limiting factor for bird populations in mesopredator-rich landscapes: a case study of the UK', Biological Reviews, 93(4), pp. 1915–1937. doi: 10.1111/brv.12426.

[24] Speakman, J. R. (1991) 'The impact of predation by birds on bat populations in the British Isles', Mammal Review, 21(3), pp. 123–142. doi: 10.1111/j.1365-2907.1991.tb00114.x.

[25] Stoate, C. and Szczur, J. (2001) 'Could game management have a role in the conservation of farmland passerines? a case study from a leicestershire farm', Bird Study, 48(3), pp. 279–292. doi: 10.1080/00063650109461228.

[26] Andren, H. (1992) Corvid Density and Nest Predation in Relation to Forest Fragmentation: A Landscape Perspective. Ecology, 73(3): 794-804.

[27] Anglestam P. (1986) Predation on Ground-Nesting Birds' Nests in Relation to Predator Densities and Habitat Edge. Oikos, 47(3), 365–373.

[28] Weidinger, K. (2009) 'Nest predators of woodland open-nesting songbirds in central Europe', Ibis, 151(2), pp. 352–360. doi: 10.1111/j.1474-919X.2009.00907.x.

[29] Bodey, T. W. et al. (2011) 'Absence of effects of predator control on nesting success of Northern Lapwings Vanellus vanellus: Implications for conservation', Ibis, 153(3), pp. 543–555. doi: 10.1111/j.1474-919X.2011.01132.x.

[30] Madden C.F., Arroyo B.E. & Amar, A. (2015) A review of the impacts of corvids on bird productivity and abundance. Ibis, 157(1).

NRW considered this evidence along with other submissions and concluded in their synthesis of evidence that: *"Priority species identified under legislation or local biodiversity plans can be vulnerable to predation by non-native and native predators. Evidence demonstrates that predator control is important where the impacts threaten the favourable condition of populations of priority species."*

10. Do you have any evidence that lethal control of fish-eating birds, in particular cormorant and goosander, leads to increases in wild fish populations?

Goosander - *Mergus merganser*

This is a piscivorous species which has been increasing throughout the UK since 1990 and that has been noted as causing localised issues with fish stocks, particularly in Scotland. According to Feltham, (1995)[31] goosanders have been estimated to predate upon 8,000-15,000 salmon smolts annually which equates to 3-16% of the annual production. Harris *et al.*, (2008)[32] concludes that there is evidence to suggest sawbill ducks may have population level impacts on salmon fisheries in certain areas, however, the extent of these impacts is still unknown. Further research is needed into this area to investigate the potential for damage in Wales by this species. We have no direct evidence of damage but results from our Scotland general licence survey which ran in 2019, 18% of our Scottish respondents felt that goosander should be added to GL01 and GL02 to reduce impacts on fish stocks.

Cormorant - *Phalacrocorax carbo*

Cormorant numbers throughout Europe have increased substantially between 1987 and 2015 however more recently have shown rapid declines in central Europe and a stable population in north west Europe. These population increases, especially of the inland *sinensis* subspecies, have resulted in concerns for both farmed and wild fish stocks. According to Humphreys et al. (2016)[33], out of the piscivorous species considered (cormorant, red-breasted merganser and goosander), cormorants were seen to cause the most damage over a broad range of fishery types. Cormorants were also seen to have sub-lethal effects such as wounding, behavioural changes and negative effects on fish condition.

A study into the diet and prey selection of cormorants at Loch Leven estimated that over the 7-month period cormorants consumed 80,803 brown trout and 5,213 rainbow trout compared to the annual fishery catches of 5,828 brown trout and 12,815 rainbow trout. It was suggested that the stocking has led to an increase in cormorant numbers and a subsequent increase in predation which is limiting the trout population[32],[34]. Cowx (2007)[35] discusses how shooting is however not an effective mitigation method as it did not seem to reduce the cormorant population, possibly because Loch Leven is just part of a larger cormorant population's range and therefore these cormorants were just replaced. Further research is needed into the extent of damage caused in Wales by cormorants and other piscivorous birds.

[31] Feltham, M. J. (1995). 'Consumption of Atlantic salmon smolts and parr by goosanders: estimates from doubly-labelled water measurements of captive birds released on two Scottish rivers.' Journal of Fish Biology, 46(2), 273-281.
[32] Harris, Catriona M., et al. (2008) 'Impacts of piscivorous birds on salmonid populations and game fisheries in Scotland: a review.' Wildlife biology 14.4: 395-411.
[33] Humphreys, E. M. et al. (2016). 'An update of the review on the impacts of piscivorous birds on salmonid populations and game fisheries in Scotland.' Available at: https://www.nature.scot/sites/default/files/Publication 2016 - SNH Commissioned Report 884 - An update of the review on the impacts of piscivorous birds on salmonid populations and game fisheries in Scotland.pdf.
[34] Stewart, D. C. et al. (2005) 'Diet and prey selection of cormorants (Phalacrocorax carbo) at Loch Leven, a major stocked trout fishery', Journal of Zoology, 267(2), pp. 191–201. doi: 10.1017/S0952836905007387.
[35] Cowx, I. G. (2007). 'Interactions Between Fish and Birds: Implications for Management,'. doi: 10.1002/9780470995372.

11. Do you have any evidence about the effectiveness of alternative non-lethal methods of addressing problems that wild birds may be causing, such as damaging crops, livestock or fisheries, posing a risk to public health or safety, or harming the conservation of other species?

Alternatives to killing or taking bird species for conserving flora and fauna, preserving public health or safety, and preventing serious damage or disease, do not reduce the overall level of damage at a landscape scale, but simply redistribute that damage. Therefore, the alternatives are neither effective nor practicable to killing or taking bird species.

It should also be pointed out that the general licences are intended to prevent issues and damage. EU guidance on the Birds Directive makes it clear that it is not a response to already proven damage, but of the strong likelihood that this will take place in the absence of action.

It is also vital that NRW understand that preventing issues often require the action to be taken either throughout the year and often at some critical periods.

For control measures to be effective in the long term they need to represent an actual, rather than perceived threat. Without any actual threat to the birds they will quickly habituate and resume causing damage. Lethal control, through shooting, is an essential part of an overall control strategy and helps to reinforce the effectiveness of non-lethal methods by providing a degree of threat to the birds.

Table 1. Assessment of alternatives to killing or taking bird species for conserving flora and fauna, preserving public health or safety, and preventing serious damage or disease.

	Non-lethal method/deterrent				
	Visual	Auditory	Chemical	Exclusion	Habitat modification
Conserving flora and fauna	-	-	-	-	o
Preserving public health or safety	+/o	O	-	+	+
Preventing serious damage or disease	+/o	+/o	+	+	o

+ can be effective; o *limited effectiveness or difficult to implement; - ineffective or impossible to implement*

For a number of situations there is simply no effective alternative to lethal control. For example, visual, auditory and chemical deterrents could not be used to prevent corvid predation on threatened bird species as the deterrents are as likely to scare away the protected bird as they are to scare the corvids. Additionally, lethal control is often used to control feral pigeons to preserve public health and safety around ports by reducing the local population at times when, or in places where, members of the public aren't present. Exclusion techniques tend not to work as netting becomes fouled by the birds creating a larger hazard and is impractical over large areas, auditory deterrents can't be used due to the proximity of members of the public and birds quickly habituate to visual deterrents.

In the scientific literature on bird deterrents lethal shooting is often described as effective, but expensive. However, this cost is invariably borne by the individual shooter, not by the farmer, countryside manager or society. This cost is borne willingly on the understanding that the shooter often receives favourable access to other shooting opportunities on the land (for example game shooting or deer stalking), provides a community benefit and also that the shooter will not have to bear unnecessary or burdensome restrictions while working for the public good.

By introducing additional requirements there is a risk that shooters will no longer willingly bear the costs and that the burden will be passed to others. In the case of conserving flora and fauna it could be the public that are required to bear this cost either through loss of biodiversity and ecosystem functions or through paying for professional bird scarers/controllers. Society could therefore face increased food costs to protect crops. Ultimately, any non-lethal method does not reduce the overall level of damage at a landscape scale, but simply redistributes it. Lethal control can significantly reduce local damage through small scale population control, but without impacting on the overall population.

For species in favourable conservation status, such as woodpigeon and corvids, lethal control (as has been practiced in the UK), is a cost-effective method that does not compromise the conservation status of the species being controlled; and allows farmers and countryside managers to target control where the issue is greatest. Additionally, it complies with the Birds Directive provisions including that there be “no other satisfactory solution” as shooting is required to supplement the effectiveness of non-lethal solutions and prevent birds’ habituation.

Some literature also suggests that it is possible that once birds habituate to a scaring device, it could then work as a cue indicating the presence of available food[36]. Under these circumstances, it would attract birds to the crop as they have learned that food is available when the cue is present. Therefore, as well as being ineffective, scaring may actually escalate damage levels.

BASC’s survey of general licence users in Wales July 2019 asked respondents how effective non-lethal methods were when tried alone and alongside shooting. A total of 656 respondents answered this question. Results showed:

(a) Visual, chemical, exclusion and habitat modification methods were most commonly rated ineffective on their own (60%, 79%, 67% and 78% respectively) and alongside shooting (43%, 58%, 53%, 56% respectively);

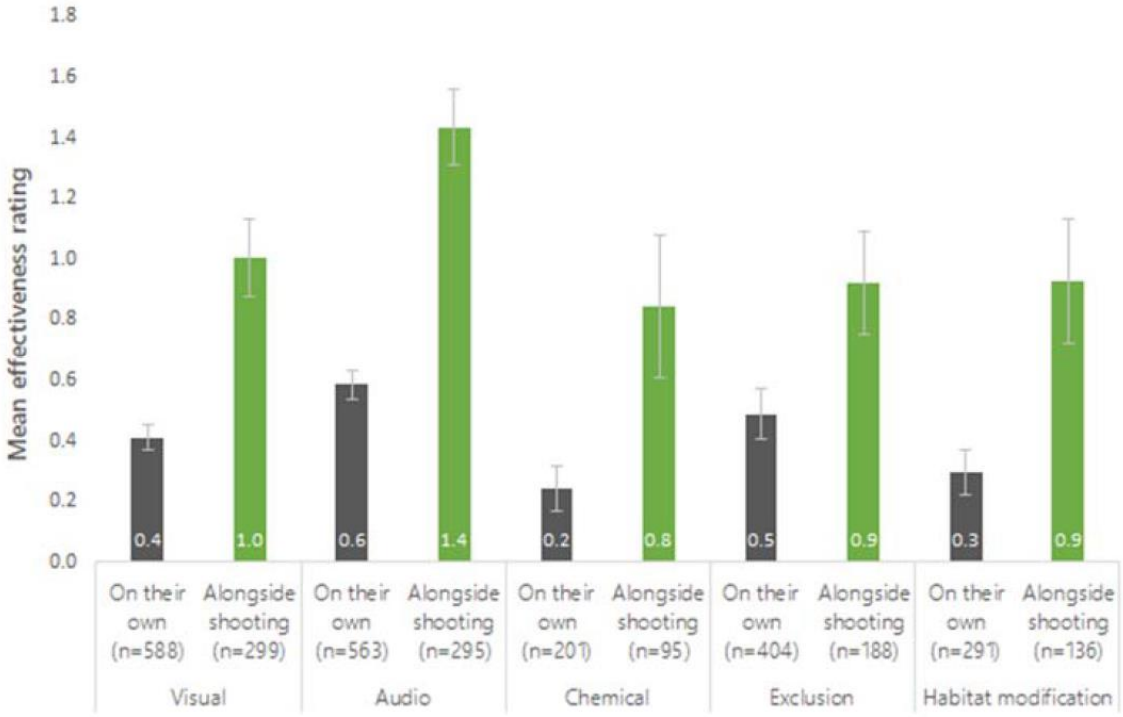
(b) Audio methods were most commonly rated effective in the short term both on their own (54%) and alongside shooting (41%).

Effectiveness ratings were assigned a score between 0 and 3 (where 0 = not effective, 1 = effective in the short term, 2 = effective in the long term and 3 = effective in the short and long term). The option ‘have not tried’ was discounted.

Mean effectiveness ratings were then compared across different methods when they were used alone and without shooting. This analysis showed that when used alongside shooting, alternative methods were consistently rated as more effective on average than when used alone, roughly doubling their average effectiveness ratings. These differences were statistically significant (Figure 1).

[36] Conover, M. R. and Perito, J. J. (1981) ‘Response of Starlings to Distress Calls and Predator Models Holding Conspecific Prey’, Zeitschrift für Tierpsychologie, 57(2), pp. 163–172. doi: 10.1111/j.1439-0310.1981.tb01320.x.

Figure 1: Mean effectiveness ratings of alternative (non-lethal) control methods, according to respondents to BASC's survey of general licence users in Wales



Key: Error bars = 2 standard error
Rating scale: 0= not effective, 1= effective in the short term, 2= effective in the long term, 3= effective in the long and short term

Deterrent techniques

Each of the main categories of non-lethal control are discussed in turn below. Each section begins with the relevant paragraph from the executive summary of an extensive 2003 Defra review on the effectiveness of these techniques[37]. This review covers many of the techniques in significant detail and so no attempt is made to replicate their review of the literature.

Visual deterrent techniques

"*Visual techniques range from extremely effective (human disturbance) to ineffective (most scarecrows). Effectiveness depends on how real a threat they are perceived to be (predators and their models) or how much they are perceived to interfere with movement (tapes and wires).*"

The most common visual deterrent is a scarecrow, but modern techniques include laser fences or grids, inflatable mannequins and raptor-like kites. Lasers have been trialled to reduce goose damage but are of limited use for preventing woodpigeon or crow damage, as these birds feed in daylight and laser deterrents are most effective at night. Additionally,

[37] Bishop, J. D. et al. (2003) 'Review of international research literature regarding the effectiveness of auditory bird scaring techniques and potential alternatives', Department of Food and Rural Affairs, (December), pp. 1–52. Available at: https://www.researchgate.net/publication/242454383

there are human health concerns associated with these devices, which has prevented their widespread use.

Scarecrows are generally ineffective at deterring birds and at best provide only short-term protection, even if they are realistic and regularly moved. Real humans, however, can be very effective scarers, though obviously, the effect is short-lived and relies on a more or less continuous human presence. Other predator mimicking techniques such as inflatable mannequins and raptor-like kites can have short-term deterrent effects but do not appear to be universally effective. These techniques also seem to only work over very restricted areas and so are not practical to implement at a farm scale.

Drones have been trialled in Scotland to deter geese from arable fields. Although these have proved effective in some circumstances they have not led to significant long-term reductions in damage, are costly to buy and run (as they require an operator) and birds still rapidly habituate to them.

Auditory deterrent techniques

"*Auditory techniques in general are thought to be relatively effective, although subject to habituation and hence of short-term benefit. Much of the information on noise is unpublished and not generally available. Artificial noises, ultrasonics and high intensity sound are either ineffective or unsafe*."

Auditory deterrents can include ultrasonic emitters, predator or distress calls and gas cannons. Clearly, almost all auditory deterrents are non-selective and have the potential to deter all birds from an area, regardless of their conservation status; this limits their use in conserving fauna. Furthermore, there are significant public nuisance issues associated with the use of gas cannons and an increase in their use is likely to generate significant public concern. This also restricts their use in protecting public health and safety as in many of the cases where action is needed there is often a significant public presence whose health and safety needs protecting – this would not be well served through the use of repeated loud noises in excess of the threshold for damage to human hearing.

For auditory deterrents to be effective they need to vary their timing and direction. However, even if used appropriately, birds can quickly habituate to auditory deterrents meaning that they become useless in a few days to weeks. A single gas cannon can protect approximately 7ha of crop – based on 4-10ha protected by blackbirds[38] and similar results summarised in a 2003 Defra review[39]. The UK has a total arable land area of 17.5 million ha[40], meaning it would take 2.5 million gas cannons to fully protect all crops. At an average price of approximately £320 per gas cannon this would mean there would be a required investment of £800 million without accounting for batteries and propane.

There is a code of practice in place for the use of bird scarers[41] which recognises their potential to cause significant nuisance, as well as the fact that they are most effective when used alongside lethal control. An analysis of FOI requests related to gas cannons found that

[38] Potvin, N. and Bergeron, J. M. (1981) 'Different modifications in the use of the acetylene cannon as a deterrent against blackbird damage to forage corn', AGRIS, 62(1), pp. 22–32.
[39] Bishop, J. D. et al. (2003) 'Review of international research literature regarding the effectiveness of auditory bird scaring techniques and potential alternatives', Department of Food and Rural Affairs, (December), pp. 1–52. Available at: https://www.researchgate.net/publication/242454383
[40] Defra. (2018). 'Farming Statistics Provisional crop areas, yields and livestock populations At June 2018 - United Kingdom'. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/747210/structure-jun2018prov-UK-11oct18.pdf
[41] National Farmers Union. (2017). 'Download our Bird Scarers Code of Practice'. Available at: https://www.nfuonline.com/news/latest-news/download-our-bird-scarers-code-of-practice/

there were an average of 15.3 complaints per year in the District Councils that released information, but with a pronounced increase more recently. There are a total of 192 District Councils in England[42] meaning there could be up to 2,880 noise complaints per year linked to gas cannons, and clearly these are likely to increase significantly if the newly-issued general licences are not simplified.

The effectiveness of auditory deterrents is greatly aided by lethal shooting which ensures that birds associate the noise with a real risk, rather than just a startle response.

Chemical deterrent techniques

"*Chemical techniques are generally found to be very effective in laboratory and cage trials, but less effective in the field. They are also relatively expensive and are time-consuming and difficult to apply. Only two chemicals are licensed for use as bird repellents in the UK*."

Chemical repellents can be taste, behavioural or tactile repellents. Given the cost (both of the repellent itself and the labour to apply it) these are not widely used in the UK. There is conflicting evidence around their effectiveness and given the cost it seems unlikely that many farmers would risk using a potentially ineffective product.

Clearly, chemical repellents cannot be used for conserving flora and fauna and are difficult to use to protect human health and safety. Tactile repellents can be used to keep birds off surfaces but these can be costly to maintain.

Exclusion deterrent techniques

"*Exclusion techniques are usually extremely effective. Efficacy depends on the degree to which birds are excluded, but the greater the exclusion the more expensive. They therefore tend to be restricted to high value crops or costly damage.*"

One of the most effective methods for protecting crops from birds is to entirely exclude birds using netting. Exclusion can also be useful for keeping birds out of warehouses, and off structures. However, exclusion is very expensive, and is not a satisfactory solution for the protection of arable landscapes. Additionally, exclusion can't be used to conserve fauna without risking excluding the fauna you are seeking to protect and may potentially result in significant, unintentional consequences such as depriving birds of prey of hunting ground. Wires and coloured tape can also be used, but birds can habituate to this very quickly. For example, experience from Islay shows that within a week of fully covering a fresh grass field with a tight mesh of red and white tape the geese had habituated to the tape and found ways to access the field and graze underneath the tape.

Habitat modification deterrent techniques

"*Habitat modification techniques are generally considered to be effective and environmentally friendly but are rarely investigated scientifically. It seems likely, however, that that they will be shown to be cost-effective in a variety of situations.*"

Habitat modification, such as reducing fertilizer use on amenity grasslands, or growing unpalatable plants can be very effective methods. However, where specific crops are grown it is clearly not feasible to use many habitat modification methods.
Alternative feeding areas have been used successfully in a number of areas and are especially effective when they are subsidised by the government as part of nationwide,

[42] Local Government Information Unit. (2021). 'Local government facts and figures: England'. Available at: https://lgiu.org/local-government-facts-and-figures-england/

integrated damage control plans. Without subsidy these schemes tend to be prohibitively expensive to farmers due to a combination of loss of productive land, and expenditure on “more attractive” sacrificial crops.

There is a role for habitat modification in protecting flora and fauna. However, there may be limits to the type of modifications that can be conducted and there are likely to be unintended consequences for other species.

12. Have you (personally, or as an organisation) in the past 5 years used any of NRW’s general licences allowing the lethal control of wild birds?

No. BASC has office premises in Wales and there has not been a need to control wild birds on these. In response to NRW's review of general licences in Wales, BASC ran a survey in July 2019 to gather practitioner evidence to inform its response.

13. Have you (personally or as an organisation) in the past 5 years used or applied for one or more specific licences from NRW to control wild birds (of any species) by shooting, trapping or destruction of eggs or nests?

No. BASC has office premises in Wales and there has not been a need to control wild birds on these. However, many of our members do control wild birds. Some of this will be on land either they own, or they take a sporting licence for, hence being classed as an occupier. The main findings of a BASC survey on General Licences in Wales are listed in our response to question 7.

14. Have you (personally or as an organisation) in the past 5 years applied to NRW for consent or assent (under section 28 of the Wildlife and Countryside Act 1981) to carry out operations which entail killing or taking of wild birds in or near an SSSI?

BASC has applied for consent on SSSI, operating in effect as agents for some of our clubs and syndicates who need to gain consent for sustainable shooting. We have limited applications for BASC itself so that we are able to issue shooting permits on certain SSSI.

Shooting occurs over at least two thirds of the UK and BASC provides advice on shooting within protected sites to members who then may go onto apply for consent. We recommend them to always include the ability to control species on the current general licences as part of any wider notice for shooting and conservation activities. We believe that general licence use on protected sites is often overlooked by both the applicant and the competent authority but have no evidence of it ever being declined when applied for.

15. Do you know of any published or unpublished reports, surveys or other evidence about the use of cage traps to catch wild birds in Wales?

The main findings of a BASC survey on General Licences in Wales are listed in our response to question 7. The survey by BASC found that of 1000 respondents asked, 28% stated that they used only trapping to control pest bird species, 19% stated that they used shooting combined with trapping and 2% stated that they used traps alongside all other legal means of control.

16. Have you (personally or as an organisation) in the past 5 years used a cage trap to catch wild birds in Wales?

If yes, please tell us what type(s) of trap you have used, which species you have targeted and for what purpose and whether it was under a general or specific licence from NRW. We would also be interested to hear of any problems you have encountered with licence conditions relating to the use of cage traps.

No. BASC has office premises in Wales and there has not been a need to control wild birds on these. However, most of our members do control wild birds. Some of this will be on land either they own, or they take a sporting licence for, hence being classed as an occupier.

BASC supports the trapping of pest birds in line with our code of practice on trapping pest birds and adhering to the terms of the relevant general licence. BASC provides advice and guidance on trapping pest birds and also following the relevant general licence.

17. Would you be willing to take part in a more detailed survey on the use of cage traps in Wales?

Yes, BASC would be willing to assist with further evidence gathering from our members as we have done in the past for similar organisations.

BASC has staff who are experts in their field including pest and predator control and continues to be involved in a number of stakeholder and technical working groups such as the one in relation to the Agreement on International Humane Trapping Standards (AIHTS). BASC provides training and advice to not only its members but also government agencies such as the Police.

18. Do you have any other evidence which you think may be relevant to our review which you'd like to share with us?

The following are sources of information containing evidence that we wish to highlight. We understand NRW have access to responses made to Defra under their calls for evidence and stress that the evidence provided is equally applicable to Wales as it is any other home country in the UK. Please let us know if you do not have access to these responses.

British Association for Shooting and Conservation (BASC) response to Defra's call for evidence on general licences May 2019 https://0ld.basc.org.uk/wp-content/uploads/downloads/2019/05/BASC-CFE-on-GL-130519-updated.pdf

Benefits of General Licences (England) (BASC 2019) https://basc.org.uk/wp-content/uploads/downloads/2019/05/Benefits-of-general-licence-control-FINAL-V1.0-1.pdf

British Association for Shooting and Conservation (BASC) response to Defra's Wild Birds General Licence Survey December 2019 https://basc.org.uk/basc-responds-to-general-licence-consultation/

19. Do you want any part of your response to this call for evidence to be kept confidential?

No