An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine

Forest Statistics Ireland 2023

Prepared by the Department of Agriculture, Food and the Marine

gov.ie/agriculture

The Department of Agriculture, Food and the Marine is responsible for ensuring the development of forestry within Ireland in a manner and to a scale that maximises its contribution to national socio-economic well-being on a sustainable basis that is compatible with the protection of the environment.

Published by:
Department of Agriculture, Food & the Marine,
Johnstown Castle Estate
Co. Wexford
Tel. 053 91 63400 / Lo-Call 0761 064 415
E-mail forestryinfo@agriculture.gov.ie
Web https://www.gov.ie/en/campaigns/a9d3c-forestry-in-ireland/

August 2023

Table of contents

1. Introduction

The Department of Agriculture, Food and the Marine is responsible for the collection and publication of forest statistics.

Forest stakeholders and policy makers require reliable statistics upon which to plan and make decisions. Ireland also has a series of international reporting requirements relating to forests and forestry which requires up to date and reliable information on our forests. These include the:

- United Nations Framework Convention on Climate Change (UNFCCC) for carbon stocks and stock changes; "Regulation (EU) 2023/839 of the European Parliament and of the Council of 19 April 2023 amending Regulation (EU) 2018/841 as regards the scope, simplifying the reporting and compliance rules, and setting out the targets of the Member States for 2030, and Regulation (EU) 2018/1999 as regards improvement in monitoring, reporting, tracking of progress and review", commonly referred to as the LULUCF Regulation"
- Food and Agriculture Organisation (FAO) for series of forest related data including the Global Forest Resource Assessment;
- Statistical office of the European Union (EUROSTAT);
- United Nations Economic Commission for Europe (UNECE) for wood harvest and trade data (the Joint Forest Sector Questionnaire);
- Joint Wood Energy Enquiry of the UNECE, IEA and FAO;
- FOREST EUROPE (The brand name of the Ministerial Conference on the Protection of Forests in Europe);
- European Commission in respect of forest health.

Forest Statistics is an annual compilation of statistics on the forests and the forest industry in Ireland.

Data revision and correction policy

While every effort is made to ensure the accuracy of data provided, amendments can occur as new data become available or errors are detected and corrected. The data presented relates to the year prior to the year of publication e.g. the data range in the 2023 edition includes information up to the end of 2022. However, as there is a certain time-lag before statistics are finalised for a given year, the relevant sections will be revised to include the new data when it becomes available.

2. Forest Area

Key Facts

- Forest trees began recolonising Ireland following the end of the last glacial stage 10,000 years ago. Analysis of pollen from peat bogs illustrates the establishment of forests that once covered 80% of the land surface;
- The area of forest is estimated to be 808,848 ha or 11.6% of the total land area of Ireland (National Forest Inventory 2023);
- Forest cover is estimated to be at its highest level in over 350 years;
- Of the total forest area, 397,364 ha or 49.1% is in public ownership, mainly Coillte[1];
- The forest estate is comprised of 69.4% conifers and 30.6% broadleaves;
- Seventy percent of the stocked forest area is less than 30 years of age.

2.1 Forest definition

The National Forest Inventory defines forests as land with a minimum area of 0.1 ha under stands of trees 5 m or higher, having a minimum width of 20 m and a canopy cover of 20% or more within the forest boundary; or trees able to reach these thresholds *in situ*. The forest definition relates to land use rather than land cover, with the result that open space within a forest boundary either permanently or temporarily unstocked with trees, along with felled areas that are awaiting regeneration, are included as forest.

2.2 Forest area

In 2022, the 4th National Forest Inventory (NFI) estimated the area of forest to be 808,848 hectares or 11.6% of the land area, excluding inland water bodies.

Trees began recolonising Ireland at the end of the last glacial stage 10,000 years ago. Analysis of pollen from peat illustrates the establishment of forests that once covered 80% of the land surface[2]. In the sixteenth and early seventeenth centuries significant forest exploitation occurred as a result of the cutting of wood for use in: ships, barrel staves, and for charcoal for iron and glass work. By the early 1700's all but the least accessible forests had been cleared.[3]

The changes in forest cover in Ireland since 1656 are indicated in Table 1 and Figure 1. All estimates prior to 1918 relate to the whole of the island of Ireland, thereafter estimates are for the Republic of Ireland only. A forest cover estimate in 1905 for the province of Ulster was at 15,000 ha, but the overall forest cover on the island of Ireland was still declining up to 1928.

Since the foundation of the State, forest cover in Ireland has grown from 1.4% of the land area, to the current 11.6%. Figure 2 shows the growth in area of both public and private forests over this period. Five inventories of the private forest estate have taken place: 1973, 2006, 2012, 2017 and 2022. The area of privately-owned forests has increased from 81,958 ha in 1973 to 412,680 ha in

[1]Coillte is a State-owned company operating in forestry, land-based businesses and added-value processing operations. The company was established as a private limited company under the Forestry Act 1988 which set out its objectives and duties. The company's shareholders are the Minister for Finance and the Minister for Agriculture, Food and the Marine.

[2]Mitchell, J. G. 1995. The Dynamics of Irish Post-Glacial Forests. In: Wood, trees and forests. Royal Irish Academy. Proceedings of a Seminar Held on 22 and 23 February 1994. Dublin

[3]Anon. 1979. *Irish Forestry Policy*. National Economic and Social Council. Government Publication Office

2022, over a five-fold increase. Over the same period, the State-owned forest area has also significantly increased from 242,056 ha to 396,168 ha. The 808,848 ha of forest in Ireland in 2022 represents 11.6% of the total land area (Figure 3).

Table 1: Development of forest area in Ireland

Year	Area (ha)	% of Total Land Area
1656[4]	170,000	2.5
1841[5]	140,000	2.0
1908[6]	125,200	1.8
1918[7]	100,717	1.4
1928[8]	89,000	1.2
1942[9]	89,403	1.3
1950[10]	98,073	1.4
1965[11]	254,350	3.7
1973[12]	323,654	4.6
1985[13]	411,529	5.9
2006[14]	697,730	10.1
2012[15]	731,650	10.5
2017[16]	770,020	11.0
2022[17]	808,848	11.6

A number of studies have aimed to map preindustrial anthropogenic land use and have addressed land cover change based the recent past or relied on extrapolations of present-day land use patterns to map past conditions. In a study by Kaplan *et al.* (2009)[18] a high resolution, annually resolved time series of anthropogenic deforestation in Europe over the past three millennia was created based upon digitizing and synthesizing a database of population, developing a model to simulate anthropogenic deforestation based on population density and applying this model to a dataset of land suitability for agriculture and pasture. Forest covers were created using estimates of the percent of usable land (land available for clearing for agriculture) at 30% for Ireland. Estimates for forest area on usable land in Ireland since 1000 BC to AD 1850 are presented in Table 2.

Table 2: Percent of forest cover on usable land (30%) over time from Kaplan *et al.* (2009)

Year	1000 BC	500 BC	AD 1	AD 500	AD 1000	AD 1350	AD 1400	AD 1850
% Forest cover	64.5%	68.4%	69.7%	50.6%	38.0%	13.0%	19.0%	0.9%

[4] Rackham, O., 1986. *The History of the Countryside*. Dent & Sons Ltd., London.
[5] Aalen, F. H. A., Whelan K. and Stout M. (Eds). 1997. *Atlas of the Irish Rural Landscape*. Cork University Press
[6] Dept. of Agri. & Technical Instruction. 1908. *Report of the Departmental Committee on Irish Forestry*. A. Thom & Co.
[7] Dept. of Agriculture, 1926. *Forest Lands and Timber Supply in the Irish Free State*. Proceedings of the First International Congress on Sylviculture, Rome, 1926.
[8] Minister for Lands & Agriculture. Dail Eireann, Volume 23, 3rd May 1928.
[9] Report on Forestry Mission to Ireland, 15th February 1951. Published by Food and Agriculture Organisation.
[10] Report on Forestry Mission to Ireland, 15th February 1951. Published by Food and Agriculture Organisation.
[11] Estimate generated from Annual Report of the Department of Agriculture, 1964/65.
[12] Estimate generated from Purcell, T.J, 1973. *Inventory of Private Forests -1973*. Department of Fisheries and Forestry and Annual Report of the Department of Agriculture 1972/73.
[13] Estimate generated from Annual Report of the Department of Agriculture, 1985.
[14] *National Forest Inventory Republic of Ireland Results*. 2007. Dept. of Agriculture, Fisheries and Food.
[15] *National Forest Inventory Republic of Ireland Results*. 2013. Dept. of Agriculture, Food and the Marine.
[16] *National Forest Inventory Republic of Ireland Results*. 2017. Dept. of Agriculture, Food and the Marine.
[17] *National Forest Inventory Republic of Ireland Results*. 2022. Dept. of Agriculture, Food and the Marine.
[18] Kaplan, J. O., Krumhardt, K. M. & Zimmermann, N. (2009). The prehistoric and preindustrial deforestation of Europe. Quat. Sci. Rev. 28, 3016–3034

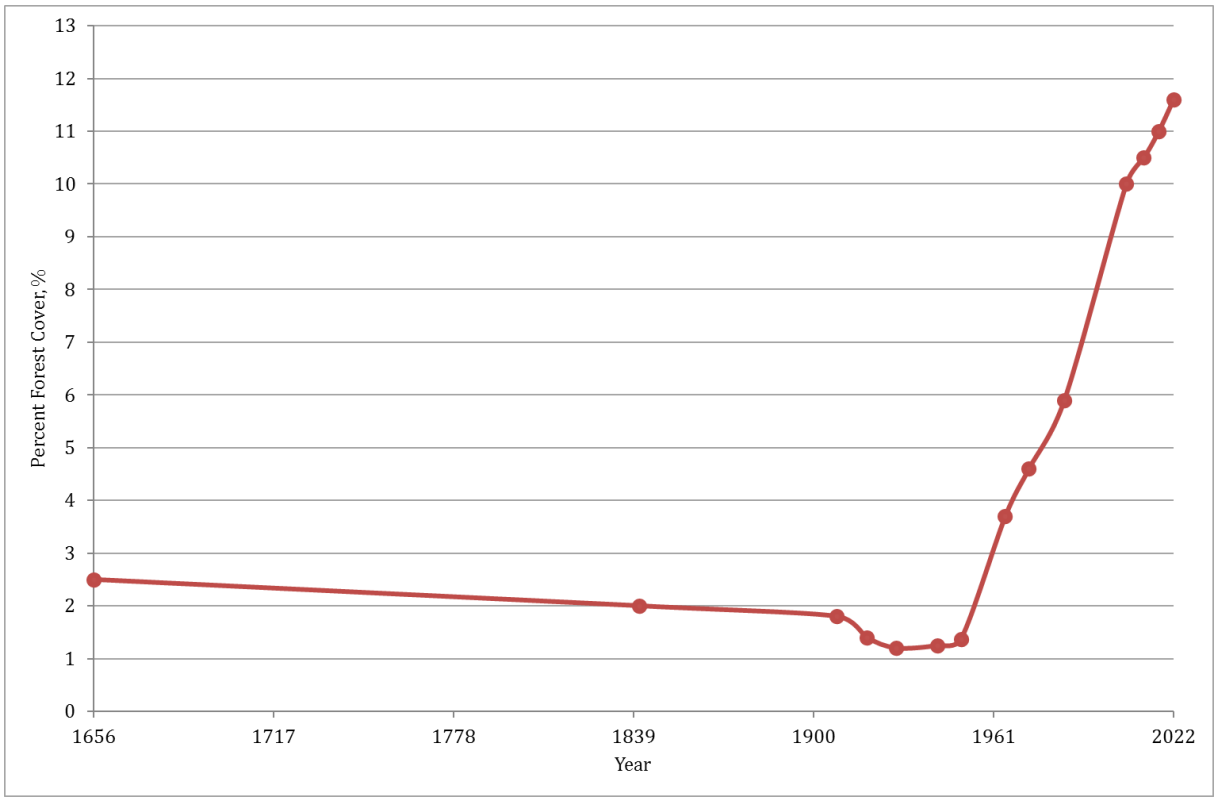

Figure 1: Ireland's forest cover, 1656-2022

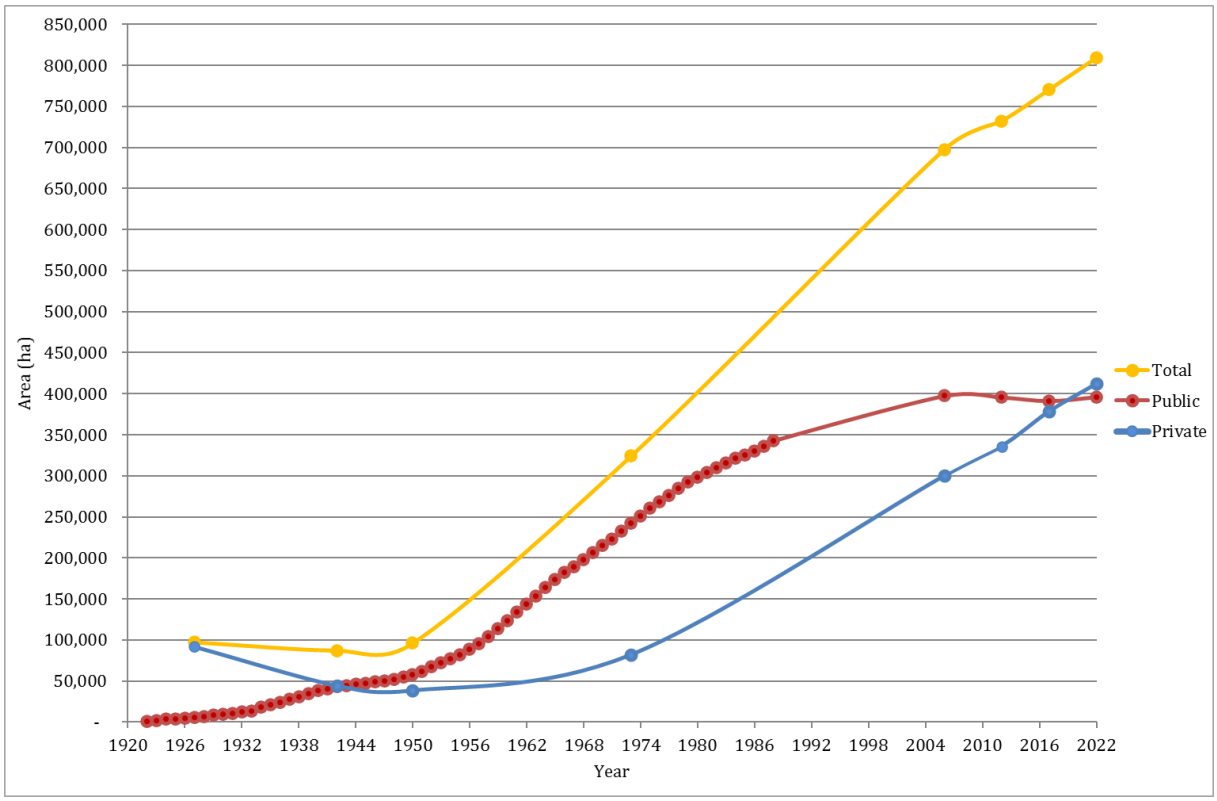

Figure 2: Forest area change since the foundation of the State, 1922-2022

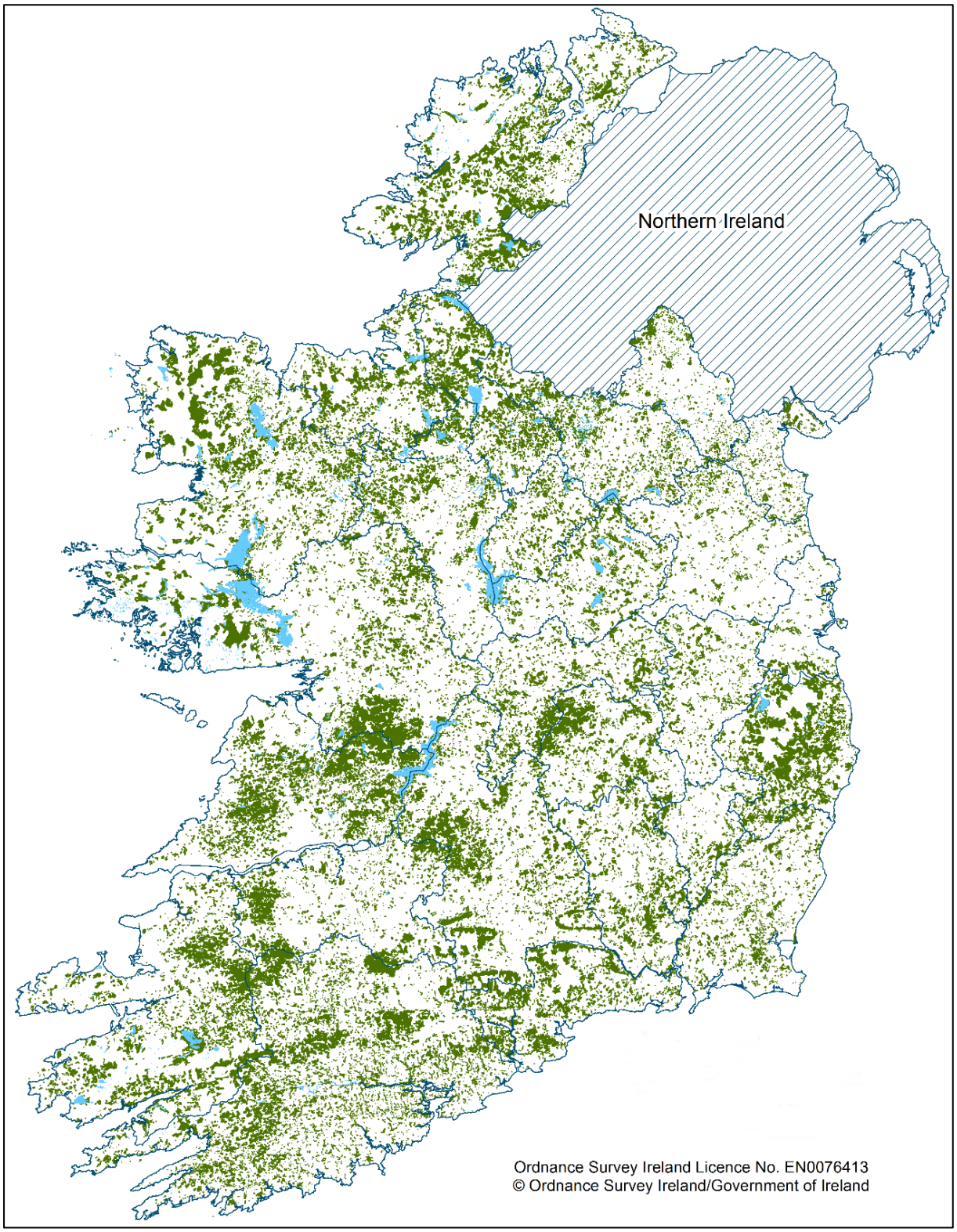

Figure 3: Forest cover in Ireland

2.3 County Forest Area

Leitrim is the county with the highest percentage of forest cover (20.1%), while Cork has the largest forest area (92,471 ha) (Table 3).

Table 3: Forest Area by County (NFI, 2022)

County	Forest Area (ha)	Percent Forest Cover within County (%)
Carlow	8,803	9.8
Cavan	19,635	10.1
Clare	57,447	18.0
Cork	92,471	12.4
Donegal	57,155	11.8
Dublin	6,011	6.5
Galway	63,795	10.4
Kerry	57,540	12.1
Kildare	11,196	6.6
Kilkenny	20,634	10.0
Laois	28,466	16.6
Leitrim	32,039	20.1
Limerick	28,332	10.5
Longford	10,355	9.5
Louth	2,428	2.9
Mayo	55,736	10.0
Meath	13,729	5.9
Monaghan	5,997	4.6
Offaly	33,351	16.7
Roscommon	31,547	12.4
Sligo	22,167	12.1
Tipperary	52,235	12.3
Waterford	27,351	14.9
Westmeath	16,759	9.1
Wexford	16,200	6.9
Wicklow	37,470	18.5
Total	**808,848**	

2.4 Forest Ownership

Within the national forest estate there are three main forest ownership categories:

1. **Public**: all State owned forests, mainly Coillte;
2. **Private (grant-aided)**: private afforested land which was in receipt of either grant and/or premium since 1980;
3. **Private (non grant-aided)**: private forests not in receipt of grant-aid post 1980. Includes areas semi-natural forests that have regenerated naturally and other long-standing plantations on private estate holdings.

For the first time in the history of the state, there are more privately owned forests than publicly owned forests. In 2022, 49.1% of forests were in State ownership, a reduction from 50.8% in 2017 (Table 4). The expansion of the private sector forest cover is a result of afforestation and natural expansion of semi-natural forests.

Table 4: Forest ownership in Ireland (NFI, 2022)

Ownership	Area (ha)	%
Public	397,364	49.1
Private (grant-aided)	288,497	35.7
Private (non grant-aided)	122,987	15.2
Total	**808,848**	**100**

2.5 Forest composition

The national forest estate is expanding and now stands at 11.6% of the total land area, with a wide variety of forest types present. The majority (88.2%) of the forests are considered stocked as there are tree species present. Forest open areas (e.g. firebreaks) and temporarily unstocked areas (e.g. areas awaiting replanting) are also present and these are an integral part of the forest estate (Table 5).

Sitka spruce is the most common species, occupying 44.6% of the total forest area and over one quarter (27%) of the overall forest area contains broadleaves. The percentage of each species is also presented in terms of the total stocked forest area (Table 6).

The interpretation of stocked areas of individual species presented in Table 5 and Table 6 needs to be carefully considered since many forests contain an intimate mixture of species[19]. Methods are used to apportion the constituent individual species from these intimate mixtures into the total area covered by the forest. The total area of a given species therefore does not represent distinct areas of land covered by pure stands of the species but represent the areas of mixed forest apportioned to them.

[19] For most NFI statistical outputs, it was more convenient to work with the species groups than with individual species. The data would not have been sufficiently representative if processed by species. The species group composition of long living broadleaves are as follows: field maple, maple, horse chestnut, strawberry tree, hornbeam, sweet chestnut, holly, nothofagus spp., white poplar, black poplar, Turkey oak, red oak, whitebeam, small-leaved lime, large-leaved lime, wych elm. The species group composition of short living broadleaves are as follows: crab apple, aspen, cherry, blackthorn, goat willow, other willows, mountain ash, and hazel.

Table 5: Composition of the total forest area (NFI, 2022)

Forest Composition		Area (1,000s ha)	%
Stocked Forest Area (i.e. the area with trees present)	Sitka spruce	360.9	44.6
	Norway spruce	27.0	3.8
	Scots pine	8.4	1.2
	Other pine spp.	62.8	8.8
	Douglas fir	9.3	1.3
	Larch spp.	23.8	3.3
	Other conifers	2.9	0.4
	Total Conifer	**495.1**	**61.2**
	Pedunculate and sessile oak	20.2	2.5
	Beech	10.7	1.3
	Ash	24.3	3.0
	Sycamore	10.5	1.3
	Birch spp.	58.0	7.2
	Alder spp.	19.7	2.4
	Other short living broadleaves	63.3	7.8
	Other long living broadleaves	11.4	1.4
	Total Broadleaf	**218.1**	**27.0**
	Total stocked forest	**713.2**	**88.2**
Forest Open Area		88.1	10.9
Temporarily Unstocked Area		7.6	0.9
Overall Forest Area		**808.9**	**100**

Table 6: Species Composition of the total stocked forest area (NFI, 2022)

Species	Area (1,000s ha)	%
Sitka spruce	360.9	50.6
Norway spruce	27.0	3.8
Scots pine	8.4	1.2
Other pine spp.	62.8	8.8
Douglas fir	9.3	1.3
Larch spp.	23.8	3.3
Other conifers	2.9	0.4
Pedunculate and sessile oak	20.2	2.8
Beech	10.7	1.5
Ash	24.3	3.4
Sycamore	10.5	1.5
Birch spp.	58.0	8.1
Alder spp.	19.7	2.8
Other short living broadleaves	63.3	8.9
Other long living broadleaves	11.4	1.6
Total	**713.2**	**100**

2.6 Forest age

The majority (70%) of Ireland's forests consists of trees of 30 years old or less (Figure 4). The age structure of the national forest estate differs according to ownership: 64.4% of the public forest is aged 30 years or less, 89.3% of the Private (grant-aided) category is aged 30 years or less, and 45.3% of the Private (non grant-aided) category is aged 30 years or less.

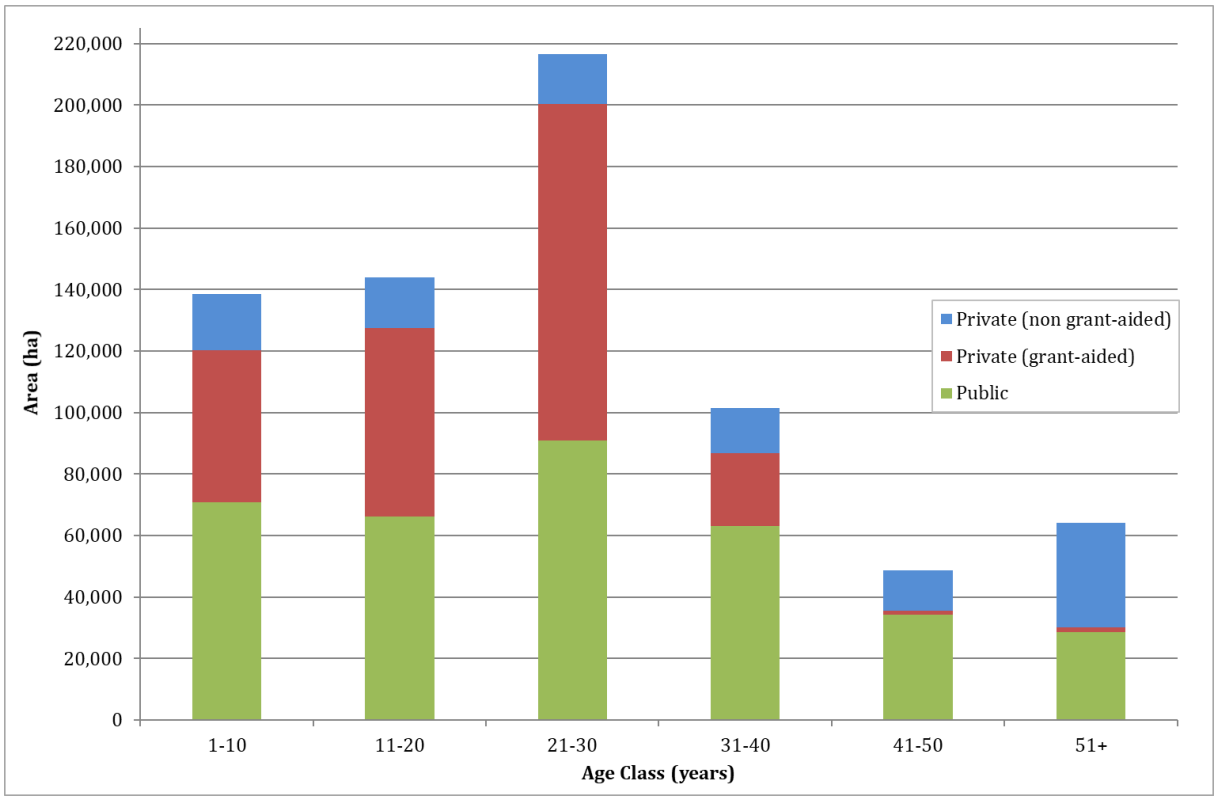

Figure 4: Forest age-class distribution by ownership (Source: NFI, 2022)

2.7 Hedgerows and Trees outside the Forest

2.7.1 Extent of Hedgerows and Trees outside the forest

In 2011 Teagasc produced a hedgerow map of Ireland, using aerial photography from 2005[20]. All areas of mature hedgerows, individual trees and non-forest woodland and scrub were digitally mapped to a 1 metre resolution. National cover of hedgerows, individual trees and non-forest woodland and scrub was estimated at approximately 482,000 ha, or 6.4%, with an 80% accuracy. Table 7 displays the results on a county level.

The fourth National Forest Inventory (2022) estimates national hedgerow and non-forest other wooded land at 375,301 ha, or 5.3% cover. This estimate differs from the Teagasc Irish Hedge Map estimate from 2011, which is most likely due to differing methodologies. In addition, the Teagasc Irish Hedge Map includes areas of non-forest woodland and scrub that under the NFI were classified as Forest.

Table 7: County level estimates of non-forest hedgerow, scrub and woodland (HSW) cover (The Irish Hedge Map, Teagasc, 2011)

County	Area of HSW (ha)	% of National HWS Stock	% of County under HWS
Galway	30,000	6.7	4.9
Leitrim	11,000	2.4	6.9
Mayo	23,000	5.1	4.1
Roscommon	19,000	4.2	7.5
Sligo	11,000	2.4	6
Carlow	8,000	1.8	8.9
Dublin	5,000	1.1	5.4
Kildare	14,000	3.1	8.3
Kilkenny	19,000	4.2	9.2
Laois	12,000	2.7	7
Longford	8,000	1.8	7.3
Louth	8,000	1.8	9.8
Meath	24,000	5.3	10.2
Offaly	13,000	2.9	6.5
Westmeath	17,000	3.8	9.2
Wexford	20,000	4.4	8.5
Wicklow	10,000	2.2	4.9
Clare	22,000	4.9	7
Cork	57,000	12.7	7.6
Kerry	23,000	5.1	4.8
Limerick	25,000	5.6	9.3
Tipperary	35,000	7.8	8.1
Waterford	12,000	2.7	6.5
Cavan	20,000	4.4	10.4
Donegal	20,000	4.4	4.1
Monaghan	16,000	3.6	12.4
Total	482,000	6.4	

2.7.2 Waterford City and County Council Tree Map

Waterford City and County Council commissioned Bluesky International's National Tree Map to aid in establishing the level of current tree cover across the city and county with a view to planning future suitable tree planting sites in order to meet its target to become Ireland's first decarbonised city. The data produced from this study helped in the production of the Draft

[20] *The Irish Hedge Map* – Version 1.0. Teagasc, 2011.

Waterford City and County Development Plan 2022-2028 to inform policy and budgets regarding using trees as part of the councils green infrastructure and carbon storage plans. Bluesky uses innovative processing techniques to assess trees using high resolution national aerial photography, accurate terrain and surface data, and colour infrared imagery (Figure 5).

On 22nd April 2020, an aerial survey recorded 7,743,563 Trees, with a maximum height greater than three metres, within Waterford City and County Councils administrative boundary. Across the administrative area of 1,857 km^2 the initial results showed a tree cover of between 2 and 21 percent in different areas, averaging at 12 percent. Waterford City and County Councils have made available an interactive geographic information system tool for viewing the data collected and processed by the Bluesky International's National Tree Map[21].

Figure 5: Waterford City and County National Tree interactive map displaying Trees by canopy size and height

2.7.3 National Land Cover Map of Ireland 2018

A land cover map for Ireland launched in 2023 maps out different land surface types in detail. It is available from the National Mapping Division of Tailte Éireann who developed it in partnership with the EPA[22]. This detailed map is a new benchmark in land evidence for Ireland. It facilitates improved monitoring and assessment of impacts and benefits for water, climate, air, noise and biodiversity, as well delivering support for better decision making on land management.

Hedgerows were classified as being narrow linear, generally interconnected lengths of woody shrub vegetation, typically found along field or property boundaries, which have a mean height less than 5 m and a cross-sectional width at the canopy of 10 m or less. Treelines were different in that they were classified as linear lengths of mature trees typically found along field or property boundaries, which have a mean height greater than 5 m and a cross-sectional width at the canopy of less than 12 m.

When the level 2 categories (410-440) are combined which include coniferous forest, mixed forest, transitional forest and broadleaved forest and woodland, the total forest area is 862,479

[21] https://storymaps.arcgis.com/stories/e74fe915215f42089f43ab87ebad8083
[22] https://www.tailte.ie/surveying/products/professional-mapping/national-land-cover-map/

ha or 12.2% of the land area (Table 8). Level 2 code 460 provides a hedgerow area of 224,787 ha representing 3.2% of the land area. When treelines (code 470) are included, this area totals 298,180 ha or 4.2% of the total land area (Table 8).

Table 8: National area (ha) and percentage for each Level 2 land cover class for 2018

Code	Level 1	Code	Level 2	Area (ha)	% of Area
400	Forest, Woodland and Scrub	410	Coniferous Forest	256,443	3.6%
		420	Mixed Forest	49,503	0.7%
		430	Transitional Forest	385,673	5.5%
		440	Broadleaved Forest and Woodland	170,860	2.4%
		Total forest (410-440)		***862,479***	***12.2%***
		460	Hedgerows	224,787	3.2%
		470	Treelines	73,393	1.0%
		Total Hedgerows (including treelines)- (460-470)		***298,180***	***4.2%***
		450	Scrub	130,098	1.8%

2.7.4 Agri-Environmental Schemes

Since the introduction of agri-environmental schemes in 1994 a total of 6,605 kilometres of new hedgerows and more than 3.7 million trees have been established on non-forest land (Table 9). These schemes provide payments to farmers to help tackle climate change, preserve biodiversity, protect habitats and promote environmentally friendly farming.

Table 9: The total estimate of newly established hedgerows and trees under agri-environmental schemes (Department of Agriculture, Food and the Marine, 2018)

Scheme	Newly established hedgerows (km)	Newly planted trees	Newly planted orchard trees
Rural Environment Protection Scheme (REPS) 1994 - 2010	4,100	1,702,972	N/A
Agri-Environnent Options Scheme (AEOS) 2010 - 2014	1,322	464,910	N/A
Green Low Carbon Agri-Environment (GLAS) 2014 - 2018	1,183	1,617,516	11,182
Total	6,605	3,785,398	11,182

2.7.5 Hedgerow Biomass and Carbon

Hedgerows form a large part of the agricultural landscape and play a key role providing shelter for animals, acting as field boundaries, supporting flood control and act as a habitat for biodiversity.

A 2014 report from the Environmental Protection Agency (EPA) examining the feasibility of a national hedgerow inventory estimated that hedgerow and non-forest woodland and scrub could potentially be sequestering 0.66 - 3.3 tonnes of CO_2/ha/year[23]. Based on existing national estimates for hedgerow and non-forest woodland and scrub cover, it states that this could result in a net removal of 0.27-1.4 Mt CO_2/year. The value of hedgerows and trees outside of forests is reflected in recently introduced agri-environmental measures which have resulted in the establishment of new hedgerows and trees outside of the forest.

[23] Carbon Sequestration by Hedgerows in the Irish Landscape. Climate Change Research Programme (CCRP) 2007–2013 Report Series No. 32. Environmental Protection Agency, 2014.

A second EPA project titled, *Biomass Retrieval in Ireland using Active Remote sensing (BRIAR)*[24], examined the use of radar to estimate biomass stocks in hedgerows. The Ordnance Survey Prime2 spatial data storage model was applied in conjunction with developed maps showing the probability of a field boundary being a stone wall or a hedgerow, to give a new national estimate for hedgerow length in Ireland of 689,000 km. This estimate is double the frequently quoted figure of 300,000 km because of a much wider definition of "hedgerow" used in the BRIAR report. Net change in hedgerow length was examined using the aerial photographic records from 1995, 2005 and 2015, along with county-level survey records, showing that there has been a net removal of hedgerows between 1995 and 2015 of between 0.16% and 0.3% per annum, although the rate is much slower in the latter half of that period.

A third project funded by the EPA and Department of Agriculture, Food and the Marine named Farm-Carbon[25] was undertaken by Forest, Environment Research & Services Ltd and Teagasc. This project used aerial photography to develop relationships between measured biomass of hedgerows and a digital elevation model which would allow changes in hedgerow above-ground and below-ground biomass stocks to be assessed.

Model equations were developed to link these biomass stocks but factors such as hedgerow management intensity, hedgerow type and dominant species reduced the robustness of the models. For the study areas of Co. Waterford and Co. Wexford the results indicate that the hedgerow biomass C pools are suggested to be a net emission of −0.3 tC ha^{-1} $year^{-1}$ due to hedgerow removals and management. The largest impact on the biomass C balance was attributed to flailing or coppicing of hedgerows and irregular profile hedgerows. Traditional management practices such as layering and increasing the hedgerow width was suggested as aims of increasing the maximum sink potential of established hedgerows.

[24]BRIAR: Biomass Retrieval in Ireland using Active Remote sensing. EPA Research Programme 2014–2020 Report Series No. 2014-CCRP-MS.17. Environmental Protection Agency, 2019.
[25] Black, K., Lanigan, G., Ward, M., Kavanagh, I. and Sullivan, L.O. (2023). Biomass carbon stocks and stock changes in managed hedgerows. Science of The Total Environment, 871.

3. Afforestation

This section provides information on afforestation levels since the foundation of the State, with a particular emphasis on private afforestation since 1980.

Key statistics

- State afforestation was relatively low up until the 1950's, but thereafter increased up to the year 2000;
- Private afforestation came to the fore in the mid-1980's: 306,266 ha of private forests were established between 1980 and 2022;
- The proportion of broadleaf afforestation significantly increased after 1993, and up to the present, averaging 19% of all afforestation since that year. Broadleaf afforestation accounted for 43% of the area afforested in 2022;
- Tree diseases such as *Phytophthora ramorum* (mainly affecting larch) and Ash Dieback *(Hymenoscyphus fraxineus*) may influence species diversity into the future;
- The average size of private grant-aided parcels of land afforested between 1980 and 2022 was 8.6 ha;

3.1 Afforestation

As was outlined in Table 1, the forest cover on the island of Ireland continued to decline up to 1928. With the introduction of the first Forestry Act in 1928 the decline of forest area was largely halted, however afforestation levels remained relatively low right up until the 1950's. The level of State afforestation dramatically increased from the 1950's up to 2000, after which State planting declined to a negligible level.

Private afforestation came to the fore in the mid-1980's following the introduction of a grant and particularly an annual premium scheme for afforestation. Long-run afforestation trends, including the change from State-led to private-led grant-aided afforestation in the 1980's and 1990's are shown in Figure 6.

Figure 7 displays the ratio of broadleaf and conifer afforestation from 1935 to the present. During the 1930's and 1940's, afforestation consisted of approximately 90% conifer species and 10% broadleaf species, and from the late 1940's to the early 1990's, broadleaves comprised approximately 4% of all afforestation. As a result of the positive differential in favour of broadleaf species in both the afforestation grant and premium schemes, the proportion of broadleaves planted increased significantly from 1993 up to the present, reaching a high of 37% from 2008 to 2011. Broadleaf afforestation subsequently declined to 20% in 2015 and 2016, primarily due to restrictions on planting ash (due to *Hymenoscyphus fraxineus*), but by 2022 broadleaves had increased to 42% of all afforestation. Over the past 20 years (2002 to 2022), broadleaf afforestation has averaged 28% and conifers 72%.

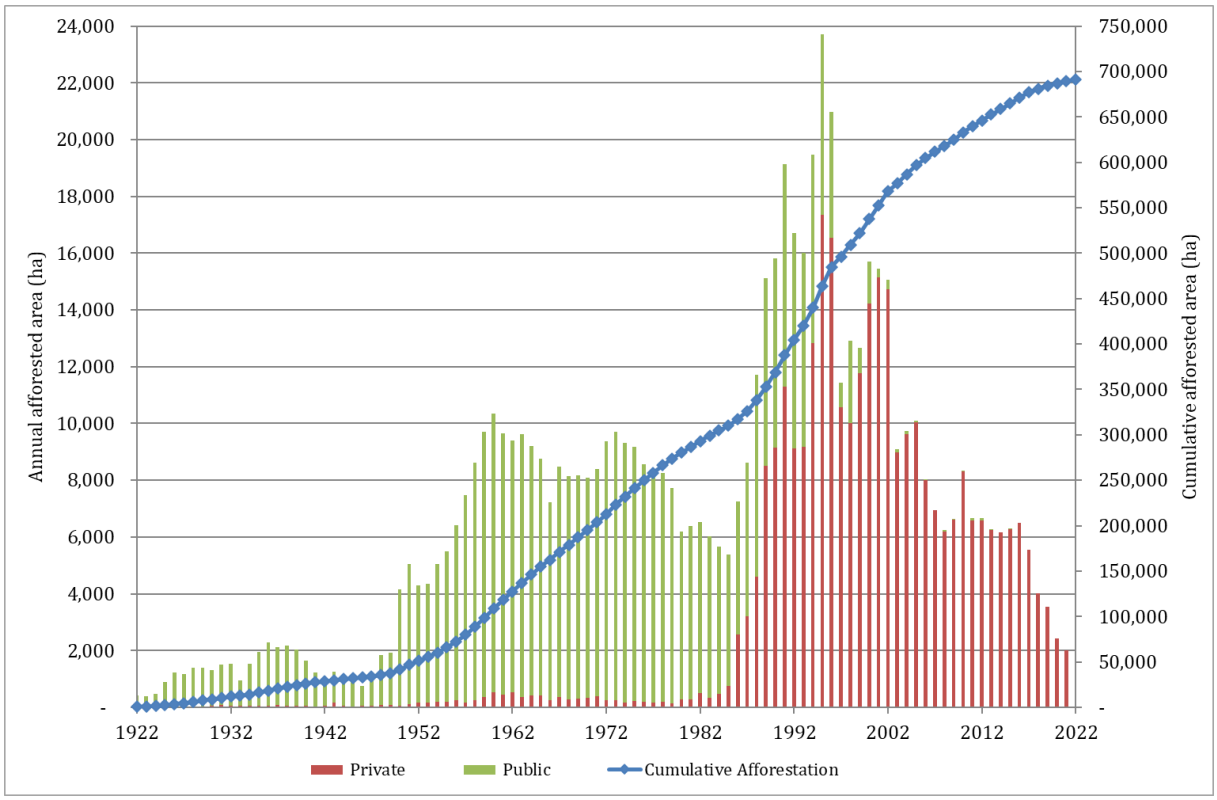

Figure 6: Annual State and private afforestation (1922-2022)

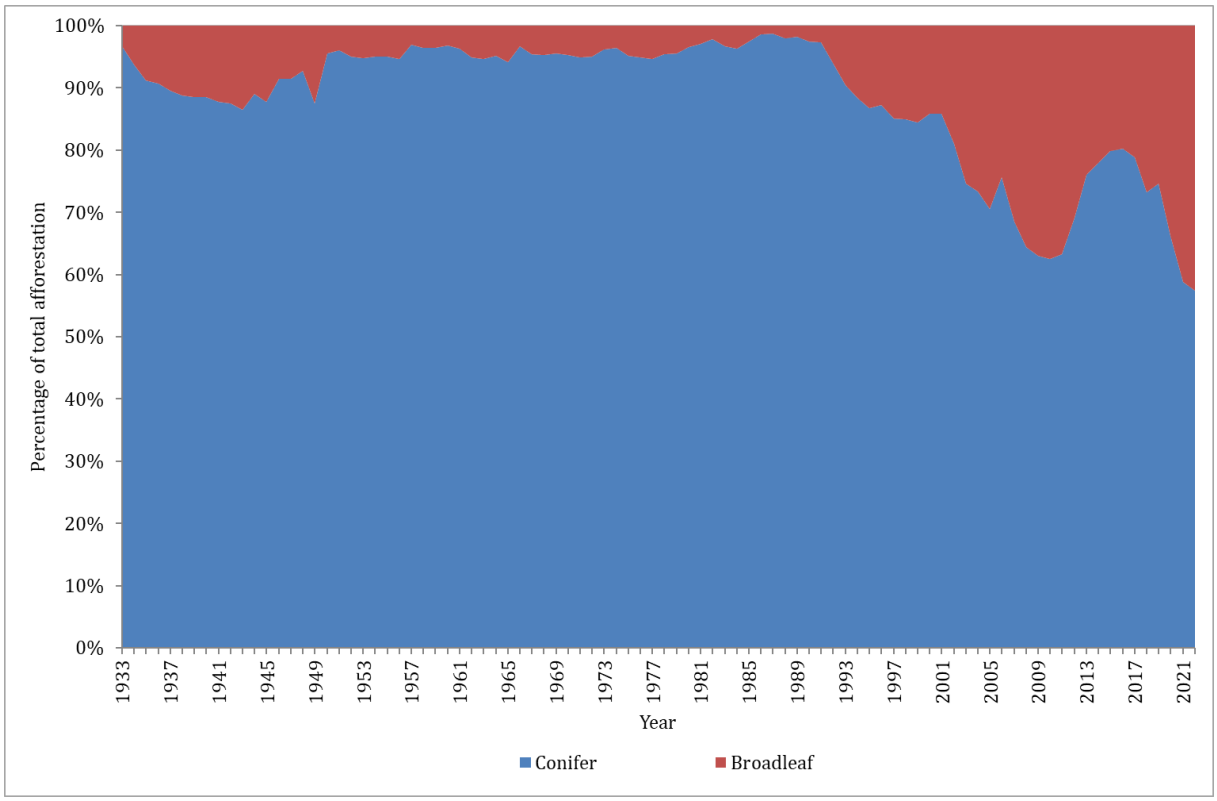

Figure 7: Conifer and broadleaf afforestation (1935-2022)

A range of conifer species were planted in the 1930's and 1940's, including Norway spruce, Scots pine and larch, along with Sitka spruce and lodgepole pine. This reflected the untested nature of the North American species being planted at the time. From the 1950's onwards, confidence in Sitka spruce and lodgepole pine grew, leading to their dominance in afforestation up to the mid-1990's, after which the role of lodgepole pine declined, reflecting primarily the improved land quality available for afforestation after this period (Figure 8) and the generally poor form of the species.

From 2006 to 2010 the species composition of afforestation remained largely stable. However, the detection of *Phytophthora ramorum* in Japanese larch in 2010, led to its withdrawal from the afforestation programme (Figure 9 & Table 10). From the mid-1990's onwards a wider range of tree species has been planted, with ash and oak dominating broadleaf planting. However, more recently, the fungal disease *Hymenoscyphus fraxineus* (Ash Dieback) was found in ash in 2012, resulting in the cessation of grant aid for this species and a subsequent contraction in broadleaf species for afforestation from 2012 to 2016. Nearly 16,000 ha of ash have been planted since 1990.

Sitka spruce remains the predominant species used in Irish forestry. It has proven to be one of the most productive conifers in Ireland and as such has become the mainstay in roundwood processing.

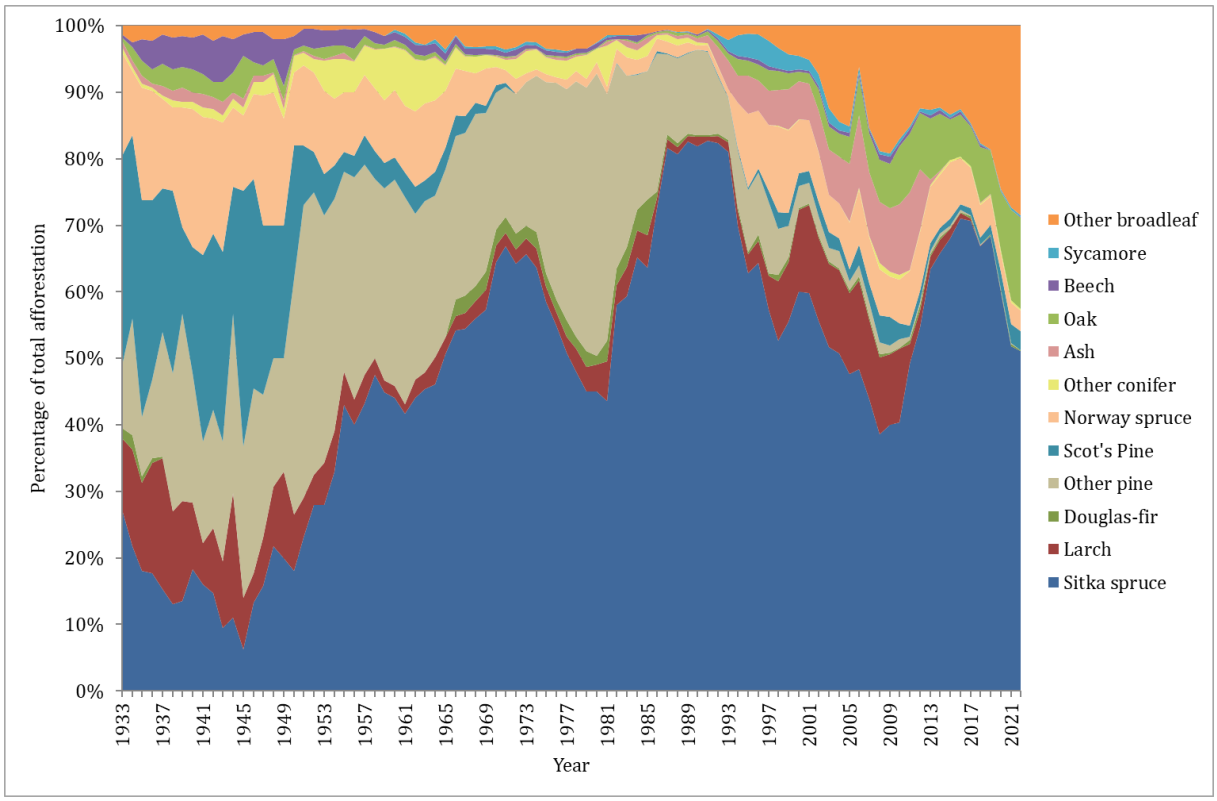

Figure 8: Species groups used in afforestation (1935-2022)

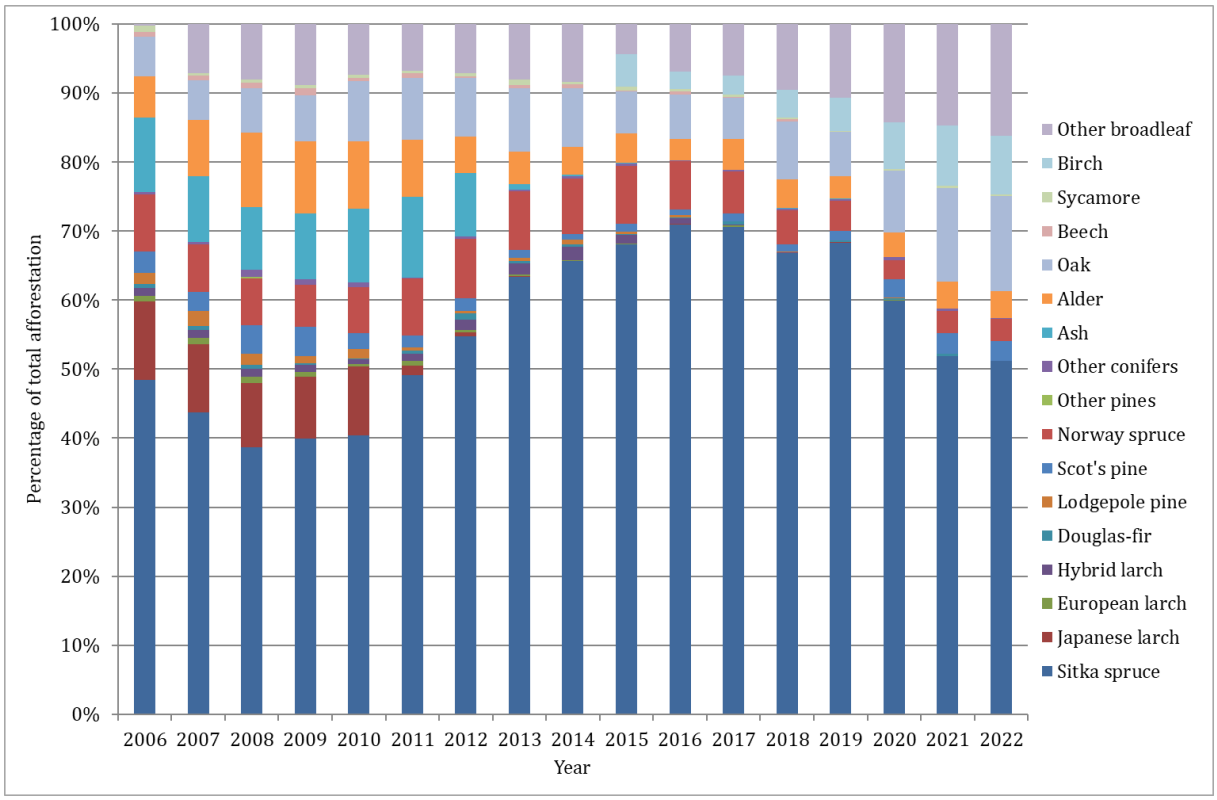

Figure 9: Grant-aided species groups (2006-2022)

Table 10: Area of grant-aided species (2006-2022)

Species	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Lawson cypress	5.2	-	9.6	3.8	2.8	-	-	-	-	-	-	-	1.2	-	-	-	1.0
Leyland cypress	-	-	2.3	0.2	8.4	-	-	-	-	-	-	-	-	-	-	-	-
Monterey cypress	0.4	-	11.1	0.3	-	-	-	-	-	-	-	-	-	-	-	-	0.4
Western hemlock	4.5	1.7	18.4	3.4	1.6	-	-	-	-	-	1.2	-	-	-	-	2.6	0.1
European larch	44.6	60.9	55.6	45.6	33.0	41.9	22.6	15.9	7.2	9.9	5.1	13.2	0.6	0.1	1.0	-	-
Hybrid larch	53.1	80.9	78.4	71.4	55.1	66.7	97.1	94.9	116.4	72.8	46.4	7.0	4.2	0.6	0.7	-	-
Japanese larch	574.2	673.6	583.5	572.1	805.6	88.6	40.6	4.8	0.1	1.3	1.1	0.2	0.3	2.7	1.7	-	-
Douglas fir	32.3	35.6	29.1	12.5	10.5	34.0	55.8	23.2	23.3	6.8	12.7	23.0	1.0	6.2	5.6	7.3	0.5
Grand fir	-	-	0.7	-	-	-	-	-	-	1.3	-	-	-	-	-	-	0.2
Austrian pine	2.7	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Corsican pine	-	-	11.5	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-
Lodgepole pine	79.7	149.8	105.7	65.7	107.7	25.3	29.7	26.1	36.9	22.9	21.5	3.0	2.8	1.6	3.3	1.2	-
Monterey pine	0.8	-	-	-	-	4.2	-	-	-	0.2	-	-	-	-	-	-	-
Scots pine	153.9	191.5	254.7	276.0	188.7	114.9	112.7	76.3	52.2	72.4	50.0	57.9	42.4	47.8	62.9	57.4	63.4
Norway spruce	417.1	472.4	425.5	388.9	539.1	534.7	569.8	522.8	484.7	520.6	448.5	332.7	196.0	151.8	63.9	62.3	68.9
Serbian spruce	4.9	17.6	14.3	31.4	32.1	-	12.3	6.3	21.2	13.4	7.7	9.3	-	2.1	9.1	4.0	2.2
Sitka spruce	2,438.5	2,992.8	2,413.1	2,565.1	3,267.3	3,200.1	3,576.0	3,902.7	3,992.1	4,230.8	4,554.2	3,854.6	2,644.4	2,377.4	1,422.2	1,018.0	1,116.4
Western red cedar	1.4	1.8	1.1	2.5	0.3	0.3	3.3	1.0	1.9	9.5	0.1	4.6	6.1	3.7	1.6	-	-
Coastal redwood	-	-	-	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-
Other conifers	0.2	1.6	7.1	5.2	6.8	3.3	0.4	3.4	1.3	0.6	1.6	0.9	-	-	-	-	-
Alder	296.0	559.3	674.8	669.5	793.5	544.1	346.8	284.9	242.7	262.7	200.0	241.9	161.7	109.6	85.2	77.0	85.3
Ash	545.7	651.7	569.3	615.2	864.6	761.9	605.4	51.7	11.2	3.5	0.9	0.8	5.7	6.4	-	-	-
Beech	33.2	40.6	52.3	66.9	34.5	44.1	20.1	24.8	34.1	11.9	31.5	8.3	15.3	1.5	0.3	1.0	1.0
Southern beech	0.6	0.4	1.0	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-
Cherry	-	0.4	-	0.3	1.9	0.3	0.9	1.3	1.3	0.2	2.2	0.2	1.4	0.4	-	2.8	2.1
Sweet chestnut	-	0.2	0.3	-	-	-	1.0	0.0	2.7	-	1.1	-	0.9	0.1	0.1	-	-
Lime	-	-	-	0.3	-	-	-	-	0.4	-	0.5	-	-	-	-	-	-
Norway maple	10.6	5.7	4.5	1.6	10.6	1.1	0.3	-	2.2	5.6	7.1	1.2	1.8	0.1	5.4	0.3	-
Sycamore	42.4	23.5	29.5	28.7	45.0	22.6	28.3	49.1	22.6	32.3	21.1	16.5	8.4	4.2	6.0	6.0	4.9
Pedunculate oak	285.3	381.8	391.0	374.1	667.3	563.9	545.2	554.6	509.3	368.8	390.7	294.3	313.9	201.5	163.1	234.7	269.7
Sessile oak	9.4	12.3	9.9	57.8	36.5	15.6	3.5	15.6	11.8	8.9	18.1	33.4	17.6	24.3	49.0	31.5	30.4
Red oak	2.5	1.7	0.6	11.6	5.7	0.5	0.7	0.5	0.2	1.0	2.8	1.7	3.3	4.4	5.3	1.7	0.8
Additional broadleaves	472.1	480.4	494.0	551.0	568.8	439.7	461.9	494.6	499.3	264.5	427.2	406.5	367.5	680.8	326.9	282.4	351.0
Birch spp.	-	-	-	-	-	-	-	-	-	293.7	161.9	147.7	162.4	167.6	161.6	172.4	184.3
Biodiversity area	-	108.4	-	226.1	222.7	144.7	117.5	97.7	81.3	77.4	85.0	76.8	66.8	71.6	59.4	53.1	90.7
Total	**8,037**	**6,947**	**6,249**	**6,648**	**8,314**	**6,653**	**6,652**	**6,252**	**6,156**	**6,293**	**6,500**	**5,536**	**4,025**	**3,866**	**2,434**	**2,016**	**2,273**

3.2 Private lands afforested, forest size and number

The average size of private grant-aided afforestation between 1980 and 2022 was 8.6 ha (Table 11). From 1980 up to the mid-1980's the average afforestation parcel was relatively small at 5.9 ha, but with the introduction of the grant and premium scheme average afforestation increased to 9.6 ha by the mid-1990s. By 2022 the average area afforested has decreased to 7.6 ha as a result of planting consisting of a portion of individual agricultural holdings and a movement away from unenclosed land. In 2010, a 20% cap per application being placed on planting on unenclosed land in (Circular 10/2010) & (Circular 18/2011: Land Types for afforestation) and in 2016 new requirements on the suitability of land for afforestation were adopted (Land Types for Afforestation).

Table 11: Size and number of individual private grant-aided afforestation (1980-2022)

Year	Number of forests		Mean forest size (ha)	
	Annual	Cumulative	Annual	Cumulative
1980	53	53	3.4	3.4
1981	46	99	7.0	5.1
1982	70	169	4.2	4.7
1983	82	251	4.3	4.6
1984	108	359	3.2	4.2
1985	156	515	6.7	4.9
1986	269	784	7.8	5.9
1987	386	1,170	7.5	6.4
1988	484	1,654	9.3	7.3
1989	720	2,374	11.7	8.6
1990	718	3,092	11.6	9.3
1991	779	3,871	9.3	9.3
1992	620	4,491	9.2	9.3
1993	1036	5,527	7.9	9.0
1994	1342	6,869	10.0	9.2
1995	1468	8,337	11.0	9.5
1996	1479	9,816	9.3	9.5
1997	1275	11,091	9.1	9.4
1998	1135	12,226	9.7	9.5
1999	1140	13,366	10.3	9.5
2000	1292	14,658	10.6	9.6
2001	1371	16,029	10.3	9.7
2002	1269	17,298	9.7	9.7
2003	1131	18,429	8.5	9.6
2004	953	19,382	8.9	9.6
2005	1343	20,725	8.3	9.5
2006	1128	21,853	7.9	9.4
2007	836	22,689	7.1	9.3
2008	685	23,374	8.1	9.3
2009	731	24,105	8.7	9.3
2010	946	25,051	8.1	9.2
2011	895	25,946	7.4	9.2
2012	908	26,854	6.4	9.1
2013	1008	27,862	6.6	9.0
2014	1022	28,884	6.0	8.9
2015	929	29,813	6.5	8.8
2016	991	30,804	6.6	8.7
2017	897	31,701	6.3	8.7
2018	593	32,294	6.7	8.6
2019	453	32,747	6.9	8.6
2020	350	33,097	6.9	8.6
2021	272	33,369	7.2	8.6
2022	282	33,651	7.6	8.6

In terms of the size class contribution to overall afforestation since 1980, the distribution is slightly skewed towards parcels of 10-30 ha; over a wide range from 0.1 ha to over 100+ ha (Figure 10 and Figure 11). Figure 10 shows that large sized individual plantings were a feature of mid 1980's- late 1990's planting. The threshold for a mandatory Environmental Impact Assessment (EIA) was reduced from 200 to 70 ha in 1996. The size of afforestation parcels decreased between 1997 and 2002, with area afforested in parcels greater than 20 ha decreasing from 46% to 35%. In 2001 the EIA threshold was further reduced from 70 to 50 ha along with sub threshold EIAs in the case of afforestation likely to have a significant effect on the environment. Since 2002, 20% of afforestation parcels have been greater than 20 ha; in the last 10 years no individual forestry application greater than 50 ha has been established. Since 2001 all afforestation applications are screened to determine whether they require an EIA, and in 2010 all developments over 50 ha are subject to a mandatory Environmental Impact Statement[26]. Presently, 32% of the total afforested area (1980-2022) consists of plantations greater than 20 ha, 62% are greater than 10 ha and 74% are greater than 7.5 ha in size.

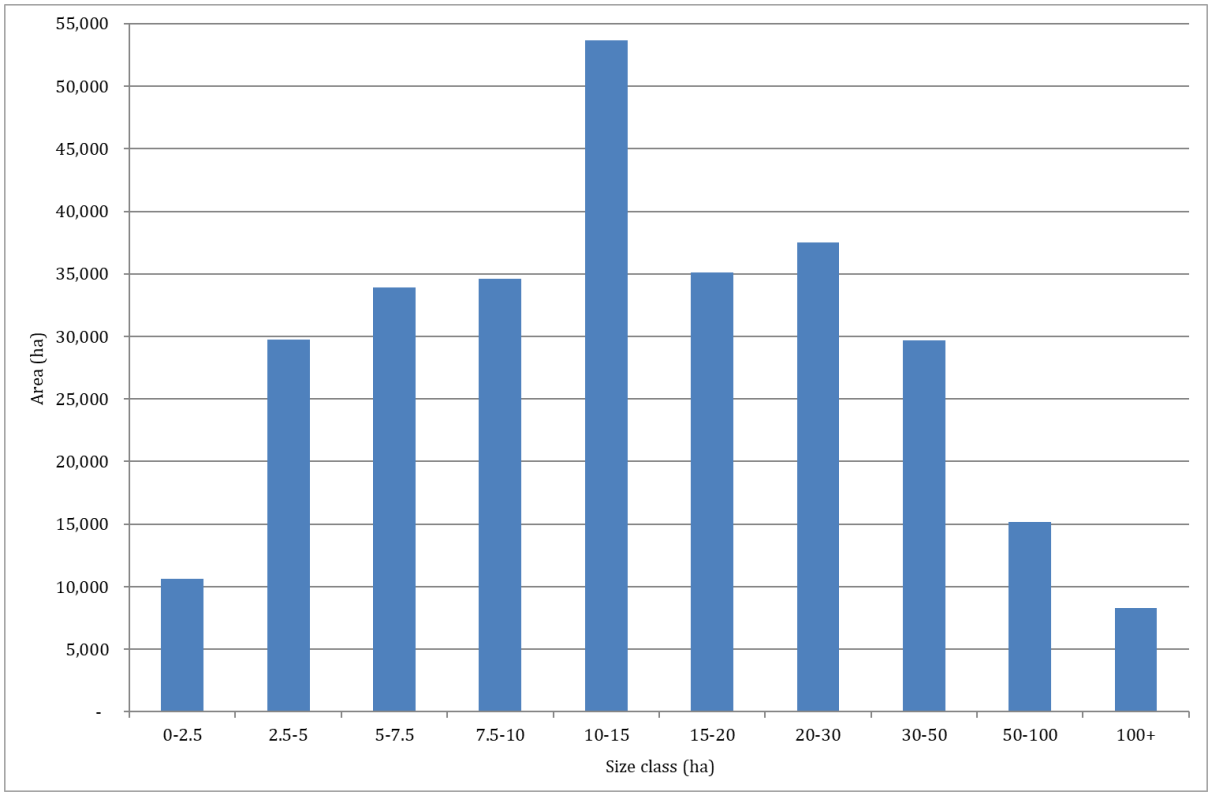

Figure 10: Size class distribution of private grant-aided afforestation (1980-2022)

[26] New procedures came into force with the passing of The European Communities (Environmental Impact Assessment) (Amendment) Regulations, 2001 (S.I. No. 538 of 2001) which set out the requirements for Environmental Impact Assessment (EIA) for forestry.

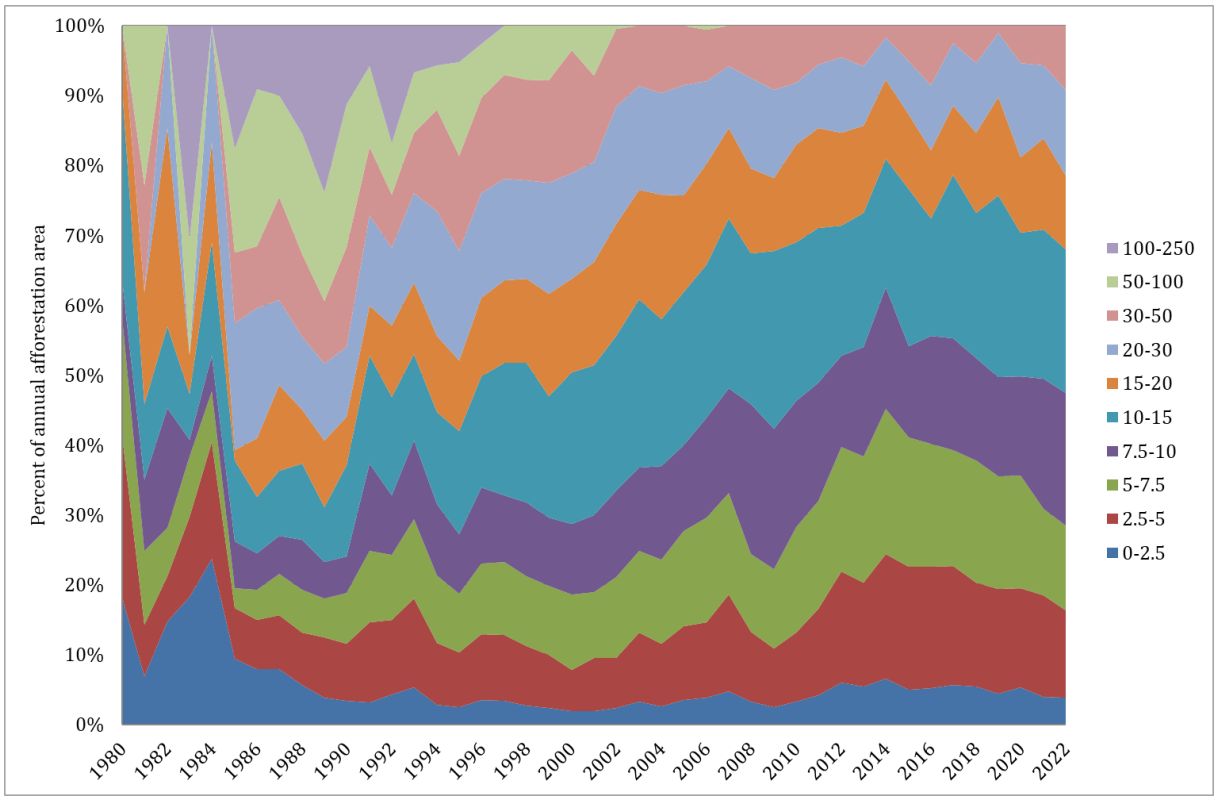

Figure 11: Percent of annual private grant-aided afforestation area by size class (1980-2022)

3.3 Grant Premium Category

Figure 12 outlines the total area of grant-aided afforestation by Grant Premium Category (GPC). Grant and premium categories are used in the afforestation scheme to label different species and species groupings.

GPC 3 (Sitka spruce, plus other species) has been the most popular category, increasing from 48% in 2004 to 79% in 2016. The increase in the area of GPC 3 is in part due to the removal of ash and larch from the afforestation programme due to Chalara and *Phytophthora ramorum* but also due to the reduction in the area of GPC 4 been afforested. However, since 2016 the percentage of GPC 3 has declined to 60% in 2022. GPC 5 (mainly broadleaves) has historically been the second most popular category, at approximately 20% during 2004 to 2011.

Since, the introduction of distinct GPC categories for native woodland establishment in 2015 there has been a steady increase in the area of new native woodlands established. Between 2019 and 2022, there was a 29% increase in the area participating in native woodland establishment GPCs.

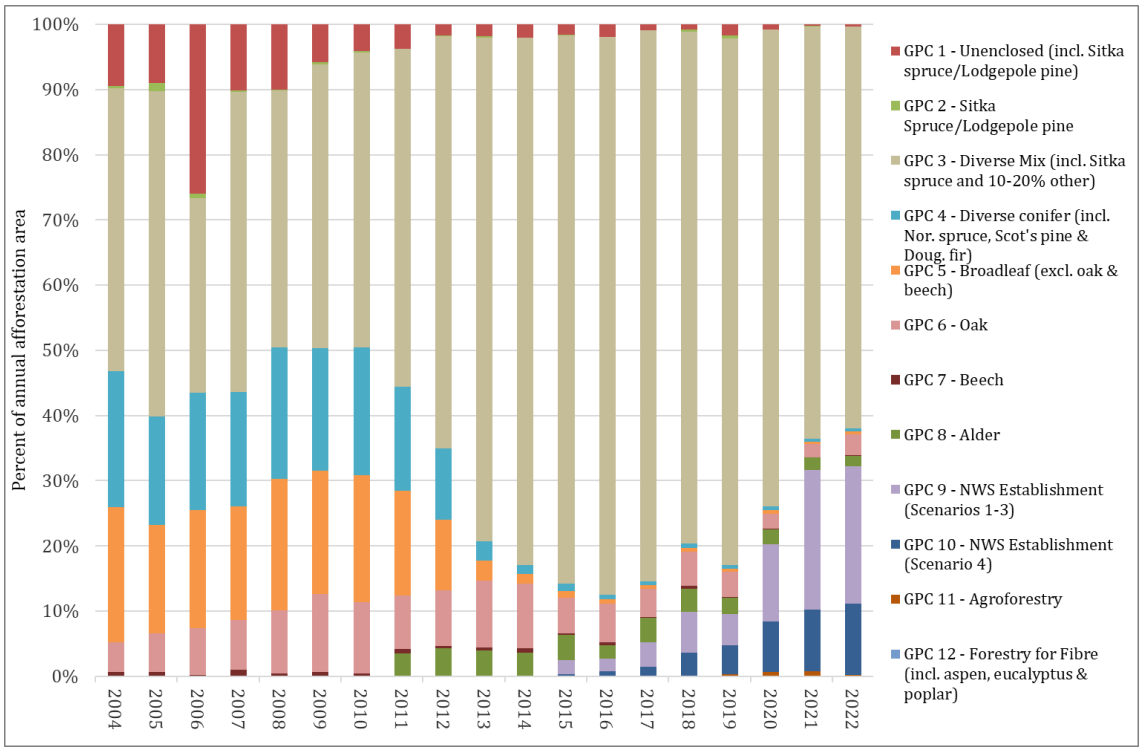

Figure 12: Percent of annual grant-aided afforestation area by Grant Premium Categories (2004 to 2022)

3.4 Afforestation scheme applications

The comparison of three statistics overtime allows the level of demand for the afforestation scheme to be assessed (Figure 13). There has been a gradual decline in the uptake of the afforestation scheme since 2013.

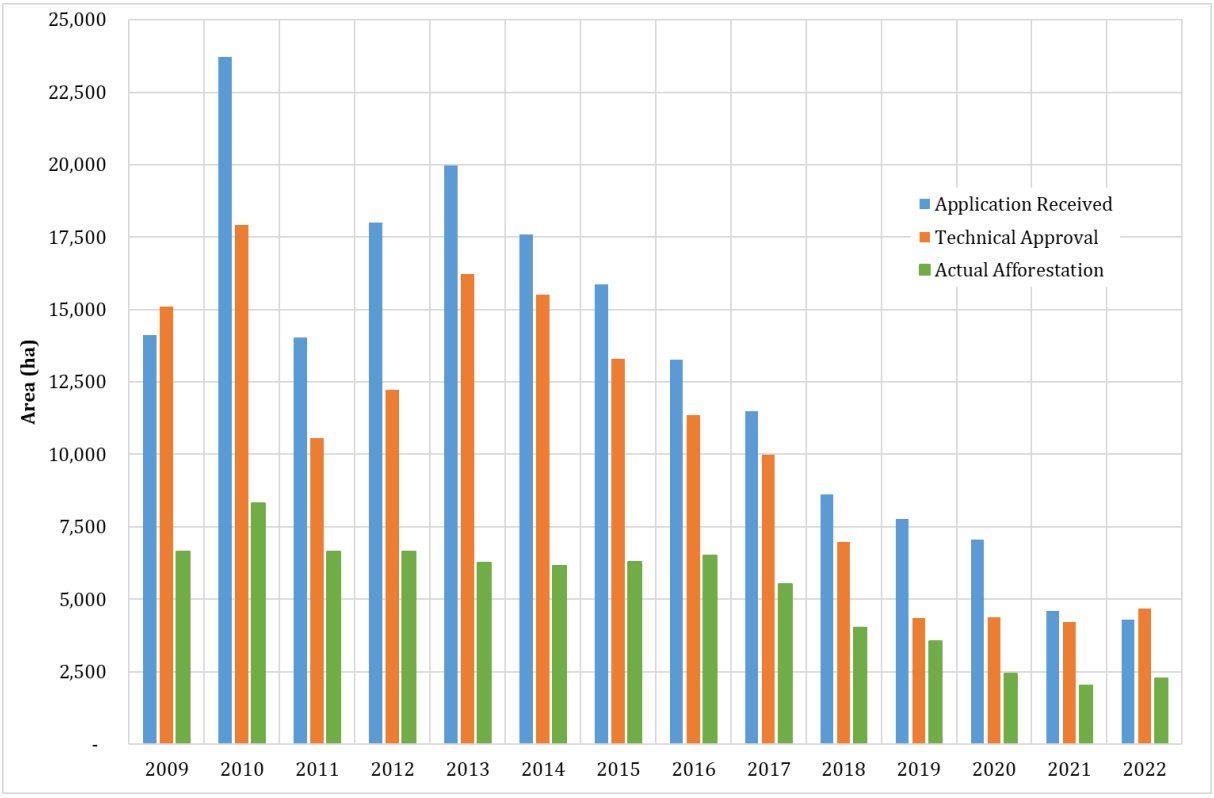

Figure 13: Area of Applications Received, Technical Approvals and actual afforestation.

3.5 Forest policy events related to afforestation

Forest policy and other land-use policies have changed overtime, which impact the regulatory environment in which forestry operates. These factors have influenced the level of afforestation by affecting aspects such as the financial return to landowners through increased support payments. Other changes have introduced criteria on the type of land to be afforested which has reduced the area of land available for afforestation.

Table 12 describes some of these policy events that have occurred since 2007 and Figure 14 displays these same events along with the annual afforestation rate.

Table 12: Policy events description associated with afforestation

Year	Event	Description
2007	Hen Harrier SPA Protocol & Quota	Coincident with the designation of the six breeding Hen Harrier SPAs an agreement between the Forest Service and NPWS was reached setting out various conditions, including limits for afforestation rates at each of the SPAs[27]
2007	New Forestry Programme	New Forestry Programme (2007-2013) launched which was funded by the National Development plan
2008	Freshwater Pearl Mussel Requirements	The Forestry and Freshwater Pearl Mussel (FPM) Requirements were published in 2008 and apply to all impacting forest operations within the catchments of FPM populations in rivers designated Special Areas of Conservation for the species (27FPM populations, 19 SACs)[28]
2009	Affor. eligible for Single Farm Payment	State aid rules allowed that any land afforested post 2009 was eligible for a Single Farm Payment (SFP) [29]
2010	Forest Consent Regulation	Under the European Communities (Forest Consent and Assessment) Regulations 2010 (S.I. 558 of 2010) (as amended by S.I. 442 of 2012), consent from the Minister was required to undertake forest operations including afforestation[30]
2010	Unenclosed Land 20% Rule	Changes to the Afforestation Grant and Premium Scheme restricted the percentage of unenclosed land in any application to be afforested to a maximum of 20% of the total application area[31]
2011	Specific Land Types Not Eligible	The introduction of Land types for Afforestation which listed a number of specific land types which would no longer be eligible for afforestation[32]
2011	Alder GPC	Alder given its own GPC and a qualified species for inclusion in a number of other GPCs[33]
2012	Appropriate assessment procedure	As required under the European Habitats Directive and the Birds & Natural Habitats Regulations 2011 (S.I. 477 of 2011), the Forest Service was required to undertake screening, and where necessary, an appropriate assessment[34]
2012	Ash Dieback	The suspension of the grant aiding of ash planting in response to the Chalara fraxinea ash dieback disease[35]
2013	NPWS Referrals	Revised system regarding referrals to National Parks & Wildlife Service (NPWS) to provide for more targeted referrals across all application 'streams'[36]
2014	New Forestry programme	The introduction of a new Forestry Programme (2014-2020) was announced and its approval by Government[37]
2014	Forests, products and people	Forests, products and people. Ireland's forest policy – a renewed vision was launched to set out an updated national forest policy strategy

[27] Hen Harrier Protocol: https://www.npws.ie/sites/default/files/publications/pdf/HHTRP%20-%20Forestry%20-%20V3.2.pdf
[28] Freshwater Pearl Mussel Requirements: https://www.gov.ie/en/publication/640f49-forestry-standards-manual/
[29] Outlook 2010 Forestry: https://www.teagasc.ie/media/website/publications/2000/Outlook2010_forestry.pdf
[30] https://www.irishstatutebook.ie/eli/2010/si/558/made/en/print
[31] Circular 10/2010: Changes to Afforestation Grant and Premium Schemes 2011
[32] Circular 18/2011: Land Types for afforestation
[33] Circular 14/2011 – Planting of Alder in GPC 5, 6 and 7
[34] Circular 02/2012 - Appropriate Assessment Procedures for Forestry Activities
[35] Circular 12/2012 – Ash dieback
[36] Circular 2/2013 - National Parks & Wildlife Service Referrals
[37] Circular 12 of 2014 - New Forestry Programme 2015 to 2020

2015	Milk Quotas Expired	For over 30 years, the EU's dairy sector operated within the framework of milk quotas to maintain the stability of cow's milk production in the EU, this subsequently expired in April 2015[38]
2015	Afforestation Cease in Hen Harrier SPAs	Within the six breeding Hen Harrier SPAs there are no longer any afforestation licences being issued[39]
2016	Land Types for Afforestation	Three separate land types were classified regarding the potential eligibility of land for support under the Afforestation Scheme, Land types for afforestation describes these land types and utilises ground vegetation to assess the suitability of land for productive forestry[40]
2016	*P.ramorum* on Larch	An updated list of accepted Tree Species and Provenances for afforestation which detailed larch species no longer being eligible for grant aid due to the outbreak of *Phytopthora ramorum*[41]
2017	Forestry Act 2014	The commencement of Forestry Act, 2014 set out the provisions for licensing (consent) for afforestation and forest road applications, aerial fertilisation licensing and felling licences[42]
2018	Revised forestry payments	As part of the mid-term review of the forestry programme (2014-2020), higher grants and premiums for the planting of new forests as well as the introduction of a higher minimum broadleaf requirement (from 10-15%)[43]
2018	Forestry Appeals Committee	The Forestry Appeals Committee (FAC) was established to provide for an appeals service against decisions on forestry licence applications[44]
2019	Appropriate Assessment & Natura Impact Statement	All licence applications for afforestation, forest road works, felling and aerial fertilisation were screened by the Department for Appropriate Assessment and where the Department cannot rule out the possibility of a significant effect on a Natura site (i.e. a SAC or SPA), it would require the submission of a Natura Impact Statement[45]
2020	Processes for Licence Backlog	The introduction of the Forestry (Miscellaneous Provisions) Act 2020 which amended the processes and procedures dealing with appeals against decisions to licence afforestation, felling, forest road works or aerial fertilisation of forests[46]
2021	Project Woodland	Ministers McConalogue and Hackett announced 'Project Woodland' to tackle issues in forestry which set out to accept the report on the implementation of Mackinnon and develop workstreams with stakeholder input to deliver action on backlogs and new forest strategy[47]
2022	Shared National Vision for Forestry 2050 published	The Shared National Vision for Trees and Forests in Ireland until 2050 is a visionary document. It anticipates by 2050 that Ireland's forests will be seen as a key solution to the climate, biodiversity, housing and health emergencies of the 2020s[48]
2022	Forest Supports announced	The new Forest Strategy (2023 -2030) which reflects the ambitions contained in the recently published Shared National Vision for Trees, Woods and Forests in Ireland until 2050 was announced along with the supports available under the proposed new forestry programme 2023 - 2027[49]

[38] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Archive:Milk_and_milk_products_-_30_years_of_quotas
[39] https://www.npws.ie/sites/default/files/publications/pdf/HHTRP%20-%20Forestry%20-%20V3.2.pdf
[40] Land types for afforestation: https://assets.gov.ie/121183/49933794-2a40-4cef-be2b-cef1adacd43f.pdf
[41] Circular 5/2016 - Accepted Tree Species and Provenances
[42] Circular 7/2017- Commencement of Forestry Act 2014
[43] Circular 03/2018- Higher Grants and Premiums for New Forest Planting
[44] https://www.irishstatutebook.ie/eli/2018/si/68/made/en/print
[45] Circular 08/2019- Appropriate Assessment
[46] https://www.irishstatutebook.ie/eli/2020/act/15/enacted/en/index.html
[47] https://www.gov.ie/en/press-release/6d840-ministers-mcconalogue-and-hackett-announce-project-woodland-to-tackle-issues-in-forestry-accepts-report-on-implementation-of-mackinnon/
[48] https://www.gov.ie/en/press-release/15d15-shared-national-vision-for-forestry-2050-published-visionary-document-based-on-project-woodlands-extensive-public-consultation/
[49] https://www.gov.ie/en/press-release/2e80d-13-billion-announced-for-new-forestry-supports/

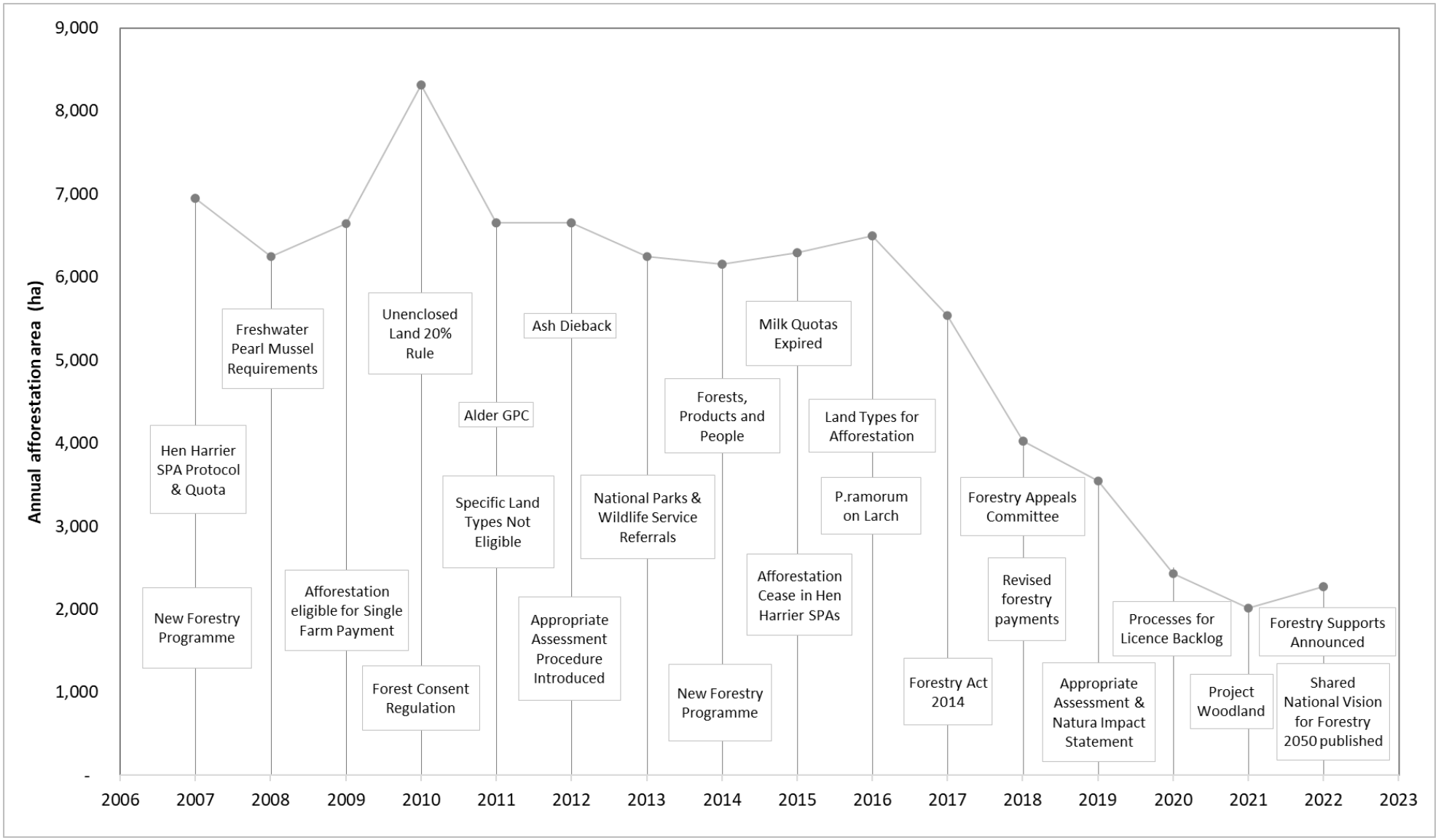

Figure 14: Policy events associated with afforestation (2007-2022) and annual afforestation rate.

3.6 Woodland Environment Fund

The Woodland Environmental Fund (WEF) facilitates the planting of more native woodlands within Ireland by providing an access point for businesses to part fund the establishment of these forests. Since the WEF was created in 2019, 1,239ha of native woodlands have received support from the WEF (Figure 15).

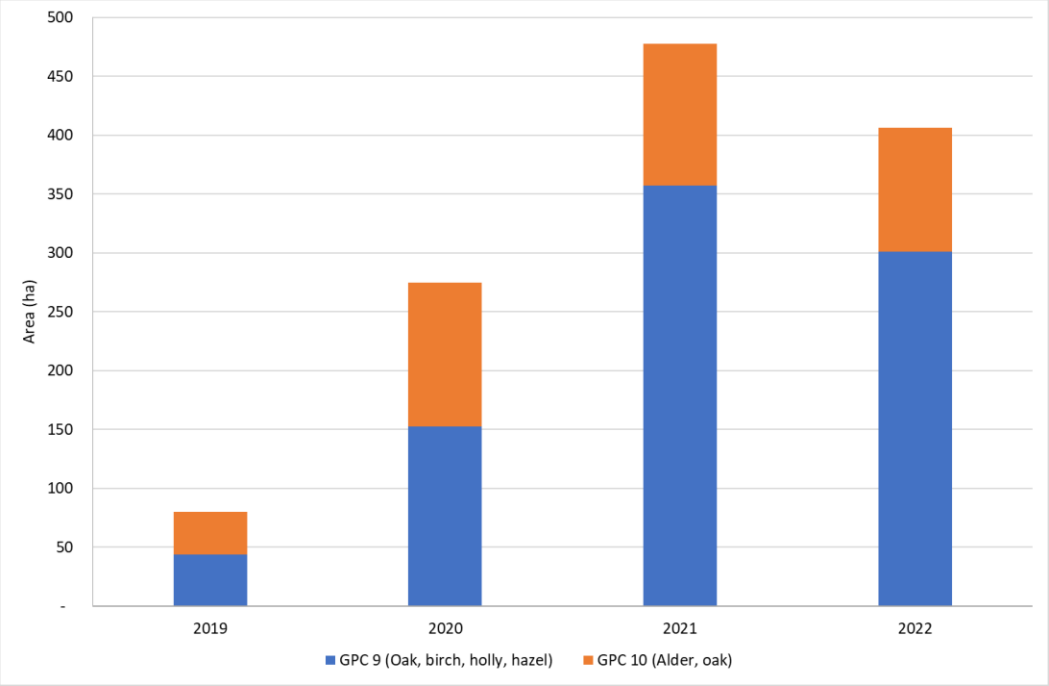

Figure 15: Area funded under the Woodland Environment Fund

3.7 Grant-aided forest removal

The area of private grant-aided forest removed from the afforestation scheme is shown in Table 13. The majority of these removals are for the following reasons: Public utilities (e.g. power lines) and Commercial Developments (e.g. windfarms).

Table 13: Grant aided forest removal

Year	Number	Area (ha)	Mean Area (ha)
2007	47	67	1.4
2008	101	209	2.1
2009	110	147	1.3
2010	74	99	1.3
2011	68	87	1.3
2012	75	91	1.2
2013	63	70	1.1
2014	52	64	1.2
2015	13	36	2.7
2016	47	156	3.3
2017	40	101	2.5
2018	34	83	2.4
2019	19	39	2.0
2020	19	35	1.8
2021	17	57	3.3
2022	18	21	1.2

3.8 Change of applicant

A substantial area of private grant-aided forests change ownership each year (Table 14). Most ownership change is within families from one generation to the next. All forest transfers are not reported, only those interact with DAFM regarding grant or annual premium payments.

Table 14: Change of applicant

Year	Number	Area (ha)	Mean Area (ha)
2007	345	3,385	9.8
2008	348	3,309	9.5
2009	374	3,850	10.3
2010	393	3,612	9.2
2011	335	2,970	8.9
2012	402	3,999	9.9
2013	379	3,440	9.1
2014	366	3,911	10.7
2015	362	3,503	9.7
2016	543	5,453	10.0
2017	395	3,350	8.5
2018	335	2,915	8.7
2019	404	3,722	9.2
2020	293	2,241	7.6
2021	278	2,107	7.6
2022	289	2,191	7.6

3.9 County level statistics

The total afforestation by county for the last 20 years is detailed in Table 15. In 2022, Cork had the highest afforestation area at 400 ha followed by Clare with 211 ha. County level statistics detailing private and public afforestation are detailed in Table 16 and Table 17 respectively. County level species composition details (i.e. broadleaf/conifer) is presented in Table 18.

Table 15: Total Afforestation (ha) by County (2003-2022)

County	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Carlow	79	54	88	60	43	49	47	100	21	73	44	15	82	46	62	26	22	6	9	4
Cavan	220	436	303	217	300	197	260	243	204	171	210	241	277	425	317	321	167	185	160	115
Clare	590	833	749	698	669	695	564	521	484	480	347	420	568	552	518	262	352	168	174	211
Cork	978	1,434	1,734	1,441	1,024	1,006	799	1,157	1,035	1,041	672	690	663	608	420	297	423	293	343	400
Donegal	388	309	345	239	321	197	172	147	59	96	40	28	72	36	54	64	45	40	22	21
Dublin	19	11	-	-	18	11	-	-	1	20	-	12	8	3	11	4	35	13	0	3
Galway	452	527	499	372	403	263	318	561	300	336	419	387	432	331	400	287	279	96	144	209
Kerry	930	893	770	664	549	478	556	736	641	366	490	574	430	405	378	332	301	289	121	122
Kildare	134	84	129	84	79	17	111	86	141	220	48	90	29	13	33	79	25	32	42	32
Kilkenny	456	297	545	322	229	199	203	523	292	294	218	231	264	181	90	136	89	21	55	38
Laois	148	183	203	71	144	178	100	178	95	193	112	168	198	163	99	71	49	26	5	26
Leitrim	325	394	411	227	191	167	179	176	325	278	356	272	513	434	536	299	289	160	98	152
Limerick	807	767	684	521	373	441	329	411	381	281	243	122	177	329	99	81	156	66	60	100
Longford	212	255	208	255	124	86	87	243	174	178	255	225	286	272	201	171	62	124	70	69
Louth	8	18	2	20	55	65	65	46	19	51	26	-	22	40	22	10	1	2	0	15
Mayo	556	483	359	325	402	344	474	548	289	293	346	453	455	429	532	256	239	208	119	161
Meath	149	150	217	287	42	89	130	252	90	203	192	67	73	105	122	106	51	33	44	27
Monaghan	59	74	59	107	70	56	88	140	70	107	93	137	38	89	61	87	59	31	17	7
Offaly	386	316	262	218	135	242	324	279	268	263	174	128	156	136	166	72	76	38	25	53
Roscommon	462	575	287	322	309	352	398	360	311	252	431	449	343	435	431	399	315	273	190	176
Sligo	242	237	254	172	205	132	233	82	87	180	354	382	268	302	190	139	119	106	92	93
Tipperary	710	633	1,087	663	546	465	455	532	494	486	410	330	341	305	162	128	158	12	32	77
Waterford	231	220	239	308	310	156	245	264	204	128	138	122	125	240	163	43	49	46	33	3
Westmeath	209	320	351	155	141	145	200	203	251	271	241	236	204	281	207	175	77	45	49	34
Wexford	225	187	247	216	178	102	182	426	308	201	229	160	128	89	114	60	59	77	15	18
Wicklow	122	48	65	71	89	115	128	100	109	188	164	219	139	251	148	121	49	46	98	107
Total	**9,098**	**9,739**	**10,096**	**8,037**	**6,947**	**6,249**	**6,648**	**8,314**	**6,653**	**6,652**	**6,252**	**6,156**	**6,293**	**6,500**	**5,536**	**4,025**	**3,550**	**2,434**	**2,016**	**2,273**

Table 16: Private Afforestation (ha) by County (2003-2022)

County	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Carlow	79	54	88	60	43	49	47	100	21	73	44	15	82	46	62	26	22	6	9	4
Cavan	220	436	303	217	300	197	260	243	204	171	210	241	277	425	317	321	167	185	160	115
Clare	588	800	736	698	669	695	564	521	484	480	347	420	568	552	518	262	352	168	174	211
Cork	963	1,432	1,734	1,441	1,024	1,006	799	1,157	1,035	1,041	672	690	663	608	420	297	423	293	343	400
Donegal	388	292	330	230	321	197	172	147	59	96	40	28	72	36	54	64	45	40	22	21
Dublin	19	11	0	0	18	11	0	0	1	20	0	12	8	3	11	4	35	13	0	3
Galway	382	494	477	356	403	235	318	561	300	336	419	387	432	331	400	287	279	96	144	209
Kerry	914	893	770	664	549	478	556	736	641	366	490	574	430	405	378	332	301	289	121	122
Kildare	134	84	129	84	79	17	111	86	101	186	48	90	29	13	33	79	25	32	42	32
Kilkenny	456	297	545	322	229	197	203	523	292	294	218	231	264	181	90	136	89	21	55	38
Laois	148	183	203	71	144	178	93	178	95	193	112	168	198	163	99	71	49	26	5	26
Leitrim	319	388	411	227	191	167	179	176	325	278	356	272	513	434	536	299	289	160	98	152
Limerick	807	763	684	521	373	441	329	411	381	281	243	122	177	329	99	81	156	66	60	100
Longford	212	255	208	255	124	86	87	243	174	178	255	225	286	272	201	171	62	124	70	69
Louth	8	18	2	20	55	65	65	46	19	51	26	0	22	40	22	10	1	2	0	15
Mayo	554	483	359	325	402	344	474	544	289	293	343	453	455	429	532	256	239	208	119	161
Meath	149	150	217	287	42	89	130	252	90	203	192	67	73	105	122	106	51	33	44	27
Monaghan	59	74	59	107	70	56	88	140	70	107	93	137	38	89	61	87	59	31	17	7
Offaly	386	316	262	218	135	242	324	279	268	263	174	128	156	136	166	72	76	38	25	53
Roscommon	451	559	272	322	309	315	370	360	288	252	431	449	334	435	431	399	315	273	190	172
Sligo	242	226	254	172	205	132	233	82	87	180	354	382	268	302	190	139	119	106	92	50
Tipperary	710	633	1,087	663	546	465	455	532	494	460	410	330	341	305	162	128	158	12	32	77
Waterford	231	220	239	308	310	156	245	264	204	128	138	122	125	240	163	43	49	46	33	3
Westmeath	209	320	351	155	141	145	200	203	251	271	241	236	204	281	207	175	77	45	49	34
Wexford	225	187	247	216	178	102	182	426	308	201	229	160	128	89	114	60	59	77	15	16
Wicklow	116	48	65	71	89	115	128	100	109	188	164	219	139	251	148	121	49	46	98	107
Total	**8,969**	**9,617**	**10,032**	**8,011**	**6,947**	**6,182**	**6,613**	**8,310**	**6,591**	**6,592**	**6,249**	**6,156**	**6,284**	**6,500**	**5,536**	**4,025**	**3,550**	**2,434**	**2,016**	**2,225**

Table 17: Public Afforestation (ha) by County (2003-2022)

COUNTY	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Carlow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cavan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clare	2	34	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cork	15	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Donegal	-	17	14	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dublin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Galway	69	33	22	16	-	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kerry	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kildare	-	-	-	-	-	-	-	-	39	34	-	-	-	-	-	-	-	-	-	-
Kilkenny	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laois	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Leitrim	6	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Limerick	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Longford	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Louth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mayo	3	-	-	-	-	-	-	4	-	-	3	-	-	-	-	-	-	-	-	-
Meath	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monaghan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Offaly	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roscommon	11	16	15	-	-	37	28	-	23	-	-	-	9	-	-	-	-	-	-	4
Sligo	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42
Tipperary	-	-	-	-	-	-	-	-	-	26	-	-	-	-	-	-	-	-	-	-
Waterford	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Westmeath	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wexford	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Wicklow	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	**128**	**122**	**64**	**25**	**-**	**67**	**35**	**4**	**62**	**60**	**3**	**-**	**9**	**-**	**-**	**-**	**-**	**-**	**-**	**48**

Table 18: Total Afforestation (ha) by County and Broadleaf/Conifer (2013-2022)

County	2013		2014		2015		2016		2017		2018		2019		2020		2021		2022	
	B'leaf	Conifer	B'leaf	Conifer	B'leaf	Conifer	B'leaf	Conifer	B'leaf	Conifer	B'leaf	Conifer	B'leaf	Conifer	B'leaf	Conifer	B'leaf	Conifer	B'leaf	Conifer
Carlow	14	31	3	12	19	63	14	32	13	50	12	13	6	16	5	1	7	2	2	2
Cavan	58	152	50	191	57	220	89	336	69	248	69	252	37	130	73	112	63	98	72	43
Clare	58	289	65	354	106	461	73	479	64	455	69	193	61	292	41	127	57	117	76	136
Cork	185	487	182	508	148	515	111	497	82	338	70	227	99	325	122	171	153	191	190	211
Donegal	10	30	4	24	10	62	7	29	15	40	11	53	20	24	13	27	7	16	14	7
Dublin	0	0	2	10	2	7	1	1	4	7	1	4	5	30	2	12	0	0	3	0
Galway	93	326	103	283	115	317	56	275	92	308	91	196	64	215	27	69	51	93	53	156
Kerry	115	375	105	470	104	327	114	291	131	247	155	177	104	197	115	174	69	53	57	66
Kildare	27	21	49	41	5	24	4	9	23	10	25	54	13	11	26	6	19	22	16	17
Kilkenny	62	156	51	180	73	192	66	115	24	65	32	104	22	67	4	17	16	39	15	23
Laois	27	85	35	133	22	176	32	132	15	83	19	53	10	39	2	24	1	4	6	20
Leitrim	71	285	41	231	71	442	73	361	82	455	54	245	44	245	45	114	41	57	29	123
Limerick	51	192	26	96	24	152	65	263	11	89	20	61	41	116	21	44	31	29	33	67
Longford	54	201	50	175	88	198	45	227	29	172	35	136	15	47	27	97	14	56	46	23
Louth	20	7	0	0	18	5	5	35	20	2	6	4	1	0	2	-	0	0	4	11
Mayo	59	288	76	378	62	393	59	369	78	453	59	197	67	172	55	153	45	74	58	103
Meath	61	131	33	33	25	48	31	74	61	61	36	70	21	30	14	19	13	31	15	12
Monaghan	32	61	33	104	8	29	16	73	14	47	35	51	21	38	16	15	10	7	6	1
Offaly	32	142	28	100	29	127	30	106	50	115	19	53	24	53	8	31	13	12	28	25
Roscommon	67	364	69	380	60	283	82	353	75	356	84	316	63	252	76	197	57	133	57	119
Sligo	69	285	49	333	28	240	42	260	29	161	16	123	30	89	17	89	33	59	59	33
Tipperary	78	332	64	266	73	268	39	266	28	134	22	106	31	127	5	7	7	25	11	66
Waterford	25	113	36	85	26	99	36	205	25	138	9	33	7	43	17	29	14	19	2	1
Westmeath	106	136	81	155	44	160	102	179	55	152	58	117	32	45	33	13	30	19	21	13
Wexford	66	163	59	101	29	100	42	47	40	75	8	52	31	28	26	51	14	0	9	9
Wicklow	54	111	53	166	17	122	37	213	34	115	54	66	23	26	29	17	67	31	78	30
Total	**1,492**	**4,760**	**1,348**	**4,808**	**1,263**	**5,030**	**1,270**	**5,230**	**1,161**	**4,375**	**1,070**	**2,956**	**893**	**2,657**	**819**	**1,616**	**829**	**1,187**	**959**	**1,314**
Percent	**24%**	**76%**	**22%**	**78%**	**20%**	**80%**	**20%**	**80%**	**21%**	**79%**	**27%**	**73%**	**25%**	**75%**	**34%**	**66%**	**41%**	**59%**	**42%**	**58%**

4. Private afforestation ownership

This section provides information on the nature of private forest owners who afforested between 1980 and 2022. The data refers to the calendar year when the forest was planted.

Key statistics

- 82% of the forests afforested since 1980 have been planted by farmers;
- Since 1980, 23,859 individual private forest owners have received grant aid to establish their forests;
- Nearly half (46.6%) of the area afforested since 1980 was by individual owners who have received afforestation grant aid at least, which should contribute to management efficiencies, due to the increased size of the individuals forest holding.
- In 2022, 62% of the area afforested was by people aged 60 years or more. While 59% of the total area that received premium payments was owned by people aged 60 years or more.

4.1 Farmer/non-farmer

Farmers accounted for 82% of private lands afforested between 1980 and 2022 (Figure 16). In the Afforestation Grant and Premium Scheme (2014-2020) changes were implemented to the differentiation of Farmers and Non-farmers in terms of premium payments. Prior to 2014 it was necessary for land owners to qualify as farmers to be eligible for an additional five premium payments. Under the Afforestation Grant and Premium Scheme (2014-2020), Farmers and Non-farmers were eligible for the same duration of premium payments. The category 'Non-farmer' includes landowners who in general are not actively farming. However, it is important to note that the non-farmer category includes; retired farmers, family members of farmers who might have inherited land but who work outside of farming and other landowners who may have recently bought the land.

A feature of the period from 1980 to 1994 was the higher average forest parcel size planted by non-farmers (15 ha), compared to an average of 5 ha for farmers (Figure 17). The differential between farmers and non-farmers reduced from 1994 to 2014, to an average of 8.7 ha for farmers and 6.7 ha for non-farmers. From 2015 onwards the average size of forests established by farmers and non-farmers has converged, at 6.3 ha for farmers and 7.0 ha for non-farmers.

In Table 19, information is presented on the area afforested in each county by Farmers and Non-farmers.

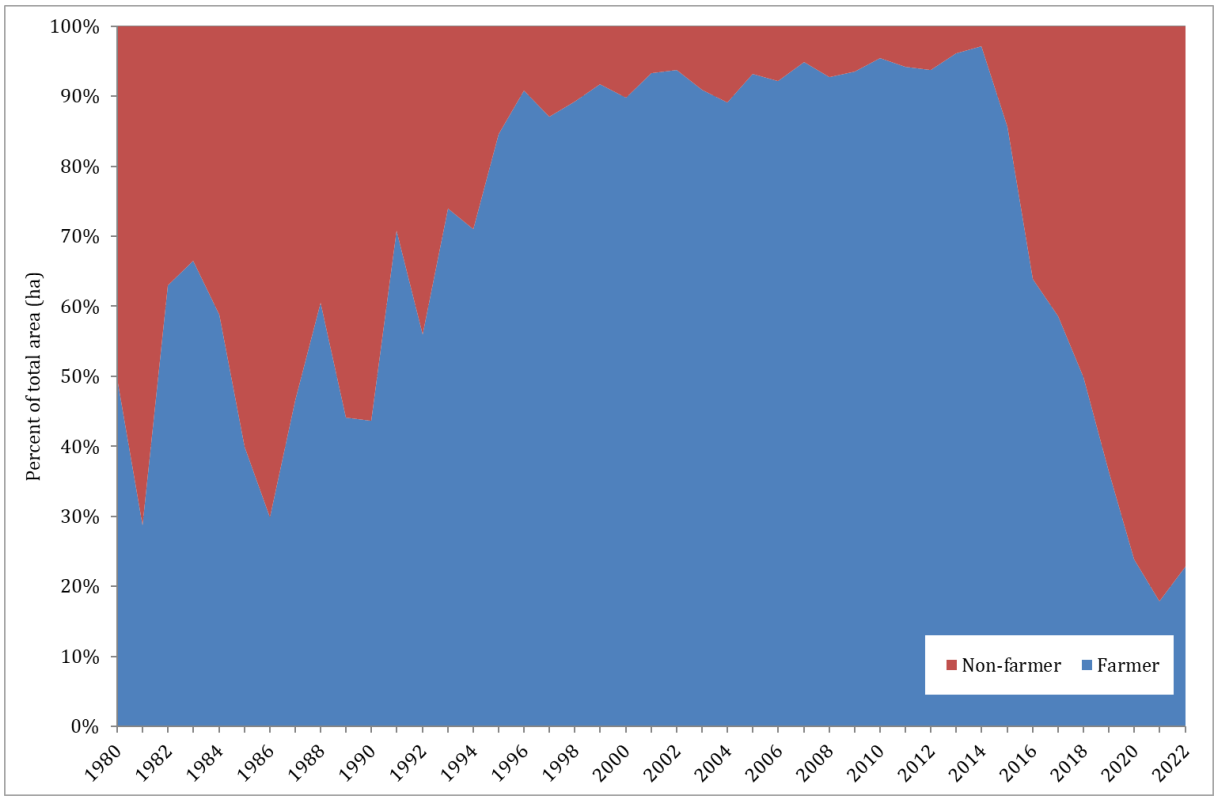

Figure 16: Farmer and Non-Farmer participation in afforestation (1980-2022)

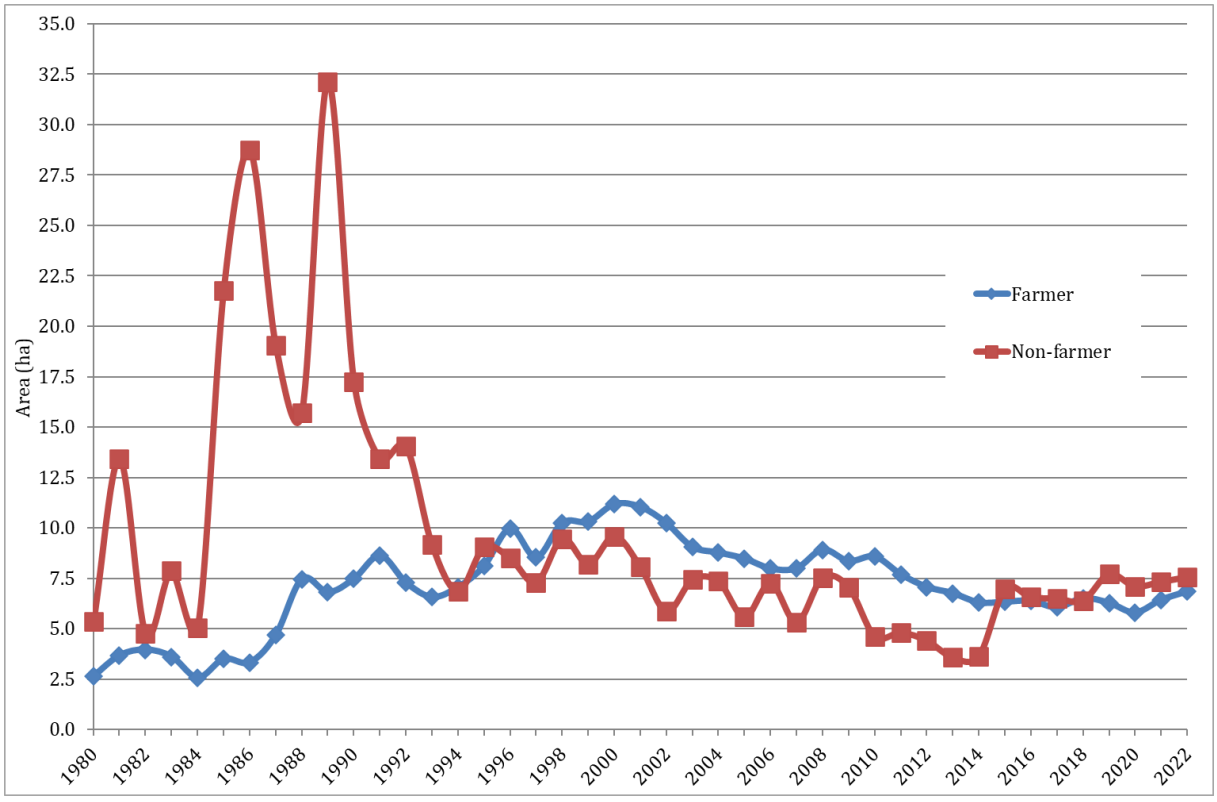

Figure 17: Average area of Farmer/Non-Farmer grant-aided afforestation (1980-2022)

Table 19: Total Afforestation (ha) by County and Farmer/Non-farmer (2017-2022).

County	2017				2018				2019				2020				2021				2022			
	Farmer		Non Farmer		Farmer		Non Farmer		Farmer		Non Farmer		Farmer		Non Farmer		Farmer		Non Farmer		Farmer		Non Farmer	
	No.	ha	No.	ha	No.	ha	No.	ha	No.	ha	No.	ha	No.	ha	No.	ha	No.	Ha	No.	ha	No.	Ha	No.	ha
Carlow	8	46	2	16	5	22	1	4	2	21	1	1	1	4	1	2	0	-	4	9	-	-	1	4
Cavan	27	188	21	129	18	108	24	213	12	88	17	80	4	24	24	161	3	16	20	145	3	19	14	96
Clare	38	259	40	259	21	101	28	161	11	61	35	291	3	23	14	145	4	26	18	148	6	56	18	155
Cork	38	206	28	214	16	144	19	153	13	88	29	335	5	39	27	253	8	53	32	290	10	98	24	302
Donegal	4	28	4	26	4	15	5	49	2	4	6	40	1	6	5	33	0	-	3	22	3	7	3	13
Dublin	1	3	2	7	1	4	0	0	2	35	0	0	1	13	-	-	0	-	-	-	1	3	-	-
Galway	35	235	24	165	25	185	24	101	16	113	17	166	6	28	12	68	4	21	16	124	6	56	16	153
Kerry	29	164	31	214	20	175	22	158	18	132	30	169	5	20	39	269	4	15	14	106	5	22	12	100
Kildare	5	22	3	11	6	59	4	20	3	10	4	14	1	7	4	25	0	-	4	42	-	-	6	32
Kilkenny	16	89	1	1	16	121	3	15	12	69	6	20	4	18	2	2	3	15	4	40	3	14	5	24
Laois	7	62	7	36	7	46	4	25	3	14	3	35	1	5	2	21	0	-	1	5	-	-	6	26
Leitrim	37	271	33	266	14	117	27	182	7	42	25	248	11	75	9	84	1	2	17	96	5	38	16	114
Limerick	14	64	7	36	4	29	9	52	5	31	13	125	2	14	5	51	2	38	3	22	1	36	7	64
Longford	30	150	10	50	20	81	12	90	5	26	6	36	6	36	12	88	2	50	4	20	3	30	7	39
Louth	4	22	0	0	2	9	1	1	1	1	0	0	-	-	1	2	0	-	-	-	1	12	2	3
Mayo	51	252	33	280	24	98	33	158	10	70	28	169	5	22	30	187	5	26	18	93	9	38	21	123
Meath	9	60	12	62	9	62	5	44	5	36	4	16	-	-	6	33	1	3	6	41	2	17	3	10
Monaghan	4	39	5	23	7	37	7	50	4	37	2	23	3	12	6	18	1	2	4	14	2	6	1	0
Offaly	18	130	10	36	9	57	4	15	9	51	5	25	3	16	5	23	3	13	3	11	2	5	6	48
Roscommon	52	293	20	138	33	180	30	219	28	137	24	179	21	115	19	158	7	34	19	156	5	36	21	140
Sligo	23	116	13	74	12	67	13	72	7	38	13	81	4	21	13	85	1	2	9	90	1	2	12	91
Tipperary	10	67	17	94	8	94	6	34	11	76	8	82	1	8	2	3	1	2	3	30	-	-	6	77
Waterford	18	132	5	32	4	18	4	24	2	15	2	35	2	20	5	26	1	10	2	23	2	1	1	2
Westmeath	23	146	10	61	13	87	11	88	6	35	7	42	3	7	8	38	1	6	6	43	2	8	6	26
Wexford	20	90	8	24	4	32	5	29	5	36	5	23	3	32	6	46	1	6	4	9	2	8	5	9
Wicklow	15	108	7	40	7	60	14	61	7	27	3	22	4	14	4	32	3	20	12	78	2	7	13	101
Total	536	3242	353	2,294	309	2,009	315	2,016	206	1,292	293	2,258	100	579	261	1,855	56	360	226	1,657	76	520	232	1,754

4.2 Number of grant aided forests planted by individual

It has been common for individual forest owners to afforest more than one forest. Table 20 details the number of individual forest owners who have had one or more grant aided forests planted since 1980. Some 78.7% of owners have planted one forest, accounting for 53.4% of the overall area. While 21.3% of the individual owners had two or more grant aided forests planted, these forests accounted for 46.6% of the area.

While these forests may not be all contiguous, the information presented shows that the private grant-aided forest estate is less fragmented than considered previously. It also shows potentially more consolidated forest holdings among individual owners than was heretofore assumed.

Table 20: Private grant aided forests planted by individual owners (1980-2022)

No. of grant applications	Individual owners		Area	
	Number	%	ha	%
1	18,771	78.7	154,079	53.4
2	3,447	14.4	54,755	19.0
3	948	4.0	23,420	8.1
4	307	1.3	10,830	3.8
5	149	0.6	7,471	2.6
6-7	111	0.5	7,443	2.6
8-9	49	0.2	4,465	1.5
10-19	50	0.2	8,841	3.1
20-49	21	0.1	8,391	2.9
50+	6	0.0	8,642	3.0
Total	**23,859**	**100**	**288,337**	**100**

The number of individual owners that have afforested by county is detailed in Table 21. It should be noted that individual owners recorded in any one year may have subsequently planted again in the following years.

Table 21: Cumulative number of individual owners and area by county in 1980–2022

County	No. owners	Area (ha)
Carlow	230	1,814
Cavan	863	8,858
Clare	1,913	23,727
Cork	2,968	31,701
Donegal	965	15,842
Dublin	85	843
Galway	1,550	16,882
Kerry	2,204	29,872
Kildare	363	3,402
Kilkenny	862	9,725
Laois	565	7,264
Leitrim	850	12,291
Limerick	1,100	13,717

County	No. owners	Area (ha)
Longford	629	5,989
Louth	90	737
Mayo	1,807	20,179
Meath	466	4,676
Monaghan	313	2,087
Offaly	710	8,615
Roscommon	1,259	13,444
Sligo	905	9,406
Tipperary	1,512	18,997
Waterford	708	7,753
Westmeath	601	7,564
Wexford	691	5,766
Wicklow	626	7,187

4.3 Annual grant applications by individual owner

As stated, when assessing the average size of the total forest holdings of individual owners a profile of a less fragmented private forest estate emerges, compared to using a simple average of afforestation areas. By 2022, the average cumulative area afforested by individual owners is 12.1 ha (Table 22), compared to the average afforestation area of 8.6 ha (Table 11). Since Table 22 only looks at the average size of individual afforestation areas, there does exist some owners who have afforested multiple forest holdings over time (Figure 18).

Table 22: Annual grant applications by individual owners (1980-2022)

Year	No. of individual owners		Mean forest size (ha)	
	Annual	Cumulative	Annual	Cumulative
1980	46	46	3.9	3.9
1981	41	74	7.8	6.8
1982	70	133	4.2	6.0
1983	78	193	4.5	6.0
1984	104	272	3.3	5.5
1985	142	382	7.4	6.7
1986	229	573	9.1	8.1
1987	353	860	8.2	8.7
1988	464	1,239	9.7	9.7
1989	659	1,789	12.7	11.4
1990	647	2,331	12.8	12.3
1991	764	3,058	9.5	11.8
1992	594	3,581	9.7	11.6
1993	938	4,410	8.8	11.3
1994	1,250	5,505	10.8	11.5
1995	1,356	6,628	11.9	12.0
1996	1,365	7,715	10.0	12.1
1997	1,163	8,603	9.9	12.2
1998	1,043	9,393	10.5	12.3
1999	1,036	10,187	11.3	12.5
2000	1,161	11,021	11.8	12.8
2001	1,248	11,967	11.3	13.0
2002	1,134	12,787	10.8	13.1
2003	1,004	13,466	9.6	13.2
2004	832	14,066	10.2	13.2
2005	1,186	14,911	9.4	13.2
2006	1,026	15,641	8.7	13.2
2007	759	16,174	7.8	13.1
2008	629	16,629	8.8	13.1
2009	695	17,157	9.1	13.0
2010	898	17,844	8.5	13.0
2011	862	18,533	7.6	12.8
2012	845	19,200	6.9	12.7
2013	939	19,916	7.1	12.6
2014	951	20,626	6.5	12.4
2015	863	21,268	7.0	12.3
2016	930	21,991	7.0	12.2
2017	819	22,605	6.9	12.2
2018	543	22,998	7.4	12.1
2019	395	23,280	7.9	12.1
2020	310	23,507	7.8	12.1
2021	234	23,687	8.4	12.1
2022	243	23,859	8.8	12.1

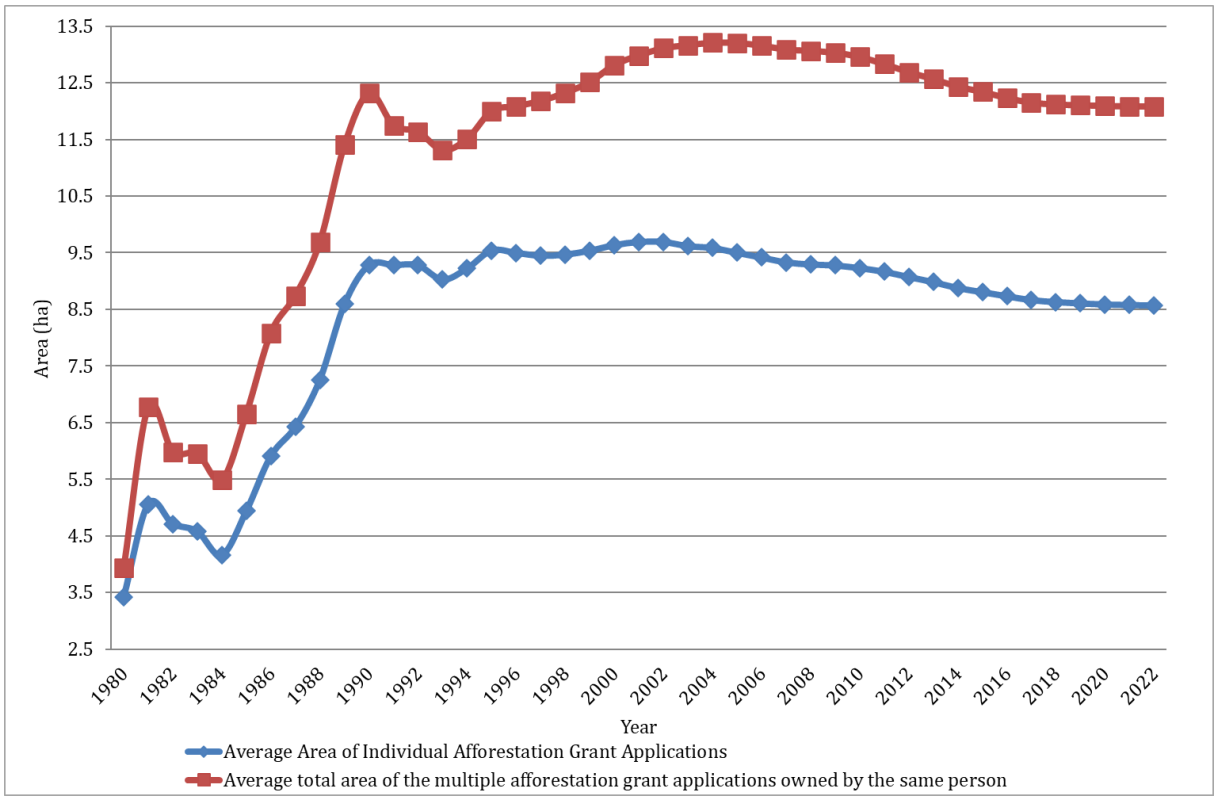

Figure 18: Average area of individual afforestation grant application vs. the average area of the combined multiple afforestation grant applications owned by the same person (1980-2022)

4.4 Age and gender profile of forest owners

In this section information is presented on the age and gender of forest owners. Figure 19 presents the increasing trend of the age of entrants to the afforestation scheme between 2006 and 2022 . In 2006, 28% of the area afforested was by people aged 60 years or more, and in 2022 this had increased to 62%.

Figure 20 details the age profile of the forest owners in receipt of premium. In 2022, 59% of the total area that received premium payments was owned by people aged 60 years or more.

Over the 16-year period (2006-2022) 83% of entrants to the afforestation scheme were male (Figure 21), which is in line with participation in other agricultural schemes in Ireland (e.g. Basic Payment Scheme). In 2022, 12% of entrants to the afforestation scheme were female, which was lower than the average over the past 16 years of 17%.

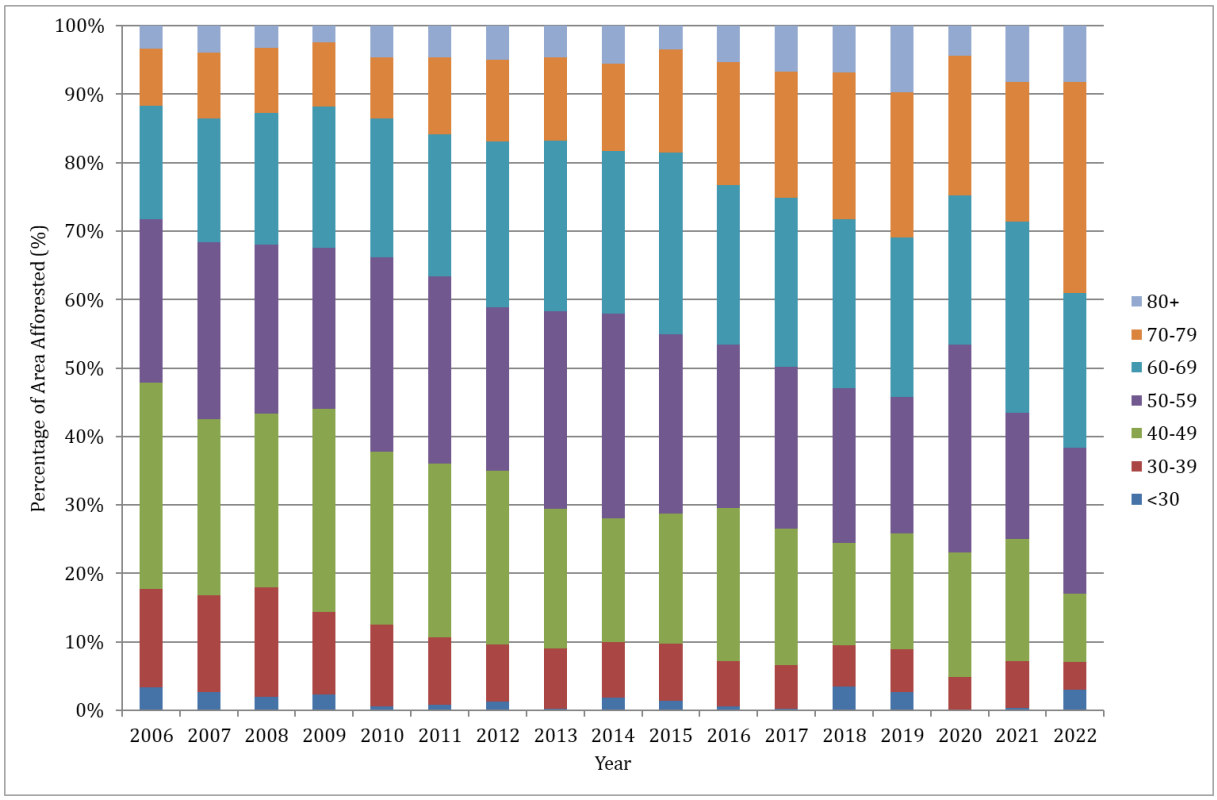

Figure 19: Age profile of forest owners at the time of when their land was afforested (2006 - 2022)

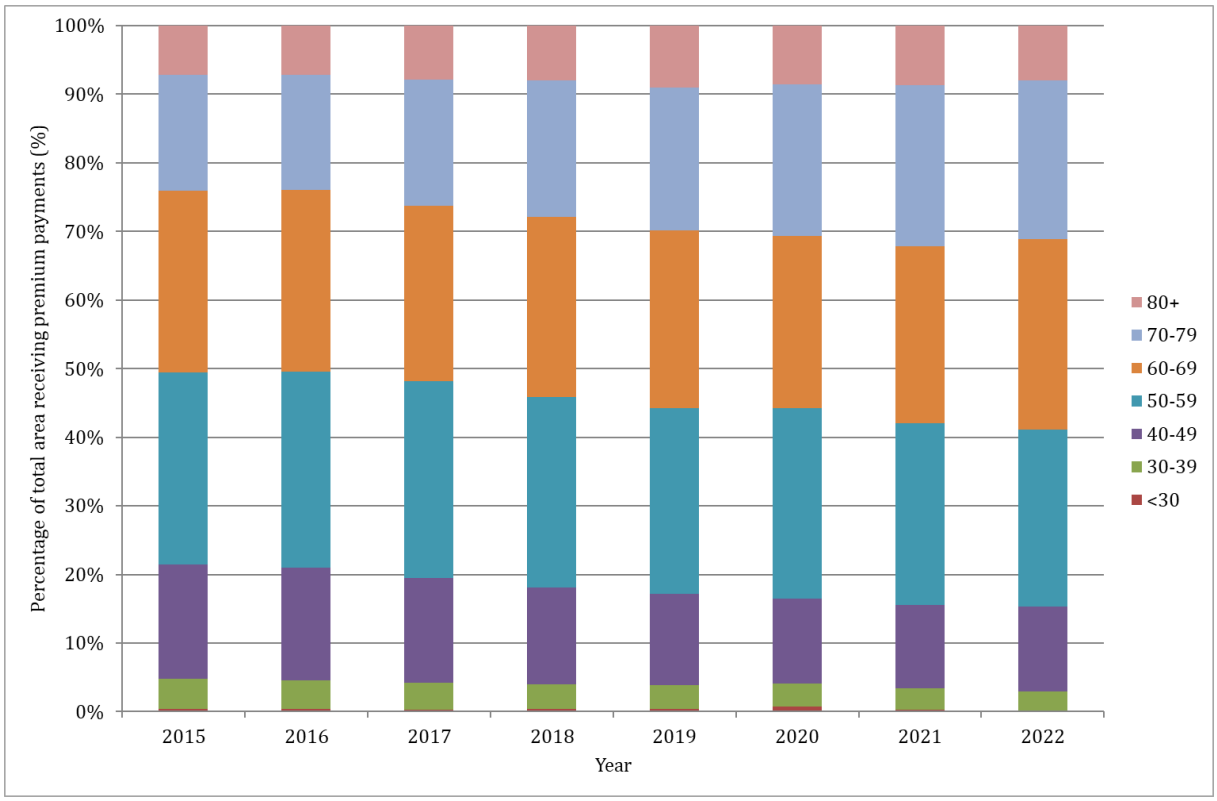

Figure 20: Age profile of forest premium recipients (2015-2022)

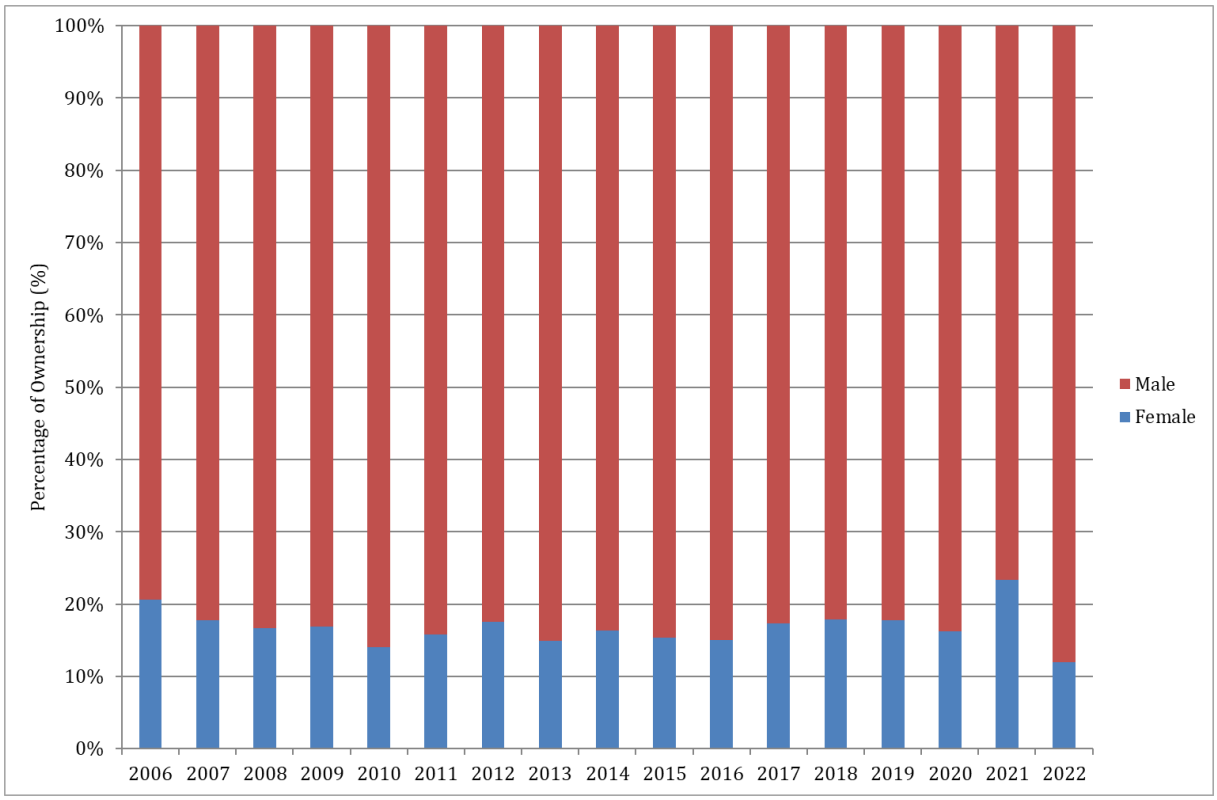

Figure 21: Gender of forest owners at the time of when land was afforested (2006-2022)

4.5 Private (non grant-aided) ownership details

Previous sub-sections in this chapter have outlined ownership profiles of the private grant-aided estate. Detailed information on the Private (non grant-aided) component of the forest estate is not available which comprised 121,786 ha in 2022 (NFI, 2022). The 1973 *Inventory of Private Woodlands*[50] provided inventory information for forest areas of 40 ha or more (17,481 ha) or 21% of the total of 81,958 ha of private forests estimated at the time. At the time, areas 40 ha or more and under single ownership represented the more commercially viable forest stands in private ownership. The remaining Private (non grant-aided) forest is comprised of primarily juvenile, short-living, naturally regenerated broadleaf species such as birch. These forest areas are commonly quite small and frequently of limited use for agriculture due to slope and other restrictions. The number of owners in this category is in the region of 20,000-30,000 individuals. In 1973 over 40% of the 81,958 ha was comprised of "*scrub*" category. The size category of the 151 estates with detailed historical inventory information is shown in Table 23.

Table 23: Inventory of Private Woodlands, 1973 - Forest-size categories

Estate Forest Area (ha)	Number of estates	Area (%)
40-50	25	7
51-100	67	24
101-500	56	59
501-1,000	3	11

[50] Purcell, T. 1979. *Inventory of Private Woodlands,* 1973, Department of Fisheries and Forestry, Forest and Wildlife Service.

5. Forest Management Operations

Key findings

- Since 1944 an average of 127 km of forest roads have been built annually in public forests;
- Between 2006 and 2022 an average of 89 km of private grant-aided forest roads were built annually;
- Over 8,360 ha were reforested on public lands in 2022;
- Public forest clearfelling amounted to 9,003 ha in 2022, while 14,836 ha of forest were thinned;
- Felling licences were issued to the private sector for the thinning of 10,252 ha in 2022, while there was an increase in clearfelling with 14,006 ha licensed.
- Currently 31,057 ha of private forest is certified under PEFC or FSC Certification

5.1 Forest Roads

Forest roads enhance the economic viability of forests primarily by improving access for harvesting and mobilising timber. In addition, forest roads also provide areas for the stacking of timber and for drying and chipping. Apart from economic enhancement and amenity, forest roads also improve the environmental and biodiversity value of forests by increasing edge effects and improving access to deal with fire. Forest roads also allow for better health and safety by providing access for emergency vehicles.

5.1.1 Public forest roading

Between 1944 and 2022, 9,996 km of forest roads have been built in the public forest estate or on average 127 km annually (Figure 22).

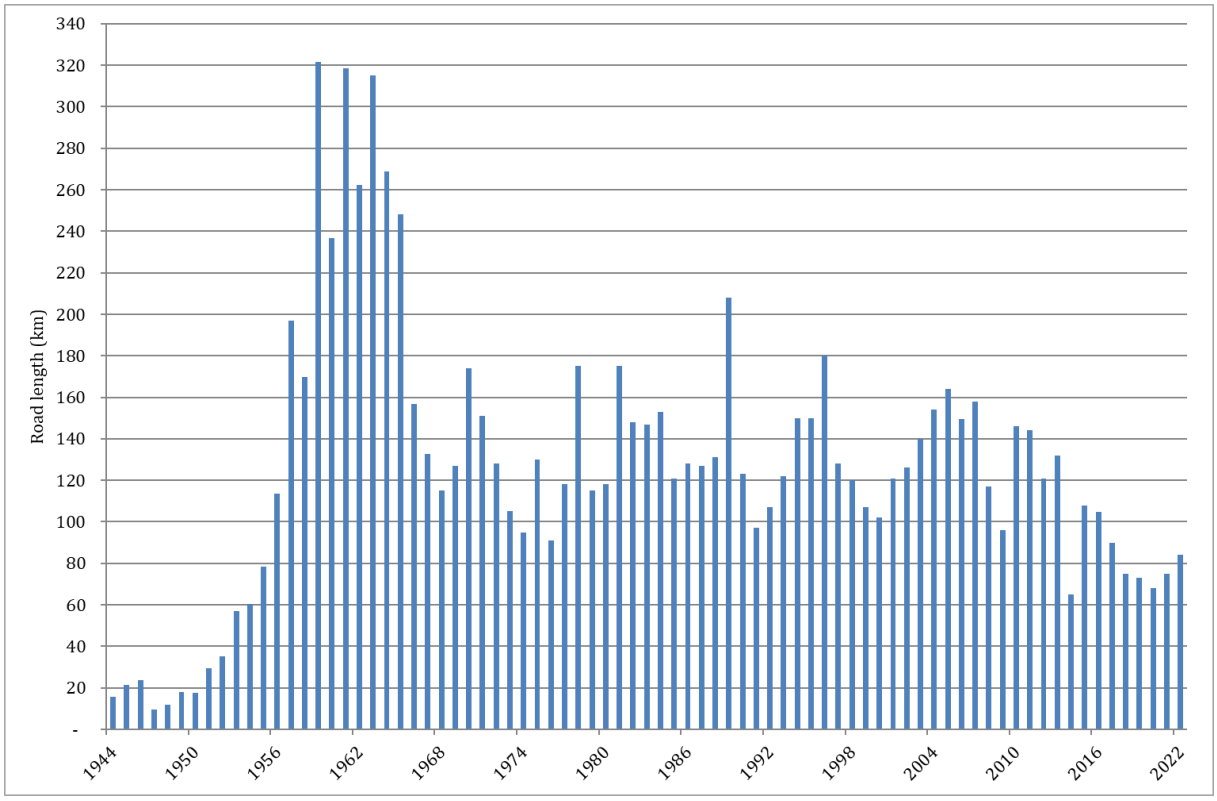

Figure 22: Forest road construction in public forests 1944–2022

5.1.2 Private forest grant-aided roading

Historically, the construction of forest roads was largely confined to the public sector. However, with the maturation of private sector forests, roads are increasingly required in private forests (Figure 23).

Since 2006, IFORIS[51] has been used to record the number and length of forest roads grant aided. As the private estate reaches harvesting stage there has been an increase in the length of forest roads built. Between 2007 and 2022, an average of 89 km of private grant-aided forest roads were built annually. Table 24 shows the private grant-aided forest road construction from 2011 to 2022 by county.

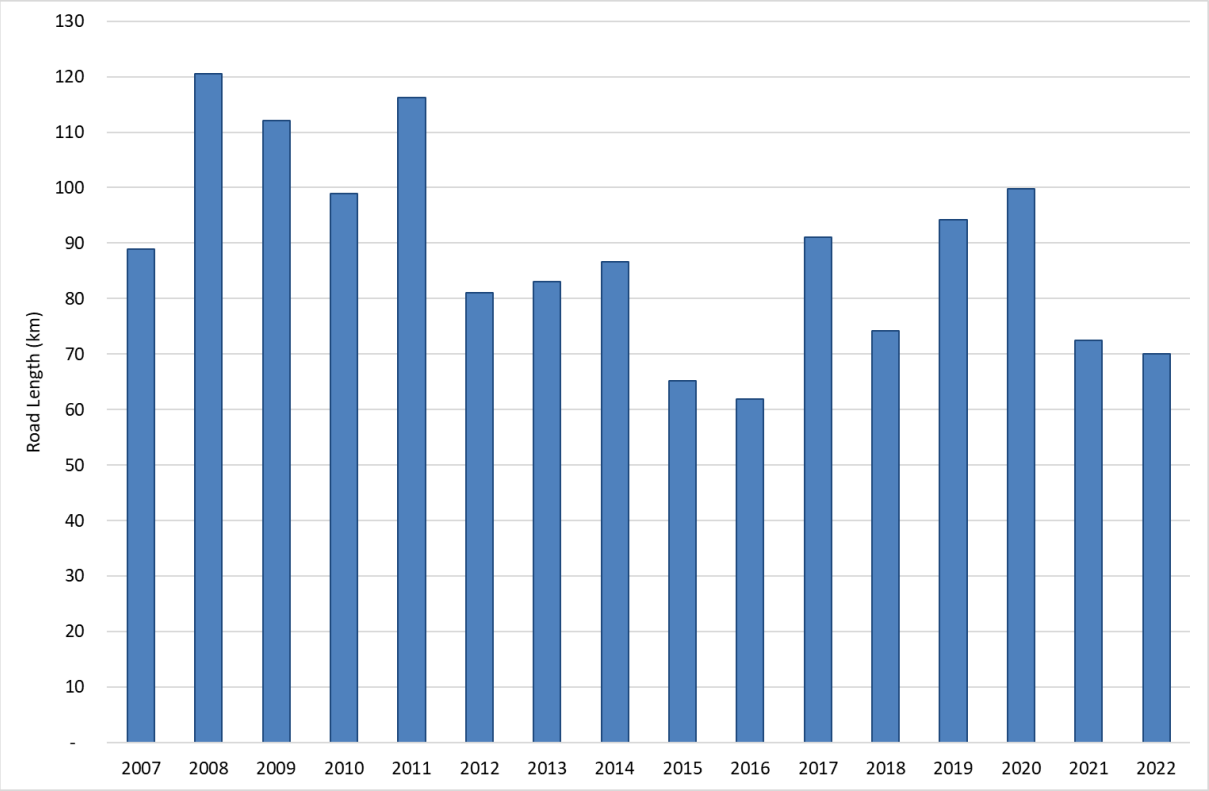

Figure 23: Private grant-aided forest road building (2007-2022)

[51] IFORIS is an Integrated Forest Information System which was developed for the processing of forestry pre-approval, grant and premium applications.

Table 24: Private grant-aided forest road building (metres) by county from (2013-2022)

County	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Carlow	60	883	0	0	798	470	210	348	261	0
Cavan	2,478	3,187	3,197	1,702	2,815	4,569	7,360	6,092	2,584	1,949
Clare	4,238	2,768	5,225	4,191	5,755	4,585	3,459	4,540	3,169	3,354
Cork	6,534	8,969	8,708	5,724	8,183	7,432	10,458	8,811	6,640	7,722
Donegal	0	1,376	402	395	2,969	2,689	1,819	2,119	1,638	2,808
Dublin	480	800	0	0	484	1,295	868	0	0	0
Galway	2,360	4,329	895	1,047	3,365	4,301	3,303	944	3,699	2,955
Kerry	10,937	11,755	7,833	4,084	12,261	10,558	9,717	9,721	10,213	10,506
Kildare	1,324	80	2,667	430	735	420	499	1,037	251	0
Kilkenny	8,984	5,664	3,630	2,226	2,842	5,691	7,118	4,201	6,470	3,605
Laois	3,812	739	2,206	3,153	3,668	2,300	1,282	2,587	823	2,794
Leitrim	5,049	6,426	2,173	1,460	1,624	2,569	5,135	7,920	1,301	943
Limerick	6,134	4,927	1,254	3,585	4,885	3,994	4,317	6,987	5,989	3,350
Longford	552	3,116	1,845	2,080	1,228	1,570	3,623	3,511	1,882	2,902
Louth	0	0	0	435	0	0	0	0	0	0
Mayo	2,000	3,480	942	266	1,105	1,047	2,329	2,563	2,655	2,526
Meath	2,791	384	2,593	1,514	1,734	1,028	2,818	660	856	416
Monaghan	170	0	50	899	1,372	2,454	475	179	919	239
Offaly	1,468	2,839	1,950	1,606	4,716	2,861	674	7,323	2,454	3,144
Roscommon	2,856	4,422	1,005	917	1,573	3,048	5,614	5,496	6,036	6,751
Sligo	2,805	5,354	2,693	1,813	1,134	1,312	1,909	2,609	781	1,822
Tipperary	7,847	6,051	7,331	10,253	8,898	3,674	6,293	6,204	4,381	5,094
Waterford	2,266	2,649	2,362	2,636	5,139	1,086	2,366	1,219	4,385	1,359
Westmeath	2,602	3,218	2,723	6,492	5,961	2,427	4,860	6,571	2,217	1,203
Wexford	882	1,121	1,292	2,759	4,083	290	2,812	2,019	2,178	1,676
Wicklow	4,455	2,148	2,140	2,278	3,730	2,546	4,820	6,155	718	2,825
Total	**83,084**	**86,685**	**65,116**	**61,945**	**91,057**	**74,216**	**94,138**	**99,816**	**72,499**	**69,939**

5.2 Felling Licences Issued

A felling licence granted by the Minister for Agriculture, Food & the Marine provides authority under the Forestry Act 2014 to fell or otherwise remove a tree or trees and to thin a forest for silvicultural reasons. Table 25 shows the area of lands granted felling licences for both thinning and clearfelling.

The area issued with felling licences for thinning was on an upward trend between 2010 and 2014, this declined by approximately 4,544 ha in 2015. This figure has subsequently increased, with 10,252 ha licensed for thinning in 2022 in private forests. A large increase in the area licensed for clearfell was evident in 2014 due to Storm Darwin. The clearfell area licensed in 2016 declined to 1,384 ha, which is still high when compared to pre-Storm Darwin clearfell areas. In 2022, 14,006 ha were licensed for clearfell in the private estate, reflecting plantations that were established during the late 1980's and early 1990's reaching maturity.

Information is also provided for the public estate in Table 25 on felling licences. In 2011 and 2016, large areas were licensed for thinning which represent a multi-annual thinning programme.

It should be noted that the areas licensed for thinning and clearfell are indicative and may not be fully utilised on the ground due to a variety of reasons e.g. markets, access.

Table 25: Area (ha) of felling licences issued (2010-2022)

Year	Public		Private		Total	
	Thinning	Clearfell	Thinning	Clearfell	Thinning	Clearfell
2010	3,634	10,558	10,382	439	14,016	10,996
2011	109,789	15,134	12,275	590	122,064	15,725
2012	353	3,026	13,037	467	13,390	3,493
2013	301	6,170	15,150	394	15,450	6,564
2014	272	8,566	15,742	3,447	16,014	12,012
2015	5,717	9,571	11,198	2,012	16,916	11,583
2016	137,848	8,395	16,549	1,384	154,397	9,780
2017	10,281	7,980	16,697	2,133	26,977	10,113
2018	11,184	9,736	14,504	4,421	25,688	14,157
2019	38,242	5,936	9,328	3,690	47,571	9,626
2020	1	7,145	7,604	4,725	7,605	11,870
2021	0	12,431	12,494	8,278	12,494	20,709
2022	14,836	9,003	10,252	14,006	25,088	23,009

5.3 Public forest thinning and clearfelling

The area of public forest clearfelled peaked in 2003, coinciding with a peak in domestic construction activity (Figure 24). Clearfell areas from 1986-2000 were estimated by averaging the reforestation areas for the two years following clearfell. Thinning activity in the public estate is shown in Figure 25. Thinning data for 1986-1996 are not available, but to create a complete time series an estimate of 10,065 ha has been assumed (i.e. average of a 10-year period 1981-1985 and 1997-2001).

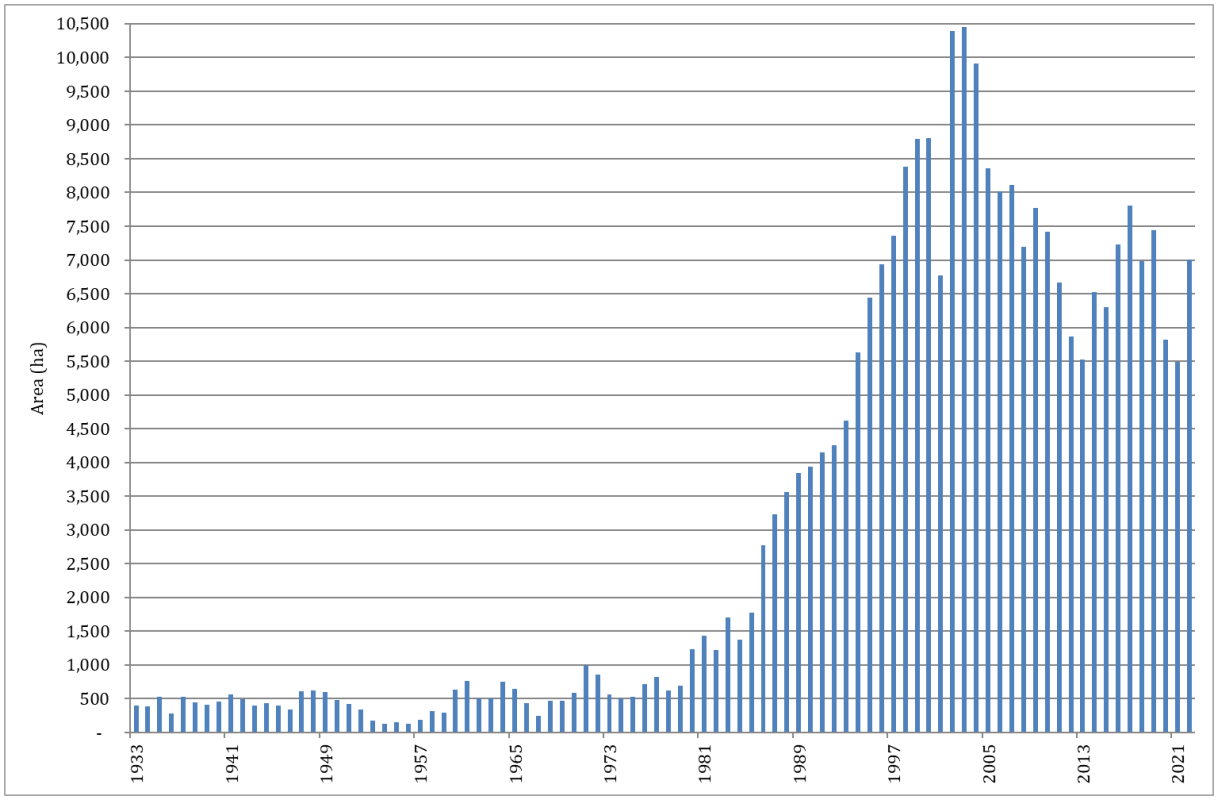

Figure 24: Public estate clearfelling 1933-2022

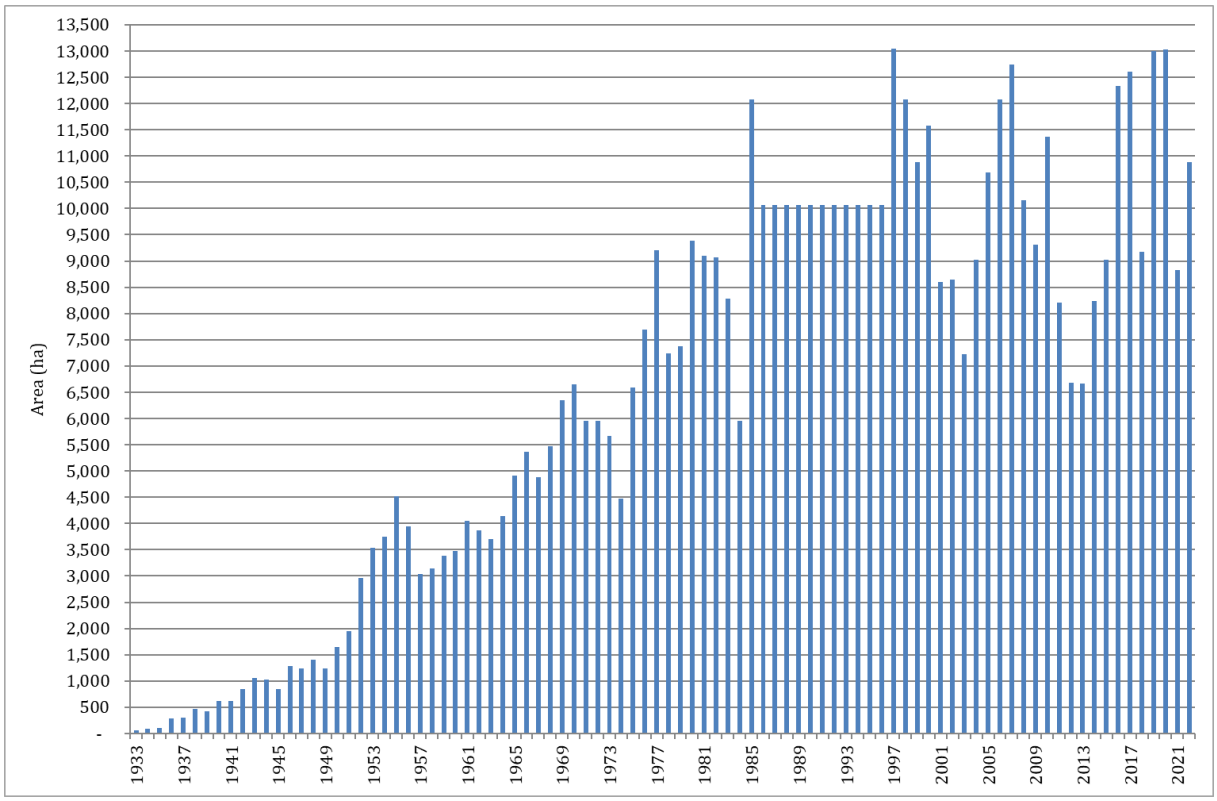

Figure 25: Public estate thinning 1933-2022

5.4 Public forest reforestation

Reforestation is the regeneration of existing areas of forests that have been felled, and it is a condition of most felling licences that the felled forest is reforested. Annual reforestation rates are mainly driven by harvesting levels (with a time lag, usually of around 2 years, between harvesting and reforestation).

Public forest reforestation rates from 1933 to 2022 are shown in Figure 26. Up until the early 1980's reforestation rates were low due to relatively low afforestation up to 1950. In the 1950's and 1960's afforestation greatly expanded, which in turn was reflected in the increasing reforestation of the 1980's and 1990's. By 2008 and 2009, the area of public reforestation had fallen by about a third, since a peak of 10,000 ha in 2003. In recent years the level of reforestation has significantly increased.

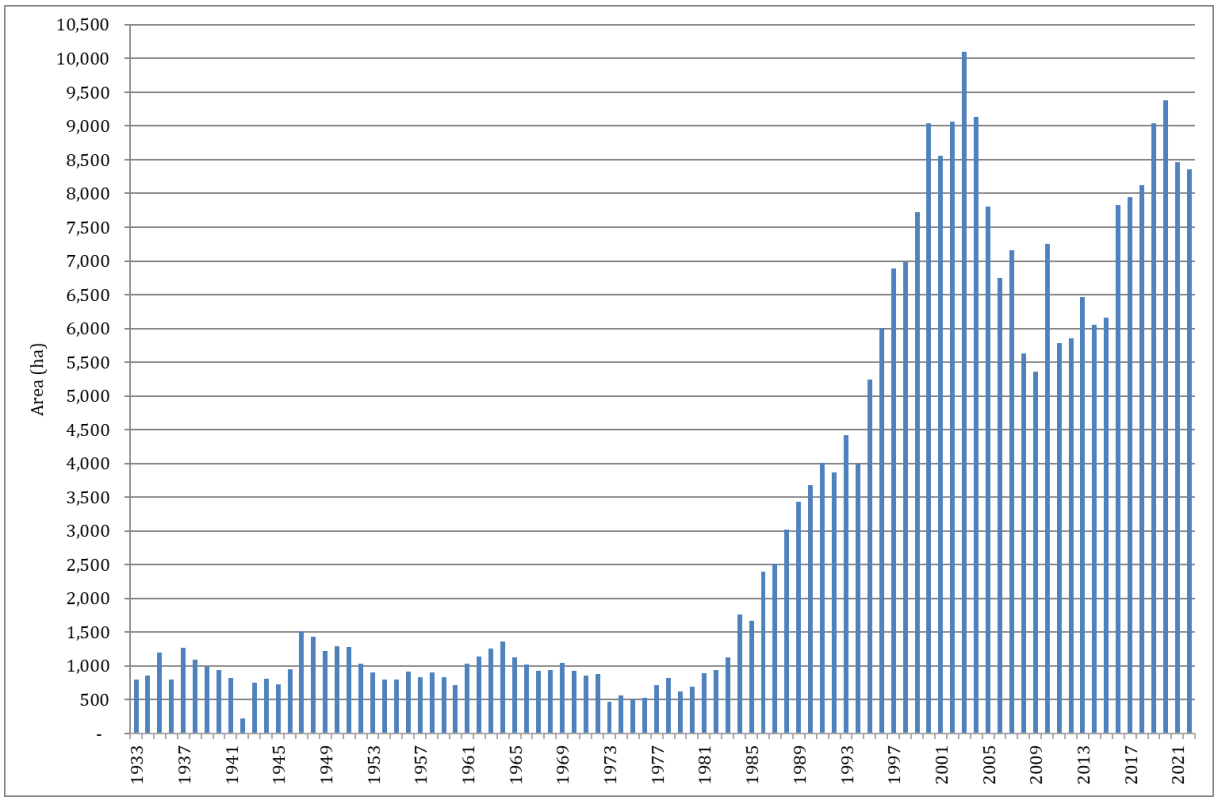

Figure 26: Public sector reforestation 1933-2022

5.5 Broadleaf Thinning and Tending

As part of the Woodland Improvement Scheme (WIS), grants are available for the tending and thinning of broadleaves. The objectives of the scheme are:

- Improvement felling of malformed or over-mature trees
- Felling of additional trees to release potential final crop trees
- Pruning to improve stem quality
- Thinning or re-spacing to promote growth
- Management and re-spacing of natural regeneration.

Grant aid for the treated area is available for either tending or thinning operations, depending on which are the most appropriate to the site (i.e. it is not necessary to carry out both sets of operations for grant aid). The tending and thinning element of the WIS was introduced in 2009. In total 7,298 ha have received payment to be tended or thinned between 2011 and 2022 (Figure 27). Ash has been the main species grant aided which is displayed in Figure 28 with Sycamore also receiving significant utilisation of the scheme. The year presented in both charts refers to the year when works were completed.

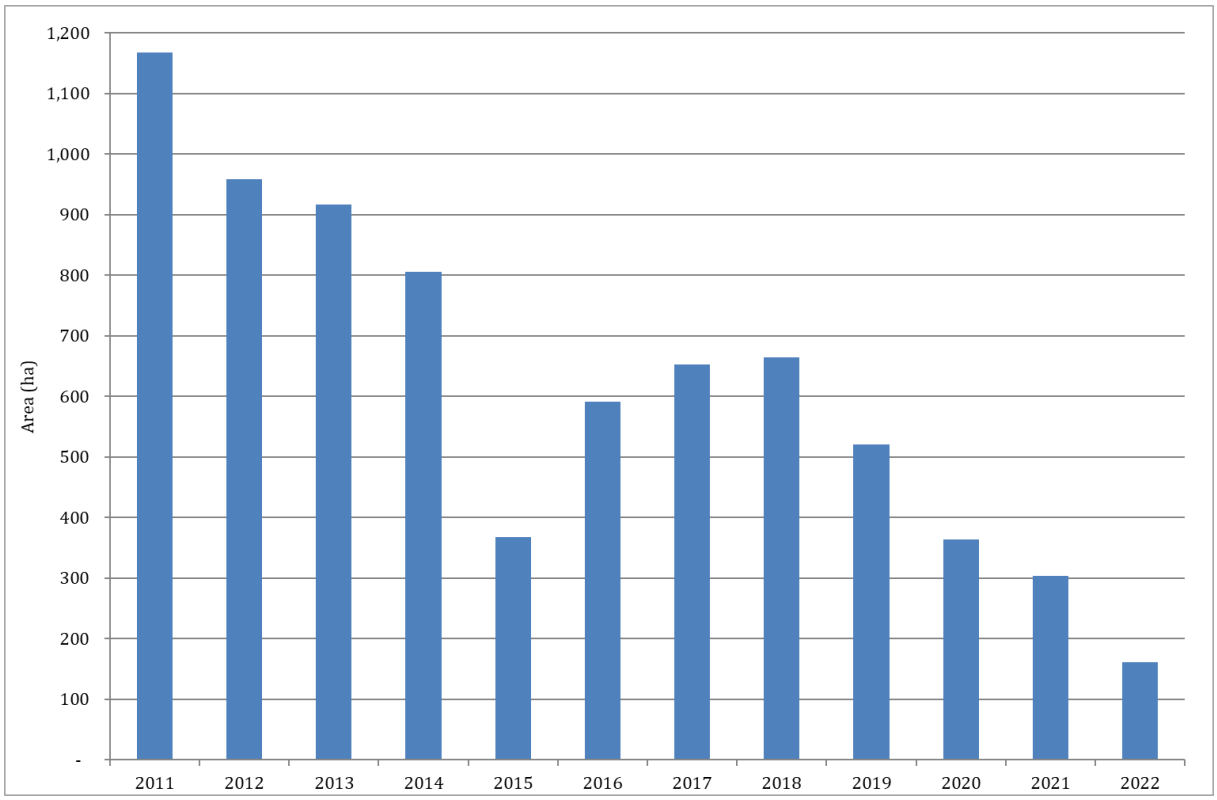

Figure 27: Total area tended and thinned under the Woodland Improvement Scheme 2011-2022

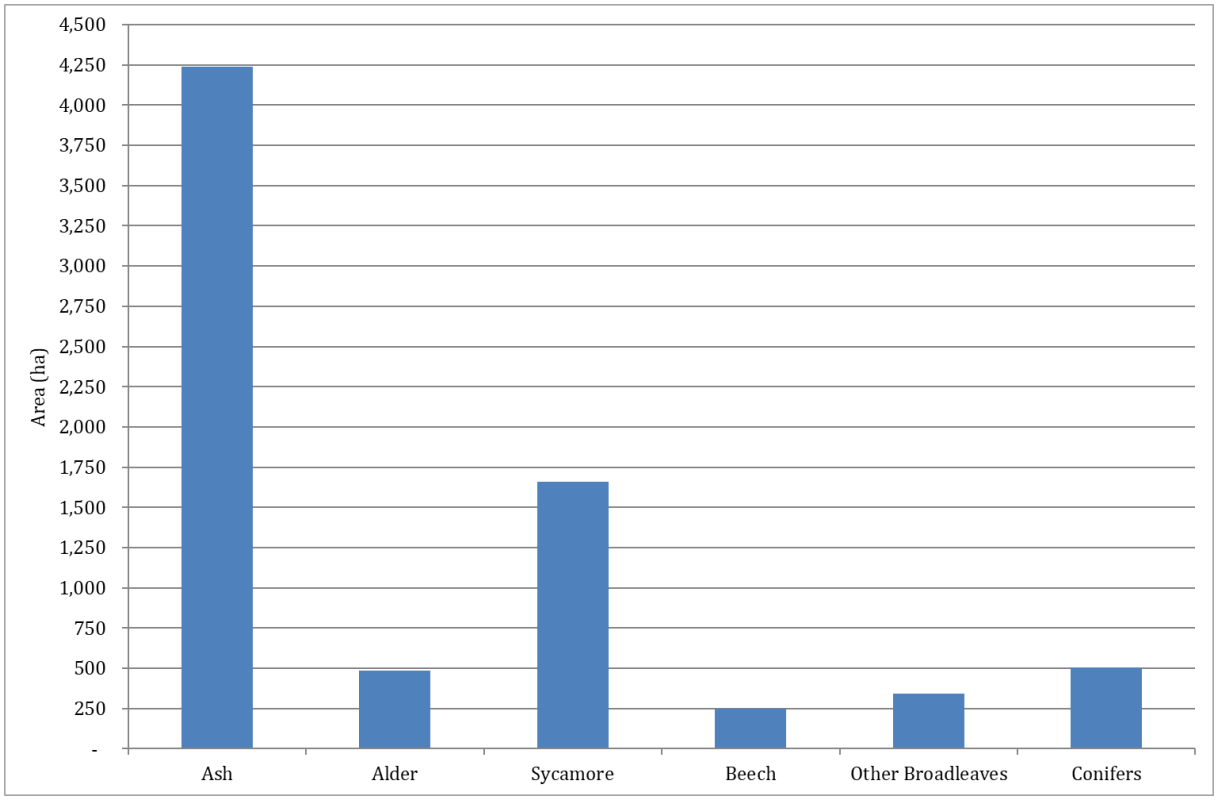

Figure 28: Species tended and thinned under the Woodland Improvement Scheme 2011-2022

5.6 Certification

Voluntary forest certification schemes are run by international non-governmental organisations to promote good forest practice. In Ireland, there are currently two certifying schemes: the Programme for the Endorsement of Forest Certification (PEFC) and the Forest Stewardship Council (FSC). Voluntary forest certification links the demand for forest products to environmental and social standards to producers who to show that wood or wood products come from certified forests. All major Irish sawmills are certified.

The management of the Coillte estate, which comprises 49% of the national forest estate, is certified by both the FSC and PEFC. Coillte first obtained certification in 2001 from FSC and became dual certified in 2014 when the company received PEFC certification.

As harvesting in the private sector increases, certification is likely to be an issue for private forest owners in the near future. Currently 31,057 ha of private forest is certified; of which 15,192 ha is certified by PEFC and 16,354 ha by FSC (Figure 29). There are 481 ha certified by both schemes.

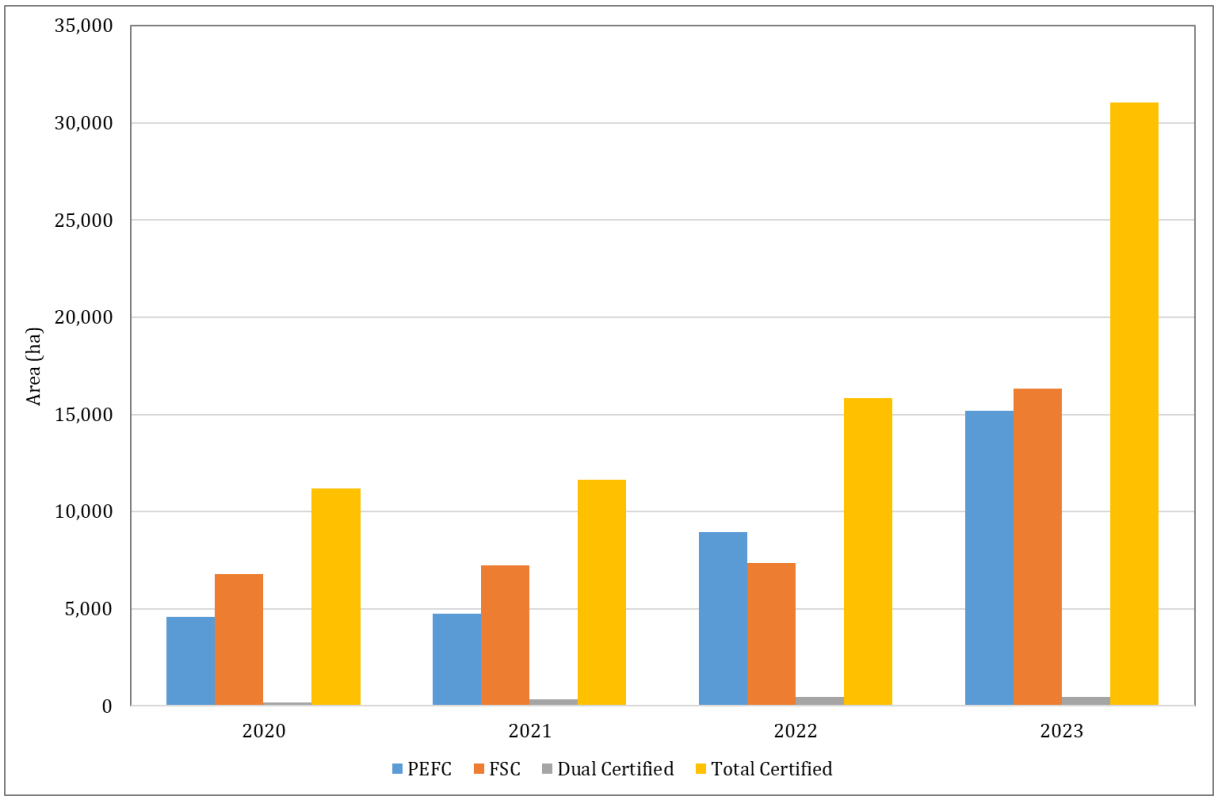

Figure 29: Private forest area certified from 2020-2023

6. Forest Production and Carbon

Key statistics

- The total roundwood harvest in 2022 (excluding firewood) was 4.14 million m^3;
- In 2022, 57% of the roundwood available for processing came from Coillte with the balance coming from the private sector;
- The share of private sector roundwood available for processing has increased from 8.2% in 2006 to 43% in 2022, reflecting the maturing private forest estate;
- The total forecast of net realisable volume production for the Republic of Ireland over the forecast period 2021-2040 is estimated as being 120.4 million m^3 overbark with an additional 13 million m^3 potentially available from Northern Ireland sources;
- Exports of wood and paper products were valued at €1 billion in 2021 compared with a value of €2 billion for imports of wood and paper products in 2021;
- In 2021 the volume of roundwood input purchases by industry was over three million cubic metres. This is an increase of 4.8% compared with 2020 and 0.4% in 2019;
- The national forest estate is an important carbon reservoir, amounting to 323 million tonnes of carbon in 2022;

6.1 Forest Wood Removals

6.1.1 Roundwood Harvest 1955-2022

The national roundwood harvest (excluding firewood & hardwood) from Irish forests between 1955 and 2021 is shown in Figure 30. No data are available for the private roundwood harvest prior to 2006, however it was estimated that 100,000 m^3 was harvested from the private forest estate in 2000[52].

Up until the early 1980's, roundwood harvest was low due to relatively low afforestation rates up to 1950. The early 1980's saw the opening of the Finsa and Medite board mills which increased demand for roundwood and sawmilling residues. In 2022, 4.14 million m^3 of roundwood was harvested in the Republic of Ireland, this is slightly lower than the previous year (2021) of 4.31 million m^3 which was the highest levels since records began. Data from 2015 to 2022 was obtained from the CSO[53].

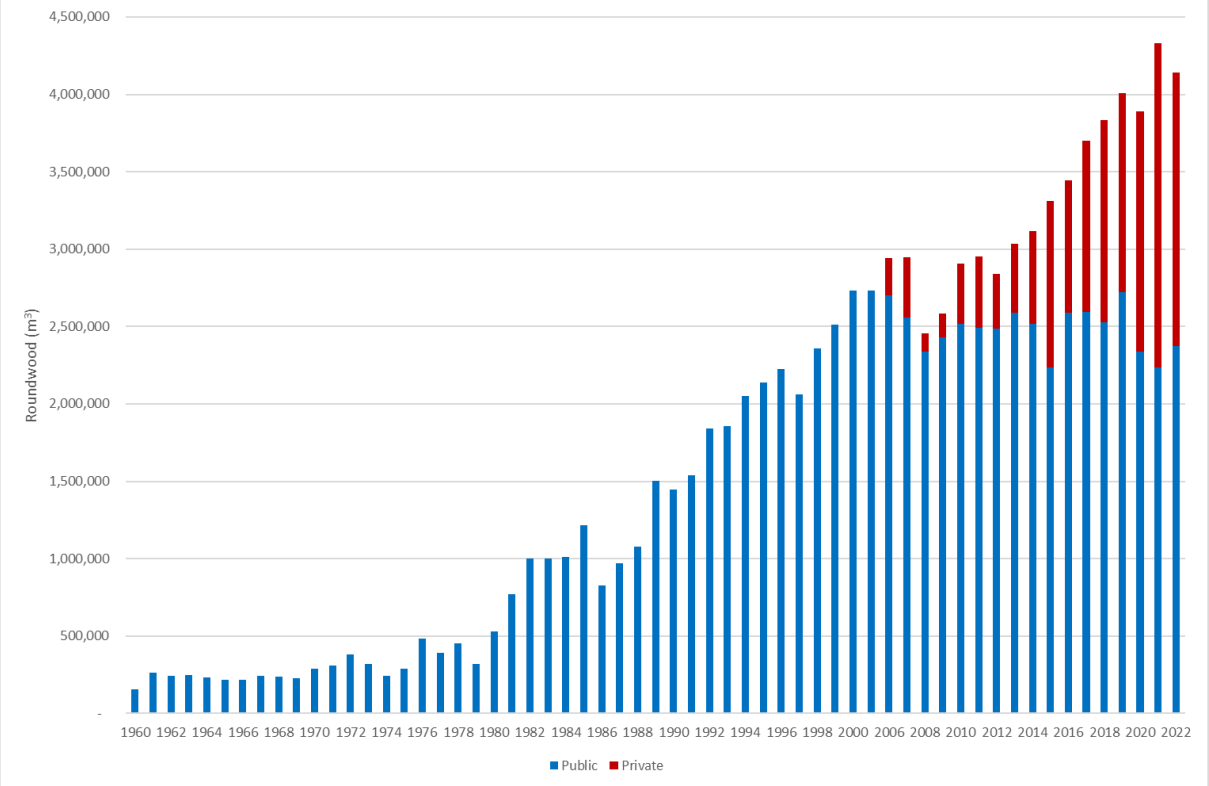

Figure 30: Roundwood harvest 1955-2022

6.1.2 Forest Wood Removals

The annual national roundwood available for wood processing, excluding firewood, is shown in Table 26. In 2022, 4.14 million m^3 of roundwood was removed from Ireland's forests for processing (excluding firewood) in the Republic of Ireland, a 25% increase compared to 2015 production. Much of this increase came from the private sector roundwood production with a 69% increase in 2022 production compared to 2015. Between 2015 and 2022, roundwood production from privately owned forests averaged 1,382,000 m^3. This is reflective of the maturing private forest estate.

[52] *Forecast of Roundwood Production from the Forests of Ireland 2001-2015*, (2001). COFORD, Dublin.
[53] Data prior to 2015 was sourced from Woodflow reports produced by Coford. From 2015-2022 data was available from: https://www.cso.ie/en/statistics/forestry/forestwoodremovals/

Table 26: Roundwood Total Removals by Product ('000 cubic metres) (2015-2022)

Product	Roundwood Total Removals			Roundwood Removals by Product					
	Public	Private	Total	Large sawlog	Small sawlog	Stake-wood	Pulp-wood	Fuel-wood	Roundwood for use as biomass
2015	2,235	1,077	**3,312**	1,016	1,000	119	1,015	103	58
2016	2,590	856	**3,445**	1,092	1,069	126	944	91	124
2017	2,592	1,106	**3,698**	1,210	1,163	136	1,018	100	70
2018	2,529	1,305	**3,834**	1,276	1,131	128	1,108	112	79
2019	2,720	1,288	**3,987**	1,242	1,121	145	1,195	112	172
2020	2,336	1,555	**3,891**	1,487	972	142	1,012	226	51
2021	2,235	2,098	**4,333**	1,749	1,120	129	1,094	209	33
2022	2,375	1,767	**4,141**	1,580	1,068	120	1,109	217	47

In recent years the private sector has begun to make a substantial contribution to the annual harvest. This reflects the greater area of private forests reaching first thinning stage, and the increased export market share gained by sawmills. More information from Table 26 and Table 27 is available from the CSO[54].

Non-coniferous removals which are mainly commercial hardwoods are still a minor element of the annual roundwood available for processing, the figure had decreased between 2018 and 2019, but has risen again since 2020 to 29,000 m^3 by 2022 (Table 27).

Table 27: Non-coniferous Removals by Product 2015-2022 (cubic metres)

Product	Large sawlog	Small sawlog	Stakewood	Pulpwood	Fuelwood	Roundwood for use as biomass	Total
2015	-	1,000	-	-	5,000	-	**6,000**
2016	-	1,000	-	-	8,000	-	**9,000**
2017	-	1,000	-	-	14,000	-	**16,000**
2018	-	3,000	-	-	13,000	-	**15,000**
2019	1,000	2,000	-	-	9,000	-	**12,000**
2020	3,000	4,000	-	4,000	11,000	1,000	**23,000**
2021	4,000	5,000	1,000	5,000	10,000	1,000	**26,000**
2022	2,000	6,000	2,000	4,000	15,000	-	**29,000**

6.2 Wood Input Purchases by Industry

In 2021 the volume of roundwood input purchases by industry was over three million cubic metres (Table 28). This is an increase of 4.8% compared with 2020 and 0.4% in 2019. Large sawlog accounted for the highest proportion of roundwood purchase volume at approximately 42% in 2021, followed by small sawlog (26%) and pulpwood (26%). More information is available from the CSO[55].

Table 28: Total Roundwood Purchases by Product 2021 ('000 cubic metres)

Product	Roundwood Purchases			Roundwood Removals by Product				
	Public	Private	Total	Large sawlog	Small sawlog	Stake-wood	Pulp-wood	Roundwood for use as biomass
2015	2063	715	2778	999	719	62	844	154
2016	2237	619	2856	1070	731	64	795	196
2017	2213	724	2937	1100	760	67	829	182
2018	2198	804	3002	1194	748	66	852	143
2019	2445	753	3198	1101	896	70	954	176
2020	2131	934	3065	1195	829	53	809	179
2021	2044	1168	3212	1343	827	67	819	155

[54] https://www.cso.ie/en/statistics/forestry/forestwoodremovals/
[55] https://www.cso.ie/en/statistics/forestry/woodinputpurchasesbyindustry/

6.3 Wood and Paper Exports and Imports

Exports of wood and paper products were valued at €1 billion in 2021 compared with a value of €2 billion for imports of wood and paper products in 2021 (Table 29). This is an increase of 13.2% for exports and 37.5% for imports compared with 2020. In recent years, export volumes of Coniferous industrial roundwood, Coniferous sawnwood, Veneer sheets and Wood-based panels, and Recovered paper have exceeded imports of these products. This is indicative of the maturing forest estate and the development of markets from the wood processing industry.

Table 29: Exports and Imports of Wood and Paper Products 2021

	Imports			Exports		
Category	**Tonnes**	**m³**	**€000**	**Tonnes**	**m³**	**€000**
Coniferous Industrial Roundwood	233,798	294,155	38,075	348,046	431,896	24,984
Non-Coniferous Industrial Roundwood	4,329	6,230	5,290	45	75	361
Wood Fuel	16,762	20,114	5,536	10,024	12,029	1,941
Other Biomass	136,770	109,746	31,797	85,333	77,732	12,118
Coniferous Sawnwood	221,203	387,888	133,318	419,870	661,943	229,606
Non-Coniferous Sawnwood	17,577	25,952	32,030	214	347	282
Veneer Sheets and Wood-based Panels	232,751	342,922	174,671	495,790	800,198	343,062
Pulp	34,638	-	32,595	540	-	535
Recovered Paper	2,457	-	2,775	407,983	-	82,748
Paper and Paperboard	341,934	-	318,051	21,942	-	30,129
Secondary Wood Products	241,039	-	607,776	90,688	-	113,872
Secondary Paper Products	279,822	-	647,067	51,650	-	193,475
Total	**1,763,078**	**1,187,006**	**2,028,980**	**1,932,126**	**1,984,220**	**1,033,113**

Figure 31 displays the exports of coniferous sawnwood which have increased from 212,000 m³ in 1995 to 661,943 m³ in 2021. Exports of coniferous industrial roundwood increased by 89% from 207,000 m³ in 1995 to 431,896 m³ in 2021. Imports of coniferous industrial roundwood totalled 294,155 m³ while coniferous sawnwood exports totalled 387,888 m³ for 2021 (Figure 32). More information is available from the CSO[56].

[56] https://www.cso.ie/en/releasesandpublications/ep/p-wpei/woodandpaperexportsandimports2021/

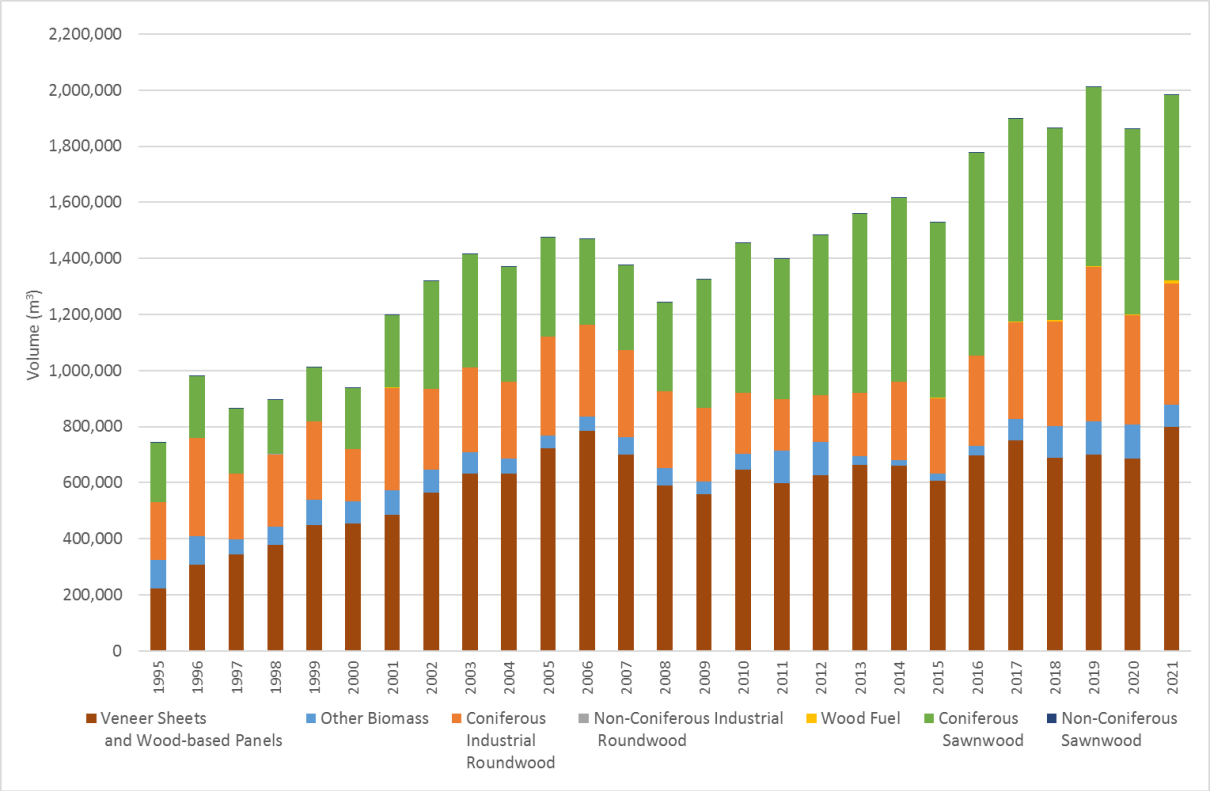

Figure 31: Volume of Exports of Wood and Paper Products 1995-2021

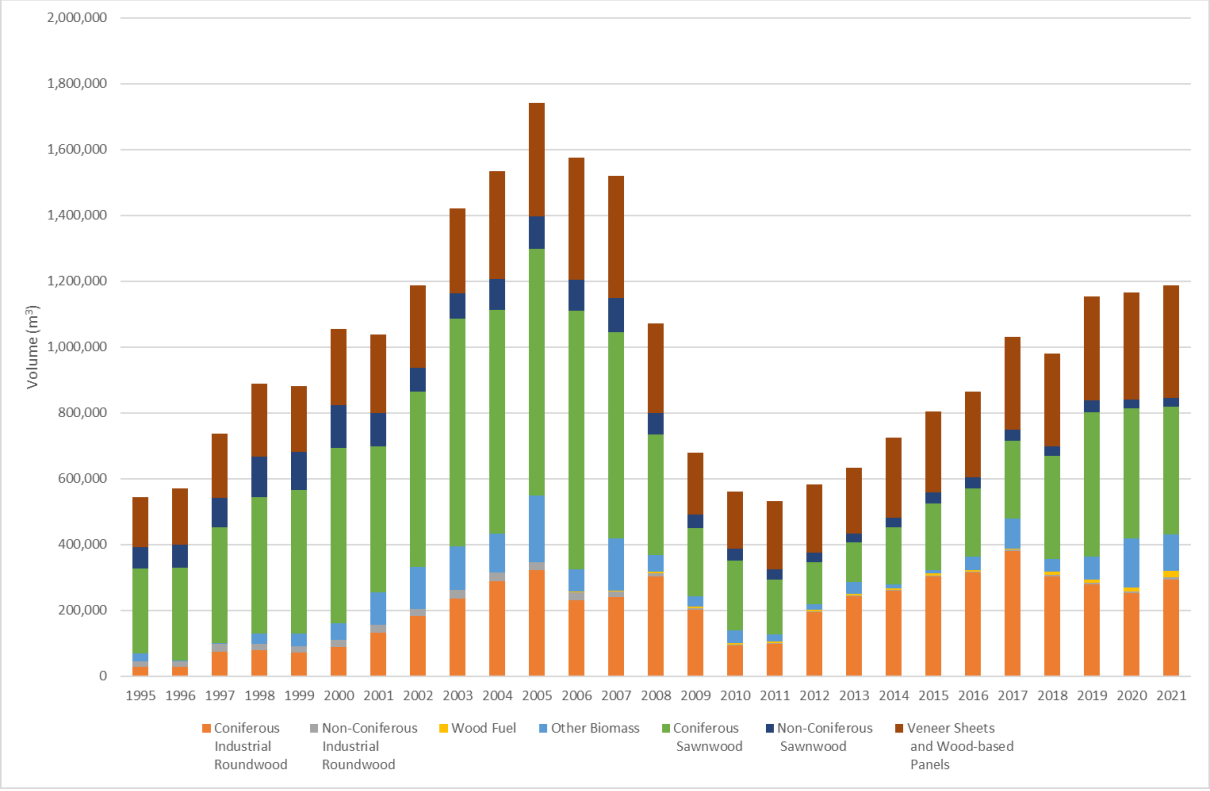

Figure 32: Volume of imports of Wood and Paper Products 1995-2021

6.4 Roundwood Forecast

6.4.1 Forecast of potential net realisable volume

The total forecast of net realisable volume production for the Republic of Ireland over the forecast period 2021-2040 is estimated as being 120.4 million m^3 overbark with an additional 13 million m^3 potentially available from Northern Ireland sources.

The annual forecast of net realisable volume will increase from 4.7 million m^3 in 2021 to 7.6 million m^3 by 2040 for the Island of Ireland. Table 30 displays the future sustainable harvest levels between 2021 and 2040 by ownership type and indicates that privately owned forests will steadily increase their share of the total harvest of roundwood in the Republic of Ireland from 35% in 2021 to 61% in 2040[24].

Table 30: Forecast of potential net realisable volume production by ownership type 2021-2040 (000 m^3 overbark)

Year	Republic of Ireland			Northern Ireland			All Ireland Total
	Private	Coillte	Total ROI	DAERA FS	Private	Total NI	
2021	1,467	2,757	4,224	489	24	513	4,737
2022	1,742	2,757	4,499	489	24	513	5,012
2023	2,385	2,757	5,142	489	24	513	5,655
2024	2,408	2,757	5,165	489	24	513	5,677
2025	2,472	2,757	5,229	489	24	513	5,742
2026	2,750	2,560	5,309	554	46	600	5,909
2027	2,922	2,560	5,482	554	46	600	6,082
2028	2,925	2,560	5,484	554	46	600	6,084
2029	3,156	2,560	5,716	554	46	600	6,316
2030	3,499	2,560	6,059	554	46	600	6,659
2031	3,738	2,717	6,456	751	40	791	7,247
2032	4,042	2,717	6,759	751	40	791	7,551
2033	3,950	2,717	6,668	751	40	791	7,459
2034	3,963	2,717	6,680	751	40	791	7,471
2035	4,428	2,717	7,145	751	40	791	7,937
2036	4,177	2,703	6,880	663	39	702	7,582
2037	4,177	2,703	6,880	663	39	702	7,582
2038	4,177	2,703	6,880	663	39	702	7,582
2039	4,177	2,703	6,880	663	39	702	7,582
2040	4,177	2,703	6,880	663	39	702	7,582
Totals	**66,733**	**53,684**	**120,417**	**12,285**	**745**	**13,030**	**133,447**

[24] *All Ireland Roundwood Production Forecast 2021-2040*, 2021. COFORD, Department of Agriculture, Food and the Marine, Dublin.

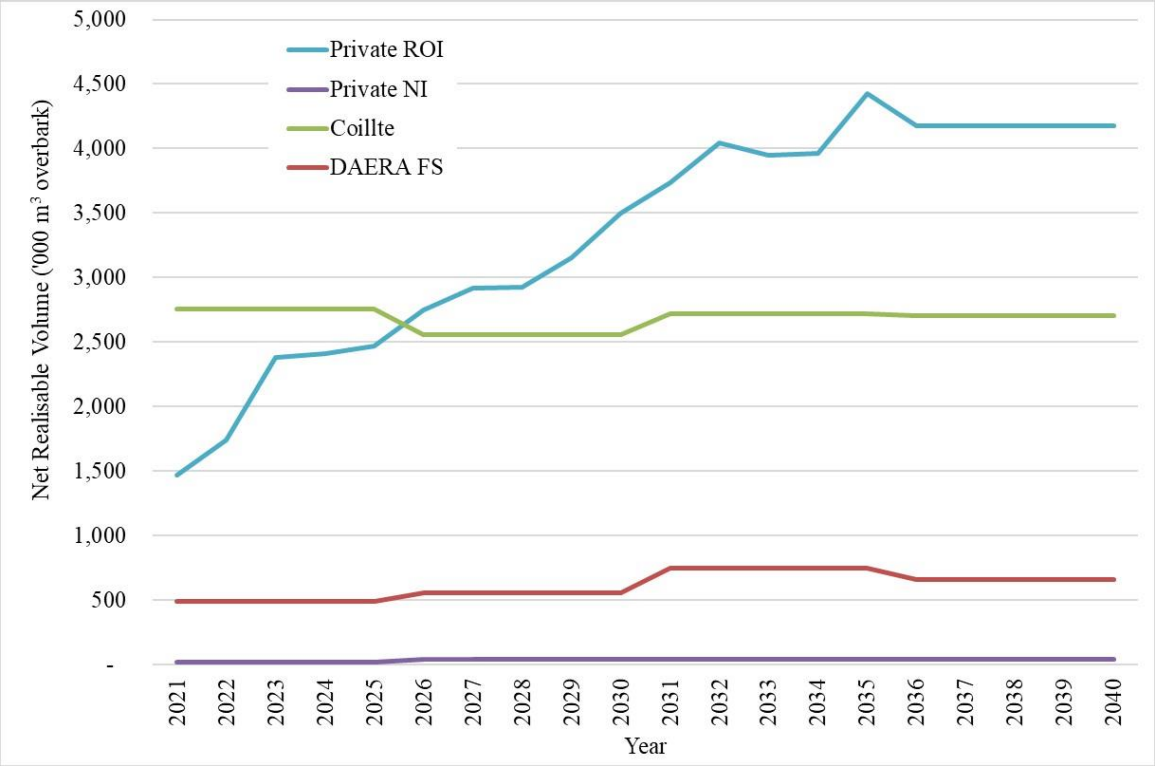

Figure 33: Forecast of total net realisable volume (2021 - 2040)

6.4.2 Harvest Area

In line with the decrease in thinning volume, there is a comparable drop in the area for thinning over the forecast period. The thinning area increases from an estimated 26,909 ha in 2021 to a peak of 35,605 ha in 2026. It is then forecast to decline to circa 25,000 ha for the period 2036-2040 (Table 31). The clearfell area increases steadily over the forecast period from 10,063 ha in 2021 to a peak of 18,368 ha in 2035. In Table 32 the relative accuracy of the roundwood forecast data from 2011, 2016 and 2021 is displayed by comparing forecast data with the annual roundwood removals from the intervening period.

Table 31: Conifer Harvest Area (ha) By Harvest Type (2021-2040)

Year	Private Sector ROI		Private Sector NI		Coillte		DAERA FS		Total	
	Thin	Clearfell	Thin	Clearfell	Thin	Clearfell	Thin	Clearfell	Thin	Clearfell
2021	9,079	3,245	60	54	16,448	5,863	1,322	901	26,909	10,063
2022	11,124	3,539	60	54	16,448	5,863	1,322	901	28,954	10,357
2023	12,577	4,914	60	54	16,448	5,863	1,322	901	30,407	11,732
2024	12,043	4,652	60	54	16,448	5,863	1,322	901	29,873	11,470
2025	13,100	5,105	60	54	16,448	5,863	1,322	901	30,930	11,923
2026	19,022	5,476	125	104	15,125	5,863	1,333	1,003	35,605	12,446
2027	16,030	6,081	125	104	15,125	5,863	1,333	1,003	32,614	13,051
2028	15,739	6,308	125	104	15,125	5,863	1,333	1,003	32,323	13,278
2029	15,955	7,006	125	104	15,125	5,863	1,333	1,003	32,538	13,976
2030	17,858	7,787	125	104	15,125	5,863	1,333	1,003	34,441	14,757
2031	17,438	8,995	125	90	14,634	5,863	1,189	1,429	33,386	16,377
2032	15,424	10,494	125	90	14,634	5,863	1,189	1,429	31,372	17,876
2033	15,261	9,620	125	90	14,634	5,863	1,189	1,429	31,209	17,002
2034	15,474	10,328	125	90	14,634	5,863	1,189	1,429	31,422	17,710
2035	14,957	10,986	125	90	14,634	5,863	1,189	1,429	30,905	18,368
2036	14,436	10,378	125	88	10,325	5,942	1,120	1,276	26,006	17,683
2037	12,843	10,000	125	88	10,325	5,942	1,120	1,276	24,413	17,306
2038	11,675	7,508	125	88	10,325	5,942	1,120	1,276	23,245	14,814
2039	12,663	6,958	125	88	10,325	5,942	1,120	1,276	24,233	14,264
2040	14,341	6,497	125	88	10,325	5,942	1,120	1,276	25,911	13,802
Total	**287,038**	**145,878**	**2,175**	**1,680**	**282,663**	**117,653**	**24,820**	**23,045**	**596,696**	**288,256**

Table 32: Comparison between the roundwood forecast and the annual roundwood removals

Year	Roundwood forecast 2011-2028			Roundwood forecast 2016-2035			Roundwood forecast 2021-2040			Roundwood Total Removals		
	Public	Private	**Total**	Public	Private	**Total**	Public	Private	**Total**	Public	Private	**Total**
2015	2,844	504	**3,349**	-	-	-	-	-	-	2,235	1,077	**3,312**
2016	2,735	565	**3,300**	2,505	915	**3,420**	-	-	-	2,590	856	**3,446**
2017	2,722	753	**3,475**	2,567	859	**3,426**	-	-	-	2,592	1,106	**3,698**
2018	2,766	630	**3,396**	2,612	868	**3,480**	-	-	-	2,529	1,305	**3,834**
2019	2,810	852	**3,662**	2,694	1,083	**3,777**	-	-	-	2,720	1,267	**3,987**
2020	2,842	1,240	**4,082**	2,673	1,246	**3,919**	-	-	-	2,336	1,555	**3,891**
2021	2,829	1,504	**4,333**	2,756	1,359	**4,115**	2,757	1,467	**4,224**	2,235	2,098	**4,333**
2022	2,864	1,416	**4,280**	2,757	1,671	**4,428**	2,757	1,742	**4,499**	2,375	1,767	**4,141**

6.4.3 Wood Fibre Availability for Wood Energy in the Republic of Ireland

Forests also provide a source of renewable raw materials and replace materials and energy produced from fossil fuels which help mitigate rises in greenhouse gases. Usage of wood fuels is increasing due to renewable energy policies and as young plantations enter the production stage.

Based on the qualifying assumptions above, the potential wood fibre available for energy and other uses totals 34.78 million m^3 over the period of the forecast (Table 33). The volume increases steadily from 0.89 million m^3 in 2021 to over 2.0 million m^3 between 2031 and 2035 and thereafter decreases to 1.82 million m^3 in 2040.

Table 33: Forecast of Wood Fibre and potential for wood energy in the Republic of Ireland (2021-2040)

Year	Roundwood 7 - 13cm	Downgrade + Wood Residues	Harvesting Residues	Total	Energy Content Millions (GJ)
	000 m^3				
2021	184	589	113	886	**6.1**
2022	258	708	93	1,059	**7.3**
2023	348	1,005	112	1,465	**10.1**
2024	325	1,002	86	1,413	**9.8**
2025	357	1,013	95	1,464	**10.1**
2026	394	982	145	1,522	**10.5**
2027	396	1,052	164	1,612	**11.1**
2028	363	1,037	153	1,553	**10.7**
2029	405	1,129	145	1,679	**11.6**
2030	467	1,280	146	1,893	**13.1**
2031	505	1,416	91	2,011	**13.9**
2032	591	1,538	98	2,226	**15.4**
2033	496	1,492	86	2,074	**14.3**
2034	593	1,432	96	2,121	**14.6**
2035	528	1,683	96	2,307	**15.9**
2036	394	1,550	55	1,999	**13.8**
2037	371	1,540	47	1,958	**13.5**
2038	327	1,512	32	1,871	**12.9**
2039	310	1,497	35	1,842	**12.7**
2040	301	1,472	45	1,819	**12.5**
Total	**7,914**	**24,928**	**1,933**	**34,775**	**239.9**

6.5 Roundwood Prices

6.5.1 Coillte Roundwood prices

Coillte is currently the dominant supplier of logs to the processing sector in Ireland. The standing timber price is the price paid per cubic metre of timber by the purchaser, where the purchaser is responsible for harvesting. The figures quoted in Table 34 below are for sales to the sawmill sector only and include all species and harvest types. As the mix of species and harvest types can vary from quarter to quarter, this can impact on contracted prices in addition to the impact of other market factors. The majority of prices quoted are for standing sales with retained pulpwood, i.e. there is no value for pulp included in these prices. Coillte retain the pulpwood to supply their boardmills, i.e. Smartply and Medite. There is no data available for 2021 or 2022.

Table 34: Coillte Average Standing Timber Prices (€/m³) by tree size category[26]

Mean Tree Size (m³)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
0.001 - 0.074	-	-	10.5	-	-	-	-	39.4	-	-	
0.075 - 0.124	-	-	-	-	-	41.2	-	-	-	-	
0.125 - 0.174	-	8.5	9.5	-	-	-	-	40.1	-	-	
0.175 - 0.224	38.6	32.8	-	-	-	-	-	56.6	-	44	
0.225 - 0.274	47.6	39.5	40.9	43.7	49.2	50.0	43.5	44.2	66.4	51.8	58.4
0.275 - 0.324	43.8	42.3	43.2	47.1	52.4	49.9	45.8	46.0	62.4	55.6	64.7
0.325 - 0.374	44.1	43.7	44.5	51.3	54.5	53.9	44.7	51.8	70.5	54.3	63.3
0.375 - 0.424	58.2	44.4	46.8	48.6	57.3	56.5	48.1	51.1	67.8	53.7	60.9
0.425 - 0.474	55.5	47.2	45.6	52.0	58.6	58.4	50.5	50.6	75.0	57.3	69.9
0.475 - 0.499	55.1	46.0	48.5	54.5	62.1	62.9	54.4	52.1	73.9	63.9	61.6
0.500-0.599	59.9	48.3	50.5	51.6	62.2	63.3	54.5	55.2	70.0	61.5	64.5
0.600-0.699	63.7	49.0	52.9	55.4	67.2	66.0	57.2	57.1	76.8	57.3	68.6
0.700-0.799	58.8	49.9	54.1	55.6	65.7	59.6	57.0	57.6	81.9	65.3	60
0.800-0.899	57.1	50.7	52.8	57.4	71.8	67.9	58.7	56.8	76.5	61.8	65.7
0.900-0.999	56.0	51.3	54.0	60.7	66.4	67.0	58.4	57.4	80.7	67.6	66.7
> 1.000	59.6	51.3	53.8	54.0	74.3	71.1	60.8	60.3	76.7	65.6	69.8
Average (€/m³)	**53.7**	**43.2**	**45.9**	**52.7**	**61.8**	**60.5**	**52.8**	**52.6**	**73.2**	**58.4**	**64.5**

[26] *Forestry & Timber Yearbook 2023*. Irish Timber Growers Association, Dublin.

6.5.2 Private Sector Roundwood Prices

The UCD Forestry Section and the Irish Timber Growers Association (ITGA) collate timber price information from private sources, publishing it in the *Forestry and Timber Yearbook* annually. The prices are averages derived from small sales data received from a range of growers and therefore prices presented in Table 35 below are for guidance purposes only. The prices presented in Table 35 include pulpwood prices from the private sector. There is no data available for 2021 or 2022.

Table 35: Annual private standing roundwood prices (€/m³) 2010-2020[27]

Category (m³)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
0.001 - 0.074	10.5	10.6	10.2	9.44	14.04	13.17	7.7	9.39	12.5	14.3	27.8
0.075 - 0.124	14.4	14.3	14.3	12.8	13.53	16.33	11.4	12.15	15.05	16.7	20.8
0.125 - 0.174	17.4	13.5	19.2	18.96	18.4	19.55	14.9	12.26	18.88	23.78	32.6
0.175 - 0.224	22.9	15.8	17.8	20.44	28.72	20.79	17.9	20.67	24.37	26.6	37.3
0.225 - 0.274	35.3	23.1	25.1	18.62	33.14	30.75	17.1	19.64	34.75	42.28	48.9
0.275 - 0.324	47.1	36.9	32.9	21.84	34.06	33.59	28	27.51	38.71	33.18	-
0.325 - 0.374	64.1	57.5	38.6	47.42	39.64	34.32	26.7	43.36	36.15	50	62.9
0.375 - 0.424	56.7	52.3	28.4	44.48	49.03	43.32	39.3	41.87	49.07	28.32	47.2
0.425 - 0.474	54.2	53.3	48.3	32	65.93	39.21	49.4	-	58.61	46.13	47.1
0.475 - 0.499	53	35	-	-	-	-	-	48	53.1	54.07	48
0.500 - 0.599	57.1	50.3	49.2	45.05	61.85	47.56	44	51.31	58.52	57.17	48.8
0.600 - 0.699	54.3	51.7	51.8	45.99	56.82	58.99	58.8	49.4	58.3	61.24	52.1
0.700 - 0.799	54.3	52.6	54.7	53.79	64.21	59.53	49.4	52.74	52.34	47.98	51.6
0.800 - 0.899	53.7	50.4	54.9	53.35	67.72	59.54	49.8	50.71	59.57	56.16	49.8
0.900 - 0.999	52.9	53.4	54.8	51.26	65.16	64.74	57.5	53.75	57.97	58.09	50.8
1.000 and over	56.9	45	54.2	52.97	60.38	61.5	60.9	54.04	58.61	60.59	49.9

An additional source of information on the range of prices paid for privately owned timber during 2023 is the IFA Timber Price Survey (Table 36 & Figure 34). The prices paid for timber varied significantly, for example the pulp prices quoted ranged from €32 to €40/tonne, depending on distance to market, access to the site and the size of the sale. The prices for sawlog varied from €88 to €105/tonne, which represents a decrease compared to the same time period January – March 2022. Figure 34 presents the IFA Timber Price Survey for the period 2016-2023 but since data is incomplete, a moving average trend line is used for the intervening periods.

Table 36: IFA Timber Price Survey January to March 2023 (Price € /tonne roadside excl. vat)[28]

Product Type	Length (m)	Diameter (cm)	Price (€)
Pulp	3 m	< 7cm	32-40
Stakewood	1.6 m	> 8cm < 15 cm	38-48
Palletwood	2.5 m	> 14 cm	42-50
	3.1 m		60-65
	3.4 m		65-70
	3.7 m		68-74
Sawlog	4.9m	> 20cm	85-95
	5.5 m		88-105

[27] *Forestry & Timber Yearbook 2023*. Irish Timber Growers Association, Dublin.
[28] Available from: https://www.ifa.ie/market-reports/timber-price-surveys/

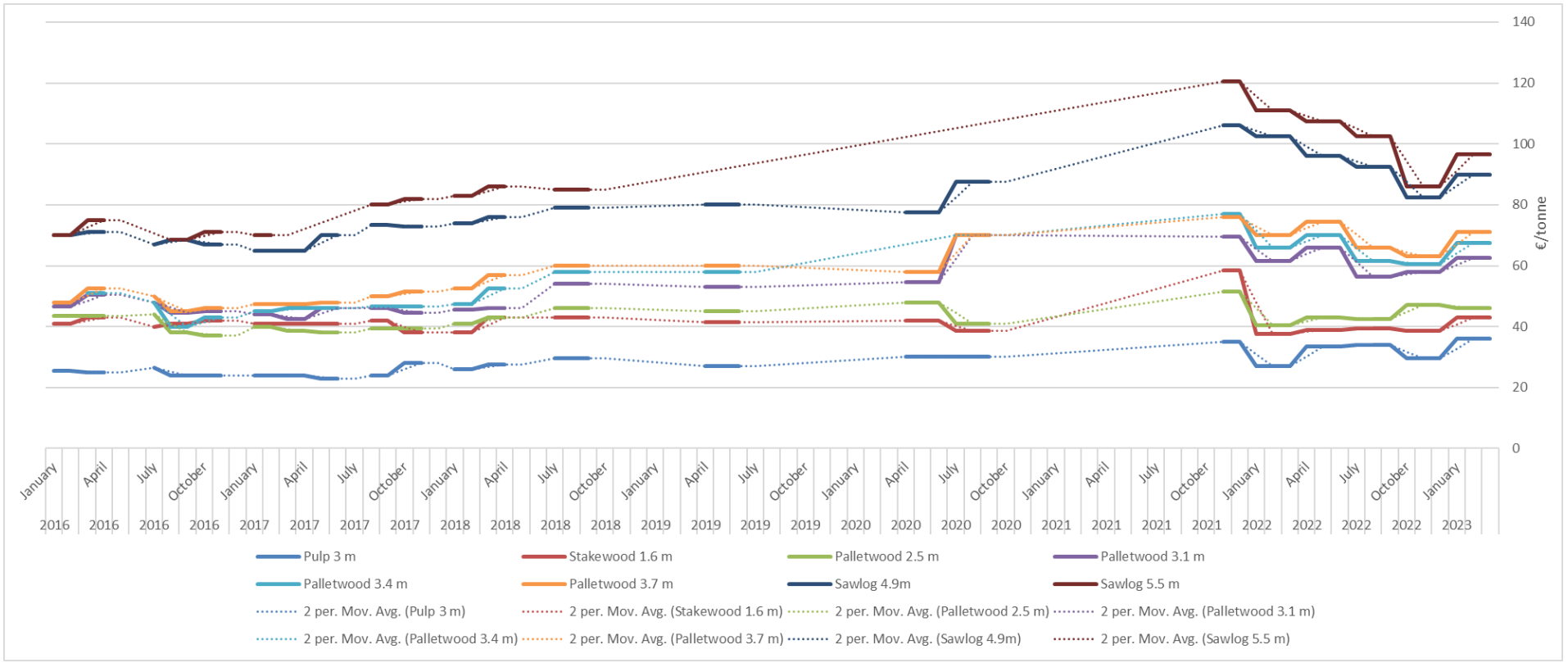

Figure 34: IFA Timber Price Survey (2016-2023)[57]

[57] Solid lines represent data published by IFA. Dashed lines added by DAFM to assist with interpretation of price changes overtime.

6.6 Wood Supply and Demand on the Island of Ireland to 2030

A COFORD report[58] was carried out in 2022 to investigate the potential wood supply and demand position on the Island of Ireland to 2030. The estimated demand for wood fibre on the island of Ireland (2025-2030) from the conventional forest products is presented in Table 37, while the supply less demand position for wood fibre (over the same period) is in Table 38. The figures presented assume that the demand for wood fibre for process use by the WBP sector will be met in full. The study also concludes that the supply less demand for wood fibre (for process use) ranges from -0.52 M m^3 in 2025 to - 0.60 M m^3 in 2030 (Table 38).

Table 37: Estimated demand for wood fibre from the conventional forest products sector on the island of Ireland (2025-2030)

Demand from the conventional forest products sector for wood fibre	2025			2030		
	RoI	NI	Total	RoI	NI	Total
	M m^3					
Sawmill	3.40	0.87	4.27	3.98	0.98	4.96
Wood-based panels	1.88		1.88	1.88		1.88
Total	5.28	0.87	6.15	5.86	0.98	6.84

Table 38: Estimated supply and demand position for wood fibre on the island of Ireland from the conventional forest products sector on the island of Ireland (2025-2030)

Sector	2025			2030		
	RoI	NI	Total	RoI	NI	Total
	M m^3					
Supply	3.37	0.38	3.75	3.90	0.45	4.35
Demand	3.40	0.87	4.27	3.98	0.98	4.96
Overall balance	-0.03	-0.49	-0.52	-0.08	-0.53	-0.61

6.7 Firewood production

Statistics on the sale of firewood from public forests between 1937 and 1987 are shown in Figure 35. Firewood consumption peaked during the Second World War due to restricted coal imports. There was also increasing firewood demand during the 1980's, reflected in increased sales during this period. Official estimates of firewood use are unavailable between the years 1988 and 2005.

[58] COFORD. 2022. Wood Supply and Demand on the Island of Ireland to 2030. COFORD, Kildare St. Dublin 2, D02 WK12

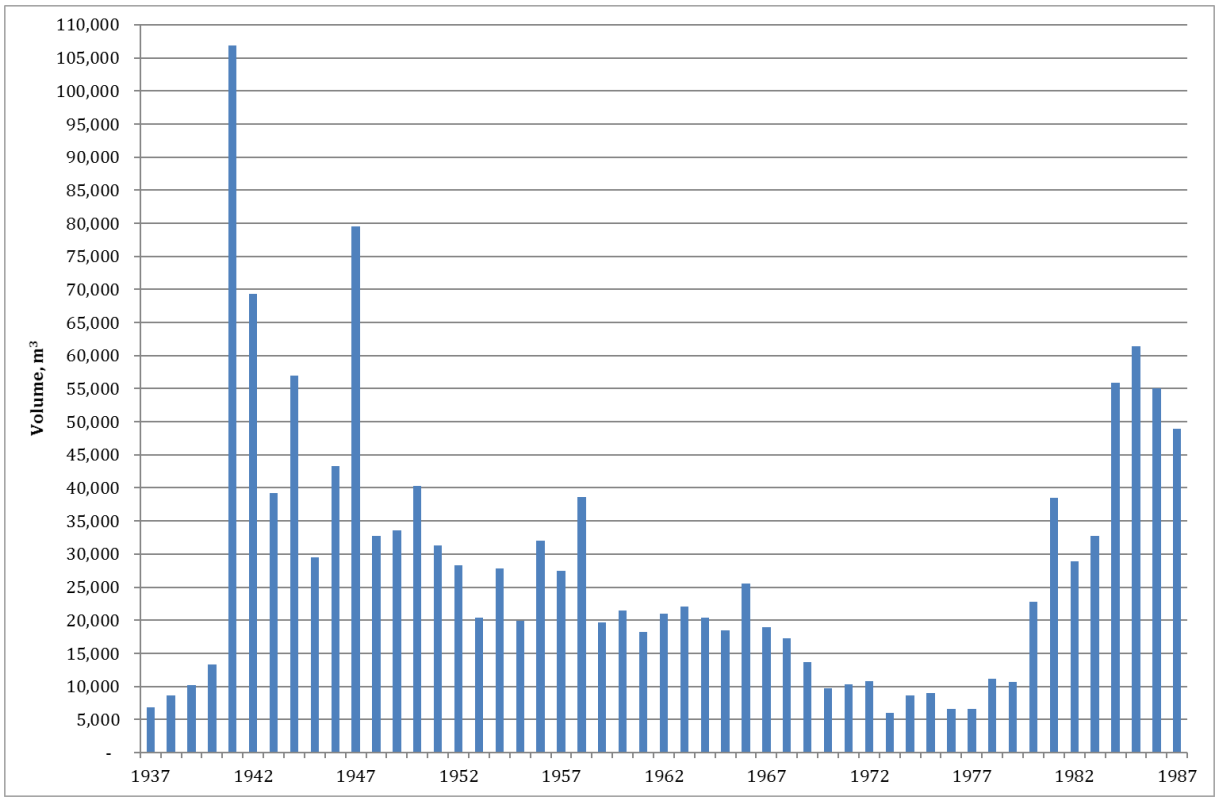

Figure 35: Firewood production volume from public forests 1937-1987

Residential energy use grew by 18.3% (0.4% per annum) over the period 1990–2015. Corrected for weather, the growth was 10%. During this time the number of households in the State increased by 74%, from approximately 1.0 million to 1.75 million. Since 1990, there has also been a decrease in the use of firewood in open fires, in line with the general decline of solid-fuel open fires, with a concurrent rise in the use of oil, gas and electricity for residential energy consumption. As a result, the share of firewood used for domestic heating has decreased since 1990[59].

Despite this, due to the significant increase in the number of households and energy usage per household there has been a concurrent increase in firewood sales since the 1980's. The firewood market in Ireland has grown by 65%, from 147,000 m^3 in 2006 to 242,000 m^3 in 2021. Figure 36 shows firewood use in Ireland between 2006 and 2021 from State and private forests, including wood sourced from non-forest areas. From 2006 to 2014, firewood information was used from Woodflow[60], from 2015 to 2021, CSO[61] information on total roundwood removals for fuelwood and wood Fuel imports were used.

[59] *Energy in Ireland 1990–2015, 2016 Report*, 2016. Sustainable Energy Authority of Ireland.
[60] Woodflow and forest-based biomass energy use on the island of Ireland, 2018. COFORD, Department of Agriculture, Food and the Marine.
[61] Data prior to 2015 was sourced from Woodflow reports produced by Coford. From 2015-2021 data was available from: https://www.cso.ie/en/statistics/forestry/forestwoodremovals/ and https://www.cso.ie/en/releasesandpublications/ep/p-wpei/woodandpaperexportsandimports2021/

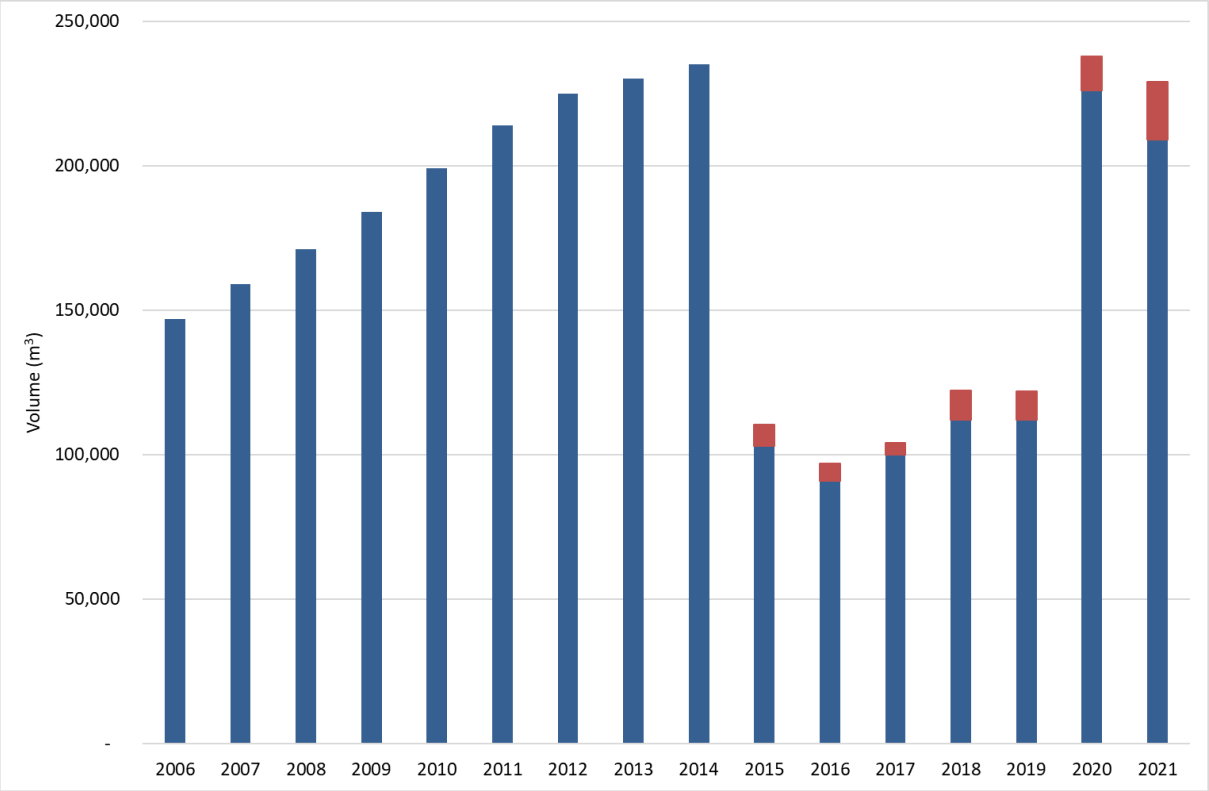

Figure 36: The domestic firewood market 2006-2021

The introduction of grant aid in 2009 for first thinning of broadleaf forests has resulted in substantial mobilisation of firewood from first thinnings, principally for domestic use. In addition, firewood is also harvested by forest owners for their own use and this is not accounted for in current figures. Initiatives such as *The Wood Fuel Quality Assurance (WFQA)* scheme for Ireland administered by the Irish Bioenergy Association (Irbea) increases consumer confidence in wood fuel products sold in Ireland. The WFQA independently certifies and verifies suppliers of firewood, wood pellets, woodchip and wood briquettes. All certification is carried out against EN ISO 17225 standards for biomass fuels. Since 1st January 2022, all wood burning stoves must comply with the Ecodesign European directive in a bid to tackle air pollution and particulate emissions. Firewood at 20% moisture content produces less than 33% of the emissions of wood fuel at 30% moisture content when burned in older stoves. However, if firewood is burned in modern Eco-Design stoves the emission levels are reduced by almost 90%. Firewood will continue to provide an important market for forest owners in the thinning of forests.

6.8 Carbon stocks

Forests and forest products play an important role in mitigating climate change by sequestering and storing atmospheric carbon dioxide (CO_2). Sequestration is the net removal of CO_2 from the atmosphere, and storage in plant biomass, deadwood and harvested wood product pools. CO_2 is taken up during photosynthesis and stored as biomass. Some carbon is released back into the atmosphere due to autotrophic respiration and from the forest deadwood, litter and soils pool due to decomposition. Sustainably managed forests are a net absorber of carbon. However, unmanaged and degrading forests eventually become a net emitter of carbon back into the atmosphere. Large emissions can also occur during catastrophic disturbance events, such as fires and windthrow. About half of carbon in harvested timber is stored in wood products (HWPs) but these carbon stores are eventually released back into the atmosphere. Use of wood for bioenergy

replaces fossil fuel use and has the potential to reduce overall emissions. Fossil fuel emissions can also be reduced by substituting energy intensive materials with wood products (i.e. product substitution).

6.8.1 National Carbon Stocks

The national forest estate is an important carbon reservoir, amounting to 323 million tonnes of carbon in 2022 as estimated using data from the 4th cycle NFI (Table 39). Carbon has increased in all pools except for litter from 2017 to 2022. Since 2012, changes have arisen in the NFI methodology and biomass estimation techniques. More accurate biomass equations, new classification systems and associated C stock values were introduced for soil and deadwood, therefore the 2017 and 2022 data are not comparable with the C stock estimates from 2006 and 2012.

The carbon stock in forest soils is the dominant component, accounting for 78% of the carbon in the forest estate in 2022. Total living tree biomass amounted to 20.1% of the total carbon stock, while deadwood, including logs, stumps and standing dead trees along with litter constituted the remaining 1.9%.

Table 39: Forest carbon stocks 2006, 2012, 2017 and 2022

	2006		2012		2017		2022	
Carbon stock	**Million t**	**%**	**Million t**	**%**	**Million t**	**%**	**Million t**	**%**
Above-ground biomass*	30.6	8.9	39.7	10.4	45.6	14.6	52.6	16.3
Below-ground biomass**	6.7	1.9	8.8	2.3	10.3	3.3	12.3	3.8
Deadwood***	1.2	0.4	2.5	0.6	2.1	0.7	2.5	0.9
Litter	2.3	0.7	6.3	1.6	7.1	2.3	3.6	1.1
Soil	304.9	88.1	323.7	85.1	246.6	79.1	252.1	78
Total	**348.4**	**100**	**381**	**100**	**311.7**	**100**	**323**	**100**

** Above-ground biomass includes all living stems, branches and needles/leaves based on a stump height at 1% of total tree height.*
*** Below-ground biomass includes all roots to a minimum diameter of 5 mm.*
**** Deadwood includes all logs, stumps and branches with a minimum diameter of 7 cm.*

6.8.2 Greenhouse emissions and removals from forests

Greenhouse gas emissions and removals are estimated using the CBM-CFS model based on data from the NFI, FAO-EUROSTAT data on harvested wood products (HWPs) and other data sources. The data presented in table 31 is taken from the National GHG inventory, which is submitted to the UNFCCC annually. Reporting also uses emission factors and activity data derived from national and international research, in accordance with IPCC good practice and UNFCCC rules, such as: carbon dioxide (CO_2) and non-CO_2 emissions from fires, drained organic soils and harvested wood products[62].

[62] Duffy, B. Hyde, E. Hanley, P. O'Brien and K. Black 2022. National inventory report Greenhouse gas emissions 1990 – 2021 Reported to the united nations Framework convention On climate change, EPA, Dublin.

Table 40: Changes in C fluxes for biomass, litter and deadwood and soil C pools and net CO_2 emissions from 1990-2021

Year	Carbon Stock Changes (Gg C) (removal is a positive value & an emission a negative value)							Overall Balance (Gg CO_2 eq.) (removal is a negative value & an emission a positive value)		
	Living biomass	Litter & Deadwood	Mineral soils	Organic soils	Fire	HWP	Total	CO_2	non-CO_2	Total
1990	1204.7	85.8	-9.7	-461.8	-21.4	112.6	910.3	-3337.9	197.7	-3140.3
1991	1234.1	92.6	-11.0	-478.3	-11.4	111.7	937.7	-3438.2	202.2	-3236.0
1992	1051.8	126.1	-12.1	-494.5	-4.6	152.9	819.5	-3004.8	206.3	-2798.5
1993	1198.1	29.5	-12.7	-507.7	-17.4	159.9	849.8	-3115.9	215.5	-2900.4
1994	1082.3	59.5	-12.8	-524.8	-21.6	176.1	758.8	-2782.3	222.8	-2559.5
1995	1000.7	87.4	-13.3	-551.2	-33.3	185.4	675.6	-2477.2	237.4	-2239.8
1996	974.3	106.3	-13.1	-571.2	-54.9	215.4	656.7	-2407.8	250.2	-2157.6
1997	1231.7	2.8	-12.6	-579.9	-16.4	216.5	842.1	-3087.9	241.9	-2845.9
1998	1057.3	62.7	-12.1	-590.0	-5.4	246.3	758.8	-2782.4	243.6	-2538.8
1999	1047.9	40.0	-11.9	-599.0	-3.1	241.9	715.9	-2625.1	247.4	-2377.7
2000	839.0	-11.1	-11.6	-610.9	-17.6	306.3	494.2	-1812.1	257.2	-1554.9
2001	905.3	59.9	-10.7	-624.5	-46.0	304.4	588.3	-2157.0	271.9	-1885.1
2002	826.5	83.1	-9.6	-635.8	-3.6	260.0	520.6	-1908.8	264.9	-1643.9
2003	968.0	20.0	-8.4	-645.2	-44.9	322.3	611.8	-2243.2	280.4	-1962.8
2004	1227.1	-55.7	-7.1	-654.1	-33.0	297.4	774.6	-2840.3	280.5	-2559.8
2005	1096.9	-8.1	-5.6	-663.3	-6.5	308.1	721.5	-2645.5	276.6	-2368.8
2006	1378.6	-51.8	-8.4	-664.5	-25.6	347.4	975.8	-3577.9	285.1	-3292.8
2007	1257.2	70.2	-6.0	-667.7	-32.2	326.8	948.4	-3477.4	289.7	-3187.6
2008	1564.8	18.5	-6.8	-670.5	-25.4	187.7	1068.4	-3917.3	290.3	-3627.0
2009	1495.5	100.3	-2.9	-675.0	-7.1	193.2	1103.9	-4047.8	287.6	-3760.3
2010	1374.1	245.7	-2.0	-683.4	-83.8	223.3	1073.9	-3937.7	314.6	-3623.2
2011	1437.7	240.4	-1.4	-688.3	-86.9	202.3	1103.7	-4046.9	318.0	-3729.0
2012	1528.5	206.7	-1.0	-694.0	-2.6	182.3	1220.0	-4473.3	294.2	-4179.1
2013	1586.2	240.2	-2.3	-694.0	-22.5	180.6	1288.3	-4723.7	300.5	-4423.1
2014	1408.7	330.9	1.3	-698.3	-18.8	208.1	1231.9	-4516.8	300.8	-4216.0
2015	1594.7	318.1	-0.8	-705.9	-10.5	198.7	1394.3	-5112.4	301.2	-4811.2
2016	1638.2	295.8	-5.0	-713.1	-2.1	219.2	1433.0	-5254.4	300.6	-4953.8
2017	1091.3	537.9	-2.0	-721.5	-112.9	237.0	1029.8	-3775.8	339.6	-3436.2
2018	1097.7	419.0	-3.1	-727.5	-29.0	225.2	982.3	-3601.7	315.6	-3286.1
2019	917.9	452.6	-3.7	-732.6	-3.4	236.3	867.0	-3179.1	309.6	-2869.5
2020	1049.8	262.2	-5.4	-732.6	-17.7	220.6	777.0	-2849.1	314.5	-2534.7
2021	580.1	483.8	-4.7	-732.5	-6.0	262.6	583.2	-2138.5	310.6	-1828.0

These estimates include HWP removals and emissions from fires and organic soils. Emissions associated with deforestation are not included. The trends in forest GHG removals are related to the level of annual harvest, extent of afforestation and changes in the age class structure of the national forests over time[63]. Negative CO_2 values represent a net removal of CO_2, but negative C values represent a net emission of C.

[63] Black, K., Hendrick, E., Gallagher., G., Farrington, P. 2012. Establishment of Irelands projected reference level for Forest Management for the period 2013-2020 under Article 3.4 of the Kyoto Protocol. *Irish Forestry* 69: 7-32.

Differences between the Ireland's greenhouse gas inventory submission for 2022 and 2023 are due to numerous factors:

- Use of new IPCC (AR5) global warming potentials for methane and nitrous oxide;
  The new UNFCCC submissions now require the use of new global warming potentials. Comparison of the previous submission value for 2020 with this submission shows the impact is small and additional 5 to 12 Gg over the period 1990 to 2021.

- Recalculation of emissions and removals associated with afforestation using a 30-year transition period;
  As required for the EU LULUCF regulation, afforested lands are reported using a 30-year transition instead of post 1990 afforestation. This has a minimal impact on the total GHG profile due to reallocation of harvest to thinning rather than clearfelling.

- Inclusion of HWP emissions and removals for deforestation;
  The new addition of CSO collected data had a large impact on the GHG profile due to different levels of harvest resulting in an increase in emissions or removals varying from 374 to -1,285 $GgCO_2$ eq for the period 2015-2021. This accounted for 84-95% of the differences in reported emissions/removals for the period 2015-2021.

- Adjustment of annual harvest for the period 2015-2022 based on new CSO harvest statistics.
  The new EU LULUCF regulation will allow accounting of HWP from deforestation, which explains most of the differences in the period 1990-2015. The emissions and removals for deforested HWP varies from 16 to -413 GgCO2 per year over the period 1990-2022.

For these reasons, the data presented in Table 40 differs significantly to the information supplied in last year's report.

7. The-Economic Contribution of the Forest Sector

Key statistics

- In 2021, Output (the value of all goods and services produced) at basic prices for the Forestry and logging sector was €198 million. The Intermediate Consumption required to produce this Output totalled €149 million.
- Output (€198 million) minus Intermediate Consumption (€149 million) resulted in Gross Value Added at basic prices of €50 million for the forestry and logging sector;
- For the Wood and wood products (except furniture) sector the output for goods and services was €1.15 billion, while the intermediate consumption totalled €796 million for 2020. This resulted in a GVA of €358 million for the sector.
- The number of people employed directly in the forestry and logging sector averaged 2,800 between 1998 and 2017;
- In 2020 total employment generated by activities in the forest and wood products sector was estimated to be 9,500 full time equivalents;
- Visits to Irish forests are estimated to be over 29 million visits per annum;
- In 2021, 24% of occupied private households visit Woodlands or forests for recreational purposes most weeks with a further 29% visiting most months;
- In 2022, total expenditure was €74 million which includes afforestation grants, annual premium payments and grant aid for forest roads.

7.1 Value of the forest and wood products sectors

The output and value-added in the forest and wood products sectors, in terms of output, value added and intermediate consumption, is shown in Figure 37 and Figure 38. Gross Value Added (GVA), a measure of economic activity, for the years 1995 to 2021 as estimated using the Output method (also known as the Production approach). The Output method is one of three ways in which GVA and Gross Domestic Product (GDP) can be calculated.

In 2021, Output (the value of all goods and services produced) at basic prices for the Forestry and logging sector was €198 million. The Intermediate Consumption required to produce this Output totalled €149 million. Output (€198 million) minus Intermediate Consumption (€149 million) resulted in Gross Value Added at basic prices of €50 million. For the Wood and wood products (except furniture) sector the output for goods and services was €1.15 billion, while the intermediate consumption totalled €796 million for 2021. This resulted in a GVA of €358 million for the sector. Further data is available from the CSO[64].

The total value of economic activity in the Forestry and Wood product sectors has increased by 31% and 27% respectively since 2020, which is displaying a steady increase year-on-year since a dip in 2012 for both output and for intermediate consumption in both sectors.

[64] https://www.cso.ie/en/statistics/nationalaccounts/nationalaccountsoutputandvalueaddedbyactivity/

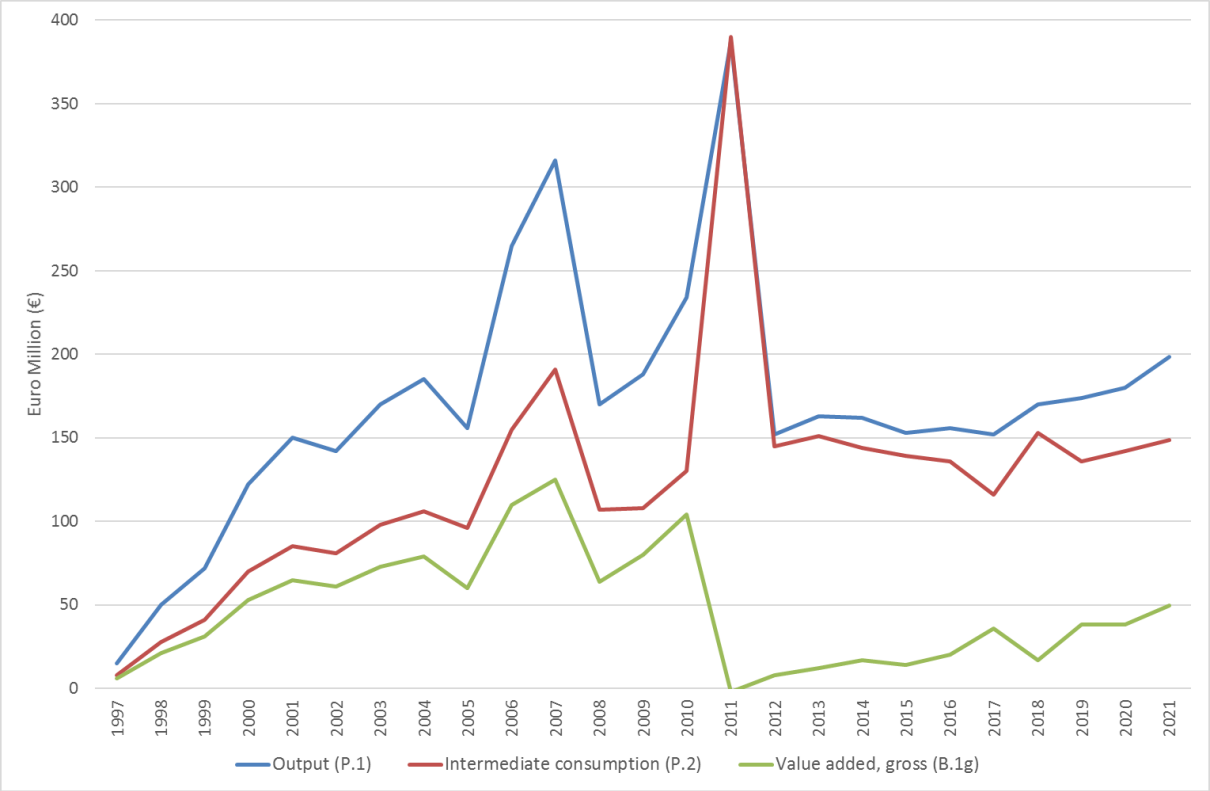

Figure 37: The Output, Intermediate consumption and GVA for the Forestry and logging Sector

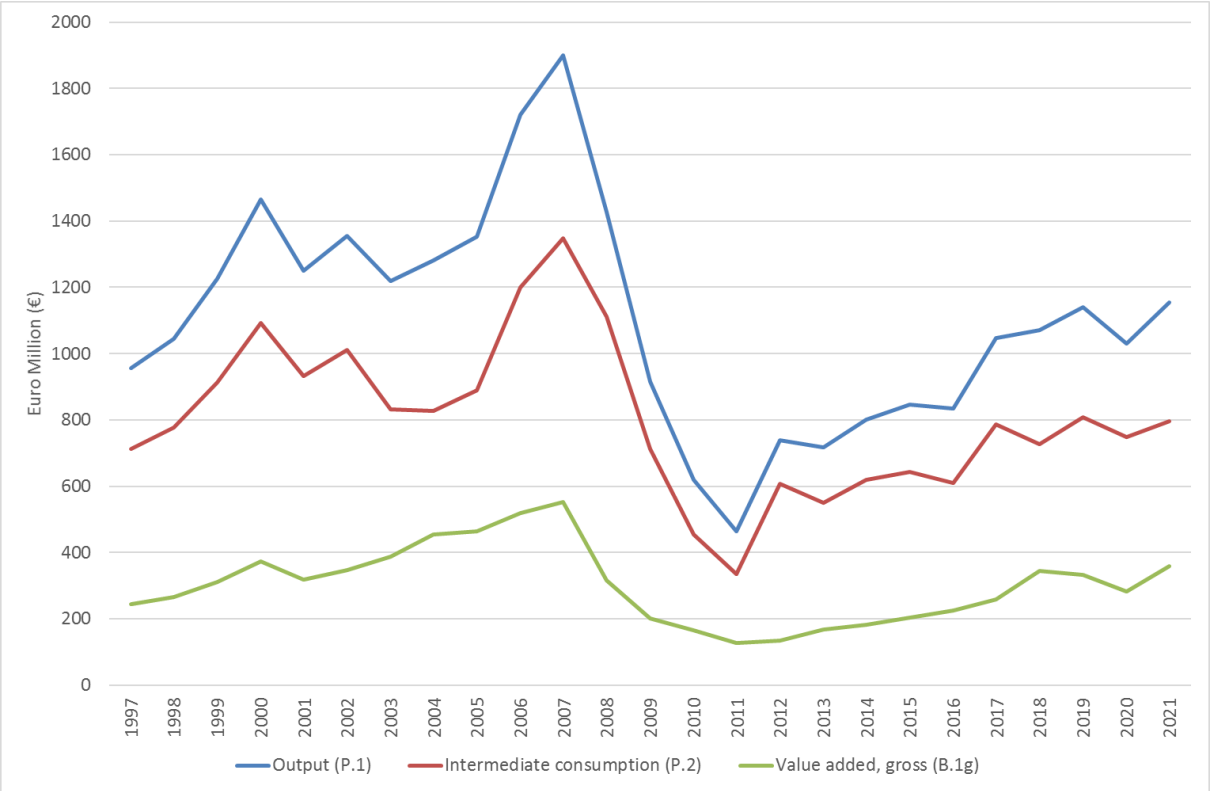

Figure 38: The Output, Intermediate consumption and GVA for the Wood and wood products (except furniture) sector

7.2 Employment in the forest sector

In 2010 direct and induced employment supported by the forest sector was estimated to be 5,531, while in the wood processing sector direct and induced employment was estimated to be 6,408[65].

In 2012 COFORD estimated that the total employment generated by activities in the forest and wood products sector was 12,000 full time equivalents[66].

In 2020, the COFORD Socio-Economic Contribution of Irish Forests working group produced estimates for employment in forestry & logging sector. A report "*The estimated employment and economic activity associated with the forestry sector*" published in 2022[67] took a bottom-up approach to survey employers in the forestry sector in order to generate coefficients that would link employment to activity as well as estimate employment for the sector. The estimate of direct employment generated in the report is shown in Table 41.

Figures shown for 2020 are derived from a number of sources (as shown in Table 41) using different methodologies to those used in 2010 and this should be taken into account when making comparisons.

Table 41: Estimated employment in the forestry and wood processing sectors

Measure	Sector	2010		2020	
		Direct	Total (Direct +indirect +induced)	Direct	Total (Direct +indirect +induced)
Employment (FTEs)	Forestry & logging	3,125	5,531	1,978	3,501
	Manufacture of wood & wood products	3,907	6,408	3,611	5,922

7.2.1 Categorisation of employment statistics

There is an EU wide nomenclature for the classification of economic activity, which is referred to as NACE[68]. The class *Forestry and Logging* is most relevant for the purpose of this publication and includes the following four components:

- Silviculture and other forestry activities;
- Logging;
- Gathering of wild growing non-wood products;
- Support services to forestry.

It is important to note that the *Forestry and Logging* class is concerned only with what occurs within the forest. Activities outside of the forest, such as the transport of logs to sawmills are not included.

There is one other class which is relevant for this publication: *Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials*. This class can be broken into the following sub-categories:

- Sawmilling and planing of wood;
- Manufacture of products of wood, cork, straw and plaiting materials:
    - Manufacture of veneer sheets and wood-based panels;
    - Manufacture of assembled parquet floors;
    - Manufacture of other builders' carpentry and joinery;
    - Manufacture of wooden containers;
    - Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials.

[65] *An Economic Evaluation of the Market and Non-Market Functions of Forestry*, 2013. COFORD, Department of Agriculture, Food and the Marine.
[66] *Irish Forestry and the Economy*, 2014. COFORD. Department of Agriculture, Food and the Marine.
[67] COFORD, 2022. *The estimated employment and economic activity associated with the forestry sector*. Department of Agriculture, Food and the Marine.
[68] Description of NACE codes available at http://www.cso.ie/px/u/NACECoder/NACEItems/searchnace.asp

7.2.2 Labour Force Survey

The Labour Force Survey (formerly the Quarterly National Household Survey) is a large-scale, nationwide survey of households in Ireland, which began in September 1997. It is designed to produce quarterly labour force estimates that include the official measure of employment and unemployment in the State. Between 2015 and 2022, each quarter field interviewers visit just over 30,000 households. In Figure 39 below, average annual estimates are displayed.

The number of people employed directly in the forestry and logging sector has averaged 2,800 between 1998 and 2017 while the average number employed directly in sawmilling and planing of wood has averaged 7,200 for the same period. A downward trend in employment in the wood processing sector has been a feature since 1998, particularly since the economic recession in 2008 (Figure 39). Estimates were not produced for 2015 or 2018-2021 as the sample size was too small to be considered reliable. Estimates for 2014, 2016 and 2017 are considered to have a wide margin of error and should be treated with caution.

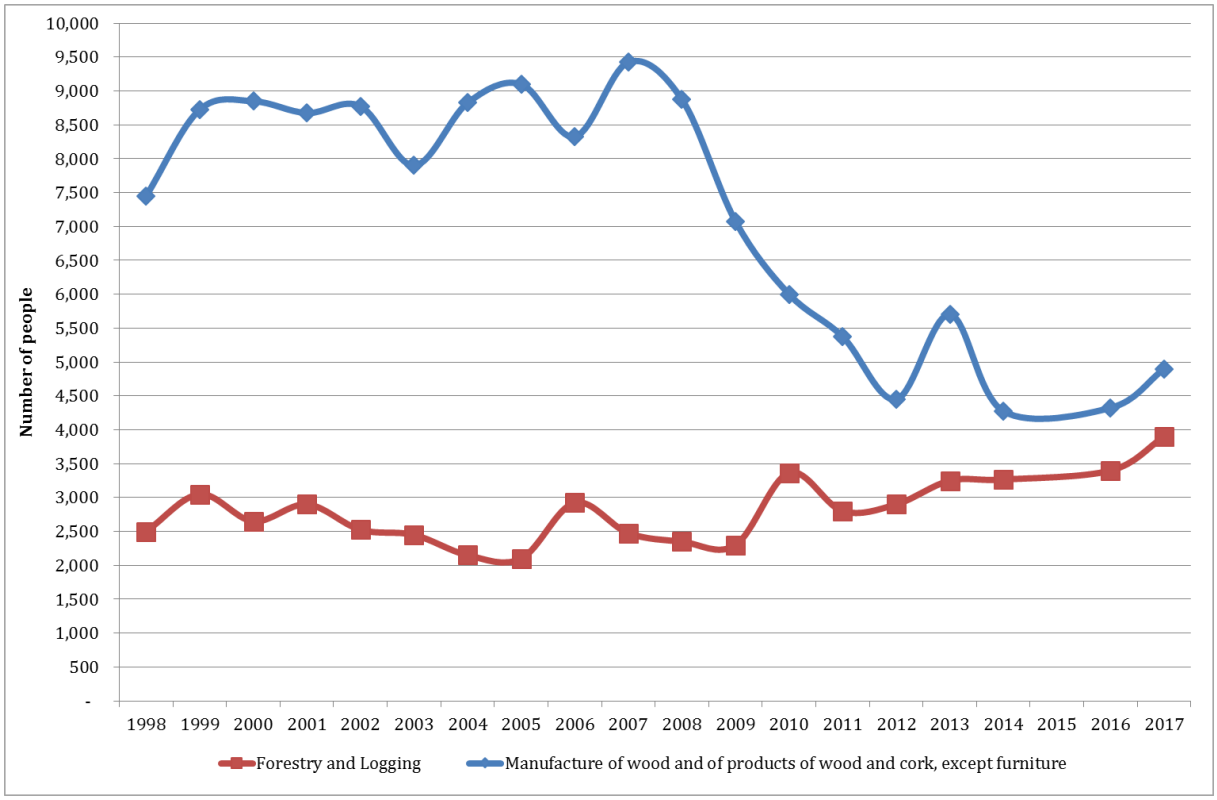

Figure 39: Labour Force Survey estimates (1998-2017)

7.2.3 Census of Ireland 2006, 2011 and 2016

Table 42 outlines persons aged 15 and over, classified by principal economic status and detailed industrial group involved in forestry, logging and related activities[69]. The unemployment rate in the sector has fallen to 5.5% in 2016 in both Forestry and Logging and Manufacture of wood and wood products. The total in the labour force for wood and wood products has also decreased significantly from 5,530 in 2011 to 4,000 in 2016 (Table 42).

The statistical classification of economic activities in the European Community, abbreviated as NACE, is used to categorise the census data. The NACE Rev.1 classification was used in 2006,

[69] Available from: https://www.cso.ie/en/csolatestnews/presspages/2017/census2016profile11employmentoccupationsandindustry.

whereas the NACE Rev.2 classification data is used for the 2011 and 2016 census. The 2022 census is due in late 2023.

Table 42: Persons 15 years and over involved in forestry by principal economic status

NACE 02 - Forestry and Logging						
Census Year	Total in labour force	At Work			Unemployed (incl. looking for first regular job	Unemployment rate (%)
		Male	Female	Total		
2006	2,548	2,142	282	2,424	124	4.9
2011	2,169	1,676	237	1,913	256	9.5
2016	2,468	1,978	290	2,268	200	5.5
NACE 16 - Manufacture of wood and of products of wood and cork, except furniture						
Census Year	Total in labour force	At Work			Unemployed (incl. looking for first regular job	Unemployment rate (%)
		Male	Female	Total		
2006	6,188	5,168	752	5,920	268	4.3
2011	5,530	3,767	647	4,414	1116	20.6
2016	4,000	3,182	429	3,611	389	5.5

7.3 Forests & Recreation

There has been a long-standing policy in place of encouraging the use of forests for outdoor recreation. Table 43 shows an upward trend in visitor number to Irish publicly owned forests between 1999 and 2015.

Table 43: Estimate of number of visits to Irish forests 1999 - 2015

Year	Number of forest visits
1999[70]	8,500,000
2004[71]	11,000,000
2005[72]	18,000,000
2015[73]	29,105,759

Since the early 1970's there has been an active programme of providing recreational facilities in State forests. At the present time there are 260 recreational forests nationwide, 12 forest parks, over 3,000 km of hiking trails in forests and six mountain bike centres throughout the country[74]. In addition to providing recreational sites such as picnic areas and trails, Coillte has an open forest policy that allows free public access to its 440,000 ha estate. The National Parks and Wildlife Service (NPWS) provide access to national parks and nature reserves, and arboreta managed by the Office of Public Works are open to the public. Also urban forests (public forests established and managed for recreation) owned by County Councils or local communities are quite intensively used being close to population centres. The most recent figures estimate 29,105,759 visits to Irish forests per annum, and values forest recreation at €179 million per annum.

For the private forest estate the decision to allow public access rests with the forest owner, and is provided on a goodwill basis[75]. Private forest owners who have availed of a roading grant in

[70] Clinch, P. (1999), *The Economics of Irish Forestry*, COFORD, Department of Agriculture, Food and the Marine.

[71] Bacon, P. and Associates (2004). *A Review and Appraisal of Ireland's Forestry Development Strategy*, Final Report. Stationery Office, Dublin

[72] Fitzpatrick and Associates (2005). *Economic Value of Trails and Forest Recreation in the Republic of Ireland*. Coillte and the National Trails Strategy Working Group of the Irish Sports Council. Final Report, Dublin

[73] ECOVALUE: *Valuing the Ecosystem Services of Irish Forests*, 2015. Teagasc.

[74] http://www.coillte.ie

[75] *Forest Recreation in Ireland A Guide For Owners & Managers*, 2006. Forest Service, Department of Agriculture, Food and the Marine.

recent years allow public access to the forest road which may be subject to certain conditions. Public access does not establish any legal right of access by the public to a grant aided forest road.

The CSO carried out a survey of Household Environmental Behaviours - Visits to Nature Areas[76] which was collected as part of the CSO General Household Survey in Quarter 3 2021. The report analyses the frequency and location of visits to nature areas by households. The survey found that 24% of occupied private households visit Woodlands or forests for recreational purposes most weeks with a further 29% visiting most months (Table 44). The age profile of these visitors is outlined in Table 45 with 31% of those aged 35-44 visiting Woodlands or forests most weeks and a further 34% visiting most months.

Table 44: The frequency of visits to green and natural spaces for recreational purposes during the last 12 months

	Most days	Most weeks	Most months	Less frequently	Did not visit	No response	Sample Households
Urban green space (such as a park, field or playground)	32%	34%	13%	12%	8%	0%	4,641
Woodland or forest	7%	24%	29%	26%	13%	1%	4,641
River, lake or canal	8%	20%	21%	33%	17%	1%	4,641
Hill, mountain or moorland	3%	13%	24%	38%	21%	1%	4,641
Beach, other coastline or the sea	8%	19%	27%	37%	9%	1%	4,641
Nature or wildlife reserve	1%	4%	13%	46%	35%	1%	4,641
Fields, farmland or the countryside	16%	15%	17%	32%	19%	1%	4,641

Table 45: Age profile visitors to a woodland or forest for recreational purposes during the last 12 months

Age group of respondents	Most days	Most weeks	Most months	Less frequently	Did not visit	No response	Sample Households
18-34 years	7%	27%	33%	26%	7%	0%	586
35-44 years	6%	31%	34%	23%	6%	0%	1,035
45-54 years	8%	24%	28%	28%	11%	1%	1,177
55-64 years	8%	20%	27%	27%	17%	1%	979
65 years or over	7%	17%	22%	27%	24%	2%	864

7.4 Public Attitudes Survey on Forestry

In 2021, a market research survey was undertaken for the Department of Agriculture, Food and Marine while developing a new Forest Strategy. This field survey was undertaken by behaviour & Attitudes of the general public to better understand attitudes towards forestry and exploring wider perspectives of forestry and trees in Ireland[77].

Many Irish adults believe that they live in close proximity to woodlands or forests, with 42% suggesting that they live within five kilometres of a forest. General attitudes to forestry are particularly positive with three out of four wanting to see more forests planted in their own county and with broad and general interest in the planting of more trees in urban areas generally (Figure 40).

[76] https://www.cso.ie/en/releasesandpublications/ep/p-hebna/householdenvironmentalbehaviours-visitstonatureareasquarter32021/

[77] DAFM, (2021). Public Attitudes Survey on Forestry. Department of Agriculture, Food and the Marine. Agriculture House, Kildare Street, Dublin.

Exercise and recreation are the key visit drivers, but most acknowledge that we benefit from forests addressing climate change and removing CO_2, while also acknowledging their contribution to mental balance, their enhancement of air quality and their ultimate contribution to habitats for plants and wildlife.

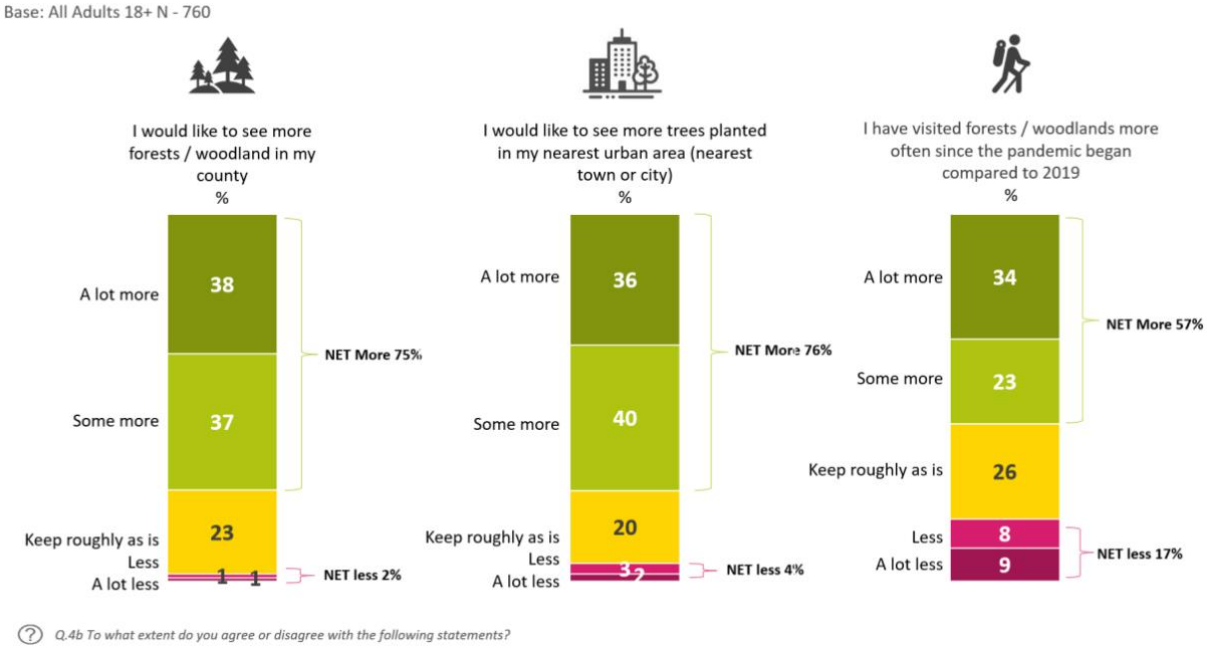

Figure 40: Attitudes towards forest and woodlands

When given a choice between broadleaf or coniferous trees, most indicate that they are happy with either, whereas the relatively small group who express a preference one way or the other (Figure 41). Just 10% of the population indicate that they live in a wood-built home, although up to a quarter more of the population say that they would like to do so.

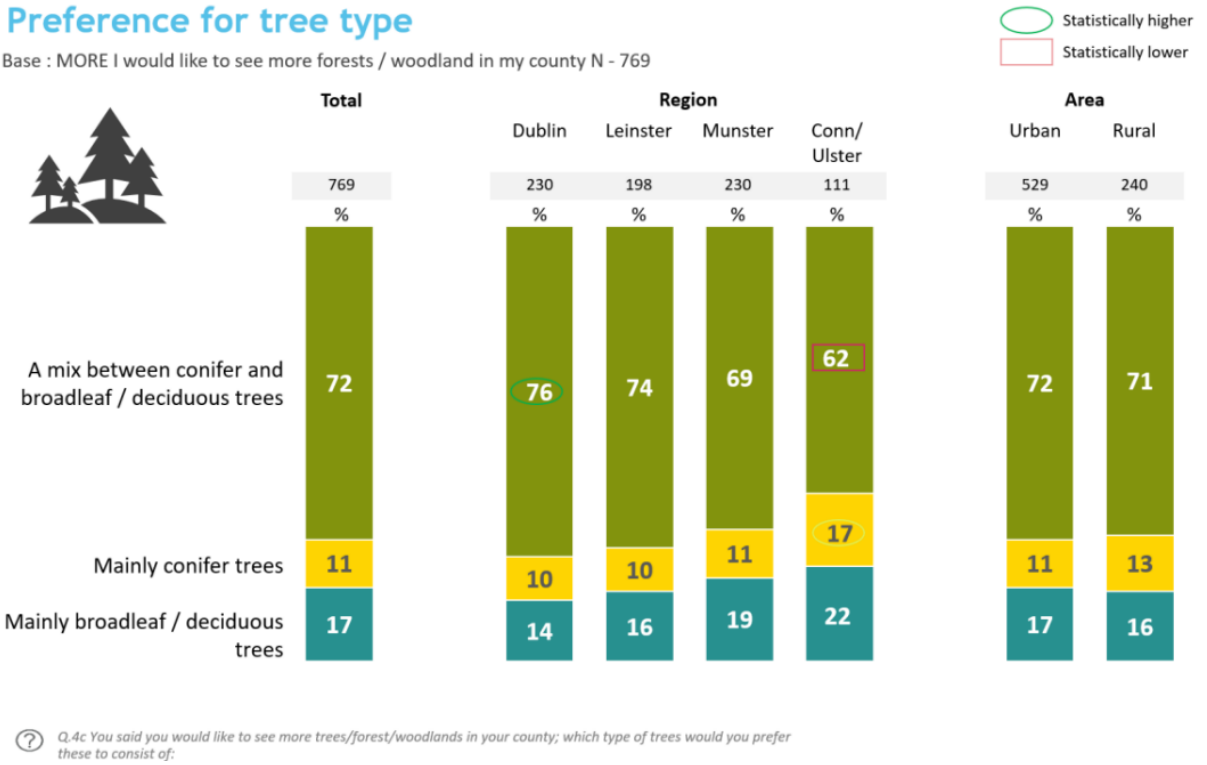

Figure 41: Public preference for a tree or forest type

7.5 State Expenditure on Forestry

Since 1993, €2.69 billion has been expended by the State and European Union on afforestation, including existing premium liabilities and other support measures for the forest sector. In 2022, €74.0 million was spent on forest activities including afforestation, maintenance grants, annual premium payments and grants for forest road infrastructure (Figure 42). Expenditure in 2022 increased by €4.56 million on the previous year due in part to increased expenditure on the support schemes and current expenditure. A detailed breakdown of expenditure by activity since 2010 is provided in Table 46.

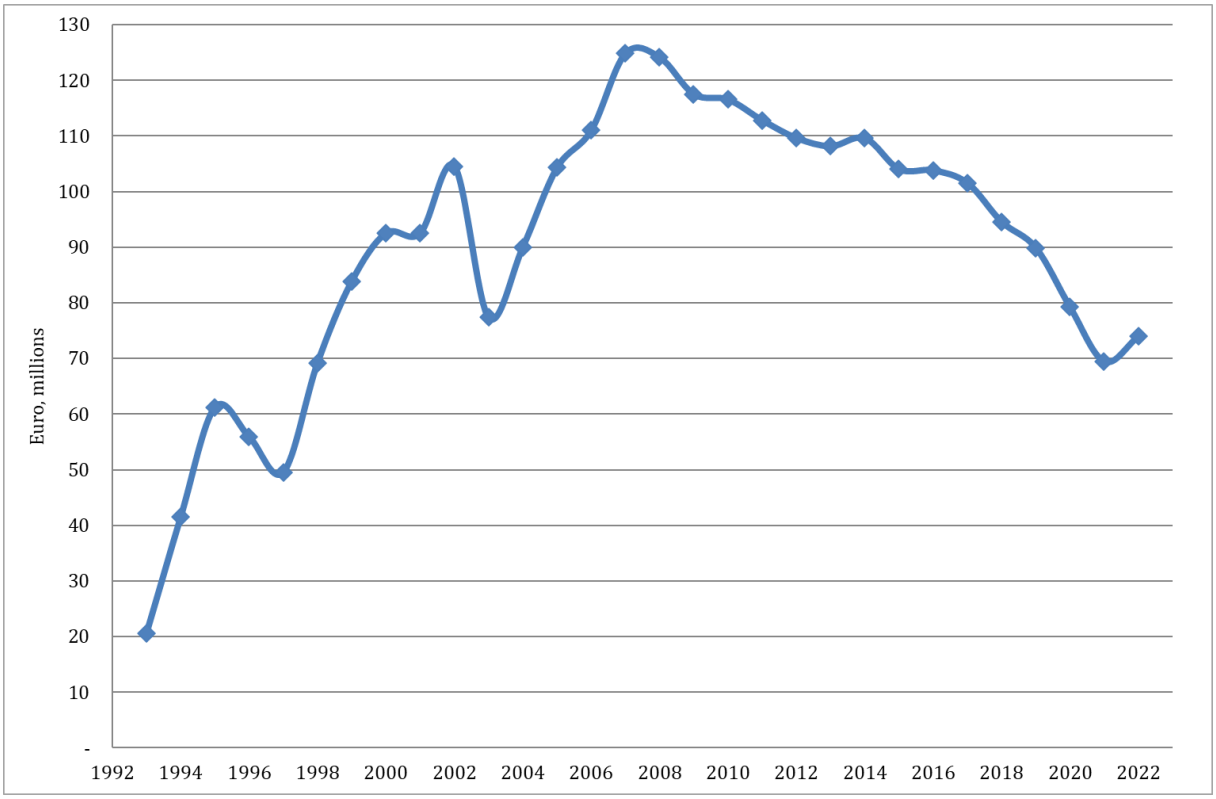

Figure 42: Total state expenditure on forestry (1993-2022)

Table 46: Annual state expenditure on forestry (2010-2022)

Expenditure (1000's Euro)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Main Afforestation Programme													
Grant – 1st Instalment	27,557	20,482	19,215	17,033	16,759	17,480	18,420	15,819	12,270	10,769	8,074	6,924	8,219
Grant – 2nd Instalment	7,441	7,697	6,334	7,291	7,630	7,357	6,881	6,192	5,916	5,243	5,396	3,834	4,209
Premium	72,285	75,005	75,685	76,013	77,501	73,609	72,418	71,511	68,089	64,063	57,540	51,269	49,504
Sundry (e.g. Debt Recovery)	505	647	379	523	620	259	79	108	106	77	88	89	62
Afforestation Total	107,789	103,831	101,614	100,860	102,511	98,705	97,798	93,630	86,381	80,151	71,098	62,117	61,994
Forest Roads-Harvesting	3,694	4,204	3,077	2,709	2,794	2,381	2,561	3,889	3,038	3,796	4,013	2,945	3,823
Reconstitution of Woodlands	966	827	567	257	253	222	248	130	109	19	27	2	0
Chalara	n.a.	n.a.	n.a.	693	1,274	688	446	811	1,822	1,311	434	236	348
Reconstitution & Underplanting	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	29	875
Storm Darwin	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	437	195	64	80	68
Woodland Improvement Scheme	248	164	70	65	76	28	22	29	17	6	0	0	3
Thinning & Tending – WIS	610	750	971	864	666	470	593	603	441	636	671	496	352
CCF - WIS	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	74.6	100.7	69.1
Shaping of Broadleaves	10	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pruning of Conifers	56	0.0	233	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NeighbourWood	180	351	435	146	6	0.0	167	130	116	0	199	45	100
Native Woodland Conservation	819	829	1,221	845	514	211	194	289	365	648	504	384	501
NDP Other Measures	3	11	-2	0	0	0	0	0	0	0	0	0	0
Environmental Assessments	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	407	1,572	2,243
Other	0	0	0	0	0	0	0	31	21	3	1	14	20
Support Schemes Total	6,587	7,136	6,573	5,673	5,582	3,999	4,356	5,912	6,366	6,614	6,396	5,904	8,402
Reforestation	13	11	0	5	0	0	11	0.4	0	1	0	0	0
Forest Inventory	7	69	41	30	18	68	34	42	45	11	81	14	66
Other Capital Total	20	81	41	35	18	68	45	43	45	11	81	14	66
Total Capital	114,395	111,048	108,227	106,568	108,111	102,772	102,199	99,585	92,793	86,777	77,575	68,035	70,462
Promotion	289	864	799	828	684	693	840	1,060	1,123	2,189	1,007	891	2,648
Training	954	226	105	80	103	0	0	0	0	0	0	0	0
Knowledge Transfer	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	37	97	310
Technical Support	393	92	85	232	268	278	234	180	112	111	124	86	135
Fees International Organisations	39	189	8	16	8	10	10	10	0	0	0	0	0
Forest Sector Development (Coford)	401	408	380	425	304	350	424	606	475	670	474	458	531
Miscellaneous (e.g. legal, printing)	94	4	41	20	144	-65	119	100	52	142	3	-110	-73
Total Current	2,171	1,782	1,418	1,601	1,511	1,265	1,627	1,956	1,762	3,112	1,646	1,423	3,551
Overall Total	116,566	112,830	109,646	108,169	109,622	104,037	103,826	101,541	94,555	89,889	79,221	69,458	74,013

8. Forest Protection and Health

8.1 Introduction

One of the key objectives of the Forestry Inspectorate of DAFM is to implement the forestry aspects of the EU Plant Health Regulation 2016/2031 and the related EU Official Controls Regulation 2017/625 which includes monitoring and control programmes for harmful forestry pests and diseases. In this regard with increased levels and new, emerging patterns in trade and greater mobility of larger numbers of people, the risk from the introduction of exotic pests and diseases is ever present. Damage may also be caused to forests by abiotic factors, with fire and wind the most common causes.

The Forestry Inspectorate also oversees the national implementation of the FAO, IPPC International Standard for Phytosanitary Measures (ISPM) 15, Regulation of Wood Packaging Material in International Trade. Not only is this important in terms of imports and protecting Ireland's forests but also for companies exporting who require compliant wood packaging, thereby facilitating Irish exports of goods of all kinds.

Regulation (EU) 2016/2031 became effective from 14th December 2019 repealing and replacing the existing Council Directive 2000/29/EC. The Official Controls Regulation 2017/625 also came into effect on that date and impacts inter alia on how official import controls, plant passport controls and diagnostics are carried out. DAFM continues to actively organise policy and operational requirements to meet the articles of Regulations 2016/2031 and 2017/625.

Increased stakeholder engagement is an important element of the new Plant Health regime and in 2022 the Forestry Inspectorate contributed to the mid-term review of the first DAFM Plant Health and Biosecurity Strategy. The importance of biosecurity was the key message during our presence at Bloom in the Park and the National Ploughing Championships and a number of Forest Health industry training days were held. Three editions of the Forest Health Newsletter were issued and made available on the updated Forest health webpage.

Key statistics

- In 2022 the continued impact of Brexit was felt through the increased focus on import controls and demand for export certification.
- The Forestry Inspectorate provided policy support to Import Controls Operations Division at Dublin Port, Dublin Airport and Rosslare Europort.
- There were no findings of any EU priority pests or pests for which Ireland has EU Protected Zone status in Irish forests during annual surveys in 2022.
- Surveys for the presence and spread of ash dieback disease were conducted in 2022 using a grid-based survey across the country. By the end of 2022 there had been findings in ash in over 695 locations in various settings- forests, nurseries and garden centres, on farm planting, roadside planting, hedgerows and private gardens in all 26 counties.
- *Phytophthora ramorum* was first detected in Japanese larch in 2010 and at the end of 2022 has been confirmed present at a total of 64 forest locations in this tree species.
- The authorisation of Professional Forestry Operators to issue plant passports under the Plant Health regulation was a key work area in 2022. The authorisation process involves the completion of the online assessment of competence followed by onsite inspections to complete the process. Fifteen companies were authorised to issue plant passports in 2022.
- 54 Irish companies are currently registered in Ireland to produce wood packaging material to the FAO IPPC International Standard for the Regulation of Wood Packaging Material in International Trade (ISPM No. 15) thus facilitating the export of goods worldwide from Ireland on compliant pallets and crates.

8.2 Biotic Threats – Pests and Diseases

8.2.1 Priority Pests and Union Quarantine Pests

The EU Plant Health Regulation sets out a list of priority pests which require mandatory annual surveys and reporting including *Agrilus planipennis* (emerald ash borer), *Agrilus anxius* (bronze birch borer), *Anoplophora chinensis* (citrus long-horn beetle), *Anoplophora glabripe*nnis (Asian long-horn beetle), *Dendrolimus sibiricus* (the Siberian silk moth) and *Bursaphelenchus xylophilus* (pine wood nematode). EU priority pests are those pests whose potential economic, environmental or social impact is the most severe for the Union territory. The Regulation also sets out a long list of Union quarantine pests which must be included in a multiannual survey plan of five to seven years. In 2022 the multiannual component of our surveys focussed mainly on pests of pine including seven species of weevil that are listed as Union quarantine pests. In 2022 Ireland also continued its participation in EU co-funded surveys for regulated pests. There were no findings of any EU priority or Union quarantine pests in Irish forests in 2022 (See Table 47).

8.2.2 Protected Zone Organisms

Ireland has Protected Zone status for 14 harmful forestry organisms present in other EU Member States but not present here. To justify Ireland's Protected Zone status, the Forestry Inspectorate conducts national forest surveys and submits reports annually to European Commission. There were no detections of any of these organisms in surveys conducted during 2020, 2021 and 2022.

8.2.3 Protected Zone Surveys

In surveys for the above regulated organisms and for general forest health monitoring purposes, a network of observation points, pheromone traps, bait logs and sampling points distributed around the country in public and private forests and forest nurseries is used. The Forestry Inspectorate also deals with queries and reports from the industry and general public in relation to forest and tree health issues including reports submitted via the web-based Tree Check App. This may involve site visits and taking of samples for laboratory analysis. Table 47 outlines the summary of these forest surveys over the year for 2022. Figure 43 displays the systematic and risk-based observation points across Ireland for the detection of bark-beetles.

8.2.4 Emerging Pests

Working closely with colleagues in the Department's Plant Science Division and Pest Risk Analysis Unit, the Forestry Inspectorate also carries out surveys each year for new, emerging pests that are generally as yet unregulated, but are regarded as potential risks to Irish forest health. In 2022 in addition to the mandatory survey work mentioned above, precautionary surveys were carried out for pests such as beech leaf disease, oak lace bug, hemlock looper, pine tortoise scale, the coniferous bark beetle *Pityogenes chalcographus* and *Phytophthora pluvialis*.

Table 47: Summary of forestry surveys in 2022

Pest by category		Number of surveys	Number of findings
EU Priority Pests			
Agrilus anxius	Bronze birch borer	33	0
Agrilus planipennis	Emerald ash borer	32	0
Bursaphelenchus xylophilus	Pinewood nematode	53	0
Dendrolimus sibiricus	Siberian silk moth	195	0
Anoplophora chinensis	Citrus longhorn beetle	32	0
Anoplophora glabripennis	Asian longhorn beetle	32	0
Aromia bungii	Red necked longhorn beetle	12	0
Union Quarantine Pests			
Phytophthora ramorum (non-EU isolates)		22	0
Monochamus spp. (non-European)		62	0
Pissodes strobi	Sitka spruce weevil	81	0
Fusarium circinatum	Pitch pine canker	113	0
Scolytidae spp. (non-European)		67	0
Pissodes fasciatus	Douglas fir weevil	22	0
Pissodes cibriani		24	0
Pissodes nemorensis	Northern pine weevil	24	0
Pissodes nitidus	Yellow spotted pine weevil	24	0
Pissodes punctatus		24	0
Pissodes terminalis	Lodgepole pine terminal weevil	24	0
Pissodes yunnanesis	Yunnan pine weevil	24	0
Pissodes zitacuarense		24	0
Cronartium spp.	Pine blister rust	98	0
Protected Zone pests			
*Ips amitinus**	Small spruce bark beetle	67	0
*Ips cembrae**	Large larch bark beetle	67	0
*Ips duplicatus**	Northern bark beetle	67	0
*Ips sexdentatus**	Six-toothed bark beetle	67	0
*Ips typographus**	Eight-toothed spruce bark beetle	67	0
*Dendroctonus micans**	Great spruce bark beetle	67	0
Cephalcia lariciphila	Larch sawfly	26	0
Cryphonectria parasitica	Chestnut blight	18	0
Dryocosmus kuriphilus	Oriental chestnut gall wasp	18	0
Entoleuca mammata	Poplar canker	14	0
Gilpinia hercyniae	Spruce sawfly	88	0
Gremmeniella abietina	Brunchorstia disease of pine	98	0
Thaumetopoea pityocampa	Pine processionary moth	32	0
Thaumetopoea processionea	Oak processionary moth	24	0
Emerging Pests			
Phytophthora pluvialis		53	0
Lambdina fiscellaria	Hemlock looper	81	0
*Pityogenes chalcographus**	Spruce wood engraver	67	0
Litylenchus crenatae mccannii	Beech leaf disease	11	0
Corythuca arcuata	Oak lace bug	24	0
Toumeyella parvicornis	Pine tortoise scale	98	0

* Coniferous bark beetle species

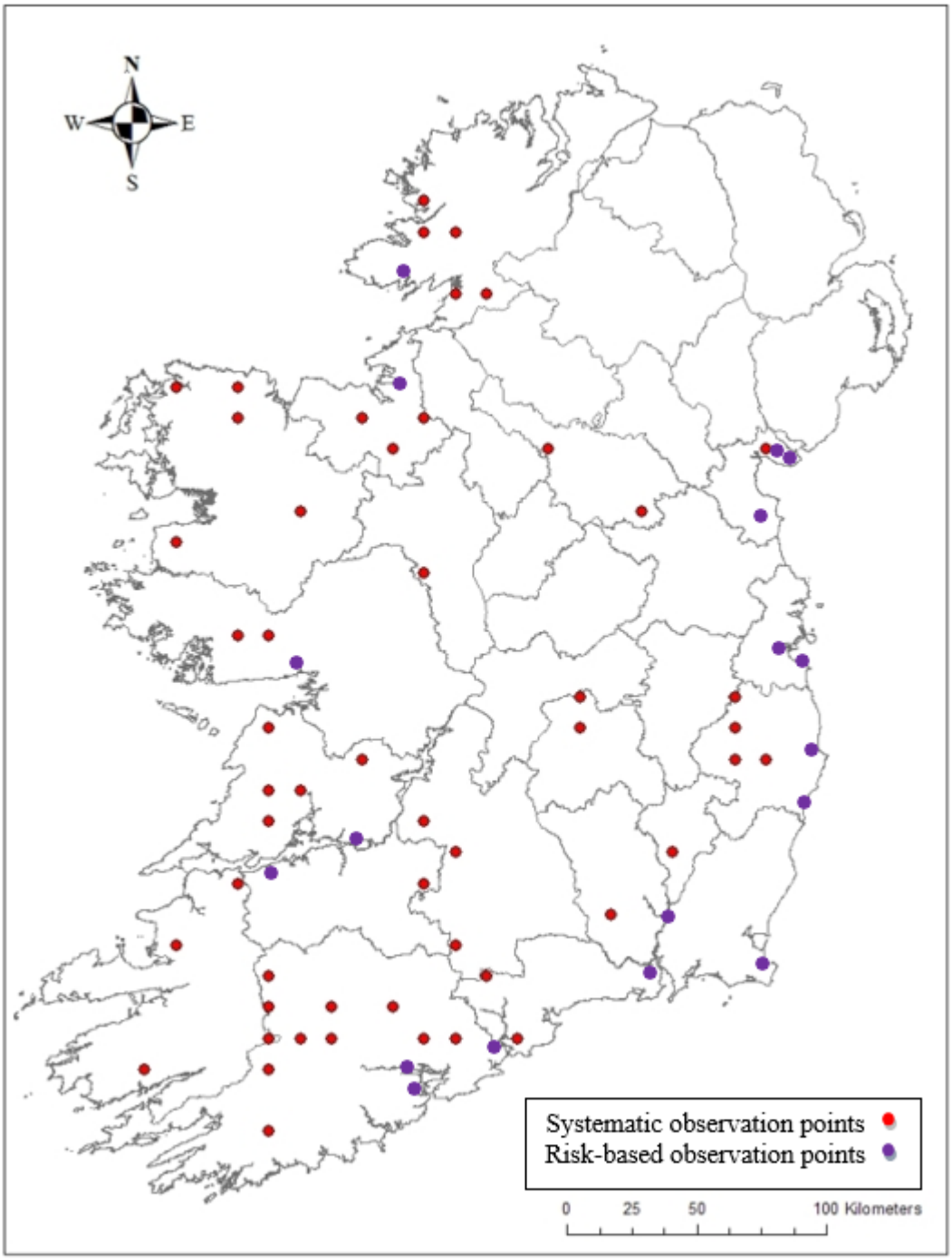

Figure 43: Indicative map of systematic and risk-based bark beetle Fixed Observation Point locations

8.2.5 Other Issues and Findings

The finding of *Ips typographus* in late 2018 in a woodland in Kent, England represents an increased threat of the introduction of this bark beetle to Ireland and prompted a coordinated response on the island of Ireland from DAFM and DAERA. There were further findings of the bark beetle in south-eastern England in 2022 and the demarcated area was extended by the British authorities. As part of the additional risk-based surveys since 2019 DAFM, in collaboration with Coillte, has maintained a supplementary network of risk-based bark beetle monitoring plots distributed through the Coillte estate. These new targeted monitoring plots complement and enhance the existing systematically distributed network of plots.

In August 2022, the Scottish forestry authorities informed the Department of Agriculture that the large larch bark beetle *Ips cembrae* had been detected in traps at three locations within the Pest Free Area (PFA) of Scotland. In total six beetles were captured. This is the first recording of the beetle inside the Scottish PFA. Scottish Forestry has conducted inspections in surrounding areas and no evidence of beetle activity or the presence of a breeding population have been found.

As a result of the finding, the Department in association with authorities of NI agreed that exports of larch roundwood and bark from the PFA to the island of Ireland are suspended. Scottish Authorities have stated that they will not be issuing Phytosanitary Certificates for roundwood of larch from the PFA while wider surveillance is completed.

Alder phytophthora caused by the oomycete *Phytophthora alni* was first detected in a forest setting in Co. Kerry in October 2022 following sampling of symptomatic alder trees. *Phytophthora alni* was first confirmed in Ireland in 1999 and subsequently in 2016, associated with trees in riparian areas, and has recently been detected in Northern Ireland. Other *Phytophthora* diseases can cause similar symptoms on alder trees. For example, *Phytophthora cambivora* is a well-known pathogen of alder trees and was also detected on affected trees at the forest site in Kerry.

8.2.6 Ash Dieback (*Hymenoscyphus fraxineus*)

Ash dieback disease was first found in Ireland in October 2012 although it is likely to have been present for a number of years prior to that, probably introduced on planting material. In the ten years since it was first found, surveys for the disease have been conducted year on year since. The disease can now be found on ash in every county suggesting rapid spread by way of aerial dispersal of spores. In addition to forest surveys, staff in the wider Department have conducted surveys in horticultural nurseries, garden centres, private gardens, roadside landscaping and farm agri-environment scheme plantings. The surveys conducted in 2022 included a survey in a selection of 10x10km grid squares where there had not previously been a confirmed positive. The surveys complemented our survey for the Union priority pest emerald ash borer. By the end of 2022 there had been findings in ash in all 26 counties in over 695 locations in various settings – forests, nurseries and garden centres, on farm planting, roadside planting, hedgerows and private gardens. In 2022, due to the wide distribution of Ash Dieback Disease reports of the disease from the general public in non-grant aided ash trees, for example garden trees and hedgerow trees, were not routinely sampled for laboratory analysis. In light of the increasing numbers of findings DAFM switched to mapping findings on the basis of whether the disease has been found in 10km grid squares rather than showing and recording individual findings. Figure 44 displays the findings as of 31st December 2022 as illustrated on a 10x10 km grid square basis.

While *H. fraxineus* is not a regulated disease under the EU Plant Health Regulation (2016/2031) a Ministerial Order to provide for measures to prevent the spread of *H. fraxineus* in the genus *Fraxinus L*. was introduced on the 6th November 2012 (S.I. 431 of 2012). It restricted the movement of ash plants and seed into Ireland as well as imposing restrictions on ash wood imports. Further to the adoption of the 'All Ireland Chalara Control Strategy' in July 2013, which was developed jointly with the Department of Agriculture and Rural Development (DARD) in Northern Ireland, the Department continued its co-operation with the UK authorities. The legislation in relation to ash wood imports was updated in 2015 (S.I. No 479 of 2015). The new Order restated the provisions contained in the previous Order as they pertain to plant and plant products but introduced a number of changes in relation to the documentary requirements around the importation of ash wood, the required pre-importation treatments, as well as taking into account the change in the scientific name of the organism in 2014. In April 2018, DAFM commenced a review of the national response to ash dieback including the Reconstitution Scheme on the basis that eradication of the disease is no longer a possibility. This included a stakeholder and public consultation period, detailed field consideration of damage level evaluation together

with a broader range of silvicultural and management options with the assistance of Teagasc and international experts. Support schemes were reviewed to ensure the continued relevance of DAFM's response and value for money, and to ensure that the forest owner is provided with a broader range of silvicultural and management options. In July 2020, the new Reconstitution and Underplanting (RUS) Scheme for ash dieback was launched.

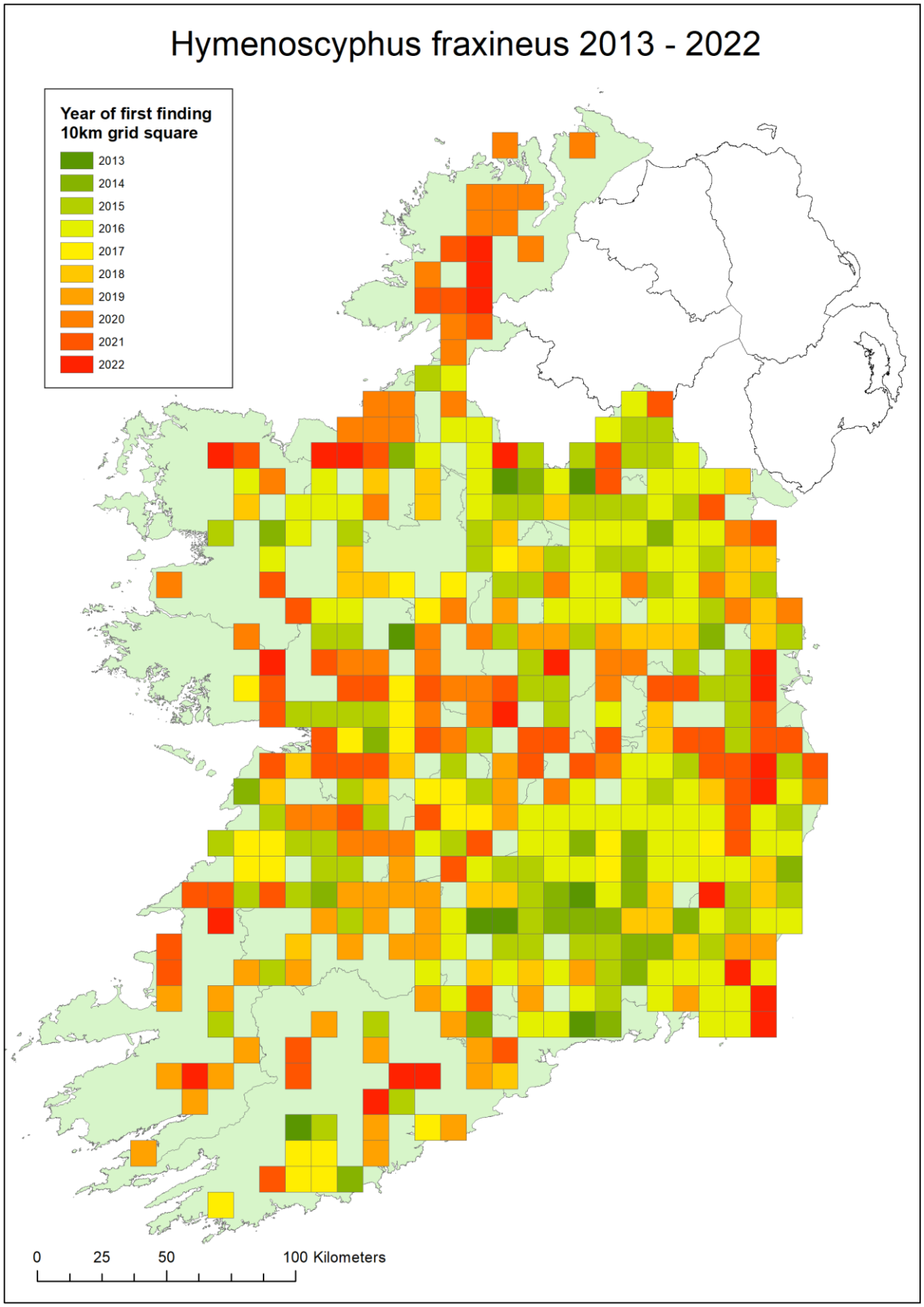

Figure 44: Ash Dieback findings in Ireland 2012 – 2022

8.2.7 Phytophthora ramorum

Since the first finding in Ireland of *Phytophthora ramorum* in Japanese larch in 2010 the Forestry Inspectorate has continued to conduct annual ground and aerial surveys of larch with the assistance of the Air Corps and Coillte. At the start of 2022 the disease had been confirmed present in Japanese larch at 56 forest locations affecting approximately 337 ha of forestry. There were four further forestry findings in Japanese larch in 2022. Since 2010 the Forestry Inspectorate has worked with Coillte (as the principal landowner affected) in undertaking sanitation felling of infected larch in an effort to limit spread and continued to do so in 2022. Figure 45 displays the findings as of 31st December 2022 as illustrated on a 10x10 km grid square basis.

At an EU level the regulatory status of *P. ramorum* changed in 2022 following a review at the Standing Committee on Plant Health and other Commission Working Groups as part of the wider revision of the Annexes to the Plant Health Regulation. EU isolates of the pathogen have been downgraded to regulated non-quarantine pest (RNQP) status. Non-EU isolates of *P. ramorum* will continue to be treated as Union quarantine pests. To date all findings in Irish forests have been EU isolates. This legislative change will impact on DAFM policy in relation to the disease.

P. ramorum has also been detected during forest surveys on beech, noble fir, Spanish chestnut, *Vaccinium myrtillus* and *Gaultheria shallon* (first world finding in the wild) growing in close proximity to infected Japanese larch. While previous surveys detected the disease for the first time worldwide on a single Sitka spruce and European silver fir tree, no subsequent findings have been detected here. Also of significance is that since 2003 a number of detections of the disease have been made in wild invasive rhododendron in forest locations.

Phytophthora kernoviae has been detected on wild rhododendron in a number of forest locations. To the end of 2022 there were eight such findings, six of which were in forests which also had Japanese larch infected with *Phytophthora ramorum*. To date all the confirmed findings of the disease have been limited to counties Wicklow, Wexford, Kilkenny, Tipperary, Waterford, Cork and Kerry. There were no additional findings of *P. kernoviae* in 2022.

A relatively newly described Phytophthora species *P. pluvialis* was found for the first time in Great Britain in late 2021 causing damage to western hemlock (*Tsuga heterophylla*) and Douglas fir (*Pseudotsuga menziesii*) in forests there. *P. pluvialis* is not a regulated pest and the risk it poses is still uncertain as the scientific understanding is developing but precautionary surveys on western hemlock and Douglas fir were carried out in Ireland in 2022. *P. pluvialis* was not detected in Ireland.

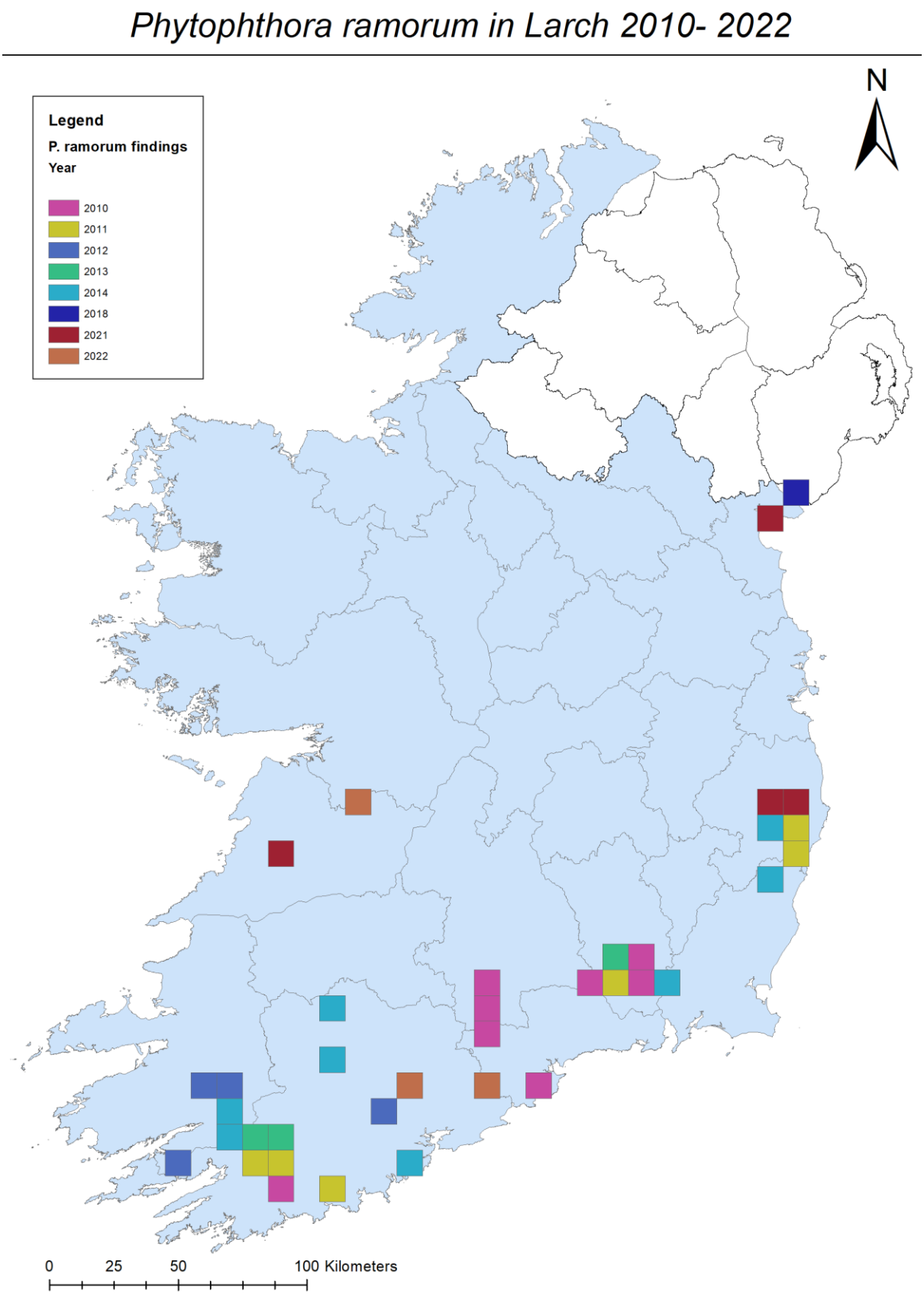

Figure 45: *Phytophtora ramorum* findings in Ireland 2010-2022

8.3 EU Plant Health Regulation & Import Controls

Import inspections of wood and wood products from Third Countries regulated under the EU Plant Health Regulation are routinely conducted to ensure compliance with entry requirements as part of the Customs clearance process. In 2021 operational responsibility for import controls at Dublin Port, Dublin Airport and Rosslare Europort were transferred to the Department's new Import Controls Operations Division. Imports from Great Britain began to be treated like other Third Country imports and there was an overall increase in the amount of import inspections carried out. In 2022, 795 third country consignments received a documentary check and if appropriate to the requirements, were physically inspected. Five were found to be non-compliant with the import requirements. Appropriate measures were taken where non-compliances were detected depending on the nature of the non-compliance.

The Department also has a presence at Tivoli Docks, Port of Cork Company for the inspection of controlled wood and wood products coming into Ireland from third countries (mainly the USA and Canada). In 2022, 57 consignments received a documentary check and if appropriate to the requirements were physically inspected. All were found to be compliant with the import requirements. The Department also has an office in Waterford port and services shipments coming into other ports if required.

In 2021 a new Regulation (2021/127) on monitoring wood packaging material associated with certain goods from China, India and Belarus came into effect, replacing the previous and expired Commission Implementing Decision (2018/1127/EU) which applied to certain goods from China and Belarus only. Wood Packaging Material associated with 25 consignments was inspected and all were found to be compliant. The Forestry Inspectorate carries out monitoring of Portuguese wood packaging material in relation to the threat of pine wood nematode (as required under Commission Implementing Decision 2012/535 as amended) and wood packaging from other countries.

The Forestry Inspectorate also provides advice and deals with queries regarding import and export requirements related to wood/wood products and forest reproductive material. The Forestry Inspectorate provides an export certification service for wood and wood products being exported to third countries, providing Phytosanitary Certificates where required by the importing country. Demand for Phytosanitary Certificates for export increased greatly in 2021 due to Brexit and remained high in 2022.

DAFM preparations in 2020 ahead of Brexit had focussed on ensuring adequate infrastructure, IT systems and staff were in place to cope with the impact of Brexit and these developments were essential in handling the new import controls required on GB trade from January 1st 2021. Prior to Brexit coming into force, these requirements were not in effect as a consequence of both Ireland and the UK being part of the single market. The impact has been the introduction of new mandatory notification and inspection requirements for both imports from Great Britain and exports to Great Britain. Forestry imports from Great Britain have largely been via 'roll-on roll-off' transport through Dublin Port but there is also a considerable trade of coniferous roundwood into a number of regional ports.

Over the years, Irish wood processors have supplemented domestically sourced roundwood, with imported roundwood from the southwest of Scotland (the "Pest Free Area - PFA"). This is the only area from which coniferous roundwood with bark (which is not kiln dried) may be imported into Ireland. This is because this area is recognised as free from quarantine bark beetles including the great spruce bark beetle *Dendroctonus micans*. With domestic supply of logs increasing in 2022, the volumes of roundwood imported from the PFA declined. The interception of *Ips cembrae* in

three traps in the PFA in 2022 resulted in the cessation of the movement of larch logs from the PFA to Ireland.

As a result of the United Kingdom leaving the EU and then the Single Market at the end of the transition period, coniferous roundwood with bark originating in the United Kingdom (Great Britain) became subject to mandatory import control. Prior to 31st December 2020, roundwood from the Pest Free Area could be imported with a Plant Passport, but without official border controls and mandatory inspections. The new requirements for the importer include the need to source a Phytosanitary Certificate from the United Kingdom authorities and to provide advance notification of the import, together with the Phytosanitary Certificate to the Department. Under the Official Controls Regulation (EU 2017/625), imports of controlled commodities can only be made through officially designated and approved places of import called Border Control Posts (BCPs) and it is at these that DAFM, through the Forestry Inspectorate, carries out Official Controls on imported goods.

In 2022, there were 73 imports of roundwood into Ireland amounting to over 112,000 tonnes of coniferous roundwood from the PFA in Scotland. This was by far and away the busiest year for this type of import into the country, as a result of difficulties with licencing.

8.4 Export Certification

The UK market is of enormous importance for the Irish forest sector. Before the UK left the EU Plant Passport requirements applied to a range of forestry plants, wood and wood products moving from Ireland to the UK. Upon leaving the EU new phytosanitary requirements applied including the requirement for an exporter of a controlled commodity to obtain a Phytosanitary Certificate from the Department of Agriculture and the Marine which involves inspection and the issue of an official document by the Department to the exporter. Previously under the Plant Passport regime there was no need for direct involvement of the Department with each individual export.

In order to meet this new demand from the exporting sector a new IT system Export Certification System (ECS) was developed and made available to the sector through an on-line portal. Exporters were briefed throughout on the new requirements and the mechanism for application for Phytosanitary Certificates backed up by training. New staff were recruited by the Department to deal with this new requirement.

Overall, in 2022 export certification was provided by the Forest Health Section for a range of forestry plants wood and wood products including sawn timber, bulk roundwood exports, bark, Christmas trees and forestry plants. In all, 605 Phytosanitary Certificates were issued to Irish exporters thus facilitating continued access to this key market.

8.5 Authorisation to issue Plant Passports

In the EU, the movement of plants for planting and other commodities such as coniferous wood that is not bark free is regulated through the plant passport system. In Ireland therefore there are annual official controls for plant passports of nurseries and other forestry professional operators. Under the new Regulation 2016/2031 the movement of coniferous roundwood for example from the forest to the processor must be accompanied by a plant passport.

Regulation 2016/2031 prescribes conditions that professional operators must meet in order to be authorised by DAFM to issue plant passports and authorised professional operators are subject to annual inspections by DAFM. In 2021, in part fulfilment of these obligations DAFM launched an online assessment for professional operators to demonstrate their competency in

relation to plant passporting as part of the authorisation process. This is hosted on the updated Forest Health Section of the gov.ie website which also provides information on forest health matters for all stakeholders. In 2022, fifteen forestry operators were granted authorisation to issue plant passports and five official controls for plant passports were carried out.

8.6 IPPC International Standard for Wood Packaging Material

In relation to exports (in addition to import controls), the Forestry Inspectorate is responsible for the implementation of the FAO, IPPC, International Standard for Phytosanitary Measures (ISPM) No. 15, Regulation of Wood Packaging Material in International Trade. ISPM No. 15 describes phytosanitary measures to reduce the risk of introduction and/or spread of quarantine pests associated with wood packaging material made of raw wood, in use in international trade.

Wood packaging material, which is being exported from Ireland to most non-EU countries around the world, is required to comply with ISPM No. 15. Since January 1st 2021, this requirement also applies to wood packaging going from Ireland to Great Britain. ISPM No. 15 thereby facilitates exports by Irish companies of goods of all kinds, which are being transported using wooden pallets, crates, loose wood dunnage etc. In practice wood packaging material made from unprocessed raw wood and used in supporting, protecting or carrying a commodity, must be subject to a specific phytosanitary treatment (e.g. heat treatment) and each individual unit of wood packaging material must be marked on at least two sides with the officially approved ISPM No. 15 mark verifying the treatment and incorporating the country code and the registration number of the producer of the packaging.

ISPM No. 15 currently does not apply to wood packaging material which is being dispatched to other EU Member States. The following services are available in relation to ISPM No. 15:

- Registration of producers of wood packaging material and kiln operators in association with NSAI
- Advice to wood packaging material manufacturers and kiln operators concerning ISPM No. 15
- Advice to importing and exporting companies concerning ISPM No. 15

To the end of 2022, there were 54 companies registered to operate within the ISPM No. 15 programme in Ireland. Companies in the ISPM No. 15 Programme are subject to Official Controls to ensure compliance with agreed Standard Operating Procedures and that the wood packaging material is fully compliant with the standard.

8.7 Abiotic Threats

This section details the extent of damage to the forest estate arising from non-living or abiotic sources.

8.7.1 Forest fires

Forest fires normally occur each year in Ireland and reach their peak in spring, particularly in forests established on formerly unenclosed land, with a preponderance of purple moor grass and heather vegetation. Figure 46 shows the area of forests damaged by fire from 1930 to 2019. In the late 1970's and early 1980's, considerable areas of public forest were burnt. Fire damage levels were high in both public and private forests in 2010 and 2011 following protracted dry periods in spring. The high level of forest fire damage in 2017 is primarily attributed to the Cloosh fire in Co. Galway, which impacted approximately 1,500 ha of forest.

Estimates of fires in privately-owned forests for the periods 1985-2005, 2010-2016 were derived by multiplying the proportion of public forest area destroyed by fire each year by the private

forest area. Since 2017 information for the private estate has been provided by way of expert estimate. The Department of Agriculture, Food and the Marine release Fire Danger Circulars[78] at times of increased fire risk to allow owners and the public to be aware of the dangers and to be prepared for forest fires.

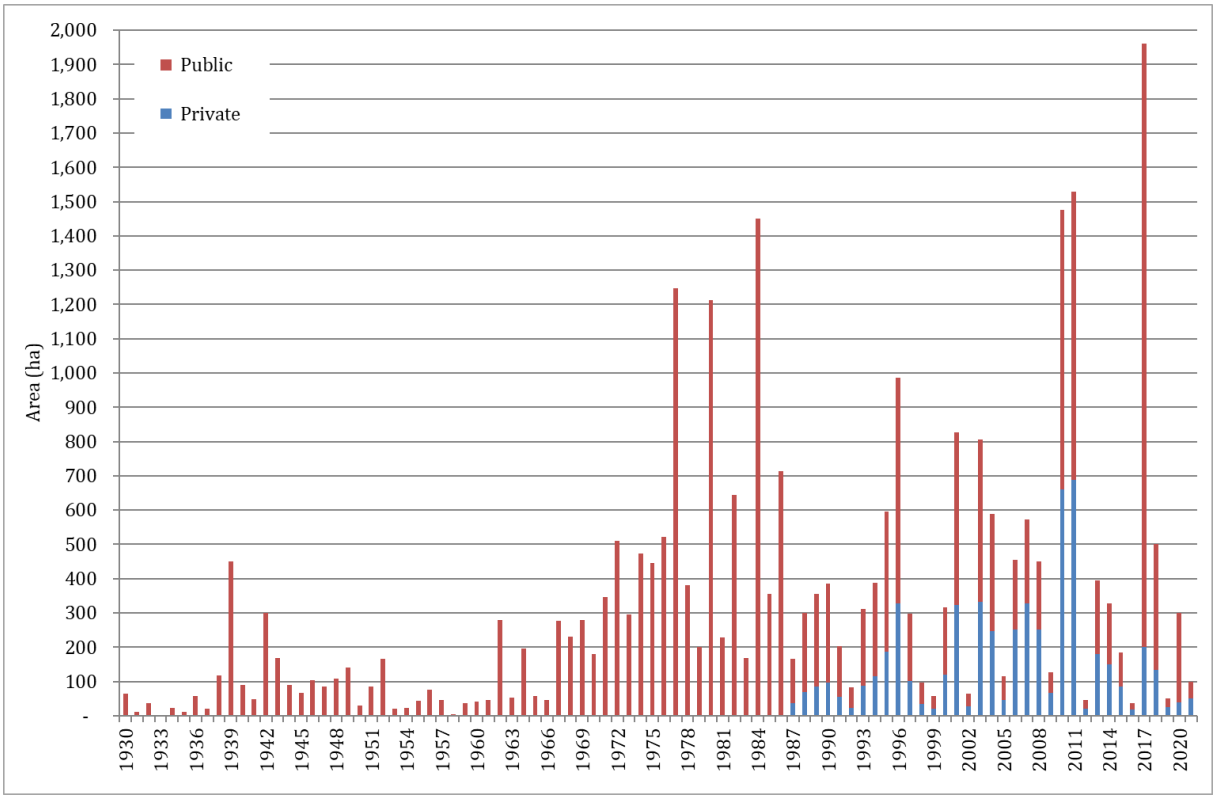

Figure 46: Area of forest damaged by fire 1930-2021

8.8 Tree Phenology

The CSO has integrated the annual observations of phenological observations from each Irish phenological garden which has been made available from Met Éireann and the National Botanic Gardens. The data provides a time series of the earliest phenophase dates of plant species found in Irish gardens[79]. The phenology of trees and plants is the study of annual seasonal changes such as the flowering, beginning or leaf unfolding or leaf fall. The dates for various phenological events are recorded in the annual cycle of a tree or plant.

For example, European beech (Fagus sylvatica) and Downy birch (*Betula pubescens*) were present at 6 and 5 gardens respectively, the date of earliest occurrence of various phenological stages has been recorded from 1968-2020 (Table 48). A sample of this data is present in Table 48 which displays the date of beginning of leaf unfolding, autumn colouring and leaf fall for both species. The length of phenological season is a measure of the number of days between beginning of leaf unfolding in the Spring and leaf fall in the Autumn which is displayed in Figure 47 & Figure 48.

The CSO provide additional information on a number of different tree species at 6 different phenological gardens on their website.

[78] https://www.gov.ie/en/publication/01773-fire-management/#fire-danger-notices
[79] https://www.cso.ie/en/statistics/climate/plantphenology/

Table 48: Julian day of Earliest Occurrence of Phenological Stages for European beech (Fagus sylvatica [Hardegsen, Germany]) and Downy Birch (Betula pubescens [Germany])

Station	European beech (*Fagus sylvatica*)						Downy birch (*Betula pubescens*)					
	Beginning of leaf unfolding		Autumn colouring		Leaf fall		Beginning of leaf unfolding		Autumn colouring		Leaf fall	
	Day	Year	Day	Year	Day	Year	Day	Year	Day	Year	Day	Year
Enniscoe House	93	2013	278	2018	305	2016	-	-	-	-	-	-
Glenveagh National Park	109	2020	248	2018	262	2018	87	2012	281	2015	293	2015
John F. Kennedy Arboretum	94	2007	260	1994	275	1974	85	1992	264	1996	274	1991
Johnstown Castle	91	1974	258	1976	283	1973	60	2019	151	2018	275	2019
National Botanic Gardens	118	1997	293	1994	318	1997	80	1977	296	1992	311	1992
Valentia Observatory	79	2011	248	1983	256	1971	72	1975	255	1983	268	1983

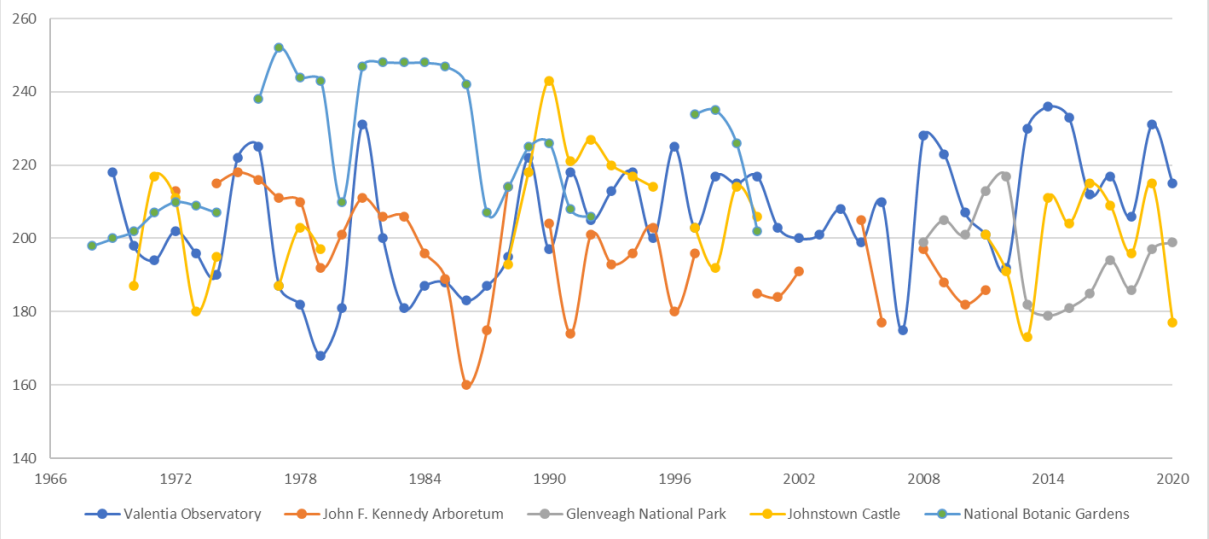

Figure 47: Length of Phenological Season for Downy Birch (*Betula pubescens* [Germany])

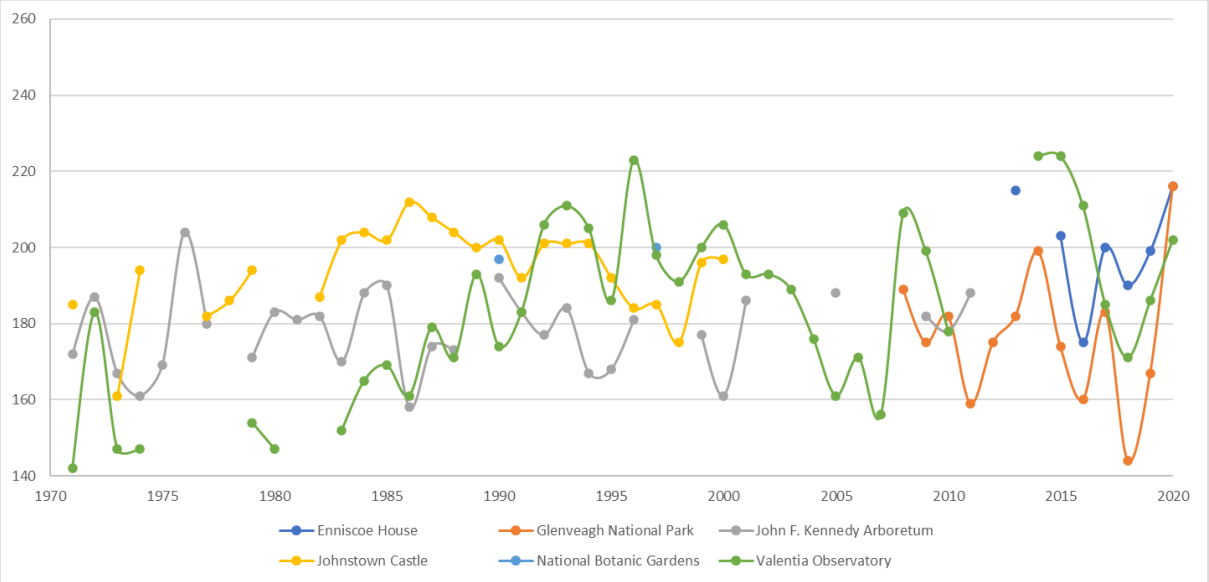

Figure 48: Length of Phenological Season for European beech (*Fagus sylvatica* [Hardegsen, Germany])

9. Forest Reproductive Material

DAFM is responsible for implementing Council Directive 1999/105/EC on the marketing of forest reproductive material. Forest reproductive material (FRM) is a collective term to describe seeds, plants and cuttings, which are important for forestry purposes. The aim of the legislation is to ensure that forest reproductive material, which is marketed, is from approved suitable sources and is clearly labelled and identified throughout the entire process from tree seed collection to processing, storage, forest nursery production and delivery to the final forest user. In recent years the Forestry Inspectorate has being participating in the ongoing EU review of seed and propagating material legislation.

DAFM provides the following services in relation to forest reproductive material:

- Registration of suppliers of forest reproductive material - seed collectors, nurseries, seed and plant importers and brokers
- Registration of seed stands Issuing of Certificates of Provenance for seed collections
- Advice on forest seed and plant regulations

DAFM is also the National Designated Authority in Ireland for the OECD Scheme for the Certification of Forest Reproductive Material Moving in International Trade. The object of the international OECD Scheme is to encourage the production and use of forest seeds, parts of plants and plants that have been collected, transported, processed, raised and distributed in a manner that ensures their trueness to name.

Forest seeds and plants may also be subject to the requirements of EU Regulation 2016/2031, the Plant Health Regulation. This regulation replaced Council Directive 2000/29/EC (commonly referred to as the Plant Health Directive) in December 2019 with an aim to modernise the plant health regime and provide more effective measures for the protection of the Union's territory and its plants and forests from destructive pests and disease.

Key statistics

- 242 Seed Collection Permits and 91 Master Certificates of Provenance were issued in 2021 in relation to home collected forest reproductive material.
- 5 new operators registered in 2022 under the requirements of the FRM Directive
- Eight new entries were included on the National Register in 2022. Including two silver birch (*Betula pendula*) clonal seed orchards.
- Fourteen entries were removed, these consisted of conifer stands that had come to the end of their rotation.
- The total area on the register at the end of 2022 stands at 4,623 ha.
- Approximately 1.1 million acorns were sown in forest nurseries during 2022.
- The other main broadleaf trees sown in nurseries for forestry include: sycamore, alder, downy and silver birch, beech, cherry and sycamore.
- Over 350 kg of Sitka spruce was sown in forestry nurseries, equating to over 35 million plants. The other main conifer species included: Norway spruce, lodgepole pine, Scots pine, Douglas fir, together with smaller quantities of larch and western hemlock.
- Increasingly improved seed (*Qualified'* and '*Tested'*) is being utilised for the main conifer and broadleaf species.

9.1 Seed Collection permits and master certificates of provenance

In 2022, 283 Seed Collection Permits were issued – an increase on the previous year (242 issued in 2021). During 2022, 64 Master Certificates of Provenance were issued (91 issued in 2021). These figures vary from year to year depending on availability of suitable seed and levels of demand.

9.2 National Register of Approved Basic Material

In accordance with EC Directive 1999/105/EC, each EU Member State holds a national register of approved forest basic material. DAFM is responsible for the national register and updates it annually. New entities are evaluated according to criteria described in the Directive and following inspection entered on the register according to four different categories.

- *Source identified:* Reproductive material derived from basic material which may be either a seed source or stand located within a single region of provenance.
- *Selected:* Reproductive material derived from basic material which shall be a stand located within a single region of provenance, which has been phenotypically selected at the population level.
- *Qualified:* Reproductive material derived from basic material which shall be seed orchards, parents of families, clones or clonal mixtures, the components of which have been phenotypically selected at the individual level and which meets certain prescribed requirements
- *Tested:* Reproductive material derived from basic material which shall consist of stands, seed orchards, parents of families, clones or clonal mixtures. The superiority of the reproductive material must have been demonstrated by comparative testing or an estimate of the superiority of the reproductive material calculated from genetic evaluation of the components of the basic material.

Eight new entries were included on the National Register in 2022. These included the registration of two '*Qualified*' clonal seed orchards of silver birch (*Betula pendula*). In addition, '*Selected*' stands of wild cherry (*Prunus avium*), pedunculate oak (*Quercus robur*) and western hemlock (*Tsuga heterophylla*), and three stands of '*Source Identified*' Sessile oak (*Quercus petraea*) were included in the national register.

The total area of forest basic material on the National Register of Approved Basic Material at the end of 2022 stands at 4,623 ha (Table 49).

Table 49: Summary of the 2022 National Register of Approved Basic Material by forest reproductive material category and area (ha)

Species	Source Identified	Selected	Qualified	Tested	Grand Total
Abies procera	-	8.9	-	-	8.9
Acer pseudoplatanus	-	54.1	2.9	-	57.0
Alnus cordata	-	0.5	-	-	0.5
Alnus glutinosa	110.4	0.3	1.8	-	112.5
Betula pendula	-	-	0.6	-	0.6
Betula pubescens	30.1	13.0	0.5	-	43.6
Castanea sativa	-	8.0	2.4	-	10.4
Chamaecyparis lawsoniana	-	3.3	-	-	3.3
Cryptomeria japonica	3.0	-	-	-	3.0
Cupressus marcrocarpa	-	1.0	-	-	1.0
Fagus sylvatica	3.0	79.4	-	-	82.4
Fraxinus excelsior	136.1	22.0	2.3	-	160.4
Larix decidua	-	14.7	-	-	14.7
Larix kaempferi	-	16.2	-	-	16.2
Larix x euroleptis	-	-	2.9	-	2.9
Picea abies	-	250.6	-	-	250.6
Picea sitchensis	-	442.6	4.9	2.4	449.8
Pinus contorta	-	105.2	2.4	-	107.6
Pinus nigra	-	63.1	-	-	63.1
Pinus radiata	-	15.8	-	-	15.8
Pinus sylvestris	37.1	161.6	4.8	-	203.5
Prunus avium	-	0.6	0.8	-	1.4
Pseudotsuga menziesii	-	226.2	-	-	226.2
Quercus petraea	1,080.1	553.5	-	-	1,633.6
Quercus robur	660.1	408.2	-	-	1,068.3
Sequoia sempervirens	1.0	-	-	-	1.0
Taxus baccata	33.6	-	-	-	33.6
Thuja plicata	-	25.4	-	-	25.4
Tsuga heterophylla	-	25.5	-	-	25.5
Total	**2,094.6**	**2,499.6**	**26.2**	**2.4**	**4,622.7**

9.3 *Utilisation of Forest Reproductive Material in Afforestation and Reforestation*

Table 50 & Table 51 summarise data on seed used in Irish forest nurseries for the period 2018-2022 for broadleaf and conifer species respectively[80]. Table 52 lists the kilograms (kgs) of seed used in Irish forest nurseries in 2022 by FRM category.

Table 50: Main broadleaf species sown (kgs seed & number of plants ('000)) in forest nurseries (2017-2022)

Species	2018		2019		2020		2021		2022	
	kg	Plants ('000)	kg	Plants ('000)	kg	Plants ('000)	kg	Plants ('000)	kg	Plants ('000)
Acer pseudoplatanus	15	21	95	133	50	70	50	70	56	78
Alnus glutinosa	92	2,754	118	3,525	134	4,023	67	1,998	97	2,924
Betula pendula	8	227	8	225	6	193	6	185	7	196
Betula pubescens	52	2,343	60	2,700	55	2,490	38	1,689	90	4,060
Fagus sylvatica	683	546	870	696	1,170	936	31	25	286	229
Fraxinus excelsior	-	-	-	-	6	15	-	-	-	-
Prunus avium	-	-	-	-	-	-	59	47	78	62
Quercus petrea	4,269	342	1,400	112	27	22	5,683	455	4,114	329
Quercus robur	25,302	2,530	15,406	1,541	2,530	202	19,614	1,961	7,704	770

Table 51: Main conifer species sown (kgs seed & number of plants ('000)) (2017-2022)

Species	2018		2019		2020		2021		2022	
	kg	Plants ('000)	kg	Plants ('000)	kg	Plants ('000)	kg	Plants ('000)	kg	Plants ('000)
Larix spp.	0.3	15	0.4	18	0.3	15	0.3	15	0.3	17
Picea abies	91	3,643	104	4,154	0.4	19	55	2,180	68	2,720
Picea sitchensis	247	24,680	380	37,950	85	3,400	211	21,050	354	35,355
Pinus contorta	22	1,983	25	2,247	38	3,421	25	2,228	44	3,979
Pinus sylvestris	80	3,197	46	1,834	16	630	35	1,392	47	1,884
Pseudotsuga menziesii	19	481	30	745	40	1,003	33	835	62	1,550
Tsuga heterophylla	1	44	0.4	28	-	-	0.1	10	0.2	14

[80] Data on seed utilisation were sourced from Coillte CGA and None-So-Hardy (Forestry) LTD. Data inclusive of subsequent sales to horticulture sector and plants for export.

Table 52: Main conifer and broadleaf sown (kgs seed & number plants ('000)) in 2022 by species and FRM category.

Species	Source ID		Selected		Qualified		Tested		Total	
	kg	Plants ('000)	kg	Plants ('000)	kg	Plants ('000)	kg	Plants ('000)	kg	Plants ('000)
Acer pseudoplatanus	48	67	-	-	8	11	-	-	56	78
Alnus glutinosa	-	-	97	2,924	-	-	-	-	97	2,924
Betula pendula	2	46	5	150	-	-	-	-	7	196
Betula pubescens	50	2,239	33	1,472	8	350	-	-	90	4,060
Fagus sylvatica	-	-	286	229	-	-	-	-	286	229
Fraxinus excelsior	-	-	-	-	-	-	-	-	-	-
Larix spp.	-	-	-	-	0.3	17	-	-	0.3	17
Picea abies	1	40	62	2,480	5	200	-	-	68	2,720
Picea sitchensis	-	-	146	14,600	-	-	207	20,745	353	35,345
Pinus contorta	-	-	41	3,674	3	305	-	-	44	3,979
Pinus sylvestris	-	-	5	200	32	1,284	10	400	47	1,884
Prunus avium	78	62	-	-	-	-	-	-	78	62
Pseudotsuga menziesii	-	-	-	-	38	960	24	590	62	1,550
Quercus petraea	907	73	3,207	257	-	-	-	-	4,114	329
Quercus robur	250	25	7,454	745	-	-	-	-	7,704	770
Tsuga heterophylla	-	-	0.2	14	-	-	-	-	0.2	14

10. International comparators

Key statistics

- At 11.4%, forest cover in Ireland in 2020 has one of the lowest in the EU 27, where the average forest cover was 38.3%; Worldwide forest cover was 31.1%;
- In 2020, public forest ownership in Ireland was at 54%, close to the EU average of 53.5%;
- Annual roundwood harvest was 4.7 million m^3, compared with an EU average of 21.8 million m^3 in the same year (2015 data);
- Fellings represented at 64.5% of annual increment in 2015, which was slightly below the EU average of 66.8%;
- Of all the EU Member States, since 1990 Ireland has had the highest rate of increase in forest expansion as a percentage of total forest cover.

10.1 Global & EU 27 Forest Cover

Despite having afforested more than 320,000 ha since 1990, Ireland remains one of the least forested countries in Europe. In 2020, when the FAO *Global Forest Resources Assessment (FRA 2020)* was published, Ireland had 11% forest cover, compared with a total forest cover of 38.3% in the EU 27 and a 31.1% forest cover worldwide (Figure 49).

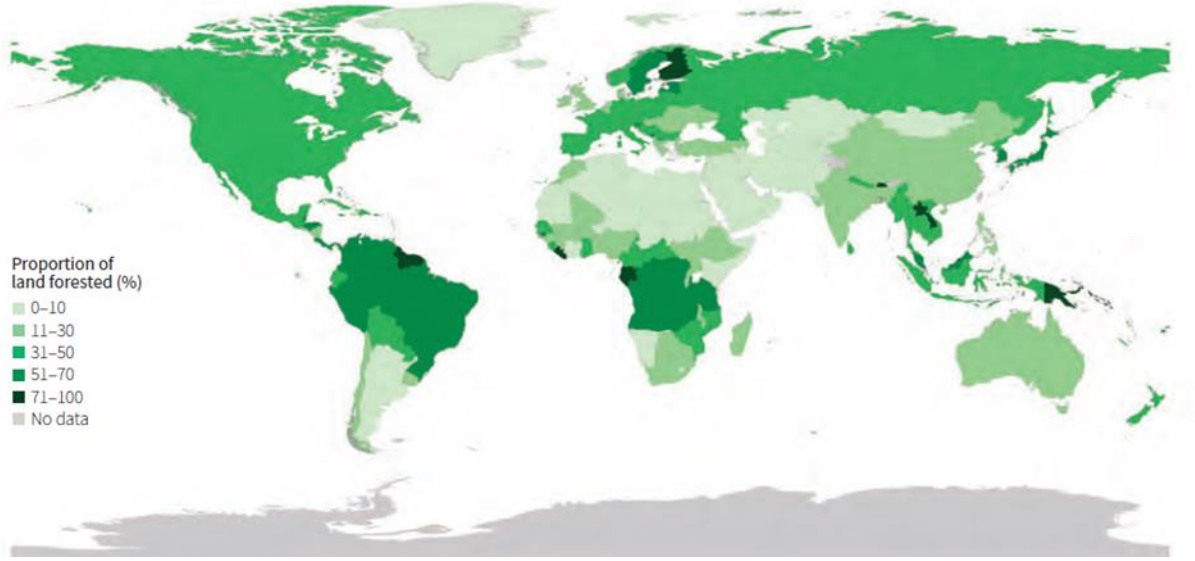

Figure 49: Forest area as a percentage of total land area (Source: FRA 2020)

The total forest area and the percentage of forest cover in European countries is detailed in Figure 50 & Figure 51. This information is from the State of Europe's Forest Report 2020 (SoEF 2020).

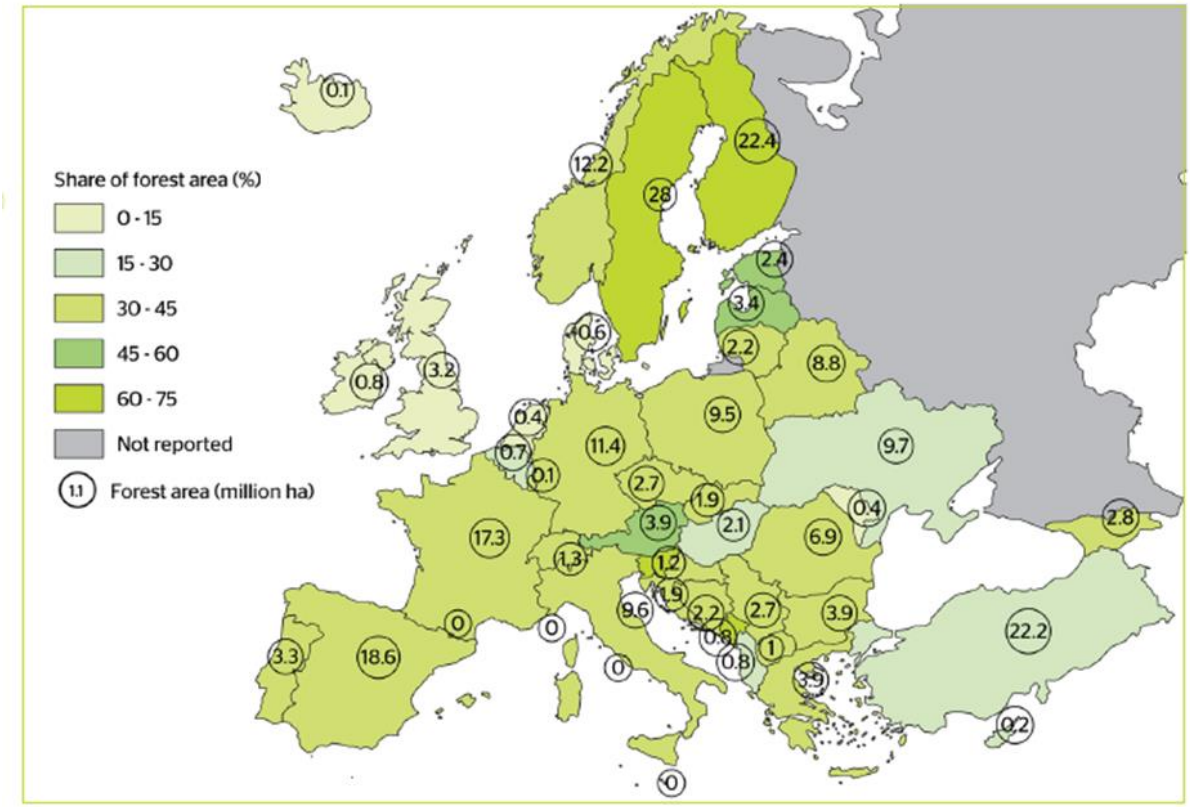

Figure 50: Forest area (million ha) and share (percentage) of country forested (Source: SoEF 2020)

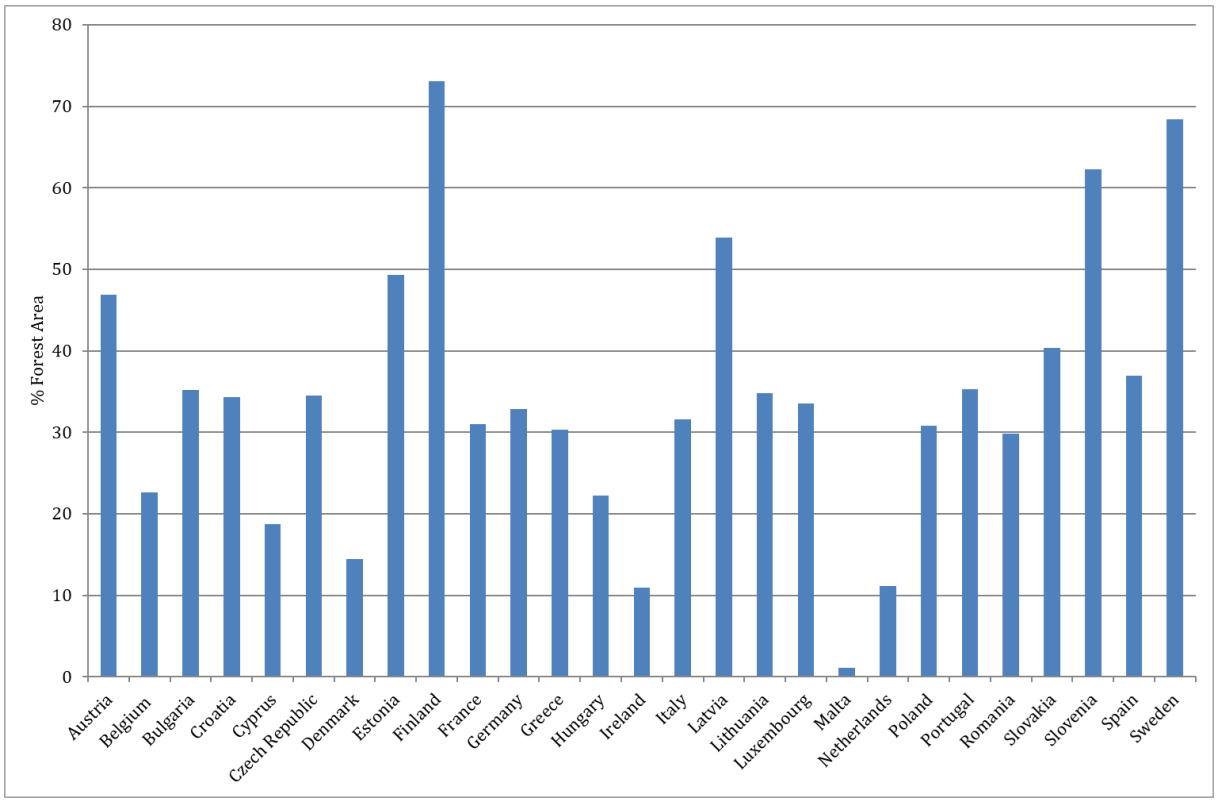

Figure 51: Forest cover in EU 27 (Source: SoEF 2020)

10.2 Forest comparison: EU 27

The *State of Europe's Forests (SoEF)* reports on the status and trends in European forests and offers a comparison of Irish forests with European counterparts. In 2020 at the time of the latest report, public forest ownership in Ireland was at 54%, close to the EU average of 53.5% (Figure 52). Due to afforestation, the proportion of privately owned forest is increasing in Ireland. Germany has the highest total growing stock of the EU 27, at over 3.6 billion m^3 (Figure 53).

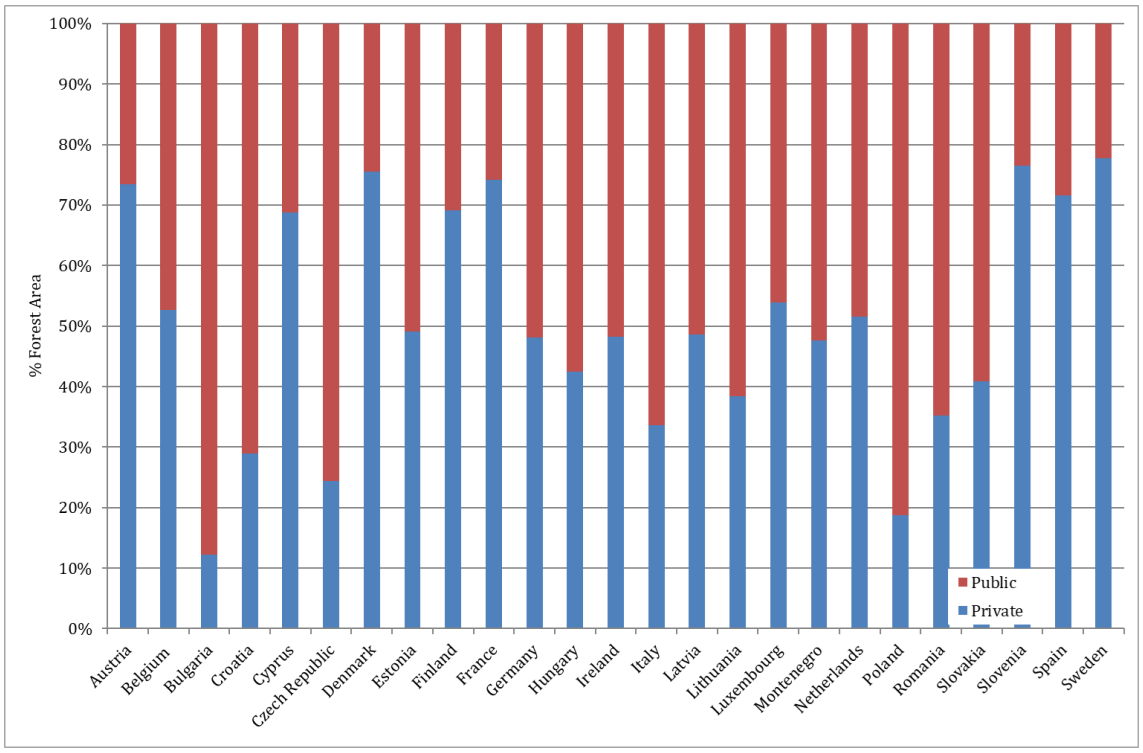

Figure 52: Forest ownership in the EU 27 (*Source: SoEF 2020*)

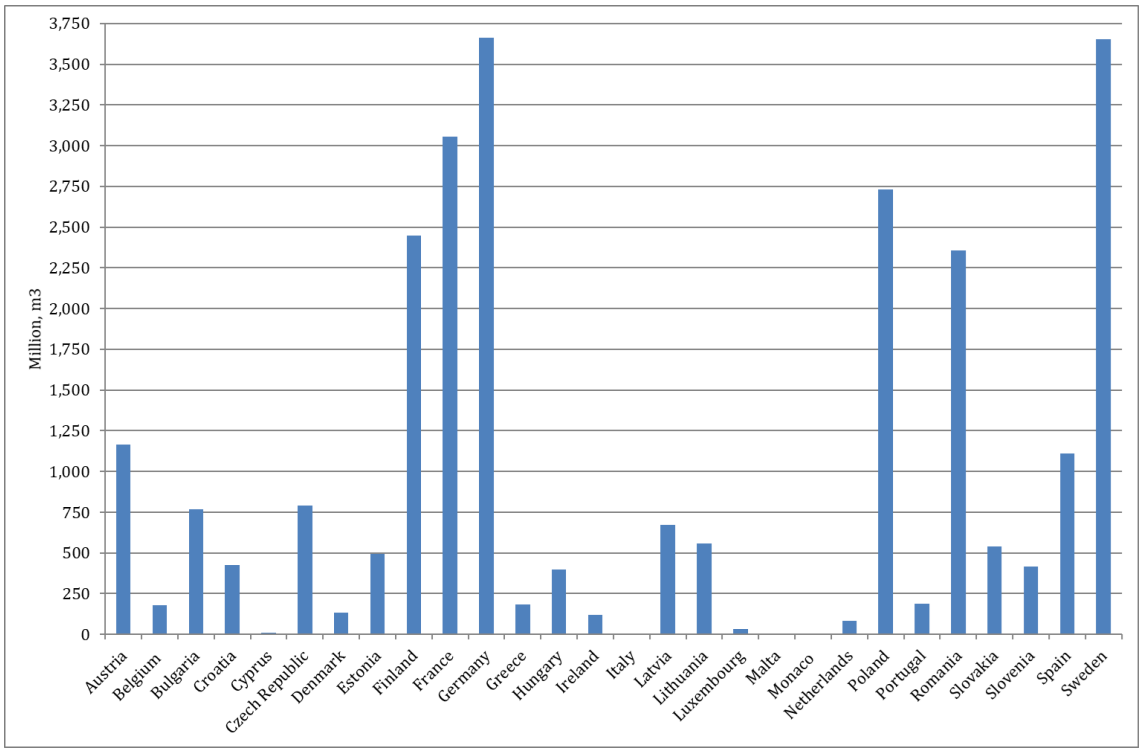

Figure 53: Growing stock in the EU 27 countries (*Source: SoEF 2020*)

Annual roundwood harvest at 4.7 million m³ in 2015 compares with an EU average of 21.8 million m³ in the same year (Figure 54). Fellings represented at 64.5% of annual increment in 2015, which was slightly below the EU average of 66.8% (Figure 55). Please note that the State of Europe's Forests 2020 only includes reports on these metrics up to 2015.

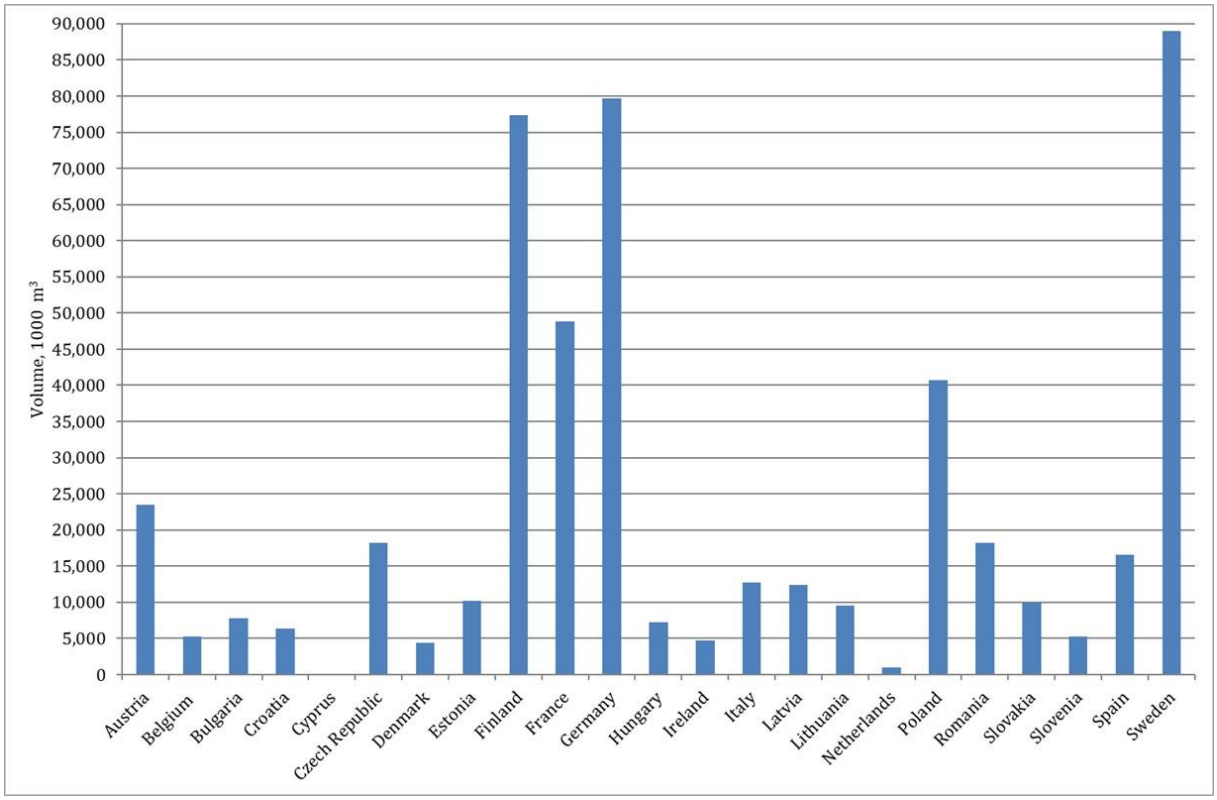

Figure 54: Felling volumes in the EU 27 (*Source: SoEF 2020*)

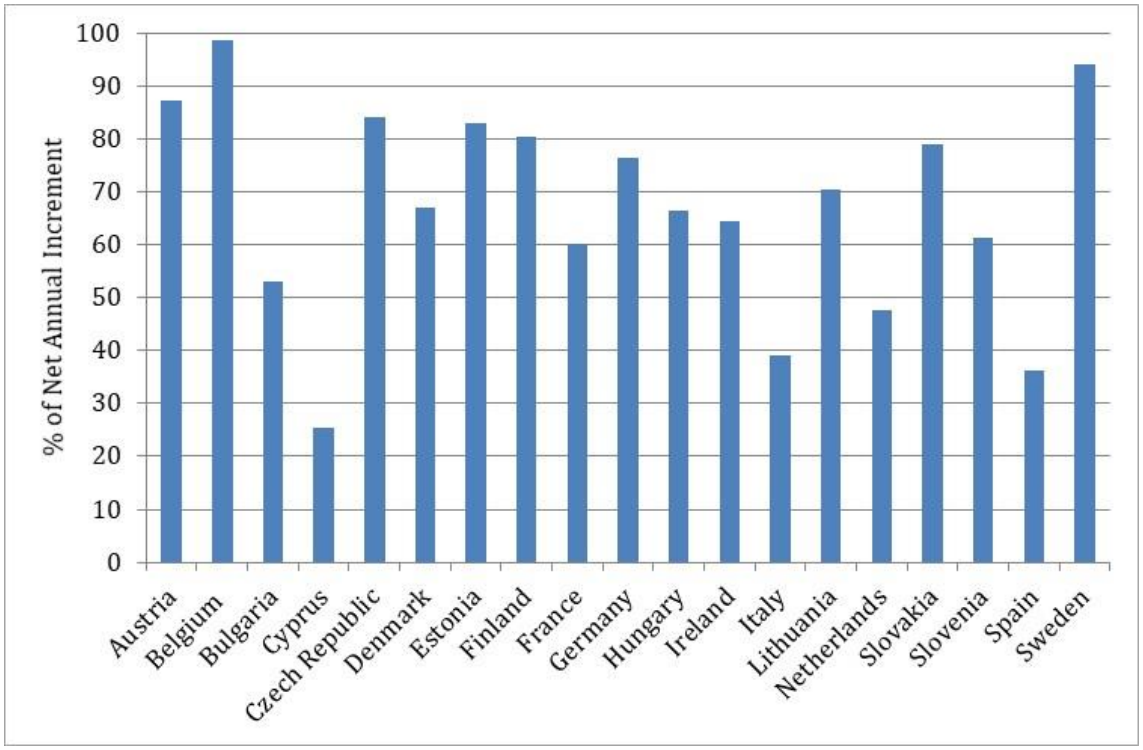

Figure 55: Harvest as a percentage of net annual increment (*Source: SoEF 2020*)

10.3 European Forest Expansion Rate

According to the *State of Europe's Forests 2020* report, since 1990 Spain has had the greatest annual expansion of forests at 156,000 ha, France at 94,000 ha and Turkey at 81,000 ha. The annual rate of change, expressed as a percentage of total forest area is highest for Iceland (3.7%), Ireland (1.8%) and Spain (1.0%) for the period 1990-2020 (Figure 56).

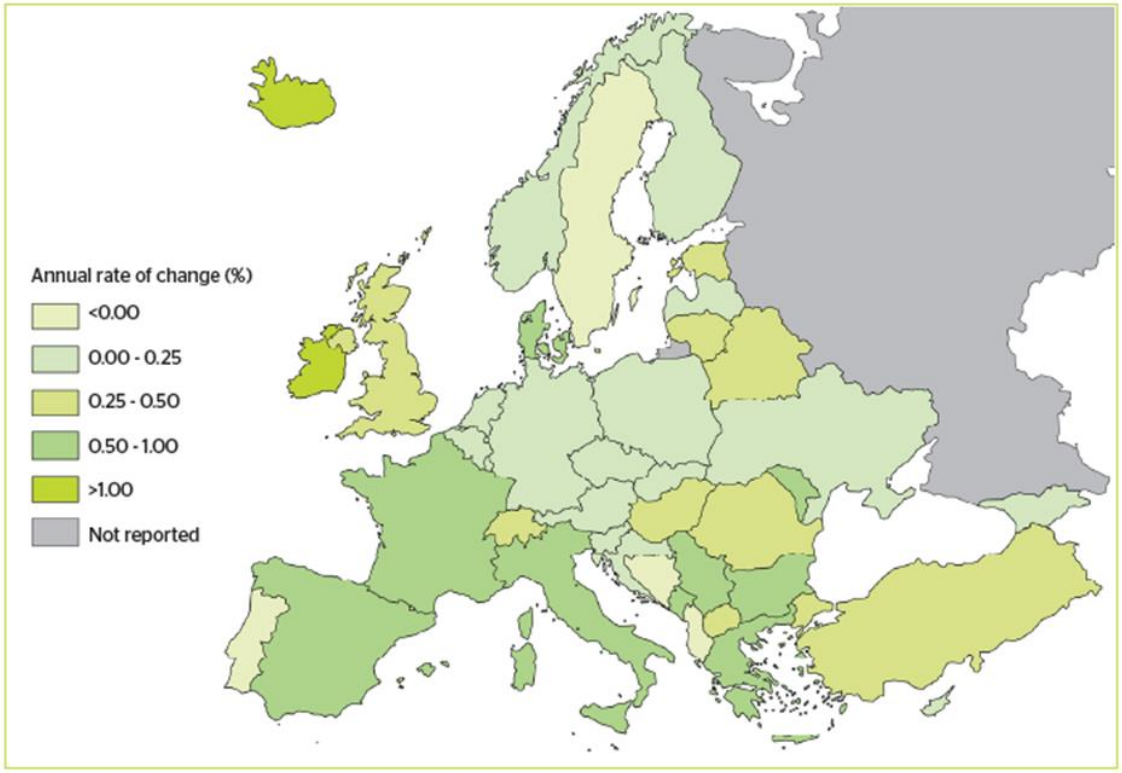

Figure 56: Annual forest area rate of change (%) by country 1990-2020 (*Source: SoEF 2020)*

NOTES

An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine