BirdWatch Ireland Submission to the Department of Agriculture, Food and the Marine consultation on the draft Forest Strategy and Draft Forest Strategy Implementation Plan[1]

Curlew, An Crotach, *Numenius arquata* (Mike Brown)

[1] Recommended citation : Duggan, O., Donaghy, A., Kennedy, J., Lusby, J., (2022) *BirdWatch Ireland Submission to the Department of Agriculture, Food and the Marine consultation on the draft Forest Strategy and Draft Forest Strategy Implementation Plan*, BirdWatch Ireland, available here https://birdwatchireland.ie/app/uploads/2022/12/BirdWatch-Ireland-Submission-to-Forest-Strategy-and-IFSIP-to-CION.pdf

BirdWatch Ireland has reviewed the draft Forest Strategy and draft Forest Strategy Implementation Plan and raises the following concerns.

BirdWatch Ireland wishes to make a submission in response to the public consultations on the proposed Forestry Programme, 2027-2027, the proposed Forest Strategy Implementation Plan for the proposed Forestry Strategy 2022-2030, the Forest Strategy and the associated SEA report, and Natura 2000 statement. We request our submission to be taken into account for purposes of Article 8 and 9 of the SEA Directive, 2001/42/EC.

BirdWatch Ireland took the following approach in this submission:

- Read and analysed the draft documents out for consultation including environmental assessments
- Undertook a spatial mapping exercise whereby threatened farmland bird and breeding wader hotspots were overlaid with tree planting data since 2014 to determine if the 2014-2022 Forestry Programme resulted in loss of habitat for these species
- Undertook spatial analysis to determine the amount of forest cover in farmland bird and breeding wader hotspots in the last 30 years
- Analysed the quality of the IFSIP environmental assessments and compliance with the relevant environmental directives.
- Analysed the consultation documents to understand if the draft IFSIP proposed any changes in policy and licensing process or mitigation measures which would indicate that safeguards were in place to protect the habitats of threatened bird species. As part of this we have specifically reviewed the Land Types for Afforestation document.
- Presented analysis of the inadequacy and failings of key current and future mitigation measures.
- Made conclusions on all of the above and the ramifications for the Irish government in relation to compliance with the Birds Directive, the Habitats Directive, the EIA Directive and the 2014 European Commission State Aid decision, the SEA Directive and any future application for state aid approval.

Key Messages

1. Since 2014, the Forestry programme 2014-2022 has sanctioned the planting of 13,719 hectares or 14.1% of forest planted nationally (Coillte and private planting) in hotspots for six of our most threatened breeding waders in Ireland.

2. Since 2014, the Forestry programme 2014-2022 has given consent to the planting of 6,538 hectares or 6.7% of forest nationally (Coillte and private planting) in hotspots important for 28 of our Red and Amber listed species on the Birds of Conservation Concern in Ireland.

3. BirdWatch Ireland mapping shows that since 1990, 78,606 or 14.6% of total forest planted has been in breeding wader hotspots and 37,036 or 6.7% of total forest planted in farmland bird hotspots.

4. BirdWatch Ireland mapping shows that the total forest replanted since 2014, within Breeding Hen Harrier SPAs is 12,382 [hectare] or 12.7% despite forest cover, including forest maturation

and forest management activities being recognised as the primary threats to the Hen Harrier population.

5. This is evidence that Ireland is in breach of the Birds Directive and the conditions of the European Commission State Aid Decision granting consent for the provision of €200 million to fund the 2014 Forestry Programme including:

    a. Projects must be undertaken in compliance with national and EU legislation (e.g. several articles of the Birds Directive).
    b. The condition to avoid planting on environmentally sensitive sites and
    c. The inappropriate afforestation of sensitive habitats such as peatlands and wetlands will be avoided, as well as the negative effects on areas of high ecological value including areas under high natural value farming.

6. A disproportionate amount of forest is being planted in important areas for birds in the wider countryside. There are likely several reasons for this.
    a. There is no strategic planning of afforestation in Ireland
    b. There is no ornithological assessment of sites/applications being proposed for afforestation.
    c. The Land Types for Afforestation document which provides guidance on the land which can be planted, is potentially a driver of loss of Annex 1 habitat and habitat for birds and other biodiversity
    d. The payments and tax-free status of afforestation premia are lucrative. No agri-environment scheme which would pay farmers to continue to farm for threatened bird species can compete. This creates the risk that even more areas of land will be opened up for afforestation further threatening bird species.

7. The draft Forestry Implementation plan for 2023-2030 which is underpinned by an almost 7-fold increase in funding **does not contain any evident changes in individual environmental assessment of afforestation applications to account for the presence or absence of birds on a site proposed for afforestation compared to the 2014-2022 Forestry Programme. It is clear therefore that we can expect further losses of habitat important for breeding waders and other farmland birds unless changes are made.**

8. The environmental assessments of the draft Forestry Programme fail to consider the impacts on the different measures on red and amber listed birds in the wider countryside. There is also woefully inadequate assessment of Annex 1 bird species in the wider countrywide (e.g. geese and swans) in breach of Article 6.3 of the Habitats Directive and various European Court of Justice rulings. The Article 12 reporting research only extracted data relating to Annex 1 species that are qualifying interests of an SPA are considered in this AA report and what is reported is incorrect. Also unclear as to why the BoCCI status of Curlew, a red listed species for breeding and wintering has N/A status associated with Table 4 in the NIS. The BoCCI status for a range of red and amber listed species is listed as N/A with no rationale as to why. These should be listed.

9. The analysis of the effects of the Forest Strategy Implementation Programme on Annex 1 species is extremely limited. It focuses in on Annex 1 species with 'bad' or 'inadequate' status that are already identified as being affected by forestry activities (according to Article 12 code)

10. Species assessments in NIS. The NIS only focuses on Merlin and Hen Harrier and fails to assess impacts on a range of other Annex 1 species or the conservation interests of the SPAs.

11. The incombination assessment of other plans and programmes is extremely general. For example the statement that the IFSIP is 'broadly in line with the EU biodiversity Strategy'. Afforestation is a significant pressure and threat to a range of threatened bird species whose populations must be restored. Assessment fails to consider this.

12. The cumulative impacts of afforestation, intensification of agriculture, peat cutting, wind farm development etc have not been adequately considered in the environmental assessments of the draft Forestry Programme.

13. It is of serious concern to us that a farmer signed up to an ACRES contract can end that contract to afforest his/her land and not be subject to penalties.

14. The fact that a farmer can receive the Basic Payment which requires adherence to Article Article 3(1), Article 3(2)(b), Article 4 (1),(2), and (4) covering legal protection for birds and a requirement to protect birds in the wider countryside and receive an afforestation payment which wipes out habitat for birds is discordant and an abuse of taxpayers money. Taxpayers are paying on the double for both the protection of habitats and their destruction. This must change.

15. Unless afforestation is planned strategically with clear objectives and processes put in place to avoid afforestation in important areas for birds, breeding waders in particular could be severely affected with the risk of national extinction of certain species as a result of the State's Forestry Programme to 2030.

Recommendations:

1. To the European Commission: The State should not be granted a State Aid decision for the next Forestry Programme unless it proves that a strategic approach to afforestation is put in place. This must include use of bird forestry sensitivity mapping which can inform important areas for birds that require ornithological survey work according to the appropriate methodologies and undertaken by suitably qualified individuals.
2. To the European Commission: Ireland is in breach of the Birds Directive as regards the failure to protect Annex 1 and non-Annex birds in the wider countryside. This is yet another example of how the Birds Case still has not been met. The State still has not complied with the Ruling by the ECJ Ruling in C/418-04 on the Fourth Complaint against Ireland: "The Court finds in the present case that the measures taken by Ireland are partial, isolated measures, only some of which promote conservation of the bird populations concerned, but which do not constitute a coherent whole" and that Ireland has failed to transpose and apply fully and correctly the second sentence of Article 4(4) of the Birds Directive relating to appropriate steps to be taken by the Member States to avoid pollution or deterioration of habitats outside SPAs.
3. To the Irish government:
    a. The Minister must bring the SEA process into line with the requirements of the SEA Directive, amends the forestry plan and programme, reforms the screening system

and takes coherent action to stop and reverse forestry-related deterioration of habitats crucial to open-habitat birds and other habitats important for nature conservation

b. Fund BirdWatch Ireland's Bird Forestry Sensitivity mapping tool project and utilise it to support strategic afforestation and to avoid planting in important areas for birds.
c. Require that ornithological assessment is undertaken by suitably qualified ecologists using the correct methodologies for any application proposed for afforestation in a farmland bird or breeding wader area.
d. Revise the environmental assessments so that they are in line with EU law and assess the impacts of the Forestry Programme on red and amber listed Birds of Conservation Concern in Ireland and Annex 1 birds in the wider countryside.
e. Eliminate the Land Types for afforestation document. It is not used systematically by foresters and could where used lead to the planting of important areas for birds.
f. Evaluate and revise the Environmental Requirements for Afforestation document since several environmental indicators associated with forestry and afforestation are declining (e.g. Freshwater Pearl Mussel, water quality) and clearly these requirements are not working.
g. Revise the Appropriate Assessment procedures for afforestation so that they include the level of detail and evidence needed to state that there will be no significant adverse effects on the Natura 2000 network.

1.0 BirdWatch Ireland spatial analysis of afforestation data and farmland bird hotspot data

The 2014-2022 Forestry Programme has resulted in loss of habitat for threatened farmland birds including breeding waders. Over 6% of all national tree planting since 2014 has occurred in hotspots for 28 farmland bird species. Over 14% of all national tree planting since 2014 has occurred in hotspots for six breeding wader species.

BirdWatch Ireland has analysed recent datasets of Coillte Forest Inventory data (2022)[2] and Private Forestry (afforestation on private land) (2021)[3] in Ireland. Details of all planting (species, year of planting and percentage of canopy) were extracted for each parcel of land, and an associated area of canopy for each species in each parcel was calculated.

These forestry data were overlaid with the Farmland Bird Hotspots and Breeding Farmland Wader Hotspots produced by the BirdWatch Ireland Hotspot mapping project 2022 (Kennedy *et al. in prep)* (see **Appendix 1** for a summary of the methodology), and with the Breeding Hen Harrier SPAs published by the National Parks and Wildlife Service.

[2] Coillte Teoranta (2019) *Coillte Forest Inventory* version 27 April 2022, Coillte Teoranta https://www.arcgis.com/home/item.html?id=51dfc0cfd9ce438eafead6d933786be9&view=list&sortOrder=desc&sortField=defaultFSOrder#overview [accessed November 23 2022]

[3] Forest Service, Private Forestry Data 2021 issued through Access to Information on the Environment request and made available to BirdWatch Ireland by Right to Know https://www.righttoknow.ie .

Spatial layers were produced highlighting recent planting (including restocking) by both Coillte and Private Forestry within these zones of interest. The area of land covered by such planting was also calculated. Where a parcel of land had multiple species planted, and the parcel was truncated by a zone of interest such as a Breeding Wader Hotspot, the same ratio of species in the overall parcel was used to calculate the area of each species in the part of the parcel within the Breeding Wader Hotspot.

The farmland bird hotspots comprise hotspots of all Red and Amber listed 28 farmland birds of conservation concern (See Table 1 in Appendix 1). The Breeding Wader hotspot comprises hotspots for 6 breeding waders (i.e. Curlew, Lapwing, Redshank, Dunlin, Golden Plover, Snipe). There is overlap in the spatial area of breeding wader hotspots and farmland bird hotspots.

The available data shows that since 2014, 60,800.91 hectare of land was planted by Coillte and 36,659.04 hectares of land was planted on private land and the total forest cover planted 2014 or after is 97,459.95 hectare.

BirdWatch Ireland overlaid the farmland bird hotspot maps with data on planting **since 2014** and found the following :

6538 hectares of forest, or 6.7% of the total, was planted in farmland bird hotspots of 28 red and amber listed farmland birds since 2014. (See Figure 1).

13,719 hectares of forest, or 14.1% of the total, was planted in breeding wader hotspots since 2014 (See Figure 2).

Total planting including replanting in hotspots for 28 red or amber listed farmland birds

- Coillte forestry planted 2014 or after, within Farmland Bird Hotspots: 3,433 [hectare]
- Percentage of Coillte forestry planted 2014 or after in Farmland Bird Hotspots: 5.6%
- Private forestry planted 2014 or after, within Farmland Bird Hotspots: 3,104 [hectare]
- Percentage of private forestry planted 2014 or after in Farmland Bird Hotspots: 8.5%
- Total forestry planted 2014 or after, within Farmland Bird Hotspots: 6,538 [hectare]
- Percentage of total forestry planted 2014 or after in Farmland Bird Hotspots: 6.7%

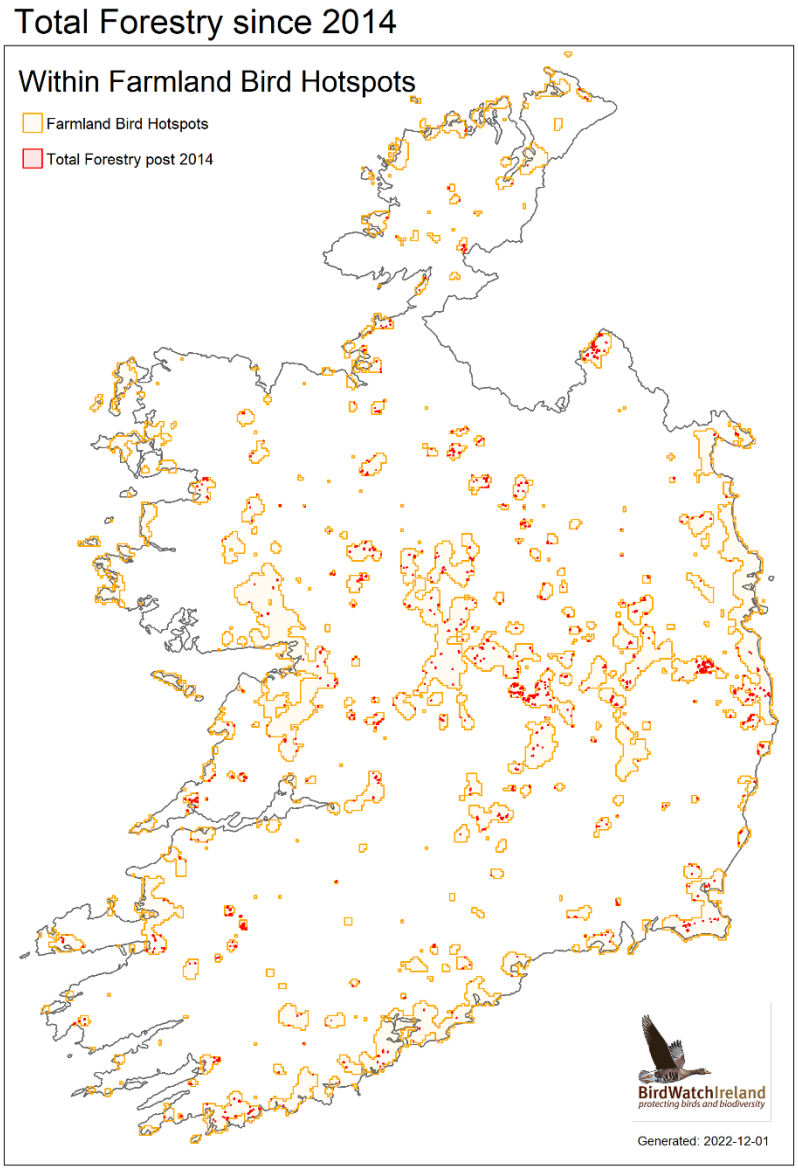

Figure 1: Total planting including replanting in hotspots for 28 farmland bird species since 2014

Total planting including replanting in Breeding Wader hotspots since 2014

- Coillte forest planted 2014 or after, within Breeding Farmland Wader Hotspots: 9,355 [hectare]
- Percentage of Coillte forest planted 2014 or after in Breeding Farmland Wader Hotspots: 15.4%
- Private forest planted 2014 or after, within Breeding Farmland Wader Hotspots: 4,364 [hectare]
- Percentage of private forest planted 2014 or after in Breeding Farmland Wader Hotspots: 11.9%
- **Total forest planted 2014 or after, within Breeding Farmland Wader Hotspots: 13,719 [hectare]**
- **Percentage of total forest planted 2014 or after in Breeding Farmland Wader Hotspots: 14.1%**

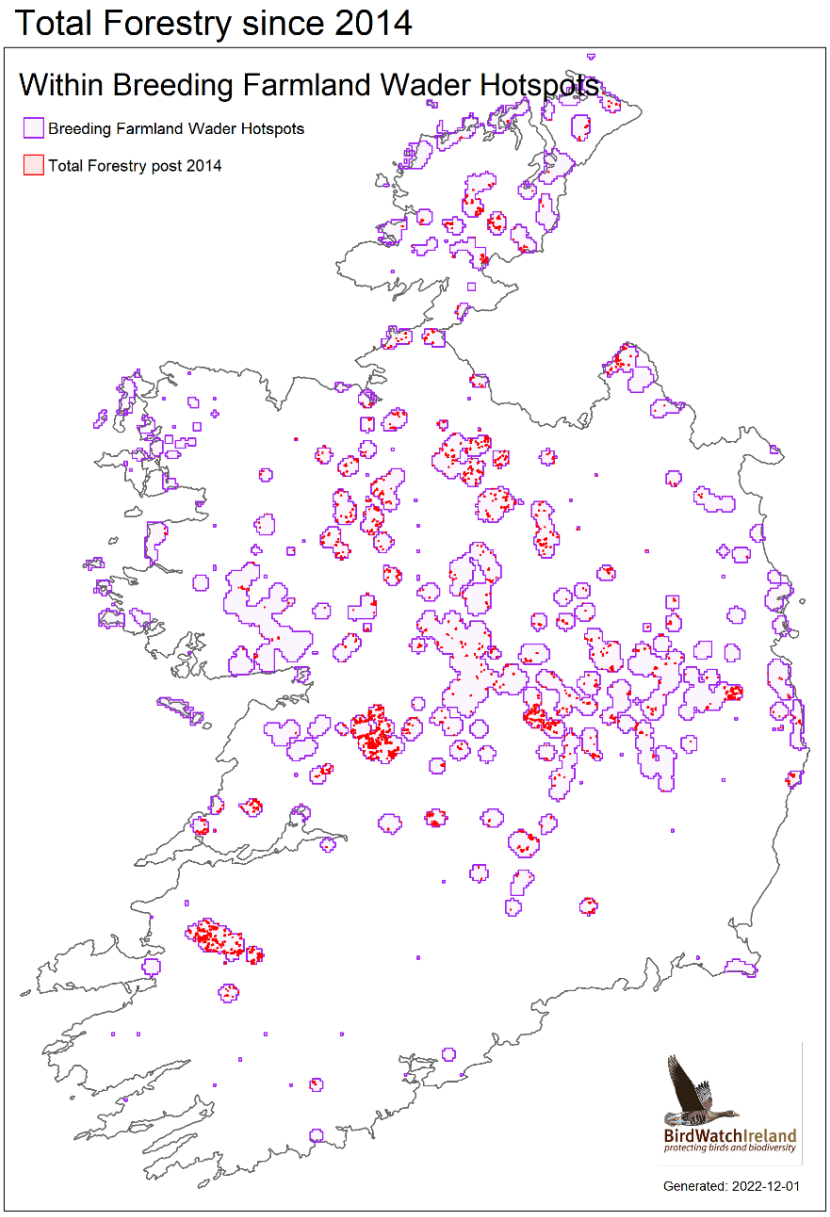

Figure 2: Total planting including replanting in breeding wader hotspots since 2014

BirdWatch Ireland mapping of afforestation and replanting in farmland bird hotspots shows that the 2014-2022 Forestry Programme has resulted in the loss of habitat for threatened farmland bird species including the most highly threatened breeding wader group of birds. The State's policies, processes and licensing system is not fit for purpose to protect habitats for farmland birds. It is actively resulting in the loss of habitat and decimation of bird populations.

The maps of farmland bird hotspots show a similar impact; many of the farmland birds selected for the hotspot mapping project are birds of open countryside; in addition to the impacts referred to above for breeding waders, other species which are likely to have been severely impacted by the loss of open ground include meadow pipit, skylark and whinchat. A full assessment of the red listed Birds of Conservation Concern in Ireland and their losses from the wider countryside where

afforestation/replanting has occurred should be undertaken to fully inform the potential impacts of these plantings.

2.0 Spatial analysis of historic planting in farmland bird and breeding wader hotspots

BirdWatch Ireland conducted a spatial analysis of tree planting on private lands and on Coillte property since 1990 overlaid on hotspots for farmland birds and breeding waders. The resulting data and maps show the following:

Farmland Bird Hotspots Overlap

- Coillte forest planted 1990 or after, within Farmland Bird Hotspots: 14,395 [hectare]
- Percentage of Coillte forest planted 1990 or after in Farmland Bird Hotspots: 5.6%
- Private forest planted 1990 or after, within Farmland Bird Hotspots: 22,640 [hectare]
- Percentage of private forest planted 1990 or after in Farmland Bird Hotspots: 8.0%
- Total forest planted 1990 or after, within Farmland Bird Hotspots: 37,036 [hectare]
- Percentage of total forest planted 1990 or after in Farmland Bird Hotspots: 6.9%

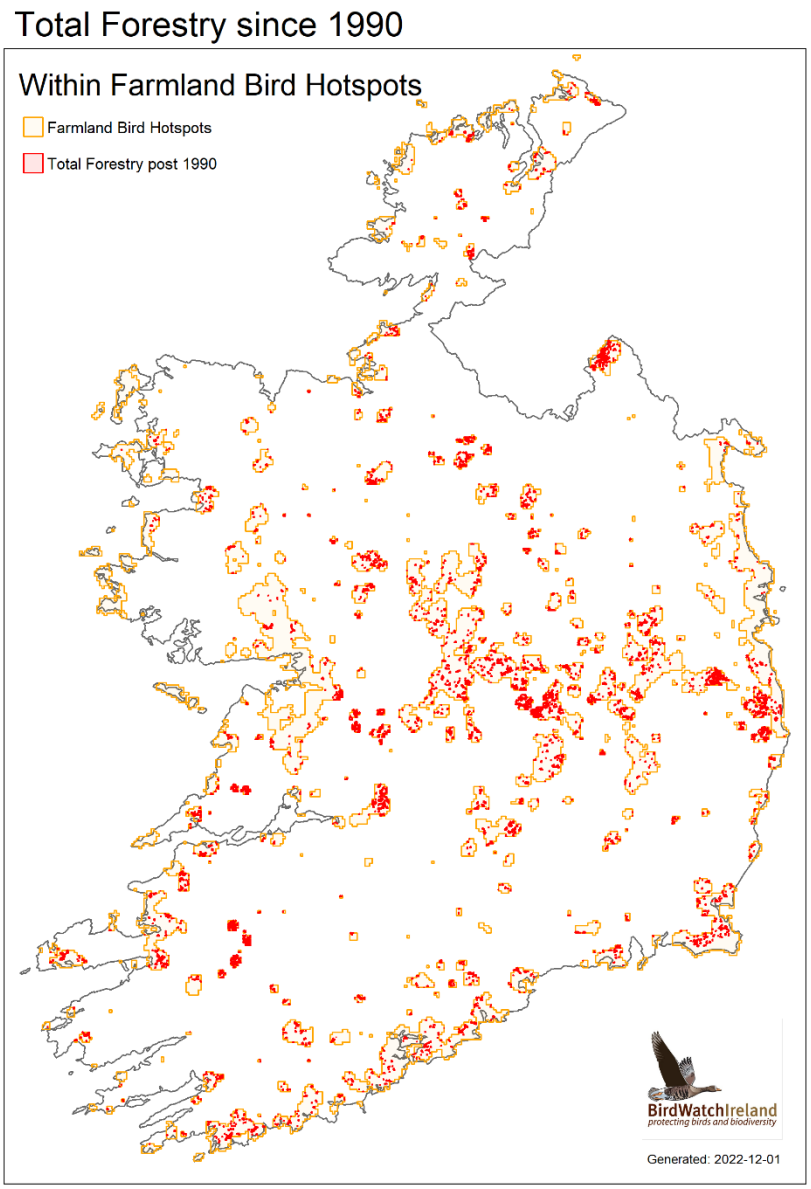

Figure 3: Total tree planting including replanting on farmland bird hotspots since 1990

Breeding Farmland Wader Hotspots Overlap

- Coillte forest planted 1990 or after, within Breeding Farmland Wader Hotspots: 38,671 [hectare]
- Percentage of Coillte forest planted 1990 or after in Breeding Farmland Wader Hotspots: 15.1%
- Private forest planted 1990 or after, within Breeding Farmland Wader Hotspots: 39,935 [hectare]
- Percentage of private forest planted 1990 or after in Breeding Farmland Wader Hotspots: 14.2%
- Total forest planted 1990 or after, within Breeding Farmland Wader Hotspots: 78,606 [hectare]
- Percentage of total forest planted 1990 or after in Breeding Farmland Wader Hotspots: 14.6%

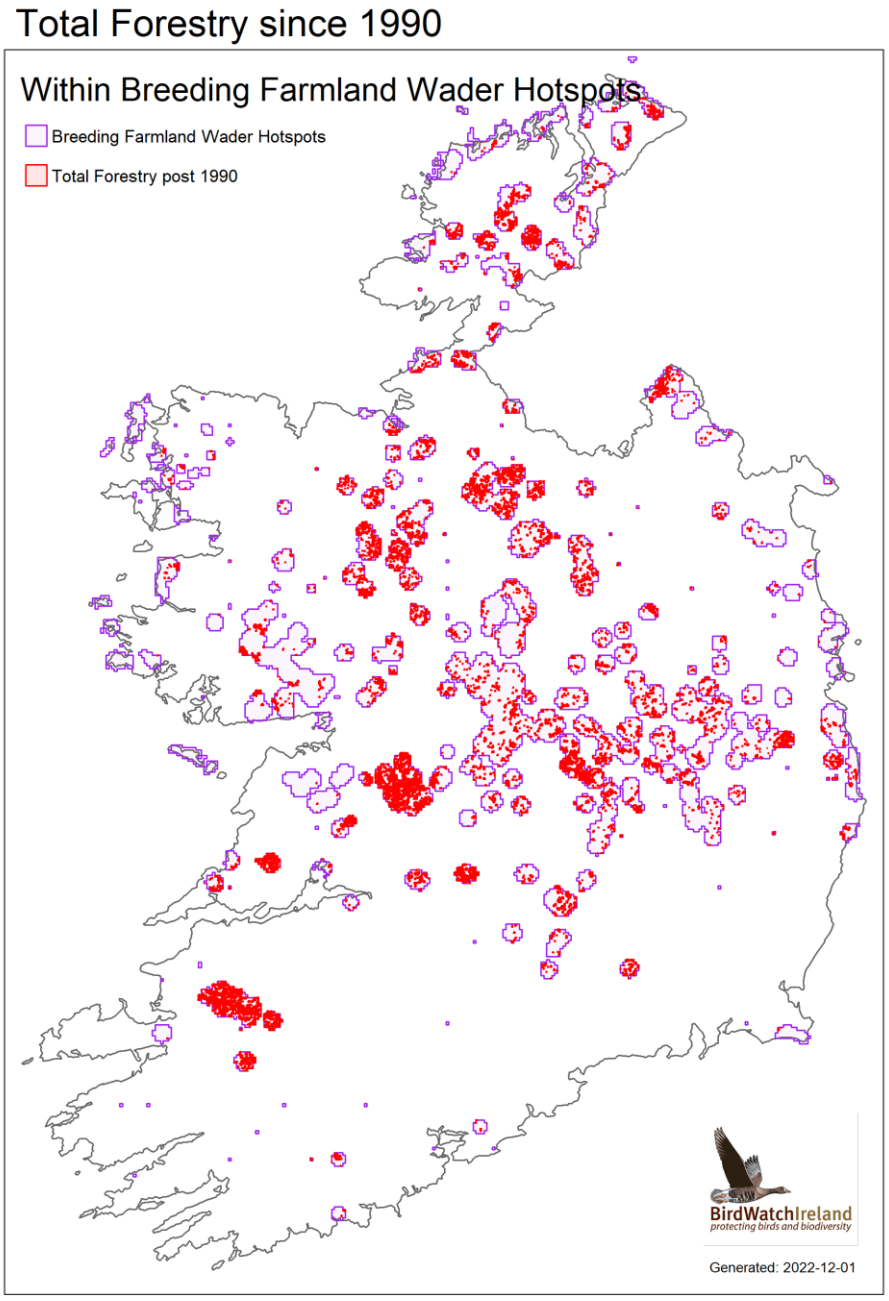

Figure 4: Total tree planting including replanting in breeding wader hotspots since 1990

The maps also clearly indicate that since 1990 alone, large areas of land important for breeding waders have been afforested. This not only causes direct loss of the open ground on which these species depend, but is also likely to have had a severe impact on productivity, as these forested areas provide habitat for the generalist predators (mainly foxes and corvids) known to predate the nests and young of breeding waders.

The loss and fragmentation of habitat and additional predation risk caused by these plantations is almost certainly a key driver of the declines highlighted by Gilbert *et al. (*2021), with almost all breeding waders having declined by more than 50% in the last 25 years.

3.0 Implications of the mapping work

The EIA Directive, 2011/92/EU, applies to all afforestation projects and requires Ireland to have a system that screens all projects for potential significance and that subjects significant applications to an EIA. Since 2014, there have been no EIAs of the numerous afforestation projects approved in the areas of high ecological value for open-habitat birds and documented in our submission. This is despite the fact that, following the ruling of the Court of Justice in Case C-392/96, *Commission v Ireland,* the responsible Minister is required to ensure that all sub-threshold afforestation projects are screened to require an EIA where, inter alia, they are likely to affect sensitive areas or have significant cumulative effects. As our submission shows, the areas of high ecological value for open-habitat birds are objectively sensitive and are also very vulnerable to the cumulative effects of forestry.

It is also our view that the issuance of licenses by the Minister during the period 2014-2022 for afforestation in hotspots for farmland birds including breeding waders is a potential breach of Article 20(3)(b)(iv) of **Regulation 20(3) of SI 191 of 2017. This article states** The Minister shall refuse an application if, in his or her opinion, the proposed development— is likely to have significant adverse impact on *inter alia* nature conservation or a European site. The screening and ecological assessment systems used by the Forest Service are inadequate and are failing to pick up important areas for birds. There is no change to this process outlined in the new IFSIP.

4.0 Impact of afforestation on threatened farmland bird species

Afforestation causes direct loss of habitat and fragmentation of open landscapes, which are often important for a range of threatened farmland birds, particularly ground nesting waders such as Curlew, Snipe and Lapwing. These species are all on the Red List of Birds of Conservation Concern in Ireland, due to declines in population and/or range[4]. Several studies have shown that breeding wader populations are negatively impacted by proximity to forest edge. In Scotland, Golden Plover and Dunlin abundances were lower near to forest edges[5], with the effects strongest within 700m[6]; Amar *et al*. report adverse impacts on Golden Plover, Snipe and Lapwing[7] and Curlew populations have been shown to be inversely related to the occurrence of woodland in some sites in Scotland[8]. Forestry provides cover for generalist predators such as Corvids and Red Fox, which predate the nests and young of breeding waders[9][10][11] and it has been suggested that the negative impacts of forestry are associated with increased predation risk, consistent with predators ranging out from forestry[12]. Douglas *et al*. (2014) reports that that 5000 Curlew pairs in Scotland may have been lost since 1945 due to afforestation of open ground.

[4] Gilbert, G, Stanbury, A., Lewis, L., (2021) Birds of Conservation Concern in Ireland 4: 2020–2026 *Irish Birds* 43: 1–22 available here https://birdwatchireland.ie/birds-of-conservation-concern-in-ireland/

[5] Hancock, M.H., Grant, M.C. and Wilson, J.D., 2009. Associations between distance to forest and spatial and temporal variation in abundance of key peatland breeding bird species. *Bird Study*, *56*(1), pp.53-64.

[6] Wilson, J.D., Anderson, R., Bailey, S., Chetcuti, J., Cowie, N.R., Hancock, M.H., Quine, C.P., Russell, N., Stephen, L. and Thompson, D.B., 2014. Modelling edge effects of mature forest plantations on peatland waders informs landscape-scale conservation. *Journal of Applied Ecology*, *51*(1), pp.204-213.

[7] Amar, A., Grant, M., Buchanan, G., Sim, I., Wilson, J., Pearce-Higgins, J.W. and Redpath, S., 2011. Exploring the relationships between wader declines and current land-use in the British uplands. *Bird Study*, *58*(1), pp.13-26.

[8] Douglas, D.J., Bellamy, P.E., Stephen, L.S., Pearce–Higgins, J.W., Wilson, J.D. and Grant, M.C., 2014. Upland land use predicts population decline in a globally near-threatened wader. *Journal of Applied Ecology*, *51*(1), pp.194-203.

[9] Laidlaw, R., Smart, J., Ewing, H., Franks, S., Belting, H., Donaldson, L., Hilton, G., Hiscock, N., Hoodless, A., Hughes, B. and Jarrett, N., 2021. Predator management for breeding waders: a review of current evidence and priority knowledge gaps. *Wader Study*, *128*(1), pp.44-55.

[10] Fletcher, K., Aebischer, N.J., Baines, D., Foster, R. and 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*(2), pp.263-272.

[11] Mason, L.R., Smart, J. and Drewitt, A.L. (2018), Tracking day and night provides insights into the relative importance of different wader chick predators. Ibis, 160: 71-88.

[12] Hancock, M.H., Klein, D. and Cowie, N.R., 2020. Guild-level responses by mammalian predators to afforestation and subsequent restoration in a formerly treeless peatland landscape. *Restoration Ecology*, *28*(5), pp.1113-1123.

5.0 Review of the environmental assessment documents associated with the Forest Strategy and Forest Strategy Implementation Plan

BirdWatch Ireland reviewed the environmental assessment documents associated with the Forest Strategy and the Implementation Plan.

5.1 Gaps in the assessments and failure to assess impacts to threatened bird species.

5.1.1 Failure to consider or assess impacts of IFSIP on Birds of Conservation Concern in Ireland

Of most significant concern to BirdWatch Ireland is the failure of the authors of the draft Environmental Report to provide any assessment whatsoever of the impacts of the IFSIP on Birds of Conservation Concern in Ireland. This is not acceptable. In **Appendix 2** we provide a spreadsheet which highlights the bird species selected according to habitat type and their interaction with forestry. This table was initially produced as part of the 2016 BirdWatch Ireland Bird Forestry Sensitivity Map Feasibility Study part-funded by the Forest Service. It was recently updated to account for changes in the BoCCI status of bird species but also as part of a risk assessment in response to the scale of the proposed state investment in the next IFSIP coupled with lucrative tax breaks could suggest that land previously considered as unattractive for afforestation could now become attractive further threatening bird species. Critically, we suggest that this type of table should be produced by the authors of the environmental assessment to ensure a comprehensive assessment as well as proven mitigation. Otherwise there are lacunae in the assessments.

5.1.2 Failure to consider or assess impacts of IFSIP on Annex 1 species including in the wider countryside

The NIS screens out impacts of the IFSIP to most Annex 1 bird species and conservation interests of Special Protection Areas, screening in Hen Harrier and Merlin only. The NIS says that Hen harrier SPA are found in Donegal, Leitrim, Cavan which is not true. This is a fundamental error and highlights the lack of research and precision by the authors. Mapping shows that the total forestry planted 2014 or after, within Breeding Hen Harrier SPAs is 12,382 [hectare] or 12.7% of of total forestry replanted despite there being a moratorium on planting in place in that time period worsening the conservation status of this species due to the impacts of predation associated with forestry.

Table 4 in the NIS contains errors. There are a number of Annex 1 bird species and conservation interests that are impacted by conversion to forestry and forestry activities whereby Table 4 states that there are no impacts (eg. Dublin, Golden Plover, Curlew) and therefore were excluded erroneously from assessment. In addition, there are several other Annex 1 species and species that are conservation interests that should be included (Kingfisher, Greenland White-fronted Goose, White-tailed Eagle and a range of wintering waterbirds who forage on ex-situ sites outside of SPAs but loss of those habitats to afforestation could result in adverse impacts to the integrity of the SPA network. Please see the table in Appendix 3, which highlights the Annex 1 species (in blue) that were left out and other species also impacted by forestry activities that should be included. We suggest though that considering the scale of the investment in the forestry programme that a wider assessment of species is needed and that the Table in Appendix 2 should inform the NIS and the Environmental report for impacts to bird species from forestry activities.

The impacts of forestry to Greenland White-Fronted Goose are highlighted in the 30-year review of Greenland White-fronted Geese by Burke et al[13]. In 2020 BirdWatch Ireland reviewed an application for afforestation license on a site known to be important for this species near Lough Mask in Co Mayo. The area is used by the Errif and Derrycraff flock of White-fronts as documented in the 2018-2019 Greenland White-fronted goose report. There is a need for the forest licensing system to include data layers which identify important areas for birds in the wider countryside to assist in the targeting of survey work to underpin applications for afforestation.

It is surprising to see so many bird species left out of this assessment. This raises concerns about the quality of the work overall. The assessment carried out under Article 6(3) of the Habitats Directive cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned (see, to that effect, *Sweetman and Others* EU:C:2013:220, paragraph 44 and the case-law cited).

In no way can this assessment be considered to be in line with Article 6.3 of the Habitats Directive or ECJ case law.

5.1.3 Failure to adequately assess impacts on Marsh Fritillary and to mitigate impacts to Molinia Meadows

In section 4.2.2, we will go into detail on concerns in relation to the Land Types for Afforestation document but refer to it now in the context of inadequate assessment of the impacts on Marsh Fritillary and Molinia Meadows.

In relation to Marsh Fritillary, the NIS states that there are no pressures and threats listed for it from activities related to forestry but Article 17 report clearly states that Abandonment of management/use of other agricultural and agroforestry systems (all except grassland) (code: A07) is a medium level pressure and threat to Marsh Fritillary and Conversion to forest from other land uses, or afforestation (excluding drainage) is a high level pressure and threat to the species (code : BO1). This is another error in the NIS that needs to be addressed and assessed properly.

In relation to the mitigation of impacts to Molinia meadows which is correctly assessed as a habitat which could suffer adverse impacts due to afforestation activities, the mitigation measures proposed are weak and general. Section 4.2 provides a review commissioned by BirdWatch Ireland into the Land Types for Afforestation document. The outcome of this review shows that the Land Types for Afforestation document, if used by applicants and foresters, could result in the afforestation of Molinia meadows and other Annex 1 habitats outside of Natura sites.

There are no adequate mitigation measures to avoid the planting of Annex 1 habitats.

5.1.4 The Native Tree Area Scheme

The Native Tree Areas Scheme is one that carries potential to create biodiversity rich woodland across the country. In this scheme new legislation was signed into law in 2022, which removes the licensing requirement for the planting of small native forests. It is proposed to allow landowners to avail of the

[13] Burke,B., Egan, F., Norriss, D., Wilson H.J., Walsh, A., (2014) A review of Greenland White-fronted Geese in Ireland 1982/83 – 2011/12, Department of Arts, Heritage and the Gaeltacht

exemption for the creation of small native forests up to one hectare and native forests for water protection through a scheme which it is intended to offer through the Draft IFSIP.

However, because this scheme will operate outside the normal regulations, without any environmental assessment; as such it is very worrying from the perspective of the ecological needs of wild birds. The list of areas excluded from the scheme are the same that are in place for the national Forestry Programme 2014-2022. We have shown in our research how even regulated afforestation activities is resulting in the loss of habitat for Red and Amber listed Farmland Birds, especially breeding waders, during the period of the current Forestry Programme 2014-2020. **We are in no doubt that this Scheme will result in the significant further loss of habitat for these species due to loss of habitat and the increased risk of predation from foxes, corvids and other predators because areas important for farmland birds threatened by afforestation have not been excluded.** The Environmental Report fails to assess this scheme against the conservation needs of Birds of Conservation Concern and the NIS rules out any impacts to Natura sites, though as we have shown above there are many failings with the Appropriate Assessment.

BirdWatch Ireland supports the overall aims of the Native Tree Area Scheme to increase native woodland but we oppose the current iteration of it, as it fails to acknowledge or avoid the impact to threatened farmland birds. This scheme needs to be revised as otherwise it is in breach of Article 4.4 of the Birds Directive.

6.2 Mitigation Measures

A statutory requirement of the IFSIP is:
"Take the appropriate steps to avoid, in candidate Special Protection Areas, pollution and deterioration of habitats and any disturbances affecting the birds insofar as these would be significant in relation to the objectives of Article 4 of the Birds Directive, outside those areas, **strive to avoid pollution or deterioration of habitats, and take appropriate enforcement action".**

The state is not striving to avoid deterioration of habitats outside of Natura sites. The state is failing abysmally to do this as our evidence shows with the 27% of afforestation between 2014-2022 occurring within farmland bird and breeding wader hotspots.

There are no adequate measures proposed to avoid planting of important areas for birds of conservation concern or Annex 1 species as regards the IFSIPs schemes for **Afforestation / Reforestation / Forest Creation / Reconstitution / Any New Planting.**

The following measures listed in Table 9 of the NIS do not mitigate the impacts to threatened bird species or habitats. This measure should be amended to include Prioritized Action Framework species, such as breeding waders.

An appropriate ecological assessment is required in sites where the habitat of Annex I bird species or Annex II species occur or are likely to occur to investigate the potential for where they occur.

Consideration should be given to timing of ecological surveys

The draft IFSIP must include built in mitigation that guarantees the avoidance of afforestation of habitats for threatened Red and Amber Listed Birds of Conservation Concern.

6.2.1 Land Types for Afforestation Guidance as a Mitigation Tool

Birdwatch Ireland undertook a review of the Land Types for Afforestation document which is used in the current Forestry Programme 2014-2022 and the IFSIP 2023-2030 as a mitigation measure to avoid afforestation of important habitats. The review consisted of an assessment of the land types proposed for afforestation to determine if they corresponded with Annex 1 habitat types and as important habitats for wild birds. Dr. Rory Hodd, botanist and ecologist, was commissioned to undertake the botanical assessment and BirdWatch Ireland staff undertook the assessment for birds.

The full report of Dr. Hodd is in Appendix 4. Figure 5 is his assessment of the Land Types and expert opinion on the potential correlation of these with Annex 1 habitats. Six of the 12 Land Types correlate with Annex 1 habitats. In the case of a number of the land types described as suitable for GPC 2-12 there is potential that areas of the Annex habitats 6210 Calcareous grassland, *6230 Species-rich *Nardus* grassland, 6410 *Molinia* meadows and 7230 Alkaline fen may be designated as suitable for afforestation, without realising their ecological value.

Dr Hodd states: "Of the three categories of land described as suitable for afforestation under GPC 1, two of them refer to land which in all or most cases would be classified as Annex I 4010 Wet heath (cf. Perrin et al., 2014), albeit degraded wet heath in the case of category 1, but with restoration potential. Peat depth does not have any bearing on whether a habitat is classified as Annex I wet heath or bog, but rather the vegetation is the determining factor, and wet heath and, indeed, blanket bog, can occur on shallow peat with little dwarf shrub cover".

In terms of the site assessment methodology, it seems sound in most aspects. One concern exists over the minimum mapping area of 0.2 ha, with unsuitable land areas below this threshold not excluded from the afforestation application. Habitats often occur as a complex mosaic and important areas of habitat can be significantly less than 0.2 ha in area, particularly areas of species-rich grassland, which are easily overlooked. The number of sampling plots is sufficient and sampling methodology is basic but adequate, although the results of the assessment should be included publicly with the application, so that all relevant data are available, for greater transparency, and it is not clear whether these assessments are actually carried out regularly. The method of assessing suitability based on R and N Ellenberg values does not present any obvious potential ecological issues.

One deficiency of the assessment is that it doesn't consider bryophyte cover as vegetation cover and does not take it into account in any way. If cover of *Sphagnum* were assessed that would reduce the chances of afforesting wet heath with good recovery potential, as *Sphagnum* is often an important component of wet heath vegetation. Furthermore, the methodology does not take into account presence of protected species of vascular plant and bryophyte, including those listed on the Flora Protection Order (FPO) or on Annexes of the EU Habitats Directive, or of other threatened species of flora and fauna, such as Marsh Fritillary butterfly and Kerry Slug. There exists very serious risk that unless a suitably qualified ecologist is assessing these habitats at the right time of the year using the correct methodologies, these habitats and the species they support as well as their ecological functions could be lost to tree plantations.

In addition, all of these habitats would support different farmland birds of conservation concern.

The Land Types for Afforestation document is listed in the draft IFSIP as a pre-existing mitigation measure when it could actually be the driver of loss of habitat and species in the wider countryside.

GPC 2-12			
Land type	**Potential annex**	**Eunis habitat**	**Notes**
Cultivated and fertilised fields used for tillage, crops and pasture grazing, and land reclaimed for grazing prior to the 1st January 2011.	None	E2.11, E2.6, I1	This land is likely to have little botanical value in most instances and does not correspond to any Annex habitats
Fields and dry grassland hill sites where the parent material is limestone or Silurian shale, or where steeper slopes limit the use of agricultural machinery.	6210 Dry calcareous grassland or *6230 Species-rich Nardus grassland	E1.26, E1.7, E2.11	This could cover a number of grassland types, including important calcareous and species-rich Nardus grasslands. In particular, high quality grasslands survive on steep slopes where agricultural machinery can't reach, as the land is more difficult to improve
Pasture dominated by soft rush, where poorer drainage restricts agricultural activity.	None	E3.41, E3.44	These are likely to be of relatively low botanical diversity, although they may be of importance for other wildlife
Areas of Midland fen peats that have been improved, and peats previously reclaimed for agriculture and now supporting rush pasture vegetation.	None	Numeorus potential categories within E2, E3	This land is likely to have little botanical diversity in general and does not correspond to any Annex habitats. Although it would previously have been important Annex habitat, it is unlikely to be possible to restore
Lands showing evidence of agricultural improvement, either through the soil conditioning of animal husbandry / manuring or historic crop production.	None	E2.11, E2.6	This land is likely to have little botanical value and does not correspond to any Annex habitats
Old hill pastures composed predominately of velvet bent, tufted hair-grass, sheep's fescue, Yorkshire-fog and sweet vernal-grass.	*6230 Species-rich Nardus grassland	E1.7	Species-rich grasslands, including examples assignable to *6230 could fall within this category, as Nardus does not need to be be present to be defined as the annex habitat and species-rich grassland can look unremarkable without an experienced botanical eye
Sites with the following species of rush: sharp-flowered rush, compact rush, bulbous rush and soft rush.	6410 Molinia meadow or 7230 Alkaline fen	Could correspond to a number of habitats	This is a very wide criterion, as those species of rush can occur in a wide range of damp habitats, sharp-flowered rush can occur in upland flushes, which can correspond to Annex I alkaline fen, while compact rush is an indicator species of Annex Molinia meadow, altough both species also occur in habitat of lower conservation priority
Drier sites on hillsides, comprising dense bracken.	None	E5.31	This habitat would be of low botanical value, but acts in some instances as an important stage in native woodland re-establishment
If present, purple moor-grass should occur with better pasture grasses, i.e. sweet vernal-grass or bent grass, or with abundant soft rush, and should not constitute heathland-type vegetation.	6410 Molinia meadow	E3.51	Much vegetation covered by this category would be species poor and of limited conservation value, but important areas of annex Molinia meadow would also be covered by this category
GPC 1			
Sites purely comprising purple moor-grass and with an average peat depth of less than 50 cm.	4010 Wet heath	F4.13	These represent degraded examples of Annex wet heath in most situations and are still considered to qualify as the Annex habitat, peat depth is irrelevant in practice
Sites comprising purple moor-grass combined with bog-myrtle, and with an average peat depth of less than 50 cm.	4010 Wet heath	F4.13	If bog myrtle is present with Molinia on shallow peat then it is Annex habitat
Sites comprising purple moor-grass with a proportion of higher scoring plants such as soft rush, sharp-flowered rush, sweet vernal-grass, bent grass, bramble, gorse or bracken.	6410 Molinia meadow or 4010 Wet heath	E3.51, F4.13	Although it may be of lower botanical value in many instances, this could potentially be either degraded wet heath or Annex Molinia meadow

Figure 5: Assessment by Dr. Rory Hodd of the correlation between the Land Types for Afforestation and Annex 1 habitats.

7.0 State Forestry Programme 2104-2022 has breached the Birds Directive and the conditions of the 2014 State Aid Decision on the Forestry Programme

In relation to open-habitat birds such as the Hen Harrier, Curlew, Lapwing, Redshank and Common Snipe, the Minister's current screening arrangements and practices for afforestation proposals fall seriously short of what is required by the Wild Birds Directive, 2009/147/EC, the EIA Directive, 2011/92/EU and the environmental conditions in the state aid decision that has governed recent tree-planting, namely S.A.39783 (2014/N).

In addition, the environmental impact of the proposed new forestry plan and programme is not properly examined in the SEA Report and falls short of what is required by the SEA Directive, 2001/42/EC.

In Case C-418/04, *Commission v Ireland*, the Court of Justice handed down a ruling on the duty of EU Member States under Article 4(4), second sentence of the Wild Birds Directive to strive to avoid pollution or deterioration of habitats outside of special protection areas. This duty is especially important for open-habitat birds which depend to a great extent on the condition of habitats in areas of high ecological value outside of SPAs. The Court referred to the need for a serious attempt to protect habitats found outside SPAs, and in paragraphs 190 and 191 explained that his implied targeted action and measures that constitute a coherent whole.

A screening system that results in the patterns of haphazard afforestation seen in areas crucial to open-habitat birds cannot be considered to be targeted at the aim of avoiding habitat deterioration. Nor can the screening system be considered to form a coherent whole with other measures to avoid the deterioration of these birds' habitats.

Since 2014, there have been no EIAs of the numerous afforestation projects approved in the areas of high ecological value for open-habitat birds. This is despite the fact that, following the ruling of the Court of Justice in Case C-392/96, *Commission v Ireland,* the responsible Minister is required to ensure that all sub-threshold afforestation projects are screened where they are likely to affect sensitive areas or have significant cumulative effects. The areas of high ecological value for open-habitat birds are objectively sensitive and are also very vulnerable to the cumulative effects of forestry.

Clause 36 of the 2014 state aid decision stipulated that negative effects on areas of high ecological value including areas under high natural value farming were to be avoided. As is shown by previous research[14][15][16] and the research presented in this submission, this requirement has not been respected – once again highlighting the deficiencies in screening.

The ongoing failures described above are not addressed in the draft IFSIP SEA Report and the Report is not a reliable source of key information required to be provided under Annex 1 of the SEA Directive.

To bring about compliance, it is now imperative that the Minister brings the SEA process into line with the requirements of the SEA Directive, amends the forestry plan and programme, reforms the screening system and takes coherent action to stop and reverse forestry-related deterioration of habitats crucial to open-habitat birds.

[14] Kelly, F, and Duggan, O,. (2019) A Cross Check of Safeguards for Birds & Other Biodiversity within Ireland's Forestry Programme 2014-2020, BirdWatch Ireland, Kilcoole, Co. Wicklow, unpublished available here https://birdwatchireland.ie/app/uploads/2022/07/Kelly-2019-BWI-Cross-Check-of-Env-Safeguards-in-Irish-Forestry-.pdf

[15] Kelly, F., (2019) Greening Irish Forestry- Recommendations for Nature Friendly Forestry. BirdWatch Ireland, Kilcoole, Co Wicklow unpublished available here https://birdwatchireland.ie/app/uploads/2019/05/BirdWatch-Ireland-2019-Greening-Irish-Forestry.pdf

[16] Corkery, I, et al. (2015) Overlap of afforestation and birds of conservation concern on farmland habitat. Teagasc Biodiversity Conference 2015. Ed. D Ó hUallacháin and J Finn. Wexford: Teagasc, 2015. 74-75.

7.1 Irish Forestry policy 2014-2022 and the draft IFSIP are not meeting the requirements of the Birds Directive

The failure to protect birds and their habitats within the wider countryside from the negative impacts of afforestation and forestry activities is a breach of the Birds Directive. The lack of protection for birds outside of SPA's is a threat to Annex I species which occur outside of their protected areas such Hen Harrier, Merlin, Golden Plover, Bewick's Swan, Greenland White-fronted Goose, Dunlin, Red-Throated Diver, Kingfisher etc [17]. Afforestation is also a threat to farmland birds of conservation concern in Ireland.[18, 19]

Article 1 and Article 2 of the Birds Directive require member states to put in place measures to protect the populations of all naturally occurring wild birds in their jurisdiction. Article 3 requires that member states "*take the requisite measures to preserve, maintain or re-establish a sufficient diversity and area of habitats for all*" …naturally occurring wild bird species. Measures should include "*the preservation, maintenance and re-establishment of biotopes and habitats shall include*" …not only the "*creation of protected areas*" but also the "*upkeep and management in accordance with the ecological needs of habitats inside and outside the protected zones*," the "*re-establishment of destroyed biotopes*" and the "*creation of biotopes*."

Outside of protected areas the second sentence of Article 4 (4) also requires that member states "*shall also strive to avoid pollution or deterioration of habitats*." Ireland has a poor record in implementing the protection of wild bird habitats in the wider countryside. A demonstration of this is the Fourth complaint in the judgment of the Court of Justice of the European Union (CJEU) in Case C 418/04 Commission v Ireland 'The Birds Case,'[20] in which the Court found that Ireland had failed to transpose and apply fully and correctly the second sentence of Article 4(4) of the Birds Directive.

As a sector which is a leading threat/pressure on numerous bird species and their habitats in the wider countryside the legal implications of many of the points within the ruling of 'The Birds Case' are directly applicable to the Forest Service. The Court found that in the measures taken by Ireland are partial, isolated measures, only some of which promote conservation of the bird populations concerned, but which do not constitute a coherent whole: "*In the Commissions view, several of the domestic measures transposing the second sentence of Article 4(4) are partial and numerous lacunae remain*[21]."

The Forest Service has failed to put in place adequate objectives, processes and legal requirements to protect bird habitats outside of the SPA network. **There is no mechanism in place in the draft IFSIP to identify whether a prospective site for afforestation supports sensitive bird species and to avoid afforestation of these sites as our evidence shows in earlier maps of afforested breeding wader and farmland bird hotspots.** This was highlighted in the NIS of the Forestry Programme 2014-2022 and nothing was done about it.

[17] NPWS (2019) Ireland's Summary Report for the period 2013 – 2019 under Article 12 of the Birds Directive. Dublin: National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht.
[18] Copland, A. S., Crowe, O., Wilson, M. W., & O'Halloran, J. (2012). Habitat associations of Eurasian Skylarks Alauda arvensis breeding on Irish farmland and implications for agri-environment planning. Bird study, 59(2), 155-165.
[19] Buchanan, G. M., Pearce-Higgins, J. W., Wotton, S. R., Grant, M. C., & Whitfield, D. P. (2003). Correlates of the change in Ring Ouzel Turdus torquatus abundance in Scotland from 1988–91 to 1999. Bird Study, 50(2), 97-105
[20] Ruling of the Court of Justice of the European Union in Case C-117/00 Commission of the European Communities v Ireland https://www.informea.org/en/court-decision/commission-european-communities-v-ireland
[21] Ruling of the Court of Justice of the European Union in Case C-418/04 Commission v Ireland 'The Birds Case,' http://curia.europa.eu/juris/showPdf.jsf;jsessionid=9ea7d0f130d5f71ac4cf6dcf4d1cb6abcb878b13a8cb.e34KaxiLc3eQc40LaxqMbN4PaN8Oe0?text=&docid=71717&pageIndex=0&doclang=en&mode=lst&dir=&occ=first&part=1&cid=772743

While there are limited measures in place to afford protection for Hen harrier and Curlew we have concerns about their adequacy. For all other species there are no measures in place which have any specific ornithological content.

The Land Types for Afforestation guidelines only protect a limited number of Annex I habitats. While these measures may benefit some bird species by default depending on the ecological skills of those reviewing and assessing the site, this guidance document on its own is not targeted enough to ensure the conservation of birds, the majority of important undesignated bird habitats or the coherence between these habitats at a landscape level. The Forest Service's existing measures are partial and isolated and lack the specific ornithological content needed to fulfil the requirements of Article 4(4). **This lacunae in the current environmental safeguards is resulting in the loss of and deterioration of habitats due to afforestation and silviculture.**

Although the second sentence of Article 4(4) of the Birds Directive does not necessarily require that certain results be guaranteed, Member States must seriously set themselves the objective of protecting habitats outside the SPAs. **The notion of striving implies that all reasonable measures must be taken to achieve the success that is sought. On this point Advocate General Kokott opinioned that "*in order for the Member States authorities at all levels to be aware of this objective in relation to their activities, in particular in connection with authorisation procedures, but not only in that respect, it must be set out in sufficiently clear terms in national law*[22]."**

This was noted by the Advocate General in point 111 of her Opinion, serious endeavours, namely the taking of all reasonable measures to achieve the success being sought, require targeted action: "*The framework for determining what is reasonable is set out in Article 2 of the Birds Directive. Under that article, Member States are to take the requisite measures to maintain the population of all European bird species which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements, or to adapt the population of these species to that level*."

"*Consequently, the measures taken in connection with endeavours made pursuant to the second paragraph of Article 4(4) of the Birds Directive must be arranged — on an ornithological basis — in such a way that they — in conjunction with other measures required under the directive — restore or maintain the level of the relevant species required under Article 2. When making the evaluation pursuant to Article 2, account must be taken of the extent to which and the condition in which the species rely on habitats and how the conservation thereof relates to the other requirements referred to in Article 2*."

The failure of the Forest Service to implement procedures and guidelines to protect vulnerable birds and their habitats in the broader countryside is a failure to achieve the duty of diligence or best endeavours which is required by the second sentence of Article 4(4) of the Birds Directive. **The Forest Service must implement specific actions which lay down protections which are specifically ornithological and which in conjunction with other measures required under the Birds Directive restore or maintain the level of the relevant species required under Article 2 of the Directive.**

7.2 The State Aid Decision for the 2014-2022 Forestry Programme

The European Commission approved the Irish Forestry Programme 2014-2020 and its €200 million budget, having concluded that it was compatible with the internal market pursuant to Article

[22] Opinion of Advocate General Kokott (2006) to CJEU on Case C-418/04: http://bit.ly/2kscfJA

107(3)(c) of the Treaty on the Functioning of the European Union[23]. However, within the State Aid Decision of Ireland's Forestry Programme 2014 – 2020 (39783 (2014/N))[24] eighty-nine conditions were laid down by the Commission to which the programme must comply. This includes **twelve environmental safeguards** relating to National and EU environmental law. The report published by BirdWatch Ireland

The fact that 13,719 hectares or 14.1% of forestry has been planted since 2014, the period of the current forestry programme, in breeding wader hotspots in Ireland with severe consequences for this most threatened of species groups and **that** 6,538 hectares of forestry has been planted since 2014 in farmland bird hotspots is evidence that Ireland is in breach of Article 1, 2, 3, 4.4 and 5 of the Birds Directive. It is failing to protect birds in the wider countryside and failing to set out a general system of protection for breeding birds.

This is a breach of the following State Aid Conditions:

Point 34 Afforestation will be avoided on environmentally unsuitable suites.
Point 36 The inappropriate afforestation of sensitive habitats such as peat lands and wetlands will be avoided, as well as the negative effects on areas of high ecological value including areas under high natural value farming.
Point 40 The environmental requirements and the ecological infrastructure will be considered in a coherent and integrated manner, in order to achieve the indicated environmental aims in relation to soil and water quality, biodiversity and ecosystems protection.
Point 56 The Irish Authorities foresee protection measures to respect environmental sensitivities, including the protection of habitats and species (including NATURA sites, Freshwater Pearl Mussel and Hen Harrier), water quality (including fisheries sensitive areas, water body status, acid sensitive areas), archaeology, landscape, and local sensitivities.

8.0 Conclusions:
Our conclusions are that the documents in consultation, in particular the SEA Report and the Natura 2000 statement, fail to assess impacts in accordance with the SEA Directive and the Habitats Directive. The evidence we submit shows that Ireland has failed and is failing to comply with the Birds Directive by causing deterioration of important bird habitats, in particular those used by open-habitat birds. It has also systematically failed to comply with environmental conditions of the last state aid decision, including those relating to avoidance of negative effects on areas of high ecological value, including high natural value areas used for farming. This failure is closely linked to a systematic failure to adequately screen afforestation projects under the EIA Directive, having regard to the requirement to take account of sensitive areas and cumulative effects. None of these failures are addressed in the SEA Report and this document also fails to present mitigation measures which would avoid similar negative effects arising under a new forestry plan and programme – or prevent non-compliance with state aid conditions similar to those that were set out in 2014.

To bring about compliance, it is now imperative that the Minister brings the SEA process into line with the requirements of the SEA Directive, amends the forestry plan and programme, reforms the screening system and takes coherent action to stop and reverse forestry-related deterioration of habitats crucial to open-habitat birds and other habitats important for nature conservation.

[23] European Commission (2012) Treaty on European Union and the Treaty on the Functioning of the European Union 2012/C 326/01: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A12012E
[24] State aid/Ireland Forestry Programme 2014 – 2020: Ireland SA. 39783 (2014/N) – IRL Afforestation and Creation of Woodlands http://bit.ly/2AC08he

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Appendix 1: BirdWatch Ireland Farmland Bird hot spot mapping (Kennedy et al *in prep)*

BirdWatch Ireland has developed Farmland Bird Hotspot maps to target agri-environment schemes under Ireland's Common Agriculture Policy Strategic Plan developed by the Department of Agriculture, Food and the Marine. Our primary aim was to identify the areas of particular importance for threatened farmland birds, we focused our mapping specifically on farmland bird species in the Birds of Conservation Concern in Ireland 4[25]. We identified 28 species of birds of conservation concern that are largely dependent on farmed habitats. Most of BoCCI 4 red listed farmland species are not included on Annex 1 of the Birds Directive and therefore are poorly represented and protected in the Special Protection Area (SPA) network.

Kennedy et al *in press* details the methodology of the BirdWatch Ireland Farmland Bird Hotspot Mapping. We provide a summary here:

1. Identified 28 species of Farmland Bird to prioritise, see Table 1:
2. Gathered 24 authoritative datasets from BirdWatch Ireland, National Parks and Wildlife Service, Department of Agriculture Food and Marine, Heritage Council, National Biodiversity Data Centre and Bord na Móna, see Table 2.
3. From these **2.5 million observations** we have extracted over **130,000 scientifically validated records** relating to the 27 species of interest
4. Transformed all relevant records into a consistent structure and coordinate reference system
5. Developed a **comprehensive scoring mechanism** which considers species, season, level of evidence of breeding, how recent the record is and species-specific and season-specific home ranges.
6. Established a **relative weighting between species** founded on key species trend indicators
7. Produced a **suite of maps at 10km and 1km** resolution indicating scoring and national hotspots for:
    a. **Farmland Birds** – taking all 28 species into consideration
    b. **Breeding Farmland Waders** – focused on Curlew, Dunlin, Golden Plover, Lapwing, Redshank, and Snipe
    c. **Barn Owl**
    d. **Geese and Swans**
8. The resulting national hotspots for Farmland Birds (taking all 28 species into account) and for Breeding Farmland Waders (taking only the 6 wader species into account) are illustrated in Figures 2 and 3 respectively. Figure 2 **highlights the most important locations for the 28 red and amber listed birds of conservation concern as whole in the country**. These hotspots have been extracted into Shapefile and Geojson formats for maximum interoperability.

These species are listed in Table 1 of Appendix 1.

BoCCI Status	Species	Scientific Name
Red	Barn Owl	*Tyto alba*

[25] Gilbert, G., Stansbury, A. & Lewis, L. 2021. Birds of Conservation Concern in Ireland 4: 2020-2026. Irish Birds 43: 1-22.

	Bewick's Swan	*Cygnus columbianus*
	Corncrake	*Crex crex*
	Curlew	*Numenius arquata*
	Dunlin	*Calidris alpina*
	Golden Plover	*Pluvialis apricaria*
	Grey Partridge	*Perdix perdix*
	Kestrel	*Falco tinnunculus*
	Lapwing	*Vanellus vanellus*
	Meadow Pipit	*Anthus pratensis*
	Quail	*Coturnix coturnix*
	Red Grouse	*Lagopus lagopus*
	Redshank	*Tringa totanus*
	Snipe	*Gallinago gallinago*
	Stock Dove	*Columba oenas*
	Twite	*Linaria flavirostris*
	Whinchat	*Saxicola rubetra*
	Yellowhammer	*Emberiza citrinella*
Amber	Barnacle Goose	*Branta leucopsis*
	Brent Goose	*Branta bernicla*
	Chough	*Pyrrhocorax pyrrhocorax*
	Greenland White-fronted Goose	*Anser albifrons*
	Greylag Goose	*Anser anser*
	Hen Harrier	*Circus cyaneus*
	Skylark	*Alauda arvensis*
	Spotted Crake	*Porzana porzana*
	Tree Sparrow	*Passer montanus*
	Whooper Swan	*Cygnus cygnus*

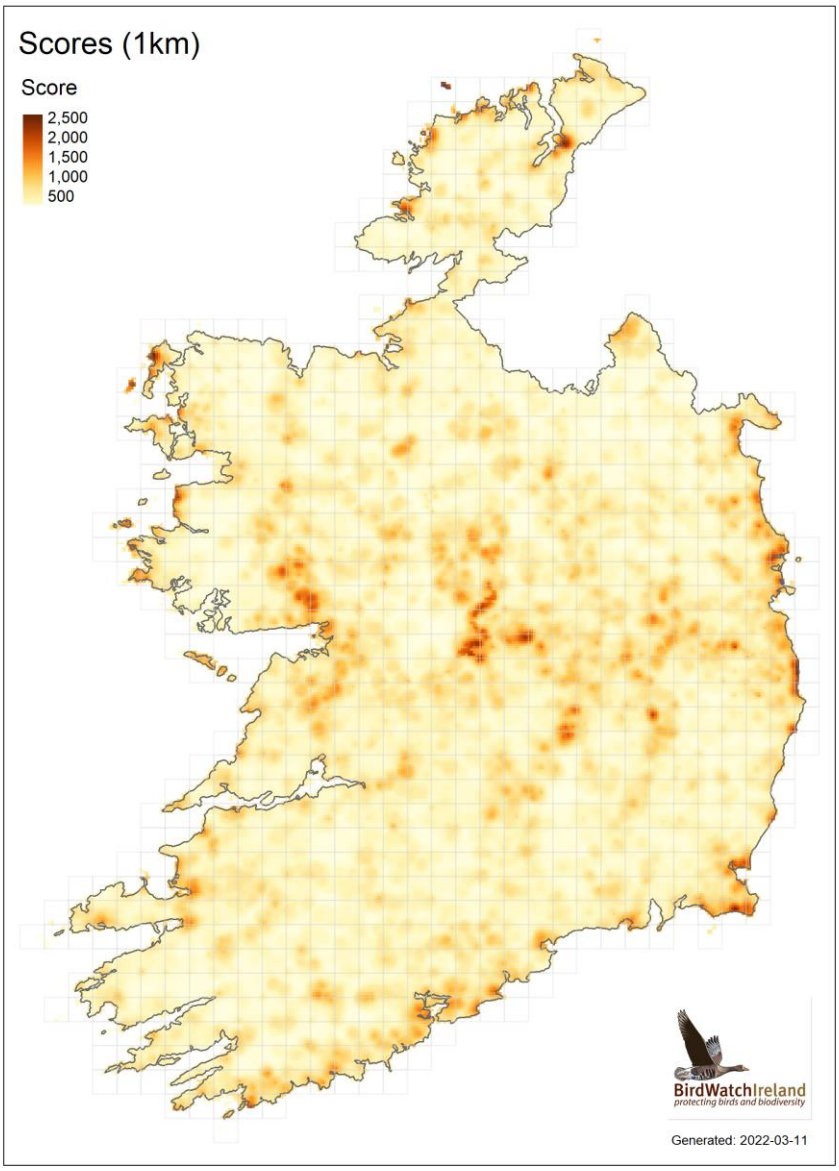
Scientifically validated datasets relevant to the 28 species of interest were identified and acquired with permission. These datasets are listed in Table 2.

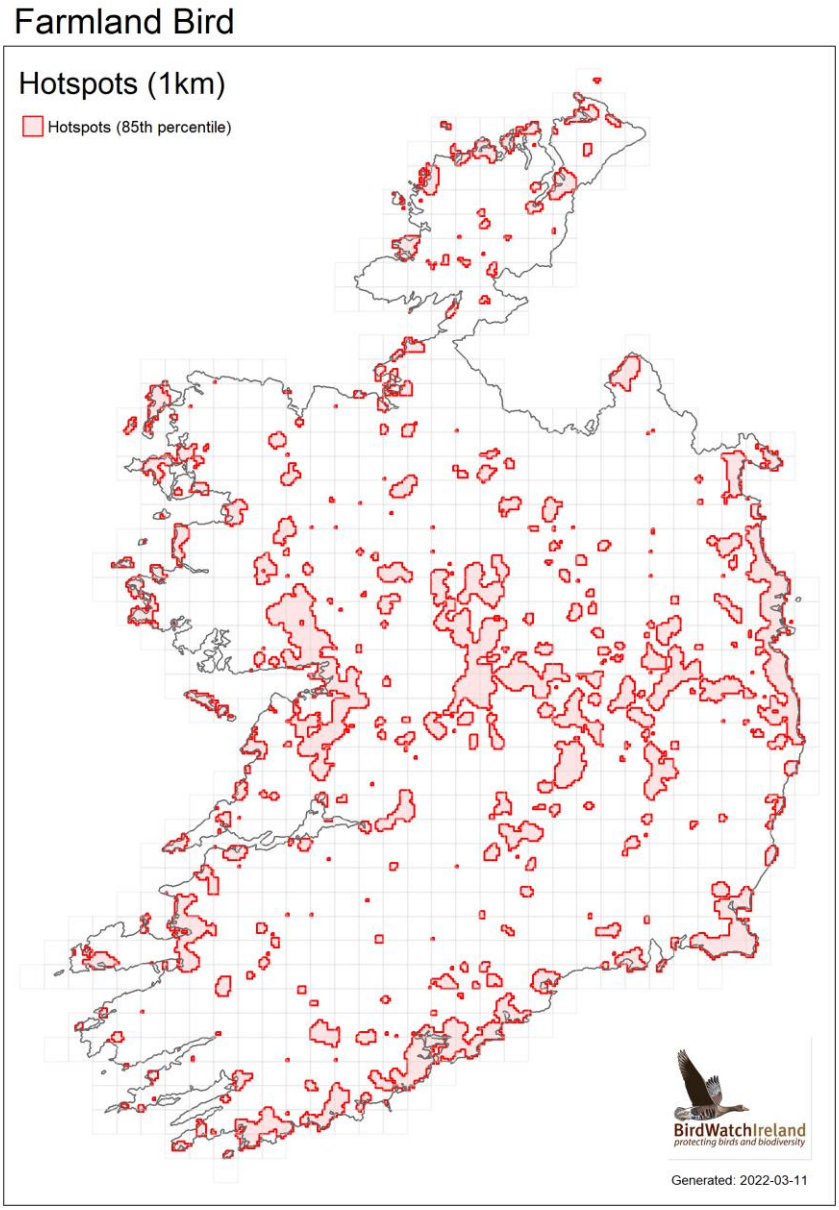
Table 1 of Appendix 1: Datasets gathered for analysis

Source	Dataset	Records
BirdWatch Ireland	Barn Owl Survey and Monitoring	411
	Bird Atlas 2007-2011	114,635
	Bird Track	772,738
	Cooperation Across Borders for Biodiversity (CABB)	3,226
	Supplementary records	29
	Whinchat - Shannon Callows 2014 (Kenny et al.)	23
	Whinchat - Shannon Callows 2017-2019	155
	Yellowhammer Galway 2020	14
Bord na Móna	Curlew Survey	45

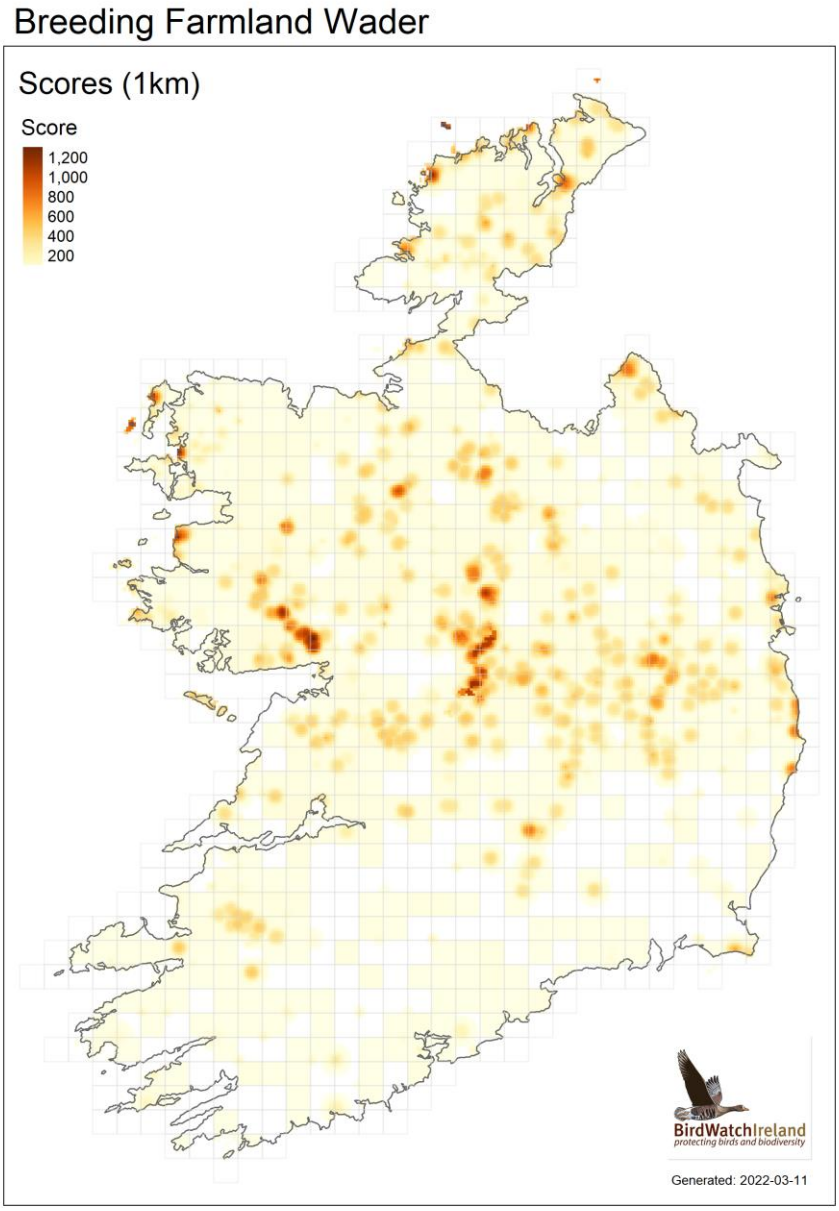
Department of Agriculture, Food and the Marine	Bride EIP	57
	Curlew EIP	30
	Lapwing Lifeline Survey 2019-2021	366
National Biodiversity Data Centre	Bird Atlas 2007-2011	458,187
	Birds of Ireland	67,229
	Kingfisher Survey 2010	6,883
National Parks and Wildlife Service	Corncrake Survey	3,499
	Countryside Bird Survey (CBS)	43,710
	Irish Wetland Bird Survey (I-WeBS)	86,017
	National Chough Survey	2,765
	National Curlew Database	294
	National Curlew Survey 2015-2017	138
	National Hen Harrier Survey 2015	157
	National Red Grouse Survey 2006-2008	491
	Red Grouse Survey of Owenduff/Nephin Complex 2012	61
	Shannon Breeding Wader Survey	31
	West Coast Survey of Breeding Waders 2019	871
Heritage Council	Late Breeding Bird Survey – Yellowhammer Records	554

Farmland Bird



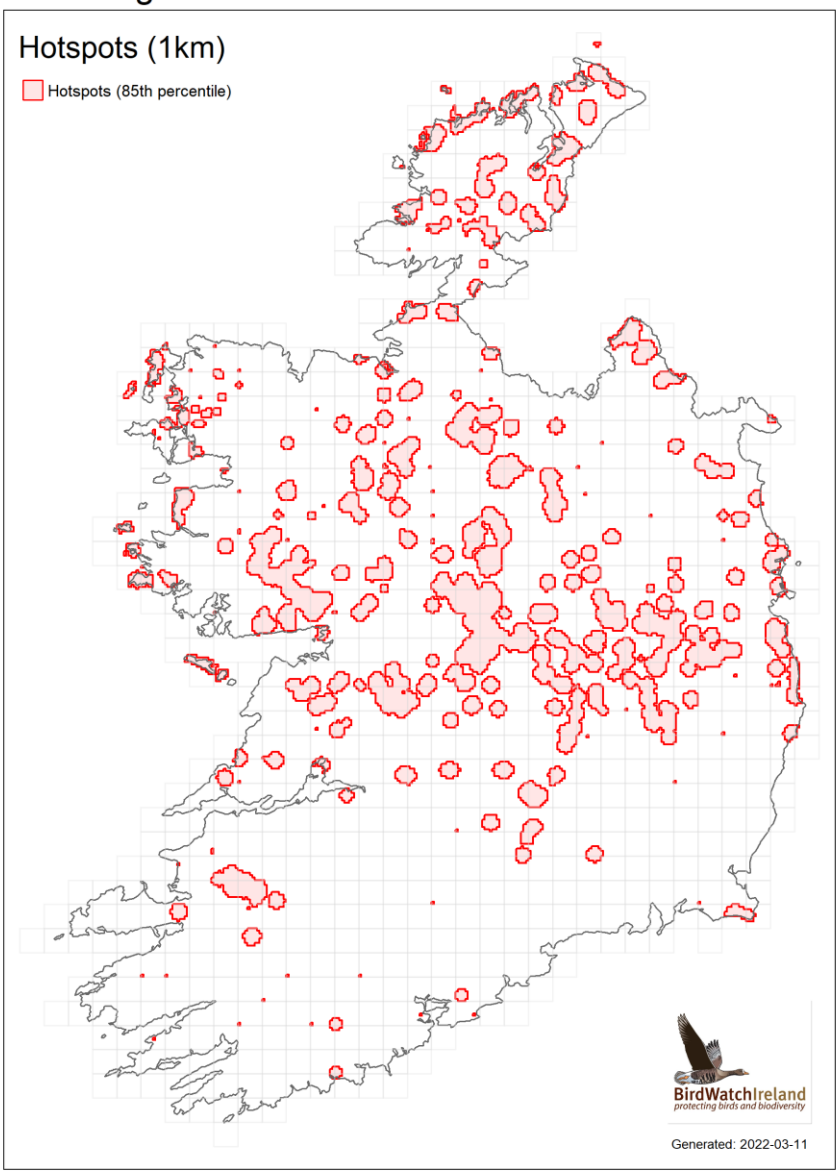


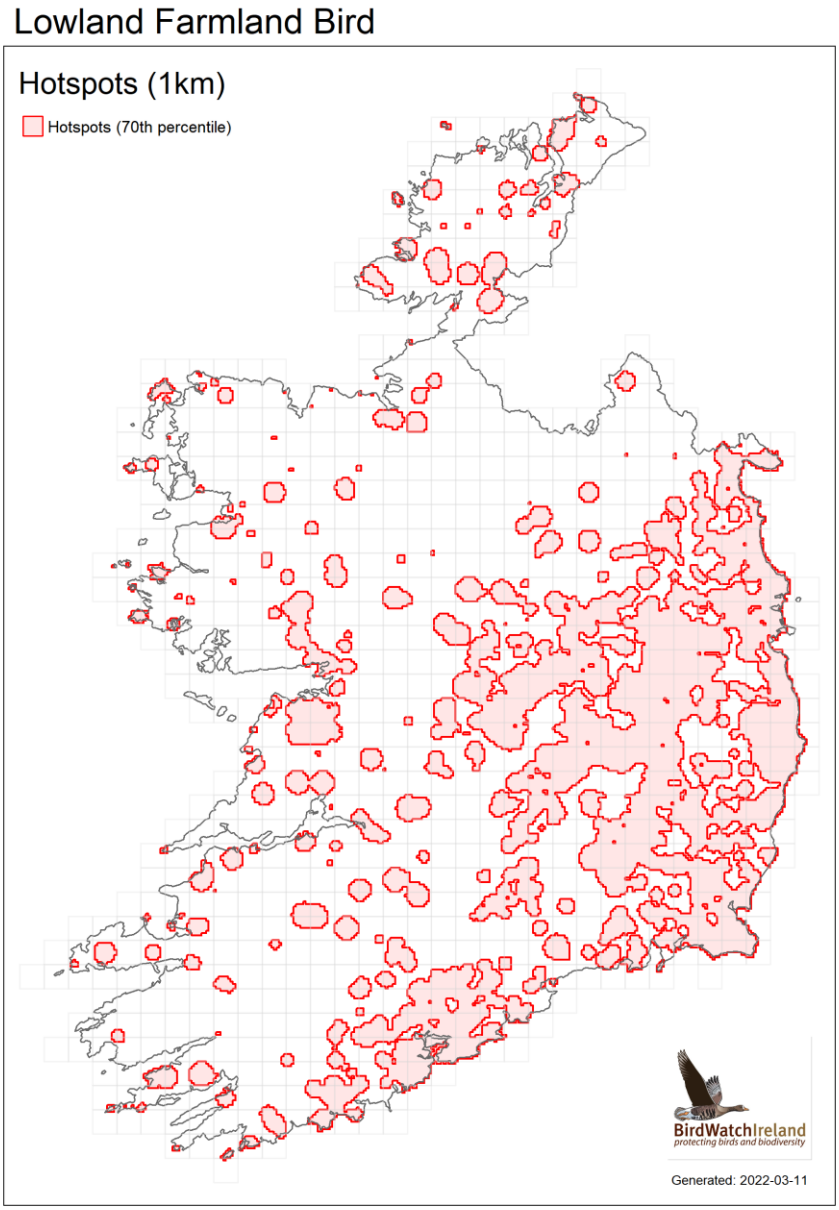
Farmland Bird Hotspots (85th percentile)



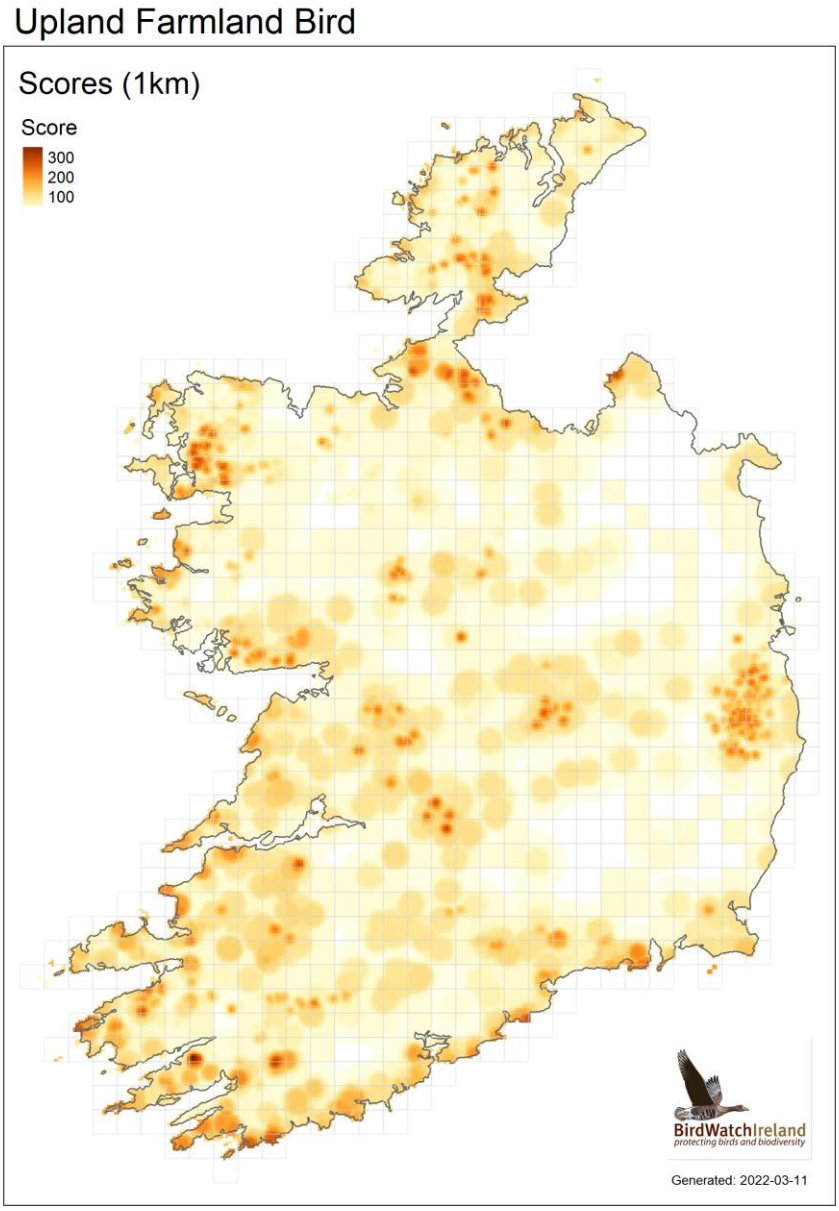
Breeding Farmland Wader Scores

Breeding Farmland Wader

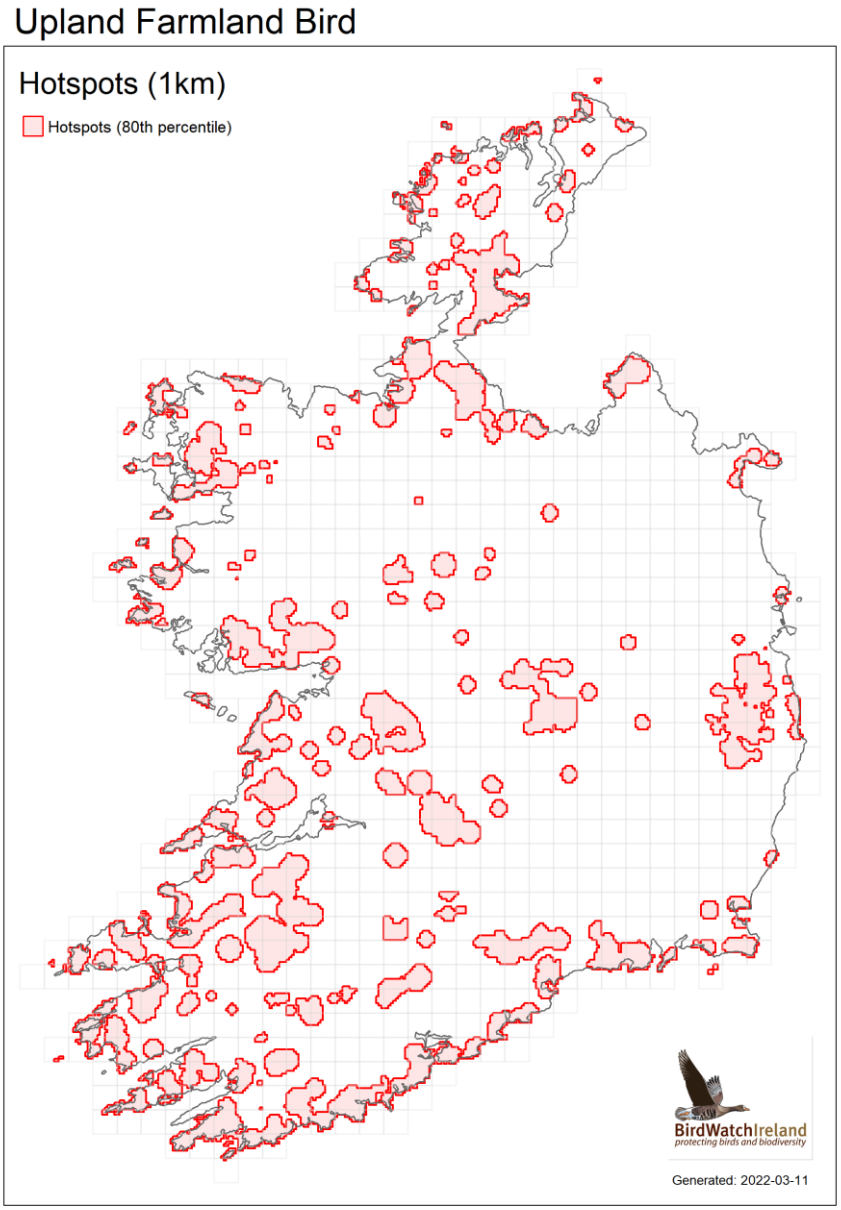




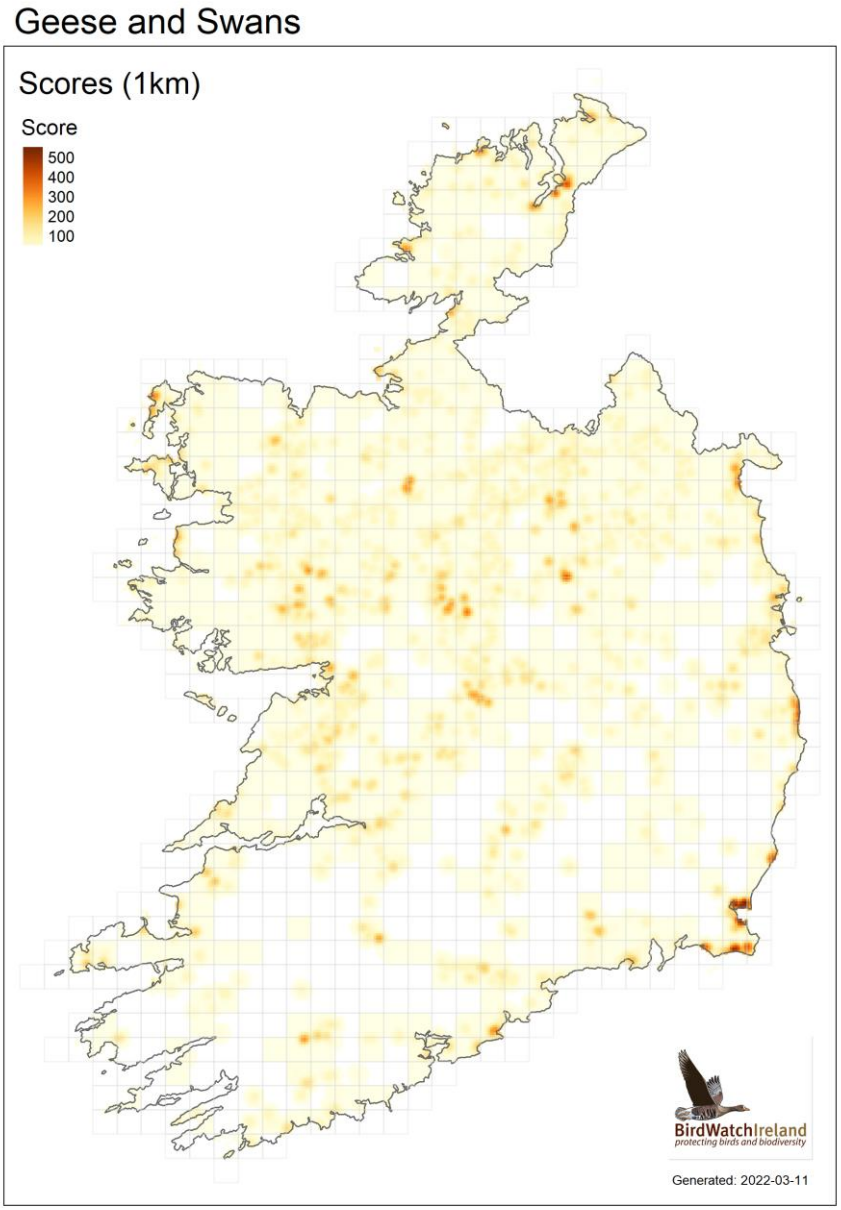
Lowland Farmland Bird Hotspots (70th percentile)



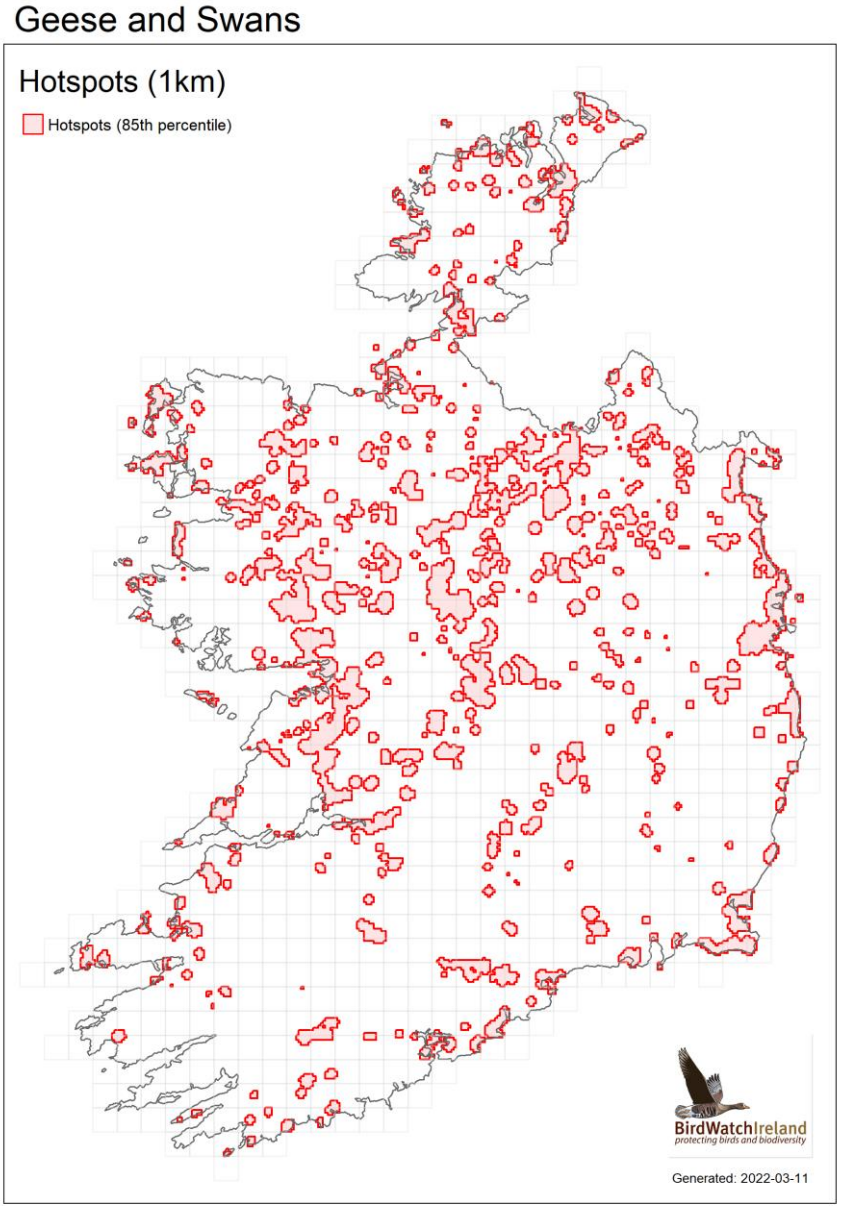
Upland Farmland Bird Scores



Upland Farmland Bird Hotspots (80th percentile)

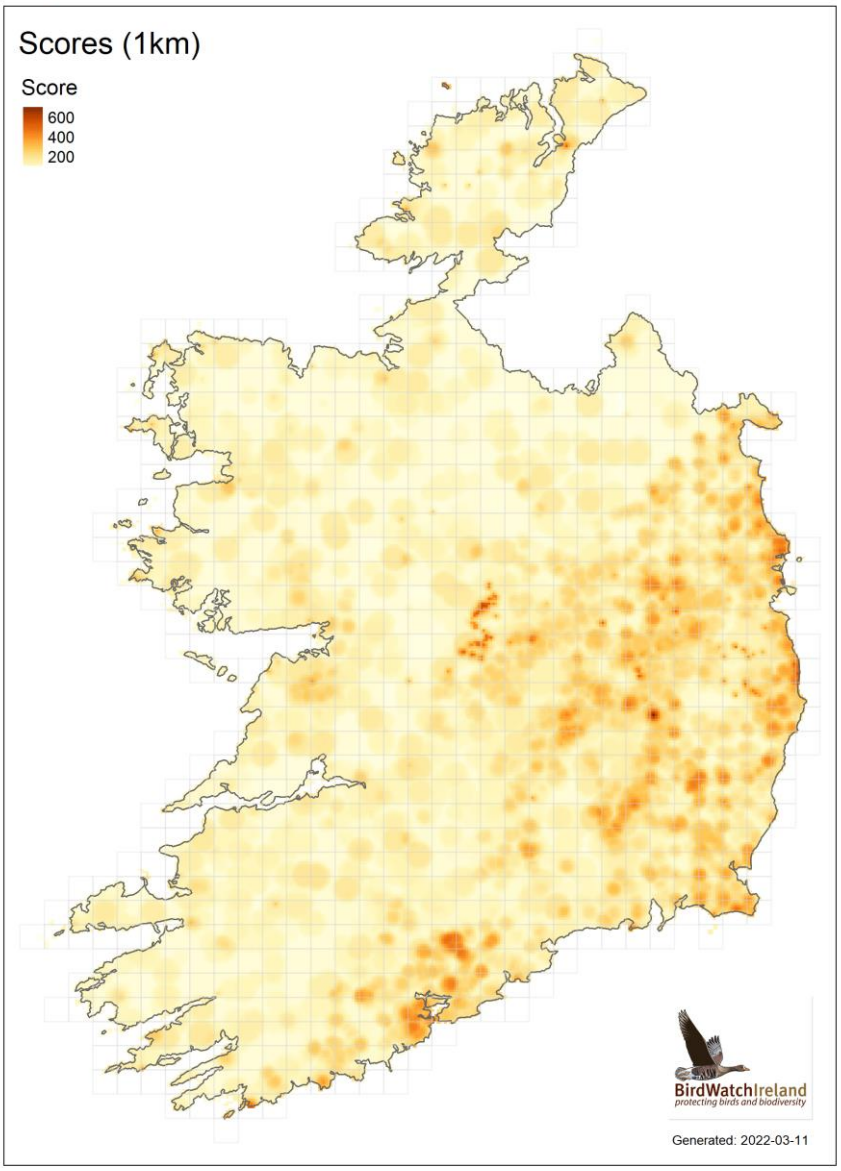


Geese and Swans Scores



Geese and Swans Hotspots (85th percentile)

Lowland Farmland Bird



Appendix 2:

Review of bird species of conservation concern (Resident/Breeding/Wintering) including habitat requirements and likely interactions with forestry. Species are listed according to Birds of Conservation Concern in Ireland (BoCCI) Status Assessments. Potential risks posed by afforestation are classified as either Low, Medium or High. This table has been updated during 2022 to reflect latest BoCCI assessment (Gilbert et al. 2021) and risk assessment update due to afforestation proposals including the Native Tree Scheme and the size of the budget and tax breaks for the IFSIP.

Bird species – Upland habitats.

(*denotes Annex I species, B = breeding; W = wintering, A = all year)

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
Red-listed species (BoCCI)				
Curlew	B	Peatlands/Heath/Grasslands. Nests on the ground in heath & bogs, rough pastures & meadows, with the nest usually in tussocky vegetation. In Ireland almost 1/3 nests found in bog habitat.	Direct habitat loss/fragmentation. Species in serious decline as a breeding species. Previous losses attributed to afforestation are documented (e.g. Amar et al. 2011; Douglas et al. 2014). Edge effects often cited as a main effect in that increased predation pressure (e.g. foxes) is attributed to presence of forestry. Also Berg (1992) found that Curlew nests tended to be further away from forest edges. Valkama et al (1999) found that in a fragmented farmland landscape containing woodland, the abundance of foxes and crows was 2–3 times higher, and Curlew nest predation rates were four times higher, than that in a continuous farmland landscape without woodland.	High
Dunlin	B	Peatlands. Breed on machair & on upland blanket bogs.	Direct habitat loss/fragmentation. Very small breeding population in NW Ireland therefore extremely vulnerable. Ground-nesting species therefore vulnerable to habitat loss and predators. Previous losses due to afforestation are documented (e.g. Lavers and Haines-Young, 1997); edge effects likely (Wilson et al. 2013).	High
Golden Plover*	B	Peatlands/Heath.	Direct habitat loss/fragmentation. Low breeding densities in NW Ireland.	High

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
		Nests on the ground in open areas of heather moors, blanket bogs & acidic grasslands.	Previous population declines, drop in productivity attributed to afforestation are documented (e.g. Stroud et al. 1987, 1990); edge effects likely (Stroud et al. 1990; Wilson et al. 2013).	
Lapwing	B	Peatlands/Heath/Grasslands.	Direct habitat loss/fragmentation. Previous losses attributed to afforestation are documented while edge effects have also been recorded (e.g. Amar et al. 2011).	High
Snipe	A	Grasslands/Peatlands/ Wetlands. Highly dispersed species, breed in a variety of habitats including farmland, grassland & bogs.	Direct habitat loss/fragmentation. Draining of land for afforestation reduced the availability of damp grasslands (Henderson et al. 2002). Significant population decline associated with increased forest edge (Amar et al 2011),	High
Meadow Pipit	A	Peatlands/Heath/Grasslands Breeds in open habitat, farmlands, uplands, raised bogs & sand dunes. Nest on the ground in short to longish vegetation.	Direct habitat loss/fragmentation. A species of open habitats therefore will be displaced by afforestation (Lack, 1938; Wilson et al. 2006; 2012). Afforestation of wet grassland will particularly affect this species (O'Callaghan et al. 2016).	High
Red Grouse	A	Peatlands/Heath. Found on mountains, moorland & lowland raised bogs. Nests on the ground in heather which it relies on heavily throughout the year.	Direct habitat loss/fragmentation. Previous research suggests numbers are reduced on moorland adjacent to plantations (Stroud et al. 1990). An estimated 28% of blanket bogs in Ireland have been afforested previously (Malone & O'Connell, 2009) which has likely contributed to the contraction of the Red Grouse population over much of its former range (Cummins et al. 2010).	High
Redshank	B	Wet grasslands; marginal western coastal sites.	Direct habitat loss/fragmentation. Previous research suggests numbers are reduced on moorland adjacent to plantations (Stroud et al. 1990) with edge effects likely.	High
Ring Ouzel	B	Peatlands/Heath. Associated with open areas of scree & scattered scrub in mountainous areas. Nests on or	Rare breeding bird in Ireland. Direct habitat loss/fragmentation. Previous documented impacts of habitat loss (Avery & Leslie, 1990) as well as negative relationships between forestry and population change (Buchanan et al. 2003). Possible mechanisms for such an effect of forestry include	High

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
		near the ground in vegetation or in rocky crevices.	decreased grazing pressure on the adjacent open ground (Avery, 1989), increased predation (Parr, 1993) or population fragmentation (Hanski, 1999).	
Twite	A	Peatlands/Heath/Grasslands. Upland pastures and moorland.	Rare breeding bird in Ireland – population and range declined substantially in recent decades. Predicted impacts include direct habitat loss/fragmentation (Brown et al. 1995).	High
Whinchat	B	Peatlands. Nests on the ground in rough grassy areas & seasonal vegetation such as bracken, often in upland areas on or near bogs & in young conifer plantations.	Population and range declined substantially in recent decades. Open habitat specialist. Direct habitat loss/fragmentation. The maturation of forests leads to the loss of this species as it only occurs in young plantations/scrub (Lack, 1939; Avery & Leslie, 1990). Mosaics of young plantations and clearfell areas may be less impacting.	Medium
Nightjar	B	Peatlands. Found in undisturbed areas of moorland, bogs & on the edge of conifer plantations. Also occurs on recently felled plantations.	Rare breeding bird in Ireland. Direct habitat loss/fragmentation. The species is lost from mature forests; however so long as sufficient young plantations and clearfell areas are available, as well as adjacent areas of open moorland, previous evidence suggests that the species will persist (Morris et al. 1994).	Medium
Kestrel	A	Peatlands/Heath/Forests	Direct habitat loss/fragmentation of foraging grounds. Kestrels breed in a variety of habitats but tend to avoid large conifer plantations (Hardey et al. 2006).	Medium
Amber-listed species (BoCCI)				
Greenland White-fronted Goose*	W	Coastal/Peatlands. Becoming rare on their traditional bog habitats. In recent years favouring more intensively managed farmland, though this may be sub-optimal compared with relatively undisturbed & intact bog.	Direct habitat loss/fragmentation. Restricted distribution. With traditional lowland peatland sites now limited, conservation of lowland grassland sites is of enormous priority; especially as species is highly site faithful (Stroud et al. 2012).	High

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
Hen Harrier*	B	Peatlands/Heath/Forests. Breed on moorland & young forestry plantations, where they nest on the ground (records of tree nesters in Northern Ireland). Breeding Hen Harriers mainly hunt over moorland.	Hen Harriers need open areas to forage; much natural habitat has been lost to afforestation, scrub/heather/gorse burning and over-grazing. Although Hen Harriers do nest in young forestry plantations, this breeding habitat is lost over time as the canopy closes over (thicket stage at between about 10 and 15 years old). Some evidence of reduced breeding success in forest dominated landscapes (e.g. Wilson et al. 2010b).	High
Red-throated Diver*	B	Upland lakes. Breeds on small freshwater upland lakes.	Rare breeding bird in Ireland. Very small breeding population therefore extremely vulnerable to indirect impacts e.g. altered drainage/water flows leading to flash floods and nest destruction of those bird species that nest close to waterbodies; as previously documented for Black-throated Diver in Scotland (Avery & Leslie, 1990). Extensive afforestation has taken place in some catchment areas (Cromie, 2002).	High
Skylark	A	Grasslands/Peatlands/Heaths. Breeds in open habitat, farmlands, uplands, raised bogs & sand dunes. Nest on the ground in short to longish vegetation.	Direct habitat loss/fragmentation. A species of open habitats therefore will be displaced by afforestation (Lack, 1939; Wilson et al., 2006; 2012). Afforestation of wet grassland will particularly affect this species (O'Callaghan et al. 2016).	High
Wheatear	B	Grasslands/Heaths/Peatlands. A bird of open habitat, nests in stonewalls or between boulders traditionally in upland habitats but also along the coast, especially on machair.	Direct habitat loss/fragmentation as the species inhabits open areas only (Paquet et al. 2006; Meffert et al. 2012)	High
Whooper Swan*	W	Dry Grasslands, turloughs, callows or waterbodies (Crowe et al. 2015). Wintering on lakes, marshes, lagoons & sheltered inlets, birds are also increasingly found in agricultural fields.	Direct habitat loss/fragmentation.	Medium

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
Merlin*	A	Peatlands/Heath/Forests. In Ireland Merlin appear to nest predominantly at the edge of plantations adjacent to open moorland.	Afforestation in upland areas can affect the availability and suitability of foraging habitats for Merlin at the landscape scale. Merlin are specially adapted to catch avian prey in open and semi-open habitats (e.g. open habitats including unenclosed lands, heather and grass moorland, and semi-open habitats such as boreal forests, as opposed to less open habitats such as dense woodland and plantation forest) (Cade, 1982; Fernandez-Bellon & Lusby, 2011) and select these open habitats in the Irish landscape for hunting. The average proportion of total forest cover within 5 km of breeding Merlin territories in Ireland was 11% and did not exceed 35% land cover within 5 km of a nest (Lusby et al., 2017). Although the extent of forest cover within Irish Merlin territories did not influence breeding performance, based on knowledge of Merlin breeding habitat selection in Ireland and Britain, Lusby et al. (2017) suggested that where forest cover is more extensive than observed within the territories (e.g. over 35% forest cover with 5 km surrounding nest sites), the suitability for breeding Merlin would be reduced. Where planted forest cover is high and Merlin preferentially select planted forest this also increases the risk of disturbance to breeding Merlin from forest management activities (Lusby et al. 2017)	High
Teal	B	Usually nest near small freshwater lakes or pools & small upland streams preferring thick cover.	Vulnerable to indirect impacts e.g. altered drainage/water flows leading to flash floods and nest destruction of those bird species that nest close to waterbodies.	Medium
Short-eared Owl	B	Grasslands/Peatlands/Heaths. Nests in upland moorlands, on raised bogs or in young forestry on the ground in a shallow depression.	Rare breeding bird in Ireland. Direct habitat loss – species tends to prefer younger age stands of forestry but so long as forestry plantations comprise a mosaic of different tree age-groups previous research suggests impacts will not be too negative (Shaw, 1995).	Low

Bird species – Lowland farmland/grassland habitats.

(*denotes Annex I species, B = breeding; W = wintering, A = all year)

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
Red-listed species (BoCCI)				
Curlew	B	Peatlands/Heath/Grasslands. Nests on the ground in heath & bogs, rough pastures & meadows, with the nest usually in tussocky vegetation.	Direct habitat loss/fragmentation. Species in serious decline as a breeding species. Previous losses attributed to afforestation are documented (e.g. Douglas et al. 2014). Edge effects often cited as a main effect in that increased predation pressure (e.g. foxes) is attributed to presence of forestry. Berg (1992) found that Curlew nests tended to be further away from forest edges. Valkama et al (1999) found that in a fragmented farmland landscape containing woodland, the abundance of foxes and crows was 2–3 times higher, and curlew nest predation rates were four times higher, than that in a continuous farmland landscape without woodland.	High
Lapwing	A	Grasslands, damp grasslands.	Direct habitat loss/fragmentation. Draining of land for afforestation may also reduce the availability of damp grasslands (Henderson et al. 2002).	High
Redshank	A	Breeds on wet grasslands; marginal western coastal sites. Forage on grassland during the winter.	Direct habitat loss/fragmentation. Previous research suggests numbers are reduced on moorland adjacent to plantations (Stroud et al. 1990) with edge effects likely.	High
Snipe	A	Grasslands/Peatlands/ Wetlands. Highly dispersed species, breed in a variety of habitats including farmland, grassland & bogs.	Direct habitat loss/fragmentation. Draining of land for afforestation reduced the availability of damp grasslands (Henderson et al. 2002)	High
Twite	A	Upland pastures and moorland (see above) as well as lowland grasslands.	Rare breeding bird in Ireland – population and range declined substantially in recent decades. Direct habitat loss/fragmentation (Brown et al. 1995).	High
Barn Owl*	A	Breeds primarily in ruined stone structures (e.g. castles & derelict buildings); occasionally nests in hollow cavities of	Will forage over young plantation forestry. Extensive plantation cover may lead to loss of foraging habitat/fragmentation.	Medium

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
		mature trees. Hunts across farmland & along hedgerows.		
Quail		Prefers large open spaces, avoids bare ground, scrub & trees. Found in cereal fields, such as winter wheat, corn fields, fallows & rough grassland. Nests on the ground.	Rare breeding bird. Preference for open habitats means afforestation would cause direct habitat loss. Foraging habitat likely too productive to be used for afforestation so potential risk is considered to be Medium only.	Medium
Whinchat	B	Rough grasslands. Nests on the ground in rough grassy areas & seasonal vegetation such as bracken, often in upland areas on or near bogs & in young conifer plantations.	Direct habitat loss/fragmentation. Population and range declined substantially in recent decades. The maturation of forests leads to the loss of this species as it only occurs in young plantations/scrub (Lack, 1939; Avery & Leslie, 1990). Mosaics of young plantations and clearfell areas may be less impacting.	Medium
Yellowhammer	A	Strongly linked with the cultivation of cereals, requiring hedgerows or other suitable cover for nesting & roosting.	Link with agricultural land, and especially cereals means that conflicts are unlikely. Will avoid conifer plantations.	Medium
Corncrake*	B	Grassland; damp grasslands.	Extremely vulnerable population. The habitat utilised is unlikely to be used for afforestation, but some marginal grasslands may pose some risk.	Medium - Low
Kestrel	A	Peatlands/Heath/Forests	Direct habitat loss/fragmentation of foraging grounds. Kestrels breed in a variety of habitats but tend to avoid large conifer plantations (Hardey et al. 2006) although with adequate edge vegetation impacts are unlikely to be serious.	Low
Red Kite	A	A species of open habitat & often associated with farmlands. Nests in trees.	Direct habitat loss/fragmentation. Evidence from UK (Wales) suggests low/neutral impacts of afforestation (Newton et al. 1981)	Low
Bewick's Swan*	W	Lakes & other water bodies near suitable grazing areas.	Foraging habitat likely too productive to be used for afforestation so potential risk is considered to be low.	Low

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
		Favoured flooded grasslands in the past, now increasingly using tilled land to feed.		
Golden Plover*	W	Breeds in upland areas (see above) and uses agricultural grassland foraging areas during winter.	Direct habitat loss/fragmentation. However, widespread foraging habitat is available during winter; mostly coastal.	Low
Grey Partridge	A	Associated with agricultural land, principally cereal growing areas, with tall or dense cover nearby.	Very rare breeding bird. Foraging habitat likely too productive to be used for afforestation so potential risk is considered to be low.	Low
Stock Dove	A	In the breeding season, nest in tree cavities in parklands, forest edge & farmland. More widely distributed in winter favouring mixed farmland.	Link with agricultural land, and especially cereals means that conflicts are unlikely.	Low
Amber-listed species (BoCCI)				
Greenland White-fronted Goose*	W	Coastal/Peatlands. Becoming rare on their traditional bog habitats. In recent years favouring more intensively managed farmland, though this may be sub-optimal compared with relatively undisturbed & intact bog.	Direct habitat loss/fragmentation. Restricted distribution. With traditional lowland peatland sites now limited, conservation of lowland grassland sites is of enormous priority; especially as species is highly site faithful (Stroud et al. 2012).	High
Skylark	A	Grasslands. Breeds in open habitat, farmlands, uplands, raised bogs &	Direct habitat loss/fragmentation. A species of open habitats therefore will be displaced by afforestation (Lack, 1939; Wilson et al., 2006; 2012).	High

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
		sand dunes. Nest on the ground in short to longish vegetation.		
Whooper Swan*	W	Dry Grasslands, turloughs, callows or waterbodies (Crowe et al. 2015). Wintering on lakes, marshes, lagoons & sheltered inlets, birds are also increasingly found in agricultural fields.	Direct habitat loss/fragmentation.	Medium
Hen Harrier*	W	Breed on moorland & young forestry plantations, nesting on the ground (records of tree nesters in Northern Ireland). Disperse to lower altitudes in winter.	Hen harriers need open areas to forage; much natural habitat has been lost to afforestation, scrub/heather/gorse burning and over-grazing. However, widespread foraging habitat is available during winter.	Medium
Linnet	A	Linnets breed in a variety of habitats, including rough grassland, uplands & coastal gorse & scrub. They often feed in open areas.	May breed in early growth stages of a plantation forest but forest cover will constitute a loss of foraging habitat.	Medium
Chough*	A	Prefer undisturbed cliff sites for nesting & require short cropped grassland mainly along coast for feeding. Also known to forage during winter at considerable distances inland.	Preference for coastal grasslands means that conflicts with afforestation are likely to be low. However some breeding pairs found in uplands of Sligo/Leitrim.	Medium - Low

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
Greylag Goose	W	Wild birds are found mainly near coastal areas in the winter, they can often be found utilising grasslands.	Preference for coastal grasslands means that conflicts with afforestation are likely to be low.	Low
Black-tailed Godwit	A	Breeds in lowland grassland; agricultural grassland also used as foraging habitat during winter.	Very rare breeding bird. Widespread winter distribution and preference for coastal grasslands means that conflicts with afforestation are likely to be low.	Low
House Sparrow	A	Found mainly around farm buildings & built-up areas. Nests in cavities in buildings, especially under eaves or holes formed by missing brickwork.	Link with agricultural land and buildings/built up areas means that conflicts with afforestation are likely to be low.	Low
Light-bellied Brent Goose	W	Traditionally associated with estuaries, salt marshes & mudflats, etc., many flocks are now also found on improved grasslands along the coast.	Link with agricultural land, productive grasslands, means that conflicts are unlikely.	Low
Starling	A	A widespread bird found in the countryside, woodland, farmland, and in towns & cities.	Link with agricultural land, productive grasslands, means that conflicts are unlikely.	Low
Swallow	B	Nest in buildings; feed over a variety of open habitats.	Link with buildings/built areas and agricultural land means that conflicts are unlikely.	Low
Tree Sparrow		Like the House Sparrow, nests in cavity in building, especially under eaves or holes formed by missing	Link with agricultural land means that conflicts are unlikely	Low

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
		brickwork. Forage across a variety of habitats, often linked with cereal production.		

Bird species – Woodland/scrub habitats.

(*denotes Annex I species, B = breeding; W = wintering, A = all year)

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
Red-listed species (BoCCI)				
Nightjar	B	Found in undisturbed areas of moorland, bogs &	Direct habitat loss/fragmentation. Rare breeding bird in Ireland.	Medium

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
		on the edge of conifer plantations. Also occurs on recently felled plantations. Ground nesting.	The species is lost from mature forests; however so long as sufficient young plantations and clearfell areas are available, as well as adjacent areas of open moorland, previous evidence suggests that the species will persist (Morris et al. 1994).	
Woodcock	A	Prefer broadleaved & mixed woodland but also found in young conifer plantations. Requires areas of moist soil for feeding. Nest on the ground in a shallow depression usually with plenty of ground cover.	Direct habitat loss – species found in younger age stands of forestry – as these close over the habitat becomes unsuitable. However so long as forestry plantations comprise a mosaic of different tree age-groups plus an element of broadleaved trees, then impacts likely to not be too negative.	Medium
Red Kite	A	A species of open habitat & often associated with farmlands. Nests in trees.	Direct habitat loss/fragmentation. Evidence from UK (Wales) suggests low/neutral impacts of afforestation (Newton et al. 1981)	Low
Stock Dove	B	In the breeding season, nest in tree cavities in broadleaved woodland, forest edge, parklands & farmland. More widely distributed in winter favouring mixed farmland.	Native woodlands provide holes for nesting, suggesting plantation woodland will be less used. The link with agricultural land, and especially cereals means that conflicts are probably unlikely.	Low
Amber-listed species (BoCCI)				
Hen Harrier*	B	Breed on moorland & young forestry plantations, nesting on the ground (records of tree nesters in Northern Ireland).	Hen harriers need open areas to forage; much natural habitat has been lost to afforestation, scrub/heather/gorse burning and over-grazing. Although Hen Harriers do nest in young forestry plantations, this breeding habitat is lost over time as the canopy closes over (thicket stage at between about 10 and 15 years old).	High

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
		Disperse to lower altitudes in winter.		
Merlin*	A	Peatlands/Heath/Forests. In Ireland Merlin appear to nest predominantly at the edge of plantations adjacent to moorland.	Afforestation in upland areas can affect the availability and suitability of foraging habitats for Merlin at the landscape scale. Merlin are specially adapted to catch avian prey in open and semi-open habitats (e.g. open habitats including unenclosed lands, heather and grass moorland, and semi-open habitats such as boreal forests, as opposed to less open habitats such as dense woodland and plantation forest) (Cade, 1982; Fernandez-Bellon & Lusby, 2011) and select these open habitats in the Irish landscape for hunting. The average proportion of total forest cover within 5 km of breeding Merlin territories in Ireland was 11% and did not exceed 35% land cover within 5 km of a nest (Lusby et al., 2017). Although the extent of forest cover within Irish Merlin territories did not influence breeding performance, based on knowledge of Merlin breeding habitat selection in Ireland and Britain, Lusby et al. (2017) suggested that where forest cover is more extensive than observed within the territories (e.g. over 35% forest cover with 5 km surrounding nest sites), the suitability for breeding Merlin would be reduced. Where planted forest cover is high and Merlin preferentially select planted forest this also increases the risk of disturbance to breeding Merlin from forest management activities (Lusby et al. 2017)	High
Linnet	A	Linnets breed in a variety of habitats, including rough grassland, uplands & coastal gorse & scrub. They often feed in open areas.	May breed in early growth stages of a plantation forest but forest cover will constitute a loss of foraging habitat.	Medium
Spotted Flycatcher	B	Often associated with relatively open broadleaved woodlands but also found in hedgerows & parks.	Appears negatively affected by monoculture Sitka spruce plantations (Sweeney et al. 2013).	Medium - Low
Goldcrest	A	Particularly associated with coniferous forests.	There are no predicted risks.	Low

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
Goosander	B	Found on freshwater lakes, pools & rivers. During the breeding season nests in tree cavities in mature broadleaved woodland near productive waters.	Rare breeding bird.	Low
Goshawk	A	Found in mature woods or plantations in Ireland but prefers a varied forest structure & landscape for hunting.	Probably resident in very small numbers, breeding has never been confirmed in the Republic of Ireland although it has been suspected.	Low
Greenfinch	A	Woodland, scrub, parks, hedgerows	Greenfinches are known to feed on conifer seeds including larches, Spruces and pines (Walsh et al. 1999). Species may breed in young plantations (Newton, 1972 in Walsh et al. 1999; Sweeney et al. 2011).	Low
Pied Flycatcher	B	Found in broadleaved woodland.	Rare breeding bird in Ireland. Associated with broadleaved woodland (Newton, 1986) and likely to avoid conifer plantations in Ireland.	Low
Short-eared Owl*	B	Grasslands/Peatlands/Heaths. Nests in upland moorlands, on raised bogs or in young forestry on the ground in a shallow depression.	Rare breeding bird in Ireland. Direct habitat loss – species tends to prefer younger age stands of forestry but so long as forestry plantations comprise a mosaic of different tree age-groups previous research suggests impacts will not be too negative (Shaw, 1995).	Low
Wood Warbler	B	Found in very similar habitats to Redstart, small numbers breeding in old oak woodlands, preferring areas with an open scrub layer.	Rare breeding bird.	Low

Bird species – Freshwater aquatic/riparian habitats

(*denotes Annex I species, B = breeding; W = wintering, A = all year)

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
Red-listed species (BoCCI)				
Common Scoter	B	Freshwater lakes.	Very small breeding population and hence particularly vulnerable.	High
Bewick's Swan*	W	Uses waterbodies near suitable grazing areas, particularly favoured flooded grasslands in the past, now increasingly using tilled land to feed.	Foraging habitat likely too productive to be used for afforestation so potential risk is considered to be low.	Low
Amber-listed species (BoCCI)				
Red-throated Diver*	B	Upland lakes. Breeds on small freshwater upland lakes.	Rare breeding bird in Ireland. Very small breeding population therefore extremely vulnerable to indirect impacts e.g. altered drainage/water flows leading to flash floods and nest destruction of those bird species that nest close to waterbodies; as previously documented for Black-throated Diver	High

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
			in Scotland (Avery & Leslie, 1990). Extensive afforestation has taken place in some catchment areas (Cromie, 2002).	
Whooper Swan*	W	Dry Grasslands, turloughs, callows or waterbodies (Crowe et al. 2015). Wintering on lakes, marshes, lagoons & sheltered inlets, birds are also increasingly found in agricultural fields.	Direct habitat loss/fragmentation.	Medium
Teal	A	Usually nest near small freshwater lakes or pools & small upland streams preferring thick cover.	Vulnerable to indirect impacts e.g. altered drainage/water flows leading to flash floods and nest destruction of those bird species that nest close to waterbodies.	Medium
Coot	A	Prefer large, shallow, nutrient-rich freshwater bodies with plenty of submerged vegetation for feeding.	Water protection measures (setback, buffer zones, native woodland zones, silt traps etc) (DAFM, 2016) should prevent significant impacts but effectiveness of these measures need to be monitored.	Medium - Low
Common Sandpiper	B	Breeds on the shores of inland lakes, fast-flowing rivers & some western islands.	Water protection measures (setback, buffer zones, native woodland zones, silt traps etc) (DAFM, 2016) should prevent significant impacts but effectiveness of these measures need to be monitored.	Medium - Low
Great Crested Grebe	A	Found on lakes & large rivers but also occurs in coastal waters outside of the breeding season. Breeds on inland freshwater lakes.	Water protection measures (setback, buffer zones, native woodland zones, silt traps etc) (DAFM, 2016) should prevent significant impacts but effectiveness of these measures need to be monitored.	Medium - Low
Kingfisher	A	Rivers.	Water protection measures (setback, buffer zones, native woodland zones, silt traps etc) (DAFM, 2016) should prevent significant impacts but effectiveness of these measures need to be monitored.	Medium - Low
Little Grebe	A	Found on small, shallow, lowland lakes, ponds, marshes, canals & on the	Water protection measures (setback, buffer zones, native woodland zones, silt traps etc) (DAFM, 2016) should prevent significant impacts but effectiveness of these measures need to be monitored.	Medium - Low

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
		fringes of larger lakes. Nest on floating vegetation, in reed beds or in other damp areas with dense vegetation by suitable water bodies.		
Mute Swan	A	Breeds on lakes, ponds & watercourses. Nest close to the water's edge in a large mound constructed from reed stems & other aquatic vegetation, seaweed in coastal areas.	Water protection measures (setback, buffer zones, native woodland zones, silt traps etc) (DAFM, 2016) should prevent significant impacts but effectiveness of these measures need to be monitored.	Medium - Low
Tufted Duck	A	Prefer large open lakes in lowland areas but are also found in town lakes, canals & slow moving rivers. Nests on the ground near water often in dense vegetation.	Water protection measures (setback, buffer zones, native woodland zones, silt traps etc) (DAFM, 2016) should prevent significant impacts but effectiveness of these measures need to be monitored.	Medium - Low
Cormorant	A	Marine and freshwater habitats.	Widespread distribution.	Low
Goosander	B	Found on freshwater lakes, pools & rivers. During the breeding season nests in tree cavities in mature broadleaved woodland near productive waters.	Scarce breeding bird.	Low
Other Species:				
Dipper	A	Particularly associated with fast-flowing, shallow upland streams but also found at lower altitudes in similar conditions. Nest site often	Acidification is main threat (e.g. Ormerod et al. 1985, 1986). Water protection measures (setback, buffer zones, native woodland zones, silt traps etc) (DAFM, 2016b) should prevent significant impacts but effectiveness of these measures need to be monitored.	Medium

Species	Season	Habitat Requirements	Interactions & Potential Conflicts with Afforestation	Risk (High, Medium Low)
		found beneath bridges in crevices or in rocks or trees.		
Grey Wagtail	B	Breeds along streams and rivers; often builds nest under a bridge.	Acidification is main threat (e.g. Ormerod et al. 1985, 1986). Water protection measures (setback, buffer zones, native woodland zones, silt traps etc) (DAFM, 2016) should prevent significant impacts but effectiveness of these measures need to be monitored.	Medium

Appendix 3 : Cross check of NIS Table 4 and Species impacted by conversion to forestry and forestry activities from 2019 Article 12 report.
DG Environment. 2017. Reporting under Article 12 of the Birds Directive: Explanatory notes and guidelines for the period 2013-2018. Brussels. Pp 63. Accessed at https://circabc.europa.eu/d/a/workspace/SpacesStore/08565ed6-40ee-499f-98a7-fbff730dfb78/Article%2012%20report%20format%202013-2018.pdf on 25/11/2022

Forestry codes are;

B01	Conversion to forest from other land uses, or afforestation (excluding drainage)
B03	Replanting with or introducing non-native or non-typical species (including new species and GMOs)
B04	Abandonment of traditional forest management
B05	Logging without replanting or natural regrowth
B08	Removal of old trees (excluding dead or dying trees)
B09	Clear-cutting, removal of all trees
B16	Wood transport
B23	Forestry activities generating pollution to surface or ground waters
B29	Other forestry activities, excluding those relating to agro-forestry

CODE	Pressure (p) or Threat (t)	Ranking	Total bird species	50	73	74	83	84	85	86	98	173	174	203	266	267	272	274	275	276	277	278	279	282	284
B01	p	H	8		Golden Plover	Curlew	Redshank	Lapwing	Dunlin	Snipe					Hen Harrier							Ring Ouzel			
B01	p	M	5													Hen Harrier (Winter)	Red Grouse		Golden Eagle	Twite					Grey Partridge
B01	t	H	9			Curlew	Redshank	Lapwing	Dunlin	Snipe	Red-throated Diver				Hen Harrier	Hen Harrier (Winter)						Ring Ouzel			
B01	t	M	5	Greenland White-fronted Goose (Winter)	Golden Plover												Red Grouse		Golden Eagle						Grey Partridge
B03	p	H	1												Hen Harrier										
B03	p	M	2																				Merlin	Long-eared Owl	
B03	t	H	1												Hen Harrier										
B03	t	M	2																				Merlin	Long-eared Owl	
B04	p	M	1									Woodcock													
B04	t	M	1									Woodcock													
B05	p	M	2									Woodcock		Great Spotted Woodpecker											
B05	t	M	2									Woodcock		Great Spotted Woodpecker											
B08	p	M	1											Great Spotted Woodpecker											
B08	t	M	2											Great Spotted Woodpecker				White-tailed Eagle							
B09	p	M	3									Woodcock											Merlin	Long-eared Owl	
B09	t	M	4									Woodcock						White-tailed Eagle					Merlin	Long-eared Owl	
B16	p	M	2												Hen Harrier			White-tailed Eagle							
B16	t	M	2												Hen Harrier			White-tailed Eagle							
B23	p	M	1										Kingfisher												
B23	t	M	1										Kingfisher												
B29	t	M	1																		Whinchat				

Appendix 4 : Report by Dr Rory Hodd

Review of potential ecological issues associated with the Forest Service 'Land Types for Afforestation' document

Rory Hodd BSc (Hons.) PhD, Botanist and Ecologist **20th April 2021**

This document was commissioned by BirdWatch Ireland to provide a brief overview of any ecological issues that may arise from the application of guidelines issued by the Forest Service to identify land that may be suitable for afforestation in Ireland. All of the following points are made without full detailed knowledge of the internal ecological review of sites within the Forest Service and how, or if, sites, away from SACs, and with no pre-existing ecological data available, are assessed for the presence of potential habitats and species, particularly those listed in the EU Habitats Directive, that may be of conservation importance. Therefore, it is possible that some of the potential issues raised may already be accounted for by other processes.

The document lists types of land that would qualify as suitable for Grant Premium Categories (GPC) 2-12 and GPC 1. Each of the land types listed was matched to the main corresponding EUNIS habitats (https://www.eea.europa.eu/data-and-maps/data/eunis-habitat-classification), with the description often found to be very broad and covering multiple EUNIS habitats. It was also considered whether any EU habitats directive Annex I habitats could potentially fall under these categories and whether there were any other ecological considerations and issues that may arise. This is summarised in the accompanying excel document for each of the land types described as suitable for GPC 2-12 and GPC 1. In the case of a number of the land types described as suitable for GPC 2-12 there is potential that areas of the Annex habitats 6210 Calcareous grassland, *6230 Species-rich *Nardus* grassland, 6410 *Molinia* meadows and 7230 Alkaline fen may be designated as suitable for afforestation, without realising their ecological value.

Of the three categories of land described as suitable for afforestation under GPC 1, two of them refer to land which in all or most cases would be classified as Annex I 4010 Wet heath (cf. Perrin et al., 2014), albeit degraded wet heath in the case of category 1, but with restoration potential. Peat depth does not have any bearing on whether a habitat is classified as Annex I wet heath or bog, but rather the vegetation is the determining factor, and wet heath and, indeed, blanket bog, can occur on shallow peat with little dwarf shrub cover.

In terms of the site assessment methodology, it seems sound in most aspects. One concern exists over the minimum mapping area of 0.2 ha, with unsuitable land areas below this threshold not excluded from the afforestation application. Habitats often occur as a complex mosaic and important areas of habitat can be significantly less than 0.2 ha in area, particularly areas of species-rich grassland, which are easily overlooked. The number of sampling plots is sufficient and sampling methodology is basic but adequate, although the results of the assessment should be included publicly with the application, so that all relevant data are available, for greater transparency, and it is not clear whether these assessments are actually carried out regularly. The method of assessing suitability based on R and N Ellenberg values does not present any obvious potential ecological issues.

One deficiency of the assessment is that it doesn't consider bryophyte cover as vegetation cover and does not take it into account in any way. If cover of *Sphagnum* were assessed that would reduce the chances of afforesting wet heath with good recovery potential, as *Sphagnum* is often an important component of wet heath vegetation. Furthermore, the methodology does not take into account presence of protected species of vascular plant and bryophyte, including those listed on the Flora

Protection Order (FPO) or on Annexes of the EU Habitats Directive, or of other threatened species of flora and fauna, such as Marsh Fritillary butterfly and Kerry Slug.

All efforts should be made to avoid afforesting Annex I habitats or the habitats of rare species. To that end, ecologists should be employed to carry out an assessments of afforestation sites, with the possible exception of the most degraded or modified sites. The ecologists should be able to recognise key indicator species of Annex habitats and know the requirements of rare species that may be present. This would be preferable to training foresters to recognise these habitats and species, as it would be more efficient and effective.