Letters

Recovering the Eurasian Curlew in the UK and Ireland

In their paper on the conservation of the Eurasian Curlew *Numenius arquata* in June's *British Birds*, 'Recovering the Eurasian Curlew in the UK and Ireland: progress since 2015 and looking ahead' (Douglas *et al.* 2021), the authors (members of the UK and Ireland Curlew Action Group) referred to the 'immediate and overriding challenges facing Curlews' and cited, quite rightly, 'intense predation pressure' as one of the threats to the species. The paper concluded with 12 recommended 'priority actions', only one of which referenced this threat, effectively kicking the issue into the long grass by calling only for 'research into how to reduce mesopredator densities in the countryside'. Sufficient research has already been completed identify the origins of high densities of predators in the countryside, and the need for action now is urgent.

The Curlew population in Shropshire has declined by an estimated 77% between 1990 and 2010, to about 160 pairs (Smith 2019a), with further monitoring since then showing it has since declined to about 120 pairs. At the current rate, the population will have halved in 12 years, and virtually disappeared within 25. In reality, the decline is likely to be quicker, because, as a result of poor productivity in recent years, the population has become skewed towards older birds, and because declines often accelerate just prior to extinction due to fragmentation of the population.

Curlew monitoring and conservation work is well developed in Shropshire, and I have been involved since its start, in 2004. In 2015–16, before nest-fencing and radio-tracking were undertaken, the local Landscape Partnership Scheme Ground-nesting Birds Recovery Project found and monitored 33 Curlew nests using cameras: 27 of these nests were lost during the incubation stage, with Red Foxes *Vulpes vulpes* responsible in 15 cases. The remainder were predated by European Badgers *Meles meles* (4), deserted (2), destroyed by sheep (1), predated by corvids (1), and lost through unknown causes (4). From the six nests where chicks hatched, none fledged. One chick was lost to agricultural activities, and all others were predated.

This research led to setting up the Shropshire Ornithological Society 'Save our Curlews Campaign' in 2018, which adopted the practice of protecting nests with electric fencing. In total, in 2018–19 and 2021, 22 nests were found and fenced. Even then, only 14 (64%) of nests passed the incubation stage. In those three years, a total of 44 chicks were tagged and tracked, but only seven or eight of them (~17%) survived to fledging; the 2021 results are summarised in *Brit. Birds* 114: 568–569. For all of those where the body or tag was recovered, evidence showed that the chick had been predated. None of the tagged chicks were killed due to agricultural operations

The radio tags have proved reliable, and a loss of signal usually indicates that the bird (and/or the tag) has been taken underground (mainly by Foxes), or, less likely, carried out of range by an avian predator. One tag, still transmitting, was found embedded in Fox scat outside a Fox den a month after the chick was lost.

In 2021, 21 chicks were tagged. Of these, 19 were predated at less than eight days old, one was predated at 14 days, and one survived to fledging at c. 35 days. Discounting the single fledged bird, the average survival of the chicks was less than 5.5 days. While electric fences around nests improve hatching rates, they are expensive and time-consuming to put in place, and they do not protect chicks when they move away from the immediate vicinity of the nest. Even with electric fencing, fledging rates still fall far short of what is needed, and more radical measures are need.

There is thus strong evidence that the principal cause of mortality in Curlew chicks in Shropshire is predation and not, for example, agricultural activity. While addressing land-use policies is undoubtedly important – and five of the 12 recommended priority actions given by Douglas *et al.* relate to this and AES – if immediate and effective action to stop predation is not taken, Curlews will be largely extinct across southern England well before the results of better land-use policy can provide any respite for them. In the immediate future,

there is a need for the Curlew Action Group to focus primarily on action to reduce predation.

We have shown that the main predator of Curlew chicks in Shropshire is the Fox, and Harris (2021) produces clear evidence that the release of Common Pheasants *Phasianus colchicus* and other non-native gamebirds sustains the Fox population at much higher levels than it would otherwise be naturally. A minimum of 726,000 Pheasants were released for shooting in Shropshire in 2018 (Shrubsole 2019), though that is likely to be a substantial under-estimate (Madden 2021). The breeding population in the county is estimated at over 40,000 pairs (Smith 2019b; Wall 2019), all descended from releases for shooting. Numbers rose by 59% between 1994 and 2019 (BTO/JNCC/RSPB Breeding Bird Survey results), fuelled by an increasing number of birds released each year over the same period. Pheasants now breed across the entire county, although areas where birds are released for shooting occupy only a small part of it.

Our own research has been put into a national context by, for example, Roos *et al.* (2018), Pringle *et al.* (2019) and Mason *et al.* (2020), which show that Pheasants released for shooting increase the number of predators, particularly Foxes.

Mason *et al.*, of the RSPB Centre for Conservation Science, provided the scientific basis that informed the RSPB Review of Shooting Policy, announced at the AGM in October 2020. This new important policy includes calling for a reduction in the number of large-scale gamebird releases (www.rspb.org.uk/gamebirdreview).

Harris, a retired Professor from Bristol University, has published an extensive list of papers about Fox numbers and their impact. His 2021 paper included evidence to show that 'the number of Foxes supported by predating and/or scavenging non-native gamebirds has increased ten-fold since the turn of the century' and 'the gamebird-shooting industry provides enough supplementary food to support between 80,000 (based solely on predation rates) and 200,000 Foxes (assuming that all the gamebird carrion was also eaten by Foxes).'

Discussion is now taking place within the recently established Curlew Recovery Partnership (CRP, www.curlewrecovery.org) on predator control to help Curlews. However, Mason *et al.* and Harris both point out that control of Foxes by Pheasant shoots occurs most frequently when Pheasants are in their release pens, and shortly after release. Control occurs least frequently after the shooting season ends in February. If this Fox control is to help Curlews, it needs to have its maximum impact in the few weeks prior to nesting, in March and April. Fox control on estates has little long-term impact, because it is usually followed by an influx of replacements from outside.

More importantly, this control addresses only the symptoms, not the cause of the problem. The Game & Wildlife Conservation Trust (www.gwct.org.uk) website refers to the number of Foxes killed as part of predator control activities and reported through the National Gamebag Census (NGC). It states: 'There has been a continuous increase in the bag index since 1961, leading to it being more than three times higher in 2009 than in 1961.' Pheasant releases, it should be noted, increased ten-fold over the same period. With considerable understatement, the website article concludes: 'The widespread rearing and releasing of gamebirds has probably improved Fox food supply in autumn and winter.'

According to the NGC, an estimated 89,000 Foxes were killed in 2016; but that number did little or nothing to reduce predation of Curlews. This raises the question: How many Foxes need to be killed to have an impact on the Fox population in April? And do conservationists want to be associated with such a high level of killing? The only way forward is to make large-scale reductions in supplementary food for Foxes and other predators, i.e. the Pheasant population, in particular the number released each year – at a landscape scale.

The absence of any mention of the need to control Pheasant releases in the paper by Douglas *et al.*, let alone any proposed action in support of the unequivocal conclusion of the RSPB policy review, is surprising. Several of the authors are RSPB staff, and I expected that the organisation's policy review would feature strongly in the paper. Why, I wonder, was this omitted?

The interaction of factors that influence predation of Curlews is undoubtedly complex, but it is perverse to ignore taking immediate action to tackle the clear and obvious main

driver of the decline while researching less important influences.

If the Curlew is the 'UK's most pressing avian conservation priority' (Brown *et al.* 2015), an Action Plan is needed that addresses the main, current driver of its decline. We need to set suitably ambitious targets, taking into account the limited time we have left, such as reducing the number of Pheasants released annually to the number currently shot each year, within five years.

Every month that passes without action eats into the very limited time that we have left to save this iconic species from local extinction, so an Action Plan is urgent. It is also important that the Action Group takes a strong lead on this issue. A lot of hope has been invested in the CRP, but several of its members are rooted in the shooting industry, and the other CRP members will need considerable support if we are to have any chance of getting a large-enough reduction in Pheasant releases to help Curlews.

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Recovering the Eurasian Curlew in the UK and Ireland: a reply

Smith (pp.769–771) raises important points regarding the pressures facing the Eurasian Curlew. There is common ground between the views of Smith and those of the UK and Ireland Curlew Action Group, particularly on the threat posed to Curlews from predation. Below, we comment on the two key issues raised by Smith, namely the drivers of high predation pressure and how to reduce the impact of predators on breeding Curlews. While Smith comments on the policies of individual member organisations of the Group, we reiterate here that the Group comprises multiple organisations, and publications arising from the Group (e.g. Douglas *et al.* 2021, the current letter) reflect the views of the Group rather than the individual partner organisations.

Drivers of high Curlew predation

The drivers of high predation pressure on Curlew eggs and chicks are unlikely to be wholly explained by any single factor. Using the parlous state of the Curlew in Shropshire as a case study, Smith concludes that high predation pressure from Red Foxes *Vulpes vulpes* is driven by the release of Common Pheasants *Phasianus colchicus*, which provides a resource subsidy supporting inflated Fox abundance. While this is entirely biologically plausible, and there is some evidence that annual release of non-native Galliformes in the UK is correlated with higher abundance and inter-annual population growth rates of some avian predators (Pringle *et al.* 2019), there is still a shortage of evidence as to whether releasing gamebirds drives higher Fox abundance. This shortage of research is perhaps surprising given the long history in the UK of releasing gamebirds, but is highlighted as an evidence gap in multiple reviews on the topic (Madden & Sage 2020; Mason *et al.* 2020; Sage *et al.* 2020). The drivers of high predation pressure on Curlews across the UK and Ireland are likely to be complex. Additional known or potential drivers of mesopredator (e.g. Fox, Carrion *Corvus corone* and Hooded Crow *C. corax*) abundance in the UK and Irish countryside, which are high in the UK when put into a European-wide context (Roos *et al.* 2018), include forestry (Douglas *et al.* 2014) and agricultural influences on landscape fragmentation (Cove *et al.* 2014), agricultural productivity (Elmhagen & Rushton 2007), aspects of livestock farming (Hewson 1984; Moberly *et al.* 2003), high-density urban Fox populations (Scott *et al.* 2014, 2018), a high abundance of lagomorphs, deer and other food resources (Lees *et al.* 2013), and the extirpation of most apex predators and suppression of those that remain (Ritchie & Johnson 2009; Newton 2021). In addition, high predation rates may depend not just on mesopredator abundances; habitat simplification, for example in intensified agricultural landscapes, may also increase birds' susceptibility to predation (Evans 2004). Furthermore, Curlews often still suffer high rates of egg and chick predation in land-

scapes where gamebird releasing is rare or absent, in both the UK and Ireland and in northwest Europe. Therefore, while the knowledge gaps concerning the impacts of released gamebirds on predator abundance in the UK clearly require urgent research attention, we believe that the situation is more complex than any single driver.

Solutions to reduce predation pressure on breeding Curlews

To reduce predation pressure, we agree that large-scale, impactful action is needed. Beyond the range of measures outlined in Douglas *et al.* 2021, this could take the form of an evaluated landscape-scale intervention for Curlews, but should be done in ways that manipulate the probable causes (i.e. land-use systems) rather than only the known symptoms (high mesopredator densities). In the UK and Ireland's lowland and upland farmed landscapes, simply adjusting habitat management (Smart *et al.* 2013) and predator control (Bolton *et al.* 2007) does not always improve breeding success and/or population trends in breeding waders, with the effectiveness of predator control varying according to predator densities. We will need more comprehensive land-use change to drastically reduce the carrying capacity of sites for predators and deliver varied habitats to reduce susceptibility to predation. Interventions to be tested may include reduction in or cessation of the release of gamebirds at an estate- or landscape-level, reduction in other sources of human-mediated food subsidy, removal of those woodland plantations likely to be imposing substantial edge effects, and removal of other features that may influence predator abundance or access on sites such as scrub and linear features – all supported by comprehensive, Curlew-focused agri-environment management to deliver optimal habitat. Existing evidence suggests that some of these can contribute to improving conditions for waders. For example, the removal of forestry plantations from moorland can reduce predator abundance indices on restored areas for approximately ten years post-removal (Hancock *et al.* 2020) and increases in breeding wader abundance on peatlands have followed habitat restoration (Carr & O'Hara 2015; O'Hara *et al.* 2017). This gives reason to be hopeful that we could make a difference if the commitment on the part of all stakeholders to evaluating landscape-scale testing of multiple drivers was there.

Of course, doing the above would be immensely challenging logistically, politically, and financially; but it is this scale of intervention in land-use patterns that will probably be required to really make a difference for Curlews. Implementing change on this scale would require new policies and for the land management communities who control these land-use patterns to step up to the challenge. This is the nature and scale of change envisaged under recommendation two in Douglas *et al.* (2021) ('integrated land-use policies that prevent perverse outcomes'), and it is fair criticism of the original paper that we did not elaborate on the scale of intervention implied.

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