

Review

Opportunities within the Revised EU Common Agricultural Policy to Address the Decline of Farmland Birds: An Irish Perspective

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Abstract: The loss of global biological diversity continues despite on-going conservation efforts. Agriculture is the major terrestrial land use in Europe and any conservation efforts to protect biological diversity must address sustainable use of these food production systems. Using Ireland, within the European Union policy framework, as an example, the declines in farmland birds are discussed. The opportunities afforded to farmland bird conservation as a result of the recent reform to the Common Agricultural Policy (CAP) are outlined. The potential for revised and refined CAP, specifically agri-environment schemes, to deliver benefits for biodiversity and for farmland bird species within Irish agricultural ecosystems is explored. Despite all the efforts to date and the significant resources invested in implementing agri-environment measures and schemes, few attempts have been made to collect monitoring and surveillance data with which to quantitatively assess the effectiveness of schemes, and measures that are designed to assist in the recovery of farmland biodiversity, including bird species, in Ireland.

Keywords: farmland birds; agriculture; agri-environment schemes

1. Introduction

There has been a recent widespread decline in global biodiversity, which represents a major global conservation challenge [1]. Specifically, there has been a well-documented widespread and severe reduction in farmland biodiversity across Europe over recent decades [2,3], with declines being particularly evident in farmland birds [4–6]. Farmland birds occupy a number of ecological niches (e.g., seed-eaters, insectivores, predators) and provide a range of ecosystem services [7–9]. Birds are useful indicators for calculating changes in the environment [10]. The Farmland Bird Index (FBI) is an EU structural and sustainable development indicator [11] that uses trends in farmland bird populations as a proxy to communicate the ecological and environmental health of agri-ecosystems [12].

Recent studies [13,14] have estimated that the populations of European farmland birds have declined by as much as 50% since 1980. This has culminated in the fact that many European bird species, that are now of conservation concern, are associated with traditional farmed landscapes [15]. However, the conservation of these rare or endangered species have recently been contextualised by the fate of more common species. Evidence from a 30 year data set on farmland birds in Europe, indicates that the overall avian abundance and biomass of some more common species, e.g., Starling *Sturnus vulgaris*, are declining at a greater rate than less abundant species [16].

2. Reasons for Decline in European Farmland Birds

Farmland bird species are dependent on farmland ecosystems that meet their ecological and biological requirements, thus these species are highly susceptible to changes in farming practices that impact these habitats. The exact explanations for the decline of farmland bird species over the last 40 years are complex and multi-faceted, however, intensification and specialisation of agricultural management strategies are perceived to be the most likely causes [5,17–19]. The disturbance of farmland ecosystems (in conjunction with fragmentation) has adversely affected more specialised farmland species [20]. European agricultural policy plays a vital role in shaping landscape management within these ecosystems [12,21]. There are increasing concerns that EU agricultural policy and a demand for increased food production will put added pressure on farmland biodiversity [22].

3. Halting the Decline of Farmland Birds

Public concern in relation to potential environmental issues associated with intensification of agriculture has encouraged policy-makers to promote agricultural policies that are more ecologically and environmentally beneficial [12,22]. Since 1985, reforms to the Common Agricultural Policy (CAP) have included the provision of agri-environment incentives, originally aimed at conserving biodiversity and reducing overproduction [23]. In an effort to address the continued decline of farmland biodiversity, agri-environment schemes (AES) were established by European Member States in the early 1990s in response to EU Agri-environmental Regulation (90/20788/EEC), [17,24]. Typically, AES consist of vertical (“narrow and deep”) policies, investing a high amount of resources into a limited number of species or habitats within a limited number of geographical areas; or horizontal (“broad and shallow”) policies, with a modest effort at each location that is more widely applied [24,25], or a combination of

both. AES are now considered the most important policy instrument to halting the decline of farmland biodiversity in the EU [24,26–28].

A number of farmland bird species have undergone a significant decline in population and range, despite agri-environment legislation being in place during some of the period of decline. Environmental changes as a result of agricultural policy and the establishment of AES may have slowed the rate of decline in some species and these schemes have undoubtedly enhanced ecological and environmental awareness amongst stakeholders and land-owners [29]. However, deficiencies in relation to the design, targeting, monitoring, evaluation and flexibility required to encompass discrete differences in landscape composition of AES across Europe has resulted in their effectiveness as a tool to maintain and enhance agri-ecology being mixed [30] or difficult to interpret [28].

A possible explanation for this apparent lack of effectiveness of AES in halting the decline of farmland birds is the dominance of low-cost horizontal agri-environment measures in the AES of many EU Member States. Although horizontal measures can result in some benefits for certain species [31], these measures typically lack the appropriate targeting or design required to adequately enhance the conservation status of threatened specialist farmland bird species. Kolecek *et al.* [25] concluded that population trends of protected bird species remained practically unchanged in countries providing horizontal measures. Reid *et al.* [32] stated that such measures, when mammal species were examined, bring greatest benefits to generalist species that are already common in agro-ecosystems. If these findings are applicable across taxa then the fortunes of generalist farmland bird species should not be relied upon to improve the conservation status of specialist species. Indeed, horizontal measures may sometimes have a negative impact on certain specialist species, as these measures can enhance populations of predatory species locally and nationally; consequently the likelihood of increased predation may negatively affect the conservation status of ground-nesting bird species of conservation concern.

Unique conservation measures to enhance the conservation status of all groups of declining farmland bird species do not exist [33]. Specialist species, including farmland bird specialists, require the adoption of vertical measures (e.g., specific and targeted) to help reverse declines in their population and range. The examples that are most effective involve the design, targeting and establishment of bespoke conservation measures tailored to the requirements of individual species [25,26].

4. Ireland as an Example of Agricultural Change

Unlike many parts of Europe, almost 60% of Ireland's land surface area is devoted to grassland agriculture [34] while having a relatively high proportion of non-cropped habitats [35]. However, ambitious agricultural production targets under Ireland's agri-food sector vision, *Food Harvest 2020* [36], may result in more marginal areas being targeted for expansion and intensification, thus putting added pressure on farmland biodiversity. Fenton [**Error! Reference source not found.**] suggested that 68% of Irish dairy farmers are likely to increase drainage on their agricultural systems in order to attain desired production targets under Food Harvest 2020. Increased drainage is known to impact negatively on threatened farmland birds species, in particular breeding waders, the majority of which require damp ground where invertebrate prey are abundant and accessible within their breeding territory and other threatened farmland birds species [37].

With the exception of the bird atlases [6], which have shown large-scale changes in the pattern of bird distribution in Ireland (and the UK), there is a lack of any detailed, long-term (>20 years) data for biodiversity (including birds) and agricultural habitats in Ireland. However, it does appear that the loss in habitat heterogeneity may be a contributing factor to the declines of certain farmland bird species in Ireland [39,40]. The advent of the Countryside Bird Survey in Ireland, which started in 1998, should facilitate the population monitoring of many farmland bird species into the future. However, for rarer farmland species, it is clear that single species studies are required [41] to assess changes in their population trends. The recent Bird Atlas [6] and the updated Irish Red-List [42] have confirmed the startling decline in the abundance and range of a number of breeding farmland species in Britain and Ireland. For example, whilst there has been an increase in the range of some farmland bird indicator species (e.g., Tree Sparrow *Passer montanus*, Buzzard *Buteo Buteo*), by and large results indicate a dramatic decline in the range of a number of traditional farmland birds and ground-nesting species including Lapwing *Vanellus vanellus* and Whinchat *Saxicola rubetra*. Farmland bird species now constitute the majority of the 26 breeding birds on the current Irish Red-List [42]. Many of these species are ground-nesting farmland species and this pattern has been reflected in other parts of Europe [43]. Whilst the decline in the range and population of a number of national flagship species (e.g., 91% reduction the range of Corncrake *Crex crex* over the last 40 years; 95% reduction in the range of Grey Partridge *Perdix perdix* over last 40 years) has been well documented, the dramatic decline in some more widespread breeding wader species (e.g., a 78% reduction in the range of Curlew *Numenius arquata*) is alarming. In addition, one farmland specialist species, Corn Bunting *Emberiza calandra*, has recently become extinct in Ireland [44].

To date, there have only been a limited number of studies focusing on biodiversity (including farmland birds) in agricultural ecosystems in Ireland [45]. Due to the large proportion of field boundaries and hedgerows in Ireland, many studies have focused on these habitats [46,47]. These studies have focused on the ecological attributes of hedgerows within farming systems that are valuable to bird species and communities that are strongly associated with hedgerow habitats. Although hedgerows contain other important species that have declined in the last 20–30 years, they only provide a limited number of their ecological requirements, e.g., nesting habitats or singing posts habitats for species such as Yellowhammer *Emberiza citrinella*. It has been demonstrated that there are important differences in how species behave in Ireland compared to other European countries. For example, in Ireland breeding Skylarks *Alauda arvensis* are associated with extensive grassland habitats, whereas in other European countries (e.g., the United Kingdom) they tend to select arable farming systems [48]. In addition, the nature of the relationship with farmland bird communities and agricultural activity, as measured by intensity, appears to be somewhat different. Many species have evolved with agricultural systems and thus require policies that ensure a balance between the continuum of agricultural intensity and abandonment [49] as agricultural intensity can have a positive relationship, up to a point, on some farmland bird populations [50,51]. These divergent results and recent finding regarding the decline in avian biomass across Europe [16] highlight that the relationship of agricultural intensification with species of conservation concern is an area of research that merits greater research and attention [51].

5. Opportunities under the Common Agricultural Policy Reform

The CAP is the main policy tool to deliver for biodiversity in the agricultural sector. The CAP has many objectives, of which protection of the environment (including a reversal in the decline of biodiversity), is cross-cutting. The recent reform of the CAP (EU 1307/2013), which aimed to update these objectives and provide a policy environment to deliver on recognised societal requirements, was a unique opportunity to promote ecologically and environmentally friendly agricultural policies [52]. The “new” CAP (2014 to 2020) maintained the structure of the previous policy (2007 to 2013), with a legislative baseline requirement (cross-compliance) and two main themes of income support for farmers (Pillar I) and support for rural development (Pillar II). This reformed CAP aimed to increase the links between the baseline and the two pillars, offering a more holistic and integrated approach to policy support.

Whilst the legislative baseline remained similar (requiring recipients of payments to comply with various pieces of legislation, including those linked to biodiversity (such as the Birds and Habitats Directives), there were fundamental changes to Pillar I, with the introduction of a new policy instrument, the Green Payments (“Greening”). Greening required that a significant share of subsidies (30%) go to rewarding farmers for the provision of environmental public goods, namely through three obligatory agricultural practices: the maintenance of permanent grassland, crop diversification and ecological focus areas (EFAs). All of these greening measures have the potential to impact biodiversity, but due to its already grass-dominated production system, they are unlikely to have a significant impact in Ireland. Perhaps of even more concern, there is a widespread belief that the Pillar I greening prescription is unlikely to have much effect throughout Europe [53]. This is due to the fact that, although the policy objectives are sound, the policy itself is seriously flawed (due to substantial weakening in relation to the potential delivery of the environmental objectives in the agreement phase through co-decision between the EU Commission, European Parliament and Council of Ministers). Furthermore, it seems likely that the policy implementation by Member States will lead to further erosion of the overall objectives to ease the regulatory burden on the farming sector, and ease the administrative burden nationally, e.g., there are significant variations in the interpretation of what is eligible as an EFA between Member States [54] with France including 16 habitat types that are eligible and Slovenia including only three.

In relation to the conservation of farmland biodiversity, Pillar II once again afforded the establishment of AES within each Member State, and remains the significant policy instrument aimed at halting the decline of farmland biodiversity in the EU. Pillar II is delivered in Member States through Rural Development Programmes (RDPs). In Ireland’s RDP, the Green Low Carbon Agri-Environment Scheme (GLAS) is the new, national AES [55]. The scheme includes measures specific to the Conservation of Farmland Birds, and these are amongst the measures of highest priority within the scheme. Appropriate advisory support, integrated monitoring and evaluation programmes and systems will also be established, such that policy-makers can assess the effectiveness of implemented measures. It is only through monitoring the performance of GLAS and environmental outcomes that the effectiveness of AES to reverse the severe declines experienced by certain farmland bird species and biodiversity in general can be ascertained [28,30]. It should be noted that a small number of declining farmland bird species have been designated for inclusion in the measure for the conservation of farmland birds in GLAS, and these are typically of very restricted geographical range (e.g., breeding waders, Chough *Pyrhacorax pyrrhacorax*, Corncrake, Grey Partridge, Hen Harrier *Circus cyaneus* and Twite *Carduelis flavirostris*). A significant challenge lies in the design and targeting of measures applicable to additional

threatened farmland bird species, particularly those found throughout the wider countryside. Breeuwer *et al.* [56] highlighted that agri-environment measures with appropriate management prescriptions might sometimes be insufficient for the recovery of target species. This may be further compounded by poor delivery of the suite of ecological requirements for each species and in a manner that makes the uptake of such optional measures unattractive to farmers. Furthermore, efforts should also be undertaken to target more widespread, declining farmland bird species (e.g., Skylark, Yellowhammer) whilst there is still a chance to halt their decline, as opposed to focusing solely on species whose decline may be terminal. The proposed GLAS has also included some additional “broad and shallow” measures targeted at the conservation of farmland birds (e.g., Wild Bird Cover, bird boxes) however, although beneficial for some granivorous birds, these measures are unlikely to have a significant impact on the majority of threatened farmland species that are of highest conservation concern. A similar situation has been documented in England, where an AES can benefit declining species, such as Yellowhammer, but not enough to reverse national declines [31].

Other measures within Pillar II also present opportunities to target declining farmland birds. These include the required reform of the Areas of Natural Constraint (formerly Less Favoured Areas), which could be targeted towards sites designated for nature conservation, and the provision of supports for non-productive investments. This latter option is usually focused on supporting infrastructural improvements to farming systems, but could equally be applied to capital works associated with one-off, non-recurring habitat creation costs (such as establishing ponds or erecting predator-proof fences for ground-nesting birds). Within Ireland’s RDP an additional Locally-led Agri-environment Measure is also proposed. This is largely to focus on targeting supports to specific areas such as the Burren and Freshwater Pearl Mussel river catchments. However, it is suggested that other, similar actions could target Hen Harriers and upland agricultural peatlands. It is our opinion that this novel approach to the delivery of agri-environment supports in Ireland, which may allow the full suite of ecological needs for species and habitats, coupled with the necessary advisory, monitoring and evaluation systems, may yet yield more effective returns than GLAS, although the Locally-led Agri-environment Measure has yet to be fully detailed or delivered.

6. Conclusions and Future Prospects

One of the major objectives of the revised CAP is the sustainable management of natural resources, which includes farmland birds. Although this objective is sound, the policy structures and instruments are poor and many commentators have stated that they are unlikely to deliver benefit for biodiversity [53]. Many policy objectives within the CAP have the potential to integrate and restore the agricultural matrix to hold farmland bird communities and other biodiversity [57]. However, in an Irish context it seems unlikely that the measures under Pillar I (“Greening”) will deliver significant benefits to biodiversity in general and threatened farmland birds in particular. Therefore the fate of many declining farmland species in Ireland is dependent on Pillar II, specifically GLAS. However, for this scheme to be effective it is essential that there is advisory support, integrated monitoring and evaluation programmes such that policy-makers can assess the effectiveness of implemented measures. It is our opinion that this will enable the development of sustainable agricultural systems. It is essential the agricultural activity in Ireland is sustainable in all aspects, *i.e.*, environmentally, economically and socially. Although models

have been developed which incorporate some of the components, e.g., Purvis *et al.* [58], holistic approaches have not been adopted as yet. The adoption of integrated sustainability is essential for the longevity of food production systems and the image of Ireland as a “green” food-producing nation.

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Author Contributions

Daire Ó hUallacháin and Barry J. McMahon conceptualised the framework and content of this review. Alex S. Copland and Kieran Buckley contributed substantially to the drafting of the manuscript through revisions, suggestions and comments.

Conflicts of Interest

The authors declare no conflict of interest.

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