Action for Curlew in Ireland

Recommendations of

The Curlew Task Force

Summary document



Conservation actions to protect and enhance the breeding population of Eurasian Curlew in Ireland in order to prevent its extinction

May 2019

Acknowledgements

Thanks are due to Mary Colwell for her involvement in instigating the Higginstown conference and her encouragement since. And to all those individuals and organisations who engaged in the Higginstown "Curlews in Crisis" conference in 2016

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The Task Force was made up of a wide range of organisations and individuals and thanks are due to all for their participation and contributions.

Organisations: BirdWatch Ireland, Bórd na Mona, Coíllte, Cork County Council, Department of Agriculture, Food & the Marine (DAFM; including agriculture sections and Forest Service), Golden Eagle Trust, Irish Cattle and Sheep Association, Irish Creamery and Milk Suppliers Association, Irish Farmers Association, Irish Natura and Hill Farmers Association, Irish Peatlands Conservation Council, Michael Martyn Agricultural Consultants, National Association of Regional Game Councils, National Parks & Wildlife Service of the Department of Culture, Heritage and the Gaeltacht, Office of Public Works, Royal Society for the Protection of Birds (Northern Ireland), An Taisce, Teagasc, Turf Cutters and Contractors Association, University College Dublin. Individuals: Alan Lauder, David Rees, John Temple-Lang.

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Background to The Curlew Task Force

The Eurasian Curlew *Numenius arquata* (hereafter 'Curlew') is the only Irish bird on the IUCN Red List of Threatened Species¹. The species is afforded protection under the EU Birds Directive (2009/147/EC) where it is listed as an Annex II species. In Ireland, the Curlew is also protected under the Wildlife Acts and the Birds and Natural Habitats Regulations, 2011 and is on the Red List of Birds of Conservation Concern in Ireland (BoCCl²).

It was readily apparent, as evidenced by the Bird Atlas of 2007-2011 and from observations in key areas, that the population of breeding Curlew in Ireland had declined to very low levels by 2011. The first national survey of breeding Curlew in Ireland was coordinated by the National Parks & Wildlife Service (NPWS) between 2015 and 2017³. The population estimate derived was 138 pairs, representing an estimated decline of 96% since the population estimate generated by the Bird Atlas of 1988-1991.

In November 2016, a workshop entitled "Curlews in Crisis" was instigated by writer and broadcaster Mary Colwell, whose personal campaign via a long-distance walk and blog had helped to further raise awareness about Curlew declines across Ireland and Britain. The conference was organised by Mary, with input from Alan Lauder, BirdWatch Ireland, University College Dublin and NPWS. The primary resolution arising from that conference was that a dedicated Task Force should be formed to identify the various issues relating to Curlew conservation and to recommend appropriate immediate actions (as well medium- and long-term actions where this was feasible.

In January 2017, then Minister for Culture, Heritage and the Gaeltacht, Heather Humphreys TD, announced the formation of the Irish Curlew Task Force, as an advisory group to include various stakeholders with an interest in the management of the Curlew and its habitat.

In addition to a number of individuals with significant experience of or engagement with, Curlew conservation, the various parties that contributed to the Curlew Task Force were: BirdWatch Ireland, Bórd na Mona, Coíllte, Cork County Council, Department of Agriculture, Food & the Marine (DAFM; including agriculture sections and Forest Service), Golden Eagle Trust, Irish Cattle and Sheep Association, Irish Creamery and Milk Suppliers Association, Irish Farmers Association, Irish Natura and Hill Farmers Association, Irish Peatlands Conservation Council, Michael Martyn Agricultural Consultants, National Association of Regional Game Councils, National Parks & Wildlife Service of the Department of Culture, Heritage and the Gaeltacht, Office of Public Works, Royal Society for the Protection of Birds (Northern Ireland), Teagasc, Turf Cutters and Contractors Association, University College Dublin.

The Task Force was chaired, voluntarily and independently, by Alan Lauder and the secretariat was provided by staff from NPWS.

Between February 2017 and November 2018, there were six dedicated Curlew Task Force meetings, attended by over 30 representatives. Representation was for the most part reserved for one representative per stakeholder organisation. These representatives were offered the opportunity to contribute to various aspects

¹ www.iucnredlist.org

² Colhoun, K. and Cummins, S. (2013). Birds of Conservation Concern in Ireland 2014 –2019. Irish Birds 9: 523-544.

³ O'Donoghue, B. G., Donaghy, A. and Kelly, S.B.A (2019) National survey of breeding Eurasian Curlew Numenius arquata in the Republic of Ireland, 2015–2017. *Wader Study* 126:1 pp43-48

of the overall discussion but had more focused input into issues they were directly associated with. To do so, the Curlew Task Force was segmented into eight focus groups (presented below). Each group had a coordinator who facilitated discussion and input from fellow group members and produced draft recommendations towards chapters of the overall Task Force. In addition, each of the focus group's recommendations were collated in this document and cross-cutting themes are included in a synthesis section.

This document synopsises the recommendations and background document produced by the focus groups and aims to succinctly draw together the recommendations of the CTF in a single document.

Curlew Task Force Sub-groups:

- 1. Curlew ecological requirements and research
- 2. Farming and agri-environment
- 3. Forestry
- 4. Bogs
- 5. Predation and nest protection
- 6. Planning and development
- 7. Curlew and people
- 8. Synthesis

Recommendations

1.Curlew Ecological Requirements

The population of Curlew is critically low and breeding productivity has been identified as a critical factor. A population model derived from known parameters predicts that in the absence of any action, the Curlew will become extinct as a breeding species in Ireland within 10 years. Saving the Curlew from extinction in Ireland is one of the greatest conservation challenges faced by Ireland.

One of the first considerations is to properly understand the species ecological requirements in an Irish context; much is known from UK and other European studies but the precise factors operating in Ireland need to be further explored to identify what measures are required to address declines here.

The Task Force identifies that the Curlew Conservation Programme, established in 2017 and focusing on action and research, should continue to be supported, and as soon as practicable, upscaled and expanded, most likely under the forthcoming Common Agricultural Policy Strategic Plan. Together, with existing measures such as agrienvironment schemes and EU programmes such as the Curlew EIP, this could provide a coherent programme of State and EU funded measures, albeit it is recognised that improvements to existing schemes are required to make them most effective for Curlew. As such then, a suite of actions, including those undertaken in the NPWS Curlew Conservation Programme, the Curlew EIP, GLAS prescriptions trialed between 2016 and 2020 and NPWS Farm Plans should be combined in a Curlew specific Programme of Measures. This Programme of Measures for Breeding Curlew in Ireland should have cross-government support with clear targets and deliverables. Other measures include an audit of land-use within Curlew areas to help identify key issues and opportunities and this was carried out in 2017 and can inform future action.

Throughout, it is also important to take account of the requirements of priority species which share Curlew habitats, to allow an approach which does not negatively influence other species of conservation concern.

Investigating novel techniques is also part of this programme, such as testing new predator control measures and examining the feasibility of "headstarting", to potentially contribute to increasing productivity to sustainable levels should they prove to be of value. There should be a continued openness to investigation and development of new approaches.

To address these aspects the CTF makes the following recommendations:

Recommendation 1.1 *Continue the Curlew Conservation Programme and develop a long-term comprehensive State Programme of Measures for Curlew in Ireland - based on learnings found from the CCP and other schemes including the Curlew EIP and GLAS*

Recommendation 1.1b Utilise, capitalise and build on the wealth of experience and expertise that has grown through the Curlew Conservation Programme, with dedicated interested parties that have progressed pioneering measures for Curlew in Ireland

Recommendation 1.2 Take into account the requirements of species of conservation concern sharing the same landscape/habitats by appropriate design of conservation measures

Recommendation 1.3 Undertake an audit of land use in Curlew territories

Recommendation 1.4 Undertake research on breeding Curlew, with particular reference to, examining the effectiveness of conservation measures and with specific reference to the landscape of Ireland

Medium to Long-term issues considered by the Task force included aspects of tracking technology and its applicability, the need to gain more information on breeding parameters related to habitat quality and the merit of using of "headstarting" as a tool to temporarily boost productivity. The latter is potentially of particular relevance and although it is unlikely to be able to be instigated immediately the need to gain a better understanding of how it could assist would be valuable in the short term.

Recommendation 1.5 Undertake research and investigations on the practicality of using "headstarting" to augment breeding Curlew productivity

2. Farming and agri-environment

The Task Force recognises that the Irish landscape and many of the habitats within it are the product of thousands of years of interaction with agriculture. While this process is dynamic and change is inevitable, an opportunity exists to manage change in order to preserve key habitats and species and in turn support farmers and rural communities. It is recognised that this can be achieved by engaging with rural communities and farmers to ensure that habitats are enhanced, and key species protected, through proper supports both in terms of finance and through knowledge and skills exchange.

Curlew, in general, benefit from an extensive-type approach to farming, with low intensity grazing, late cut meadows and low input of chemicals and nutrients. The CTF recognise that modern agriculture has overall, not suited the species requirements with greater intensification, mechanisation, specialisation and conversion of natural and semi-natural habitats to unsuitable conditions either through intensification or in some cases through abandonment, all within fifty years.

There now exists the opportunity to design measures, particularly under the Common Agricultural Policy and the Rural Development Programme, for Curlew. It is acknowledged that in the present RDP, farmers with breeding Curlew have been prioritised for a specific Curlew agri-environmental measure under the Green Low-carbon Agri-environment Scheme (GLAS). However, the scheme lacks crucial elements such as an Advisory and Capital Works programme. The pilot Curlew Conservation Programme (CCP) has since 2017 led the main activity for conservation of breeding Curlew and has learned many lessons during this time which can be utilised for inclusion in future RDP measures. The Curlew EIP (European Innovation Partnership) project, developed by BirdWatch Ireland in conjunction with other partners, was supported by the Department of Agriculture, Food & the Marine (DAFM) as one of the first EIP-Agri - projects in Ireland. In addition, NPWS has, since the early 1980s, funded specific measures for breeding waders, engaging directly with farmers at specific sites. All of these can contribute to developing a comprehensive and effective state funded programme for Curlew.

There have been various other efforts for breeding wader conservation led by eNGOs, such as BirdWatch Ireland, which have worked directly with farmers on the ground and included undertaking capital works, e.g., the Halting Environmental Loss Project (HELP) funded by INTERREG IVA. However, there is now a need to urgently expand and increase the funding for these types of initiatives to deliver more comprehensive and effective agrienvironment measures for Curlew.

Recommendation 2.1 Develop High Level requirements for Curlew within future Rural

Development Programmes, specifically;

- a) Carry out annual surveys to monitor the population and identify where Curlew are located
- b) Urgently address the loss of curlew habitat
- c) Develop, finance, target and adapt proactive measures through bespoke management schemes
- *d)* Implement habitat measures (including the adoption of sensitive farming and non-productive investments)
- e) Deliver effective nest protection
- *f)* Landscape-scale approaches (including farm clusters and collaborative working)

- g) Consider wider positive benefits to biodiversity/landscape of adopting these approaches
- *h)* Consolidate and utilise data and experience available from various sources including the CCP, EIP, BnM, Gun Clubs, local projects, etc.

3.Forestry

An increase in the cover of commercial forestry is one of the most significant changes that Curlew have experienced within their preferred landscape. While more than 300,000ha of peatland have been planted in Ireland, new planting on peatland has largely ceased. However, publications relating to 'Land Availability for Afforestation' (COFORD land availability working group, 2016⁴) and 'Land Types for Afforestation' (Forest Service, 2016⁵) specifically earmark and target the types of grassland habitat required by Curlew (and other species of conservation concern) for afforestation. This along with ambitious targets to increase the area of forestry to cover 17% of the Irish Republic by 2030 continues to threaten Curlew.

Curlew declines in Britain and Ireland have been frequently associated with direct and indirect effects of afforestation and these effects include; direct replacement of Curlew habitat by afforestation, fragmentation of Curlew breeding habitat providing smaller suitable areas and increased vulnerability to predators and perception of predator risk (conifer plantations provide refuge for meso-predators, resulting in increased risk of predation for ground nesting birds; edge effect is a contributory factor in predation and in effecting behavioural avoidance, dissuading species from nesting near forestry). A range of studies indicate that proximity to forestry is a major influencing factor in nest success and as a result productivity is lowered. Douglas *et al.* (2014)⁶ recommended not only siting new afforestry away from important bird breeding areas, but furthermore, the removal or redistribution of existing forestry away from important breeding bird areas. Removal of forestry, forest and scrub patches and sometimes individual trees has been typically used at breeding wader sites, where traditionally forestry would be absent, to enhance occupancy and breeding success and to improve hydrological conditions.

An 'audit' of Curlew territories was undertaken by NPWS in 2017 and this identified that a number of individual territories have currently suitable Curlew habitat that could be afforested, if adequate safeguards are not put in place.

It is important that land of conservation importance to vulnerable or threatened species is not afforested, if this results in the displacement or loss of birds such as Curlew from that land or its surrounds. The State has an obligation to ensure that such activities are not approved without appropriate consideration of the implications for Curlew, given its current status. The Forest Service of the DAFM, has incorporated locations where Curlew have been recorded during the breeding season, into the Integrated Forest information System (IFORIS). This is updated annually, to incorporate new information. This is to inform inspectors that Curlew may be nesting on site, so they can take this rare and sensitive species into account when assessing applications to plant or fell

⁴ COFORD Land Availability Working Group (2016). *Land Availability for Afforestation - Exploring opportunities for expanding Ireland's forest resource*. COFORD, Dublin.

⁵ Forest Service (2016). Land Types for Afforestation. Department of Agriculture, Food & the Marine, Wexford.

⁶ Douglas, D.J.T., Bellamy, P.E., Stpehen, L.S., Pearse-Higgins, J.W., Wilson, J.D. & Grant, M. (2013). Upland land use predicts population decline in a globally near-threatened wader. Journal of Applied Ecology. DOI: 10.1111/1365-2664.12167.

trees within 1km of existing sites or 250m of 'historical' sites. These new measures are welcome, but there is concern that these buffers are not sufficiently large and do not take into account the loss of potential for population re-establishment. The measures require review and updating with new information and should take a suitably precautionary approach. A buffer radius of significantly greater than 1km from a nesting Curlew pair in order to provide certainty. In summary, it is recommended that afforestation should be avoided where there is a risk either to Curlew that are already present or where population recovery may be feasible.

The provision of agri-environment supports of equivalent value and longevity to Forestry supports should be available to make sympathetic farming a realistic option to forestry in Curlew areas. This would not only provide benefits to Curlew but can also make a contribution to people's livelihoods and to community cohesion of these predominantly upland marginal areas.

Opportunities for the removal of forestry, in order to rehabilitate or recreate peatland and wetland habitats which could support Curlew, do exist. To achieve this, the identification of such opportunities is a first step and this could be carried out on State lands and on lands where biodiversity management is prioritised, notably those under the control of Coíllte and Bord na Móna. This has the potential for benefits for biodiversity for carbon sequestration, for hydrology and for breeding Curlew.

Recommendation 3.1 *Safeguard Curlew breeding and feeding sites from inappropriate forestry planting by enhancing procedures for the proper consideration and approval of new plantings and related activities, specifically including:*

- Review of existing guidance to take account of the above
- Increase the screening zone around Curlew areas to provide greater certainty of avoidance of impact on Curlew
- Build in site specificity with regard to e.g. wider hydrological impacts, cumulative impacts with other plantings, landscape, aspect etc.
- Ensure all planting applications are reviewed by ornithologists with Curlew expertise and knowledge
- Inclusion within guidance a consideration of historical curlew sites to ensure the potential for recolonisation through conservation effort is not lost

Recommendation 3.2 *Audit and identification of key opportunities for deforestation and habitat restoration on previously afforested areas for Curlew and wider benefits*

Recommendation 3.3 *Develop and promote viable options for sympathetic land management supports within Curlew areas where forestry is not desirable*

4.Bogs

Approximately two-thirds of Curlew in Ireland are believed to breed on bogs. It is therefore important that these peatlands where Curlew are known to be nesting are safeguarded and appropriately managed, to protect pairs and enhance their breeding success. Areas of intact peatlands need protection and management to provide breeding habitat for Curlew in the future. Opportunties for rehabilitation of damaged peatland habitats also provide an opportunity for the restoration of Curlew populations where this can be done effectively.

The commercial and domestic utilisation of peatlands has led to the loss of 77% of peatland habitats in the Republic of Ireland (Malone & O'Connell, 2009⁷). Turbary and mechanical cutting have resulted in a 47% loss of peatland habitats, representing over half a million hectares of land. As well as turf cutting, there are a wide range of uses for peatlands, which are causing serious habitat losses such as: forestry (19% loss), overgrazing (5%) and agricultural reclamation (6%). Out of the 1,151 peatlands of conservation importance that the Irish Peatlands Conservation Council (IPCC) monitor, 10% were recorded hosting Curlew activity in 2018, whether breeding or non-breeding. It is important to identify bogs where turf cutting is operational within Curlew territories as such information will allow the Turf Cutters and Contractors Association (TCCA), NPWS and other stakeholders to explore safeguarding and positive action on Curlew management with the turf cutters and contractors operating on these peatlands. Specific site advice as to which plot or plots are sensitive (i.e. where nesting is suspected or confirmed) is required to ensure avoidance, compensation for or delaying of turf cutting. In 2018, there were three examples (two in Kerry, one in Roscommon) of where turf cutting would have jeopardized the safety of Curlew nests monitored by the Curlew Conservation Programme (CCP). The Curlew Action Teams (of the CCP) and the turf cutters/contractors in question, engaged positively with one another to delay turf cutting on the relevant banks, to allow eggs to hatch. In addition, there have been examples of turf cutters/bog owners undertaking positive works for Curlew under the Curlew Conservation Programme, such as tree removal, scrub removal and assisting with predator control. Follow-up surveys to identiy sites where Curlew breed or have the potential to breed and sensitivity mapping/risk analysis should be undertaken to target engagement programmes with local turf cutters or contractors.

There are key landwoners and organisations holding large tracts of bog in various states of condition. Bórd na Mona and Coíllte in particular are the largest landowners in Ireland and have a policy and operational framework within which bog restoration actions can be carried out which would benefit Curlew. Some works have already been undertaken, e.g., Bord na Móna have undertaken, with BirdWatch Ireland and NPWS, surveys of Curlew on their landholdings and identified protection measures in a conservation plan. There is greater potential for this type of action and further direct targetting of Curlew protection and and management should be prioritised where feasible.

Recommendation 4.1 *Identify where Curlew are breeding in active turbary areas and design a blueprint for proactive and positive engagement with turf cutters/plot owners*

Recommendation 4.2 *Bord na Móna to continue to survey and monitor Curlew and propose conservation actions on their estate*

⁷ Malone, S. & O'Connell, C. (2009). *Ireland's Pealtand Conservation Action Plan 2020 – Halting the loss of peatland biodiversity*. Irish Peatland Conservation Council, Lullymore, Rathangan, Co. Kildare.

Recommendation 4.3 *Coillte to undertake survey and monitoring of Curlew on their land and propose conservation actions for Curlew*

Recommendation 4.4 *Irish Peatland Conservation Council (IPCC) to continue to survey and monitor Curlew on their land and propose conservation actions for Curlew*

5. Predation and nest protection

Many of the "Birds of Conservation Concern in Ireland" (Colhoun & Cummins, 2013) are ground nesting species. There are many variables driving the conservation challenges for these species, but the existing predation level is a significant cause for concern for many species and must be addressed in the short-term. The impact of predation on ground nesting birds is felt to have increased over recent decades and this is shown, in a number of studies, to be driven by land use change. These changes include the intensification of agriculture, the introduction of forestry into open ground and the reduced area of wetlands, all resulting in a fragmented and edge-rich landscape, with strong populations of meso-predators including Fox, Mink, Pine Marten, Badger, Hooded Crow, Magpie etc. In the case of breeding waders, that will mob potential predators in a colony type response, a decline in the breeding population will also see the remaining nests and chicks made increasingly vulnerable to predation.

Naturally, any population that is not rearing an adequate cohort of young will eventually decline. For those populations that have declined, an increase in the number of young reared will be required if the population is to stabilise or recover.

The existing population model for Irish Curlew highlights the impact of low productivity above other parameters and there is an unquestionable need to address unsustainable predation rates on the Irish Curlew population as an immediate conservation priority to halt declines and allow stabilisation and recovery.

Controlling the impact of predators can be undertaken in a range of ways, primarily and most effectively by use of lethal methods to remove predators but also including, in certain circumstances, predator exclusion and deterrence. Effective predator control for Curlew can be defined as the systematic removal or deterrence of generalist nest predators during the most vulnerable time, within a defined area, resulting in lower losses to predation. This can include clearing existing predators from immediate site, creating a protection zone around breeding bird and/or reducing background populations of potential predator that will repopulate. Ultimately the results of a predator control programme for Curlew should be judged by the productivity of the local Curlew breeding attempts, while the sustainability of the species in the long-term is the ultimate goal and predator control alone cannot achieve that.

Recommendation 5.1 *Design and deliver effective predator control to protect breeding Curlew*

Recommendation 5.2 *Systematically record effort and consider effectiveness of predator control*

Recommendation 5.3 *Consider carefully public attitudes and understanding of predator control*

Recommendation 5.4 *Incorporate predator control into national RDP schemes aimed at Curlew*

6. Planning and development

Ireland has numerous goals, objectives, targets and plans that involve developing infrastructure and planning future land-use. It is imperative that vulnerable habitats and species, like Curlew, are appropriately considered as part of these plans and objectives, both at strategic level and at site level. It is, of course, also vital that Curlew are not 'scapegoated' or persecuted if they are portrayed as a potential threat to developments. This is something that needs to be considered carefully, with early engagement with developers and planning bodies, and meaningful alternatives put in place for important sites.

Nationally, Curlew are included on the Red List of Birds of Conservation Concern in Ireland and are included in Ireland's Prioritised Action Framework⁸ as a conservation priority. As Curlew are not listed on Annex 1 of the Birds Directive, no Special Protection Areas (SPAs) have been designated with Curlew as a selection feature. Breeding Curlew are included on the schedules for some SPAs, but this does not guarantee protection and management within the designated site. About half of known Curlew breeding sites are thought to occur within Natura 2000 sites and the site synopses should be amended as appropriate to ensure that the presence of Curlew is noted. A mechanism to provide a legal basis for measures to protect Curlew and the red listed species is required, which should include the consideration of further designations.

Information on locations of breeding Curlew is important in terms of dealing with all planning related matters and all relevant bodies, including relevant NGOs should have access to this information when requiring it to consider planning applications, this should be built into new mechanisms (covered by earlier chapters) to provide up to date locational information.

Curlew and other breeding waders favour open landscapes, with a clear view of surrounding areas. Afforestation of open habitats such as moorland and wetlands can cause loss and fragmentation of of suitable Curlew breeding habitat. Research has shown that Curlew tend to nest further from forestry edges than would be predicted by chance and this is largely attributable to the fact that predation rates are often higher in landscapes fragmented by forestry. Studies show even a small increase in forestry cover (e.g. from 0-10%) has a significant impact. Current procedures for assessing the majority of forestry applications are likely to need significant upgrading to ensure they robustly protect Curlew. The demand for new forestry is higher on the type of land utilised by Curlew and should afforestation applications be rejected on farmland with Curlew, alternatives for providing equivalent income and suitable ongoing management for Curlew, should be considered.

DAFM has issued an interim protocol for forestry applications in relation to Curlew but this requires review in light of the most up to date information on impacts on Curlew (see 3.1).

⁸ https://www.npws.ie/sites/default/files/general/PAF-IE-2014.pdf

Some landowners choose afforestation over farming due to socio-economic pressures. Currently payments for land management to protect Curlew do not match afforestation payments, both in terms of return on investment and security of contract length. There should be a mechanism to allow for longer term agreements for priority species. Another option that should be considered closely is the classification of open Curlew habitat as "Area of Biodiversity Enhancement" (ABE), as termed by the Forest Service. If ABE was approached on a landscape, regional or national scale, the landowners with Curlew habitat could potentially draw down forestry grants, while the trees that would have been planted on that land can be planted elsewhere in the national forest estate, in forest blocks in less biodiverse or less environmentally sensitive areas. The NPWS Farm Plan Scheme (FPS) is funded by the exchequer and could have long term management agreements for land management for key species that offer a realistic alternative for forestry. Precedents have already been set and relevant examples of long-term payment mechanism include the peatlands, cessation of cutting payments and Afforestation grants.

There is an aspiration to protect High Nature Value farmland from afforestation in the Rural Development Regulations. There is a need to ensure that Curlew breeding areas are identified as HNV farmland. In addition, all land management schemes should look at cooperative payments to build critical mass of suitable habitat.

Widespread agricultural improvement of grasslands through drainage, fertilisation and reseeding has led to reduction of the quality of Curlew breeding habitat. Whilst much of this activity took place in the past, it is still ongoing and current government policies, such as Food Harvest 2020, continue to encourage these practices outside designated sites.

The European Communities (Environmental Impact Assessment) (Agriculture) Regulations were introduced to regulate, *inter alia*, the reclamation of semi-natural areas and drainage works for agricultural purposes. Most of the on-farm reclamation activity that would take place on private land holdings, falls well below the thresholds, meaning that screening for environmental impacts is not required and such activity within known breeding Curlew sites may well be proceeding without appropriate levels of screening.

Curlew are significantly impacted by the construction of wind turbines within their breeding areas (e.g. Pearce-Higgins *et al.* (2012⁹). In Ireland, there are ambitious targets for expanding the role of renewable energy. The Planning and Development (Strategic Infrastructure) Act 2006, provides for new streamlined consent procedures that apply to wind farms expert opinion indicates that wind turbines are likely to have a population-level impact as increasing numbers of wind farms are constructed within breeding areas and are likely also to prevent the re-establishment of populations if lost due to other reasons. Specific guidance for siting of wind farms in relation to Curlew should be provided. This new guidance should apply equally to new applications and applications requiring renewal. This should form part of Ministerial Guidance.

⁹ Pearce-Higgins, J. W., Stephen, L., Douse, A. and Langston, R. H. (2012), Greater impacts of wind farms on bird populations during construction than subsequent operation: results of a multi-site and multi-species analysis. Journal of Applied Ecology, 49: 386-394

Recommendation 6.1 In the planning system, safeguard Curlew sites from inappropriate development by providing Curlew locational data and Ministerial Guidelines to Planning Authorities

Recommendation 6.2 In the forestry grant system, fully safeguard Curlew sites from inappropriate development and offer meaningful alternatives to incentivise landowners in specific areas to manage their land for farming and Curlew

Recommendation 6.3 *Consider protecting key areas for Curlew through improved regulation or legislative powers*

7. Curlew and people

Our natural heritage is a link to our own cultural heritage and cultural links with Curlew in particular are very strong and it is clear that the Curlew is well known and much loved, species. Its distinctive long legs and long curved bill afford the Curlew a charismatic appearance. Its calls, described as "plaintive", "haunting", "bubbling", "cry" and "the very essence of wild Ireland" are renowned and mark the bird out as something truly special. The Irish countryside would certainly be much the poorer were Curlews to disappear.

The Curlew Task Force formed to provide recommendations for saving the species from extinction in Ireland. This was borne of moral, as much as legal, obligation to protect the species. It is important that Irish people are given a central place in the story of Curlew conservation and that the intrinsic links that exist between the Irish people and Irish Curlew are realised and strengthened.

Local action provides a focus for community engagement and NGO and local initiatives have the potential to work well for biodiversity. It is important that available funding streams are identified in order to guide organisations and local people towards sources of funding should they wish to propose projects aimed at helping Curlew.

The influence of local champions of the Curlew, advocates for their conservation who are sincere, genuine and reliable people, can be significant. Achieving local 'buy-in' to a particular initiative can be due to personalities as much as the cause itself and can be the difference between a project being a success or not. There are good local people that can take forward the cause of the Curlew in all areas where Curlew breed. It is important to create an environment where these people can be engaged and in turn engage others in the locality.

Recommendation 7.1 Promote awareness of Curlew Conservation, through;

- Widespread awareness raising through media and events relating to Curlew ecology and conservation
- Engage in World Curlew Day and other appropriate events by all groups associated with Curlew conservation

Recommendation 7.2 *Facilitate Community Effort on Curlew Conservation – using the Curlew as a flagship species to inspire pride in local natural heritage*

Recommendation 7.3 *Devise a mechanism to continue to identify and support local "Curlew Champions" as developed by the CCP*

Medium and longer-term potential actions were identified which would further Curlew conservation through cultural connections including;

Collating and publishing literary and artistic reference material in relation to Curlew

Further local connections and profile through clubs and activities linking Curlew to well-regarded local traditions (akin to the Curlew Cup schools Gaelic football competition instigated in Kerry in 2018)

Linkage to HNV farmland and celebrating and supporting its value for Curlew and in turn the farmers that maintain it

Developing means of linking Curlew on farmland and opportunities to developed better rural regeneration and integrate young people into farming more effectively to retain them in areas. Curlew may help by providing a means of resisting the trend toward afforestation of land and the need for active, extensive farming approaches with associated supports.

Developing information and educational materials to raise awareness of both Curlew and the management activities that assist them, which in turn can benefit farming.

Curlew accreditation - giving an accolade to e.g. schools or clubs and potentially even farms, where effort to understand or help with Curlew conservation has been made

A Curlew Fund – expanding and developing further on the National Parks & Wildlife Service/Department of Culture, Heritage & the Gaeltacht fund for small local projects to help Curlew, opening up the option to increase the scale of projects and widen the funding base

8.Synthesis

This section aimed to bring together the recommendations made by the Task Force sub-groups (Annex 1 contains a complete list of recommendations). Additional recommendations are made here which are necessary to provide an overarching framework to support the delivery of the short-term recommendations provided in the rest of this document and for identifying, developing and delivering medium and longer-term actions.

The demand for an ongoing forum for engagement on Curlew conservation has been palpable throughout the Task Force operation. The Task Force has sat separate but parallel to, practical conservation efforts through e.g. the Curlew Conservation Programme, efforts by NGOs, by semi-state bodies, by communities and by individuals. Future planning for Curlew in the medium and longer term should seek full formal engagement through appropriate means by all relevant sectoral interests and delivery bodies. A mechanism such as a national Species Action Plan, with an attendant steering group mechanism, would seem the most appropriate

future forum for development of a plan, provide oversight and impetus, for delivery of ongoing Curlew conservation. SAPs are a recognised tool internationally for the delivery of focused conservation action and stakeholder engagement but require adequate resourcing and the development of a means of formal sign up and monitoring to be successful.

The large amount of Curlew research going on across Eurasia and particularly in Northern Europe, generates new information and an evidence base for Curlew conservation work. Keeping up with this and ensuring the latest information produced is applied appropriately to Curlew conservation in Ireland will be important. Ireland also has a role to play within Curlew conservation internationally, recognizing that the wider biogeographic population status may well influence trends in Ireland to some degree. The Task Force approach has already been recognised as an innovative way forward by organisations and individuals across the island of Ireland, within the UK and wider within Europe. In turn then, Ireland needs significant representation at All-Ireland and International Curlew forums, including; The AEWA Flyway Action Plan group, The Curlew Forum (UK based) and through the International Wader Study Group. This representation should include attendance at relevant meetings and conferences and a means of reporting back to stakeholders within Ireland through an SAP or equivalent process.

Recommendation 8.1 *Develop a national Species Action Plan for Curlew - including a steering group which delivers "sign up" to actions and monitoring*

Recommendation 8.2 *Work with Partners in Northern Ireland to achieve biogeographic consensus on Curlew conservation effort*

Recommendation 8.3 *Ensure active engagement with key international Curlew research and conservation information exchange*

Annex 1: List of recommendations

1. Curlew Ecological Requirements

Recommendation 1.1 Continue the Curlew Conservation Programme and develop a long-term comprehensive State Programme of Measures for Curlew in Ireland - based on learnings found from the CCP and other schemes including the Curlew EIP and GLAS

Recommendation 1.1b Utilise, capitalise and build on the wealth of experience and expertise that has grown through the Curlew Conservation Programme, with dedicated interested parties that have progressed pioneering measures for Curlew in Ireland

Recommendation 1.2 Take into account the requirements of species of conservation concern sharing the same landscape/habitats by appropriate design of conservation measures

Recommendation 1.3 Undertake an audit of land use in Curlew territories

Recommendation 1.4 Undertake research on breeding Curlew, with particular reference to, examining the effectiveness of conservation measures and with specific reference to the landscape of Ireland

Recommendation 1.5 Undertake research and investigations on the practicality of using "headstarting" to augment breeding Curlew productivity

2. Farming and agri-environment

Recommendation 2.1 Develop High Level requirements for Curlew within future Rural Development Programmes, specifically;

- a) Carry out annual surveys to monitor the population and identify where Curlew are located
- b) Urgently address the loss of curlew habitat c) Development, financing, targeting and adaptability of proactive measures through bespoke management schemes
- d) Implementation of habitat measures (including the adoption of sensitive farming and non-productive investments)
- e) Effective nest protection
- f) Landscape-scale approach (including farm clusters and collaborative working)
- g) Consideration of wider positive benefits to biodiversity/landscape of adopting these approaches
- h) Consolidate and utilise data and experience available from various sources including the CCP, EIP,
 BnM, Gun Clubs, local projects, etc.

3. Forestry

Recommendation 3.1 Safeguard Curlew breeding and feeding sites from inappropriate forestry planting by enhancing procedures for the proper consideration and approval of new plantings and related activities, specifically including:

- Review of existing guidance to take account of the above
- Increase the screening zone around Curlew areas to provide greater certainty of avoidance of impact on Curlew

- Build in site specificity with regard to e.g. wider hydrological impacts, cumulative impacts with other plantings, landscape, aspect etc.
- Ensure all planting applications are reviewed by ornithologists with Curlew expertise and knowledge
- Inclusion within guidance a consideration of historical curlew sites to ensure the potential for recolonisation through conservation effort is not lost

Recommendation 3.2 Audit and identification of key opportunities for deforestation and habitat restoration on previously afforested areas for Curlew and wider benefits

Recommendation 3.3 Develop and promote viable options for sympathetic land management supports within Curlew areas where forestry is not desirable

<u>4. Bogs</u>

Recommendation 4.1 Identify where Curlew are breeding in active turbary areas and design a blueprint for proactive and positive engagement with turf cutters/plot owners

Recommendation 4.2 Bord na Móna to continue to survey and monitor Curlew and propose conservation actions on their estate

Recommendation 4.3 Coíllte to undertake survey and monitoring of Curlew on their land and propose conservation actions for Curlew on their estate

Recommendation 4.4 Irish Peatland Conservation Council to continue to survey and monitor Curlew on their land and propose conservation actions for Curlew on their lands

5. Predation & nest protection

Recommendation 5.1 Design and deliver effective predator control to protect breeding Curlew Recommendation 5.2 Systematically record effort and scrutinise effectiveness of predator control Recommendation 5.3 Consider carefully public attitudes and understanding of predator control Recommendation 5.4 Incorporate predator control into national RDP schemes aimed at Curlew

6. Planning & development

Recommendation 6.1 In the planning system, safeguard Curlew sites from inappropriate development by providing Curlew locational data and Ministerial Guidelines to Planning Authorities

Recommendation 6.2 In the forestry grant system, fully safeguard Curlew sites from inappropriate development and offer meaningful alternatives to incentivise landowners in specific areas to manage their land for farming and Curlew

Recommendation 6.3 Consider protecting key areas for Curlew through regulation/legislation

7. Curlew & people

Recommendation 7.1 Promote awareness of Curlew Conservation, through;

Widespread awareness raising through media and events relating to Curlew ecology and conservation

• Engagement in World Curlew Day and other appropriate events by all groups associated with Curlew conservation

Recommendation 7.2 Facilitate Community Effort on Curlew Conservation – using the Curlew as a flagship species to inspire pride in local natural heritage

Recommendation 7.3 Devise a mechanism to continue to identify and support local "Curlew Champions" as developed by the CCP

8. Synthesis

Recommendation 8.1 Develop a national Species Action Plan for Curlew - including a steering group which delivers "sign up" to actions and monitoring

Recommendation 8.2 Work with partners in Northern Ireland to achieve bio-geographic consensus on effort

Recommendation 8.3 Ensure active engagement with key international Curlew research and conservation information exchange

Annex 2 Recommendations of the Curlew Task Force – Background Document

Recommendations of the Curlew Task Force

Background Document



May 2019

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Background to the Curlew Task Force

The first national survey of breeding Curlew in Ireland was coordinated by the National Parks & Wildlife Service between 2015 and 2017¹. By the end of the breeding season in 2016, the majority of the country had been surveyed (only the Shannon Callows remained to be surveyed in 2017). It was at that point, readily apparent that the population of breeding Curlew in Ireland had plummeted even greater than the decline which was apparent from the Bird Atlas of 2007-2011. In fact, it is now estimated that 96% of breeding pairs have been lost since the Bird Atlas of 1988-1991. In November 2016, a workshop entitled "Curlews in Crisis" was organised by writer and producer Mary Colwell, who had walked 500 miles across Ireland and Britain to raise awareness about Curlew declines. The main resolution arising from that conference was that a dedicated Task Force should be formed to deal with the various issues relating to Curlew Conservation and to recommend appropriate action. In January 2017, then Minister for Culture, Heritage Heather Humphreys announced the formation of a Curlew Task Force, to include various stakeholders with a say in the management of the Curlew and its habitat. While the Department of Culture, Heritage & the Gaeltacht facilitated the Curlew Task Force, it was felt important to have an independent Chair, so that all stakeholder contributions were independently reflected in the recommendations of the Task Force. Alan Lauder was appointed Chair at the first meeting of the Curlew Task Force in February 2017.

Participant Organisation	Participant Organisation	Participant Organisation
An Taisce	GET	NPWS – administrative
BirdWatch Ireland	ICMSA	OPW
BNM	ICSA	RSPB NI
Boleybrack Project	IFA	RSPB NI
Caomhnú Arann	IGPT	ТССА
Coíllte	INHFA	Teagasc
Cork County Council	IPCC	UCD
Curlew Conservation Programme	IPCC	
Curlew Conservation Programme	NARGC	
DAFM Forest Service	NPWS Agri-ecology	
DAFM Member	NPWS – Regions	

In addition to a large number of individuals with significant experience of Curlew conservation, the various organisations and projects that contributed to the Curlew Task Force are outlined below.

¹ O'Donoghue, B. G., Donaghy, A. and Kelly, S.B.A (2019) National survey of breeding Eurasian Curlew Numenius arquata in the Republic of Ireland, 2015–2017. Wader Study 126:1 pp43-48

Between February 2017 and November 2018, there were six dedicated Curlew Task Force meetings, attended by over 30 representatives from various sectors and backgrounds. Representation was for the most part reserved for one representative per stakeholder organisation. These representatives were offered the opportunity to contribute to various aspects of the overall discussion but had more focussed input into issues they were directly associated with. To do so, the Curlew Task Force was segmented into seven separate focus groups as presented below. Each group had a rapporteur who animated discussion among fellow group members and reported back to the overall Task Force. The individual groups focussed on what are considered to be the primary matters pertaining to Curlew conservation in Ireland in the 21st century. In addition, a synthesis group coordinated the collation of each focus group's recommendations, into the output document that is presented here. The synthesis group also identified cross-cutting themes and narratives presented that emerged from the various group discussions and made recommendations where these were overarching.



The chapters of this document are a representation and a distillation of the discussions and recommendations of each focus group.

Chapter 1. Curlew ecological requirements and research

A solid foundation of Curlew ecology and ecological requirements will be fundamental to delivering concrete conservation measures for the species, as Ireland moves to secure its future. There is already a great deal of knowledge of factors that are good and bad for Curlew, but there is also much yet to be discovered. An overview of knowledge and research requirements in an Irish context are discussed in Chapter 1.

Chapter 2. Farming and agri-environment

Ireland is largely a farmed landscape and for generations, farming was the bedrock of the Curlew here, when thousands of pairs bred successfully in both upland and lowland locations. However, farming has changed dramatically and rapidly in many areas, with associated habitat loss and risks to breeding

Curlew. At the same time, the farming sector is considered to be in the best position to help save Curlew as a breeding species in Ireland, but only if correct policies, supports and frameworks are put in place to encourage Curlew friendly farming.

Chapter 3. Forestry

Ireland has one of the lowest covers of forestry in Europe, currently standing at 11% of the national land cover. The State has set a target of 17% forestry cover by 2030 and offers generous grants and premia to landowners to plant their land. Thousands of hectares of Curlew habitat have already been planted and unless adequate safeguards are put in place, with viable alternatives presented to landowners in Curlew areas, there is a risk of further direct and indirect negative implications for the species. At the same time, the forestry sector could be in a position to re-instate habitat for Curlew in particular areas, by redesigning or removing forest stands, or not replanting forestry.

Chapter 4. Bogs

Curlew have long been associated with the bogs of Ireland and to this day, despite major losses of quality habitat, particularly in the midlands to commercial/industrial peat cutting, bogs are a vitally important part of the ecological and conservation requirements of Curlew in Ireland. It is believed that two-thirds of Curlew in Ireland are nesting on bogs and utilising nearby grasslands or other habitats to supplement the diet they acquire on the bogs. Turf cutters and contractors, who would for generations have associated the call of the Curlew with a day in the bog, can therefore play an enormous part in the future of Curlew in Ireland.

Chapter 5. Predation & nest protection

Beyond habitat loss, one of the primary drivers of Curlew decline in Ireland has been predation of eggs, chicks and adults. This is in many ways related back to habitat loss and fragmentation, allied to apparent increases in meso-predators like Fox, Mink, Hooded Crow and Magpie. Investment in habitat maintenance, creation or enhancement may all be for naught if the same predator finds the same nest, with the same result. It is imperative, as things stand in the Irish landscape of today, to undertake predator control if the Curlew population is to be saved from extinction. There are some novel techniques of nest protection emerging and research and experience is being used to inform the approach going forward. Those skilled in predator control can play a vital part in helping Curlew to rear their chicks and stem the loss of Curlew from the countryside.

Chapter 6. Planning and development

Ireland is a developed nation and continues to develop. There is an increasing desire to develop in less developed areas, including marginally productive farmland or hill land. In recent decades, there have been substantial developments of wind farms, aligned to Ireland's determination and obligation to meet climate objectives. While there is a desire and obligation to develop, there is also a desire and obligation to protect vulnerable landscapes, habitats and species that have called the areas they live in home, for much longer than any development has been considered. Ireland's planning laws and environmental regulations provide a framework for the protection of wildlife and habitat and planners and regulators have a major role to play in ensuring appropriate development is guided in a way to avoid unnecessary damage to the environment.

Chapter 7. Curlew and people

There has never been a conservation story that has worked without the acceptance, will or support of the people, particularly the landowners and local community. Communication is everything in conservation. If it were not for people, there would be no need for the concept of 'conservation'. People need to be placed at the centre of the conservation story of Curlew, along with the Curlew itself. There has been a rich and fascinating history between Curlew and people in Ireland. The Curlew is as much part of our heritage as our language, literature, music or dance. Indeed, there are dances, songs and a long line of writings that feature or were inspired by the Curlew. We are at a seminal moment however, whereby we now have a generation that fondly remember the Curlew as a soundtrack to their summers but also a generation that may never grow up to know what a Curlew looks or sounds like. It is essential that local landowners and communities are involved in the continued story of Curlew in Ireland; it has been a relationship for thousands of years and there should be a future to this relationship too.

Chapter 8. Synthesis

The preceding chapters all deal with separate matters, but those matters are intertwined to varying degrees and of course all relate directly to Curlew conservation. The synthesis chapter brings together the list of recommendations and adds in those strategic recommendations not covered in other chapters and which will be required to provide synergy and an overarching framework for future efforts.

Chapter 1. Curlew ecological requirements and research



Curlew – a pressing conservation priority

The Eurasian Curlew *Numenius arquata* (hereafter 'Curlew') is the only Irish bird on the IUCN Red List of Threatened Species². The species is afforded protection under the EU Birds Directive (2009/147/EC) where it is listed as an Annex II species. In Ireland, the Curlew is also protected under the Wildlife Acts and the Birds and Natural Habitats Regulations, 2011.

The Bird Atlas, which incorporated fieldwork in the four breeding seasons of 2008-2011 prompted serious concerns in relation to the Irish Curlew population (Balmer et al., 2013). A national survey commissioned by the National Parks & Wildlife Service in 2015 and 2016 confirmed a calamitous decline of the national breeding population of Curlews and for the first time, a clear picture had been presented as to how many Curlew now breed in Ireland and where they occur. Whereas up to 4000 pairs are estimated to have bred in the Irish Republic in the late 1980s, a total of just 138 pairs were confirmed in the first national breeding Curlew survey undertaken between 2015 and 2017. This represents a 96% decline and a similarly stark and worrying estimated 34% decline on the estimates provided by Bird Atlas fieldwork between 2008 and 2011. Breeding productivity is so low that population viability analysis predicts that in the absence of any action, the Curlew will go extinct as a breeding species in Ireland within 5-10 years. It is considered that the Curlew is the most pressing bird of conservation concern in the UK (Brown et al., 2015³) and taking population levels and extent of decline in population in range, it is accepted to be in even greater jeopardy in Ireland. There is no doubt, but that saving the Curlew from extinction in Ireland is one of the greatest conservation challenges of our time.

² <u>www.iucnredlist.org</u>

³ Brown, D., Wilson, J., Douglas, D., Thompson, P., Foster, S. McCulloch, N., Phillips, J., Stroud, D., Whitehead, S., Crockford, N. and Sheldon R. (2015) *British Birds* **108**, 660–668



Figure 1.1. The declining Curlew in Ireland. From Left to Right: 1968-71 Atlas of Breeding Birds (Sharrock, 1976⁴), 1988-91 Atlas of Breeding Birds (Gibbons et al.et al., 1993⁵) and 2015-2017 National Breeding Survey (O'Donoghue & Donaghy, 2018⁶).

One of the first considerations in addressing a conservation issue like this is to understand the species ecological requirements and why the decline has occurred and continues to occur, as well as to understand what can be done to address these factors. Ultimately, in Ireland, most if not all terrestrial conservation issues need to involve people as a fundamental and integral consideration, both in terms of risk and opportunity.

Curlew breeding ecology

The Curlew is a relatively long-lived bird (c. 15 years), compared to smaller wader species. The Curlew is monogamous, with strong breeding site fidelity (Berg, 1992⁷). Curlews typically begin to return to breeding grounds in March. They nest on the ground, often on low tussocks or in a clump of rushes. The nest is a large depression, with a diameter of approximately 15-24cm and a depth of 3-12cm, lined with vegetation and feathers. The male may make a number of scrapes, of which the female selects one and lines it. Eggs are typically laid in April. Regular clutches have four eggs, which are laid 1-2 days apart. Curlew can attempt to rear one brood of chicks in a breeding season, but replacement clutches may be laid after egg loss. Incubation lasts 27-30 days from laying of last egg to hatching. Both parents share incubation duty. The bird that is not incubating will act as a sentry and will try to defend the nest typically by alarm calling and mobbing intruders. Hatching of eggs mainly happens in May and occurs synchronously, so the young will be of similar age. The young are precocial and nidifugous and

⁴ Sharrock, 1976. J.T.R. SharrockThe atlas of breeding birds in Britain and Ireland. T. & A.D. Poyser.

⁵ Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993) The new atlas of breeding birds in Britain and Ireland: 1988-1991. T. & A.D. Poyser

⁶ O'Donoghue, B.G. and Donaghy, (2018). National survey of breeding curlew in the Irish Republic, 2015-2017. Manuscript submitted for publication.

⁷ Berg, Å. 1992. Factors affecting nest-site choice and reproductive success of Curlews (*Numenius arquata*) on farmland. *Ibis* 134: 44-51.

are cared for both parents and brooded while small. They are however self-feeding. Chicks will fledge from 32-38 days after hatching and become independent around that time. The adults will leave the breeding site before the young, with a successful breeding attempt usually completed by mid-July. Birds are thought to first breed from the age of 2 years onwards.

In Northern Ireland, the productivity at two sites between 1993 and 1995 was estimated to 0.14-0.47 fledglings/pair, which is believed to be lower than required to maintain a stable population (Grant et al.1999⁸). Estimated productivity from the pairs monitored in the national breeding survey in the Republic of Ireland is estimated to be as low as 0.16-0.51 (NPWS, BWI and FERS, unpublished data).

Predation is understood to be an important pressure on Curlew breeding productivity (Ainsworth et al., 2016), though its importance may vary from site to site. In a study using surveillance cameras at Curlew nests, Cross et al.(2017) found just 3 out of 21 nests to have hatched chicks and all seven chicks were known (or assumed) to be dead after less than a week. All seven chicks were fitted with small radio-tags whilst still in the nest. Two tags were recovered from under obvious perches indicating avian predation, one was recovered from under a hedge along with the metal leg-ring suggesting mammalian predation and one was the unfortunate victim of agricultural activity. Of the 18 failures at egg stage at least eight were due to Fox (*Vulpes vulpes*) and at least three were due to Badger (*Meles meles*). One nest was trampled by sheep, another was trampled by cows and one nest was deserted, possible due to low and prolonged helicopter activity. The cause of failure at the remaining nests was not ascertained. Curlew are territorial birds during the breeding season. In higher population densities they would act together to defend nest sites and chicks against predators.

Breeding Curlew habitat

Curlew breed in a wide range of natural and semi-natural habitats, preferring open landscapes with wide visibility and tolerating high winds and rainfall. Damp terrain with dry patches, often near water is favoured (Cramp & Simmons 1983⁹).

Haworth & Thompson (1990) found that Curlew avoided areas prone to disturbance, where potential disturbance was a measure of public access, tracks and roads. Similarly, in a study on wind farms Pearce Higgins et al. 2009) report Curlew as particularly prone to displacement. Grant (1997) found that in the North Pennines, the chance of nests occurring within a field increased significantly with the presence of wetland and moorland. Rough grassland is of considerable importance during the chick rearing period (Grant, 1997¹⁰).

Breeding Curlew in Ireland typically inhabit 'open' landscapes, with extensive land-use that provides a mixture of generally low vegetation heights (up to 0.5m) and densities for both nesting and feeding.

⁸ Grant, M.C., C. Orsman, J. Easton, C. Lodge, M. Smith, G. Thompson, S. Rodwell & N. Moore. 1999. Breeding success and causes of breeding failure of Curlew (*Numenius arquata*) in Northern Ireland. *Journal of Applied Ecology* 36: 59-74.

⁹ Cramp, S. & K.E.L. Simmons. 1983. *Handbook of the birds of Europe, the Middle East and North Africa. The Birds of the Western Palearctic. Volume III: Waders to Gulls.* University Press, Oxford.

¹⁰ Grant, M. C. 1997. Breeding Curlew in the UK: RSPB research and implications for conservation. *RSPB Conservation Review* 11: 67–73.

These are typically unimproved grassland/rushy pastures and peatland (Denniston, 2013¹¹). A relatively high water table with easily probed ground that is rich with invertebrates (both on and beneath the ground surface) is beneficial in supporting adults and chicks through the breeding season, which generally begins in March and continues into July. Curlews are omnivorous in the breeding area, mainly taking invertebrates on and below the ground surface. Common prey items during the breeding season include Beetles (Coleoptera), crane fly larvae (Tipulids) and earthworms (Annelids) (Cramp & Simmons, 1983). Wet surface areas and wet features are used by breeding waders in several different ways. Shallow areas of surface water are important foraging areas for wader chicks, providing a source of easily accessible aquatic prey (Ausden et al., 2001¹²). Raised water levels keep surface soils soft which is important for probing feeders. Henderson et al.(2002)¹³ found a relatively strong selection by breeding Curlew for bog/mire or unimproved grassland. Some of the remaining strongholds for Curlew in Ireland also include agriculturally unimproved wet grasslands with seasonal grazing (e.g. Lough Erne and the Shannon Callows). During the 1987 survey in the Shannon Callows, the majority of pairs (62%) nested in hay meadows with the remainder using tussocky pasture (Nairn et al., 1988¹⁴). A study on the breeding bird populations of Irish peatlands found Curlews to be closely associated with raised bog and also strongly associated with peatlands with high horizontal density of vegetation cover (Bracken et al.2008¹⁵). Peatlands are certainly a very important habitat for breeding Curlew in Ireland as witnessed by the fact that 70% of nests found in the national survey in 2015 and 2016 were on bogs. Ireland's peatlands cover a large proportion of the country (20.6%) and occur as raised bog, lowland blanket bog, upland blanket bog and fens (Renou-Wilson et al., 2011¹⁶).

Traditional farmland and moorland management across Ireland was ideal for breeding Curlew. Curlews in Ireland today mainly breed on peatlands and forage on grasslands.

Changes in the environment and landscape: factors associated with decline

Changes in land-use including afforestation of natural or semi-natural habitat, an intensification and increased mechanisation of agricultural practices and turf cutting (or in some cases land abandonment) and associated habitat fragmentation and nest predation are considered the most significant causes of breeding wader and Curlew decline, predominantly through suppressing breeding

¹¹ Denniston, H. 2013. *Exploring the relationship between declines in breeding Curlew (Numenius arquata) and habitat change in Ireland*. MSc. Thesis, University College Cork.

¹² Ausden M., Sutherland W.J. & James R. (2001) The effects of flooding lowland wet grassland on soil

macroinvertebrate prey of breeding wading birds. Journal of Applied Ecology, 38, 320-338.

¹³ Henderson, I.G., Wilson, A.M., Steele, D. & Vickery, J.A. (2002) Population estimates, trends and habitat associations of breeding Lapwing *Vanellus vanellus*, Curlew *Numenius arquata* and Snipe *Gallinago gallinago* in Northern Ireland in 1999. *Bird Study* 49: 17–25.

¹⁴ Nairn, R.G.W., Herbert, I.J. & Heery, S. 1988. Breeding waders and other wet grassland birds of the River Shannon Callows, Ireland. *Irish Birds* 3: 521–537.

¹⁵ Bracken, F., McMahon, B.J. & Whelan, J. (2008). Breeding bird populations of Irish peatlands, *Bird Study*, **55**, 169-178

¹⁶ Renou-Wilson, F., Bolger, T., Bullock, C., Convery, F., Curry, J., Ward, S., Wilson, D. and Muller, C. 2011. *BOGLAND: Sustainable Management of Peatlands in Ireland.* Environmental Protection Agency. Wexford, Ireland.

success (Berg 1992; Chamberlain et al.2000; Donald et al.2001; Wilson et al.2004¹⁷; Pearce-Higgins & Grant, 2006; EC, 2007; Sweeney et al.2012). Even where suitable habitat remains, changes in land-use practices within suitable breeding habitats are also likely to be exacerbating declines caused by direct habitat loss. Other factors such as human (and dog) disturbance have also been cited and there may be factors at play that are yet to be fully established; for example climate and climate change (Crick, 2004; Renwick et al.2011; van Gils et al., 2016). The relative importance and interplay of all these factors can differ between areas and a deeper understanding of their local relevance may be needed to achieve recovery from site to site. Changes in land-use have been and continue to be mainly influenced by policies and markets.

Agriculture has gone through enormous changes since Ireland joined the EEC in 1973. The influence of CAP and the demand for cheap food has resulted in a much changed landscape, with largely fewer and poorer quality natural and semi-natural habitats now, than a few decades ago. There are also fewer farmers, but larger farm holdings, with greater stock numbers and larger continental breeds. Years of drainage, 'reclamation' and moves towards more productive fields in terms of grass/crop outputs have rendered the landscape less conducive to wildlife such as Curlew. Pesticides are widely used, impacting on the invertebrate food required by Curlew.

More intensive grassland management includes earlier and more frequent mowing and topping. There has been an overall change from hay to silage making, affecting breeding birds through deterioration of sward as a nesting habitat, decreased prey availability and direct nest destruction (Vickery et al., 2001). Modern agricultural machinery is large and fast and is accessing areas that may not previously been accessed by machinery. Increases in the use of pesticides and fertilisers also indirectly effect bird populations through changes in invertebrate populations and prey availability (Potts 1986, in Chamberlain et al.2000). Increased stocking densities of cattle in lowland grassland impact breeding waders directly through trampling of nests (Beintema & Müskens 1987).

On the other end of the spectrum of farmland management, there are areas of land and farms that have been semi and entirely abandoned, with no management to maintain the environment that previously existed (primarily through grazing). Some soils may have become less interesting or productive through a loss of nutrients and minerals including calcium and thereby have reduced invertebrate populations. The areas of High Nature Value farmland that hold breeding Curlew in Ireland today are few and far between. It is of concern that the economic viability of such farm holdings is in jeopardy.

Another significant and substantial change on the landscape that Curlew would have once thrived in has been afforestation of moorland and farmland. While the planting of peatlands has for the most part become a thing of the past (>300,000ha of peatland have been planted), the recently produced "Land Availability for Afforestation" (COFORD land availability working group, 2016) and "Land Types

¹⁷ Wilson, J.D., Anderson, R., Bailey, S., Chetcuti, J., Cowie, N.R., Hancock, M.H., Quine, C., Russell, N., Stephen, L. and Thompson, D.B.A. (2013). Modelling edge effects of mature forest plantations on peatland waders informs landscape-scale conservation. Journal of Applied Ecology.

for Afforestation" (Forest Service, 2016) documents specifically earmark and target the types of grassland habitat required by Curlew (and other species of conservation concern) for afforestation.

Curlew declines in Britain and Ireland have been frequently associated with direct and indirect effects of afforestation (Avery, 1989; Walsh et al, 2000; Ratcliffe, 2007; Douglas et al., 2014; Ainsworth et al., 2016). Apart from the direct deletion of habitat by afforestation, resulting fragmentation of Curlew breeding habitat is also likely to have significantly reduced numbers as the remaining pairs occupy smaller areas and occur in lesser numbers, becoming more vulnerable to predators. Conifer plantations provide refuge for meso-predators, resulting in increased risk of predation for ground nesting birds (Petty, 1985; Ratcliffe and Petty, 1986; Stroud et al., 1987; Chadwick et al., 1997; Grant et al., 1999; Smedshaug et al., 2002; Carey et al., 2007; Amar et al., 2011; Douglas et al., 2013 and 2014). Edge effect is a contributory factor in predation (Gates and Mosher, 1981; Lynch and Whigham, 1984; Helle; 1985; Harris, 1988; Yahner, 1989; Andren, 1992; Rodriguez et al., 2001; Manolis et al., 2002; Reino et al.2010; Calladine et al., 2014) and in effecting behavioural avoidance, dissuading species from nesting near forestry (Stroud et al., 1990; Douglas et al., 2014). Avery (1989) found nest predation rates to increase closer to forestry. Valkama et al.(1999) found a 20% hatching rate for Curlew with nests in a landscape where random points were on average 180m from forestry, but a 91% hatching rate for Curlew with nests in a landscape where random points were on average 600m from forestry. In that study of a fragmented farmland landscape containing woodland, the abundance of foxes and crows was 2–3 times higher, and Curlew nest predation rates four times higher, than that in a continuous farmland landscape without woodland.

In a study area comprised of forestry, upland grassland, heathland and blanket bog, Amar et al.(2011) found 85-95% decline of breeding waders where there was 50% forest cover within 1km of survey plots, whereas an absence of forest cover was associated with population stability. Beyond the hatching stage, Douglas et al.(2014) determined population changes and fledging success were negatively associated with forestry cover within 1km of edge of study plots.

Douglas et al.(2014) recommended not only siting new afforestation away from important bird breeding areas, but furthermore, the removal or redistribution of existing forestry away from important breeding bird areas. In one landscape in northern Scotland, the Forestry Commission and the RSPB have been removing commercial conifer plantations for blanket bog restoration, also to the benefit of breeding waders.

Large commercial conifer plantations can also have an effect on the hydrology of surrounding habitat, often degrading adjacent areas of peatland (Renou-Wislon et al., 2011).

All Irish peatlands have been impacted by human induced changes and very few remain in their natural state (Renou-Wislon et al., 2011). Since the 1950s there has been a sharp decline in the area of peatland resulting from the introduction of mechanised turf extraction (both industrial and domestic), afforestation, intensification of agriculture and land reclamation through drainage (Renou-Wislon et al., 2011). The advent of industrial and commercial peat extraction and turf cutting for domestic heating has led to further declines of Curlew habitat and direct disturbance and nest/chick loss. Over half a million hectares of peatlands have been used for peat extraction (<u>www.ipcc.ie</u>). Large scale commercial peat extraction is still an issue for the pairs of Curlew that breed on bogs, the exact extent

of which needs to be ascertained. It should be borne in mind, that approximately two-thirds of the Curlew in Ireland are believed to be nesting on peatland.

The advent of industrial and commercial peat extraction and turf cutting for domestic heating has led to further declines of Curlew habitat and direct disturbance and nest/chick loss. Over half a million hectares of peatlands have been used for peat extraction (<u>www.ipcc.ie</u>). Large scale commercial peat extraction is still an issue for the pairs of Curlew that breed on bogs, the exact extent of which needs to be ascertained. It should be borne in mind however, that 71% of the 124 Curlew territories confirmed in 2015 and 2016 were on peatland.

At the same time as breeding habitats have been deteriorating in quality and extent, predator densities have been recovering from the adverse effects of persecution, over-hunting and/or toxic pesticides (Amar et al.,2010). These two factors together (particularly when habitat is fragmented and breeding numbers drop below certain thresholds) are likely to have led to increased predation of eggs and chicks, contributing to the negative trends in nest success and chick survival recorded in western Europe in the last 40 years (Grant et al., 1999; Bellebaum & Bock 2009; MacDonald & Bolton 2008; Rooderberg et al.2012, Schekkerman et al.,2009). Grant et al.,1999) reported that low productivity as a result of predation recorded in breeding Curlew populations in Northern Ireland was sufficient to explain population declines of 25% in six years, between 1986 and 1922. Productivity levels were estimated at between 0.14-0.26, well below the levels of 0.48-0.62 thought to be required for a stable population. An in-depth consideration of the impacts of predators on various ground nesting species, including Curlew, can be found in the "Understanding Predation Report" (Ainsworth et al.,2016).

While an overview has been presented above, in terms of the changed landscape and environment that has seen a loss of Curlew and unviable breeding productivity at remaining sites, it is important to consider every breeding Curlew site on its own merits, when considering the main factors impacting on the breeding attempts of that site.

Efforts to date - some done, lots more to do

A "Management Plan for Curlew 2007-2009" was produced by the European Commission, with a headline objective of reaching favourable conservation status for the species over 10 years (EC, 2007). The Management plan, *inter alia*, requests Member States to undertake the following measures focussed on breeding Curlew:

- Use and promote effective agri-environmental schemes to encourage favourable management of agricultural areas that holds breeding Curlew (including support for evidence-based prescriptions designed to benefit Curlew).
- Produce management plans or schemes for key Curlew breeding areas to ensure no further loss of numbers and distribution and to increase reproductive success and colonising ability.

The same Management Plan highlighted that there were no proactive management initiatives for Curlew in Ireland at the time. In more recent years, a Curlew Task Force has been established and the

Halting Environmental Loss Project (HELP), the NPWS Shannon Callows Breeding Wader Grant Scheme, NPWS Shannon Callows Breeding Wader Farm Plan Scheme and Results Based Agrienvironment Pilot Scheme have all been undertaken, with application of specific measures for Curlew (among other breeding waders). Unfortunately, due to funding and capacity, these schemes have had a relatively small footprint. Nevertheless, useful knowledge has been built up with regard to managing sites with landowners, primarily farmers. In 2015, the Department of Agriculture, Food & the Marine, the National Parks & Wildlife Service and BirdWatch Ireland designed agri-environmental measures for Curlew under GLAS and afforded priority entry to the scheme for farmers in known Curlew breeding sites across Ireland. The effectiveness of the measure is uncertain however, given only a minority of farmers in these areas are managing land for Curlew and there is no capacity for capital works, advisory or predator control, all of which are crucial tools to be able to call upon in the effort to support breeding Curlew. In 2015, the Forest Service (FS) received locational data for breeding Curlew, to allow careful consideration of afforestation grant aid applications. Maintaining habitat at Curlew breeding sites would go some way towards addressing negative land use-changes. In reality, it is apparent that further effort is required in terms of proactive management and nest/chick protection if the drastic decline is to be halted and reversed. To stem the loss of habitat would be a fundamental requirement in the first instance, aligned with supports for landowners through finance and advice, to facilitate positive and proactive measures for breeding Curlew.

The initial recommendation of the sub group was to "Pilot a Curlew Conservation Programme" but with the advent and operation of the CCP since 2017 this has been amended in light of the relative successes and lessons learned.

Curlew Conservation Programme – "doing and learning by doing"

While there is a relatively good understanding of the habitat requirements of Curlew and the issues that can negatively affect Curlew, there is a clear need for further information on particular issues, to refine the effectiveness of any proactive measures that are to be employed for Curlew conservation. Answers to pertinent questions can often be found by trialling methods and comparing the breeding success of pairs where different methods (and no methods at all) are undertaken.

In 2017, the National Parks & Wildlife Service designed a Curlew Conservation Programme, which has three key pillars, with an emphasis on 'local' to ensure flexibility to adapt to local situations and requirements:

(1) Action on the ground by a Local Curlew Team consisting of a Curlew Advisory Officer, a Curlew Champion and a Nest Protection Officer

(2) Action on the ground by landowners (through the Curlew Conservation Partnership) and

(3) A research project investigating the effectiveness of the measures undertaken, with a view to informing future roll-out and application of measures.

The Curlew Conservation Programme in its pilot phase has a presence in seven core breeding areas (Figure 2). Action is implemented in the form of working with landowners to protect nests from predation (seen as the greatest constraint to breeding success) and to undertake habitat

enhancement or creation. Each area has a locally based team (primarily consisting of local people) to carry out this action, while the efficacy of the efforts will be determined by a research project. It is intended to build on this in future years.

Six core breeding areas included on pilot project (2017). Seven areas in 2018. These areas account for c. 55% of the Irish Curlew breeding population.

Local Teams Local Action Local Solutions



Figure 1.2. The seven Curlew Conservation Action Areas: (1) Stacks Mountains; (2) Lough Ree; (3) Roscommon-Mayo; (4) Mid and North Leitrim (5) Monahan; (6) Donegal and (7) Northern Lough Corrib.

Curlew Advisory Officer

This is the lead role locally. The Curlew Advisory Officer (CAO) is the primary link between their own local project team, the local community and the Curlew Conservation Programme manager. The CAO is tasked with nest finding, nest protection, liaising with and providing advice to landowners and team members on Curlew conservation, local administration, ecological recording and engaging with the Curlew Research Officer.

Local Curlew Champion

This is a pivotal role and is the key to fostering positive relations between 'the project' and 'the community'. The difference between an agri-environment scheme and an agri-environment scheme that achieves real 'buy in', is genuine understanding and support by the landowners and local community. This is best achieved by local people hearing positive soundings from local people. The Curlew Champion is tasked with encouraging close working relationships between project personnel and landowners, forming a local Curlew discussion group, organising meetings, building a positive profile for Curlew and the NPWS Curlew Conservation Project among landowners and local community, highlighting issues and proposing solutions for landowners and the project
Curlew Nest Protection Officer

One of the key constraints for breeding Curlew is the difficulties they are experiencing in hatching eggs and rearing young. Predation is believed to be a main cause of breeding failure. It is proposed to address the issue of predation initially using a two-pronged approach – nest protection fences and predator control operatives. The role of the predator control operatives is to humanely and legally cull Fox, Mink, Hooded Crow and Magpie solely in the vicinity of Curlew breeding territories (within 1km of nest sites). It will be along the lines of existing predator control contracts issued by the Department (e.g. for the Shannon, Donegal, Mayo, Lough Corrib, etc.) but very defined in its remit i.e. the immediate vicinity of Curlew nest sites. The predator control operative can also assist in efforts to find breeding Curlew, in association with local NPWS/eNGO personnel/local Curlew advisor/landowners/Curlew researcher and indeed in assembling and maintaining nest protection fences. The presence of predator control operatives employed by NPWS has proven thus far, to be largely welcomed by landowners, particularly livestock farmers. The efficacy of the predator control efforts employed shall be critically analysed by the Curlew Research Officer.

Curlew Action Team Assistant

In some of the busier Curlew Action Team areas, it has proven beneficial to have an assistant role to supplement/augment the efforts of the Curlew Action Team. The Assistant can be utilized as required in various aspects of the local team's efforts. This has also provided an entry to conservation related work and valuable work experience for new/young practitioners.

Curlew Conservation Partnership

In order to engage with those who own and manage lands where Curlew breed, a Curlew Conservation Partnership (scheme) has been designed to advise and support landowners to support Curlew. Efforts undertaken to date include nest protection, delayed mowing in nesting fields, scrub clearance, rush control, scrape creation/drain profiling, removal of treelines and self-sown conifers, and the construction of predator proof fences. The Curlew Conservation Partnership is carefully designed and administered to avoid double payments or conflict with measures in GLAS. Landowners are regularly asked for their feedback on their thoughts on the Curlew Conservation Partnership. The local Curlew Advisory Officers and Curlew Champions are the main points of contact for landowners and will take care of actions and administration at a local level. This scheme includes novel approaches to agrienvironmental planning and is providing valuable insight ahead of recommendations on the next Rural Development Programme. The Curlew Conservation Partnership also allows for application of grants from NPWS to local communities looking to support their breeding Curlew pairs.

Curlew Research Officer

A research project is underway since November 2017 at University College Dublin, financially supported by the Department of Culture, Heritage & the Gaeltacht, to objectively analyse the efficacy of measures undertaken as part of the Curlew Conservation and gain further insight into the environmental factors impacting Curlew breeding success. The research will also consider the human element of this conservation story, including what landowners and conservationists require in terms of a successful conservation framework. The lead has been taken by a post-doctoral researcher. This is a vital role to inform how well the conservation efforts are working, in order to ensure further efforts

are well targeted and informed. Items identified for investigation in the immediate future in order to inform Curlew Conservation (including items specific to the Curlew Research Officer) are outlined under Recommended Action 1.4.

Recommendation 1.1 Continue the Curlew Conservation Programme and develop a longterm comprehensive State Programme of Measures for Curlew in Ireland - based on learnings found from the CCP and other schemes including the Curlew EIP and GLAS

Recommendation 1.1b Utilise, capitalise and build on the wealth of experience and expertise that has grown through the Curlew Conservation Programme, with dedicated interested parties that have progressed pioneering measures for Curlew in Ireland

The Curlew Project European Innovation Partnership

The EIP AGRI initiative was championed by both the Department of Agriculture, Food & the Marine and the Department of Culture, Heritage & the Gaeltacht, as it provides a "bottom up" and proactive approach to implementing various aspects of the Rural Development Programme. A total of €55 million has been allocated by the Department of Agriculture, Food & the Marine to 22 EIP projects, including a number of locally-led agri-environmental projects. One of these is the Curlew Project, a €1.1m proposal made up of various partners including BirdWatch Ireland, the Irish Grey Partridge Trust, Teagasc, INHFA, and independent agri-environmental planners. The project aims to prevent further losses to the Irish Curlew population through the protection and enhancement of known Curlew breeding sites and also to educate and financially support farmers and rural dwellers to create and manage Curlew habitats. The project began in 2018 and will operate initially for four years in South Leitrim and the southern half of Lough Corrib.

The following objectives are being perused:

-Trial innovative methods which have so far not been tested in Ireland, on both farmland and bog habitats, to reduce predation and protect and enhance suitable habitat, both at the site and landscape level.

-Establish baselines and targets for breeding success, habitat condition, landowner participation, predator densities and capital works.

-Determining Curlew Breeding outcomes by assessing the behaviour of adults and monitoring for the presence of juveniles and fledged young.

-Trialing the use of temporary electric fences at nest sites.

-Training farmers/landowners to undertake direct predator control.

-Direct control of generalist predators at known nest sites.

-Enhancing habitats through capital works.

-Trialing a hybrid agri-environmental scheme combining a results-based approach with some prescriptive elements specifically for Curlew.

-Monitoring the extent to which peat extraction is causing disturbance to nesting habitat by mapping the extent and timing of active turf cutting.

Local Curlew Community Projects

The Curlew Task Force has established a register of local projects focussing on Curlew. Six of these projects have been funded by the Department of Culture, Heritage & the Gaeltacht under the Curlew Conservation Partnership. This augments the efforts of national efforts and provides a presence of Curlew action in areas that may otherwise have none.

GLAS

Ireland has advanced a specific Curlew conservation measure under its national agri-environment scheme, GLAS. This is something that many other countries in Europe do not have. Farmers in Curlew breeding territories receive priority entry to GLAS, which is a voluntary scheme and can receive up to €5,000 per annum for five years to maintain or enhance Curlew breeding habitat. A total of 385 farmers are involved in this measure, with 4,374ha of land included, with up to €8 million expected to be paid out to farmers in Curlew areas over the current RDP.

GLAS Breeding Wader and Curlew Specification

Objective

Maintain and increase the breeding success of breeding waders by halting habitat loss and enhancing habitat availability and suitability. Farmland Bird Actions can only be undertaken on private lands i.e. not on commonage lands.

Background

National and regional numbers of Breeding Waders have suffered severe declines over recent years, in particular Lapwing, Dunlin, Redshank, Golden Plover, Snipe and Curlew. This is due mainly to a loss of habitat, especially as a result of the intensification of agriculture and afforestation of land which, in turn, has led to increase in predation rates. Without intervention the populations of some of these species are facing extinction. Breeding waders depend largely upon extensive farming systems, such as extensive grazing of upland commonages, lowland wet grasslands or machair grassland, to maintain habitats appropriately i.e. vegetation for nests and chick-feeding areas during the breeding season.

Note: Your advisor will advise you as to whether you have Breeding Wader or Curlew parcels on your land when he/she is submitting your GLAS application for you online.

Suitable habitats for breeding Curlew are semi improved or unimproved rough grassland, particularly rushy pastures, wet grasslands, moorland, heath and bog. Where possible, these are the habitats that

should be selected within the identified Curlew parcels where a farmer is not selecting all identified Curlew Parcels.

GLAS Tranche 3 Requirements

Produce a sward cover by extensive grazing of parcels within the GLAS contract to allow for

- a mosaic of short, medium and tall vegetation cover to develop between 15th March and 1st July annually. This should not be achieved through strip or rotational grazing of parcels in receipt of the Breeding Wader or Curlew GLAS payment.
- 2. There must be a grazing enterprise of owned livestock on the holding.
- **3.** The action can be delivered on full or split LPIS parcel(s). Where the action is on a split parcel, it must be digitised out and marked on the map submitted. Parcels must be fenced and stockproof from the commencement date of the GLAS contract.
- 4. Machinery operations cannot be carried out between the 15th March and 15th July on parcels within the GLAS contract.

Fertilisers and other chemicals are not permitted on parcels in receipt of the GLAS Breeding
 Wader and Curlew payment. Where noxious and/or invasive weeds are present, they must be controlled ideally by mechanical means; however, spot treatment using pesticides may be required in some circumstances.

- Rushes, where present must be controlled annually (see recommendation 1 below), but notbetween 15th March and 15th July. The use of a weed wiper for control of rushes is permissible outside this period.
- Silage or hay can be cut from curlew parcels within the GLAS contract by closing off parcels
 in the springtime and not cutting them before 15th July annually. In the case of breeding wader parcels within the GLAS contract, these can only be closed off for silage/hay AFTER the 15th July has passed annually.
- 8. No reseeding of breeding wader or curlew parcels within the GLAS contract is allowed.

<u>Notes</u>

Where rushes are topped before the 15th March and/or after the 15th July, approximately 30% of the rush cover should be retained.

It is recommended that parcels entered for the GLAS Breeding Wader/Curlew payment be stocked at no more than 1.0 LU/ha during the breeding season of 1st April to 30th June annually.

Where the parcel is a Breeding Wader, Curlew or Geese and Swan parcel, the action "Protection of Watercourses" will not be displayed on the online system and a participant will not be able to undertake it, as this is not in the best interests of the bird species concerned.

Recommendation 1.2 Take into account the requirements of species of conservation concern sharing the same landscape/habitats by appropriate design of conservation measures

There a potential for habitat and species other than Curlew to benefit from or suffer from action focussed on Curlew conservation (apart from unprotected species such as Fox, Mink, Hooded Crow). Some of the key species that may be sharing Curlew breeding sites include Irish Hare, Hen Harrier, Merlin, Kestrel, Red Grouse, Dunlin, Lapwing, Redshank, Snipe, Gulls, Skylark, Meadow Pipit Marsh Fritillary, Argent and Sable moth, Large Heath, and possibly a number of other invertebrates. Important habitats (in their own right) may include species rich wet grassland, blanket bog, lowland raised bog, hay meadow. Suffice it to say that consideration should be taken of these habitats species and the likelihood of any negative or positive effects of Curlew action on them, before carrying out any such action. Time spent by local teams observing on the ground and discussions with NPWS personnel (particularly local NPWS staff) will help in this regard.

The Hen Harrier measure of GLAS brings many synergies to Curlew conservation efforts and is likely to have the greatest footprint of any AE measure in Curlew territories, along with Low-input Permanent Pasture. Scope for allowing additional effort above/beyond the GLAS requirements (and paying farmers for same) is being explored with DAFM. There is also the prospect of European Innovation Partnership projects (colloquially known as "Locally-led Agri-environment Schemes") operating in areas where Curlew are present. There may be times where particular issues where conservation interests or the interests of agri-environmental measures are in competition for the same space and need to be addressed on a field-by-field basis e.g. presence of scrub (useful for many species but a potential negative for Curlew), creation of ponds, blocking or unblocking of drains, timing of mowing, stocking rates during summer, etc. By and large it can be accepted that efforts for Curlew conservation are not significantly detrimental to the interests of other species or habitats, but this needs to be considered on a field-by-field basis and according to the measure proposed for Curlew (scrape creation or scrub clearance are thought to be the main concerns).

In many cases, a wide range of species that could benefit from predator control work. For example, research in the UK has shown that effective predator control benefitted a suite of ground-nesting species, including Meadow Pipit, Lapwing, Red Grouse, Snipe and Skylark. There could also be knock-on positive benefits for Hen Harrier, Merlin and Kestrel through increasing numbers of prey species (this has been noted in Antrim) as well as reducing direct predation of nests by foxes. Habitat management may also benefit other ground nesting waders notably Lapwing and Snipe.

It is interesting to consider also the likely implications for people, arising from efforts for Curlew. As well as maintaining the cultural heritage links and maintaining the sights and sounds of Curlew in the summer countryside, there are some real win-win scenarios that would arise. One obvious one would be the financial reward for those with Curlew on their land and of course rush cutting can also promote a grass sward, a win-win for curlew and landowners.

Recommendation 1.3 Undertake an audit of land use in Curlew territories

It is very important to understand the constitution of lands within existing Curlew territories, even at a coarse level, so as to understand the extent of threats, pressures and opportunities. Immediate factors to consider include habitat/land cover, potential for afforestation, agri-environmental plans, protection status and degree of fragmentation of habitat. Analysing this data would provide insight on pressures acting on remaining Curlew territories and perhaps elucidate why Curlew have been lost from 34% of territories in the past decade. It would also provide scope for identifying where opportunities and threats lie and what can be done to exploit these opportunities in the interests of landowners and Curlew, while allaying threats as much as possible. It would be really useful to consider how much land is being managed positively for breeding Curlew.

In 2017 following intensive work, NPWS collated various datasets internally and from Department of Agriculture, Food & the Marine, the Property Registration Authority of Ireland, Coíllte Teoranta, Teagasc and IT Sligo and created a "Curlew Dashboard" whereby queries of land-use in individual territories can be made. As it stands, a habitat classification for each territory is not possible, unless mapping is carried out in the field. Work is currently ongoing to enable all-inclusive queries of the Curlew Dashboard, across the footprint of all territories. Members of the Curlew Task Force have been asked for feedback on the types of questions they would like answered and the uses they would like to see this information put to, for well-informed Curlew conservation policy and action.

The research project underway between NPWS and UCD could include inter-alia correlate Curlew breeding success and productivity to habitat and landscape features or proactive interventions. The research project could also potentially incorporate socio-economic considerations such as age profile of farmers and future prospects for land use as well as understanding what is required to encourage a landowner to manage land proactively for breeding Curlew. On the ground site appraisal to collect data on habitat quality/suitability, potential threats to the site/area, any background on predator numbers or existing predator control, history of use of the site by Curlew, recommended management actions, requirement for predator control and whether predator fencing suitable for this site as well as other factors that may become apparent would ideally be investigated by a local Curlew Action Team. This will involve interviews with landowner or manager as well as an assessment to the habitat conditions. Focus should be on both nesting and feeding sites. Nesting habitat is likely to be a much smaller area and so more suitable to an on-the-ground habitat assessment with feeding area assessment more likely to be a 'look see', less detailed assessment. There needs to be consensus among on suitable habitat conditions and a checklist should be devised for any field staff that are carrying out site assessments. The checklist should be able to cover both the farmland/rough upland sites as well as lowland bog sites. It would be useful to understand historical, current and future management as well as the farmers anecdotal understanding of the population on their farm (e.g. have they moved around based on management, were there more etc.). Clearly a dialogue with the land owner is important in these regards.

Coarse level habitat information should be ascertained for sites confirmed in the first national breeding Curlew survey or presently extant. In time, detailed assessment of all sites should be undertaken. Sites that held breeding Curlew during the period of the Bird Atlas (2008-2011) should also be considered, but the immediate priority should be to collate data on sites where Curlew are confirmed to be currently breeding. This work shall be undertaken as part of the research project between NPWS and BirdWatch Ireland.

Habitat quality/suitability, potential threats to the site/area, any background on predator numbers or existing predator control, history of use of the site by Curlew, recommended management actions, requirement for predator control and whether predator fencing suitable for this site as well as other factors that may become apparent will be investigated by the Curlew Action Teams operating in the Curlew Conservation Programme.

Recommendation 1.4 Undertake research on breeding Curlew, with particular reference to, examining the effectiveness of conservation measures and with specific reference to the landscape of Ireland

A question of resources and priorities

Much of this chapter deals with research requirements, in order to better inform the approach to applied conservation, either in policy or on the ground. If resources are limited however, executive decisions will have to be made as to what the most pressing or research requirements are, what is most cost-effective and whether money spent on research to provide a better approach in the long run is a more appropriate investment than putting that money into direct interventions on the ground or vice versa.

Locating nest areas

Knowing where Curlews are nesting is integral to targeting conservation action. Finding Curlew nests can be difficult, but it is possible through liaison with local people and close observations to define fairly well the area where birds are nesting. Contact has been made between the Curlew Conservation Programme and various people working on Curlew in Northern Ireland and Britain, to establish the methods best applied to Curlew nest finding in particular situations. Determining nest locations is essential in providing opportunity for protecting nests and investigating breeding ecology. Of course, breeding records beyond the core areas of the Curlew Conservation Programme are also be sought and welcome, with a view to protecting nests and investigating breeding ecology wherever possible.

Nest areas should only be visited by licenced individuals, in accordance with an agreed protocol. The following protocol is recommended but can be adapted as required:

Protocol for visiting Curlew nest areas

Justification: This is required to enact any nest protection measures such as predator proof fences and to place observation/trail cameras where possible and appropriate. There is no need to visit the exact nest itself. Nest protection fences and trail cameras will be erected at a distance of roughly 25m from the nest. The nest itself shall only be visited if it is suspected that the breeding attempt has failed.

Prior experience: Curlew nests are visited in Wales and Shropshire, in similar terrain and habitat to Ireland, with no adverse impacts. Works such as trapping adults for satellite tracking and erecting nest protection fences have also been conducted in Wales and Germany respectively, with no adverse

impacts reported (Rachel Taylor and Natalie Meyer, pers comm.). However, for now, visiting the precise nest location will not be a part of the Curlew Conservation Programme in Ireland.

- 1. The first priority is always the welfare of the birds and every effort will be made to minimise distress to the birds or tracks leading to the nest area.
- 2. While it is not intended to visit the actual nest, it is possible that the observer may by chance find the precise nest location. In such cases, nests shall not be approached to within 1.5m (an adequate distance to still allow a licenced fieldworker to view the nest). Under no circumstances should eggs or chicks be touched.
- 3. Visits will be kept to a minimum, both in terms of the number of visits made, and the duration of individual visits. The erection of the fences shall be undertaken following the protocol of NABU (Germany), with any specific lessons learned in the Irish context taken into account as early as possible.
- 4. Post visit, the fieldworker shall observe the nest site from a discrete location (out of view of the breeding birds) for at least 30 minutes and longer if required. If any negative consequences of the following nest visit protocol during the breeding season these will be immediately brought to the attention of the project management and NPWS and a decision will be made concerning the mitigating action to be taken.
- 5. The first nest visit will be made only when:
 - a) the nest area location has been identified by observations to within an accuracy of at least 100m.
 - b) it can be concluded with reasonable certainty that laying has been completed (at least 7 days after the start of incubation).
- 6. The visit will be made by one observer. It is advisable to have a second observer watching the visit from an appropriate distance and location (out of view of the birds but with a good view of the nest site), in order to guide the observer to the location of the nest. In this case, observers would stay in radio contact with each other.
- 7. The primary observer will not remain in the area of the nest for more than 60 seconds, and would take care to keep damage to vegetation surrounding the nest to a minimum. If the nest visit is found to require a small amount of disturbance to vegetation, the visit may proceed on the condition that the 'entry' point to the nest is returned to a condition that would be similarly hard for mammalian predators to penetrate as it was found in. If the nest visit is found to require more significant disturbance to surrounding vegetation, it will be abandoned. The observer will remain no longer than necessary to take a GPS reading of the nest site and continue to move through the area, giving negligible outward indication of his discovery.
- 8. Visits will be made between 1100 and 1900 when temperatures are up.
- 9. Nest visits will only be carried out during dry, calm weather, to ensure that any temporary avoidance of the nest during and after the visit doesn't expose the nest contents to inclement weather, and to minimise the scent trail left by the observer.

Use of predator proof fences

Predator proof fences have been utilised with success in Germany, allowing Curlew to rear chicks successfully without impact from ground mammals like foxes. This method will be trialled in Ireland

when and where appropriate. The fences will be erected using an identical protocol to that employed in Germany. There may be a need to use petrol strimmers to cut some tussocky vegetation – this is likely to disturb birds and it will be vital to pay close attention to the first such effort and how the birds adjust and obviously every other effort thereafter. This may not be appropriate in tall heather, which would take too long to cut, leading to undue disturbance. Naturally, once the chicks leave the nest, should they exit the nest protection fence perimeter, they are at risk of predation (and indeed within the fence they may be at risk of predation from corvids). Thus, it is important that systematic predator control is employed at each site. It is also important to provide suitable habitat and vegetation structure for chicks once they have left the nest.

Liaison with NPWS regional staff

Management in all areas where nests are being visited have been informed of fieldwork plans, so that they could inform and engage Conservation Rangers and other regional staff as appropriate. Going forward, NPWS contacts have been identified in each area to receive regular updates on all nests found and relevant activities (including habitat enhancement works, predator control issues, etc.). NPWS staff are encouraged to fully partake in the Curlew Conservation Programme and have been very active in a number of areas thus far.

Census of predators

Efforts should be made at recording the density of Fox, Mink and Corvids and any other relevant predators within 1km of known Curlew nests. Trail cams have been employed for the research element of the Curlew Conservation Programme. The records of the Nest Protection Officer will be an important register in this regard also, to see over time whether predator numbers in particular areas are decreasing.

Researching the efficacy of measures undertaken

Actions undertaken as part of the Curlew Conservation Programme are being monitored. In particular, breeding productivity is being monitored and cross-referenced to nest protection and predator control interventions and also related to habitat.

Category	Research focus
Nesting	i. Finding nest areas (with local advisor/landowner/NPWS Personnel) to enable conservation action
	ii. Habitat Selection (nest site and habitat composition in 3km hinterland). Information should include average sward height, rush density, grazing pressure during nesting period (April-July), access to chick rearing features, number of chick rearing features, distance to nearest predator perch, etc. It would also be good to look into prey abundance at these sites and which fields do adults prefer to

A Curlew Research Officer is combining with the local Curlew Action Teams to study the following:

	feed in, in order to see if these conditions can be replicated
	elsewhere. Soil invertebrate abundance could reveal a lot. Just by
	counting earthworms, leatherjackets, beetles etc.
	iii Site fidelity
	b. Dhen also win a Cauthana Inden dia utaut
	iv. Phenology in a Southern Ireland context
	v. comparing land use in territories that have been lost since 2007
	and those that remain
Predators within nesting	i What predators are frequenting pest sites when (times and dates
areas (most appropriate	in relation to stage of breeding) and how often?
distance from nest to be	
proposed in submission)	
	II. What habitats/features correlate to predator abundance and
	activity?
Nest Protection	Compare breeding success and productivity at protected nests vs
	unprotected nests
Breeding Success and	I. Hatching success
Productivity	
	ii. Fledging success
	iii. Relating breeding success/productivity to habitat and landscape
	features (e.g. edges, distance to forestry, tracks, etc.)/nest
	protection trials etc.)
Socio-economic	i Future prospects for land use
	ii. Requirements of landowners
	iii. Thoughts of local people and landowners towards habitat and
	landscape changes.
Curathanda	
Synthesis	The best approaches for breeding Curlew conservation in Ireland

Discussion points relating to Curlew ecological requirements and research in the mid-long term

Satellite Tracking

There is much yet to be understood about the Curlew's use of the landscape. Anecdotal evidence in many areas suggest birds are very site faithful, to the point that they return to the same fields each Spring and Summer, but to what extent they range in order to feed during the breeding season, or at different times of the breeding season, is largely unknown. New research by the BTO in Wales and the RSPB in southern Scotland shows that Curlew can use relatively small or very large swathes of the countryside around their nests (Rachel Taylor, pers. comm.) and different habitats at different times (Ewing et al, 2017¹⁸). There may be individual variation depending on various circumstances relating to the birds themselves and their landscape (including habitat quality). Information in an Irish context would undoubtedly be useful, particularly in terms of approaches to safeguard or enhance breeding habitat and preventing fragmentation of a Curlew's territory. It would be interesting to see if there are differences between how the populations using bogs and those in more grassland habitats utilise the landscape. Satellite tracking would also provide some very much needed information on movements pre and post breeding and identifying linkages between sites used at different times of year. In the absence of satellite tracking, migration of birds through Ireland at inland wetland and bog sites in July/August which are failed breeders from Scotland/Norway, may be mis-identified as local fledged juveniles. Some juvenile birds stay on their wintering grounds for the first full year (Adriaan de Jong, pers comm.), meaning that non breeding adults from Norway/Scotland in their first year could be confused for breeding birds at some sites; where these 1st year birds spend the winter is not really known, but inland wetland sites and bogs may be used as "summering" sites by these birds, further confusing the picture.

It is of course important to understand fully the links between wintering and breeding ecology. The survival and fitness of birds coming towards breeding season can determine the capacity of individual birds to breed. It would be particularly interesting to determine the degree to which Irish Curlew stay in Ireland through the August-March period, or whether some travel for example to Britain or continental Europe. There is a need to consider the threats and pressures acting on Curlew "wintering" grounds and what can be done to help Curlew through that difficult period.

There are two main approaches to catching Curlew for satellite tagging -(1) capture on the nest and (2) canon netting when the birds arrive back on territory but before they actually commence nesting. With new developments of "sylastic" harnesses, it may also be possible to fit tags to young Curlew before fledging, thereby enabling studies on their survival (thereby informing population dynamics and modelling of future prospects) and philopatry in addition to migration, landscape and habitat use.

There is a school of thought that satellite tracking may be risky, in terms of disturbance, particularly in areas where the population continues to decline. Satellite tracking would have to be licenced by

¹⁸ Ewing, S.R., E.S. Scragg, N. Butcher & D.J.T. Douglas. 2017. GPS tracking reveals temporal patterns in breeding season habitat use and activity of a globally Near threatened wader, the Eurasian Curlew. Wader Study 124(3): 206–214.

the National Parks & Wildlife Service and approved by the BTO and the welfare of any individual bird or breeding attempt or local population should always be paramount in consideration of any licence applications.

Colour Ringing

Colour ringing of Curlew could prove useful towards informing whether Curlew seen at the end of the breeding season bred locally or are visiting migrants. It could also provide insight on where Irish Curlew go for the winter and whether the same birds return to the breeding areas each Spring and Summer. It might be worth considering cannon netting wintering birds, whereby more birds could be potentially caught at a time. In turn, this could provide information on (a) whether birds return to same wintering areas if observed in winter and (b) where they spend the breeding season.

Colour ringing is obviously dependent on sightings and it may be that satellite tags are more likely to provide useful answers. Colour ringing would be relatively low-cost in terms of equipment, but labour intensive unless undertaken in conjunction for example with head starting (to be considered) under 1.2.5. If head starting is undertaken then colour ringing would be integral to that technique.

It is important again to note that there can be risks associated with this method, including nest finding in order to ring chicks in the nest before dispersal and perhaps added risks of predation (chicks are naturally well camouflaged, but with brightly coloured rings they are likely to be more vulnerable to avian predators).

Analysis of habitat quality

Understanding the quality of habitat as well as the availability or amount of habitat is crucial. The main issues at play in terms of habitat quality need to be studied, including fragmentation, soil types, soil wetness, soil chemistry and biology, soil compaction, invertebrate availability, field maintenance/management, openness, management of sward and stock, rush levels, rate of loss of habitat, etc. Also, habitat quality is not solely about physical properties; predator abundance and predation management should also be considered when assessing habitat quality and it is important to also understand what makes the landscape more attractive or beneficial to predators of Curlew. So too the matters of livestock and habitat management are key to understand availability of invertebrates needed for Curlew to feed and survive. There is a real need for better understanding of chemical applications of both livestock and sward. For example, extensively grazed land may have greater availability of invertebrates due to better soil and vegetation structure, less impact of internal and external control of parasites/flies, and little or no chemical application on swards controlling "weeds", whereas intensively managed land may have worse vegetation structure, livestock treated for internal and external parasite/fly control, and "noxious weed" control. It is suspected that in upland areas of the country, compaction both by livestock and machine allied to soil type and wetness makes subsoil invertebrates harder to access for Curlew. Therefore, most invertebrates may be taken from the surface, and if the vegetation structure is not suitable, the get the bigger invertebrates needed will not be available. The application of slurry or chemical fertilisers as opposed to Farm Yard Manure is also suspected to have resulted in a shift in food availability.

The research element of the Curlew Conservation Programme funded by NPWS at UCD will go some way towards providing an initial understanding of habitat quality for Curlew in an Irish context.

Knowledge from international studies and experience should also be garnered and put to use as appropriate. As Curlew use habitats on a landscape scale, it is important to consider the question of habitat quality at a landscape level as well as at field level.

Relating habitat quality to breeding productivity

Habitat quality, particular features on the landscape and predator abundance will impact on breeding success and productivity. There needs to be a greater understanding of what the most influential factors are and what can be done to deliver what is good for Curlew and avoid what is bad for Curlew. As Curlew use habitats on a landscape scale, it is important to consider the question of habitat quality at a landscape level as well as at field level. The research element of the Curlew Conservation Programme will have made significant progress in this regard, for the first time studying Curlew and its habitat/landscape in an Irish context.

Egg weighing

Egg weighing together with egg measuring can provide a method for determining hatching dates. It is a technique that has been successfully for a number of bird species, including other waders. Grant et al.et al.(2000)¹⁹ provide a formula for calculating hatching dates from egg weighing and measuring for Curlew. The advantage of this method is that once a nest has been visited and measurements have been taken, there is no need to return to the nest until after the predicted hatching date in order to determine success (or failure) of the nest. Of course, there are risks involved in visiting nests in the first place and a protocol should be developed to determine when it is appropriate to visit a nest. In the Curlew Country project, they use this technique as many of their nests are in silage fields and they can liaise with farmers over timing of farming operations once they have a predicted hatching date.

Head-Starting

The concept and practice

Head starting is a method for getting eggs and/or chicks through the early stages and avoiding predation issues. This technique can be employed to remove the extremely hazardous life stages of eggs and chicks from the wild in cases where predation or other factors, at these stages is driving population declines in bird species. Essentially eggs from wild clutches are taken and reared in captivity. Head starting involves hatching the eggs in incubators and then rearing chicks to fledging stage and then releasing them back to the wild. Egg starting is a very similar process but the eggs are replaced in wild nests just before their hatching date and the adults then rear the chicks. With egg starting, dummy eggs can be placed in the wild nest to ensure that the nest is still being actively used by the adults at the time when the real eggs are replaced and due to hatch. With head starting, the process can be used to encourage adults to lay a second clutch and have another attempt at raising a second clutch.

¹⁹ Murray C. Grant, Chris Lodge, Niall Moore, Jon Easton, Chris Orsman and Malcolm Smith. Estimating the abundance and hatching success of breeding Curlew *Numenius arquata* using survey data. Bird Study (2000) 47, 41–51

Head starting is currently being used by the Wildfowl and Wetlands Trust (WWT) in the conservation of Spoon-billed Sandpipers in Asia and now also for Black-tailed Godwits in eastern England. For more information on these two projects, see their websites:

- https://www.saving-spoon-billed-sandpiper.com/
- <u>https://projectgodwit.org.uk/</u>

Work on the Spoon-billed Sandpipers has shown that head starting has raised the productivity from 0.6 chicks per pair to 3.2. Birds that have been reared and released are now themselves part of the breeding population and are rearing young. It is still yet to be seen whether birds that have been head-started are as 'fit' as wild birds (e.g. is their adult survival the same as wild birds?) and work is ongoing to look into this aspect.

2018 was the second year for the Project Godwit so at this stage, it is still too early to say that head starting works for them, but birds released as fledglings in 2017 have survived. Of the 25 fledglings released, 5 were seen on migration in appropriate locations and 9 birds returned to the breeding sites in east England in 2018.

Modelling work carried out by WWT has shown that head starting can be an appropriate technique in the following situations:

- To buy time in an emergency situation (e.g. It is estimated that the head starting of the godwits will buy 20 years to address underlying issues).
- To kick-start recovery where sites have been restored to suitable condition.
- To escape a bottleneck (where a local population is so small that it is at risk of extinction).

Head starting is not looked upon as the solution to the decline of a bird species and it can't fix any underlying problems. However, it can be seen as one of a suite of measures that are required to allow a population to recover. It can also be used to help to maintain the population whilst work to address other issues (e.g. habitat management) takes place. Given that head starting can be expensive both in terms of finance and staff resources, it is not a sustainable long-term solution.

Curlew Country is a project based in Shropshire, England that is carrying out work to save Curlews in this part of the world (see <u>https://curlewcountry.org/</u>). This includes monitoring nests, predator control and the use of fences around nests. In 2017, they started trialling head starting and carried on with this work in 2018. It is understood that there is a project in Poland and others in Germany and Holland where they are also head starting Curlews.

This report details a meeting held with WWT and Curlew Country to look at the practicalities of undertaking head starting if it is determined that this is a technique that is to be used in Ireland. It is fair to say that WWT with their resources, expertise and history of rearing birds in captivity have adopted a 'gold standard' approach to head starting. They also have to take biosecurity extremely seriously so as not to put their captive collections and other breeding programmes at risk. Curlew Country have taken a very much more pragmatic approach, reflecting also their own resources in comparison to the WWT.

Preparation work

WWT undertook a health risk analysis prior to commencing head starting on godwits. This identifies potential diseases and other health risks so that their team were prepared for any health concerns.

Experience from rearing other birds can identify certain problems. For example, the godwit chicks were found to have Campylobacter but as this is occurs in wild populations, it was considered ok to release them. WWT also had experienced vets on hand and took blood to check for diseases. Curlew Country found that a number of chicks had splayed legs once they were hatched (probably due to the humidity in the incubators) and had to splint the legs with elastic bands and drinking straws.

The location of the incubator and rearing pens will need to be considered. If it is located some distance from the breeding sites, then mobile incubators may be needed to transport eggs from the nest to the incubation site. Another consideration is that it is still not known how Curlews develop their sense of 'home'. The best guess is that is from star maps and probably during the chick rearing stage, so location of the rearing pens maybe important for the chicks to determine where their original nest site is so that they can return in years to come to breed.

Egg Collection

For godwits, eggs were taken as early as possible so as to give the adult birds a chance to lay a second clutch. Although this had to be balanced against the fact that it has been found that if the eggs have been incubated for a few days before collection, it increases the hatching success in the incubators. It is important to collect as many eggs as possible from different nests at the same time, so that all the eggs in an incubator are roughly the same age. This is due to managing humidity in an incubator for eggs at different stages (see later). Curlew Country would take eggs from a partial clutch and replace them with dummy eggs to encourage the adults to lay further eggs.

Egg Incubation

Incubators can cost anywhere from €100 to over €3,000. A key point in incubation is to maintain the right humidity for the age of the eggs. Humidity should increase as the egg gets closer to hatching. This is why it is important to have eggs that are the same age in an incubator. Laying and hatching dates can be determined by measuring egg weights and weight loss. WWT monitor egg weights on a daily basis. They maintain three incubators, one at the standard conditions ($37.5^{\circ}C$, 55% humidity), one with reduced humidity and at increased humidity), eggs can be moved between the incubators if incubation is not progressing as planned. WWT have a team of staff watching incubation, including through the night. Grant (1996^{20}) is an important reference in predicting hatching dates. Curlew Country did not weigh eggs but had a good idea of hatching dates from observations of the adults in the field. They also did not have the staff to keep a 24-hour watch on the incubation and did not watch throughout the night.

All WWT staff attended an avian incubation course run by the Durrell Conservation Trust (<u>http://wildlife.durrell.org/training/courses/avian-egg-incubation-workshop</u>).

Chick Hatching and Rearing

If humidity levels in the incubator are correct, then the eggs should hatch without any assistance. In practice, Curlew Country found that on occasion, they did need to help the chick break out of the egg. Project Godwit (WWT) kept the incubators in a Portakabin. The newly hatched chicks were put into

²⁰ Grant, M.C. (1996) Predicting hatching dates of curlew *Numenius arquata* clutches. *Wader Study Group Bull.* **80**, 53–54

large plastic boxes under a heat lamp for 7 days, also in the Portakabin. They were then transferred to plastic rabbit hutches within a polytunnel.



Figure 1.3 Polytunnels used by the Wetlands & Wildfowl Trust for captive rearing of Curlew chicks

The polytunnels were large structures using commercial frames. Instead of plastic, the frames were covered with two layers of netting. The double netting provides protection against Sparrowhawks and other raptors. Around the base of the polytunnel frame, metal sheets were buried into the ground to prevent foxes, badgers from digging underneath.

These polytunnels are expensive. They are located close to the breeding sites and in area which close to where the birds will be released. Curlew Country did not have these resources and they used a pheasant pen and also a local poultry breeder who had their own pens. Both WWT and Curlew Country stressed the need to pad any posts or timbers inside the polytunnel or pens to prevent the young birds from damaging themselves. WWT play recordings of adult contact calls to the young birds. They also play alarm calls whilst show images of predators (dogs, foxes etc) as predator avoidance training. Neither WWT nor Curlew Country undertake any specific measures to avoid imprinting on the young chicks. They restrict access to the rearing pens to only those staff that are directly involved in rearing the birds and minimise contact.

The chicks are fed on commercially available insectivorous pellets, mealworms and crickets. Curlew Country also went foraging for insects, earthworms, beetles to feed the chicks.

Location of the rearing pens is very important. As mentioned earlier, Curlews are extremely site faithful and return to the nest site location once they start to breed. It is not known when or how they learn where their nest site, but the best guess is during the chick stage. If this is the case, then locating rearing pens close to nests sites would be important. This also applies to the release site. In 2017, Curlew Country released reared birds at a site where pre and post breeding flocks of Curlews

gather. The birds are colour ringed but so far, no reports of their birds have been received. This is an area that is little understood at the moment. WWT are trying to contact workers in Poland to see if they have any more knowledge and if they have seen head started birds return to breeding sites or even breed themselves.

Considerations for an Irish head starting scheme

Head starting is a technique that has been shown to increase productivity for Spoon-billed Sandpiper and for Black-tailed Godwit. Additionally, head started Spoon-billed Sandpipers are now breeding and indications are that Black-tailed Godwits will also do so. To date, there is little information on how head started Curlew develop and whether they return to their breeding sites. Curlew Country have had two years head starting Curlew, so it is too early to say whether any of their birds will return to breed. Head starting projects are being developed for other areas of southern England and planned to be implemented in 2019. Apparently, head starting Curlew has been tried in Poland and Holland/Germany but no information from these schemes is available as yet. WWT are going to contact these schemes to see what additional information they may have.

If a head starting scheme is to be implemented in Ireland, the following considerations will need to be addressed:

1. Location of incubator and rearing pens

A central facility where all the eggs are brought to location for incubation and rearing would be a costeffective solution. Potentially Lough Boora with its facilities for the partridge project could be used or somewhere like Dublin Zoo or Fota Island who may well have staff expertise in hatching and rearing chicks. This would require less staff resources. The downside is that there remains the possibility that the birds won't know where their natal sites are, or that they return to the rearing area in future years rather than the areas where the eggs were collected. Having one facility also raises the potentially catastrophic consequences of an outbreak of disease, or fire or predator break into the pens. The alternative is to have a number of sites located close to core Curlew areas. This reduces the risk of a catastrophic event affecting all birds, it could also eliminate the issue with birds not knowing where their natal sites are. In this instance, staff resources could be higher as the birds would need 7 days a week care and attention. An alternative is to look for local people who might have relevant expertise such as pheasant rearers, poultry breeders or falconers who breed birds.

2. Availability of food

Some research will be needed to find out if commercial food for the chicks is available in sufficient and guaranteed quantities in Ireland. This is particularly live food such as mealworms and crickets.

3. Location of release sites

The approach taken by Curlew Country in 2017 was to release birds at a post breeding gathering site in mid Wales. In Ireland, the location of post breeding flocks should be identified as potential release sites. Alternatively, individual eggs and chicks are to be marked so that they can be released close to their original nest sites. This is an area where the experience in Poland may be of considerable benefit.

4. Funding

Funds will be required whichever approach to incubation and rearing sites is taken. Head starting cannot be viewed as one off project with funding for one year's trial. Curlew don't breed until their second year, so any results of head starting, in terms of getting birds back into the breeding population, would not be shown for at least three years. Funding would therefore have to be guaranteed for at least five years as a minimum in order to show any effects of the work.

There is a school of thought that head starting should not be employed unless the wild population and the habitat are secure. Obviously, there is little point in rearing and releasing chicks into the wild without a longer-term vision and plan to ultimately provide quality habitat with realistic chances of those birds rearing young in future. Head starting is not to be used as a substitute for solving habitat and predator issues, it can only be considered as a time-buying exercise, to hold onto a population while those bigger issues are being addressed. The IUCN have strict guidelines about such ex-situ management programmes, including in terms of site selection (IUCN, 2013)²¹.

Recommendation 1.5 Undertake research and investigations on the practicality of using "headstarting" to augment breeding Curlew productivity

A definitive understanding of Curlew breeding ecology, survival, philopatry, efficacy of conservation measures, etc.

Curlew have only recently begun to be studied in Ireland and there is a lot yet to be learned in order to fully inform their ecological and conservation needs. While the Curlew Conservation Programme was initiated at a point where Curlews were in crisis, and this crisis may continue for a long time to come, research should continue to be part of any conservation efforts going forward. It would be important that any data collated as part of any research or conservation projects throughout Ireland, whether nationally or locally, is collected in a standardised fashion, capable of contributing to overall research on ecological and conservation requirements.

It is suspected that Irish curlew may have slightly different behaviour and niche requirements than curlew elsewhere across the species range. A common denominator across the EU however, has been the Common Agricultural Policy (CAP) and the large scale changes in agriculture that have been witnessed since the latter half of the 20th century. The need to put the environment and biodiversity at the centre of CAP decision making is now more pressing than ever and a definitive understanding of Curlew ecological requirements will be paramount in that regard if meaningful measures are to be implemented for the species both in Ireland and across the various EU Member States. "Joined up" thinking within and across countries to deliver a network of sites to support Curlew (and various other breeding wader species currently at risk) is also of great importance and initiatives by the EU, the African-Eurasian Migratory Waterbird Agreement (AEWA) and the Ramsar Convention are crucial in that regard.

²¹ IUCN/SSC (2013). Guidelines for Reintroductions and Other Conservation Translocations. Version 1.0. Gland, Switzerland: IUCN Species Survival Commission. <u>https://portals.iucn.org/library/efiles/documents/2013-009.pdf</u>

Given the precarious position in which Curlew are found in Ireland, the conservation measures undertaken here will be a prime case study, from which other countries across the species range can learn, either in terms of success or failure. It behoves the international community and the European Union to play an active part in the conservation of Eurasian Curlew in Ireland, at the western extremity of its global range. As populations are declining elsewhere across Europe, it may in fact be only a matter of time before similar drastic declines are realised, if action is not taken in time, and the loss of Curlew in Ireland may be the harbinger of this threat. Information, advice, financial advice and political pressure will all be required in promoting a brighter future for Curlew in Ireland and elsewhere.

Chapter 2. Farming and Agri-Environment



Ireland is largely a farmed landscape

The Irish landscape and the habitats within it are the product of thousands of years of interaction with agriculture. During this time, various aspects of our wildlife have either moved to exploit the niches that this interaction has created or disappeared where conditions were no longer suitable. This relationship has never been constant; agriculture has always been a dynamic industry. Like any other, it has responded to changing social and economic conditions and there have been changes with people as well as nature. We can expect that this pattern will continue in the future. The challenges that face agriculture and rural communities today and in the future will result in further changes in land use patterns. While change is inevitable, an opportunity does exist to manage change in order to preserve key habitats and species and in turn support the custodians of the landscape. This can only be done by engaging with the rural communities and farmers to ensure that habitats are enhanced and key species protected and properly supported, both in terms of finance and knowledge exchange.

The Curlew is a prime example of a species that is influenced by agriculture. For generations, the extensive type approach to farming benefited Curlew in Ireland, with low intensity grazing, late cut meadows and low input of chemicals, whether fertiliser or animal dosages. It is fair to say that modern agriculture since Ireland's accession into the European single market, has overall not suited the species requirements, with greater intensification (or abandonment in many cases), mechanisation, specialisation and conversion of natural and semi-natural habitats to unsuitable conditions. There does however exist great potential and opportunity to design measures, particularly under the Common Agricultural Policy and the Rural Development Programme for Curlew and it is acknowledged that in the present RDP, farmers with breeding Curlew were prioritised for a specific Curlew agrienvironmental measure under the Green Low-carbon Agri-environment Scheme (GLAS) and a Curlew project was supported as one of the first EIP-Agri projects in Ireland. In addition, the National Parks & Wildlife Service has since the early 1980s funded specific measures for breeding waders, engaging directly with farmers at specific sites. There have been various other efforts for breeding wader conservation by eNGOs like BirdWatch Ireland, working on the ground with farmers also. The success or failure of these efforts and any efforts in the future will revolve around 'the mind, the heart and the pocket'. Experience in Ireland to date has shown there are some common elements for any successful agri-environmental efforts:

SAOIRSE

Support (both financial and advisory)

Appropriateness (measures need to be appropriate to site specific requirements)

Ownership (locally-led and part of the landowners' and community's interest and agenda)

Involvement (landowners in particular need to feel a real sense of involvement)

Results (ultimately, the raison-d'être of any agri-environment measure is to deliver results for its target)

Satisfaction (in the efforts undertaken)

Encouragement (from peers, Government, and the general public)

There are various intricacies to consider and paths to negotiate if farmers are to fully realise the potential they have to save Curlew from being lost from their farm or locality and indeed nationally, but the above ingredients will be fundamental. So too is political will. Will forestry, wind turbines and the intensification of farming continue to replace traditional farmland habitats of Curlew, or can real alternatives be provided in the form of rewarding land managers for the production of public or environmental goods?

This chapter discusses various issues around farming and agri-environmental policy with a view to determining how farmers can be supported to deliver a better environment for breeding Curlew.

Knowing where Curlew are, local effort

Farmers can be an eye on the ground, looking out for Curlew on their farms. It makes sense that farmers know their land and what is on it better than anyone else and in the best position to identify traditional breeding or feeding areas. The Curlew is a rather unmistakable bird, which is well known to farmers, having bred and fed in their fields and mountains for generations. Whether they wish to report Curlew to third parties or not, it would be important that farmers would see the Curlew as something valuable, a part of their local heritage, and that their land is crucially important given the loss of Curlew from the vast majority of farms across Ireland and further afield. Ideally, farmers with breeding Curlew on their land should be rewarded and supported for hosting Curlew and looking after their requirements. Already, the National Parks & Wildlife Service and the Department of Agriculture, Food & the Marine worked together to prioritise farmers known to have Curlew on their land, so that they would automatically qualify for GLAS should they wish to apply (and text messages were sent by DAFM to alert farmers to this fact). Under GLAS, farmers can earn up to ξ 5,000 a year for managing Curlew habitat. The construction of agri-environmental schemes is discussed in more detail later in this Chapter and in Chapter 2. One would hope that access into a well-designed and worthwhile scheme would attract farmers to report that they have Curlew breeding or feeding on their land.

However entering a scheme or dealing with planners/conservation groups or letting others know about what is on one's land is often something that farmers may wish to shy away from, for various reasons. This does not preclude them from managing their land in a Curlew-friendly way, and individuals are often open to tweaking their management if it makes sense to them and if the interest and advice is there. Simple and straightforward information on Curlew friendly farming could be provided at strategic locations or via selected media to suit the target audience, or by having someone who the farmer and local community trusts, based in an area and working on Curlew. An example of simple measures, which need not cost the farmer, is available at https://www.rspb.org.uk/Images/curlew_england_tcm9-207558.pdf and could be replicated for Ireland by interested parties. Ideally this would have the input and/or approval of farming organisations and farm advisory services.

A good starting point in planning a future for once widespread birds like Curlew, would be to consider what the landscape used to be like when it thrived in the Irish countryside, and what happened to get to where we are today. We also need to understand why this has happened and what is required to get to where we want to be, underpinned by a viable farming community. This should not be a nostalgic memory of the past, but a real opportunity to stymie the loss of traditional farming activities and its associated biodiversity.

A positive campaign to encourage local people to report sightings should be undertaken annually, in order to target and prioritise favourable conservation action. So too, there should be clear and straightforward communications to promote supportive actions for Curlew. There are various ways and media for doing so, but most effective would be building of trust and relationships between 'conservation bodies' and local landowners and communities. Ultimately, landowners supporting Curlew should be championed, and their land seen as something very important on a national scale, whereas over previous generations such 'marginal' land may have been considered as something not to be proud of.

Habitat management – maintenance, enhancement, creation

While there are various aspects of Curlew ecology that are yet to be full understood, the basic and fundamental requirements of breeding Curlew are rather straightforward and like most species, revolve around food and protection. There needs to be a sufficient supply of food through the breeding season, and most especially the pre-egg laying and post hatching periods are critical. The type and location of food will differ as the season moves on, but in general, well structured, moist and penetrable soils with readily accessible invertebrate prey will be required by adults while a diverse vegetation structure and shallow pools or muddy patches will be required by the young chicks that have to concentrate on surface insects. Farming or land-use processes can play a major role in delivering or depriving such requirements. The opening Chapter on Curlew ecological requirements deals with this in some more detail, but examples of generally negative processes include removal/infilling of wet areas, use of chemicals and ivermectin dosages, excessive spreading of slurry, compaction of soils and removal of feeding habitat, while beneficial processes include creation of feeding habitat, careful management of soil structure (which will also benefit agricultural output and sustainability), use of farmyard manure, avoidance of chemicals and ivermectin dosages and maintenance of wet areas. There are of course various other processes and factors, all of which will need to be considered on a site-specific basis. For example, while drainage might in general be

considered as a potential negative process, the Curlew Conservation Programme run by the National Parks & Wildlife Service to benefit Curlew has in certain circumstances unblocked and created drains to alleviate the flooding of farmland where Curlew nest, with drains being profiled in a way that they double-up as safe feeding areas for chicks and parents.

Protection can be afforded to Curlew by providing suitable vegetation structure as nesting cover. Avoidance of tree planting close to nesting sites is very important; not only can it provide cover or vantage points for predators, it can actually dissuade Curlew from nesting in an area. Disturbing activities should be kept to a minimum when Curlew are prospecting for nest sites. However it is acknowledged that this is also a very busy and important time of year for farming, with cattle being turned out to pasture, or fertiliser being spread and so on. Knowing where the sensitive areas are is vital and local knowledge, particularly by the farmers will be essential in this regard. Removing stock from the immediate vicinity of a nest or reducing stocking rate (and type) to a certain threshold can make a big difference in terms of reducing the risk of trampling by large cattle or eating of eggs by sheep.

Creation and enhancement of habitat can be effected in a relatively short space of time by groundwork undertaken to remove negative features or create beneficial features. Examples for breeding Curlew could include removal of scrub or problematic trees, rush control, profiling of drains, introduction of feeding scrapes, construction of predator proof fences and various other efforts that can be designed to suit the site-specific situation. Farmers often have the best ideas in that regard and should always be included in decision making from the outset of any suggested plans, which ultimately will require their approval on lands that they own in any case. While any habitat enhancement or creation is to be welcomed, in terms of strategy it would be best to undertake such works in areas where they are most likely to work for Curlew e.g. within or near existing territories, away from predator refuges, areas of regular disturbance, etc. A landscape and hinterland consideration is required, not just a field-by-field consideration. It is important that any capital works or introduction of habitats to benefit Curlew are not undertaken without proper consideration of the receiving environment, including in the case of protected areas where appropriate assessment may be required. For example, one might not wish to delete a rare plant or species rich grassland to create a scrape or delete an important Marsh Fritillary site by clearing scrub or mowing rank vegetation.

In terms of habitat management, it can often be the case in Curlew conservation, that measures put in place to help Curlew can also benefit farming (e.g. rush maintenance and lime spreading), with many efforts effectively being cost neutral (e.g. selecting of grazing sequence to avoid trampling, or temporarily fencing off a part of a field where a pair are incubating eggs). Where there is a need to enact measures that would result in costs incurred or income foregone, this should ideally be financially supported. The question of opportunity cost is also important to consider, especially given the fact that in the majority of Curlew breeding areas farming is technically financially unviable and other options such as renewable power or afforestation will be considered.

Existing agri-environmental schemes for Curlew in the Irish Republic

There are various measures under the Rural Development Programme that will be of benefit to breeding Curlew, to varying degrees, depending on the location, the measures undertaken and the quality of the outcome of those measures. The Basic Payment Scheme and Area of Natural Constraints

Scheme are vital for the continued management of much of the farmland in the breeding range of Curlew in Ireland. Agri-environmental schemes (AES) are similarly crucial to supplement farm income. Circuitously, AES measures like Low-input Permanent Pasture, Traditional Hay Meadow or Commonage Management Plans may all contribute positively towards Curlew conservation. This section will outline Curlew specific measures, which see Ireland somewhat ahead of the curve compared to many other countries across the species' range, which do not have national agri-environmental measures aimed specifically at breeding Curlew. Further details can be found in Chapter 1.

Green-low Carbon Agri-environment Scheme

Ireland has advanced a specific Curlew conservation measure under its national agri-environment scheme, GLAS. This is something that many other countries in Europe do not have. Farmers in Curlew breeding territories receive priority entry to GLAS, which is a voluntary scheme and can receive €366/ha, up to €5,000 per annum for five years to maintain or enhance Curlew breeding habitat. A total of 385 farmers are involved in this measure, with 4,374ha of land included, with up to €8 million expected to be paid out to farmers in Curlew areas over the current RDP.

European Innovation Partnership

In Spring 2018, the Irish Breeding Curlew EIP was granted just over €1m of funding from the Department of Agriculture, Fisheries and the Marine (DAFM) for a four-year project to address factors contributing to the decline of breeding Curlew in Ireland. The project will operate in two focus areas, southern Lough Corrib in County Galway, and the bogs important for Curlew in south Co. Leitrim. New, innovative programmes will be initiated in these areas to improve nesting outcomes through various measures, including training farmers in predator control and nest protection, agri-environment measures and capital works. The operational group of this EIP is comprised of Birdwatch Ireland, the Irish Natura and Hill Farmers Association (INHFA), Irish Grey Partridge Trust (IGPT) and Teagasc.

Curlew Conservation Programme

In 2017, the National Parks & Wildlife Service designed a Curlew Conservation Programme, which has three key pillars, with an emphasis on 'local' to ensure flexibility to adapt to local situations and requirements:

(1) Action on the ground by a Local Curlew Team consisting of a Curlew Advisory Officer, a Curlew Champion and a Nest Protection Officer

(2) Action on the ground by landowners (through the Curlew Conservation Partnership) and

(3) A research project investigating the effectiveness of the measures undertaken, with a view to informing future roll-out and application of measures.

The Curlew Conservation Programme in its pilot phase has a presence in seven core breeding areas. Action is implemented in the form of working with landowners to protect nests from predation and to undertake habitat enhancement or creation. Each area has a locally based team (primarily consisting of local people) to carry out this action, while the efficacy of the efforts will be determined by a research project. It is intended to build on this in future years.

Knowledge exchange

'Knowledge exchange' denotes the transfer of knowledge and experience in various directions, between various players. No one person or organisation or interest group holds all the answers to Curlew conservation, but together all the relevant stakeholders can formulate plans that work for both the Curlew and landowners. It is important that where required, landowners are provided with advice in terms of what they can do to manage for Curlew. This advice can come from ecologists, agri-environmentalists, predator control advisors and/or any other relevant people/groups with appropriate expertise and experience. It is important also, that ecologists, agri-environmentalists and predator control advisors understand the reasons underpinning the decisions and operations of a farm. It is important too that stakeholders are not 'pigeon-holed' or boxed-off into what some may see as stereotypical categories. An individual working professionally in ecology may also be farming part-time, or a full-time farmer may have more knowledge and experience in ecology than a newly qualified environmental science graduate. What is most important is that all stakeholders work together in an environment where individual expertise and experience is encouraged to come to the fore, respected and used meaningfully.

Achieving farmer buy-in and understanding of the objectives of any farm plan is critical to delivering results (Burton & Schwarz, 2013; Cullen et al., 2018). The importance of good advisory supports and regular engagement and communication cannot be underestimated in terms of realising results. It would be crucial that any agri-environmental scheme into the future has on-going knowledge exchange built-in, specific and pertinent to the measures that the farmers are undertaking or the species and habitats found on the scheme participant's lands. Probably the best way to realise this would be to have well trained advisors, dedicated to particular issues or areas. In the case of the Curlew Conservation Programme piloted by the National Parks & Wildlife Service, the role of Curlew Advisory Officer has worked very well in realising the potential of fields and farms to deliver for Curlew in a way that suits the farmers also. The Curlew Advisory Officers have worked closely with land managers in terms of carrying out particular operations or grazing regimes at optimum times. These advisors have also raised local awareness of the critical situation for Curlew and have enabled targeted knowledge exchange and liaison between various stakeholders, from farmers to gun clubs, to agricultural planners and researchers. Dedicated wader advisory has also proven pivotal in efforts employed by BirdWatch Ireland and RSPB Northern Ireland at different sites throughout Ireland. The presence of an advisor in future schemes will be essential in realising more effective results for both farmers and Curlew. For example, there may be no need to delay fertilising, mowing or slurry spreading on fields not used by Curlew at particular times, and perhaps some fields are more critical in terms of intervention like scrub clearance or rush cutting than others. Similarly, there is no control at the start of a scheme as to where a Curlew may lead its chicks; for example into a newly cut silage field that is not part of any scheme. A local advisor could work with the farmer or contractor to avoid or safeguard the chicks. Only on the ground knowledge can deliver that type of nuanced and adaptive effort, with best value for the scheme's money (most often public money).

As well as having specialised Curlew Advisory Officers, it would be important and beneficial to have general agricultural and agri-environmental planners trained in the identification and requirements of breeding waders like Curlew, to ensure that planned actions do not inadvertently act against this vulnerable group and conversely, that planned actions can benefit these species. Some argue that there needs to be better regulatory control, with farmers and planners clearly advised on how schemes are supposed to work, and why short-cuts on complex conservation measures are not a good idea.

Discussion groups can also be a very useful forum when designed and delivered properly. They can act as a fertile ground for creating solutions, disseminating best practice and encouraging further effort. Local or regional workshops specifically on Curlew ecological requirements for participating landowners, could be held in the early stages of any agri-environmental scheme for Curlew in the future. More broadly, there is an increasing requirement for various aspects of High Nature Value farming (HNVf) to be considered in the same mode as beef, sheep, tillage, dairy and so on, in terms of research and education. With the advent of the European Innovation Partnerships and the successes of agri-environmental programmes including on the Aran Islands and in the Burren, it could well be an opportune time to make Ireland a leading player in terms of HNVf.

Fire – friend or foe

Fire can be a destructive or constructive tool or process, depending on the context, receiving environment and when/how it is applied. In the case of Curlew, there may be particular situations whereby burning can bring heath habitat back into suitable condition, rather than it becoming too rank. Of course it is essential that appropriate management is applied thereafter, for example through grazing, to maintain the habitat in suitable condition. If burning is to be engaged as a management practice, there needs to be clear guidance on when it is required/acceptable and how it is to be done. Again, this type of decision making would benefit from having Curlew Advisory Officers on the ground. Burning is not required but can be included as a management technique within Commonage Management Plans (CMPs) submitted for GLAS. This must follow existing guidelines and requirements. Specific guidance for burning in Curlew areas could be formulated and included as a management technique within CMPs in future.

It is largely accepted that burning should not be used as a tool on raised or blanket bogs for Curlew. Burning when applied inappropriately can destroy nests or unfledged young, remove habitat and reduce food availability. Traditional skills and practices, availability of help, timing, location, types of habitat, appropriateness for the local environment, grazing systems, and wider landscape issues all need to be considered in the conversation on burning; it is not a simple matter of good or bad, yes or no. The risk of fire spreading out of control is an important consideration. This is often associated with areas of forestry on the landscape and a reluctance of farmers to burn near these plantations, or an aging farming population or a reduction in stock numbers in mountainous areas, thus resulting in vegetation "getting ahead" of the grazing regime, whereas traditionally patches of vegetation would have been burned annually allowing for this resource to be kept in balance and not develop to the stage where it could be considered a 'fuel load'. It may be necessary to consider protective measures in particularly at risk locations, including by the use of firebreaks, either created mechanically by mowing or the scarifying of the ground surface layer or by intensive grazing e.g. by sheep.

Nest protection

Predator control will be an essential part of maintaining the population of Curlew in Ireland, given the modern-day architecture of the landscape and habitats, allied with an abundance of meso-predators with a dearth of apex predators (e.g. eagles and wolves). The investment of money, time and energy into creating or enhancing habitats could be all for naught if predators continue to remove Curlew

eggs, chicks or adults. Various aspects relating to predator control are discussed in Chapter 5. A fundamental requirement for any predator control is landowner agreement and in Ireland, the majority of land in Curlew areas will be owned and managed by farmers. While targeted and focussed on the immediate vicinity of the Curlew nests, a landscape scale approach will be needed in terms of predator control. If a predator control officer has access to nine out of ten farms to carry out nest protection efforts, and the tenth farm is where the nest is and where there is a refuge for predators, this could effectively undermine all efforts in terms of end result. Landowners could be incentivised to allow predator control, or to work collaboratively as a cluster in terms of nest protection efforts. Farmers and landowners could participate in nest protection efforts where appropriate training, expertise, experience and licencing are in order. Farmers and landowners could check traps on a regular basis. However, there needs to be an ultimate responsibility held by a dedicated predator control officer and such input from farmers and landowners should be to augment efforts, rather than as a mainstay of efforts. Farmers can also assist in recording and reporting predators and become involved in monitoring them.

Considering socio-economics and future planning / succession of ownership

It is known that the general age profile of farming in Ireland is increasing, with a decline in the number of farmers in younger age categories. Almost a third of farmers are at retirement age or above, while more than half are over 55 (CSO, 2018)²². There has been a sustained trend of less young people entering farming, even after the present generation leave the land after them. This is particularly acute in much of the HNV farmed landscape of Ireland. In general, farmers working land in areas of HNVf are older, operate specialist drystock farms and record lower levels of farm income. Areas with higher probabilities of HNVf are characterised by higher levels of unemployment and out migration of younger people. There are some differences between HNVf areas. These are associated with proximity to larger (urban) labour markets which provide off-farm employment opportunities for more members of the farm household (Meredith et al., 2015)²³.

It is important to plan forward by considering who will the caretakers of the Curlew's landscape and habitats be in the immediate, medium and long-terms. Socio-economics and succession of ownership are two of the main issues facing farmland biodiversity in Ireland today. Investment today could be completely undone if the next landowner has no interest in undertaking conservation friendly measures. When new owners take up the management of a farm, there is a greater risk now than seen in previous generations, that the methods of land management will change dramatically. Indeed, farming may disappear entirely, a trend seen over recent decades, as the next generation have full time employment away from the family farm and may have no desire or ability to farm the land. Such changes are nigh impossible for the Curlew to keep pace with or to live with. The Curlew Conservation Programme is considering socio-economics in the research part of the Curlew Conservation

²² CSO Farm Structure Survey https://www.cso.ie/en/statistics/agriculture/farmstructuresurvey/

²³ Implications of socio-economic change for the production of High Nature Value Farmland: A case study of Ireland 2000 and 2011. Meredith, D., Crowley, C., Jones, G., Green, S., Matin, S., Moran, J. O'Sullivan, C., Ó Huallachain, D. and Finn, J. In: Ó hUallacháin, D. and Finn, J.A. (eds.) 2015, Farmland Conservation with 2020 Vision, Teagasc, Wexford, pp 36-37. ISBN 978-1-84170-620-7

questionnaire. While many survey correspondents in the Curlew areas see farming primarily as a way of life and a link between generations of their family, they find it hard to see a future in farming unless the current model of large afforestation grants or unbalanced playing field of 'productive' farmers and 'marginal' farmers is addressed; for example through adequate recognition and support of their provision of biodiversity, carbon, water, etc.

Facilitating inter-generational change and land mobility is a key concern in the Common Agricultural Policy and the Irish Rural Development Programme. Schemes such as the Basic Payment Scheme, Areas of Natural Constraints Scheme and Green Low-carbon Agri-environment Scheme are all schemes that many farmers across Ireland's breeding Curlew distribution will be familiar with and avail of. It is vital that if farming is to continue in these areas, that such supports continue. If the next generation are to be attracted into farming, these schemes plus land mobility schemes such as the young farmers scheme will be vital. It needs to be realized however, that despite these schemes presently being available, much of the farmland that Curlew depends on continues to be converted into spruce plantations given the afforestation schemes offer tax free, long-term investments with the added bonus of farmers retaining their BPS payments. Obviously for those making the decision to convert HNVf or Curlew breeding habitat to forestry, the afforestation schemes are more attractive or suit their situation more aptly (i.e. many will be working away from the land they have inherited and the lure of long-term and large grants results in the land being planted as opposed to farmed). This is a crucial point that cross-cuts various Chapters of the Curlew Task Force recommendations and needs to be considered carefully if there is to be a future vision with farmers or landowners managing their land and providing a home for Curlew.

Every avenue possible should be explored to make farming (or leasing for farming) in an environmentally friendly way a strong option for landowners. It would also be worth exploring public/private partnerships by building incentives/rewards for farmers through markets for "green" credentials based on scientifically sound sustainability measures/actions. The Origin Green programme is reviewing, refining and developing a wider range of measurable actions/targets, which could potentially incentivise actions to support sensitive species including Curlew in future.

Well financed, properly targeted, integrated and developed supports, with specialist advisors and long-term options will be required to attract young farmers to farm in a way that might at present seem retrograde in terms of what a 'progressive' farmer should be (i.e. not aiming for maximum stocking or agriculturally 'improving' fields or hill land). Such supports must give clear and unambiguous recognition to the importance of paying for HNV farmland and other public goods. However, it also needs to be recognised that supports such as those under agri-environmental schemes could only ever be but part of the picture and not a panacea for the more global rural/urban issues in Ireland today. Interesting and useful insight can be found at <u>www.airo.maynoothuniversity.ie</u> (All-Island Research Observatory), while various cases have been made as to the multiplier effect of farming for local economies, particularly in the more rural parts of Ireland.

Link between HNV distribution and Curlew

An analysis undertaken by NPWS shows there is virtually full overlap in terms of Curlew breeding distribution and the distribution of High Nature Value farmland (HNVf) in Ireland. Indeed, land with

breeding Curlew arguably could automatically be termed HNV, given it hosts a rare or threated species of high conservation importance. This is a special type of farmland that exists primarily because of the people that have managed that land over a long period of time, often through generations of family management. The type of extensive practice that results in HNV farmland, particularly with breeding Curlew, is becoming rarer and rarer.

Many of the new EIP projects are based in areas of HNV farmland (under RDP priority 4(a) 'restoring, preserving and enhancing biodiversity, including in Natura 2000 areas, and in areas facing natural or other specific constraints, and high nature value farming, as well as the state of European landscapes'). These projects are piloting locally-led, bottom-up approach to agri-environmental schemes and landscape management with several including Results-Based Payments Schemes. Although not all in curlew breeding areas, the network of projects will work towards improvement of landscape conservation in HNV areas through many different management practices (e.g. sustainable grazing, addressing inappropriate burning, invasive species control, etc.). It is envisaged that the network of projects and schemes will provide innovative approaches to supporting extensive farming management practices.

Recommendation 2.1 Develop High Level requirements for Curlew within future Rural Development Programmes, specifically;

a) Carry out annual surveys to monitor the population and identify where Curlew are located

b) Urgently address the loss of curlew habitat c) Development, financing, targeting and adaptability of proactive measures through bespoke management schemes
 d) Implementation of habitat measures (including the adoption of sensitive farming and non-productive investments)

- e) Effective nest protection
- f) Landscape-scale approach (including farm clusters and collaborative working)

g) Consideration of wider positive benefits to biodiversity/landscape of adopting these approaches

h) Consolidate and utilise data and experience available from various sources including the CCP, EIP, BnM, Gun Clubs, local projects, etc.

a) Knowing where the Curlew are; carry out annual surveys to monitor the population and identify where Curlew are located

This is a fundamental requirement; particularly given how site faithful Curlew are. Effective conservation action cannot be implemented using a scattergun approach. It needs to be targeted and needs to be informed by an understanding of the issues at play in precise locations. Yet fine detail on the locations of breeding Curlew is often lacking or outdated. Recent research has also shown that Curlew are ranging more widely in the breeding season than previously considered and there is much yet unknown about the species' movements and habits in the landscape. Ideally national, regional and local surveys would be undertaken annually and underpin the targeting and type of actions, but this is seldom possible given finance and resources. Range states should look to have full national coverage

in the lead up to each new Rural Development Programme, which in the case of EU Member States could also tie in with monitoring requirements for Article 12 of the Birds Directive.

b) Avoidance of loss of curlew habitat (including from forestry, land reclamation, etc.)

When Curlew locations are known, structures and procedures should be in place for authorities responsible for licensing developments including those relating to forestry, agriculture, planning (renewables, housing, etc.), wetland management, etc., to ensure Curlew breeding and feeding locations are considered carefully in assessing applications or proceeding with development plans. Land use mapping and strategic planning are central in this regard, given various objectives in Government programmes e.g. for climate, biodiversity, agriculture, forestry, etc. There needs to be realistic alternatives to afforestation, most notably in the form of a financially attractive, long-lasting agri-environment measures. There is a strong need for a coherent policy in Curlew areas as it relates to farming supports and afforestation, and to avoid conflicting (relative to Curlew) financial supports. Forestry earmarked for felling should be considered not to be replanted, or a similar area planted elsewhere away from curlew areas.

c) Development, financing, targeting and adaptability of proactive measures through bespoke management schemes

Development of proactive measures is of course key to turning things around and stemming the decline of Curlew populations. Proactive measures should be developed by specialist ecologists, with input from agriculturalists in the case of agri-environmental schemes (AES). Shared-learning and experiences across regions and countries should be encouraged and facilitated.

Targeting of action can be best decided on when Curlew locations are known. Prioritisation of key areas to effect action may need to be decided upon, depending on available budgets but it should not be a case of prioritising only the largest populations; range is equally important and outlying breeding populations have intrinsic value in their own right and to local heritage, communities and individuals.

In the farmed landscape, agri-environmental schemes are central to engaging landowners and land managers to proactively support Curlew and Curlew habitats. Ideally a pilot phase should be enacted before wider roll-out to national level but this is not always possible, particularly given the precarious position of many range member states. It is important to have a palette of options, rather than a generic approach, so that more landowners will be attracted to partake. For example, not all landowners with breeding Curlew will be farming, so agri-environmental schemes should be available for such landowners wishing to contribute. Similarly, simple advisory support for philanthropic farmers (that don't want the red tape of schemes) may reap rewards in certain cases, while more tailored annual or multi-annual agreements will be required with others. While it is important to have structure and rigidity in any scheme, particularly national schemes, there should also be space for accommodating important lands into agreements, which came to light after the close of applications for larger national schemes. Advisors and land managers/farmers should be trained about how to best manage for Curlew. Specialist and dedicated Curlew/breeding wader advisors would be preferable to general agri-environmental advisors, but general agri-environmental planners should be given appropriate training and involvement. There is merit in establishing specific Curlew Discussion Groups for particular areas which are critical for Curlew, whereby knowledge exchange between land managers and ecologists should be supported and encouraged. Demonstration sites and open days

are worth investing time and money in to show best practice on various aspects of conservation action.

One common complaint in relation to AES measures to date, from both environmental and farming perspectives has been that the prescriptive/top-down approach can be too rigid or not appropriate to all locations at all times. The Irish Government's Curlew Conservation Programme model of having locally-based Curlew Action Teams (CATs) has proven to be a useful structure that can be readily replicated elsewhere to make agri-environmental schemes more relevant and results focussed. This approach is locally-led, flexible and adaptable so that the issues and priorities in any given area are appropriately dealt with. Above all, given it is imbedded in the local community, it engenders greater local buy-in and instils a sense of local ownership and pride, rather than national programmes which are often seen as developed by those with no links to the local area. This is key to achieving results and cannot be overestimated in its importance. The multifaceted nature of the issues being targeted requires the establishment of a multi-disciplinary team. The teams in Ireland generally consist of a Curlew Advisory Officer (local lead role, ecological input, surveys, advising on measures required on a field-by-field basis), a Nest Protection Officer (legal and ethical control of predators including lethal methods, translocation and nest protection fences) and a Curlew Champion (to champion the cause of the Curlew with landowners and among the local community and to build relationships and trust with the locals and the project and in turn to listen to landowners and feedback their observations and opinions to administrators). Other options on a locally-based Curlew Action Team could include an administrative officer for processing payments/office work relating to the CAT and/or an assistant for various field tasks. By and large the skillsets (including interpersonal skills) needed for each of these roles can be found in the local region, which further serves to strengthen the links to the community and buy-in from relevant stakeholders.

There needs to improved oversight, including inbuilt flexibility and adaptability, of how schemes operate for Curlew, and to prevent any unintended consequences. Contradictions between other existing RDP measures and Curlew requirements must be avoided -this would be best achieved by local Curlew Advisory Officers knowing where Curlew are active. Synergies with other RDP/Agri-Environmental Scheme measures would be important. There should be scope for additionally on other existing RDP measures in Curlew areas if required. This will require simplification and flexibility in agrienvironmental schemes/RDP measures. A criticism of GLAS has been the incompatibility of participation rules for those in the Organic Farming Scheme, which in the case of Curlew would greatly benefit the species. In a similar vein, there should be 'joined-up thinking' on the issue of land eligibility for Basic Payment Scheme, whereby farmers are not channelled towards clearing Curlew habitat, which might in certain circumstances be considered poorly productive from an agricultural point of view. This also speaks to the matter of afforestation in Curlew areas, where farmers and eNGOs have provided examples of where on one hand the Department of Agriculture are offering/providing grants through GLAS to support Curlew habitat in particular areas, but at the same time have offered/provided grants to plant land in the same area. If this happens and if Curlew are lost from the area, it would undermine the investment in safeguarding habitat and also risk the local farmers' priority ranking for targeted agri-environmental schemes.

Measures should support Curlew but should not be dissuasive for landowners/farmers. For example a restriction on fertilisers during the breeding season across all land parcels entered into an AES for

Curlew could dissuade farmers from entering any land at all. The presence of a local Curlew Advisory Officer could determine precisely when and where such restrictions would be required, rather than in all land entered into the measure. Curlew champions could encourage and support farmers to work proactively for Curlew, whether through schemes or simple cost-neutral measures.

Longer-lasting AES would secure longer-term management and security of important breeding and feeding areas, with greater financial security for farmers too. It may also attract more farmers to take up environmentally friendly measures for Curlew. Participation should be reviewed every five years according to where Curlew remain active, in order to make the most of resources, bearing in mind that Curlew are largely site faithful. While ideally planning of AES should extend beyond 5 to 7 years in the interest of curlew conservation and also of farmers, there are practical difficulties with the RDP operating period and budgeting beyond 5/7 years. The case for longer-term schemes has been made from various quarters and it is due to be considered in the context of the next CAP. Consistency of management measures and actions within AES can still be achieved across AES and the consultation process for the next CAP will include discussion on curlew action. It is vital that this important aspect is considered, given one of the main challenges to maintaining extensive farming that supports threatened species like Curlew are the 15-year grants and premia offered for converting to forestry.

d) Implementation of habitat measures (including the adoption of sensitive farming and non-productive investments)

The 'Goldilocks' analogy of habitat being too hot (intensive) or too cold (extensive/abandoned) is appropriate to the Curlew. Fundamentally, action taken should be about results and habitat that is 'just right' should be envisioned and agreed upon and appropriate action taken from there to deliver that habitat. In terms of AES, the RBAPS/Results-based Agri-environmental Payment Scheme project (<u>www.rbaps.eu</u>) showed how results-based payments for farmers undertaking agri-environmental measures for breeding waders in Ireland can work successfully and are appreciated by farmers as a fair model for payment. The ideal habitat scenario was envisioned and the closer the farmer got to delivering that habitat, the higher the payment s/he received for doing so. How the farmer achieves that is often best determined by the farmer themselves. Score sheets have been developed for breeding waders to assign a quality score to the condition of habitats found on the farm and with some tweaks can be designed specifically to Curlew habitat requirements in particular landscapes. While habitat availability and structure are obvious considerations in scorecards or payments to land managers, the quality of soil structure and health and biomass/invertebrate availability needs to be a central consideration. Agri-environmental schemes should consider enhanced payments for landowners who wish to undertake organic methods in their efforts towards managing for Curlew.

In terms of prescriptive or mandatory actions, damaging activities such as mowing nesting sites or grazing at unsustainable levels or use of pesticides that impact on Curlew should be factored into results-based payments as appropriate (i.e. resulting in decreased or no payment). As mentioned earlier, these need not apply to all fields that a farmer is managing, rather those that the Curlew requires.

For example, cutting silage fields in areas close to Curlew nests is a potential threat to Curlew as are associated field operations after cutting (e.g. transport of silage in trailers or bales) as young chicks are often led into recently cut silage fields in upland nesting areas (indeed Curlew can also nest within silage fields). Some of these issues can be addressed by having full time advisor working on the ground,

keeping in touch with local farmers about whereabouts of nests and chicks. Field operations can then be delayed (often a few days can make all the difference) if chicks present. A similar situation exists for rush cutting or heather flailing or burning. If a Curlew is breeding in a particular area, a local advisory officer would be able to liaise with the farmer and apply flexibility in relation to mowing dates, etc.

Non-Productive Investments or capital works should be incorporated into direct action for Curlew where required. Efforts might include predator proof fences, scrub clearance, removal of perches for avian predators, liming and aeration of soils to enhance invertebrate numbers, scrape creation, drain blocking, drain unblocking, management of water levels and much more, all depending on the site specific requirements (again referring to the need for locally-based advisors with flexibility to adapt to what is needed and what can be made work on a case by case basis). Non-productive investments or capital works can have immediate impacts and can often be long lasting and should be a mainstay of any Government supported initiatives for Curlew conservation.

Prescription-based or results-based farm plans or a hybrid?

The main approach adopted for AES in Ireland and abroad to date has been a prescriptive one. While intuitively farm plans under REPS, AEOS, GLAS or NPWS should have contributed positively for biodiversity, it is difficult to make direct links between these interventions and the conservation status of habitats or species either locally or nationally. Indeed at a glance, one might say that despite serious investment in AES over successive CAPs, biodiversity has continued to decline in Ireland and the EU. In a special report from the EU Commission, determining precisely the return for money invested in agri-environmental schemes across Europe has been an issue and it is clear that closely evaluation of impacts as they relate to input is needed (EU Commission, 2011) and that results-based payments offer a new approach in regard to achieving results and measuring impact (Maher et al., 2015). It should be the intention of any AES in future, to have a clear results-based focus, whereby achievements or deliverables can be measured and reported.

Results-based payment schemes are becoming more developed and may become more common in the next Common Agricultural Policy and Ireland's RDP post 2020. The RBAPS piloted in Ireland (<u>www.rbaps.eu</u>) had a focus on breeding waders as well as other interests. A scorecard was developed during this project for breeding wader habitat quality, building on a previous iteration developed as part of the NPWS Farm Plan Scheme. The scorecard may need to be adapted for the specific and nuanced habitat requirements of Curlew (as opposed to breeding waders as a group), but this should require relatively little effort. It would be important also to incorporate some consideration of food availability/soil quality/organic matter. Effectively, if this approach were to be rolled out, farmers that produce better quality habitat for Curlew would receive higher payments, and vice versa. It would be important of course to provide farmers with the funds and advice to improve their scores and payments, via capital works.

Finally, and regardless of the types of farm plan being delivered or the delivery mechanism, we need to learn from the experiences of others to ensure better prospects for such interventions into the future (Ó h<u>U</u>allacháin & Finn, 2011).

e) Effective nest protection

In many areas, given a fragmented landscape and an unbalanced meso-predator population (e.g. crows, foxes, mink), there may be little point in putting all resources into providing the best habitat for Curlew, if predator control and/or nest protection are not fully considered and supported. The same fox will find the same eggs or chicks, with the same result. It is generally accepted that the crisis in Curlew populations stems from problems in rearing the requisite number of chicks to maintain a stable population. Research has shown that properly designed and implemented predator control, operated on a landscape scale and focussed in the media breeding territories can pay great dividends. In many areas, proper and open discussion will be required in relation to predator control, which presents sensitivities that must be considered respected. Mobile, temporary nest protection fences have been trialled with successful results in Ireland and in Germany and would be worth considering as part of a suite of measures aimed at protection Curlew breeding attempts. Larger, more expensive nest protection fences should be considered for dedicated areas where there is a good chance of maintaining or growing a population. Predator control on islands (including on lakes) can in many cases reap rewards for Curlew given mammalian predators will not 'refill' these islands as readily as they might in mainland situations. Peninsulas are also suitable locations for erecting permanent predator proof fences, given they effectively make 'islands' of the peninsula by cutting off land access to mammalian predators. It should be noted that predator control undertaken for Curlew will also pay dividends for other vulnerable nesting species sharing the same area.

f) Landscape scale approach (including farmer clusters and collaborative working)

A landscape scale approach is required for enacting meaningful conservation effort for many birds and Curlew is one of the birds that requires this approach, often ranging across multiple landowners with a selection of complex habitat requirements. Collaboration in the form of farmer clusters, with transaction costs covered, can all be delivered to achieve greater joined-up thinking on the landscape as the Curlew sees (and requires) it. This is also true for predator control effort, given there may be little return from controlling foxes on one farm if they are denning and roaming across other farms.

There is also a need to think about engaging with land owners/farmers outside of schemes. Many farmers could do straightforward, yet great work for curlew while not in any scheme and a simple guide on avoiding disturbance to or tips on helping Curlew in the field would be worth promoting. This can be done by local teams/discussion groups/literature/web platforms/media, etc.

While a serious issue, AES measures should not focus *solely* on farming methods. Non-Productive Investments (capital works) and nest protection (including predator control) need to be fully integrated into any programme for Curlew conservation. This requires skills and financing, whether for locating, designing and implementing capital works such as scrapes or scrub clearance or rush control, or whether for achieving effective predator control to the point that fledging success increases.

g) Consideration of wider positive benefits to biodiversity/landscape of adopting these approaches

Measures undertaken for Curlew should not be undertaken blindly. While often mutually beneficial, works for Curlew, including scrape creation, scrub clearance, tree removal, water level management,

fencing and so on all have the potential to interfere with the ecological functioning of other habitats or species. Time spent in designing and targeting should avoid conflicts at the time of implementation/post-action. In relation to Natura sites or annexed species, Appropriate Assessment and Natura Impact Statements will need to be considered.

h) Consolidate and utilise data and experience available from various sources including the CCP, EIP, BnM, Gun Clubs, local projects, etc.

Other efforts under Rural Development Programmes

There is scope for the funding of further research on Curlew ecology and this should be supported to inform better use of finance for more effective application of measures and realization of results.

The Curlew is a high profile species and a much loved bird. It is important to maintain this close relationship between local people and the Curlew. Awareness raising, support of and engagement with community and volunteer groups and schools should also be encouraged and facilitated. Local grant aid of environmental projects could feature a prioritisation for Curlew in specific areas.

There may be opportunities to engage on wider issues such as climate change and flood alleviation through sustainable upland management that could use the Curlew as a flagship species. These are likely to need to be large-scale projects (e.g. LIFE, EIP-Agri, etc.) but may be able to gain national support if re-wetting upland Curlew sites could be used to help stop flooding downstream in catchments, or if maintaining upland carbon-rich soils could be used to offset carbon emissions elsewhere. Essentially, there is a need for wider thinking to get a broader church of support for actions to benefit Curlew.

Ireland's Prioritised Action Framework²⁴ shall be used to determine priorities for trialling and delivering measures for applied conservation management.

Finally, options for deriving funding for agri-environmental measures outside of the Rural Development Programme should not be forgotten. Chapter 7, which deals with Curlew and People, outlines some currently existing avenues for funding and there may be more to come in future. It is important to have a long-term vision and commitment that does not simply stop at the current Rural Development Programme. It should also be considered that there will be landowners hosting Curlew that are not farmers, but equally in a position to help these birds if supported properly.

²⁴ https://www.npws.ie/sites/default/files/general/PAF-IE-2014.pdf

Chapter 3. Forestry



Forestry and Curlew – some background

One of the most significant and substantial changes on the landscape that Curlew would have once thrived in, has been afforestation of moorland and farmland. While more than 300,000ha of peatland have been planted in Ireland, this is for the most part, a thing of the past. However, publications relating to 'Land Availability for Afforestation' (COFORD land availability working group, 2016²⁵) and 'Land Types for Afforestation' (Forest Service, 2016²⁶) specifically earmark and target the types of grassland habitat required by Curlew (and other species of conservation concern) for afforestation. Ireland has ambitious targets to increase the area of forestry to cover 17% of the Irish Republic by 2030. The '20% rule' that limits the area of unenclosed land that can be planted has for some time been under scrutiny, but remains in place at the time of writing, with the Department of Agriculture, Food & the Marine considering another approach to a requirement to have a ratio of 4 units of enclosed land planted for every 1 unit of unenclosed land. An 'audit' of Curlew territories was undertaken by NPWS in 2017 and this found that a number of individual territories could have habitat replaced by forestry, if adequate safeguards are not put in place.

Curlew declines in Britain and Ireland have been frequently associated with direct and indirect effects of afforestation (Avery, 1989²⁷; Walsh et al, 2000²⁸; Ratcliffe, 2007²⁹; Douglas et al., 2014³⁰; Ainsworth et al., 2016³¹). Apart from the direct deletion of habitat by afforestation, resulting fragmentation of Curlew breeding habitat is also likely to have significantly reduced numbers as the remaining pairs occupy smaller areas and occur in lesser numbers, becoming more vulnerable to predators. Conifer plantations provide refuge for meso-predators, resulting in increased risk of predation for ground

²⁵ COFORD Land Availability Working Group (2016). *Land Availability for Afforestation - Exploring opportunities for expanding Ireland's forest resource*. COFORD, Dublin.

 ²⁶ Forest Service (2016). Land Types for Afforestation. Department of Agriculture, Food & the Marine, Wexford.
 ²⁷ Avery, M.I. (1989). Effects of upland afforestation on some birds of the adjacent moorlands. Journal of Applied Ecology 26(3), 957-966.

²⁸ Walsh, P.M., O'Halloran, J., Kelly, T.C. & Giller, P.S. (2000). Assessing and optimising the influence of plantation forestry on bird diversity in Ireland. Irish Forestry.

²⁹Ratcliffe, D. (2007) *Galloway and the Borders*. Collins, London.

³⁰ Douglas, D.J.T., Bellamy, P.E., Stephen, L.S., Pearce-Higgins, J.W., Wilson, J.D., Grant, M.C. (2014). Upland land use predicts population decline in a globally near-threatened wader *Journal of Applied Ecology* 51, 194-203.

³¹ Ainsworth, G., Calladine, J., Martay, B., Park, K., Redpath, S., Wernham, C., Wilson, M. and Young, J. (2016). *Understanding Predation*. Moorland Forum, Edinburgh.
nesting birds (Petty, 1985³²; Ratcliffe and Petty, 1986³³; Stroud et al., 1987³⁴; Chadwick et al., 1997³⁵; Grant et al., 1999³⁶; Smedshaug et al., 2002³⁷; Carey et al., 2007³⁸; Amar et al., 2011³⁹; O'Donoghue et al., 2011⁴⁰; Douglas et al., 2013⁴¹ and 2014; Wilson et al., 2013⁴²). Edge effect is a contributory factor in predation (Gates and Mosher, 1981⁴³; Lynch and Whigham, 1984⁴⁴; Helle; 1985⁴⁵; Harris, 1988⁴⁶; Yahner, 1989⁴⁷; Andren, 1992⁴⁸; Rodriguez et al., 2001⁴⁹; Manolis et al., 2002⁵⁰; Reino et al.et al.2010⁵¹; Calladine et al., 2014⁵²) and in effecting behavioural avoidance, dissuading species from nesting near forestry (Stroud et al., 1990⁵³; Douglas et al., 2014). Avery (1989) found nest predation rates to

³⁵ Chadwick, A.H., Hodge, S.J. and Ratcliffe, P.R. (1997). *Foxes and Forestry*. Forestry Commission, Edinburgh.

³⁷ Smedshaug, C.A., Lund, S.E., Brekke, A., Sonerud, G.A. and Rafoss, T. (2002). The importance of the farmland-forest edge for area use of breeding Hooded Crows as revealed by radio telemetry. Ornis Fennica 79, 1-13.

³² Petty, S.J. (1985). Counts of some breeding birds in two recently afforested areas of Kintyre. Scottish Birds 13, 258-262.

³³Ratcliffe, P.R. and Petty, S.J. (1986) *The management of commercial forests for wildlife. In: Trees and Wildlife in the Scottish Uplands* (ed. D. Jenkins), pp. 177-187. ITE, Banchory.

³⁴ Stroud, D.A., Reed, T.M., Pienkowski, M.W. and Lindsay, R.A. (1987) Birds, Bogs and Forestry. The Peatlands of Caithness and Sutherland. Nature Conservancy Council, Peterborough, UK.

³⁶ Grant, M.C., Orsman, C., Easton, J., Lodge, C., Smith, M., Thompson, G., Rodwell, S. & Moore, N. 1999. Breeding success and causes of breeding failure of Curlew *Numenius arquata* in Northern Ireland. *Journal of Applied Ecology* 36, 59–74.

³⁸ Carey, M., Hamilton, G., Poole, A. and Lawton, C. (2007). The Irish Squirrel Survey 2007. COFORD, Dublin. ³⁹ Amar, A., Grant, M. Buchanana, G. Sim, I., Wilson, J., Pearse-Higgins, J.W. & Redpath, S. (2011). Exploring the relationships between wader declines and current land-use in the British uplands. *Bird Study* 58, 13-26.

⁴⁰ O'Donoghue, B.G., O'Donoghue, T.A. and King, F. (2011). The Hen Harrier in Ireland: Conservation issues for the 21st Century. Biology and Environment: Proceedings of the Royal Irish Academy. 111(B), 83-93.

⁴¹ Douglas, D.J.T., Bellamy, P.E., Stpehen, L.S., Pearse-Higgins, J.W., Wilson, J.D. & Grant, M. (2013). Upland land use predicts population decline in a globally near-threatened wader. Journal of Applied Ecology. DOI: 10.1111/1365-2664.12167.

 ⁴² Wilson, J.D., Anderson, R., Bailey, S., Chetcuti, J., Cowie, N.R., Hancock, M.H., Quine, C., Russell, N., Stephen, L. and Thompson, D.B.A. (2013). Modelling edge effects of mature forest plantations on peatland waders informs landscape-scale conservation. Journal of Applied Ecology.

⁴³ Gates, J.E. and Mosher, J.A. (1981) A functional approach for estimating habitat edge width for birds. Amer. Mid. Nat. 105, 189-192.

⁴⁴ Lynch, J.F. and Whigham, D.F. (1984) Effects of forest fragmentation on breeding bird communities in Maryland, USA. Biol. Conserv. 28, 287-324.

 ⁴⁵ Helle, P. (1985) Effects of forest fragmentation on bird densities in northern boreal forests. Ornis Fenn. 62, 35-41.

⁴⁶ Harris, L.D. (1988). Edge effects and the conservation of biotic diversity. Conservation Biology 2, 330-332.

⁴⁷ Yahner, R.H. (1988) Changes in wildlife communities near edges. Conserv. Biol. 2, 333-339.

⁴⁸ Andren, H. (1992). Corvid density and nest predation m relation to forest fragmentation a landscape perspective. Ecology 73, 794-804

⁴⁹ Rodriguez, A., Andren, H. and Jansson, G. (2001). Habitat-mediated predation risk and decision making of small birds at forest edges. Oikos 95, 383-396.

⁵⁰ Manolis, J.C., Andersen, D.E. and Cuthbert, F.J. (2002). Edge effect on nesting success of ground nesting birds near regenerating clearcuts in a forest dominated landscape. Auk 119, 955-970.

⁵¹ Reino, L., Porto, M., Morgado, R., Carvalho, F., Mira, A. and Beja, P. (2010). Does afforestation increase bird nest predation risk in surrounding farmland? Forest Ecology and Management 260, 1359–1366.

⁵² Calladine, J., Dott, H., Douglas, D. and Garner, G. (2014). *Monitoring of moorland fringe biodiversity: the bird communities of the interface between conifer plantations and moorland in the Galloway Forest Park and their relationshops with moorland fringe habitats.* Scottish Natural Heritage Commissioned Report No. 456.

⁵³ Stroud, D.A., Reed, T. M. and Harding, N.J. (1990). Do moorland breeding waders avoid plantation edges? Bird Study 37(3), 177-186.

increase closer to forestry. Valkama et al.et al.(1999⁵⁴) found a 20% hatching rate for Curlew with nests in a landscape where random points were on average 180m from forestry, but a 91% hatching rate for Curlew with nests in a landscape where random points were on average 600m from forestry. In that study of a fragmented farmland landscape containing woodland, the abundance of foxes and crows was 2–3 times higher, and Curlew nest predation rates four times higher, than that in a continuous farmland landscape without woodland.

In a study area comprised of forestry, upland grassland, heathland and blanket bog, Amar et al.et al.(2011) found 85-95% decline of breeding waders where there was 50% forest cover within 1km of survey plots, whereas an absence of forest cover was associated with population stability. Beyond the hatching stage, Douglas et al.et al.(2014) determined population changes and fledging success were negatively associated with forestry cover within 1km of edge of study plots.

Douglas et al.et al.(2014) recommended not only siting new afforestation away from important bird breeding areas, but furthermore, the removal or redistribution of existing forestry away from important breeding bird areas. In one landscape in northern Scotland, the Forestry Commission and the RSPB have been removing commercial conifer plantations for blanket bog restoration, also to the benefit of breeding waders.

The ranging behaviour of Curlew is something that is only recently being explored, with GPS tracking projects in Britain showing birds may travel to different extents, depending possibly on the quality of the habitat surrounding the nest or even characteristics of the individual birds. A number of adult birds tracked so far, have been found to travel between 3km and 15 km from their brood in search of food (BTO unpubl. data; GWCT unpubl. data).

Large commercial conifer plantations can also have an effect on the hydrology of surrounding habitat, often degrading adjacent areas of peatland (Renou-Wislon et al., 2011⁵⁵).

It is important that lands of conservation importance to vulnerable or threatened species are not lost to forestry if forestry will result in the displacement or loss of those birds from the land or hinterland. The State has an obligation to ensure that such results are not grant aided with public money. The Forest Service of the Department of Agriculture, Food & the Marine, have incorporated locations where Curlew have been recorded during the breeding season, into the Integrated Forest information System (IFORIS). This is updated annually, to incorporate new information. This is to inform inspectors that Curlew may be nesting on site, so they can take this rare and sensitive species into account when assessing applications to plant or fell trees within 1km of existing sites or 250m of 'historical' sites.

The following interim procedures are in operation by the Forest Service until the Curlew Task Force discussions are completed.

Interim procedure regarding CURRENT NESTING SITES (06 June 2017):

⁵⁴ Valkama, J., Currie, D. and Korpimaki, I. (1999). Differences in the intensity of nest predation in the curlew Numenius arquata: a consequence of land use and predator densities? Ecoscience, 6, 497–504.

⁵⁵ Renou-Wilson, F., Bolger, T., Bullock, C., Convery, F., Curry, J., Ward, S., Wilson, D. and Muller, C. 2011. *BOGLAND: Sustainable Management of Peatlands in Ireland*. Environmental Protection Agency. Wexford, Ireland.

If an afforestation application intersects with a 1 km radius buffer of a current Curlew nesting site, DAFM will require the engagement of a suitably qualified and experienced ornithologist by the applicant. Technical approval will only follow where the ornithologist is satisfied that the overall afforestation proposal (with mitigation measures, if required) is compatible with the conservation of the species.

If this scenario arises, utilise the template specifications set out below, for the 'Further Information Required' certification. There is no requirement for referral to the Forest Service Ecologist at this stage.

Specifications for 'Further Information Required' letter, for <u>CURRENT</u> CURLEW NESTING SITES

This afforestation application [INSERT CN] is within 1 km of a current Curlew Nesting Site. Therefore, to inform its continued evaluation of the application, the Forest Service requires the engagement (by the applicant) of a suitably qualified and experienced ornithologist with relevant knowledge of Curlew, to undertake the following:

- To review background information on the status of breeding Curlew in the locality of the application site.
- To undertake a walkover habitat survey and to map the habitats of the application site, based on A Guide to Habitats in Ireland by J.A Fossitt (2000), with links made to habitats listed under Annex I of the EU Habitats Directive, where appropriate.
- To carry out an assessment of the suitability of habitats on the site (within the context of the surrounding area) for breeding and foraging Curlew.
- To assess the potential impacts arising from the proposed afforestation in relation to breeding and foraging Curlew, with reference to the potential loss of nesting and foraging habitat, habitat fragmentation, disturbance and predation, <u>and</u> the identification of mitigation measures to avoid such impacts.

The ornithologist will prepare a report for submission to the Forest Service documenting the above and including a declaration regarding whether or not the overall afforestation proposal (with mitigation measures, if required and as detailed in the report) is compatible with the conservation of the species. This report will also list the qualifications and relevant experience of the ornithologist.

Any ornithologist engaged by the applicant to undertake the above work may contact the Forest Service for further details.

<u>Please note</u>:

- In all cases, refer any submitted ornithologist report to the Forest Service Ecologist, for comment.
- The above only applies to Curlew, and other silvicultural and environmental considerations also may apply.
- The above is an interim procedure only, pending the outcome of the Curlew Task Force, which the Forest Service is actively engaged with.

Interim procedure regarding FORMER NESTING SITES (06 June 2017):

If an afforestation application intersects with a 250 m(*) radius buffer of a former Curlew nesting site, the DAFM will require the engagement of a suitably qualified and experienced ornithologist by the applicant. The ornithologist will make recommendations regarding the appropriateness or otherwise of the overall afforestation proposal and any necessary measures to protect potential breeding and foraging habitat for possible use in the future by Curlew.

(* Some Former Nesting Sites have been afforded a 350 m radius buffer, due to a lesser degree of accuracy regarding the point data supplied to the Forest Service.)

If this scenario arises, utilise the template specifications set out below, for the 'Further Information Required' certification. There is no requirement for referral to the Forest Service Ecologist at this stage.

In addition, if notified by NPWS of breeding activity, the nesting site will be promoted to the current nesting site dataset and assigned the 1 km radius buffer, and the procedure for current nesting sites will apply – see above.

Specifications for 'Further Information Required' letter, for <u>FORMER</u> CURLEW NESTING SITES

This afforestation application [INSERT CN] is within 250 m of a former Curlew nesting site. Therefore, to inform its continued evaluation of the application, the Forest Service requires the engagement (by the applicant) of a suitably qualified and experienced ornithologist with relevant knowledge of Curlew, to undertake the following:

- To review background information on the status of breeding Curlew in the locality of the application site.
- To undertake a walkover habitat survey and to map the habitats of the application site, based on A Guide to Habitats in Ireland by J.A Fossitt (2000), with links made to habitats listed under Annex I of the EU Habitats Directive, where appropriate.
- To carry out an assessment of the suitability of habitats on the site (within the context of the surrounding area) for breeding and foraging Curlew.
- To assess the appropriateness or otherwise of the overall afforestation proposal and to identify any necessary measures to protect potential breeding and foraging habitat for possible future use by Curlew.

The ornithologist will prepare a report for submission to the Forest Service documenting the above and setting out recommendations regarding the appropriateness or otherwise of the overall afforestation proposal, and detailing any necessary measures to protect potential breeding and foraging habitat for possible future use by Curlew. This report will also list the qualifications and relevant experience of the ornithologist.

Any ornithologist engaged by the applicant to undertake the above work may contact the Forest Service for further details.

<u>Please note</u>:

- In all cases, refer any submitted ornithologist report to the Forest Service Ecologist, for comment.
- The above only applies to Curlew, and other silvicultural and environmental considerations also may apply.

The above is an interim procedure only, pending the outcome of the Curlew Task Force, which the Forest Service is actively engaged with.

Interim Curlew & felling procedure (06 June 2017):

The following relates to felling licence applications for sites / portions of sites overlapping a Curlew breeding territory buffer (both current and former).

Where overlap occurs, please add (*via* cut-and-paste) the following text (as indicated by *bold& italic* font) as a condition of the licence, if issued.

CONDITION FOR CLEARFELLS:

"The proposed clearfell is situated within an area important for breeding Curlew. In general, the clearfell operation must take place <u>outside</u> of the Curlew breeding season 17 March – 17 July inclusive, in order to avoid potential disturbance to breeding birds. However, clearfelling can proceed within this period if a buffer of existing forest that is 30 m or greater in width and located between the clearfell area and adjoining non-forest land, is retained during this period, to screen potential disturbance. Also, the forest should not be accessed using unpaved ground across non-forest land (including fields and bogs) during the above breeding season, as this may lead to disturbance / nest destruction."

CONDITION FOR THINNINGS:

"The proposed thinning is situated within an area important for breeding Curlew. There is no related restriction on thinning activity during the Curlew breeding season 17 March - 17 July inclusive. However, the forest should not be accessed using unpaved ground across non-forest land (including fields and bogs) during the above breeding season, as this may lead to disturbance / nest destruction."

(Note, in relation to clearfelling and Curlew, there are, in general, no specific restrictions regarding reforestation.)

Further developments will need to be made on afforestation and felling procedures to ensure Curlew breeding sites are safeguarded by adequate buffer zones, which can be updated in real-time, with alternative accommodations for applications that are refused. To do so will require a full incorporation of the scientific facts and ecological requirements and consultation between various stakeholders including Forest Service, NPWS, researchers, foresters and BirdWatch Ireland. It is imperative that public money is not invested in removing habitat required by Curlew, leading to further territory fragmentation or displacement/loss of Curlew.

Recommendation 3.1 Safeguard Curlew breeding and feeding sites from inappropriate forestry planting by enhancing procedures for the proper consideration and approval of new plantings and related activities, specifically including:

- Review of existing guidance to take account of the above
- Increase the screening zone around Curlew areas to provide greater certainty of avoidance of impact on Curlew

- Build in site specificity with regard to e.g. wider hydrological impacts, cumulative impacts with other plantings, landscape, aspect etc.
- Ensure all planting applications are reviewed by ornithologists with Curlew expertise and knowledge
- Inclusion within guidance a consideration of historical curlew sites to ensure the potential for recolonisation through conservation effort is not lost

Coíllte Forest Estate and Curlew Conservation

Coíllte own and manage approximately 440,000 hectares of forest land equivalent to about 7% of the total land area of Ireland. Much of this land is forested but there are also significant areas of open moorland and wetland on the Coíllte estate.

Coíllte's main business is commercial forestry, which involves growing and managing trees to commercial maturity before felling and replanting these trees again. Coíllte planted over 19 million trees in 2018 and almost of all of this was reforestation to replace trees that had been harvested. Coíllte at present, do very little afforestation i.e. planting of trees for the first time on a given site.

The large areas of open lands that Coíllte own are largely managed for nature conservation and biodiversity management. Coíllte have actively restored large areas of both blanket bog and raised bog habitats in partnership with the LIFE Nature unit of the European Commission and the National Parks and Wildlife Service over a number of successful habitat restoration projects. These sites and those with similar potential could make ideal curlew breeding grounds.

Coíllte have welcomed the formation and outputs of the curlew task force and are hopeful that forestry can play a positive and significant role in future Curlew conservation in Ireland. Coíllte would welcome greater collaboration between the agencies and groups involved, for example the sharing of nest location information which could assist in targeting future areas for habitat restoration.

Recommendation 3.2 Audit and identification of key opportunities for deforestation and habitat restoration on previously afforested areas for Curlew and wider benefits

MEDIUM & LONG-TERM CONSIDERATIONS

Issues that have been raised through Task Force discussions which are placed within the medium and long term for attention, through a future forum of engagement, include;

<u>A national afforestation plan</u> – spatial planning which takes into account the most effective and sensitive siting of forestry into the future, not least including the concerns of open ground habitats and wildlife, including Curlew. Noting the need to avoid compromising the ability to restore populations of key species.

<u>Development of viable marginal farming options</u> - Providing viable options for landowners to continue farming and managing the environment in marginal uplands and similar areas where the push has in recent years and continues to be towards forestry. This may be through the wider applicability of High

Nature Value Farmland management and attendant development of funding supports. In effect developing a strategy to promote Curlew management so that farmers are not disenfranchised.

<u>Identification of strategic restoration of open ground on planted areas</u> - consideration of forestry earmarked for logging in next, say, 10 years in being not replanted or re-planted with a different shape. This could be tied into restoration plans for Curlew populations in key areas?

Longer term, the inclusion of consideration of open ground management into forest certification standards would have the potential to see Curlew issues sensitively managed in relation to forests.

Recommendation 3.3 Develop and promote viable options for sympathetic land management supports within Curlew areas where forestry is not desirable

Chapter 4. Bogs



The importance of bogs to Curlew in Ireland

Ireland's peatlands cover 20.6% of the country and occur as raised bog, lowland blanket bog, upland blanket bog and fen (Renou-Wilson et al., 2011⁵⁶). All of these peatlands have been impacted by human activity and today, peatlands of conservation importance cover just 269,267ha in the Republic of Ireland and 27,000ha in Northern Ireland (Malone & O'Connell, 2009⁵⁷). The utilisation of peatlands has led to the loss of 77% of peatland habitats in the Republic of Ireland (Malone & O'Connell, 2009). Turbary and mechanical cutting have resulted in a 47% loss of peatland habitats, representing over half a million hectares of land (Malone & O'Connell, 2009). As well as turf cutting, there are a wide range of uses for peatlands, which are causing serious habitat losses (see figure 4.1) such as: forestry (19% loss), overgrazing (5% loss) and agricultural reclamation (6%).

Breeding Curlew have seen a devastating decline of 96% since the 1980's in Ireland (O'Donoghue & Donaghy, 2018⁵⁸), with loss of important breeding habitat being one of the key factors. Peatlands are an extremely important habitat for breeding Curlew in Ireland. Roughly two-thirds of Curlew in Ireland are believed to breed on bogs. It is therefore important that peatlands where Curlew are known to be nesting are safeguarded to encourage breeding success and that areas of intact peatlands are protected to provide breeding habitat for Curlew in the future.

⁵⁶ Renou-Wilson, F., Bolger, T., Bullock, C., Convery, F., Curry, J., Ward, S., Wilson, D. and Muller, C. 2011. *BOGLAND: Sustainable Management of Peatlands in Ireland.* Environmental Protection Agency. Wexford, Ireland.

⁵⁷ Malone, S. & O'Connell, C. (2009). *Ireland's Pealtand Conservation Action Plan 2020 – Halting the loss of peatland biodiversity*. Irish Peatland Conservation Council, Lullymore, Rathangan, Co. Kildare.

⁵⁸ O'Donoghue, B.G. and Donaghy, (2018). National survey of breeding curlew in the Irish Republic, 2015-2017. Manuscript submitted for publication.



Figure 4.1: Peatland utilisation in the Republic of Ireland. Source: Malone & O'Connell, 2009

Recommendation 4.1 Identify where Curlew are breeding in active turbary areas and design a blueprint for proactive and positive engagement with turf cutters/plot owners

Out of the 1151 peatlands of conservation importance that the Irish Peatlands Conservation Council (IPCC) monitor, 10% were recorded in 2018 to host Curlew activity, whether breeding or non-breeding (see figure 4.2). It is important to identify bogs where turf cutting is operational within Curlew territories as such information will allow the Turf Cutters and Contractors Association (TCCA), NPWS, and other stakeholders to explore safeguarding and positive action on Curlew management with the turf cutters and contractors operating on these peatlands. Items for consideration would include onsite advice as to which plot or plots are sensitive (i.e. where nesting is suspected or confirmed) avoidance, compensation or delaying turf cutting. Some data has been already collected through the Curlew Conservation Programme, other sources of information regarding turf cutting would be the IPCC peatland database, but also remote sensing could be employed, overlapping known Curlew territories with high resolution orthophotographs that would show active turbary areas.

In 2018, there were three examples (two in Kerry, one in Roscommon) of where turf cutting would have jeopardized the safety of Curlew nests monitored by the Curlew Conservation Programme (CCP). The Curlew Action Teams of the CCP and the turf cutters/contractors in question, engaged positively with one another to delay turf cutting on the banks in question, to allow eggs to hatch. In addition, there have been examples of turf cutters/bog owners undertaking positive works for Curlew under the Curlew Conservation Programme, such as tree removal, scrub removal and helping with predator control. As stated, it would be important to have a sensitivity map/risk analysis undertaken for the various bogs where Curlew breed, in order to target surveys and engagement with local turf cutters or contractors in real time.



Figure 4.2. Map of peatland sites where Curlew have been recorded 2018 (source: IPCC).

Once Curlew territories where turf cutting is operational are identified the TCCA will be approached to discuss how Curlew are to be safeguarded in these areas. It is important that turf cutting contractors and turbary owners be made aware of the presence of Curlew on their bogs and the moral and legal requirement for them to not willfully destroy or disturb the protected birds or their nests, eggs or young. Many people have a great affinity with Curlew and if they are made aware that there are Curlew breeding on their land, they may be willing to take steps to help safeguard the birds. Communication and the interpersonal skills of the person communicating the message are vital in that regard. The precarious position of breeding Curlew locally and nationally should be explained and the positive aspects of having Curlew e.g. drawing significant funding to the local area for farmers through agri-environmental schemes should also be outlined and understood. Ideally, there would be a remuneration/turf replacement scheme available to any turf cutter who has to delay cutting or who might not be in a position to cut his/her plot should the turf cutting machine have left the locality before the Curlew have hatched their eggs. Appropriate local liaison, appropriately timed and delivered will be essential in communicating effectively the responsibility and importance of the plot owner or turf cutter helping the Curlew make it through its most vulnerable stage. Real time reaction and decisions will need to be made onsite and it will be impossible to guarantee where Curlew will nest in a particular year. Turf cutters and turbary owners can also contribute very well to habitat enhancement measures, for example by re-contouring drains to reduce the risks of chicks being trapped or drowned, blocking or freeing up drains as appropriate, creating scrapes, removing selfsown conifers, clearing scrub or cutting rushes, etc. etc. There may be scope in some cases for rehabilitating sections of bog that are no longer of interest from a turbary point of view. Any capital works will be site specific, but any complete conservation scheme aimed at protecting Curlew on bogs should contain such efforts in its toolbox.

Landowners should be encouraged to monitor Curlew on their lands, identify nest sites and undertake predator control measures. Training and compensation should be provided for their efforts through the Curlew Conservation Partnership. The Curlew Conservation Programme has already approached landowners in their 6 core areas.

Recommendation 4.2 Bord na Móna to continue to survey and monitor Curlew and propose conservation actions on their estate

BnM Biodiversity Action Plan (BAP)

The BnM BAP outlines objectives, actions and targets for the management of biodiversity on BnMowned lands. The projects listed below are part of the BnM BAP, which has a specific action relating to Curlew - "Develop habitat management measures particularly for Curlew building on the results of the 2015 and 2016 breeding Curlew survey."

BnM Curlew surveys

Specific breeding Curlew surveys have been commissioned by BnM on their property since 2015. The main objective has been to inform BnM or where Curlew are breeding on selected bogs in their care and to provide management advice to help conservation of Curlew on those sites. At least 17 sites have been surveyed, with at least 13 pairs recorded (BnM, 2017⁵⁹). The majority of sites with Curlew are on bogs where BnM have decided to conserve bog habitat and to carry out restoration works through the BnM Raised Bog Restoration Project. The findings of these surveys and the conservation recommendations have been communicated to many different internal and external stakeholders, in a bid to highlight the importance of Curlew conservation. BnM intend to continue to engage with ecologists to survey several selected sites for breeding Curlew in future.

BnM Raised Bog Restoration Project

This is an ongoing project with more than 1200ha of raised high bog restoration completed to date. This project focused on partially drained raised bogs but which were undeveloped (for peat production) raised bogs, which and, therefore, had potential for raised bog restoration. BnM made the decision to conserve these bogs and carry out raised bog restoration. The main objective is to block drains, re-wetting the bog and restoring active raised bog and peat forming plant communities on the project sites. Another 1000ha of drained high bog is targeted for raised bog restoration in the coming years. Some of these sites currently have breeding Curlew. Habitat restoration is one of the key actions to help conserve breeding Curlew.

Engagement with local/community projects

Ballydangan Red Grouse Project is a community-based conservation project that has been established on BnM-owned Ballydangan Bog (part of the Clonboley Bog Complex) since 2010. It developed through engagement between Moore Gun Club and BnM. A large part of the bog is now leased to Moore Gun Club and the project is supported by the employment of several local people through a

⁵⁹ Bord na Móna Ecology Team, 2017. *Bord na Móna Curlew Monitoring Project 2017*. Bord na Móna, Leabeg, Blueball, Tullamore, Co. Offaly.

community employment scheme (Department of Social Protection). BnM continues to support this project. Bog restoration work on this site and on adjoining bogs (Clonboley) was completed in 2016. The ongoing conservation management (including predator control) has proven beneficial for many species including Curlew, with the population stabilized or increasing. As well as the direct onsite action, BnM and the project partners have had an active role in talking to various schools and groups, both on the bog and off it, in relation to the importance of Ballydangan bog, raised bogs in general and the birdlife that survives in some sites, including Curlew and Red Grouse.

The work at Ballydangan provides a template for similar conservation projects. BnM may be in a position to support other community groups to develop other conservation projects at other sites such as Killeglan in Roscommon or Littleton Bog in Tipperary (which was awarded funding from the Department of Culture, Heritage & the Gaeltacht under the Curlew Conservation Partnership).

BnM cutaway bog rehabilitation

BnM are obliged to rehabilitate industrial peat production bogs when peat extraction has ceased. The BnM rehabilitation programme is ongoing and to date, over 12,000ha of peatlands have been rehabilitated. The main objective of rehabilitation is to stabilise the industrial peatland landscape when peat production ceases. Natural colonisation is a key part of rehabilitation, along with targeted active management, allowing the natural development of a range of cutaway habitats including wetlands. Some cutaway peatlands have been rehabilitated and developed for other landuses such as forestry and farmland. Rehabilitation can also be combined with afteruse cutaway peatland development for industrial or other uses.

Land-use after peat production has ceased has not been defined for the majority of active BnM production bogs. The Strategic Land-use Framework is a decision making tool used by BnM to help determine after-use for cutaway. Landuse after peat production ceases will be a combination of different uses to deliver on key objectives of maximising the commercial, environmental and social value of BnM cutaway peatlands. Biodiversity will be a key land-use along with industrial use and amenity.

There have been frequent breeding wader surveys over the years and cutaway can develop into suitable breeding habitat for breeding waders such as Lapwing, Redshank, Snipe, Ringed Plover and Green Sandpiper. These surveys never identified any breeding pairs of Curlew on any of the cutaway sites/former industrial peat production sites. It is likely that emerging cutaway habitats are not suitable or do not appeal to breeding Curlew. Flocks of post-breeding birds and wintering flocks of Curlew use cutaway wetlands periodically.

Cutaway rehabilitation may be beneficial for Curlew at selected sites. For example, 30 ha of cutaway bog adjacent to Lodge Bog was re-wetted in January 2017, creating new wetlands. This habitat, adjacent to a high bog site used by breeding Curlew, is likely to be beneficial to these breeding Curlew.

Recommendation 4.3 Coíllte to undertake survey and monitoring of Curlew on their land and propose conservation actions for Curlew IPCC own and manage a network of peatland nature reserves across Ireland for the conservation of peatland habitats and the wildlife that they support. At present Curlew are breeding on just one of these sites – Lodge Bog Nature Reserve in Co. Kildare. IPCC have been monitoring the Curlew on Lodge Bog since 2005. A study completed in 2012 (Ó Corcora, 2012) found evidence of Curlew breeding on Lodge Bog. The main threat to the birds on the site is believed to be predation.

The actions undertaken to protect and promote Curlew at Lodge bog have included surveys and monitoring, nest protection/predator control, habitat enhancement (like drain blocking, *Sphagnum* restoration and tree removal), farmer engagement, habitat mapping and education. These efforts have received funding from various bodies including the Department of Culture, Heritage & the Gaeltacht, the Heritage Council and Seacology. A video entiteled "Action for Ireland's breeding Curlew" was created in 2018 and events focusing on Curlew for National Curlew Day and Heritage Week have been hosted by the IPCC. There is a page dedicated to Curlew on the IPCC website www.ipcc.ie Lodge Bog is now being used by the IPCC as a demonstration site for Curlew conservation in Co. Kildare.

Since 2017, Kildare BirdWatch has teamed the IPCC in monitoring Curlew on Lodge Bog. This has revealed the possibility of two pairs nesting there. Breeding success remains inconclusive. Predation is still thought to be the main threat to the birds but other threats include agricultural activity on neighbouring lands where Curlew are feeding and livestock entering the bog and disturbing the nests. IPCC will continue to work with Kildare BirdWatch to protect the Curlew on Lodge Bog in the coming years.

Recommendation 4.4 Irish Peatland Conservation Council (IPCC) to continue to survey and monitor Curlew on their land and propose conservation actions for Curlew on their lands

Chapter 5. Predation and nest protection



Curlew -a precarious position and in a predator-rich landscape

Many of the Birds of Conservation Concern in Ireland are ground nesting species (Colhoun & Cummins, 2013⁶⁰). There are many variables driving the conservation crisis for these species, but undoubtedly predation is among the primary causes of concern. This in itself has been exacerbated by land use change including the intensification of agriculture and broad-brush introduction of forestry, resulting a fragmented and edge-rich landscape, with strong populations of meso-predators including Fox, Mink, Pine Marten, Badger, Hooded Crow, Magpie, etc. In the case of breeding waders that will mob potential predators in a colony type response, a decline in the breeding population will see the remaining nests and chicks made increasingly vulnerable to predation.

Naturally, any population that is not rearing an adequate cohort of young individuals to offset mortality, will eventually decline and obviously for those populations that have declined, an increase in the number of young reared will be required if the population is to stabilise or recover. There is an unquestionable need to address unsustainable predation rates in the Irish Curlew population. There are many questions however as to how, when, where and by whom this should be done. This Chapter presents the deliberations of the 'Predation and Nest Protection' discussion group of the Curlew Task Force, which was comprised of various individuals with experience and expertise in this field.

Recommendation 5.1 Design and deliver effective predator control to protect breeding Curlew

What is effective predator control?

Effective predator control can be defined as the systematic removal or deterrence of generalist nest predators during the most vulnerable time for ground-nesting birds, within a defined area, resulting in lower losses to predation. This can include clearing existing predators from immediate site, creating a protection zone around breeding bird and/or reducing background populations of potential predator that will repopulate. Ultimately the results of a predator control programme for Curlew should be judged by the productivity of the local Curlew breeding attempts, while the sustainability of the species in the long-term is the ultimate goal. It may take 5-10 years before the full results of a predator control programme can become apparent, particularly with relatively long-lived species like Curlew, whose population will not increase 'overnight'. There is little point in engaging in predator control for a single season or a limited number of seasons, unless wider landscape issues have been addressed in that time. Predator control programmes need to be dynamic and responsive and predator/prey

⁶⁰ Colhoun, K. and Cummins, S. (2013). Birds of Conservation Concern in Ireland 2014 –2019. Irish Birds 9: 523-544.

relationships need constant and ongoing review and indeed ongoing effort. Undertaking predator control should not be considered the treatment of a root cause of population decline. Habitat restructuring would be required to redress the balance that once existed between Curlew and their predators, which co-existed for thousands of years before the decline of Curlew populations. However, the extent to which that balance has been thwarted, particularly in a highly fragmented landownership as in Ireland, with large areas of agriculture, forestry and scrub, means that this is unlikely to happen in any but a limited number of instances.

How, When, Where, Who

Predator control can be undertaken by a variety of approaches and no single approach should be considered as the only approach or as a default approach. Oftentimes, the 'best' approach will need to be decided on a case-by-case basis, by a competent professional, considering the predators in question and the site specific circumstances (including habitats, topography, location, history, other species of conservation concern locally, etc.). Oftentimes, a combination of approaches will be most appropriate and a plan of action should be outlined as soon as possible, ideally in advance of any predator control effort. Where lethal control is to be employed, there is a range of different equipment that can be legally and safely used, with appropriate expertise and consideration. Risks to non-target animals should always be considered very carefully, particularly in the case of fen traps, snares or poisons (for rats). Lethal control may not be required in many instances and nest protection fences, either permanent or temporary can be employed. Manipulation of habitats such as removing predator refuges like scrub or corvid perches can pay dividends in particular cases. There may be scope to employ deterrents against predators. Ultimately, predator control on the ground will be determined by a predator control officer's 'field craft' and repertoire of skills and experience.

Whatever the methods employed, predator control should always be systematic and time focused. It is imperative that predator control, when undertaken, should always be done in an ethical and professional manner, with all due regard for animal welfare and legislation. Any predator control programme undertaken nationally, regionally or locally should be designed by or in close consultation with professional predator control personnel. On the ground action should be led by professional predator control personnel. On the ground action should be led by professional predator control personnel. This can be augmented and assisted by competent personnel within gun clubs or by competent landowners, but needs to be led by a dedicated predator control officer, responsible for a particular area and a particular brief. Relying solely or primarily on voluntary effort runs a risk of animal welfare issues e.g. traps not checked systematically or regularly or inefficient or unsuitable use of resources.

This is not to diminish the important role that gun clubs can play in redressing the balance in terms of predator loading in Curlew territories, nor the community outreach potential that extends from gun clubs. A single predator control officer can only cover so much ground and assistance will be required in circumstances where large areas, large predator populations or high-risk situations need to be addressed. It is crucial however, that there is at least one lead person with the necessary field and people skills, based locally to coordinate and oversee all predator control effort as part of any specific predator control programme. For any predator control programme, there needs to be an appropriate 'Standard Operating Procedures' (SOPs) manual produced or adopted, which any operative on that programme must understand and subscribe to. Bringing voluntary commitment from gun club

members in line with an appropriately designed SOPs, or providing dedicated training and involvement with relevant personnel and agencies (including local NPWS) can realize more effective use of their time and resources. In time, where resources allow, supplying competent members of local gun clubs with equipment can help promote further input by those gun clubs.

In conservation programmes that employ more than one predator control officer, it is best practice to have a lead predator control officer, who is responsible for overseeing the work of other officers and acting as a primary conduit for communication between project administrators, other curlew workers, researchers and the predator control officers.

Some fundamental requirements for anybody undertaking predator control include:

- Being up to date with all modern methods of predator control
- Possessing a comprehensive knowledge of the predators they have to control and their habits
- Knowing where and when to set traps so that they will have most affect, when to visit traps and how to target specific predators
- Being aware of protected predators in the nesting area and liaise with NPWS as to the best way to deal with them
- Being mindful of the opinions and rights of others and being mindful of the core objectives of their employer

There is a divergence of opinion on the guiding principles in relation to nest protection, when it comes to considering available resources.

Opinion 1: Given the extent of fragmentation of habitat and breeding populations, it is considered that breeding Curlew cannot recover fully in the wider Irish countryside – at least in the short to medium term. Therefore objectives should be aligned to stabilise the population is existing breeding grounds. In a case where resources for predator control are insufficient (considering the fragmented nature of the landscape and the fact that breeding Curlew populations are at a very low density) a triage approach should be given due consideration. In effect, this would mean that resources would be directed into areas with the best chances of securing a population long term and not investing limited resources into other areas where the chances of long term successful are considered low. Triage by budget compression provides better funding for a larger sample of species, and that a larger sample of adequately funded recovery plans should produce better outcomes even if by chance (Gerber 2015⁶¹).

Opinion 2: Given how fragile the Irish breeding Curlew population is, and even more so on a regional and local basis, every pair that is known of deserves to have some element of nest protection. Loss of a single pair of Curlew could mean loss of Curlew from a locality or even an entire county indefinitely. It is vital to try and fledge chicks from the last remaining nests if a population is to remain and grow, for if lost, it will be lost forever. The number of Nest Protection Officers with the appropriate skill sets will have to be increased, and/or multiplication of effort with gun clubs and landowners who are

⁶¹ www.pnas.org/cgi/doi/10.1073/pnas.1525085113

willing and able to engage in a coordinated way. Funding for this could be sought in line with national agri-environmental schemes and it would be worthwhile for the National Parks & Wildlife Service to consider establishing a dedicated Predator Control Unit.

Whatever the approach, it needs to be understood and accepted that the effect of predator control can take a number of years (5-10) before results can be detected in the productivity of the species of concern (Tapper et al.et al.1996⁶²; Fletcher et al.et al.2010⁶³; 2013⁶⁴).

It is vital that predator control officers are briefed on the locations of nesting Curlew, in order to enable the most effective targeting of predator control effort. The Curlew Conservation Programme targets solely the land within 1km of Curlew nests. Predator control officers should ideally be supplied with equipment that will enable their work to be more effective such as:

- Training to an accredited and official standard
- Night vision (ideally thermal imaging equipment, secondary preference infra-red night vision spotters/scope mounts)
- Trail cameras
- Trap equipment
- Appropriate firearms and ammunition
- Maps and GPS Unit
- Standardised recording sheets
- Personal Protective Equipment including camouflage gear

As well as a predator control officer's field skills, his/her interpersonal skills will be of great importance. A predator control officer that goes about their business in a courteous and official manner and who can explain the purpose of their work to the general public and in particular landowners, is more likely to gain access to a sufficient area to enable their work to be effective. In time, relationships will form between well-liked and respected officers and the local landowners and community, to the point that local people can help the officer in his/her work in a wide range of ways. The added benefits of predator control officers operating in rural and isolated areas cannot be underestimated, given these officers will often be operating at nighttime and can effectively act as eyes and ears from a security point of view, by informing An Garda Síochána of any suspicious activity in these areas. It is also important that predator control officers understand the need to and are able to keep meticulous records of predator control effort (see section below on recording effort).

Predator control for breeding Curlew is best undertaken from early Spring (late January/early February) to reduce background populations to the end of the breeding season, when hopefully chicks will have fledged. This will typically be late July/early August but may extend into late August/early September, depending on particular circumstances. At different periods throughout this tenure, the predator control officer should be focusing on particular issues, particular methods and particular

⁶² <u>https://www.jstor.org/stable/2404678?seq=1#metadata_info_tab_contents</u>

⁶³ Fletcher, K., Aebischer, N.J., Baines, D., Foster, R. & Hoodless, A.N. 2010: Changes in breeding success and abundance of ground-nesting moorland birds in relation to the experimental deployment of legal predator control. Journal of Applied Ecology 47: 263-272.

⁶⁴ Fletcher, K., Hoodless, A.N. & Baines, D. Impacts of predator abundance on red grouse *Lagopus lagopus scotica* during a period of experimental predator control. Wildlife Biology 19: 248-256.

predators. Some predators and methods will be more time consuming than others and use of time is a vital consideration. Any habitat manipulation measures should be undertaken outside of the nesting season.

Nest Protection Fences

Predator proof fences have been used to great effect for ground nesting birds, including waders. Examples in Ireland include those on Inishee Island on the River Shannon near Banagher, constructed by BirdWatch Ireland using funds from the Heritage Council and Inchinalee Island on the River Shannon near Athlone, constructed by National Parks & Wildlife Service. Predator proof fences on islands can perform particularly well due to their secure nature. Innovative designs can be incorporated in planning a predator proof fence. For example, in October 2018, the National Parks & Wildlife Service constructed a predator proof fence across the mainland connection of a peninsula to effectively make an 'island' of the peninsula, thereby lessening the chances of the island being colonized by ground mammals during the breeding season. Predator proof fences have also been constructed at inland locations with positive results.

It is important when constructing predator proof fences, to learn from experiences elsewhere and to develop the most effective predator proof fence possible, with specifications that will deter entry from above and below the fence and a design that will withstand the vagaries of weather, flooding, livestock, etc. and which will be low maintenance, particularly during the breeding season so as to avoid undue disturbance to breeding birds (a solar panel to keep a large battery charged is essential for example). It is also vital of course to consider land-use and access and to incorporate the wishes of the landowner in relation to grazing and animal husbandry. It goes without saying that landowner agreement is required in advance of progressing any plans for fence construction and so too is future proofing an agreement to facilitate the fence for its lifespan. Experience has shown that landowners are often amenable to such measures, particularly where it suits both animal husbandry and conservation needs. Value added features can be incorporated at the time of construction while machinery and equipment are on site; for example scrub clearance, scrape creation, and cattle handling facilities. Predator proof fences are logically only as good as their weakest point – any faults and the fences could actually be detrimental in that a ground predator could be 'locked into' the fence. Care should be taken to ensure fence posts do not function as perches for avian predators.

A permanent predator proof fence represents an expensive capital outlay. A good understanding of the site, its history, its intricacies and the landowner(s) is required before planning and investing for the future. A more flexible and responsive approach to nest protection fencing is that of mobile electric mesh fencing, which has been piloted in Germany and Ireland. This can be deployed, where appropriate and feasible, around Curlew nest sites (the precise location of which can change from year to year), with a perimeter of at least 100m (the total area inside the fence being 0.0625ha. A demonstration video including the type of fence and a guide on its set up and construction has been produced by Mark Craven for the Curlew Conservation Programme.

Those looking to deploy nest protection fences should

- be licenced by the National Parks & Wildlife Service
- have landowner permission

- have the fences in store and be familiar with their set up, having performed dry-runs multiple times
- be certain of the nest location and have an estimate of how advanced egg laying is and an indication of the characteristics of the parent birds (some will be very nervous while others may be familiar with occasional disturbance, etc.).
- be competent in deciding where a nest protection fence is appropriate and feasible and where it is inappropriate or unfeasible
- receive advisory support during first efforts
- follow a defined protocol, be conscious of environmental conditions/weather on the day and have sufficient help (ideally 3 experienced people).
- observe carefully the reaction of the parent birds from an inconspicuous vantage point
- document and report on the reaction of parent birds and the success or otherwise of the fence

The nest protection fences are essentially a measure to help the parents hatch their eggs without being predated by ground predators. Naturally, once chicks have hatched and are mobile, the temporary nest protection fence will need to be dismantled and the chicks will then be vulnerable to ground predators. It may be possible in certain circumstances to have a wider perimeter fence created to exclude ground predators for the early stages of chick rearing, prior to them being able to fly. In most circumstances, the surrounding predator population will need to be addressed concurrently to the use of the nest protection fence.

Recommendation 5.2 Systematically record effort and scrutinise effectiveness of predator control

Recording of predator control efforts and their efficacy

It is crucial that predator control effort is recorded in a clear, systematic and standardised way. This should be transferable and repeatable across any project aimed at predator control in Curlew areas. It should also be straightforward for predator control officers, who will have a busy workload in the field. Apps with drop down menus and geo-referencing functionality would be ideal in order to minimise time spent completing data sheets and potential errors transferring field notes to record sheets. All trap locations and shooting effort should be recorded using GPS and related to a code for each Curlew territory. The number of predators controlled and the methods used should be readily available at any time during the breeding season, but particularly at the end of the season when that effort can be related back to breeding success. Learning and experience from every year in every territory should be taken forward into the following year. The more data collated in relation to predator control and Curlew breeding success, the greater the insight available on the efficacy of particular methods in particular circumstances.

It is also important to understand what predators are having or are most likely to have greatest impact in a particular Curlew territory. Trail cameras can be deployed at select locations and there is no substitute for visual observations in the field; any predator control officer should be able to read the landscape for particular predators and spend time observing prior to acting. Temperature loggers have been used elsewhere in ground nesting bird studies, to determine whether Fox is the primary cause of nest predation. Discrete nest cameras have also been used previously to good effect and provide insight on all activity at the nest. There is a regular narrative from particular quarters that the Pine Marten or the Buzzard are the root cause of Curlew decline in Ireland. This is of course untrue, and while these predators can take Curlew eggs or chicks, the undisputable evidence is that habitat loss has been the primary cause of decline and that there are predators like Fox and Hooded Crow which have been shown to have far greater impact on Curlew than either Pine Marten or Buzzard.

Much of the above is being investigated as part of the research undertaken by UCD on the data of the Curlew Conservation Programme. Over time, perhaps years, graphs showing catch rates of predators like mink, hooded crow and fox should show a downward trend. It is important also however to consider how many such predators are left in the Curlew territory, for example through transect surveys, hair surveys, scat surveys or trail cameras.

Recommendation 5.3 Consider carefully public attitudes and understanding of predator control

Public perceptions and public engagement

Predator control is a well-established and necessary part of conservation for species that are vulnerable to excessive predation in today's landscape. Various conservation projects at home and abroad, including by State bodies and bird conservation charities, control common meso-predators as part of their efforts to protect highly vulnerable species at risk of extinction. While many understand and are in favour of undertaking predator control, it is accepted that many may not understand the need for predator control or agree with it in principle. This is something that clearly needs to be respected. Clear communication on the need for and the type of predator control is required by any project that utilises predator control techniques. As mentioned earlier, it is imperative that only the highest standards in terms of animal welfare, ethics and legalities are abided by and these are red line issues by which any predator control effort must be judged, either by those involved in the project, or outside of the project. Particular consideration should be given to the methods employed. Projects should also consider whether to place tags on traps to identify that they are being used as part of a conservation project (obviously landowner agreement will be required in the first instance). A Standard Operating Procedures manual will be essential if a project is required to explain the methods being used and the standards to which it operates.

Respect for the prerogative that there are different perspectives on different species is also necessary. Some guidelines around this issue include:

- 1. Minimise the potential for wildlife-conflict
- 2. Justification for Control
- 3. Clear and Achievable Outcome-Based Objectives
- 4. Animal Welfare
- 5. Social Acceptability
- 6. Systematic Planning
- 7. Decision Making by Specifics of the species which need to be controlled

See Dubois et al.et al.(2017)⁶⁵ for more detail.

Any predator control can only be undertaken with the permission of landowners and in certain cases the owner of sporting rights. Local gun clubs should be appraised of planned efforts at the outset of any predator control programme and kept involved and informed. Farmers who's land any efforts are to be undertaken on should be spoke to on a regular basis, ideally in advance of each visit or as appropriate, particularly in the case of livestock farmers to ensure that livestock are not unduly disturbed (and indeed that traps are not damaged by livestock). Obviously, the country code should be followed closely in relation to access, fences, gates and general respect for property.

Recommendation 5.4 Incorporate predator control into national RDP schemes aimed at Curlew

Predator control and the Rural Development Programme

Each year, millions of euros are spent in Ireland on Agri-Environmental Schemes, including those focussed on bird conservation. It is now recognised that such investment, solely focussed on habitat, can be undone by excessive predation, particularly in the case of ground nesting birds in a fragmented landscape (in other words, "the same Fox will smell the same chicks"). The European Innovation Partnerships for the "Curlew Project" and the "Hen Harrier Project" entail an element of nest protection/predator control, as does the Curlew Conservation Programme run by the National Parks & Wildlife Service/Department of Culture, Heritage & the Gaeltacht. This is something that should be given specific consideration in designing agri-environmental schemes in the next RDP. Synergies could be realised between measures and between projects including the European Innovation Partnership Projects. For example, a well designed and implemented predator control programme for Curlew could also benefit Hen Harrier and vice versa. In Northern Ireland, there is an option for farmer participants in the agri-environmental scheme there to undertake predator control in an effort to reduce the chances of vulnerable species being predated. It cannot be stressed enough however, that there needs to be competency and full accountability for any predator control efforts and it is the view of the Curlew Task Force that this is best realised through the employment of professional predator control officers. There may be scope for volunteer farmers, as with gun club members, to assist the efforts of the predator control officer, for example by ensuring traps are supplied with food and water, checking daily for catches and releasing non-target species, but a full considered measure would need to be designed, with training, accreditation, on-going mentoring by professionals, and necessary spot checks.

Medium-Long term considerations

⁶⁵ https://doi.org/10.1111/cobi.12896

There is no doubt but that an effective predator control programme needs to be part of any conservation effort for Irish Curlew as things stand. Experience in the UK has shown that upland waders are 3 times more likely to raise a chick on an area with active predator control.

All of the preceding points will need to be developed upon not only in the immediate term, but also going forward for years to come and in many cases, indefinitely. Ireland should continue to build its capacity for nest protection and its tolerance and understanding of the need for predator control. It should be recognised that predator control measures focussed on Curlew are also likely to benefit other vulnerable species within the same area. The extent to which predator control provides results in terms of species of conservation concern should continue to be monitored scientifically.

In terms of building capacity and progressing standards, it would be worth considering a certified training course for predator control officers, which would be obligatory for those wishing to align themselves to any conservation programme. There could/should also be an accreditation scheme for such individuals. The International Humane Trapping Standards (AIHTS) needs to be considered in any predator control programmes going forward.

A dedicated predator control unit of the National Parks & Wildlife Service is also something that could be given due consideration, given many of the conservation concerns in Ireland are impacted excessively by predation and given that full time employees are more likely to build up relationships with relevant stakeholders and to progress projects further. A pitfall of seasonal employment only for predator control officers for any conservation programme is that such contracts do not offer stability to the contractor or the client.

Agri-environmental schemes should continue to strive towards 'joined-up thinking', whereby measures aimed at benefiting one habitat or species do not unduly perturb the requirements of another species, particularly in the case of threatened species like Curlew. For example, wild bird cover on/near breeding wader sites or the introduction of hedgerows should not be planned in sensitive breeding wader locations as they can attract and provide cover, food and vantage points for Curlew predators.

In the long run, and starting as soon as possible, efforts will have to be made to address the current imbalance in terms of predation. The landscape and land-use practices as they currently exist, stand to benefit meso-predators and disadvantage ground nesting species like Curlew. As a most basic start, Ireland should be carefully considering how any further land use change within Curlew territories will increase or decrease the risk of nest/chick/adult predation. For example, Douglas et al.(2014) found that increasing woodland cover from 0% to 10% of the land area within 1km of Curlew breeding site meant that if Curlew were to maintain their population, an increase in human predator control effort of about 48%, to a level associated with high-intensity grouse production would be required. The same authors recommended not only siting new afforestation away from important bird breeding areas, but furthermore, the removal or redistribution of existing forestry away from important breeding bird areas. In one landscape in northern Scotland, the Forestry Commission and the RSPB have been removing commercial conifer plantations for blanket bog restoration, also to the benefit of breeding waders.

Chapter 6. Planning and development



Planning for the future

Ireland has numerous goals, objectives, targets and plans that involve developing infrastructure and planning future land-use. From both a planning and conservation perspective, it is imperative that vulnerable habitats and species are appropriately considered as part of these plans and objectives, both at a strategic level and at site level. It is of course vital that Curlew are not 'scapegoated' or persecuted if they are portrayed as a risk to developments and this is something that needs to be considered carefully, with early engagement with developers and planning bodies, and meaningful alternatives put in place for important breeding sites.

Legal Status of Curlew in Ireland

The international conservation and legal status of Curlew is set out in Table 6.1.

Table 6.1: International conservation and legal status of the Eurasian Curlew (Source: Brown, 2015⁶⁶)

Global Status ⁶⁷	AEWA ⁶⁸	Bonn	Bern	EU Birds
		Convention ⁶⁹	Convention ⁷⁰	Directive ⁷¹
Near Threatened, NT	arquata: A4	II	111	Annex II/2

⁶⁶ Brown, D.J. 2015 International Single Species Action Plan for the Conservation of

lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32009L0147:EN:NOT.

the Eurasian Curlew Numenius arquata arquata, N. a. orientalis and N. a. suschkini. AEWA Technical Series No. 58. Bonn, Germany

⁶⁷ IUCN Red List of Threatened Species. A taxon is Near Threatened (NT) when it has been evaluated against the criteria but does not qualify for Critically Endangered (CR), Endangered (EN) or Vulnerable (VU) now, but is close to qualifying for or is likely to qualify for a threatened category in the future.

⁶⁸ AEWA Status of the Populations of Migratory Waterbirds. "A4" in Table 1 of the AEWA Action Plan denotes a species listed as NT by the IUCN <u>http://www.cms.int/documents/appendix/appendices_e.pdf</u>.

⁶⁹ The Convention on Migratory Species. Species on Appendix II represent migratory species with an unfavourable conservation status that would benefit from international co-operation organised by tailored agreements. http://www.cms.int/documents/appendix/cms_app1_2.htm

⁷⁰ Convention on the Conservation of European Wildlife and Natural Habitats. Species listed on Appendix II are protected. http://conventions.coe.int/Treaty/en/Treaties/Html/104.htm.

⁷¹ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds. Species listed on Annex II/2 can be hunted in listed Member States which have a defined hunting season for the species. http://eur-

Nationally, Curlew are included on the Red List of Birds of Conservation Concern in Ireland (Colhoun & Cummins 2013), due to a decline in the breeding population of at least 50% between 1980 and 2013. As a red listed species, they are included in Ireland's Prioritised Action Framework⁷² as a conservation priority.

As Curlew are not listed on Annex 1 of the Birds Directive, no Special Protection Areas (SPAs) have been designated with Curlew as a qualifying feature in Ireland. Breeding Curlew are included on the schedules for some SPAs, but this in itself does not guarantee protection within the designated site.

Forestry

Curlew and other breeding waders favour open landscapes, with a clear view of surrounding areas. (Berg 1992a, Valkama et al.1998). Afforestation of open habitats can cause loss and fragmentation of suitable Curlew breeding habitat. Research has shown that Curlew tend to nest further from forestry edges than would be predicted by chance (Berg 1992a, Valkama et al.1998).

This is largely attributable to the fact that predation rates are often higher in landscapes fragmented by woodland (Valkama et al.1999) and breeding waders may nest further from forest edges to avoid these habitats, which contain higher densities of avian and mammalian predators (Stroud et al.et al.1990, Valkama et al.et al.et al.1998, Berg 1992a). Douglas et al.et al.et al.(2014) suggest that increasing woodland cover from 0-10% within 1km of Curlew breeding sites requires a 50% increase in human predator control effort to achieve population stability.

The Department of Agriculture, Fisheries and the Marine (DAFM) current Afforestation Policy (Ref: IRL-DAFM-FS.023) aims to plant an additional 43,000 ha between 2015 and 2020. This policy aims to avoid negative impacts on protected habitats and species however, agricultural land is a prime target for afforestation and these areas may well hold breeding curlew. It is acknowledged in the report that precise locations for certain species may be unknown and it therefore it is difficult to assess the impacts of afforestation in these instances, but where afforestation takes place within Curlew breeding territories, there is likely to be a significant negative impact on these pairs.

In addition, for applications below 50ha, there is no requirement for an Environmental Impact Statement. The majority of applications fall below this threshold and to date therefor, breeding Curlew territories are likely to have been lost as a result of this policy. E.g., in Scotland, it is estimated that that 5000 pairs of Curlew may have been lost since the mid-1940s from replacement of open ground with conifer woodland (Ratcliffe 2007).

DAFM in 2018, issued an interim protocol for forestry applications in relation to Curlew. Details of this are outlined in Chapter 3.

Some landowners choose afforestation over farming due to socio-economic pressures. Currently payments for land management (including to restore degraded habitat (abandoned/forested land)) to

⁷² https://www.npws.ie/sites/default/files/general/PAF-IE-2014.pdf

protect Curlews do not match afforestation payments, both in terms of return on investment and security of contract length.

Currently, agri-environment payments are tied to the 5 to 7-year cycles of the CAP. However, there should be a mechanism to allow for longer term agreements for priority species. This would encourage farmers with priority species to enter agri-environment schemes likely to benefit breeding Curlew. A recent report on the Results Based Agri-Environment Project (RBAPS) highlights this issue:-

"Forestry in Ireland in particular, is highly incentivised due to traditional low uptake by the farming community. If the payment cannot compete with the returns from these land uses then it is unlikely to offset threats in the long term, which may undermine the development of a market that rewards the quality of biodiversity."⁷³

NPWS's Farm Plan Scheme (FPS) is funded by the exchequer and could have long term management agreements for land management for key species that offer a realistic alternative for forestry. Precedents have already been set and relevant examples of long-term payment mechanism include the peatlands, cessation of cutting payments and Afforestation grants.

It was highlighted that High Nature Value farmland is given protection from afforestation in the Rural Development Regulations. There is a need to ensure that Curlew breeding areas are identified as HNV farmland. In addition, all land management schemes should look at cooperative payments to build critical mass of suitable habitat (see chapter xx).

Reclamation

Widespread agricultural improvement of grasslands through drainage, fertilisation and reseeding (Vickery et al.2001) has led to reduction of the quality of Curlew breeding habitat. Whilst much of this activity took place in the second half of the last century, it is still ongoing and current government policies, such as Food Harvest 2020, continue to encourage these practices outside designated sites.

In 2011, the European Communities (Environmental Impact Assessment) (Agriculture) Regulations were introduced to regulate, *inter alia*, the reclamation of semi-natural areas and drainage works for agricultural purposes. Table 6.2 sets out the thresholds above which screening is required.

Type of on-farm Activity	Screening Required
Commencing to use uncultivated land or semi- natural areas for intensive agriculture	Above 5 ha
Land drainage works on lands used for agriculture	Above 15 ha

Table C. 7 Thresholds above which FIA servenin	a is required for earlieultural related activities
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Most of the on farm reclamation activity that would take place on private land holdings, falls well below the thresholds, meaning that screening for environmental impacts is not required. Therefore

⁷³ Action: Call for proposals-Pilot on-farm projects to test result-based remuneration schemes for the enhancement of biodiversity: End of Project Technical Synthesis Report. EFNCP 2018

proposed activity within known breeding Curlew sites can proceed without the need for screening, which should alert DAFM to possible impacts. Furthermore, it is unclear whether landowners not claiming Basic Payment at the time of undertaking above threshold works are required to apply for screening.

Wind Farms

Pearce-Higgins et al.et al.(2009⁷⁴) predicted a 42% reduction in density of nesting Curlew within 500m of wind turbines. Follow up work recorded reduced densities of curlew at wind farm sites during the construction phase, with populations possibly declining by about 40% as a result of disturbance, with the populations failing to recover in these areas subsequently (Pearce-Higgins et al.et al.(2012). Whilst it was not clear whether the displaced pairs were lost entirely to the breeding population, the authors advocated the precautionary principle to assume that this was the case.

In Ireland, the Sustainable Energy Authority of Ireland (SEAI) oversees the development of sustainable energy policies and practice; ambitious targets for expanding the role of renewable energy have been set, notably the target of 33% of electricity consumption to come from renewable resources by 2020, with the aim of achieving 15% of electricity consumption on a national basis from renewable energy sources by 2010 and 33% by 2020.

The Planning and Development (Strategic Infrastructure) Act 2006, provides for the streamlining of the planning process for certain types of major energy, transport and environmental infrastructure of strategic importance. The new streamlined consent procedures apply to, *inter alia*, wind farms and in accordance with the wind farm planning guidelines and the above targets, permissions have been granted for a large number of wind farms throughout the country (Figure 6.1). Curlew are known to breed in some of these areas. Figure 6.2 shows current known breeding locations.

Whilst the evidence suggests different populations might respond differently, expert opinion indicates that wind turbines are likely to have a population-level impact, especially in the future as increasing numbers of wind farms are constructed within breeding areas (Brown 2015).

⁷⁴ Pearce-Higgins, J. W., Stephen, L., Douse, A. and Langston, R. H. (2012), Greater impacts of wind farms on bird populations during construction than subsequent operation: results of a multi-site and multi-species analysis. Journal of Applied Ecology, 49: 386-394



Figure 6.1. Map of Windfarms in Ireland (Source: SEAI Wind Energy Road Map 2011-2050).



Figure 6.2. Known Curlew breeding locations in the Republic of Ireland, 2015-2017.

Recommendation 6.1 In the planning system, safeguard Curlew sites from inappropriate development by providing Curlew locational data and Ministerial Guidelines to Planning Authorities

General Planning

Local Authority (LA) planning department staff and other relevant authorities such as An Bord Pleanála (ABP), may not know how critically important breeding Curlew sites are. To date, NPWS have not provided these authorities with the location and importance of known breeding sites. This alone is critical and there is a need to identify the knowledge gaps which currently hinder the relevant bodies from making recommendations/decisions which would protect breeding Curlew sites. Recommendations on avoiding development within breeding territories, especially from LA staff, are not a guarantee of protection.

There have been recent cases such as the Owenduff case, where refusal was issued on the basis of either the presence of Red Grouse, a red listed non-Annex 1 species (i.e., of similar status to Curlew) or on the presence of an Annex 1 species outside a Natura 2000 site. However, these cases have not translated into Government guidance at present. It is considered that LAs and ABP are more likely to take action to prevent inappropriate development close known breeding sites if direction to do so is issued via Ministerial Planning Guidelines. This should include direction for a policy for inclusion in County Development Plans (CDPs), which should be amended to include this if necessary.

There is also a question of scale and at present, given research in Britain, the Planning and Development focus group consider the area within 3km around Curlew territories should come into consideration in planning assessments.

In summary, NPWS must notify LAs of the known Curlew breeding sites and provide guidance as to their importance. This guidance can inform both local decisions and policies in County Development plans. Also, cross departmental Ministerial Guidelines for protecting known Curlew breeding sites must be drawn up and issued without delay. In the specific context of wind farms, this will be important given the overlap of Curlew with upland and peatland areas, where wind farms have tended to be developed most in Ireland so far. Any new guidance should apply equally to new applications and applications requiring renewal. The Planning and Development focus group also recommend that An Taisce, which is a prescribed body to receive planning notices, should have some information about important breeding sites of Curlew highlight potential impacts.

Recommendation 6.2 In the forestry grant system, fully safeguard Curlew sites from inappropriate development and offer meaningful alternatives to incentivise landowners in specific areas to manage their land for farming and Curlew

A Freedom of Information request for the number of afforestation applications in the last year which required an EIA, indicated that no requests for EIAs were made from DAFM, as all applications were below the 50ha threshold. This would indicate that Curlew breeding territories may have been lost to afforestation up to the time of the introduction of the new guidelines.

While the interim protocol is welcome, a number of additional recommendations were proposed:-

-The strict application of a 1km buffer zone around the single point on a map attributed to each breeding pair may be insufficient, as little data on Curlew territory sizes in Ireland is available. As a precaution, the exclusion zone should be greater than 1km, possibly up to 3 km.

-To ensure good quality collection of breeding bird data, a list of approved surveyors recognised as having sufficient experience to undertake this work should be made available.

-A qualified ecologist should assess the ornithological survey from the applicant.

In addition, areas with breeding Curlew should be clearly identified as High Nature Value farmland and protected under the Rural Development Regulations.

Exchequer funded schemes to protect breeding Curlew should be developed. These should include longer term contracts (up to 10 years) to offer a financially competitive alternative to forestry within. All land management schemes should look at cooperative payments to build critical mass of suitable habitat.

Recommendation 6.3 Consider protecting key areas for Curlew through regulation/legislation

The current lack of a legal basis for recommendations for measures to project breeding Curlew and other red listed, non-Annex 1 species is of serious concern and needs to be urgently addressed. The Owenduff case, where planning permission was refused on the basis of the presence of Red Grouse, a red listed (but not Annex 1) species, highlights this issue and may set a precedent.

About half of known Curlew breeding sites are thought to occur within Natura 2000 sites, and though not qualifying features, the site synopsis should be amended to ensure that the presence of Curlew is highlighted as a feature of interest. This should be a general rule relating to red listed species.

The possibility of designating known curlew breeding sites outside Natura 2000 sites as proposed Natural Heritage Areas (pNHAs) was discussed by the focus group on Planning and Development. An Taisce have analysed pNHAs for qualifying interests, some of which include birds. However, it was recognised that further designations of pNHAs may be unpopular.

Article 4(4) of the Birds Directive relates to broader countryside measures and the Birds Case (Case C 418/04 Commission v Ireland) states the need for specific ornithological content to protect Curlew.



Chapter 7. Curlew and people

Curlew – a much loved bird

"Of all bird songs or sounds known to me there is none that I would prefer than the spring notes of the Curlew...The notes do not sound passionate they suggest peace, rest, healing joy, an assurance of happiness past, present and to come. To listen to Curlews on a bright, clear April day, with the fullness of spring still in anticipation, is one of the best experiences that a lover of birds can have."

- Edward Grey

Our natural heritage is a link to our own cultural heritage. What remains is a living experience of what our parents and grandparents would have seen and heard during their lives. The cultural links with Curlew in particular, are very strong and it is clear that the Curlew is well known and much-loved species. It distinctive long legs and long curved bill afford the Curlew a charismatic appearance. Its calls, described as "plaintive", "haunting", "bubbling", "cry" and "the very essence of wild Ireland" are renowned and mark the bird out as something truly special; something that people will remember from a day out by the coast in the winter or a summer walk through the hills and grasslands where they can still be found. It is certainly a sight and a sound, an experience that people look forward to having when they go into the Irish countryside. The Irish countryside would certainly be much the poorer were Curlews to disappear. The hills and grasslands would not be as beautiful, wild or welcoming. We would miss the haunting cry of the Curlew. It is saddening then to realise that we in Ireland have already lost almost all our Curlew that breed here. Even since the late 1980s there has been a 97% decline and in the past decade there has been a 34% decline.

The Curlew Task Force, formed to provide a plan to save the species from extinction in Ireland, was borne out of moral as much as legal obligations to protect the species. It is important that the Irish people are given a central place in the story of Curlew conservation and that the intrinsic links that exist between the Irish people and Irish Curlew are realised and strengthened. People are an everrecurring theme in the recommendations of the Curlew Task Force. In short, without the landowners and managers providing habitat, clearly there would be no Curlews. This chapter will focus on the connections to be made with local people and the public at large, including researching historical and literary references (apparently the Curlew is the most referenced bird in Irish literature), promoting the Curlew as an 'iconic' Irish bird, and animating and supporting local groups to 'do something' for their local Curlew and their local area. Actions under this subject, as in other chapters, range from the immediate or 'quick' efforts that can be undertaken, to medium and longer-term items. Many of the tasks identified, even immediate or 'quick' efforts, not be possible without human or financial capacity.

Recommendation 7.1 Promote awareness of Curlew Conservation, through;

- Widespread awareness raising through media and events relating to Curlew ecology and conservation
- Engagement in World Curlew Day and other appropriate events by all groups associated with Curlew conservation

Promoting the Curlew and conservation efforts for Curlew

It is important that the Curlew is promoted and that conservation efforts pertaining to the species and its environment are effectively communicated to the public at large and particularly to communities living in areas that still have Curlew breeding in their midst. Many do not realise that the Curlew is one of the most pressing conservation issues in Ireland today, because they may see hundreds or thousands of migrant/visiting Curlew during the winter.

Promoting Curlew conservation could follow a somewhat 'traditional' path, by targeting and enthusing 'birders' or 'conservationists' who would appreciate further knowledge and opportunities to help, but the key people to engage and enthuse and empower are those who manage the land the Curlew depend on and the local communities that should be proud to say they have some of Ireland's last remaining breeding Curlew.

Table 7.1 summarises some immediate initiatives that could be undertaken to promote the Curlew in Ireland.

What	How	Who	When	Where
World Curlew Day	Public events,	Everyone	21 April	Anywhere, but
	media, schools,			especially key
	etc.			breeding Curlew
				areas
Features on Curlew	Media	NPWS, BWI,	Regularly (aim for 12 articles	Newspapers local
ecology and	(traditional)	IPCC, ICMSA,	published each year) – front	to Curlew
conservation		IFA, INHFA,	loaded March-May to	National
		ICSA, GET,	encourage people to report	Newspapers
		Teagasc,	Curlew in summer	Wings (BWI
		Curlew		magazine)
		Media, IWT		Nature Renewal
				(GET magazine)
				Irish Farmers
				Monthly
				Dairy Ireland

Table 7.1. Promoting the Curlew – tasks, timelines and leaders.

				Irish Farmers Journal Today's Farm (Teagasc Magazine) Peatland News (IPCC) IEN Green News IWT magazine Radio (national and local) TV
Features on Curlew ecology and conservation	Media (web/social)	NPWS, BWI, IPCC, ICMSA, IFA, INHFA, ICSA, GET, Teagasc	Regularly (aim for 30 separate tweets / posts annually) – front loaded March-May to encourage people to report Curlew in summer	Task Force member websites Task Force member Twitter Task Force member Facebook
Updates on Task Force	Media (social)	NPWS to lead	As appropriate (to completion of CTF)	www.npws.ie (and can be shared/linked by others)
Curlew Poster	Design text and artwork (see Figure 1)	NPWS	Completed 2017	Anywhere! Including online. In particular, these posters should be available to local schools in areas where Curlew breed. Specifically targeted framed posters would be ideal at local livestock marts.
Car Sticker (See Figure 2)	Design	NPWS	Completed 2017.	Anywhere! Including online. In particular, these stickers should be available to local schools in areas where Curlew breed.
Presence at Bloom Festival	BWI stand	BWI	June	Bloom Festival
Tullamore Show	Task Force Member Stands	Task Force Members with stands at show	August	Tullamore Show

National Ploughing Championships	Task Force Member Stands	Task Force Members with stands at NPC	September	National Ploughing Championships
Irish Game and Country Fair	Task Force Member Stands	Task Force Members with stands at NPC	August	Irish Game and Country Fair (Birr)
Roscommon Lamb Festival	Bord na Móna and the Ballydangan Red Grouse Project	Bord na Móna and the Ballydangan Red Grouse Project, NPWS Curlew Champion	April-May	Roscommon
Biodiversity Week	As Appropriate e.g. talks, walks. BioBlitz	Conservatio n Bodies	Мау	Biodiversity Week events
Concise farmer and turf cutter information pamphlet or pamphlets (A5 front and back/A5 4 pager?)	Distributed locally and at NPC, included in mailshots from DAFM	Farming Organisation s, TCCA, Individuals, NPWS, BWI, DAFM	Spring 2019	Curlew Areas, NPC
International Bog Day	Talks, walks etc,	Peatland community groups, National Parks, Community Wetlands forum	July	Peatland sites nationwide
Curlew Day – a celebration of Curlew in Ireland	Media, interaction and Animation, talks, walks etc,	Curlew Task Force members – join with International efforts in promoting Curlew conservation	April	Various locations and online
Heritage Week	Talks, walks etc,	Conservatio n groups, community groups	August	Heritage week events nationwide
School tours , group visits and general tourist visits to Bog of Allen Nature Centre	Talks and walks	IPCC, An Taisce (Green Schools), NPWS Curlew Champions, NPWS	Year round	Bog of Allen Nature Centre

		Education Guides		
Outreach	Talks to community groups, tidy towns, school visits	IPCC, BWI, NPWS	Year round	Organised venues nationwide
Curlew conservation information leaflet for general public	Giving general information about the Curlew , its habitats and conservation importance and efforts	IPCC/NPWS	May 2017 Completed and published.	Displayed and distributed at various relevant outlets and events.
Curlew Cup	 a Gaelic Football blitz involving c.6 teams from Curlew breeding strongholds to raise awareness and "mainstream" consciousness of the Curlew in remaining strongholds and make the Curlew a bird that the local people can identify with and support 	Various Curlew Task Force members NPWS Curlew Action Teams	Autumn	Could be rotated between Curlew areas





and cracks, and safety from predators, traditional land management practices that would have helped sustain the inflew and various other species in the past, have now dwindled and the moticage luss changed dramatically in tany plates.

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and outing this time, Cutlew e seen across many parts of it, especially by the coast. It is a leftd sight to see Cutlew probing diffuls of bays and estuaries and ig on coats, lugworms, shelltish ther delicates.



Figure 6.1. Curlew Poster commissioned by NPWS/DCHG 2017



Figure 7.2. Curlew Stickers (regular sticker on left; car window sticker on right)

Recommendation 7.2 Facilitate Community Effort on Curlew Conservation – using the Curlew as a flagship species to inspire pride in local natural heritage

Identification of funding streams and engaging communities

NGO and local initiatives have the potential to work very well for biodiversity. It is important that available funding streams are identified in order to guide organisations and local people towards sources of funding should they wish to propose projects aimed at helping Curlew. Table 2 summarises the funding streams that have been identified to date.

Table 2. Funding streams available, should organisations/groups/individuals wish to apply for funding to deliver conservation initiatives aimed at Curlew.

Funding Stream	Relevant players			
EIP/Locally-led	NPWS / DAFM / BWI			
NPWS	NPWS (incorporating support of farming organisations, turf			
	cutters & predator control)			
Heritage Council	Heritage Council			
LEADER	Local Action Groups (LAGs) / DAHRRGA			
LIFE	NPWS / BnM / Department of Employment Affairs and Social			
	Protection / Department of Communications, Change Action and			
	Environment / Coíllte			
Rural Social Scheme / TUS	NPWS / Department of Employment Affairs and Social Protection			
	/ Local Action Groups (LAGs)			
Philanthropies	Whoever steps up to the plate and makes the case to potential			
	supporters. See here for successful initiative between Seacology			
	and Irish Peatlands Conservation Council			
Joint Ventures	Resources are required to deliver intensive or large scale actions			
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	 could several bodies contribute to a joint venture? 			
Research funding streams	Irish Research Council / Government Departments / Teagasc			

Recommendation 7.3 Devise a mechanism to continue to identify and support local "Curlew Champions" as developed by the CCP

Identification of local champions and sincere, genuine and reliable people to work locally for Curlew

If local people 'buy-into' a particular initiative and get behind it, that can be the difference between a project being a success or not. There are good local people that can take forward the cause of the Curlew in all areas where Curlew breed. It is important to create an environment where these people can be engaged and in turn engage others in the locality. Some possibilities are outlined in Table 7.3.

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lembers asked to promote Curlew conservation
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ecord any sightings.
is vital that landowners and farmers are kept at the
entre of considerations as they ultimately manage
ne land that the Curlew depends upon. Farmers
nould not feel alienated or threatened by
onservation measures, rather they should be
ncouraged and supported to play the important role
hat is required of them. NPWS have successfully
lioted a Curlew Champion position in each of the
urlew Conservation Programme areas in order to
alse with farmers and fandowners on initiatives to
rotect currew. In turn, this will noperally build to a
age where the majority of farmers in these areas
f farmers taking pride that Curlew is on the farm and
according them limiting damaging operations
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round them, etc. Most farmers would take an

Table 7.3. Curlew Champions

	them will do it in their own quiet way and not want a 'champion' tag.
Local Wildlife Groups	Members asked to promote Curlew conservation efforts through talks, walks and events, distribute posters and leaflets. They could also be asked to record any sightings. They could also show their own initiative in designing, engaging in and/or delivering local action for Curlew.

Discussion points relating to Curlew and People in the mid-long term

Cultural references/heritage

The Curlew is said to be the single-most referenced piece of Irish wildlife in Ireland's great literary heritage. Various poets and writers have featured Curlew, particularly its distinct and wild call. Even songs and dances feature the Curlew, clearly reflecting how widespread and well known the Curlew once was. Present and future generations will not connect with this call in a way that Irish people have done for centuries. Towards this end, it would be timely and worthwhile to collate as many references to Curlew in the Irish arts as possible. So too, references to local place names (both Gaelic and Anglicized) and local folklore relating to Curlew. First hand experiences and accounts of Curlew in the Irish country Summer from more elderly people need to be captured now, before this part of Ireland's living memory is lost from the places where Curlew have been lost from themselves. Heritage is a concept centrally focused on people and the connections between generations. With the loss of Curlew comes the loss of Ireland's heritage both naturally and culturally and if that is lost, so too will be the desire to help the Curlew, which has shared the landscape with Irish people for thousands of years. Now is the time to act.

Mainstreaming consciousness of the Curlew in remaining strongholds and having the Curlew a bird that the local people can identify with and support

Public support, particularly among the local community, is of paramount importance in any conservation story. Saving a species from extinction, either locally, nationally or globally, should ultimately be something that people want to do if it is to happen. The Curlew has long been revered and celebrated by Irish people, but the links and connection to the Curlew are being lost as Curlews themselves are being lost and as time moves on. These connections need to be bolstered and safeguarded and any conservation initiative should involve the community and ideally come from the community. At the centre of all that should be the landowners and land managers, in an irish context this being predominantly the farmers.

If Curlew conservation is to be of the community and by the community, it should revolve around the cultural and social heritage of particular areas. An example of this was the Curlew Cup initiated by the National Parks & Wildlife Service in Kerry in 2018, whereby all local schools in communities with breeding Curlew were brought together for a Gaelic Football competition, played out for the pride

and honour of claiming the Curlew Cup and bragging rights over nearest neighbours, at least for a year until rivalries will be renewed. This community approach brought together hundreds of school children and teachers, with an educational and fun aspect to mainstreaming consciousness of the Curlew and the importance of the local area. This instilled pride in the next generation, who in turn told their siblings and parents and wider relations, thereby raising the profile of the Curlew, the local conservation initiatives underway and links between the community and "their" Curlew, something not many communities can claim nowadays.

This approach can be replicated across the last remaining strongholds of Curlew in Ireland. It does not necessarily have to be Gaelic Football. It simply needs to be something that is special to the locality and build on this as a celebration of and by the community.

Overlap with HNV farmland areas

An analysis undertaken by NPWS shows there is virtually full overlap in terms of Curlew breeding distribution and the distribution of High Nature Value farmland (HNVf) in Ireland. This is a special type of farmland that exists primarily because of the people that have managed that land over a long period of time, often through generations of family management. Those that manage Curlew habitat, both individually and collectively should be celebrated and supported. The type of extensive practice that results in HNV farmland, particularly with breeding Curlew, is becoming rarer and rarer and those at the centre of deciding what happens with their land should be provided with a viable and realistic option of continuing to manage the land in a HNV friendly manner.

Socio-economics

It is known that the general age profile of farming in Ireland is increasing, with a decline in the number of farmers in younger age categories. Almost a third of farmers are at retirement age or above, while more than half are over 55 (CSO, 2018)⁷⁵. There has been a sustained trend of less young people entering farming, even after the present generation leave the land after them. This is particularly acute in much of the HNV farmed landscape of Ireland. In general, farmers working land in areas of HNVf are older, operate specialist drystock farms, and record lower levels of farm income. Areas with higher probabilities of HNVf are characterised by higher levels of unemployment and out migration of younger people. There are some differences between HNVf areas. These are associated with proximity to larger (urban) labour markets which provide off-farm employment opportunities for more members of the farm household (Meredith et al., 2015)⁷⁶.

Facilitating inter-generational change and land mobility is a key concern in the Common Agricultural Policy and the Irish Rural Development Programme. Schemes such as the Basic Payment Scheme, Areas of Natural Constraints Scheme and Green Low-carbon Agri-environment Scheme are all schemes that many farmers across Ireland's breeding Curlew distribution will be familiar with and avail of. It is vital that if farming is to continue in these areas, that such supports continue. If the next

⁷⁵ CSO Farm Structure Survey https://www.cso.ie/en/statistics/agriculture/farmstructuresurvey/

⁷⁶ Implications of socio-economic change for the production of High Nature Value Farmland: A case study of Ireland 2000 and 2011. Meredith, D., Crowley, C., Jones, G., Green, S., Matin, S., Moran, J. O'Sullivan, C., Ó Huallachain, D. and Finn, J. In: Ó hUallacháin, D. and Finn, J.A. (eds.) 2015, Farmland Conservation with 2020 Vision, Teagasc, Wexford, pp 36-37. ISBN 978-1-84170-620-7

generation are to be attracted into farming, these schemes plus land mobility schemes such as the young farmers scheme will be vital. It needs to be realized however, that despite these schemes presently being available, much of the farmland that Curlew depends on continues to be converted into spruce plantations given the afforestation schemes offer tax free, long-term investments with the added bonus of farmers retaining their BPS payments. Obviously for those making the decision to convert HNVf or Curlew breeding habitat to forestry, the afforestation schemes are more attractive or suit their situation more aptly (i.e. many will be working away from the land they have inherited and the lure of long-term and large grants results in the land being planted as opposed to farmed). This is a crucial point that cross-cuts various Chapters of the Curlew Task Force recommendations and needs to be considered carefully if there is to be a future vision with farmers or landowners managing their land and providing a home for Curlew.

Linking Curlew conservation initiatives to rural regeneration

As discussed above, the future prospects for land use in the Curlew breeding areas is of paramount importance. Curlew conservation initiatives can help as a tool in the toolbox to keep landowners farming in these areas and doing so in an environmentally appropriate way. However, there is a larger picture of rural development to consider also, if future generations are to establish themselves in these areas and continue to farm, because the reality is that farming is not profit making in these areas and the majority of farmers now and into the future will require off-farm jobs to maintain an expected standard of living.

Information packs and website/online portal

Information packs for various age groups including adults can be a useful way of educating people about Curlew, their natural history, ecological requirements and conservation. Curlew workshops, volunteer "meitheals" and information days held in local communities are all worthwhile initiatives. These approaches have already been piloted successfully by the Curlew Conservation Programme, particularly through the "Curlew Champion" role and can be successfully replicated in most areas.

The Curlew Conservation Programme has already begun to build some experience and capacity in terms of advising other projects at home and abroad, in terms of methods that can be employed to help Curlew. For example, community and landowner engagement, scrub clearance, liming, rush maintenance, nest protection fences, sourcing of equipment, available workers, and so on. A dedicated online portal for those interested and involved in Curlew conservation could be established with "how to" guides and videos available for reading, streaming or downloading. This in turn could prove very useful in fast tracking local efforts and ensuring high standards and proper procedures are followed. It could also in time act as a platform for blogs and input from practitioners, farmers, administrators as well as schools education and researcher reference (e.g. incorporating literature and reports pertaining to Curlew conservation). It would be worth exploring such an initiative via Creative Ireland.

Curlew accreditation

In line with the popular Green Flag initiative, local schools in Curlew breeding areas could vie to receive Curlew accreditation, for undertaking and passing a module on the Curlew.

Biodiversity is an important subject that could be incorporated into agricultural colleges (it is already present in many of the bachelor's degrees in Agriculture), with Curlew incorporated as a case study to show the importance of farming in a species survival.

A form of Curlew accreditation could be considered for farm produce that comes from Curlew areas, should a market be possible for same.

A Curlew Fund

The National Parks & Wildlife Service/Department of Culture, Heritage & the Gaeltacht has made available a fund for communities to undertake projects that benefit Curlew locally. Funding is awarded on a competitive basis and has proven popular with and very appreciated by local communities. There are other avenues funding available as outlined earlier in this Chapter, but the idea of a specific "Curlew Fund", funded either by private or public interests is certainly worth exploring.

Chapter 8. Synthesis

The Synthesis group aimed to bring together the recommendations made by the Task Force subgroups to ensure there is no repetition or conflicting advice between the sub-groups' recommendations within each chapter and to examine gaps and any need for overarching, strategic recommendations which were not covered by the sectoral based sub-groups. A list of all recommendations is contained at the end of this chapter.

Recommendation 8.1 Develop a national Species Action Plan for Curlew - including a steering group which delivers "sign up" to actions and monitoring

The need for an ongoing forum for engagement on and co-ordination of, Curlew conservation has been palpable throughout the Task Force operation. Noting that the need for this was the genesis of the Task Force itself, recognising that many sectoral interests, expert individuals and organisations were needed in forming a cohesive approach to identifying key actions. In the final Task Force meeting it was noted that the question of "what happens next?" needed to be addressed in terms of a structure or grouping to continue engagement and co-ordinated action. The Task Force has sat separate, but parallel, to practical conservation efforts through e.g. the Curlew Conservation Programme, efforts by NGOs, by semi-state bodies, by communities and by individuals. The task force does not assume a role in the long-term. The future co-ordination of conservation effort for Curlew across all sectors in the medium and longer term should seek full formal engagement, through appropriate means, of relevant sectoral interests and delivery bodies and as such, an alternative mechanism with a mandate and defined structure is needed.

A Species Action Plan, with an attendant steering group mechanism, would seem the most appropriate future forum for continued engagement and coordination. It could develop a longer term, more detailed, plan, provide oversight and impetus for delivery of ongoing Curlew conservation. SAPs are a recognised tool internationally, for the delivery of focused conservation action⁷⁷⁷⁸ and stakeholder engagement but to be successful, they require adequate resourcing and the development of a means of formal sign up and monitoring. They are used widely within the EU and are recognised as a delivery tool by many international conservation bodies. They have been used for addressing the conservation of specific, habitats and species within Ireland regularly⁷⁹⁸⁰ and such a plan would have the capacity to encompass the action identified and delivered through international, state, NGO, sectoral and community-based plans and projects.

Curlew in Northern Ireland have also been in long term serious decline but in recent years conservation programmes, including those on nature reserves have started to show signs of success. In some cases, there are significant Curlew populations close to or even straddling the border and as

⁷⁷ https://www.unep-

aewa.org/sites/default/files/publication/ts58 eurasian curlew issap website version.pdf ⁷⁸ https://www.birdlife.org/europe-and-central-asia/species-action-plans

⁷⁹ https://www.npws.ie/species-action-plan

⁸⁰<u>https://www.birdwatchireland.ie/OurWork/SpeciesHabitatConservationinIreland/ActionPlansforIrishBirds20</u> 0911/tabid/946/Default.aspx

such are part of a single ecological unit which extends across that border and requires sympathetic management throughout.

The Northern Irish population also provides the potential to provide bio-geographic continuity in across the island of Ireland and may be a source of future individuals should the population start to recover. It is important then to maintain co-operative working across the biogeographic area and close links with those delivering for Curlew Conservation in Northern Ireland.

Recommendation 8.2 Work with Partners in Northern Ireland to achieve bio-geographic consensus on Curlew conservation effort

The large amount of Curlew research going on across Eurasia and particularly in Northern Europe, generates new information and an evidence base for Curlew conservation work. Keeping up with this and ensuring the latest information produced is applied appropriately to Curlew conservation in Ireland will be important. Ireland also has a role to play within Curlew conservation internationally, recognizing that the wider bio-geographic population status may well influence trends in Ireland to some degree. The Task Force approach has already been recognised as an innovative way forward by organisations and individuals across the island of Ireland, within the UK and wider within Europe. In turn then, Ireland needs significant representation at All-Ireland and International Curlew forums, including; The AEWA Flyway Action Plan group, The Curlew Forum (UK based), the UK and Ireland Curlew Working Group and through the International Wader Study Group. This representation should include attendance at relevant meetings and conferences and a means of reporting back to stakeholders within Ireland through an SAP or equivalent process.

Recommendation 8.3 Ensure active engagement with key international Curlew research and conservation information exchange

List of all recommendations

1. Curlew Ecological Requirements

Recommendation 1.1 Continue the Curlew Conservation Programme and develop a long-term comprehensive State Programme of Measures for Curlew in Ireland - based on learnings found from the CCP and other schemes including the Curlew EIP and GLAS

Recommendation 1.1b Utilise, capitalise and build on the wealth of experience and expertise that has grown through the Curlew Conservation Programme, with dedicated interested parties that have progressed pioneering measures for Curlew in Ireland

Recommendation 1.2 Take into account the requirements of species of conservation concern sharing the same landscape/habitats by appropriate design of conservation measures

Recommendation 1.3 Undertake an audit of land use in Curlew territories

Recommendation 1.4 Undertake research on breeding Curlew, with particular reference to, examining the effectiveness of conservation measures and with specific reference to the landscape of Ireland

Recommendation 1.5 Undertake research and investigations on the practicality of using "headstarting" to augment breeding Curlew productivity

2. Farming and agri-environment

Recommendation 2.1 Develop High Level requirements for Curlew within future Rural Development Programmes, specifically;

- a) Carry out annual surveys to monitor the population and identify where Curlew are located
- b) Urgently address the loss of curlew habitat c) Development, financing, targeting and adaptability of proactive measures through bespoke management schemes
- d) Implementation of habitat measures (including the adoption of sensitive farming and nonproductive investments)
- e) Effective nest protection
- f) Landscape-scale approach (including farm clusters and collaborative working)

g) Consideration of wider positive benefits to biodiversity/landscape of adopting these approaches

h) Consolidate and utilise data and experience available from various sources including the CCP, EIP, BnM, Gun Clubs, local projects, etc.

3. Forestry

Recommendation 3.1 Safeguard Curlew breeding and feeding sites from inappropriate forestry planting by enhancing procedures for the proper consideration and approval of new plantings and related activities, specifically including:

- Review of existing guidance to take account of the above
- Increase the screening zone around Curlew areas to provide greater certainty of avoidance of impact on Curlew
- Build in site specificity with regard to e.g. wider hydrological impacts, cumulative impacts with other plantings, landscape, aspect etc.

• Ensure all planting applications are reviewed by ornithologists with Curlew expertise and knowledge

• Inclusion within guidance a consideration of historical curlew sites – to ensure the potential for recolonisation through conservation effort is not lost

Recommendation 3.2 Audit and identification of key opportunities for deforestation and habitat restoration on previously afforested areas for Curlew and wider benefits

Recommendation 3.3 Develop and promote viable options for sympathetic land management supports within Curlew areas where forestry is not desirable

4. Bogs

Recommendation 4.1 Identify where Curlew are breeding in active turbary areas and design a blueprint for proactive and positive engagement with turf cutters/plot owners

Recommendation 4.2 Bord na Móna to continue to survey and monitor Curlew and propose conservation actions on their estate

Recommendation 4.3 Coíllte to undertake survey and monitoring of Curlew on their land and propose conservation actions for Curlew on their estate

Recommendation 4.4 Irish Peatland Conservation Council to continue to survey and monitor Curlew on their land and propose conservation actions for Curlew on their lands

5. Predation & nest protection

Recommendation 5.1 Design and deliver effective predator control to protect breeding Curlew Recommendation 5.2 Systematically record effort and scrutinise effectiveness of predator control Recommendation 5.3 Consider carefully public attitudes and understanding of predator control Recommendation 5.4 Incorporate predator control into national RDP schemes aimed at Curlew

6. Planning & development

Recommendation 6.1 In the planning system, safeguard Curlew sites from inappropriate development by providing Curlew locational data and Ministerial Guidelines to Planning Authorities

Recommendation 6.2 In the forestry grant system, fully safeguard Curlew sites from inappropriate development and offer meaningful alternatives to incentivise landowners in specific areas to manage their land for farming and Curlew

Recommendation 6.3 Consider protecting key areas for Curlew through regulation/legislation

7. Curlew & people

Recommendation 7.1 Promote awareness of Curlew Conservation, through;

- Widespread awareness raising through media and events relating to Curlew ecology and conservation
- Engagement in World Curlew Day and other appropriate events by all groups associated with Curlew conservation

Recommendation 7.2 Facilitate Community Effort on Curlew Conservation – using the Curlew as a flagship species to inspire pride in local natural heritage

Recommendation 7.3 Devise a mechanism to continue to identify and support local "Curlew Champions" as developed by the CCP

8. Synthesis

Recommendation 8.1 Develop a national Species Action Plan for Curlew - including a steering group which delivers "sign up" to actions and monitoring

Recommendation 8.2 Work with partners in Northern Ireland to achieve bio-geographic consensus on effort

Recommendation 8.3 Ensure active engagement with key international Curlew research and conservation information exchange

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