



GREENING IRISH FORESTRY

Recommendations for Nature Friendly Forestry

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A report by

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Contents

| | |
|--|----|
| Context | 3 |
| The impact of afforestation on Irish biodiversity..... | 4 |
| Prospects for biodiversity loss..... | 8 |
| Tools to Green Irish Forestry | 8 |
| Plant the right trees | 8 |
| The need to implement environmental safeguards | 11 |
| Protect birds and biodiversity | 12 |
| Carry out ecological assessments | 14 |
| Use forestry sensitivity mapping | 15 |
| Protect High Nature Value farmland | 19 |
| Protect Flora Protection Order species | 24 |
| Review existing thresholds for EIA..... | 25 |
| Conclusion | 26 |

GREENING IRISH FORESTRY - Recommendations for Nature Friendly Forestry

Context

Under the Irish Forestry Programme 2014-2020¹ a target has been set to increase Ireland's forest cover area from its current level of 10.7% to 18% by 2046². This, it is projected will require over 46,000 ha of land to be afforested by an estimated 25,000 landowners. This would be equivalent to afforesting an area half the size of Dublin. Between 1990-2015 Ireland has had the highest rate of afforestation in the EU (4.6%)³. This drive to afforest vast areas of farmland across the country in combination with the ongoing intensification of agricultural land⁴ will result in one of the most dramatic changes in land-use on the island in centuries. Invariably the scale of the social and environmental changes will have far reaching consequences for biodiversity. Looking forward, whether forestry in Ireland will have a net positive or negative influence on biodiversity will ultimately depend on a range of factors, such as where afforestation takes place, the model of forestry used and the environmental safeguards that are implemented. According to the National Parks and Wildlife Service (NPWS) forestry is currently a significant threat and pressure on habitats and species protected under the Habitats Directive⁵ and the Birds Directive⁶. While according to the Environmental Protection Agency forestry is the greatest pressure nationally on our last remaining lakes and rivers of high ecological value⁷.

The indications are that unless there's a shift in government policy then the predominance of non-native plantations and the use of clear-felling within Irish forestry will continue. That is to say that plantations of non-native conifers will be planted on marginal farmland and clear-felled. The expansion of forestry will therefore exacerbate the accepted negative biodiversity and water quality impacts associated with this model of forestry on a regional and catchment scale. One of the most pressing concerns for BirdWatch Ireland is that afforestation will be strategically targeted on marginal agricultural land, particularly in areas where low intensity land uses such as hill farming have persisted for generations⁸. This marginal farmland contains some of the important remaining areas for biodiversity in the country, including high-status waters bodies¹⁰, protected semi-natural habitats and High Nature Value farmland (HNVf)¹¹. Commercial forestry in its current form is not compatible with the sustainable management of many of these sites. In order to ensure that Irish

¹ Forest Service (2015) Forestry Programme 2014-2020; Forest Service, Department of Agriculture, Food and the Marine Ref: IRL-DAFMFS.023 <http://bit.ly/2k1nvc5>

² Department of Agriculture, Food and the Marine (2014) Forests, products and people. Ireland's forest policy – a renewed vision. Department of Agriculture Food and the Marine, Dublin.

³ FOREST EUROPE, 2015: State of Europe's Forests 2015.

⁴ Feehan, J., 2003. Farming in Ireland: History, Heritage and Environment. Walsh Printers, Roscrea, Co. Tipperary.

⁵ NPWS, 2013. The Status of Protected EU Habitats and Species in Ireland. Overview Volume 1. Unpublished Report, National Parks & Wildlife Services.

Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland. Editor: Deirdre Lynn

⁶ NPWS (2014) Ireland's Summary Report for the period 2008 – 2012 under Article 12 of the Birds Directive. Dublin: National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht.

⁷ Department of Housing, Planning, Community and Local Government (2017) Draft River Basin Management Plan for Ireland (2018-2021), Dublin: Department of Environment, Heritage and Local Government

⁸ Forest Service (2016) Land Types for Afforestation; Forest Service, Department of Agriculture, Food & the Marine, Ireland, Johnstown Castle Estate, Co. Wexford

⁹ COFORD (2016) Land Availability Working Group. Land Availability for Afforestation - Exploring opportunities for expanding Ireland's forest resource. COFORD, Dublin

¹⁰ Moran, J. and Sullivan, C. (2017) Co-benefits for Water and Biodiversity from the Sustainable Management of High Nature Value Farmland.

¹¹ Matin, S., Sullivan, C.A., Ó hÚallacháin, D., Meredith, D., Moran, J., Finn, J.A. and Green, S (2016) Map of High Nature Value farmland in the Republic of Ireland. Journal of Maps 12: 373–376.

forestry is sustainable moving forward we must ensure that the right trees are planted in the right places and are management appropriately.

- ✓ **Right Trees**
- ✓ **Right Place**
- ✓ **Right Management**

In order to achieve this goal, BirdWatch Ireland propose a range of changes to the current afforestation policies and forestry practices which we believe would greatly improve the sustainability of the sector moving forward.

The impact of afforestation on Irish biodiversity

Historic deforestation has transformed Ireland from a prehistoric primeval forest to one of the least forested countries in Europe¹². However, in recent years the rate of commercial afforestation in Ireland has been the highest in the EU¹³. Today only about 10.7% of Ireland's land area is under forest cover¹⁴ and of this only around 2% of the country is covered by what is termed native or semi-natural woodland, and much of this is highly fragmented and modified¹⁵.

The biodiversity of our woodlands is also impoverished relative to the UK and mainland Europe. Taking woodland birds as an example, there is an East-West decline in avian-diversity across Europe with Ireland being particularly low in species¹⁶. This is likely the result of a combination of both historical and biogeographical factors. The historical deforestation of Ireland² in combination with the isolation of Ireland during and after the last glacial maximum¹⁷ and our cool maritime climate are all contributing factors to the low levels of woodland biodiversity in Ireland¹⁶. The forested areas we do have are dominated by plantation forestry. Plantation forests make up 90.6% of the total forest area in Ireland³. 72.8% of the national forest estate is made up of non-native conifers, with 52.4% of forestry in Ireland being made up of just one species, Sitka spruce (*Picea sitchensis*)¹⁸. Ireland's unnatural and industrial model of forestry is very unusual in a European context (Forest Europe, 2015). For example, Ireland has the third highest level of plantation forestry in Europe and the highest share of forest area dominated by introduced tree species. This is in stark contrast to Europe as a whole where 87% of forest area is semi-natural (Figure 1)³.

¹² Aalen, F.H.A., Whelan, K. and Stout, M. (Eds.). (1997) Atlas of the Irish rural landscape. Cork University Press, Cork.

¹³ Forest Europe, 2015: State of Europe's Forests 2015.

¹⁴ Forestry-Service (2014), Ireland's Forests Annual Statistics, Wexford: Department of Agriculture, Food and the Marine

¹⁵ Perrin, P., Martin, J., Barron, S., O'Neill, F., McNutt, K. & Delaney, A. (2008) National Survey of Native Woodlands, 2003-2008. Unpublished report to the National Parks and Wildlife Service, Dublin.

¹⁶ Fuller, R. J., Gaston, K. J., & Quine, C. P. (2007). Living on the edge: British and Irish woodland birds in a European context. *Ibis*, 149, 53-63.

¹⁷ Blondel, J. (1997) Evolution and history of the European bird fauna. In Hagemeyer, W.J. & Blair, M. (eds) The EBCC Atlas of European Breeding Birds: Their Distribution and Abundance: cxxiii-vi. London: Poyser.

¹⁸ Forestry-Service (2014), Ireland's Forests Annual Statistics, Wexford: Department of Agriculture, Food and the Marine

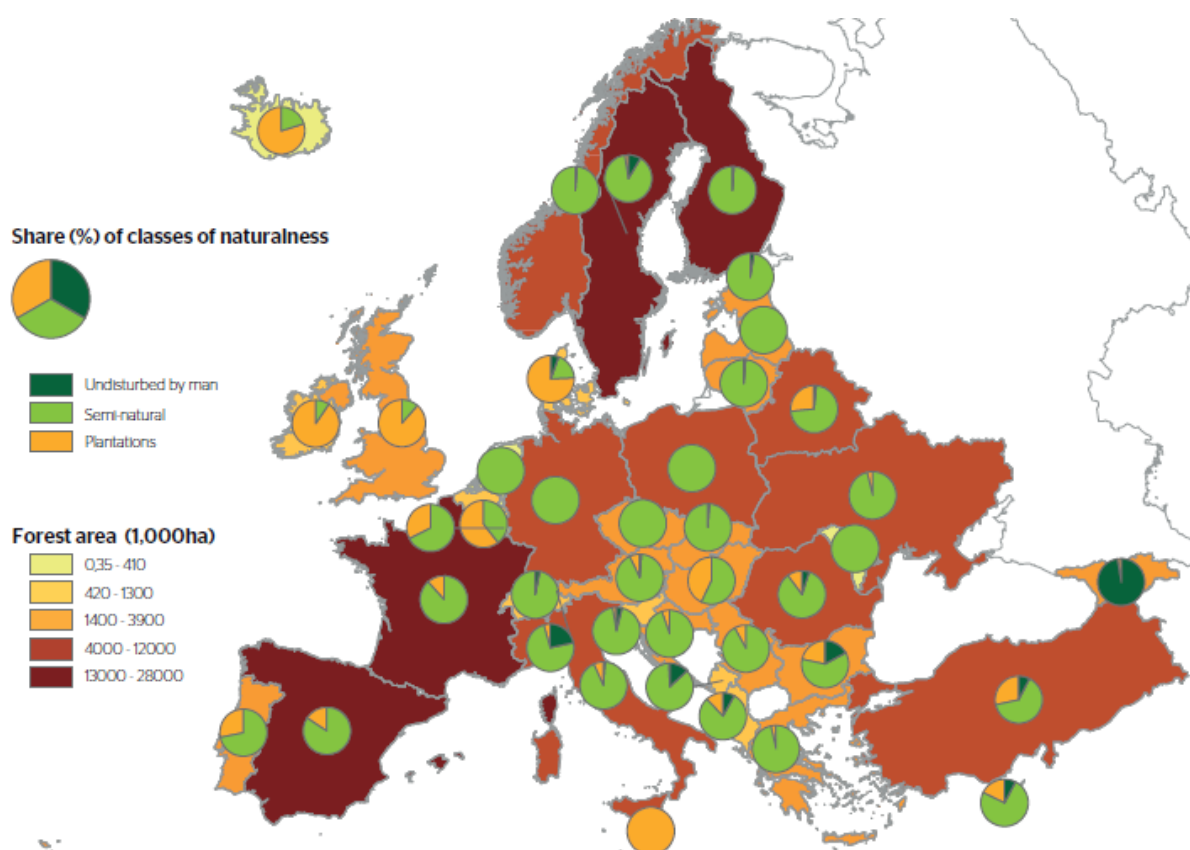


Figure 1: Share of the classes of naturalness (percent) in the forest area in Europe by country, 2015³.

As forestry in Ireland is dominated by plantations of non-native conifer species like Sitka spruce¹⁴ and the Native Woodland Scheme only accounts for a small proportion of afforestation¹. When considering the environmental impacts of afforestation in Ireland we shall therefore mainly focus on the impacts of this predominant forestry model. These plantations support a lower diversity and abundance of bird species relative to native broadleaves⁵⁰ and support fewer specialist species^{49,46}. Internationally afforestation most negatively impacts on biodiversity when it replaces natural ecosystems, such as forests, grasslands, and shrublands, and when exotic tree species are used rather than native species⁴⁶. In Ireland afforestation has most negatively impacted on bird biodiversity when it replaces the habitat of open habitat specialists^{48,51} and ground nesting birds, which in an Irish context is typically on marginal farmland in upland areas or along the Western seaboard¹⁹. For these open habitats specialist's afforestation results in direct habitat loss, edge effects²⁰ and habitat fragmentation^{47,48,21}; in addition, these fragmented landscapes support a high abundance of predators relative to open habitats increasing the risk of predation^{22,23}.

¹⁹ COFORD (2016) Land Availability Working Group. Land Availability for Afforestation - Exploring opportunities for expanding Ireland's forest resource. COFORD, Dublin

²⁰ Amar, A., Grant, M., Buchanan, G., Sim, I., Wilson, J., Pearce-Higgins, J. W. & Redpath, S. (2011) Exploring the relationships between wader declines and current land-use in the British uplands. *Bird Study* 58, 13-26.

²¹ Pearce-Higgins, J.W., Grant, M.C., Robinson, M.C. & Haysom, S.L. 2007. The role of forest maturation in causing the decline of Black Grouse *Tetrao tetrix*. *Ibis* 149: 143-155. doi: 10.1111/j.1474-919X.2006.00623.x

²² Ainsworth, G., et al., 2016. Understanding Predation A review bringing together natural science and local knowledge of recent wild bird population changes and their drivers in Scotland, Edinburgh: Scotlands Moorland Forum.

²³ Douglas, D J T., et al. (2014) Upland land use predicts population decline in a globally near threatened wader. *Journal of Applied Ecology* (2014): 194-203.

Bird species in Ireland that are known to be under pressure from afforestation include Hen Harrier (*Circus cyaneus*), Merlin (*Falco columbarius*), Golden Plover (*Pluvialis apricaria*), Bewicks Swan (*Cygnus columbianus bewickii*), Greenland White-fronted Goose (*Anser albifrons flavirostris*) and Dunlin (*Calidris alpina schinzii*)^{24,25}. Of these open habitat specialists' waders are the group which has been most negatively impacted on by afforestation such as Curlew (*Numenius arquata*) and Lapwing (*Vanellus vanellus*)^{48,51}. In Ireland research has shown that species like Skylarks (*Alauda arvensis*) will strongly avoid forested habitats²⁶ while populations of Hen Harriers²⁷ and Merlin²⁸ are not self-sustaining when levels of forest cover at a landscape level exceeds certain thresholds.

From a conservation perspective the negative impact of afforestation on open habitat specialists has been magnified by the fact that many of the species that have been worst affected are Birds of Conservation Concern in Ireland (BOCCI)²⁹. Of the ten-priority species within BirdWatch Ireland's Group Action Plans for Irish Birds³⁰ which are being impacted by afforestation and woodland management, six are Red listed and three are Amber Listed BoCCI's. This includes species like Curlew^{31,32} whose population has undergone a decline of 97% in the last 40 years and is now facing national extinction³³. Research in the UK has shown that even small increases in forest cover at a 1km scale can have a significantly negative impact on the population size and breeding success of Curlew²³.

Birds are accurate indicators of biodiversity loss³⁴ and the declines in certain bird groups is illustrative of the broader impacts that current afforestation policies are having on biodiversity nationally. There is ample additional evidence that a range of protected habitats and species are also being negatively impacted by afforestation in Ireland. According to the NPWS forestry is a pressure or threat on almost 40% of the habitats and over 20% of species protected under the Habitats Directive. Forestry is second only to agriculture as pressure and threat on annexed habitats and species³⁵. The habitats which have been most negatively impacted by forestry are peatlands, grasslands, wetlands and coastal habitats. The forestry semi-state Coillte for example owns 232,500 ha of peatlands making them the largest owner of peatland habitat in Ireland. Ten of thousands of hectares of rare raised bog and blanket bog habitat have been drained and afforested in past decades³⁶. While the industrial scale afforestation of bogs has thankfully ceased the NPWS have identified that protected Annex I peatland habitats such as Wet Heath, Dry Heath, Alpine and Sub

²⁴ NPWS (2014) Ireland's bird species' status and trends for the period 2008-2012. Dublin: National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht.

²⁵ NPWS (2014) Ireland's Summary Report for the period 2008 – 2012 under Article 12 of the Birds Directive. Dublin: National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht.

²⁶ 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.

²⁷ Irwin, S., Wilson, M., O'Donoghue, B., O'Mahony, B., Kelly, T., & O'Halloran, J. (2012). Optimum scenarios for Hen Harrier conservation in Ireland. Cork: Department of Agriculture, Food and the Marine by the School of Biological, Earth and Environmental Sciences, University College Cork.

²⁸ Lusby, J., Corkery, I., McGuinness, S., Fernández-Bellón, D., Toal, L., Norriss, D., ... & Quinn, J. L. (2017). Breeding ecology and habitat selection of Merlin *Falco columbarius* in forested landscapes. *Bird Study*, 1-10.

²⁹ Colhoun K and Cummins S (2013). Birds of Conservation Concern in Ireland 2014 –2019. *Irish Birds*. 9: 523–544.

³⁰ BirdWatch Ireland (2014) BirdWatch Ireland's Group Species Action Plans for Irish Birds: Prioritisation of actions, species priorities and implementation. BirdWatch Ireland, Kilcoole, Co. Wicklow.

³¹ Buscardo, E., et al. (2008) The early effects of afforestation on biodiversity of grasslands in Ireland. *Biodiversity and conservation*: 17(5), 1057-1072.

³² Franks, S., et al., (2017): Environmental correlates of breeding abundance and population change of Eurasian Curlew *Numenius arquata* in Britain, *Bird Study*, DOI: 10.1080/00063657.2017.1359233

³³ Donaghy, A., (2016) Breeding Curlew Survey 2016: Results from Sligo, Leitrim, Cavan and Monaghan & East Galway, Roscommon, Offaly and Longford (Excluding the Shannon Callows). Unpublished report to National Parks and Wildlife Service. BirdWatch Ireland 2016

³⁴ Pereira HM, Ferrier S, Walters M et al (2013) Essential biodiversity variables. *Science* 339:277–278

³⁵ NPWS (2014) Ireland's Summary Report for the period 2008 – 2012 under Article 12 of the Birds Directive. Dublin: National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht.

³⁶ NPWS (2015) A National Peatlands Strategy 2015. Dublin: National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht.

Alpine Heath, Rhynchosporion depressions and the priority habitat Active Blanket Bog are still being lost and degraded by forestry³⁷. Annex I grasslands such as Molinia Meadows and the priority habitat Species-rich Nardus grasslands are particularly at risk from afforestation and have already been completely lost from parts of their range due to afforestation³⁶.

Forestry is also negatively impacting on aquatic biodiversity and water quality. According to Ireland’s Environmental Protection Agency forestry is a significant pressure on water quality and freshwater biodiversity at a national level³⁸. These impacts are largely associated with the management of forestry including drainage, forestry planting and clear-felling³⁹. Of the water bodies at risk of not meeting their objectives under the Water Framework Directive, forestry is the fourth most significant pressure nationally. For Ireland’s most pristine rivers and lakes that are at risk of not meeting their high ecological status objective, forestry is the greatest pressure nationally impacting on these ecologically important water bodies³⁸. According to the EPA the number of high-quality river sites nationally has declined from 31.6% in 1987–1990 to just 17.0% in 2014–2017. While the number of high-quality lakes has declined from 22% in 2007-2009 to 17% 2015-2017⁴⁰. Many of these high ecological status waterbodies are protected not only under the Water-Framework Directive but also under the Habitats and Birds Directives due to habitats and species that they support. The loss of high ecological status is a critical conservation issue for Ireland’s internationally important populations of Freshwater Pearl Mussel (*Margaritifera margaritifera*) the endemic subspecies the Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*) and the Atlantic salmon (*Salmo salar*)³⁶. Despite these multiple layers of protection there has been a drastic decline in the number of high-status sites in Ireland over recent decades⁴⁰.

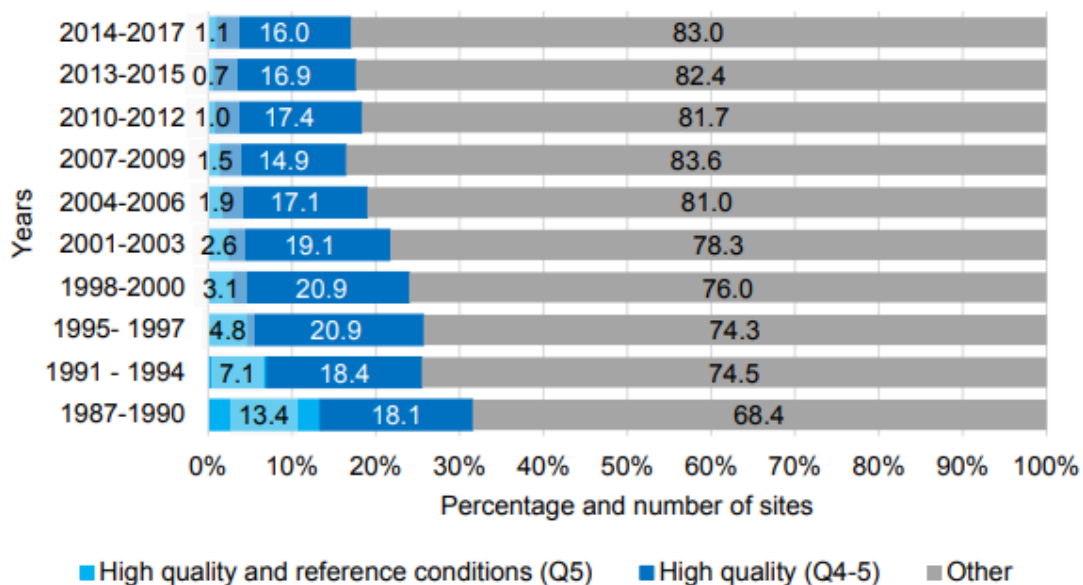


Figure 2: Trend in the percentage of high-quality river sites (Q5, Q4–5) since 1987⁴⁰

³⁷ NPWS (2013) The Status of EU Protected Habitats and Species in Ireland. Habitat Assessments Volume 2. Version 1.1. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

³⁸ Department of Housing, Planning, Community and Local Government (2017) Draft River Basin Management Plan for Ireland (2018–2021), Dublin: Department of Environment, Heritage and Local Government

³⁹ EPA (2015) Water Quality in Ireland 2010-2012, Dublin: Environmental Protection Agency, PO Box 3000, Johnstown Castle, Co. Wexford, Ireland.

⁴⁰ EPA (2018) Water Quality in 2017: An Indicators Report, Dublin: Environmental Protection Agency, PO Box 3000, Johnstown Castle, Co. Wexford, Ireland.

Prospects for biodiversity loss

Forestry in Ireland is a primary driver of biodiversity loss. Given the Government's target to increase afforestation over the coming decades these negative impacts will only intensify unless steps are taken to avoid or counter them. One of the most concerning aspects of Irish forestry policy is that afforestation will be strategically targeted on marginal agricultural land, particularly in areas with wet mineral soils and semi-natural grasslands^{41 9}. This marginal farmland overlaps with the distribution of some of the most important areas for biodiversity in the country, including high-status waters bodies⁴², protected semi-natural habitats and High Nature Value farmland (HNVf)⁴³. HNVf is the term used to describe farmland which is associated with either a high species and habitat diversity, or the presence of species of European, and/or national, and/or regional conservation concern, or both⁴⁴. Effectively many important cultural landscapes which support habitats and species that are incompatible with Ireland's predominant forestry model are being earmarked for afforestation. In the case of Birds of Conservation Concern in Ireland (BoCCI) recent research has identified a strong overlap between newly afforested areas and threatened bird species⁴⁵. Worryingly a high percentage of the 10 x 10km squares which had recently had some afforestation contained BoCCI which are known to be negatively impacted by afforestation, including Curlew (84%), Skylark (76%), Lapwing (75%), Redshank (72%) and Golden Plover (33%)⁴⁵.

Tools to Green Irish Forestry

As we have already argued under a business as usual scenario forestry expansion in Ireland will take place on marginal agricultural land with wet mineral soils which are likely to support semi-natural grasslands and rushy fields⁹. This will result in the afforestation of marginal farmland of high importance for biodiversity. To avoid any conflict between the Government's afforestation targets and the conservation of legally protected habitats and species it is necessary that appropriate safeguards are in place. Forestry in Ireland is mainly driven by the private sector with the expansion of the national forest estate occurring on an ad hoc basis through the afforestation of private landholdings. It is therefore difficult to predict where afforestation will take place and assess what the direct and cumulative impacts are likely to be. By improving upon the existing the environmental safeguards that are in place, as well as the quality of ecological assessment and the tools that are available to identify potential conflicts then the sustainability of Ireland's forest sector can be greatly improved. In this context BirdWatch Ireland would like to suggest a range of options which would improve the environmental sustainability of Irish forestry.

Plant the right trees

It is known that the impact of afforestation on biodiversity will vary across different species and habitats and will be influenced by a range of factors including, the selection of tree species,

⁴¹ Forest Service (2016) Land Types for Afforestation; Forest Service, Department of Agriculture, Food & the Marine, Ireland, Johnstown Castle Estate, Co. Wexford

⁴² Moran, J. and Sullivan, C. (2017) Co-benefits for Water and Biodiversity from the Sustainable Management of High Nature Value Farmland.

⁴³ Matin, S., Sullivan, C.A., Ó hUallacháin, D., Meredith, D., Moran, J., Finn, J.A. and Green, S (2016) Map of High Nature Value farmland in the Republic of Ireland. *Journal of Maps* 12: 373–376.

⁴⁴ Cooper, T, et al. 2007 HNV Indicators for Evaluation, Final report for DG Agriculture. Brussels: European Commission, Institute for European, Environmental Policy

⁴⁵ 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.

management intensity, site location and the preceding land-use type/intensity^{46,47,48}. The impact of afforestation in Ireland has been positive for some bird species such as conifer specialists like Crossbill (*Loxia curvirostra*) and Siskin (*Carduelis spinus*)^{49, 50}. The impact of afforestation will be most positive where afforestation replaces high-intensity land use types such as improved grasslands, typically in low-altitude areas⁵¹. The scale of this positive impact of afforestation will increase depending on the proportion of native broadleaves, the diversity of tree species and the diversity of age-classes⁵¹. Where these conditions are met the positive impact on woodland bird biodiversity will be further enhanced when native woodland cover and connectivity with woodland fragments and Ireland's hedgerow network are increased^{51,52}. Adopting a more continental approach to forestry where forestry consists of semi-natural woodlands made up of native broadleaves or a native / non-native mixes would improve the biodiversity value of Irish forestry^{53,54,55,56}. There are a range of afforestation options within the current Forest Programme including schemes facilitating the establishment of native woodland for conservation, native broadleaves and agroforestry¹. Many of the schemes depending on how and where they are implemented have the potential to positively impact upon biodiversity. In order to change the face of forestry in Ireland steps will have to be taken to increase the take up of these options. As a semi-state body Coillte should lead the way by converting their existing forest estate to semi-natural woodland.

- ✓ **Plant more native tree species and more native broadleaves**
- ✓ **Convert plantations to semi-natural woodlands of broadleaves or native / non-native intermixes**

In Ireland clear-felling is the dominant method used to harvest wood⁵⁷. The environmental impacts of clear-felling are dramatic, turning forested environments that may have been developing for decades into open environments. The physical activity of harvesting and sudden changes in factors such as temperature regime and shading can result in impacts on soil and water quality⁵⁷. The sudden loss of habitat can also negatively impact on arboreal species⁵⁸. For these reasons and impacts on landscape, amenity and recreation continuous cover forestry is replacing clear-fell forestry in many parts of Europe. In continuous cover forestry there is an uneven-aged stand

⁴⁶ Bremer, L. L. & Farley, K.A. (2010) Does plantation forestry restore biodiversity or create green deserts? A synthesis of the effects of land-use transitions on plant species richness. *Biodiversity Conservation* 19, 893–3915. Doi:10.1007/s10531-010-9936-4.

⁴⁷ Buscardo, E, et al. (2008) The early effects of afforestation on biodiversity of grasslands in Ireland. *Biodiversity and conservation*: 17(5), 1057-1072.

⁴⁸ Graham, C T, et al. (2015) Implications of afforestation for bird communities: the importance of preceding land-use type. *Biodiversity and Conservation*: 1-21.

⁴⁹ Balmer, D et al. (2013) *Bird Atlas 2007-11: The Breeding and Wintering Birds of Britain and Ireland*

⁵⁰ Iremonger et al. (2006) Investigation of experimental methods to enhance biodiversity in plantation forests. BIOFOREST PROJECT 3.1.3 FINAL REPORT

⁵¹ Walsh, P., O'Halloran, J., Kelly, T. & Giller, P. 2000. Assessing and optimizing the influence of plantation forestry on bird diversity in Ireland. *Irish Forest*. 57: 2–10.

⁵² Sweeney, O F M, Wilson, M W, Irwin, S, Kelly, T C, & O'Halloran, J (2010). Are bird density, species richness and community structure similar between native woodlands and non-native plantations in an area with a generalist bird fauna?. *Biodiversity and Conservation*, 19(8), 2329-2342.

⁵³ Coote, L., French, L. J., Moore, K. M., Mitchell, F. J. G., & Kelly, D. L. (2012). Can plantation forests support plant species and communities of semi-natural woodland?. *Forest Ecology and Management*, 283, 86-95.

⁵⁴ Humphrey, J. W., Davey, S., Peace, A. J., Ferris, R., & Harding, K. (2002). Lichens and bryophyte communities of planted and semi-natural forests in Britain: the influence of site type, stand structure and deadwood. *Biological conservation*, 107(2), 165-180.

⁵⁵ Økland, B. (1994). Mycetophilidae (Diptera), an insect group vulnerable to forestry practices? A comparison of clearcut, managed and semi-natural spruce forests in southern Norway. *Biodiversity & Conservation*, 3(1), 68-85.

⁵⁶ Gustafsson, L., Fiskesjö, A., Hallingbäck, T., Ingelög, T., & Petterson, B. (1992). Semi-natural deciduous broadleaved woods in southern Sweden—habitat factors of importance to some bryophyte species. *Biological conservation*, 59(2-3), 175-181.

⁵⁷ Gallagher, M. B., Johnson, M., O'Gorman, K., O'Halloran, J., Giller, P., & Clenaghan, C. (2000). The impact of clearfelling operations on physico-chemical parameters of aquatic ecosystems in southwest Ireland. *Internationale Vereinigung für theoretische und angewandte Limnologie: Verhandlungen*, 27(2), 1108-1115.

⁵⁸ Sidorovich VE, Solovej IA, Sidorovich AA, Rotenko II (2008) Effect of felling on the distribution of rodents and their predators in a transitional mixed forest. *Polish Journal of Ecology* 56:309–321

structure and a continuously maintained forest cover, which does not follow the cyclic harvest-and-regeneration pattern found in clear fell forestry⁵⁹. Selective logging where individual trees are harvested is required by legislation in Switzerland while in other parts of Europe retaining mature trees and allowing natural regeneration of forest cover is gaining popularity⁶⁰. The enhanced structural diversity associated with continuous cover forestry can improve the capacity of a forested landscape to support a greater diversity of bird species⁶¹. To improve biodiversity value of forestry, management should also seek to maintain critical structural elements, such as dead and decaying wood, economically unimportant but ecologically valuable tree species, and large trees⁵⁹. Retaining large trees provides habitat for species that depend on large living trees or large stems of deadwood⁵⁹. Continuous cover forestry can also improve carbon sequestration in forestry by minimizing disturbances in the stand structure and soil, thereby reducing the risk of unintended C losses. By establishing mixed species forests the stability of the forest can also be increased helping to reduce the risk of high rates of soil carbon loss⁶².

- ✓ **Replace clear-fell harvesting with continuous cover forestry**
- ✓ **Retaining large trees within forestry plots to provide habitat for species that depend on large living trees and deadwood**

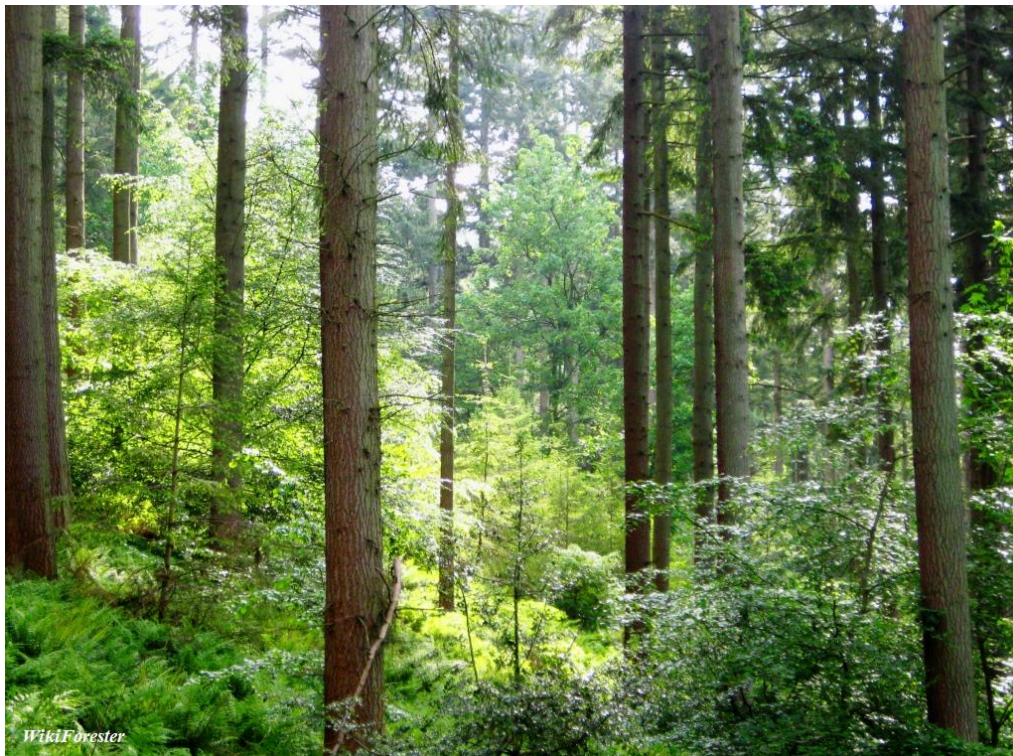


Figure 3: This image shows an 85-year-old stand of Douglas fir in the Lake District, Cumbria, England, in the process of transformation to a continuous cover forest. Small gaps created in the canopy are enabling a wide variety of species to regeneration and develop in the understory. A continual cycle of interventions is leading to a progressively more irregular structure, through time.

⁵⁹ Pukkala, T. (2006). Optimising the semi-continuous cover forestry of Finland. *Allgemeine Forst und Jagdzeitung*, 177(8/9), 141

⁶⁰ Hart, C. (1995). Alternative silvicultural systems to clear cutting in Britain: a review. HMSO Publications Centre.

⁶¹ Calladine, J., Bray, J., Broome, A., & Fuller, R. J. (2015). Comparison of breeding bird assemblages in conifer plantations managed by continuous cover forestry and clearfelling. *Forest Ecology and Management*, 344, 20-29.

⁶² Jandl, R., Lindner, M., Vesterdal, L., Bauwens, B., Baritz, R., Hagedorn, F., ... & Byrne, K. A. (2007). How strongly can forest management influence soil carbon sequestration?. *Geoderma*, 137(3-4), 253-268.

The need to implement environmental safeguards

Based on the available evidence afforestation and silviculture as funded under past and present forestry programmes is having a significant negative impact on biodiversity both inside and outside of protected areas and across both terrestrial and freshwater environments. These negative impacts conflict with international obligations such as the EU’s Biodiversity Strategy⁶³ and the United Nations sustainability development goals⁶⁴. The implementation of the Forestry Programme 2014-2020¹ is resulting in breaches of Irish and EU environmental law, including the Birds Directive (Directive 2009/147/EC), the Habitats Directive (Directive 92 /43 /EEC), the Water Framework Directive (2000/60/EC) and the EU’s Rural Development Regulations relating to the protection of High Nature Value farmland.

As the consenting authority for afforestation, the Forest Service of the Department of Agriculture, Food & the Marine must ensure that afforestation and the management of the national forest estate is compliant with the EU’s policy framework including the state aid decision and national and European environmental legislation. The Forest Service endeavour to avoid environmental impacts using their Code of Best Forest Practice – Ireland and by adhering to the principles of Sustainable Forest Management (SFM). A framework of environmental guidelines is provided by the Forestry Standards Manual (2015)⁶⁵, Environmental Requirements for Afforestation (2016)⁶⁶ and the Land Types for Afforestation Document (2016)⁶⁷. These guidelines intend to provide direction for the foresters and the forest service staff to meet the minimum environmental standards. It is clear however that despite the existing safeguards that afforestation and forestry management is having a significant negative impact on habitats and species both within and outside of protected areas. In some instances, the failure of personnel to properly implement the existing procedures may be the root cause of some environmental impacts. There are also gaps in the existing procedures which are resulting in the forestry sector being non-compliant with key environmental laws and regulations. Common failures and the corresponding breaches of environmental legislation are summarised in Table 1.

| Failure | Environmental Legislation |
|--|--|
| The failure to protect Annexed birds and habitats within Natura 2000 sites from the negative impacts of afforestation and silviculture. | Birds Directive: Article 2, Article 4 (1), Article 4 (2), Article 5 |
| | Habitats Directive: Article 6(3) and Article 6(4) of the Habitats Directive. |
| The failure to protect birds and their habitats within the wider countryside from the negative impacts of afforestation and silviculture | Birds Directive: Article 1, Article 2, Article 3, Article 4(4), |
| | Habitats Directive: Article 3(3) and Article 10 |
| The failure to protect the water quality and ecological status of water bodies from | Article 4 of the Water Framework Directive |

⁶³ European Union (2011) The EU Biodiversity Strategy to 2020, European Commission, Brussels, Belgium

⁶⁴ United Nations (2018) Sustainable Development Goals <https://bit.ly/2iHjQmD>

⁶⁵ Forest Service (2015) Forest Standards Manual; Forest Service, Department of Agriculture, Food & the Marine, Ireland; Department of Agriculture, Food & the Marine Johnstown Castle Estate Co. Wexford <http://bit.ly/2BQj2kL>

⁶⁶ Forest Service (2016) Environmental Requirements for Afforestation, Forest Service, Department of Agriculture, Food & the Marine, Ireland, Johnstown Castle Estate, Co. Wexford <http://bit.ly/2i0SSa9>

⁶⁷ Forest Service (2016) Land Types for Afforestation; Forest Service, Department of Agriculture, Food & the Marine, Ireland, Johnstown Castle Estate, Co. Wexford <http://bit.ly/2B4Gpdb>

| | |
|---|---|
| the negative impacts of afforestation and silviculture | Article 6(3) and Article 6 (4) of the Habitats Directive |
| The failure to protect High Nature Value farmland from the negative impacts of afforestation and silviculture | Article 6 of the supplementing regulations of the Rural Development Regulations (No. 1305/2013) |
| The failure to protect Flora from the negative impacts of afforestation and silviculture | Section 21 of the Wildlife Act, 1976 |

Table 1: The compliance of the Forestry Programme 2014-2020 with EU Environmental legislation

Ireland has a poor record when it comes to implementing EU environmental law, as evidenced by the number of high-profile cases taken against Ireland⁶⁸⁶⁹ by the European Court of Justice. Ensuring that Ireland addresses any outstanding compliance issues with the implementation of the Forestry Programme would also be judicious considering that the State Aid Decision which underpins the funding of the programme requires compliance with national and EU legislation, with specific reference to afforestation within Natura 2000 sites and High Nature Value farmland.

Protect birds and biodiversity

Ensuring full compliance with the Birds Directive (Directive 2009/147/EC) and the Habitats Directive (Directive 92 /43 /EEC) must be a priority for both the current and future Forestry Programmes. The current Forestry Programmes own Strategic Environmental Assessment (SEA)⁷⁰ and Natura Impact Statement (NIS)⁷¹ identified that mitigation measures would be necessary in order to prevent significant adverse or residual impacts on the environment. Unfortunately, many of the mitigation measures which were developed to prevent negative impacts on Natura 2000 sites and Annex species have never been implemented. Following the reasoning of the Forestry Programmes own SEA⁷⁰ and NIS⁷¹ it must be concluded that significant impacts on protected habitats and species will continue unless mitigation measures are fully implemented. BirdWatch Ireland believe that the following mitigation measures identified in the Forestry Programmes SEA⁷⁰ and NIS⁷¹ were sensible and should be fully implemented:

- ✓ **Establish a monitoring system to ensure that the Forestry Programme is not negatively impacting on biodiversity.**
- ✓ **Complete site-by-site ecological assessments of the impact of forestry on all qualifying interests of all Natura 2000 sites.**
- ✓ **Complete site-by-site ecological assessment where Annex I habitats or the habitat of Annex I birds or Annex II species occur or are likely to occur.**
- ✓ **Avoid sites with breeding Annex I bird species within Natura sites.**

⁶⁸ European Communities, 2006 nature And Biodiversity Cases – Ruling of the European Court of Justice

⁶⁹ Ruling of the Court of Justice of the European Union in Case C-418/04 Commission v Ireland ‘The Birds Case,’ <https://bit.ly/2oLK1so>

⁷⁰ Davie, H & Michael, I (2014) Ireland’s Forestry Programme 2014-2020 Strategic Environmental Statement (SEA); ADAS UK Ltd, 4205 Park Approach, Thorpe Park, Leeds LS15 8GB <http://bit.ly/2iv14vE>

⁷¹ Davies, H (2014) Ireland’s Forestry Programme 2014-2020, Appropriate Assessment (AA), Natura Impact Statement ADAS UK Ltd 11D Milton Park Milton Abingdon Oxfordshire OX14 4RS <http://bit.ly/2AAWDr6>



Figure 4: A female Hen harrier (*Circus cyaneus*) in flight. Commercial forestry is one of the greatest threats to this Amber listed bird of prey⁷²

Establish a system to monitor the impact of forestry on biodiversity

Establishing a monitoring system to ensure that the Forestry Programme is not negatively impacting on biodiversity would help to identify existing and emerging conservation conflicts. There is a currently a lack of detailed information on the negative impacts of forestry on specific habitats and species throughout the country. The high-level assessments produced by the NPWS of the conservation status of habitats and species protected by the Birds and Habitats Directives do identify whether forestry is a high-ranking threat or pressure on protected wildlife, but the report does not offer the kind of detailed observations or recommendations which would inform the development of conservation measures. The establishment of a monitoring system of the impact of the Forestry Programme on biodiversity would be useful in quantifying the scale of the threat posed by forestry and the system should be designed to alert the Forest Service where conservation conflicts need to be addressed in collaboration with relevant bodies such as the NPWS. While extensive research has been carried out into the relationship between forestry and some species like Hen harrier⁷², this work was only initiated following the long-term decline of the species population nationally. An appropriate monitoring system should be designed in collaboration with relevant government departments and relevant NGO's which can identify where significant conflicts are emerging rather than waiting until serious negative impacts have already occurred. The sooner issues are identified the better placed the sector will be to address them before they escalate. Having a system of monitoring in place would provide added reassurance that best practice is being followed and would help to avoid the costs associated with restoration measures.

- ✓ **Establish a monitoring system to ensure that the Forestry Programme is not negatively impacting on biodiversity.**

⁷² NPWS (2015) Hen Harrier Conservation and the Forestry Sector in Ireland. Dublin: National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht.

Carry out ecological assessments

The Forestry Programmes SEA⁷⁰ and NIS⁷¹ highlight the need for a high-level ecological assessment of the compatibility of different types of afforestation and management measures with the conservation requirements of the qualifying interests of all Natura 2000 sites. The need to ensure that forestry is not negatively impacting on the qualifying interests of Natura 2000 sites is legally required by both the Birds Directive (Article 2, Article 4 (1), Article 4 (2), Article 5) and the Habitats Directive (Article 6(3) and Article 6(4)). High-level assessments of potential conflicts between forestry with the legal protection afforded to Natura 2000 sites would aid the Forest Service in managing existing forestry within Natura 2000 sites and would help to inform ecological assessments including Appropriate Assessments and Environmental Impact Assessment.

- ✓ **Complete site-by-site ecological assessments of the impact of forestry on all qualifying interests of all Natura 2000 sites.**

BirdWatch Ireland have in the past highlighted that there are inadequate safeguards and training in place to ensure that afforestation does not negatively impact on Natura 2000 sites⁷³. Aside from certain species like Hen Harrier and more recently Curlew there are species-specific measures in place to protect Annex I birds or listed Birds of Conservation Concern in Ireland within the forestry consent processes. The requirement to assess the ecological impacts of a plan or project on Natura 2000 sites are laid down by Article 6(3) and 6(4) of the Habitats Directive. While the Forest Service do have an Appropriate Assessment Procedure to implement these requirements there are ongoing issues with their implementation resulting in applications being inappropriately exempted from Appropriate Assessment. It is unclear whether the ongoing failure to carry out Appropriate Assessment in sensitive sites is part of a sectoral bias in favour of afforestation or whether it is the result of the need for more ecologists in the field and better training. We believe that foresters and forestry inspectors would benefit from better guidance, including guidance on what the direct, indirect and cumulative impacts of afforestation are on specific species and habitats. No guidance exists on what habitats or landscape features are important for specific protected birds or what specific thresholds of forest cover negatively impact on individual species. Even small changes in forest cover can affect the breeding success and population viability of some species²³. Without adequate guidance, it is impossible for an inspector to carry out a proper ornithological assessment, Appropriate Assessment screening or a screening for an Environmental Impact Assessment. As many of the bird species which are known to be negatively impacted by afforestation are now on the Red and Amber lists of Birds of Conservation Concern in Ireland (BOCCI)²⁹, there is an urgent need for the forest sector to develop and implement safeguards to safeguard the most vulnerable species. Steps to improve the quality of ecological assessments would include:

- ✓ **Develop species specific safeguards to protect Red and Amber listed Birds of Conservation Concern in Ireland which are known to be negatively impacted by afforestation and forest management.**
- ✓ **Develop and implement species specific guidelines to inform ornithological assessments and mitigation measures for Red and Amber listed Birds of Conservation Concern in Ireland which are known to be negatively impacted by afforestation and forest management.**

⁷³ BirdWatch Ireland (2016) Submission on Forest Service 'Environmental Requirements for Afforestation' <https://bit.ly/2Mg9jcX>

- ✓ **Develop and implement species specific thresholds for forest cover in order to protect Red and Amber listed Birds of Conservation Concern in Ireland which are known to be negatively impacted by afforestation and forest management.**
- ✓ **Ensure foresters and forestry inspectors are trained in the identification of protected habitats and species.**
- ✓ **Employing regional ecologists to carry out site by site ecological assessments**
- ✓ **Ensuring that the NPWS are sufficiently resourced to allow them to fulfil their role as statutory consultees.**

BirdWatch Ireland had previously called for improved ecological assessments in our submission on the Forest Service 'Environmental Requirements for Afforestation' consultation⁷³. We supported our concerns with reference to the Bioforest Project⁵⁰. The Bioforest Project was a collaborative multidisciplinary study which was carried out between the EPA, COFORD, and several Irish Universities. It remains one of the most thorough studies to have been carried out on biodiversity in Irish plantation forests. The study identified deficiencies in the afforestation consent procedure and found that the "*lack of adequate strategic assessment, failure of regulations to require biodiversity assessment for the vast majority of afforestation proposals, and serious deficiencies in those biodiversity assessments that are carried out mean that sites of high biodiversity importance are currently at risk of being damaged by afforestation*". A review of forestry Environmental Impact Statements (EIS) found that the personnel carrying out the biodiversity assessment had not received adequate training or guidance. The report conclude that more guidance and training were necessary. Recurring deficiencies in the analysed ecological assessments included insufficient scoping, non-standardised habitat/vegetation classifications, reliance on incomplete lists of species with little or no information on abundance or distribution within the site, and little or no evaluation of the conservation importance of the site. Despite these deficiencies two thirds of afforestation projects for which an EIS was submitted were approved. These are ongoing issues that threaten biodiversity in both designated and undesignated sites. The Bioforest project made a number of recommendations on the need for on-site ecological assessments:

- ✓ **All afforestation sites should be surveyed for the presence of semi-natural and species rich grassland before consent is granted for afforestation**
- ✓ **Pre-afforestation site surveys should map habitats using a standard classification and note the presence of indicators and other biodiversity features**
- ✓ **Foresters submitting grant applications should have completed accredited ecological training courses or employ qualified ecologists**

Use forestry sensitivity mapping

A landscape-based approach to afforestation using spatial planning is one approach which could allow planners and stakeholders to foresee and manage potential conflicts with conservation objectives. Sensitivity mapping is being used internationally to identify potential conflicts with conservation or ecosystem management and alter developments or land use strategies accordingly⁷⁴. The distribution of activities or developments can then be planned in a way that avoids, reduces or offsets the identified negative impacts on wildlife or ecosystem functioning. This approach can allow decision makers to avoid unnecessary litigation and reputation damage and

⁷⁴ Gökmen, E. Y., & Gülersoy, N. Z. (2018). Spatial Planning as a Tool for Effective Nature Conservation: A Conceptual Framework for Turkey's Spatial Planning System. *Journal of Landscape Ecology*, 11(1), 73-98.

ensure that their operations are managed in a sustainable way. The application of sensitivity mapping has been used across a broad range of sectors including resource assessments, recreational planning, biodiversity conservation and environmental impact assessments.

At an EU level the European Commission recommended back in 2010 that wildlife sensitivity maps be used in order to avoid potential conflicts between development and the protected species of EU importance throughout their entire natural range⁷⁵. In an Irish context the ruling of the Court of Justice of the European Union (CJEU) on the fifth complaint in Case C 418/04 Commission v Ireland ‘The Birds Case,’ found that Ireland had in numerous ways failed to protect wild birds and the habitats. This case precipitated the production of by BirdWatch Ireland of 10 Group Species Action Plans⁷⁶ for Ireland’s ‘priority, migratory and dispersed’ birds based on their habitat requirements. A key recommendation of these reports was the necessity for better land-use planning using spatial tools.

Birds are good indicators of biodiversity at a landscape level³⁴. They are also well studied relative to other groups and enjoy a high level of protection through international legislation such as the Birds Directive (Directive 2009/147/EC). It is therefore not surprising that bird distribution has been used internationally to underpin sensitivity mapping tools. Bird sensitivity maps have proven themselves to be a useful planning tool, which can be used in the pre-planning, screening, planning or assessment processes. They aim to identify potential sensitivities using existing bird data or proxies such as designated areas^{77,78}. To date bird sensitivity maps have been most commonly used in the wind energy sector, with tools having been developed at a national level in Germany⁷⁹, Scotland (Bright et al., 2006), England⁸⁰ and Lesotho⁸¹ and regionally for the Middle East and North East Africa⁸². In Ireland a bird sensitivity mapping tool for wind energy developments and associated infrastructure was developed by BirdWatch Ireland, in close collaboration with a range of partners from the scientific, industry and government sectors⁷⁷.

Bird sensitivity mapping for forestry is a tool which would provide the necessary guidance for the assessment of new forestry in Ireland. BirdWatch Ireland believe that such a planning tool is needed to underpin future sustainable expansion of forestry. The Forest Service of the Department of Agriculture, Food and the Marine must look to such innovative solutions in order to ensure that Ireland continues to improve standards and avoids adverse impacts not only on biodiversity within designated sites but also in the wider countryside. This is an objective which is a requirement of Sustainable Forest Management (SFM). The Forest Service have themselves within the ‘Forest Biodiversity Guidelines’⁸³ advocated for “*the incorporation of biodiversity considerations (in map and*

⁷⁵ European Commission, 2010. Wind energy developments and Natura 2000: EU guidance on wind energy development in accordance with the EU nature legislation. Publication Office of the European Union, Luxembourg.

⁷⁶ BirdWatch Ireland (2011) BirdWatch Ireland’s Group Action Plans for Irish Birds. BirdWatch Ireland, Kilcoole, Co. Wicklow <https://bit.ly/2DETSau>

⁷⁷ McGuinness, S., Muldoon, C., Tierney, N., Cummins, S., Murray, A., Egan, S., & Crowe, O. (2015). Bird sensitivity mapping for wind energy developments and associated infrastructure in the Republic of Ireland. BirdWatch Ireland, Kilcoole, Wicklow.

⁷⁸ Bright, J. A., Langston, R. H. W., Bullman, R., Evans, R. J., Gardner, S., Pearce-Higgins, J., & Wilson, E. (2006). Bird Sensitivity Map to provide locational guidance for onshore wind farms in Scotland. Royal society for the protection of birds research report, (20).

⁷⁹ Garthe, S. & Hüppop, O. (2004). Scaling possible adverse effects of marine wind farms on seabirds: developing and applying a vulnerability index. *Journal of Applied Ecology*, 41(4), pp.724–734.

⁸⁰ Bright, J. A., Langston, R., & Anthony, S. (2009). Mapped and written guidance in relation to birds and onshore wind energy development in England. RSPB.

⁸¹ Sands, D. (2015). Mapping the sensitivity of Lesotho’s avifauna to wind farm developments (Doctoral dissertation, University of Cape Town).

⁸² Allinson, T. (2017). Introducing a new avian sensitivity mapping tool to support the siting of wind farms and power lines in the Middle East and northeast Africa. In *Wind Energy and Wildlife Interactions* (pp. 207-218). Springer, Cham.

⁸³ DAFM (2000) Forest Biodiversity Guidelines, Dept. of Agriculture, Food and the Marine.

descriptive format, as appropriate) into the initial site development plan” and “focus on how best to conserve and enhance biodiversity in Irish forests, through appropriate planning, conservation and management.”

In 2018 BirdWatch Ireland authored a scoping report on the development of a bird sensitivity mapping tool for forestry in Ireland⁸⁴. The outputs of the report ‘Bird Sensitivity Mapping for Forestry - a tool and guidance for strategic planning of new forestry in Ireland’ included:

- To devise a methodology for species selection i.e. assess aspects of the ecology of species most likely to be affected by new planting so as to identify relevant parameters for inclusion in a sensitivity scoring model;
- To produce a list of species for inclusion, based on the above exercise, and through consultation with in-house and key external species experts;
- To identify the scope of the mapping exercise i.e. whether it would address new forestry alone, or also include existing forestry and forestry management activities;
- To identify complimentary mapping layers (existing forest cover, peatland cover, alien invasive plant species for example) that can be accessed/published alongside any online Forestry Sensitivity Mapping tool;
- To encourage stakeholder engagement in the development of a mapping tool, its associated guidance, and application for the end-user.

This study informed the creation of a Species Sensitivity Index (SSI) which was based on 12 factors:

- Conservation status (based on five criteria of population status and two additional factors (range size and endemic status), and;
- Vulnerability (five factors based on aspects of a species’ ecology that makes them vulnerable to the effects of afforestation).

The scoping report lays the foundation for the development of what we believe will be an essential tool in the evolution of sustainable forestry management in Ireland. The scoping report has established a Species Sensitivity Index for afforestation in Ireland. This index is not static and can be reviewed and updated as further research and data becomes available. The next logical step is to move forward to phase 2 and the development of a consolidated bird sensitivity map for afforestation in Ireland. The consolidated map should be based on the known distribution of already identified vulnerable species as well as their habitats. These eventual species-habitat layers may then be combined to generate a sensitivity map.

⁸⁴ Lewis, L., Cummins, S., Crowe, O., Duggan, O., & Lusby, J. (2018) Bird Sensitivity Mapping for Forestry - a tool and guidance for strategic planning of new forestry in Ireland - Phase 1 – Scoping. BirdWatch Ireland, Kilcoole, Wicklow.

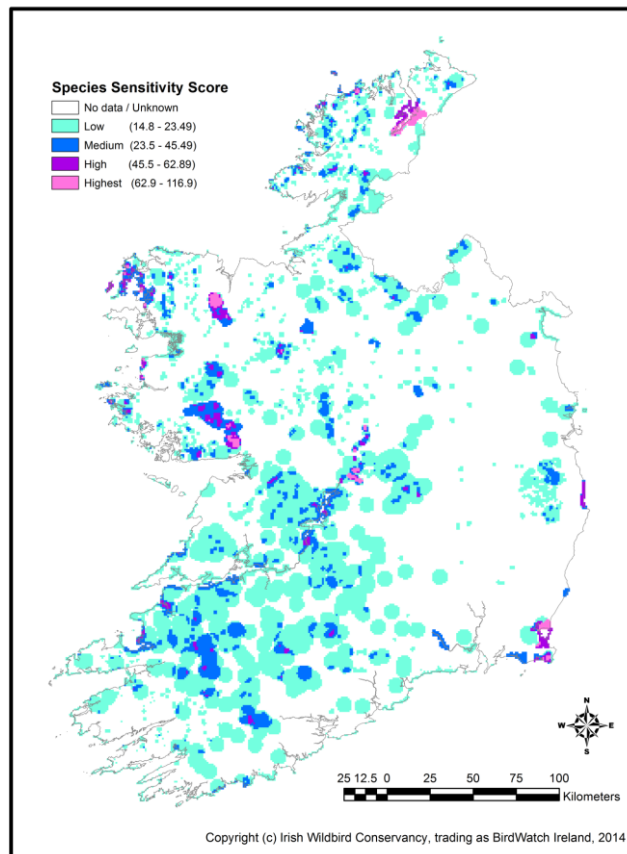


Figure 5: Composite Sensitivity Map of mainland Republic of Ireland, following mapping and assessment of 22 key species of birds in relation to the risk posed by wind energy development. The maps do not aim to identify ‘no-go’ areas for afforestation, nor do they aim to provide a ‘green light’ to afforestation; they simply provide a platform where practitioners can access existing information and guidance.

Once complete the sensitivity map would be GIS based and freely available through an online public GIS platform. It would be accompanied by written guidance which would outline for practitioners the ecological requirements of the species grouped in each layer, such as site selection, breeding habitat preferences and site specific and land use factors. This will support consultants, developers and regulatory authorities to interpret the information available through the sensitivity map in combination with finer assessments carried out by foresters and inspectors. As with all tool’s sensitivity mapping is not a panacea and it comes with its own limitations. Sensitivity maps are intended for guidance purposes only. The maps do not aim to identify ‘no-go’ areas for afforestation, nor do they aim to provide a ‘green light’ to afforestation; they simply provide a platform where practitioners can access existing information and guidance. Sensitivity maps do not replace the need for site-based assessments of the impacts of afforestation on biodiversity. Additional ecological assessment may still be necessary. However, what the tool will do is help to streamline the decision-making process and allow for limited resources to be targeted towards the cases where applications have the highest risk of negatively impacting on biodiversity. Avoiding unnecessary conflicts between our national afforestation and biodiversity targets will ultimately be beneficial for the forest sector.

- ✓ **Develop and implement a ‘Bird Sensitivity Mapping Tool for Forestry’ which will help to inform the future sustainable expansion of forestry in Ireland.**

- ✓ **Bird Sensitivity Mapping in tandem with species specific, guidelines, safeguards and thresholds for forest cover, should be used to protect Red and Amber listed Birds of Conservation Concern in Ireland, which are known to be negatively impacted by afforestation and forest management.**

Protect High Nature Value farmland

Both within Ireland and across the EU the loss of farmland biodiversity has been severe over recent decades. Recent research from Germany has demonstrated a 75 % decline in total flying insect biomass in protected areas over the last 27 years⁸⁵ while populations of European farmland birds have declined by as much as 50% since 1980⁸⁶. In Ireland the situation is little different with many of our Red Listed birds of conservation concern being heavily dependent on farmland⁸⁷. In Ireland within the space of four decades farmland birds like Corncrake (*Crex crex*), Twite (*Carduelis flavirostris*), Whinchat (*Saxicola rubetra*), Grey partridge (*Perdix perdix*) and Yellowhammer (*Emberiza citrinella*) have undergone dramatic declines in their distribution while Corn Bunting have disappeared completely as a breeding species⁸⁸. The loss of farmland biodiversity is an important contributor to biodiversity loss in Europe. Over 50% of Europe's most highly valued biotopes occur on low-intensity farmland⁸⁹. Of Europe's most threatened habitats and species, 57 types of habitat and 257 species depend on or are associated with farming. Worryingly over 75% of these habitats and at least 70% of the species are in unfavourable conservation status⁹⁰. The conservation of biodiversity on European farmland agricultural land is accepted at an EU level as being critical to the successful implementation of the Pan-European Biodiversity and Landscape Strategy (PEBLDS), the Bern Convention, the European Landscape Convention, the Birds and Habitats Directives, and Rural Development policy (Community Strategic Guidelines for Rural Development)⁹¹.

The concept of High Nature Value Farmland (HNVf) has been around since the early 1990's⁹². High Nature Value farmland has most commonly been defined as “*those areas in Europe where agriculture is a major (usually the dominant) land use and where that agriculture supports or is associated with either a high species and habitat diversity, or the presence of species of European, and/or national, and/or regional conservation concern, or both*”⁹³. Indeed “*the highest grade of HNV farmland is that which supports the presence of species of European conservation concern*”⁹⁴. In the EU the need to identify and protect HNVf is part of an integrated approach to rural and environmental policy which sees farming as being about more than just food production. It is

⁸⁵ Hallmann CA, Sorg M, Jongejans E, Siepel H, Hofland N, Schwan H, et al. (2017) More than 75 percent decline over 27 years in total flying insect biomass in protected areas. PLoS ONE 12 (10): e0185809. <https://doi.org/10.1371/journal.pone.0185809>

⁸⁶ Brambilla, M.; Casale, F.; Bergero, V.; Bogliani, G.; Crovetto, M.; Falco, R.; Roati, M.; Negri, I. Glorious past, uncertain present, bad future? Assessing effects of land-use changes on habitat suitability for a threatened farmland bird species. Biol. Conserv. 2010, 143, 2770–2778.

⁸⁷ Colhoun K and Cummins S (2013). Birds of Conservation Concern in Ireland 2014 –2019. Irish Birds. 9: 523–544.

⁸⁸ Balmer, D.E.; Gillings, S.; Caffrey, B.J.; Swann, R.L.; Downie, I.S.; Fuller, R.J. Bird Atlas 2007–2011: The Breeding and Wintering Birds of Britain and Ireland; BTO Books: Thetford, UK, 2013.

⁸⁹ Bignal, E M and McCracken, D I (2016) Low-intensity farming systems in the conservation of the countryside. Journal of Applied Ecology: 413-424.

⁹⁰ Keenleyside, C, et al. High Nature Value farming throughout EU-27 and its financial support under the CAP. London: DG Environment, Contract No ENV B.1/ETU/2012/0035, Institute for European Environmental Policy, 2014.

⁹¹ Paracchini, M. L., Petersen, J. E., Hoogeveen, Y., Bamps, C., Burfield, I., & van Swaay, C. (2008). High nature value farmland in Europe. An estimate of the distribution patterns on the basis of land cover and biodiversity data. EUR, 23480.

⁹² Baldock, D., Beaufoy, G., Bennett, G., and Clark, J. (1993). Nature Conservation and New Directions in the Common Agricultural Policy. London: Institute for European Environmental Policy.

⁹³ Andersen, E., Baldock, D., Bennett, H., Beaufoy, G., Bignal, E., Brouwer, F., et al. (2003). Developing a High Nature Value Indicator. Report for the European Environment Agency, Copenhagen.

⁹⁴ Cooper, T, et al. 2007 HNV Indicators for Evaluation, Final report for DG Agriculture. Brussels: European Commission, Institute for European, Environmental Policy

recognised that HNVf is an important reservoir for biodiversity, ecosystem services and cultural heritage which are dependent on farming⁹⁵.

In many parts of Europe including Ireland, the farming systems that are of most value for biodiversity conservation are low-intensity raising of livestock on unimproved vegetation that is grazed, browsed, or cut for hay⁹⁶. Although more intensively managed farmland can be considered HNVf due to the presence of populations of species of European conservation concern⁹⁷. In general, HNVf systems are associated with low intensity land management, high levels of semi-natural land cover and habitats and species of conservation interest⁹³. The association of HNVf with low agricultural production and marginal rural areas has meant that due to a range of socio-economic pressures HNVf is being lost due to land abandonment, afforestation and agricultural intensification⁹⁷.

According to the Forest Service's Land Types for Afforestation Document⁹, the SEA⁷⁰ of the current Forestry Programme and Council for Forest Research and Development (COFORD)⁹⁸ the expansion of forestry in Ireland will occur on marginal agricultural land. This same marginal farmland is strongly associated with the occurrence of HNVf⁹⁷. Because of this relationship there is a direct overlap between land which is being earmarked for afforestation⁹⁹ and HNVf⁹⁷. Teagasc research has demonstrated this overlap in Figure 6¹⁰⁰ (Land available for afforestation (left) and HNV farmland⁹⁷ (right)). The map on the left highlights in orange the areas which are affected by National and EU environmental designations and in light green land which is classified as marginal agricultural land. Both areas overlap with the predicted distribution of HNV farmland on the right. An overlap between newly planted forests and HNVf which is associated with has already been established for Birds of Conservation Concern in Ireland (BoCCI)¹⁰⁰. Recent forest planting has overlapped with 78% of the 10 x 10km squares occupied by birds of conservation concern, with 11% of these squares being planted with 100ha or more. The overlap between recent forest planting with species such as Barn Owl (*Tyto alba*) was as high as 93%. There observation led the authors of the study to conclude that *"afforestation may represent a threat at a regional and national scales to some of these bird species in the near future. At least for the already threatened species, which depend on grassland areas for foraging, plantation forests may already be having a negative impact."*

⁹⁵ Pointereau, P., Paracchini, M. L., Terres, J. M., Jiguet, F., Bas, Y., & Biala, K. (2007). Identification of High Nature Value farmland in France through statistical information and farm practice surveys. JRC Scientific and Technical Reports. EUR, 22786, 76.

⁹⁶ Bignal, E.M. and McCracken, D.I., 1996. Low-intensity Farming Systems in the Conservation of the Countryside. Journal of Applied Ecology, 33, 413-424.

⁹⁷ European Communities (2009). Guidance document. "The application of the High Nature Value Impact indicator. Programming period 2007-2003

<https://bit.ly/2DG1Zo5>

⁹⁸ COFORD (2016) Land Availability Working Group. Land Availability for Afforestation - Exploring opportunities for expanding Ireland's forest resource. COFORD, Dublin: <http://bit.ly/2AAGcx1>

⁹⁹ Farrelly & Gallagher (2016) Potential availability of land for forestry, TRResearch Volume 11: Number 1. Spring 2016, ISSN 1649-8917 <https://bit.ly/3fTSTeZ>

¹⁰⁰ 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.

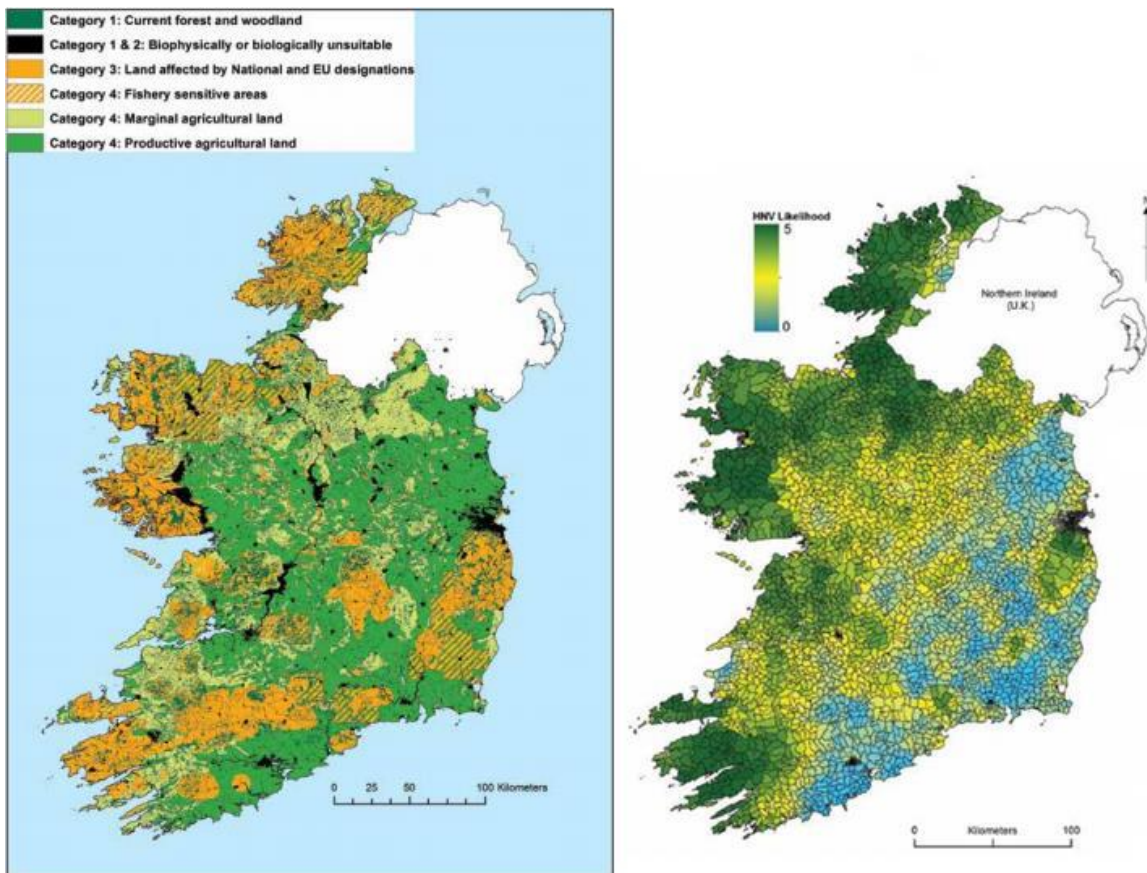


Figure 6: Left⁹⁹ - Classification of Ireland's land area in relation to the availability of land for afforestation and the area of productive and marginal agricultural land with most potential for forestry expansion. Areas with solid orange colouring denote land with National and EU designation. Hatched orange areas denote land which are fisheries sensitive. Light green areas denote marginal agricultural land with no designation. Right¹¹ - Predicted distribution of HNV farmland in the Republic of Ireland. The overlap between HNV farmland and areas deemed suitable for afforestation by Teagasc highlights the threat posed by the forestry programme and the lack of consideration given to biodiversity conservation within Ireland's forestry strategy.

The need to protect HNVf has been recognised within the EU's Common Agricultural Policy the Rural Development Policy⁹⁵. Aside from the protection afforded to habitats and species associated with HNVf through EU and Irish legislation HNVf itself is also afforded protection from afforestation through Article 6 of the supplementing regulations of the Rural Development Regulations (No. 1305/2013)¹⁰¹ (emphasis added):

*"Minimum environmental requirements with which the afforestation of agricultural land must comply should be laid down ensuring that **no inappropriate afforestation of sensitive habitats including areas under high natural value farming takes place** and that the need for resilience to climate change is taken into account. On sites designated as Natura 2000, afforestation should be consistent with the management objectives of the sites concerned. Special attention should be paid to specific environmental needs for particular sites such as the prevention of soil erosion. More stringent rules should be provided for afforestation operations leading to the creation of larger forests in order to take into account the impact of scale of those operations on the ecosystems and to*

¹⁰¹ European Commission delegated regulation No 807/2014 supplementing regulation (EU) No 1305/2013 <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0807&from=en>

ensure that they comply with the objectives of the Green Infrastructure Strategy (1) and new EU Forest Strategy (2)."

These obligations are acknowledged within the current Forestry Programme¹. The need to protect HNVf is mentioned in Priority 4 (a) of the programme: in order to preserve restore and enhance *"biodiversity, including in Natura 2000 areas and high nature value farming, and the state of European landscapes."* Unfortunately, there are no corresponding objectives or actions under priority 4 which mention HNV farmland. The obligation to protect HNV farmland is referenced later in the Forestry Programme where it states, *"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."* This statement obliges the Forest Service to ensure that safeguards are put in place to protect HNVf. Despite the Forest Service's acceptance that HNVf should be protected there are currently no guidelines or recommendations within the afforestation approvals process to implement these obligations.

By way of explanation for this omission the Forestry Programme states that *"the concept of High Nature Value land is not yet fully established in Ireland and HNV land has not been specifically designated or mapped."* There has been an obligation on Member States to use HNVf as an indicator since 2005¹⁰². There is a common definition of HNVf but the European Commission have imposed no common methodology for the identification of HNVf in order to allow Member States to tailor their approaches to their own regional conditions and their available data¹⁰². The European Commission have also provided guidance on the identification and monitoring of HNVf since 2009¹⁰³. Member States like Ireland have had ample time to ensure that HNVf is mapped and protected. The Forest Service have a responsibility to ensure that they have the appropriate measures in place to identify and protect HNVf from afforestation.

In relation to agri-environmental schemes Ireland is at the forefront in Europe when it comes to identifying HNVf systems and protecting them through the implementation of results-based schemes¹⁰⁴. Progress has been made in mapping the predicted distribution nationally of HNVf¹⁰⁵ and there is existing data on the distribution of many semi-natural habitats¹⁰⁶¹⁰⁷ and species of European conservation concern¹⁰⁸. However, the predicted distribution map of HNVf occurrence which has been produced has its limitations. As a predictive map it has not been ground truthed and cannot be used to identify the presence of HNVf at field level. The map is based on the land cover approach to HNVf mapping which is based on criteria relating to vegetation types and landscape structure. This approach has its limitations in that unless it is accompanied by an analysis of biodiversity, it risks excluding HNVf which should be protected due to high levels of biodiversity or due to the presence of species of conservation interest. Unless land cover approaches to HNVf mapping are accompanied by objective biodiversity data then they may fail to indicate HNVf extent or quality¹⁰⁹.

¹⁰² European Commission (2016) Directorate-General for Agriculture and Rural Development – Unit E.4 (2016): Report. Preparing the assessment of HNV Farming in RDPs 2014-2020: practices and solutions. Good Practice Workshop, Bonn 7-8 June 2016. Brussels.

¹⁰³ IEEP, 2007. Guidance Document to the Member States on the Application of the High Nature Value Indicator. Report for DG Agriculture. Contract Notice 2006-G4-04.

¹⁰⁴ Ó hUallacháin, D and J A Finn (2015) Farmland Conservation with 2020 Vision. xx-xx. ISBN 978-1-84170-620-7. Wexford: Teagasc.

¹⁰⁵ Matin, S., Sullivan, C.A., Ó hUallacháin, D., Meredith, D., Moran, J., Finn, J.A. and Green, S., 2016. Map of High Nature Value farmland in the Republic of Ireland. Journal of Maps 12: 373–376.

¹⁰⁶ O'Neill, F.H., Martin, J.R., Devaney, F.M. & Perrin, P.M. (2013) The Irish semi-natural grasslands survey 2007-2012. Irish Wildlife Manuals, No. 78. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

¹⁰⁷ Perrin, P.M., Roche, J.R., Barron, S.J., Daly, O.H., Hodder, R.L., & Devaney, F.M. (2014). National Survey of Upland Habitats (Phase 4, 2013-2014), Site Report No. 16: Caha Mountains cSAC (000093), Cos. Cork and Kerry. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

¹⁰⁸ Balmer, D.E., Gillings, S., Caffrey, B., Swann, R.L., Downie, I.S. and Fuller, R.J., 2013. Bird Atlas 2007-11: the breeding and wintering birds of Britain and Ireland. Theftford: BTO.

¹⁰⁹ Campedelli T, Calvi G, Rossi P, Trisorio A, Tellini Florenzano, G, The role of biodiversity data in High Nature Value Farmland areas identification process: a case study in Mediterranean agrosystems, Journal for Nature Conservation (2018)

Including biodiversity data as HNVf indicators allows for identification of farmlands of highest natural value which other approaches may might fail to identify. Research in Italy¹¹⁰ has shown that the failure to consider biodiversity as a HNVf indicator resulted in some of the most important areas for biodiversity being excluded. Landcover based approaches to HNVf identification can be biased towards identifying heterogeneous landscapes excluding agricultural landscapes which many be less diverse, but which are still HNVf due to the presence of birds of conservation interest^{109 111 112}.

Denmark as an example have a strong species focus to their approach to HNVf mapping¹⁰². They have included a broad range of biodiversity including data from national authorities and citizen science. By using a number of biodiversity proxies their approach to HNVf mapping is cost-effective and reduces the risk of missing important areas for biodiversity due to gaps in individual data sets¹⁰². Denmark's biodiversity mapping approach includes 'red list of species' and all species on Annex II and IV of the Habitats Directive. The European Commission recommend that the more precise, frequent and widespread the monitoring of the abundance of the selected taxa the better the biodiversity indicators will be¹¹³. Birds are one of the most commonly used biodiversity indicators in HNVf mapping due to the availability of high-quality data, with good spatial coverage and standardized monitoring programmes in nearly all Member States¹⁰⁹. Birds are also known to be good indicators of HNVf with positive correlations having been observed between population trends for farmland birds (Farmland Bird Index, FBI) - including both generalist and specialist species - and the extent of HNVf^{114 115}.

BirdWatch Ireland believe that the development of a bird sensitivity mapping tool in tandem with other existing biodiversity data sets and existing landcover based approaches to HNVf identification would support the Forest Service in preventing HNVf from being afforested. Using bird data will help to avoid afforesting agricultural land which is considered HNVf due to "*the presence of species of European, and/or national, and/or regional conservation concern, or both.*" Habitat based approaches to HNVf on their own may fail to detect non-annexed habitat which is HNVf due to the presence of Annex I bird species and Birds of Conservation Concern in Ireland. Using European designations as the sole qualification for whether a habitat or a species is of conservation concern will fail to protect biodiversity of national and/or regional conservation concern.

- ✓ **Develop a HNVf mapping tool using existing bird, biodiversity and landcover data to prevent the inappropriate afforestation of HNVf.**

A HNVf mapping tool will come with its own limitations and cannot replace the need for site-based ecological assessments. What HNVf can do is provide practitioners with the best available data in a format that will enhance their ability to make good planning decisions and reduce the risk of non-compliance with the Irish and EU legislation. Avoiding unnecessary conflicts will ultimately be beneficial for the forest sector.

110 Forconi, V., Mandrone, S., Vicini, C. (Eds.). (2010). Aree agricole ad alto valore naturale: dall'individuazione alle gestione. Manuali e linee guida. ISPRA, Roma.

111 Morelli, F., & Girardello, M. (2013). Buntings (Emberizidae) as indicators of HNV of farmlands: a case of study in Central Italy. *Ethology Ecology & Evolution*, (ahead-of-print), 1–8.

112 Morelli, F., Jerzak, L., & Tryjanowski, P. (2014). Birds as useful indicators of high nature value (HNV) farmland in Central Italy. *Ecological Indicators*, 38, 236–242.

113 European Communities (2009). Guidance document. "The application of the High Nature Value Impact indicator. Programming period 2007-2003

114 Doxa, A., Bas, Y., Paracchini, M. L., Pointereau, P., Terres, J.-M., & Jiguet, F. (2010). Low-intensity agriculture increases farmland bird abundances in France. *Journal of Applied Ecology*, 47(6), 1348–1356.

115 Doxa, A., Paracchini, M. L., Pointereau, P., Devictor, V., & F, J. (2012). Preventing biotic homogenization of farmland bird communities: the role of High Nature Value farmland. *Agriculture, Ecosystems & Environment*, 148, 83–88.

Protect Flora Protection Order species

There are over a thousand vascular plants known to be native to Ireland. 106 (8.8%) of these have been assigned an IUCN Red List threat category: 20 (1.7%) are Critically Endangered, 25 (2.1%) are Endangered and 61 (5.0%) are Vulnerable; these comprise Ireland's Red-listed taxa. 15 taxa (1.2%) are Regionally Extinct, 98 (8.1%) are Near Threatened, 887 (73.2%) are Least Concern and 105 (8.7%) are awaiting assessment¹¹⁶. Three vascular plants and several bryophytes are protected under the Habitats Directive. Sixty-eight vascular plant taxa are protected by Section 21 of the Wildlife Act, 1976, as amended by the Wildlife (Amendment) Act, 2000, and are set out in the Flora (Protection) Order, 2015¹¹⁷. Except under licence none of the taxa listed on the Flora (Protection) Order may be taken, damaged, kept, bought, sold or their habitat/environment wilfully altered, damaged, destroyed or otherwise interfered with. The high level of protection afforded to these plants is not reflected in the Environmental Requirements for Afforestation. Under the relevant guideline's forester are not obliged to carry out an ecological report but "may" do so. There is no training or guidance given to foresters to identify FPO species. Forestry inspectors have data on a limited number of small white orchid (*Pseudorchis albida*) populations. These are the only populations of FPO species which are mapped. In the absence of training, ecological expertise and a lack of tools to help foresters identify FPO species the requirements of the Wildlife Act cannot be properly implemented.

Therefore, foresters need to be trained in the identification of FPO species and in the identification of suitable habitat. In order to ensure that the required level of protection is afforded to FPO species the Forest Service's environmental guidelines should be updated so that ecological reports are required from qualified ecologist for any site which is likely to support FPO species. The Forest Service should avail of existing data on the distribution of FPO species and the distribution of associated habitats to identify sites which are likely to support FPO plant communities. Data sets like the NPWS's map of the distribution of FPO bryophytes¹¹⁸ are already publicly available and could easily be used in the afforestation approvals process.

- ✓ **Ensure foresters are trained in the identification of FPO Species and in the identification of habitats that are likely to support FPO species.**
- ✓ **Update the Environmental Requirements for Afforestation guidelines so that ecological reports are required from qualified ecologist for any site which is likely to support FPO species.**
- ✓ **Ensure that the Forest Service use sensitivity mapping layer that includes the most up to date NPWS data on the distribution of FPO species when assessing applications.**

¹¹⁶ Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) Ireland Red List No. 10: Vascular Plants. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

¹¹⁷ S.I. No. 356/2015 - Flora (Protection) Order, 2015 <https://bit.ly/2HhaNVh>

¹¹⁸ NPWS (2015) Flora Protection Order Map Viewer – Bryophytes <https://bit.ly/2GcQwLj>



Figure 7: A small white orchid (*Pseudorchis albida*). One of many FPO species which are threatened by commercial forestry.

Review existing thresholds for EIA

Under the current Forest Consent and Assessment Regulations¹¹⁹ all afforestation projects, whether grant-aided or not, must be assessed for their potential environment effects to determine whether an Environmental Impact Assessment (EIA) is required. The regulations lay down thresholds over which an EIA is triggered during the afforestation approvals process. District inspectors are required to have received training in the identification of EIA thresholds and in carrying out sub-threshold EIA screenings. The Forest Service have a sub-threshold EIA process to guide forestry inspectors. In practice however EIA's are rarely carried out in Ireland despite afforestation often taking place on sites which have environmental sensitivities. Under the current Forestry Regulations 2017 (SI No 191 of 2017) an EIA is only required for afforestation if the project exceeds 50 hectares or (ii) the project is less than 50 ha but is likely to have a significant effect on the environment. BirdWatch Ireland believe the 50ha threshold for a mandatory EIA is far too high to allow meaningful environmental protection in an Irish context. For example, the national average enclosed field size is 2.5 ha¹²⁰ and the average Irish farm is 32.5 ha¹²¹; while the average size of private grant-aided afforestation since 1980 to 2016 was 8.8 ha¹²². Even ignoring the potential for applications being designed to avoid the EIA thresholds, having a 50ha threshold is still too high to ensure that the vast majority of applications will be subject to EIA. In contrast in England, Wales and Scotland the respective Forestry

¹¹⁹ S.I. No. 558/2010 - European Communities (Forest Consent and Assessment) Regulations 2010 <http://www.irishstatutebook.ie/eli/2010/si/558/made/en/print>

¹²⁰ Teagasc (2012) Average size of enclosed agricultural fields by townland in the Republic of Ireland <https://bit.ly/2DfjgeZ>

¹²¹ Central Statistics Office (2013) Farm Structure Survey 2013 <https://bit.ly/2SYrJS3>

¹²² DAFM (2018) Forests Statistics – Ireland 2017 is an annual compilation of statistics on the forest estate and the forest industry in Ireland <https://bit.ly/2TUk0o3>

Commissions require that all afforestation applications within designated sites such as Sites of Special Scientific Interest (SSSI) and Natura 2000 sites must undergo mandatory EIA screening¹²³. There is no such guidance from the Forest Service in Ireland. Given the established impacts of forestry operation on the environment sensitive sites such as Natural Heritage Areas and Natura 2000 sites should automatically be subject to a screening for EIA. The 50ha threshold for a mandatory EIA should be revised and scientifically justified thresholds should be adopted for sites which are environmentally sensitive (such as Natura 2000 sites) or are of high scenic amenity.

- ✓ **The 50ha threshold for a mandatory EIA should be revised and replaced with scientifically justified thresholds for both environmentally sensitive sites.**

Conclusion

Ireland currently has one of the highest rates of afforestation in the EU^{1 3} and according to government policy this is set to continue as an ambitious target of increasing forest cover from 10.7% to 18% by 2046. Under a business as usual scenario if the type of trees being planted and the way they are being harvested does not change then there will be an increase in water quality issues in many catchments. Likewise, if the expansion of forestry is disproportionately targeted towards marginal agricultural land then the observed negative impacts on both freshwater and terrestrial biodiversity will continue. Given the that many of the species and habitats which are being worst affected by afforestation are already threatened in Ireland further declines in their conservation status and distribution will have catastrophic consequences for Irish biodiversity. This prediction however need not come to fruition. Ireland has one of the lowest levels of forest cover in the EU and there is potential to sustainably increase the level of forest cover in Ireland without negatively impacting on biodiversity. Rather than merely seeking to ensure that Irish forestry is compliant with national and European environmental legislation Ireland could strive to be a world leader in sustainable forest management. Whether forestry in Ireland will have a net positive or negative influence on biodiversity will ultimately depend on a range of factors, such as where afforestation takes place, the model of forestry used and the environmental safeguards that are implemented.

By implementing the suggestions outlined in this report and ensuring that the right tree, is planted in the right place and is under the right management then Irish forestry could be actually enhance regional and national biodiversity:

| BirdWatch Ireland's Recommendations to Green Irish Forestry |
|---|
| ✓ Plant more native tree species and more native broadleaves |
| ✓ Convert plantations to semi-natural woodlands of broadleaves or native / non-native intermixes |
| ✓ Replace clear-fell harvesting with continuous cover forestry |
| ✓ Retaining large trees within forestry plots to provide habitat for species that depend on large living trees and deadwood |
| ✓ Establish a monitoring system to ensure that the Forestry Programme is not negatively impacting on biodiversity. |
| ✓ Complete site-by-site ecological assessments of the impact of forestry on all qualifying interests of all Natura 2000 sites. |
| ✓ Complete site-by-site ecological assessment where Annex I habitats or the habitat of Annex I birds or Annex II species occur or are likely to occur. |

¹²³ Forestry Commission England (2017) EIA Screening Guidance <https://bit.ly/2HgAvJL>

| | |
|---|--|
| ✓ | Avoid sites with breeding Annex I bird species within Natura sites. |
| ✓ | Training for foresters and forestry inspectors on the identification of Annex I habitats and species. |
| ✓ | Employing regional ecologists to carry out site by site ecological assessments |
| ✓ | Ensuring that the NPWS are sufficiently resourced to allow them to fulfil their role as statutory consultees. |
| ✓ | All afforestation sites should be surveyed for the presence of semi-natural and species rich grassland before consent is granted for afforestation |
| ✓ | Pre-afforestation site surveys should map habitats using a standard classification and note the presence of indicators and other biodiversity features |
| ✓ | Foresters submitting grant applications should have completed accredited ecological training courses or employ qualified ecologist. |
| ✓ | Develop and implement a 'Bird Sensitivity Mapping Tool for Forestry' which will help to inform the future sustainable expansion of forestry in Ireland. |
| ✓ | Ensure foresters are trained in the identification of FPO Species and in the identification of habitats that are likely to support FPO species. |
| ✓ | Update the Environmental Requirements for Afforestation guidelines so that ecological reports are required from qualified ecologist for any site which is likely to support FPO species. |
| ✓ | Ensure that the Forest Service use sensitivity mapping layer that includes the most up to date NPWS data on the distribution of FPO species when assessing applications. |
| ✓ | The 50ha threshold for a mandatory EIA should be revised and replaced with scientifically justified thresholds for both environmentally sensitive sites. |

