# SOS Save our Curlews Campaign Report 2022


## 1. INTRODUCTION

The *Birds of Shropshire* estimated that the Curlew population declined by 77% between 1990 and 2010, down to around only 160 pairs, and had disappeared from 62% of the Bird Atlas survey squares that they occupied in 1990. They have continued to decline since, down to below 120 pairs. At the current rate of loss, the population will halve in 12 years, and virtually disappear within 25. There is a real danger that Curlew will become extinct in the County, unless urgent and effective action is taken to save them.

The Shropshire Ornithological Society (SOS) *Save our Curlews* Campaign started in 2018, and includes project work to find out what is happening to the local population, and campaign work based on the project results to attempt to stem and then reverse the decline.

## 2. PROJECT WORK

This involves nest finding, protecting nests with electric fencing, and radio-tagging and tracking chicks to find out how they use the landscape, and what happens to them. Understanding the reasons for low levels of chick survival is the key to an effective conservation plan.

Project work started in 2018, and has operated in four of the last five years (the exception being 2020, due to covid-19 restrictions) in the Upper Clun and Clee Hill areas, and in two years (2021 and 2022) in the Strettons area.

### Project Results 2022

Nine nests were found and fenced, three in each of three separate Community Wildlife Group areas.

Four fenced nests were predated. The fences are effective in keeping out mammalian predators, and there was no evidence that any of the fences were breached, so the eggs were probably taken by corvids. However, sitting Curlews have been seen to withstand attacks from Carrion Crows, so it is likely that the Curlews were absent from the nest when the eggs were taken (except perhaps in one case where nearby nesting Ravens were the most likely predators). Absence may have been due to human disturbance, or both birds were away feeding at the same time, but Curlews usually sit tight once incubation is underway, so it may have occurred after foxes near the fence had previously caused the Curlews to abandon the clutch, or leave it unattended, as apparently happened in 2021.

Five nests produced 18 chicks, which were all radio tagged. Three chicks died of natural causes (starvation, hypothermia or disease), in two cases within very thick silage where they would have had great difficulty moving through or finding food.

The other 15 chicks were all predated. The identity of the predators cannot be known for certain, except in one case where the tag continued transmitting from a Buzzard nest. However, the remains found with the tag (if any), the location where the tag was found, and in some cases the distance from where the live chick was last seen, has allowed an assessment to be made on the balance of probability. Four tags were never found, in spite of intensive searching, suggesting they were taken down a fox hole. The most likely predators were Buzzard (4), avian (unknown - 5) and fox (6).

Potential avian predators of small chicks include Buzzard, Kite, Carrion Crow and Raven, and Curlews have been seen frequently driving away these species. Kestrel is also a possible predator, but no defensive action against Kestrel has been observed.

Only three out of 18 chicks (17%) survived beyond 8 days, with the longest surviving chick (19 days) still more than two weeks from fledging. The average lifespan of the 18 chicks was less than only 6.8 days, only a small fraction of the fledging period of about 35 days.

While the predator cannot be known in all cases with 100% certainty, it is certain that all the potential predators, mammalian and avian, have higher populations than their naturally sustainable level

because of the large amount of food available from the release of millions of gamebirds each year for shooting, only around 35% of which are actually shot (see below).

**Cumulative Project Results 2018 – 2022**

During the entire period of the SOS project to date, 31 nests have been found and fenced, with eggs hatching in 20 (65%). Two more clutches (6%), both from the same pair in different years, never hatched although they were incubated for the full term, and another clutch (3%) partly hatched, but the chicks died almost immediately afterwards. This shows that fencing has a high success rate, protecting 74% of nests.

Five nests were predated (16%), all by corvids, four in 2022 referred to above and one in 2021; two were abandoned (10%), both in 2021 when foxes are known to have closely approached the fences; and one (3%) was predated when the fence was knocked over by unshorn sheep (3%).

However, fences protect the prospective Curlew for only four of the nine-week period between egg-laying and fledging. The main focus of this project has been to initially protect the nests and then radio-tag and track chicks, to see what happens to them and how they use the landscape.

Altogether 61 chicks have been tagged and tracked. Five, probably 6 (only 10%) fledged. Eight (13%) died of natural causes (starvation, hypothermia, disease), but two of these were unable to move through very thick silage, and two were probably separated from their parents by constant aerial harassment of the family party.

If the tag is found, with or without the remains of the chick, it is usually possible to make a judgement on the likely predator from field signs. In two cases, tags were found transmitting from a Buzzard nest, and one was under a Kite nest. Unidentified avian predators accounted for another seven.

If neither the tag nor any part of the chick is found, then it has almost certainly been taken underground by a fox. Last year a tag was found still transmitting, embedded in a fox scat right outside a fox den, 28 days after it was last detected when attached to a Curlew chick. Foxes appear to have accounted for 32 (52%) out of the 61 tagged chicks. It is not known why the proportion predated by foxes in 2021 was so high.

No chicks have died as a direct result of agricultural activities, but that is only because they had been predated first. Had they lived, about half the chicks would have still been unable to fly by the time the agri-environment schemes allowed grass-cutting of the fields they would have been in at that time (mid-July). There are no such restrictions on the majority of farms because they are not in agri-environment schemes and grass-cutting is likely to take place earlier than mid-July.

In addition, two chicks fledged in 2021 from a fenced nest that were not tagged, so the total productivity from 31 fenced nests over the four years is 7 – 8 fledged young.

In 2022, five chicks from three other nests that were not found and fenced were located when they were about a week from fledging, two in each of two broods, and one in the third brood. At least three, possibly all five, of these chicks fledged.

An effort has also been made to find and monitor chicks from an estimated 45 additional unfenced nests in the project areas. Very few chicks have hatched in unfenced nests and, other than the 2022 successes mentioned above, there is no evidence for any other fledged young in any of the four years.

Table 1 summarises the outcomes for the 31 nests found and fenced.

| Year | Nests Fenced | No. of nests lost | | | | Nests hatched |
|---|---|---|---|---|---|---|
| | | Predated | Aban-doned | Unhatched / Not viable | Trampled (Sheep) | |
| 2022 | 9 | 4 | | | | 5 |
| 2021 | 12 | 1 | 2 | 1 | | 8 |
| 2019 | 4 | | | 1 | 1 | 2 |
| 2018 | 6 | | | 1 | | 5 |
| **Total** | **31** | **5** | **2** | **3** | **1** | **20** |

Table 2 summaries the fate of 61 radio-tagged chicks.

| Year | No. Chicks radio-tagged | Fledged young | Cause of chick death | | | | |
|---|---|---|---|---|---|---|---|
| | | | Natural causes | Buzzard | Kite | Avian (unknown) | Fox |
| 2022 | 18 | 0 | 3 | 4 | | 5 | 6 |
| 2021 | 21 | 1 | 1 | 1 | 1 | | 17 |
| 2019 | 6 | 3 | | | | 1 | 2 |
| 2018 | 16 | 1-2 | 4 | 2 | | 1 | 7 |
| **Total** | **61** | **5 - 6** | **8** | **7** | **1** | **7** | **32** |

As an indication of the predation pressure on unfenced nests, in 2021 another four nests were found, but they were all predated in the period between finding and when the fencer arrived to fence them, usually the following day.

**Landscape use 2018-2022**
Nests have usually been found in long grass (no livestock), which may be ungrazed pasture, or fields shut up to grow a grass crop (hay or silage).

Three tagged broods produced fledged young. Two moved quickly out of less-dense late cut farm grassland onto open moorland, while the third stayed in such grassland for most of the fledging period, then moved into a neighbouring cut-silage field, perhaps when the chicks were large enough to be relatively safe from aerial predators. Of the three broods from unfenced nests that produced fledged young in 2022, two similarly remained mainly in low density late-cut grassland (one on an organic farm) and moved into pasture or cut fields when close to fledging, while the third was very mobile, and seen in eight different pasture fields in the two weeks before fledging.

Otherwise, there have been no obvious clear patterns of behaviour, largely because the tagged chicks have not lived very long. Some broods moved several hundred metres, and used different fields, but others remained in one or two fields. There was a tendency to move out of silage, which contains little food, into pasture. Some broods suffered continuous harassment from aerial predators, which might have influenced movements. In several cases, all the chicks in the brood survived for several days, but as soon as one disappeared the rest quickly followed, suggesting that once a predator discovers a brood, it returns to take them all. A more detailed analysis of chick movements is underway.

**Egg shells**
Twelve unhatched eggs were sent to Sheffield University, for expert analysis, in 2021. All except one clutch contained well-grown embryos, but several had thin eggshells. We suggested that this needed further study, to find out if the thin shells affected hatching rates, and resulted from agricultural chemicals. The University has initiated a wide-ranging enquiry, and asked Curlew projects all over the country to send in complete unhatched eggs, and fragments. Two whole eggs, and fragments from 11 more, were sent in 2022.

**Monitoring of other pairs**
Ten Community Wildlife Groups (including the three involved in this project) have monitored the vast majority of the County Curlew population, estimated at about 120 pairs, since 2018 or earlier. No evidence has been found that any Curlews fledged, other than those referred to above (but analysis of 2022 results is not yet complete). This monitoring was also carried out in 2020, when there was no project work, but again there was no evidence that any Curlews fledged anywhere in Shropshire.

A previous project in the Shropshire Hills found and monitored 33 Curlew nests in 2015 and 2016, using cameras: 27 of these nests were lost during the incubation stage, with foxes responsible in 15 cases. No young fledged from these nests.

**Funding Project Work**
SOS has contributed to the project costs from its own funds, and an appeal to members, Community Wildlife Group members and the general public. Shropshire Wildlife Trust organised the appeal, including to its own members, in 2018-19.

SOS gratefully acknowledges grants from the Stepping Stones project, firstly via Strettons area Community Wildlife Group, with funding from the People's Postcode Lottery in 2021, and secondly, with funding from the Green Recovery Challenge Fund, in 2022, the Shropshire Hill AONB Conservation Fund in all four years, British Birds Charitable Trust (2021 and 2022), and Wader Quest, the Garreg Llwyd Windfarm Community Benefit Fund and Stretton Focus Community Awards, all in 2021

This is a long-term project, which will continue in future years.

## 3. CAMPAIGN WORK

### Why is predation so high?

Project work has shown that breeding productivity is insufficient to stem the decline, due almost entirely to very high predation levels of nests and chicks. If the current levels of predation had operated for any length of time, Curlews would have been locally extinct many years ago. So what has changed, relatively recently, to increase predator pressure?

Nationally, the curlew population reached its peak in the mid-1970s, and the decline which followed until around 1990 was attributed mainly to agricultural change, notably land drainage and the switch from single-cut "hay" meadows to multi-annual silage crops. However, these changes were largely complete by 1990, and their impact on Curlew breeding success would have levelled out since then. Therefore, although silage cutting before the end of July needs to be halted if Curlew numbers are to recover to previous levels, it is not the main current cause of the continuing decline. If we could wave a magic wand to create land management and farming practice that was perfect from a Curlew viewpoint, it would not prevent the continuing decline, because it would not affect predation levels.

Small-scale predator control on farms was widespread 50 years ago, and it would have undoubtedly helped Curlew. The practice seems to have reduced considerably since then, but its scale would not have made much impact on increasing predation rates. These are driven by the most significant change in the landscape, the release of gamebirds, which have increased in the UK from 4 million in 1961 (the first year that an estimate was made) to 40 million in the mid-2000s and 57 million in 2016. It is implausible that ever-increasing availability of such a large and widespread food source for predators and scavengers has not had a massive effect on their population levels.

In Shropshire in 1990, the Buzzard and Raven populations were largely restricted to the south-west, and were estimated at 300 and 50 breeding pairs, respectively. These populations might have been expected to decline, reflecting a decline in their main sources of food. The sheep population rapidly increased by over 60% between 1975 and 1990, when it passed 1,000,000, and it remained almost that high until 1998. It has since declined by 24% to 750,000 in 2013, attributed to farms not re-stocking after the cull in 2001 to limit the spread of "Foot and Mouth" disease, and the abolition of the farm subsidy "headage payment" in 2005, which previously encouraged over-stocking. The amount of sheep carrion has probably declined by an even bigger percentage, as lower densities have reduced mortality, and fewer carcasses are left out. The rabbit population declined substantially as well, because of disease. However, by 2013 these two avian predators and scavengers had both increased locally about 8-fold, to 2,500 and 400 respectively, and the breeding distribution change maps in the BTO Atlas 2007-2011 showed a rapid expansion of range from Shropshire across most of southern England since 1991. The national Atlas also showed an increase in the breeding relative abundance of Carrion Crow across eastern England since 1991.

There will be a time lag between the food source becoming available in new areas, and the predators and scavengers finding it, and then breeding successfully in sufficient numbers to become established. It is therefore likely that the spread of these species eastwards and southwards is not yet complete, and there will be an increasing tendency for their numbers and distribution to match the "Pheasant Heat Map" (Shrubshole 2019).

Over a similar period, the pheasant population in England increased by 44% between 1995 and 2020 (BTO/JNCC/RSPB Breeding Bird Survey results), fuelled by the increase in gamebird release referred to above. A minimum of 726,000 pheasants were released for shooting in Shropshire in 2018 alone (Shrubshole 2019), though that is likely to be a substantial under-estimate (Madden 2021). The breeding population in the county was estimated at over 40,000 pairs (Smith 2019), all descended from releases for shooting. Numbers increased by 59% between 1994 and 2019 (local BBS results), fuelled

by an increasing number of birds released each year over the same period. The gamebirds have wings, so they do not stay where they are released. pheasants have spread right across the entire county, and it is the tenth most-numerous breeding species, although areas where birds are released for shooting occupy only a small part of it.

BTO research (Pringle et al, 2019) showed that, nationally:-

1. The release of more than 40 million captive-bred pheasants and red-legged partridges in Britain annually represents a significant addition to the potential food resource base for predators and scavengers. If this extra food availability subsidizes predator populations, gamebird releases could increase predation pressure on other wild birds, affecting their populations.
2. Using three extensive datasets, the spatial and temporal associations between reared and free-roaming gamebirds (pheasant and red-legged partridge), and five species of avian predator (buzzard, jay, raven, magpie and hooded and carrion crows combined) in lowland rural Britain were examined. Patterns of spatial variation in the abundance of free-roaming gamebirds across Britain appear to be largely determined by gamebird releases, over and above any effects of land use or habitat. Predominantly positive associations between gamebird abundance (both reared and free-roaming) and the abundance and inter-annual population growth rates of predators tested suggest that large-scale variation in avian predator populations may be positively affected by gamebird releases.
3. The positive associations between large-scale gamebird release and predator populations shown here may have implications for prey populations if the releases cause increased predation pressure. If this occurs, game management could have an indirect negative impact on some prey species partially counteracting previously reported positive or benign effects of game management on wider biodiversity. Overall impacts of gamebird releases are likely to be determined by complex interactions between multiple factors, including induced predation pressure, better understanding of which would be possible with compulsory recording of releases and numbers of predators killed. Restriction of releases warrants further investigation and consideration as a potential conservation tool for wild bird populations.

A summary of the paper in BTO News included a model which estimated that 100 pheasants released in a 1 km square increases the crow population in the following year by more than 10%. The number of pheasants released each year on average in each 1km square in Shropshire is well over 200.

A paper by RSPB research scientists found “that predation, mainly by foxes and non-native mammals, can limit the numbers of ground-nesting species, such as waders, gamebirds, and seabirds” (Roos *et al*, 2018). This led to an RSPB Review of Shooting Policy, announced at the AGM in October 2020. Mason *et al*, of the RSPB Centre for Conservation Science, provided the scientific basis that informed the review, which led to a new policy which included calling on the shooting industry for a voluntary reduction in the number of large-scale gamebird releases because of the damage they do to the environment, and the harm to many species of birds and other animals, by October 2022 (www.rspb.org.uk/gamebirdreview). Given the lack of progress towards a more sustainable gamebird shooting industry over decades and minimal signs of positive change for the future, RSPB has now “concluded that further regulation and better enforcement of existing rules will be required to deliver the changes necessary in the face of a nature and climate crisis”.

Although avian predation of Curlew nests and chicks is important, the SOS *Save our Curlews* project has shown that the main predator of Curlew chicks in Shropshire is the fox, and Harris (2021, 2022) produced clear evidence that the release of pheasants and other non-native gamebirds sustains the fox population at much higher levels than it would otherwise be naturally. The paper included evidence to show that ‘the number of foxes supported by predating and/or scavenging non-native gamebirds has increased 10-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).’ Research by the Game and Wildlife Conservation Trust (GWCT) has shown that fox is the main predator of pheasant. A review of “Non shooting losses of released pheasants” (Sage 2017) also concluded that “in our studies it has been difficult to show an effect of predator control”.

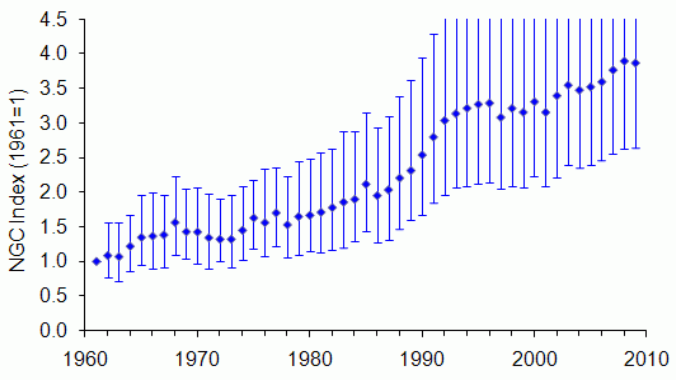
Nationally, discussion is now taking place on predator control to help Curlews. However, Mason *et al.* and Harris both point out that control of foxes by pheasant shoots occurs most frequently when pheasants are in their release pens, and shortly after release, in mid-summer. Control occurs least

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. Reliance on gamekeepers to reduce the impact of fox and avian predation on Curlews is therefore doomed to failure.

More importantly, this control only addresses the symptoms, not the cause of the problem. The GWCT 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 release, it should be noted, increased 10-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.' What the website graph shows, firstly, is that foxes are preferentially attracted to where gamekeepers operate (i.e. where gamebirds are released), and secondly that, however many foxes are killed, there are always more at these sites the following year. "Control" does not keep pace with the population level supported by the increase in the food supply.

**Index showing the year-on-year increase in the number of foxes killed by gamekeepers 1961-2010 Source: GWCT website (www.gwct.org.uk)**




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, and even more were killed in the following year. This raises the question, how many foxes need to be killed to have sufficient impact on the fox population during the Curlew breeding season? And do conservationists want to be associated with such a high level of killing? It is unlikely that there will be widespread support, amongst wildlife enthusiasts or the general public, for an annual massacre of foxes, particularly as there will be little or no resulting benefits for Curlews. GWCT has shown that culling of individual animals is clearly ineffective. SOS will not support relaxation of legal protection for avian predators and scavengers such as Buzzard and Raven, especially in the interests of the pheasant shooting industry.

The only way forward is to make large-scale reductions in the supplementary food provided for foxes and other predators and scavengers – i.e. pheasants and other gamebirds, in particular the number released each year for shooting – at a landscape scale.

**Action Plans**

While there are many pressures contributing to the decline of Curlew, nationally and locally, and their relative importance will vary from place to place, the effect of these pressures is cumulative, so it is important to address them all. However, given the current rapid decline of the population, driven by predation of nests and chicks, we do not have many years left to save them. Most of the changes that would be beneficial, particularly reversing the effects of agricultural change, will take a long time to have any impact, but we will continue to encourage land-use change for the benefit of Curlew and other wildlife as and when we can.

Our research to-date shows that Curlew chicks are predated before they run the risk of harm from agricultural activities, and effective and urgent action at a landscape scale to reduce predation is the necessary first step if the current, rapid, population decline is not to result in their extinction in Shropshire.

Nationally, only about one-third of the gamebirds released are actually shot, and not all of these are collected up. Most of the others die as result of wounds, or by road-kill, or do not survive in the wild, resulting in an excess of carrion that supports enhanced populations of the Curlews' potential predators, mammalian and avian. We therefore need to regain a balance in number of predators and scavengers at a landscape scale. To make a start, Shropshire Ornithological Society called for the

number of gamebirds being released into the countryside each year to be reduced to the number currently shot, within five years.

In the last couple of years the economic viability of shoots has been seriously compromised by cancellations due to covid 19, inability to import pheasants for shooting due to Avian Influenza, and a substantial increase in costs of grain (food for the penned poults) on the world market, due to the war in Ukraine. This provides an opportunity for shoots to move to a more sustainable policy, removing the excess of gamebirds in the countryside.

The Action Plans also need to look forward to the time when predation pressure on Curlew is reduced, by which time it will be necessary to have also reduced loss of chicks by silage cutting. This will require land management at a landscape scale that will allow the remaining Curlews to thrive. In the longer term, measures to counteract the impact of climate change will also be needed.

However, to stress the point, there will be no Curlews left to benefit from changes in land management or climate change mitigation if predation is not reduced, considerably and immediately.

**Campaign work**

These results are sent to the South of England Curlew Forum, the UK and Ireland Curlew Action Group and the Curlew Recovery Partnership, so the work is an integral part of the case to Government for effective Curlew conservation measures.

Gamebird release is clearly the activity that is responsible for the decline of Curlew locally. Shropshire is eleventh in the league table of English counties of official figures of pheasants released in 2018. The counties with higher numbers, in order, are North Yorkshire, Devonshire, Cambridgeshire, Norfolk, Oxfordshire, Suffolk, Somerset, Hampshire, Hereford & Worcester and Lancashire (Shrubshole 2019). It is unlikely that these releases do not contribute to poor breeding success of Curlews across most of England.

National conservation organisations, including the Curlew Recovery Partnership, the UK and Ireland Curlew Action Group, and the RSPB, also need to produce Action Plans to reduce predation of Curlews as a matter of urgency by reducing the excess number of predators and scavengers at the landscape scale. In the letters to British Birds last winter, which asked why the UK and Ireland Curlew Action Group had not addressed the issues of predation and gamebird release, the Action Group responded that "While this [gamebird release] is entirely biologically plausible" as an explanation for high levels of predation, they put forward no proposals to tackle the issue. Our reply, which asked "Is there any other plausible explanation" for the level of Curlew predation, was met with no response.

We ask the question again "Is there any other plausible explanation for the populations of predators and scavengers in the landscape being much higher than their naturally sustainable levels, apart from gamebird release."

We will continue to publicise our results, explanation for them, and questions, at every opportunity.

## 4. CONCLUSION

The SOS Save our Curlews project will continue in future years. We intend to work in different parts of the County, to ascertain if predation levels are fairly uniform. This will be our contribution, to keep producing more evidence for the need for immediate action to reduce predation pressures at the landscape scale by limiting gamebird release.

Project results and a full set of references can be found on our website
www.shropshirebirds.com/save-our-curlews/

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