



LIFE Waders for Real

End of Project Conference

Outcomes

6th – 7th November 2019

GWCT HQ Fordingbridge, Hampshire



Game & Wildlife CONSERVATION TRUST

LIFE Waders for Real

Project Overview

Waders for Real started in 2014, seeking to reverse the decline of breeding waders in the Avon Valley, a river floodplain of high biodiversity interest, part of which is designated as a Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI).

Monitoring of lapwing breeding success before LIFE Waders for Real showed that productivity was too low to maintain a stable breeding population, with 61% of Lapwing nesting attempts failing, 82% of which were due to predation, alongside only 35% Lapwing brood survival. In addition, to predation issues, the increased prevalence of intensively grazed short swards, inappropriate water levels and encroaching scrub were reducing the extent of suitable sites within the Avon Valley for breeding waders. To halt the decline of lapwing and redshank, work was needed to improve breeding success via the reduction of predation and increase habitat suitability.

During the project, the number of breeding redshank has increased from 19 pairs in 2015 to 35 in 2019 with the Lapwing population now holding stable at 70 – 80 pairs. Drumming Snipe were also heard on the water meadows in 2018.

Establishing an environment to aid wader recovery has focused on the creation of wader hotspots, where a combination of intensive habitat improvements and management of wader chick predators has been conducted. In-field wet features provide optimum conditions for foraging breeding wader chicks, supplying a rich source of invertebrates to eat and soft soil to facilitate probing.

The project has also focused research on the red fox, having previously been identified as the main predator of lapwing clutches in several studies. However, very little was known about fox hunting behaviour, particularly in wet grassland habitats. Foxes in the Avon Valley were fitted with GPS collars to evaluate their use of particular habitat features in this landscape, including temporary electric fencing, as well as investigation of diet composition.



LIFE Waders for Real

End of Project Conference

Conference aims:

- ***Celebrate the successes, difficulties and lessons learnt through the LIFE Waders for Real project***
- ***Consider how we can take the Waders for Real approach and replicate it around the country***
- ***Consider best practice, current knowledge gaps and future research opportunities***
- ***What do we need from government and policy?***
- ***How do you inspire farmers and wildlife managers to be better and bolder at conserving wildlife in the years ahead?***



Delegates from a variety of organisations including RSPB, Natural England, the NFU, other NGOs as well as private landowners/managers /farmers and GWCT staff were invited, with 50 – 60 people in attendance on both days of the conference.

The conference was an opportunity for conservationists with a variety of approaches and experiences to come together to talk about the above aims. The conference was structured with the intention to form usable outcomes, through conversation of the current position in respect of breeding waders, the landscape scale approach, the role of working conservationists and how future management and policy should be shaped in respect of these areas.

Delegates were placed in a table scenario (8 tables in total); the purposeful aim of this approach was so people could fully interact in the breakout discussions at the end of each themed session of presentations. All attendees were given a different table number for each of the three themed sessions

over the two days, and therefore had the opportunity to sit with and talk to a variety of people throughout the conference. Each breakout discussion session included eight questions, one for each table to discuss and feed back to the room an overview of outcomes from their given question.

Conference Themed Sessions:

Theme 1: Monitoring waders and management to increase breeding success

This theme included talks from individuals who study or work with breeding waders, whether on private land or in a reserve scenario, sharing their knowledge in increasing breeding success. Lizzie Grayshon, Project Lead on the W4R Project gave an overview of work and results from the Avon Valley, followed by Gareth Foulton who is the Estate Manager at Elmeley NNR. Next was a PhD student from the University of East Anglia, Harry Ewing. Harry spoke about his work studying Curlew in Breckland and his myriad of questions still yet to answer regarding this species. Jen Smart, Head of Species at the RSPB gave attendees an insight into Project Godwit and the successes of using head starting as one tool in the conservation of the Black-tailed Godwit. Lastly, Nick Tomlin of the RSPB gave a talk about securing the future of the Stone Curlew, and what work has been done to date and where work should be heading.

Theme 2: Monitor predator activity and predator management

Talks in theme 2 focused on predator management in relation to breeding wader success, with talks from many of the GWCT staff who have focused their research on predator management for many years. Mike Short opened the talks with an update of the GPS fox tracking in the Avon Valley, followed by Lizzie Grayshon talking about non-lethal predator management used within the W4R project, particularly in respect of electric fencing. Next Dave Parish, Head of Scottish Lowland Research, gave the audience an overview of another LIFE project involving the use of laser fences to deter mammalian pests. Before a coffee break Dr Tom Porteus of the GWCT Predation team gave an insight into fox culling and the effort required to manage fox populations effectively. Dr Jonathan Reynolds, Head of Predation spoke about small mammalian predators and the difficulties in understanding abundance and then followed by Ryan Burrell, a W4R ecologist providing an insight into various lapwing nest and chick predation events during the project. Finally, a guest speaker from Ireland, Michael Stinson told the attendees about a project run by the Lough Erne Wildfowls' Council in Northern Ireland, and how their efforts are changing a dire situation for breeding waders in Ireland.

Theme 3: Working with farmers and land managers, maintain momentum and next steps

The final theme concentrated on looking at the project's relationship with stakeholders and understanding what works and what has not worked, as well as looking into the future and talking about what should be done next. Lizzie Grayshon gave an overview of the journey of the W4R project from research to results, then she handed over to Amanda Perkins of Curlew Country who gave a talk on the project's relationship with their farmers and land managers and what it has taken to build trust with individuals to ensure effective conservation on the ground. Next Jess Brooks, the Farmland Biodiversity Advisor at GWCT, talked about the Farmer Cluster concept which has now taken off around the country and looking to be incorporated into policy. Sam Franks from the BTO then spoke about working with various partners for wader monitoring and conservation, raising a reflection that gamekeepers have a wealth of knowledge and field skills that should be utilised to a greater extent. To close the conference talks Dr Andrew Hoodless, Head of Wetland Department at GWCT spoke about current and future policy frameworks and wrapped up the main points from the previous day's theme 1 and 2 discussions.

LIFE Waders for Real

Presentation Abstracts



LIFE Waders for Real – Why the project started?

Andrew Hoodless, LIFE Waders for Real, GWCT

In 1982 the Avon Valley constituted one of the top eight lowland wet grassland sites in England for breeding waders. Since then four surveys at 6-7 year intervals have shown a dramatic decline in numbers of breeding waders, mirroring trends seen across Europe. Numbers of northern lapwing pairs have fallen from 208 in 1990 to 71 in 2010. Pairs of redshank have dropped from 117 to 22, and common snipe from 29 to one.

Monitoring of lapwing breeding success in the Avon Valley for the last eight years has shown that productivity is currently too low for maintenance of a stable breeding population. To halt the decline of lapwing and redshank, we urgently need to intervene to improve breeding success, which should lead to increases in breeding density.

We aimed to deliver the project through a partnership between the private sector (farmers, landowners), conservation charities (Game & Wildlife Conservation Trust, Hampshire & IOW Wildlife Trust) and the public sector (Natural England, Environment Agency).

Theme 1: Monitoring waders and management to increase breeding success

Monitoring waders and management to increase breeding success

Andrew Hoodless, LIFE Waders for Real, GWCT

Our monitoring work in the Avon Valley has been critical when figuring out how best to recover the populations of breeding waders. Detailed monitoring is extremely important to document any changes during and after management, it is also extremely useful to feed back to those on the ground doing the work. Getting the right habitat for the species you are looking to recover is critical to your success.

In this theme we will hear from a number of different projects, on different wader species and will talk about the different methods of increasing breeding success.

Waders in the Avon Valley

Lizzie Grayshon, LIFE Waders for Real, GWCT

The Waders for Real project aimed to reverse the decline of breeding waders in the Avon Valley, focusing targeted efforts on selected wader species by increasing habitat in core areas and the wider landscape, alongside predator exclusion methods and bespoke support for farmers and land managers. The project has also allowed for us to monitor predation pressure, understand the effects of the project's actions on other taxa and share the projects aims and findings with stakeholders and the wider community. The project's fundamental approach was to create hotspots of favourable wader habitat to encourage nesting colonies, with crucial support and feedback from monitoring, for farmers.

The project's chosen hotspots are areas where lapwing populations were known to still breed and had good existing habitat being managed under agri-environment scheme for breeding waders, and where farmers and landowners were keen to improve breeding success. The hotspots received targeted advice, habitat management, detailed monitoring and temporary electric fencing as a non-lethal predator control method.

Mean lapwing nest survival over the course of the project increased from 48% to 53%, this was supported through liaison with farmers on stocking density and grazing pressure, the use of temporary electric fencing and using our project predator monitoring research to inform local predator control efforts. Lapwing productivity is however more dependent on chick survival;

therefore, radio tracking allowed us to closely monitor chicks to better understand survival, range size and habitat use.

Over the course of the project we have seen a stabilisation in lapwing pairs and a considerable increase in redshank pair numbers. There are also promising signs of snipe attempting to recolonise in specific areas of the valley. Through greater understanding of habitat requirements and a substantial increase in habitat stability, breeding wader populations have positively responded to the project's actions and provides a foundation for future conservation work.

Elmley Nature Reserve

Gareth Fulton, Estate Manager, Elmley NNR

Elmley is a 3300-acre estate on the north Kent coast and is the only farmer owned and managed National Nature Reserve in the UK. Elmley's conservation work is dedicated to breeding waders, and lapwing in particular. ECT use lapwing productivity as their benchmark with over 3000 fledged chicks in the last ten years of detailed independent monitoring with a productivity above >1.0 chicks per brood annually over the last five years. This productivity has been achieved through close management of the water levels, micro-topography, sward – through grazing primarily with suckler cows and predator control from March to May. Management of six - fox, stoat, corvids and translocation of hedgehogs - of the twenty-two predators of wader chicks at Elmley has proven to be a critical additional activity, one which is not supported by the current higher tier agri-environment scheme. The future aim at Elmley is to learn more about where first and second year birds disperse to and if they are recruiting to local breeding sites.

Local and landscape-scale management for threatened breeding wader populations

Harry Ewing, PhD Candidate, University of East Anglia

In the UK, the abundance of breeding Eurasian curlew (*Numenius arquata*) has declined by ~48% in the last 20 years and most UK populations are thought to suffer from high rates of nest predation and unsustainably low rates of breeding productivity. This has led to range contraction and many local extinctions, especially in the lowlands. One of the largest remaining populations of lowland breeding curlew occurs in Breckland, eastern England (est. 150 pairs). Here, the population is thought to be stable or possibly increasing in abundance and range, but the reason why curlew are persisting in this area is unknown.

A University of East Anglia PhD project on Breckland curlew began in 2019 with the aim of gathering evidence to inform the deployment of conservation management designed to boost breeding productivity. During the first year of the project, surveys and nest monitoring were conducted to investigate how demographic rates vary across a gradient of habitat and land management types in the Brecks, with the aim of identifying situations in which breeding productivity needs boosting but also situations in which breeding productivity is already high, so that the conditions promoting population stability or growth can be replicated elsewhere.

In total, 74 pairs of breeding curlew (45% on RAF bases) and 61 curlew nests were found across eleven Breckland field sites, including rank grassland, grass-heathland and arable habitats. Hatching success of curlew nests across all Breckland field sites was low (19% probability of a nest surviving incubation (PSI)) however, hatching success was higher in fenced areas (53% PSI) compared to unfenced areas (17% PSI). Overall curlew breeding productivity was also low, with only nine chicks fledging from the 61 nests found across field sites. All nine chick fledged in areas of rank grassland.

These preliminary results suggest that curlew chicks are more likely to hatch in fenced areas compared to unfenced areas and are potentially more likely to fledge in areas of rank grassland. Rank grassland and secure, fenced areas are not commonly found in the wider Breckland landscape but

are often features of RAF bases and could explain why bases host a high proportion of the Breckland breeding curlew population, despite accounting for less than 5% of the Breckland land area. However, the extent to which RAF bases contribute towards the positive population trends of curlew in the Brecks remains unclear. In years two and three of the project, patterns emerging from these preliminary data will be explored further and conservation management tools will be trialled in the Brecks with the aim of wider deployment.



Saving black-tailed godwits from extinction in the UK
Jennifer Smart, LIFE Project Godwit, RSPB England

There are now fewer than 50 pairs of black-tailed godwits *Limosa limosa limosa* breeding in the UK with around 80% of the population at the Nene Washes where low breeding success, driven by high predation, was causing the population to decline. Project Godwit, a five-year partnership between the RSPB and the Wildfowl and Wetlands Trust funded by EU LIFE, aims to secure the future of black-tailed godwits as a breeding species in the UK.

Two key conservation interventions are being used: 1) to improve breeding success at the Nene Washes, predator management in the form of lethal control, field and site-level predator exclusion and diversionary feeding, have been used to try to reduce the activity of key predators and their effects on nest and chick survival and 2) to improve population level breeding success and to influence recruitment of godwits to new and traditional breeding site, head-starting is being trialled.

Three years into this programme of conservation interventions, our within site predator exclusion is increasing nest survival and our combined predator management has significantly reduced the activity of foxes but we are yet to see the improvements in breeding success we need because of the complex nature of the predator community and between year variation in the relative importance of different nest and chick predators. In contrast, head-starting has provided a significant boost to population breeding success and has led to an increase in the number of breeding pairs and the number of sites supporting godwits especially around the Ouse Washes grasslands that were created for black-tailed godwits. With two more years of Project Godwit, these results provide a positive outlook for godwits in the UK.

Securing the Future of the Stone-curlew in the UK

Nick Tomlin, RSPB England

Since the mid-1980s the RSPB has employed staff to monitor and protect stone-curlews in Wessex. At this time the species had declined to around 30 pairs in the area as a result of eggs and chicks being destroyed during agricultural operations. The RSPB team located pairs and nests and worked with landowners to protect them – either marking the nests for tractors to drive around, or lifting chicks during farm operations. In addition, a network of fallow plots was created that provided suitable breeding conditions without the threat of mechanical work. These were sacrificial cultivated areas with bare ground habitat and have been provided through agri-environment schemes since the late 1990s. The project has been very successful in increasing the stone-curlew population, through habitat management and nest protection measures, but these measures are usually only successful with a team on the ground to survey and provide tailored advice to farmers. Our hope is to find a way to reduce the need for intensive monitoring without having a detrimental impact on the Wessex Stone-curlew population.

Theme 2: Monitor predator activity and predator management

Monitoring predator activity and predator management

Jonathan Reynolds, LIFE Waders for Real, GWCT

Earlier talks have shown that predation losses are enormously important for the population trajectory of lapwing and redshank in the Avon Valley. GWCT's predation team have a long record of researching predation control methods, devising ways to measure their effectiveness, improving them where we can see a way, and trying out novel approaches. Throughout the W4R project, the predation team have applied their skills where possible to cast light on how predation happens and the best way to prevent it. We have a particular expertise with foxes, and foxes have been implicated as major predators in many studies of wading birds; so it made sense that much of our effort in the Avon Valley went into studying foxes in this context. Mike Short has been consistently successful over 4 years at catching and tagging foxes to the limits of our budget, showing us how foxes move around the wader breeding areas and the adjacent countryside. Tom Porteus has used very sophisticated models to figure out the impact of fox culling on fox numbers at the local level, and he has now applied this expertise to one of the key estates in the Avon Valley to show how effective that lethal control is. But contrary to what you might expect, GWCT's interest is not single-mindedly on lethal control.

Lizzie Grayshon and her team have used electric fencing throughout the project to create a safer environment around known concentrations of lapwing nests, and report on how that worked. Dave Parish will describe trials to test the effects of a novel 'laser fence' on predators and pests. As well as these home-grown talks, Michael Stinson will describe how predator control and habitat management by a voluntary group works around Lough Erne. At the end of the W4R project we still have a lot of knowledge gaps around predators. One of those concerns that small mustelid predators. I'm going to describe our attempts to figure out where they were present, something that really didn't work out as planned.

GPS-tracking foxes on river meadows: understanding their ecology around breeding waders

Mike Short, LIFE Waders for Real, GWCT

The red fox figures prominently in studies of predation on ground-nesting birds. It's one of several generalist predators that are very successful in modern man-made landscapes, where rural enterprises can generate plentiful anthropogenic food resources. Foxes are difficult to manage, and a fundamental management decision is whether to (a) use lethal control measures to continually remove individuals that may pose a threat, or (b) rely on physical barriers such as electrified-fencing or watercourses, to prevent foxes from reaching vulnerable birds. In lowland river valleys, both approaches face practical constraints.

There is increasing acceptance that breeding wader populations will recover only if we somehow reduce the level of predation. But which approach works best, in terms of delivering more birds: lethal or non-lethal control? Effective reduction of fox predation on waders requires a clear understanding of fox ecology and behaviour on and around river meadows.

Since 2015, as part of LIFE Waders for Real, we have GPS-tracked 37 adult foxes around wetland sites in the Avon Valley during the nesting season. Location data (circa. 175,000 fixes) recorded at 10minute intervals provide a detailed picture of how these foxes used river meadow habitats, including areas where temporary electric fencing was used to protect breeding birds. On a site where waders no longer breed but habitat remains favourable, we found foxes living at very high densities (>13 fox/km²), which was more than twice the density of foxes on sites where waders still breed.

These results are yet to be fully analysed but have already enhanced our understanding of fox activity and movement patterns in the Avon Valley, with clear relevance to other situations. This new knowledge will help shape future agri-environment prescriptions for predator management and inform game and wildlife managers undertaking fox control.

Non-lethal predator management including temporary electric fencing, its practicality and limitations

Lizzie Grayshon, LIFE Waders for Real, GWCT

The Waders for Real project aimed to boost wader breeding productivity on the wet meadows of the Avon Valley by implementing various non-lethal predator management options. Nest cages were trialled early in the project as a lapwing nest protection measure, but implementation and observation saw that many lapwing did not readily accept the cages and therefore temporary electric fencing was prioritised as a predator management tool for the remainder of the project.

Temporary electric fencing was deployed across the project hotspots sites and erected where birds had nested in previous years, where grazing would not be affected, near to in field wet features so chicks did not have to forage too far and at locations which allowed for fencing equipment to be accessed as easily as possible.

This fencing can help to boost breeding success in low density populations, during the vulnerable breeding season, however wet meadow habitats can negatively affect the performance of temporary electric fencing through vegetation growth or flooding, therefore regular fence maintenance such as vegetation management and voltage checking is required. These actions allow voltage to be maintained at the levels required to deter mammalian breaches and protect active nests.

Nest survival in fenced areas were higher in years 2018/19 of the project but it is more difficult to protect chicks with fencing as they are mobile and can move to different locations. The Waders for Real project found that temporary electric fencing required a lot of work and are not practical for all areas, but when used and maintained correctly, they can be beneficial to breeding waders and can be a good option for areas which are inappropriate for lethal control.

LIFE Laser Fences

Dave Parish, LIFE Laser Fence, GWCT Scotland

The LIFE Laser Fence project has been adapting an existing bird-scaring laser system to see if it might work equally well on mammalian pests. This is a collaboration between a number of organisations in the UK, Netherlands and Spain, led by Liverpool John Moors University. Trials have been focusing on rats, rabbits, deer and grey squirrels, with some additional work on wild boar and wolves, using handheld devices primarily for investigating behavioural responses and programmable 'autonomic' devices for protecting a given area from incursion. Results to date suggest a modest response rate to presentation of the laser, with subtle differences due to laser colour, power output and presentation style.

The effect of culling foxes on the Bisterne Estate

Tom Porteus, LIFE Waders for Real, GWCT

Red foxes have been identified as a key predator of breeding waders in wet meadow habitats. Predation can be managed by lethal control through shooting or trapping of target predator species, or by non-lethal control by habitat management or exclusion fencing. While lethal control is controversial, non-lethal methods are not appropriate or effective in all situations. To justify use of lethal control, it is important to demonstrate its effect.

Aiming to reverse the decline in breeding waders in the Avon Valley, the LIFE Waders for Real project monitored wader breeding success and implemented non-lethal control methods on hotspot sites within the valley between January 2015 and July 2019. Two sites were within the 16 km² Bisterne Estate. We used data on fox culling activities by the estate gamekeeper during the project to evaluate the effect of culling on the fox population within the estate and related this to wader productivity. Fox culling effort was intensive, with shooting at night ('lamping') the most used method. A total of 334 foxes were killed across the estate, of which 181 were adult males and 112 adult females. The number of foxes killed was highest in 2016, but declined year-on-year. Using a Bayesian state-space population model accounting for births, deaths and migration, we estimated fox density fortnight-by-fortnight by fitting to three lamping sighting rate indices. The posterior median estimate for the density of foxes expected on the estate in the absence of culling (the 'carrying capacity') was 7.9 fox/km², with the estimate of immigration rate meaning 62 foxes were coming onto the estate each year to rapidly replace those removed. Lamping on foot using a thermal imager was over twice as efficient as from a vehicle using a spotlamp. Estimated fox density during the critical March-June nesting period was on average >2 fox/km² in 2015 and 2016, but in subsequent years was reduced to <8% of carrying capacity. Fox culling was thus highly effective, and the low fox densities in the last two years of the project correlated with the higher lapwing breeding pair counts and productivity estimates in those years. Lethal fox control therefore has an important role alongside non-lethal methods but requires intensive efforts during the nesting period to be successful.

Monitoring small mammalian predators

Jonathan Reynolds, LIFE Waders for Real, GWCT

- We attempted to map the presence of four small mustelid species (weasel, stoat, polecat, mink) in and around four 'hotspot' sites for wader breeding in the Avon Valley. Following established routines used in the UK and New Zealand to monitor the success of trapping programmes, we used 'ink tunnels' consisting of a plastic tunnel measuring 50x10x10cm in which an inked card recorded footprints of visiting animals. In 2016, we deployed tunnels on a 150m grid layout, with the intention that any mustelid would have several tunnels available within its home-range. Tunnels were situated in linear features where possible, and were 'landscaped' as trap tunnels would be. Ink cards were checked and replaced weekly. Because of indistinct prints and size overlap among the four mustelid species, it was not possible to identify all small mustelid footprints to species, hence we considered all four species together.
- Virtually all tunnels recorded small rodents or shrews on numerous occasions, and the majority also recorded small birds or amphibians, demonstrating that the recording medium was effective. However, detection rate of the four mustelid species was unexpectedly low. This could have been because these species were present only at low density; however trail cameras being used in the W4R project to monitor activity of larger predators recorded stoats and weasels more frequently than did ink tunnels, including places where nearby ink tunnels should have detected them. Similarly, mink rafts deployed on the main river channel and lesser backwaters detected mink where nearby ink tunnels did not. Taking these failures into account, detection rate in ink tunnels was 0.07 per tunnel and week. Considering the likely activity ranges of these mustelid species, we estimate that detection probability was more likely 0.02 per tunnel and week. In the following year, we set up experimental comparisons to test the effect of scent attractants on mustelid detection rate. Adding egg, meat or scent lure to ink tunnels failed to increase detection probability for small mustelids.
- We conclude that ink tunnels as used here were an unsatisfactory tool for reliable mapping of small mustelid predator activity. Trail cameras were unexpectedly better for stoats and mink (and presumably therefore polecats), but did not detect weasels, which are typically active out of sight in long grass or in vole tunnels. Approximately 1,000 person-hours of work were used in deploying and operating ink tunnels during 2015-2016. In view of the unsatisfactory results, we abandoned this method for 2017-19.

Insights from monitoring nest and chick predation in the Avon Valley

Ryan Burrell, LIFE Waders for Real, GWCT

Historic declines in breeding waders were largely driven by the loss and degradation of breeding habitat. As a result, conservation efforts have focused on restoring habitats through agri-environment schemes. However, the impact has been limited, with populations of many breeding waders still in decline. High levels of nest and chick predation and resulting low breeding success is limiting the ability of populations to recover even in the presence of suitable habitat. Hence, it is crucial to understand the predators involved on site by site basis to identify suitable predator management strategies. Within LIFE Waders for Real, we monitored the outcomes of wader nests and chicks using temperature loggers and radio-tracking respectively.

Temperature loggers were placed in the lapwing nest cup, with the trend in temperature readings providing the timing of predation events. Potential wader nest predators can be split by their nocturnal and diurnal activity, with no avian nest predators active during the night. 52 nests were monitored using temperature loggers, with significantly greater nest predation occurring at night and therefore by mammalian predators; a result in keeping with other studies of lapwing nest predation on lowland wet grassland. Suggesting that, to improve nest survival within the Avon valley we required more effective methods to limit mammalian nest predation: electric fencing trials elsewhere in the project have sought to achieve this goal.

The LIFE Waders for Real project identified chick fate where possible as part of a radio-tracking study of chick habitat use. 98 chicks were monitored by radio-tracking with 23 confidently identified as predated. Additionally, the signal was lost from a large proportion of chicks which could also result from predation. Significantly more known chick predation was attributed to avian predators; however, this must be assessed against the finding bias of this method, with radio-tags more likely to be relocated on elevated nests and posts, versus being buried or taken underground by mammalian predators. The large proportion of signal losses may be a result of further mammalian predation.

This work has identified that further efforts are needed to limit the ability of a range of predators to predate lapwing nests and chicks, with further research on the mortality of lapwing chicks to identify the specific predators responsible.

An introduction to the Boa Island Breeding Wader Project **Michael Stinson, Lough Erne Wildfowlers' Council**

The Boa Island Breeding Wader Project is an innovative partnership led by Lough Erne Wildfowlers' Council working with the local farming community adjacent to Lower Lough Erne, Co. Fermanagh, N. Ireland. The project seeks to support the recovery of breeding wader species, formerly common in the area, primarily Snipe/ Curlew/ Lapwing/ Redshank; all of which have suffered dramatic declines as breeding species in Ireland during the last 30 years.

The project commenced in 2014, initially receiving funding from wildfowling permit revenue, local NI government grants and Wildlife Habitat Charitable Trust support, has restored more than 10 hectares of habitat has been improved for breeding waders through restoration of species-rich grassland (primarily through encroaching scrub removal) and has promoted adoption of more wader sympathetic sward management.

Based on advice from GWCT, targeted seasonal fox, corvid and invasive American Mink management is also undertaken. During the past 5 years, the project has achieved encouraging results with several species based on independent monitoring; 2014-18 Snipe increase of 480% (5-29 displaying birds) and Redshank have increased from 0 pairs to 7 on the main sites. Additionally, Common Sandpiper has increased from 2 – 7 pairs in the same timeframe.

The project has recently received a significant funding boost from the NLHF's local Landscape Partnership, which will allow the project to expand. This partnership between the shooting community, landowners, statutory and non-statutory partners could be of interest to those wishing to build non-traditional partnerships to support wader recovery and has the potential to be replicated elsewhere. Twitter: @LoughErneWaders

Theme 3: Working with farmers and land managers, maintain momentum and next steps

Our journey from research to results

Lizzie Grayshon, LIFE Waders for Real, GWCT

The Waders for Real approach share results from research, through trusted relationships and by communicating them effectively with working conservationists on the ground; the farmers, land managers, river keepers and graziers. Sharing research outcomes provides enthusiasm for effective management practices and further monitoring to be carried out. This approach has achieved a stabilisation of the lapwing population in the Avon Valley and the project now hopes to influence future policy.

The beginning of the project sought to understand where knowledge gaps were in the farming community in relation to breeding wader management, what the motivations were to be involved and what support would be needed going forward. It was important throughout the project to work with and keep all stakeholders informed, and many farmer meetings were held to keep everyone up to date and educated in response to the monitoring taking place throughout the Valley. These meetings were also an opportunity for all stakeholders to get to know one another and build up a support system.

The project also continually shared its story and results at many networking opportunities such as countryside shows, to reach the wider community, and has also had a solid media presence thorough social media and press coverage.

Most positively, there have been some unexpected outcomes from the projects actions, where our advice on wader management has led to requests for advice on many other ecological aspects of land management, with people eager to do more than originally suggested, as well as wanting to continue non-lethal predator control work, such as continuing to erect temporary electric fencing. Ultimately, the ability for farmers to feel confident in managing their land for wildlife is the desired legacy of the Waders for Real project and we hope to continue to support that growth by assisting with funding applications, arranging training opportunity, and to be at the end of the phone or to meet in person, to help and advise whenever it is needed.

Curlew Country is at the heart of the local community, working to protect lowland breeding curlew in the Shropshire Hills and Welsh Marches

Amanda Perkins, Curlew Country, GWCT

We place great importance on working constructively with land managers to find out what is preventing the curlew from breeding successfully and then taking pragmatic steps to save the curlew. We are working to establish a workable model for every farmer with curlew on their land, to achieve breeding success and prove that the additional environmental benefits that will be achieved through managing for waders will deliver public goods at a reasonable cost.

Generally, we have found that local people treasure the curlew population and are keen to help. Land managers enable us to carry out close observation of nests on their land and interventions that aim to reverse the lack of breeding success in the local curlew population.

The project has trialled new intervention methods in the race to save curlew. These have included predation control, both lethal and non-lethal assessing the cost of impact on the farm business, as well as headstarting. This is the process of collecting eggs from wild nests under licence, and incubating them artificially to be reared and released back into the wild.

The Importance of Landscape-Scale Working

Jessica Brooks, GWCT

Working on a big scale can benefit not only the natural environment but farm businesses too, and trigger widespread engagement with communities. Farmers can achieve more together than they ever would in isolation. Over the last 8 years farmers have quickly understood the benefits of joining forces to manage the countryside, showing huge enthusiasm. A farmer cluster model allows them to devise their own conservation plans, choosing target species, issues and habitats. Work is usually underpinned by agri-environment schemes and the groups are 'facilitated' by an advisor chosen by them.

Being in a group allows access to lots of benefits now and in future. Working together brings more resource and expertise, making challenges like wildlife monitoring and predation control easier to tackle. The next agri-environment scheme, ELMs, will likely reward farmers for collaboration, and if payments are tied to biodiversity outcomes, guidance from a trusted advisor will be crucial. Collaboration offers a greater likelihood of access to new environmental markets, such as those emerging in the private sector. Many developers, companies and retail corporations are required to or have voluntarily created funds to spend on environmental projects, and they will be looking to award funding to projects which operate ambitiously, and at scale.

The Importance of Farm Monitoring

It is important to survey your wildlife or other objectives you have set, individually or as a group, because:

- It addresses knowledge gaps and gives you information about the farm/landscape which informs management and conservation action.
- It gives you the confidence that what you are doing to improve things is working.
- It sets benchmarks of achievement within and between your project and with National datasets.
- It allows Treasury to be reassured that the public money spent on agri-environment is being spent well and objectives are being achieved.
- Discoveries and feedback on progress engages people, and rewards their efforts!

Working with partners for wader monitoring & conservation

Sam Franks, BTO

The UK's breeding waders represent a group of species of high conservation concern. Actions to address population declines could have potential, wider biodiversity and ecosystem service benefits, for example peatland restoration, but may also conflict with other land management objectives such as woodland expansion or 'rewilding'. Building consensus on conservation priorities will be vital for decision-making going forward, and in order for all parties to have ownership of the outcomes, involvement from a range of stakeholders will be key to building the body of knowledge underlying informed decision-making. BTO have collaborated with local stakeholders, including the national park authorities, farmers and game management estates, on breeding wader research projects in the Yorkshire Dales National Park and the East Cairngorms Moorland Partnership. We trained estate staff and volunteer groups to monitor breeding waders, building survey design around work patterns. Project participants conducted transect surveys and found and monitored nests using temperature loggers and cameras. Given the right tools, local stakeholders can become an integral part of the monitoring process, which gives shared ownership of the findings.

What does a future Environmental Land Management (ELMs) Option look like for lapwing?

Andrew Hoodless, LIFE Waders for Real, GWCT

Looking ahead post Brexit, the Environmental Land Management Scheme (ELMs) will aim to replace the current rural grant system including Basic Payment Scheme and Countryside Stewardship Scheme. ELMs aims to deliver the Government's ambitions set out in its 25 Year Environment Plan, by simplifying agri-environmental contracts, providing guidance through expert advisors, and supplying '*public money for public goods*' to incentivise widespread uptake. There will be scope for innovation, potential to work collaboratively across farming boundaries and with financial incentives linked to the level of environmental ambition. ELMs will test and trial various approaches to feed into large scale national pilots set to begin between 2021-2024, with the expectation that ELMs will be put into operation between 2025-2030. Current land management schemes have lacked targeted advice, have been too prescriptive, inflexible and overly bureaucratic. It is hoped that ELMs will provide more freedom for land managers to make their own plans for wildlife, with advisors providing realistic suggestions on what will work for species such as breeding waders.

Bisterne Estate Hotspot - Excursion

The Bisterne Estate is a partner in the GWCT's LIFE Waders for Real project, together with many other land managers and farmers in the Avon Valley, working together at a landscape scale for wildlife, with project sites stretching from Salisbury down to Christchurch.

The estate hosts two of our four hotspot sites, with these hotspots focusing on areas holding important numbers of breeding waders and have each received intensive management, advice and monitoring, targeted at increasing productivity and breeding densities. We hope this approach will allow lapwing and redshank to recolonise unoccupied sites beyond these areas in the future.

The Bisterne estate comprises of 390-400 fields, with a range of habitats including a variety of forestry, sandy heaths, farm fields, wet bog and water meadows. Making room for nature is a priority for the estate by incorporating many nature friendly management options. There is also a rough shoot managed on the estate which provides recreational and cultural services to the local community, in addition to providing benefits to farmland birds by integrating cover crops and winter feeding through integrated game management. Predation control for the protection of all ground nesting birds is also carried out on the estate, through careful monitoring and targeted lethal control.

The Waders for Real project has worked closely with the Bisterne Estate in relation to their water meadow habitats to target lapwing conservation. Through working together, and as a result of this cooperation we have seen successes through the combined activities of habitat creation (i.e. ditches and scrapes), increased habitat management, increased predator control and the use of temporary electric fences. Lapwing pairs on the water meadows have increases from 21 in 2015 – 30 in 2019, redshank pairs have increased from 4 in 2015 - 16 in 2018.

The whole of the Bisterne Estate team is committed to successful lapwing conservation and monthly estate meetings ensure everyone working on the ground is in the loop in relation to conservation objectives and that farming activities such as grazing, cropping regimes and cover crop rotations etc are timed and well-coordinated.



Waders for Real Conference Discussion Outcomes 6-7 November 2019

Discussion Topic A: Managing habitat and monitoring to increase wader productivity

1. How can wader habitat be managed on a landscape scale?

GWCT's Farmer Cluster initiative, a group of land managers working together, is a good way to achieve this, but it requires a trusted facilitator who comes from within the community. Working across boundaries via group meetings, allows farmers to learn through experience and pass on information to neighbours. For waders, it can provide a patchwork of connected habitats with a wide variety of suitable conditions. A general shift towards mixed farming could also help waders on a landscape scale. However, we don't yet fully understand what's required to achieve large-scale success, so more research is needed. Water catchment management is particularly challenging as infrastructure, ownership, designation and abstraction all need to be taken into account.

Suggestions for ELMS

- In particular, grassland and water need to be managed on a catchment basis to allow colonies of waders to expand.
- Wet features need to fit with farming practices, if they are to be rolled out on a large scale. For example, lapwing can be as happy with linear wet features as they are with a large round scrape in the middle of a field, which can be harder to accommodate.
- Compensation should be available for those farmers in a Farmer Cluster who, due to geography, maybe more adversely affected by landscape-scale conservation measures. They might lose more land by rewetting, for example.
- Any results-based payment should be for the cluster area as a whole rather than individual farms, as land managers can't guarantee birds will nest within their boundary, even if they have improved the habitat.
- Local demonstration farms and examples of successful landscape scale conservation on large nature reserves would be helpful learning resources for Farmer Clusters.
- Supermarkets should be made aware of suppliers which are in Farmer Clusters or other ELMS schemes. Labelling on produce from these suppliers should indicate they come from farms in conservation schemes.
- Facilitators should have the authority to grant derogations.
- Sometimes tensions can arise between estates and tenant farmers with estates taking payments and then farmers expected to carry out the work. Land agents set up agreements and it is not always clear what has been set up and if management is compliant. Landscape scale payments distributed through Farmer Clusters might work better.

2. How can monitoring waders be incorporated into farming practice?

It is important to make monitoring fit into the farming calendar and activities. Farmers should only be expected to provide easily captured data not carry out complex surveys. Land managers could ask local birding groups to carry out surveys or pass on their skills to volunteers in the local community.

Suggestions for ELMS

- Payment for a commitment to monitoring could be an option in a scheme.
- To guarantee commitment and consistency, a long-term monitoring strategy is essential as is regular advice from qualified staff on surveying and submission of data.
- Apps could be designed and used for systematic long term monitoring.

3. Is monitoring of habitat creation enough to guarantee success?

Habitat creation is important in itself. For example, if you want a lapwing population to expand you need to create suitable areas for them to move into. However, other factors could be limiting wader productivity and expansion so as well as habitat creation, we also need to monitor bird numbers.

Suggestions for ELMS

- The underlying reasons for the various agri-environment measures relating to waders should be explained to land managers and schemes should be both correctly targeted and adaptive. Otherwise there is a risk that farmers might do everything by the book but still not attract any birds because the prescribed habitat is not right for that situation.
4. Do we actually know enough about the habitat requirements for lapwing, redshank, snipe and other waders?

It was agreed that we know a good deal about small scale habitat requirements for lapwing to nest, but not yet enough about redshank, snipe or curlew. For redshank and snipe we know little about the carrying capacity of a particular landscape and for snipe, in particular, we need greater knowledge of the impact of water, food availability and temperature.

For all wader species, creating the right environment for nesting success is much easier than for chick survival, where more research is needed. It seems lapwing would manage in habitat created for the other wader species, but snipe and redshank, have specific requirements.

We also need to learn more about: what happens to waders outside the breeding season; what impact continued water abstraction will have; what the birds require on a both a landscape and international scale, particularly in relation to climate change; and the long term impact of manipulating habitat features.

Other observations:

There is no water on arable landscapes and yet lapwing breed there. This may indicate that within the same species there are groups of birds which are especially adapted to certain environments.

The lowest lying land appears to be favoured by redshank.

Choosing the right breed and age of cattle is key to improving habitats for waders.

Suggestions for ELMS

- Schemes should encourage connections and cooperation between the different bodies trying to conserve target species across the UK and overseas.

5. Is it better to manage habitat less intensively across a whole farm or to concentrate effort on a smaller number of fields or hotspots?

Both strategies depend on a number of factors including farm economics/practicalities and how much land can be sacrificed; the species targeted (e.g. lapwings' colonial defence is strengthened by concentrated efforts on smaller areas, but this would be less suitable for curlew); the make-up of habitat (some parts of a farm may not be suitable for waders); which other species/habitats are being conserved on the same estate as they may have different requirements to waders.

Other observations

Lethal predation control is arguably only effective on a larger scale, so there might be a greater need for fencing if you are concentrating efforts on a small area.

In some existing schemes options are not possible for smaller farms.

Suggestions for ELMS

- There should be options for both large and small scale management for waders and schemes should take into account target species, farm economics/practical restrictions and existing type of landscape or habitat.

Discussion Topic B: Monitoring predator activity and predator management

1. Is predator management necessary to retain these wader species in the Avon Valley?

A consistent approach to fox and small mammal control is needed to keep populations to a level that allows wader productivity to rise and their colonial defence strategy to become effective. Many farms in the Avon Valley had been in HLS agreements for many years but waders had continued to decline. One of the reasons for this was inadequate predator management. Without predation management being taken into account there is a risk efforts will fail and land managers will be demotivated.

In the Avon Valley proximity to urban areas and forestry blocks, help to explain the high density of foxes and fish farms could be the reason for the abundance of herons, which also predate on wader chicks. Other factors driving the increase in predator numbers across the UK might include, growth in landfill sites, outdoor pig rearing, greater use of maize, gamebird releases, protections and reintroductions of predator species. More research in this field is needed.

It was agreed that protected species can also pose a threat to wader species in the Avon Valley and some form of control to maintain a balance and protect prey species may be necessary. For example, fences can be a good solution when used in the right place, at the right time and diversionary feeding can work to mitigate raptor predation.

It is sensible to focus on the generalist species that are known to be a problem. However, understanding of several predator species in the Valley was felt to be poor. We need to know more about chick predators (as opposed to nest predators) such as small mammals, stoats in particular, and raptors. In some areas the extent and behaviour of even the more closely monitored generalist predator species such as foxes and mink is not yet clearly understood. Different species appear to predominate in different years, and it is difficult to predict these fluctuations. For example, It seems there are more stoats after removing foxes, which is a potential problem.

Suggestions for ELMS

- Agri-environment funding for predation management is needed both for lethal and non-lethal measures (such as temporary fencing and habitat manipulation).
2. What role does non-lethal control (e.g. exclusion fencing, habitat manipulation, nest cages) play?

When done in the right way, in the right place and tailored to farming practices, non-lethal management can be helpful to boost productivity, but it can require considerable amounts of time and effort. For example, erecting and maintaining and moving temporary fences, which may need to be moved each year due to shifting of wader breeding sites and to confuse predators. Non-lethal methods are unlikely to be sufficient on their own and should be used in conjunction with lethal control and habitat creation.

Suggestions for ELMS

- Non-lethal predator management should be flexible enough to fit in with farming practice and keep disruption to a minimum.
 - It should be part of a package with habitat measures and lethal control.
3. Is there a good rational case for lethal predator control? Is it effective, humane and affordable?

Yes, if you put in sufficient time and planning to targeted predator control, it can be very effective in meeting conservation goals and invaluable to some threatened prey species. The right methods must be deployed on the right scale (for example, care is needed to make sure predator control does not create a vacuum) and it should be used in conjunction with habitat improvement and non-lethal control methods.

It can be humane provided control is targeted, best practice is followed and it is carried out by a professional with sufficient understanding of fieldcraft and the correct equipment such as the breakaway snare.

Ideally predation managers should be trusted members of the local community. The more trust an individual has the more likely people will accept lethal control where necessary.

The equipment required is not too expensive but payment for hours spent can make predator control costly (see below). Participation in a project involving several farms or incorporating it into shoot management can help meet the costs.

Suggestions for ELMS

- There is no point in implementing lethal control of predators if there is no suitable habitat for waders.
- Predator control should be part of a package of measures including habitat improvement and non-lethal predation management measures.
- To understand the efficacy of predator control requires monitoring before, during and after on a continuing cycle.

4. Are Defra/Natural England policies helpful with respect to predator management? How could they be improved?

It was felt that current government policy does not have a position on predation management, in that there are almost no options to fund it, despite its proven importance in protecting prey species. This leaves the onus on land managers to fund predator control where they can to protect their waders, both temporary fencing and lethal control. For example, at the 4,000-acre Elmley Nature Reserve, one member of staff spends five hours a day, covering 36km on a quadbike, from mid-March to Mid-July making the cost of predator management £7,000 per year. Although many land managers are committed to conservation, their goodwill can be stretched too far. If predator control is discontinued or is not taking place in the first case, the benefit of public funding for habitat measures may be reduced or lost.

Suggestions for ELMS

- Increased education for land managers through ELMS on why predation control is important provided it is delivered locally with tailored guidance from advisors.
- Better use of existing licencing system to manage protected predators when they are impacting on threatened species.
- Education is needed to prompt public acceptance of the need for predation management in certain situations.
- Predator management comes with both capital and ongoing costs. Both should be acknowledged and supported.
- Sites with public access can also produce issues outside farmers' control such as dog walkers disturbing or predating ground nesting birds. Funding for public campaigns to minimise disturbance should be available.

5. Are we committed to indefinite intervention? Will there ever be a 'hands off' stage?

It is hoped that there will be a stage when wader numbers have recovered sufficiently, and intervention can be reduced. However, there are many unknowns such as optimum population size and how much habitat would be required to support it.

Some participants felt that in reality, the proximity of dense human populations in the Avon Valley mean inevitable increases in disturbance for waders and higher predator numbers in future. Therefore, intervention will remain necessary to maintain sufficient wader habitat and productivity. However, ongoing monitoring should continue to inform levels of predator control, which could be reduced in time. There was concern that predation management will not continue if society dictates that these activities should not happen and this would be to the detriment of wader survival.

Discussion Topic C. Maintaining momentum and next steps

1. How much scope is there to do more habitat work in the Avon Valley while maintaining viable farming businesses?

Potential impediments to doing more habitat work are: funding; support for ongoing maintenance (e.g. if you put in a scrape, in a few years it becomes unsuitable); motivation, availability of advice and lack of continuity due to change in NE advisors; historical distrust of schemes; and reluctance to do things differently particularly with regard to water catchment management.

Not everyone in the current schemes are in them with the aim of achieving environmental outcomes – this needs to be addressed as it leads to failure. On the other hand, people who are keen to make a difference and might have natural capital to offer are sometimes excluded because they don't meet the criteria.

Currently there is a lack of flexibility in the schemes and many are unrealistic in working landscapes. Flexibility in future schemes is essential. For example, in the case of conservation grazing, guidelines should be tailored to the size of farm and restrictions of the business such as the farming calendar, geography, which species is being targeted and specific conditions in a particular year.

There was optimism that Farmer Clusters could be a motivating force and help smaller farmers with advice that they might not otherwise have access to and the Agriculture Bill suggested more support for public goods. As well as public funding Farmer Clusters should consider other sources of revenue such as corporate investment or involvement in conservation projects such as Waders for Real.

Suggestions for ELMS

- Schemes have to be highly flexible and fit in with running a farming business and different conditions in a given year.
 - Access to advice should be easier. Advisors need more time to construct bespoke options for particular habitats/species based on local knowledge and should be available to provide continuous guidance. Advisor needs to be 'on call' regarding ecological and social issues.
 - Bespoke advice needed for smaller land managers including support with stewardship applications. Advice should be targeted at those who really need it.
 - Financial incentive provided for maintenance as well as establishment of habitat.
 - Should be flexibility around Capital works e.g. funding amendments if the scheme needs to be changed.
 - There should be less bureaucracy and a simpler application process.
 - Payments need to be prompt as difficulties and frustrations in scheme workings will decrease enthusiasm and future uptake. The RPA needs some sort of accountability. The rigid guidelines for assessment for payment don't work currently. Local knowledge and assessment is crucial as the same approach does not work everywhere. Payment needs to be appropriate to level of work required.
2. Are new payments by results schemes needed? How would success be measured? How will the targets be decided?

A switch to some form of payment by results is needed with a safety net in case people don't produce the goods through no fault of their own (e.g. poor advice or the carrying capacity for a particular species already having been reached). More money would need to be invested for surveying and monitoring a results-based system.

Suggestions for ELMS

- Before recommending schemes advisors should talk to farmers about what wildlife they have on their farms and what they value in terms of habitat.
- We need to move away from rigid prescriptions and have the freedom to adapt schemes based on desired outcomes.
- Payment could be graded with a base level of habitat creation, then, for example, bonus payments based on number of pairs of lapwing attracted to the site, followed by fledging success.
- There could be a national bonus pot with money to distribute if local or regional targets were achieved this would produce 'lapwing envy' and encourage others in a spirit of friendly competition.
- Any results-based system should be based on a range of species not just waders e.g. fallow plot management could be rewarded for producing, skylark, stone curlew and arable flora.
- Need to develop a body of trained volunteers to achieve more reliable surveying etc
- Look at potential for self-assessment of agri-environment scheme compliance. NE should provide entry level courses in ecology and wildlife ID skills to help land managers with self-monitoring.
- Ideally data collected would be collated and contribute to our greater knowledge of species across the UK.