

The Second National Forest Inventory

Republic of Ireland

Results



Department of
**Agriculture,
Food and the Marine**

An Roinn
**Talmhaíochta,
Bia agus Mara**

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Covering the National Forest Inventory, 2009 to 2012

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The Forest Service of the Department of Agriculture, Food and the Marine is Ireland's national forest authority. It is responsible for the regulation of the forestry sector, the administration of forestry grant schemes, forest protection, the control of felling and the promotion and support of forest research. The Forest Service promotes Sustainable Forest Management as a central principle of Irish forest policy, whereby forests are managed to provide economic, social and environmental benefits on a sustainable basis for both current and future generations.

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Spatial Data

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Revision

Task	Description of change
7.4.1	The original statistics presented have not changed, only the text in the methodology box. The original methodology text stated incorrectly that the statistics presented were a normalised mean. The methodology text has been corrected to state that the statistics presented refer to the mean of plot sums per hectare.
7.4.2, 7.4.3 and 7.4.4	The original statistics presented were for tree volume, from ground to 7cm top diameter. In line with other tree volume derived statistics presented in Chapter 7, the revised statistics presented refer to tree volume from stump to 7cm top diameter.
9.4.1	The statistics presented have changed to net increment. The original text stated incorrectly that the derived per hectare statistics presented were gross annual increment. The text has been corrected to state that the per hectare statistics presented refer to net annual increment.
9.4.2, 9.4.3 and 9.4.4	The statistics presented have not changed, only the text in the heading and methodology box. The original text stated incorrectly that the derived per hectare statistics presented were gross annual increment. The text has been corrected to state that the per hectare statistics presented refer to net annual increment.
10.1.1 and 10.1.5	The original statistics presented have changed due to an error in the filter that was applied to select those plots with deadwood present.

LIST OF ABBREVIATIONS

BA	Basal Area
BFC	British Forestry Commission
CI	Confidence Interval
cm	Centimetres
Dbh	Diameter at breast height
ECE	Economic Commission for Europe
FAWS	Forest Available for Wood Supply
FOA	Forest Open Area
FWPM	Fresh Water Pearl Mussel
GO	Generated Origin
GPS	Global Positioning System
ha	Hectares
IFER	Institute of Forest Ecosystem Research
LUT	Land Use Type
NF	Non-Forest
NFI	National Forest Inventory
NHA	National Heritage Area
NO	New origin
NPWS	National Parks and Wildlife Service
OLL	Other Long-Lived Species
OSL	Other Short-lived species
RMSE	Root Mean Square Error
SAC	Special Area of Conservation
SFM	Sustainable Forest Management
SPA	Special Protection Area

ABSTRACT

The 2006 National Forest Inventory (NFI) was the first statistical and multi-resource inventory carried out on the national forest estate. In order to assess changes in the forest estate over time repeated assessments are required. As a result, the field data collection for the second NFI commenced in 2009 and was completed in 2012. Again multi-resource information was generated including parameters such as area and species composition, growing stock (m³), biodiversity, health and vitality, carbon content and soil type; for the entire national forest estate. Data on minor tree species and natural regeneration were also included. With this Second NFI new parameters such as forest area change, volume increment and latest harvesting volume estimates allow, for the first time, monitoring of Sustainable Forest Management (SFM) on a temporal basis.

The national forest estate is still expanding and has now reached 10.5% of the total land area, with spruce as the predominant species, but with a wide variety of forest types present. The forest estate area is classified into three forest ownership categories: Public (57%), Private (grant aided) (30%) and Private (other) (13%). Wicklow is the county with the highest percentage of forest cover (18%), while Cork has the largest forest area (83,619 ha).

The NFI results indicate that the national forest estate is an important and expanding sink for carbon, at 381 million tonnes. This carbon resource has proven to be of pivotal significance in Ireland achieving its Kyoto target under the first commitment period of 2008-2012.

The total standing growing stock of Irish forests is estimated to be over 97 million m³, an increase of over 25 million m³ on the 2006 standing volume; while growing stock volume has nearly tripled in the Private (grant aided) forests over this same time period. The total growing stock volume consists mostly of spruce and pine species however there is a significant quantity of growing stock present in older broadleaf forests.

The balance between increment and felling is an important indicator of SFM in a country as it describes the sustainability of wood production over time, the current availability of wood and the potential for the future. Gross annual volume increment between 2006 and 2012 was 7.685 million m³. The mean annual standing volume harvested within this period was 3.6 million m³. Nearly half (47%) of the gross annual increment was harvested between 2006 and 2012, demonstrating sustainable harvesting in Ireland's forest estate. Completing both the 2006 and 2012 NFI's allows, for the first time, a field-based assessment of forest increment in Ireland for the entire forest estate.

A picture also emerges of greater utilisation of the forest resource in the second NFI, with the area of forests thinned increasing by over 20,000 ha. The area of "no thin" forest has doubled in the Private (grant aided) estate to 42,010 ha since 2006, while the Public estate no thin area is estimated at 94,590 ha. The "no thin" category denotes forest theoretically at a maturity stage where it could be thinned but has not been thinned due to a variety of factors such as high windthrow risk, economic factors/considerations or thinning may be imminent.

There are a number of environmental designations that affect forest management but do not necessarily restrict all forest operations. Over half (51%) of the forest area had one or more environmental designation, compared to 43% in 2006. The increase in hen harrier SPA designations has resulted in 77,000 ha being designated since 2006. In addition 24,000 ha have been designated for the protection of the Fresh Water Pearl Mussel.

There is an important biodiversity resource within Irish forests, with many non-tree plant species and lichens frequent across the forest estate. There are significant proportions of open areas and areas with natural regeneration present, the latter particularly so in the older private forest estate. Overall, the estate appears healthy with low levels of damage.

The inventory data indicate that afforestation of peatland has become less important; as the afforestation programme is now concentrated on wet mineral soils, even though the proportion of basin peats being afforested has increased in the last ten years. However the latter trend is largely as a result of the afforestation of peatland that had already been reclaimed for agriculture. Afforestation of blanket peat is declining, reflecting a shift away from the unenclosed land type.

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Chapter 1

INTRODUCTION

1.1 OVERVIEW

1.1.1 Background

Soon after the formation of the Irish State forest cover in Ireland had fallen to its lowest level in recorded history; in 1928 just 89,000 hectares (ha) or circa 1% of the national land area was under forest cover. During the first 85 years of the 20th century, afforestation in Ireland was almost exclusively the responsibility of the State, and by 1985 forest cover had increased to approximately 411,000 ha. The mid 1980s saw a significant increase in private forest development, with the introduction of EU-funded grant schemes aimed at encouraging private land owners, mainly farmers, to become involved in forestry. As a result, the area of the national forest estate has now increased to approximately 731,000 ha. Of this, circa 53% is in public ownership and 47% in private ownership.

Despite this increase in the amount of forest cover the State did not have comprehensive inventory information of the entire national forest estate until 2007. This previous lack of information on the composition of our forests, in relation to species, timber volumes, increment and biodiversity, had been an impediment to the sustainable management and utilisation of the national forest resource.

1.1.2 NFI

The purpose of the National Forest Inventory (NFI) is to record and assess the extent and nature of Ireland's forests, both public and private, in a timely, accurate and reproducible manner to enable the sustainable development of our forest resource. Reliable, current and consistent information is required to inform domestic forest policy, to support forest research and fulfil national and international reporting commitments.

The undertaking of a NFI arose from a strategic action in the 1996 'Growing for the Future' (Anon. 1996) policy document for the development of the forest industry in Ireland. Data from the NFI is used to estimate carbon stocks through the calculation of forest biomass figures in Irish forests and greenhouse gas emissions associated with land-use change. The NFI was also initiated in response to demands for multi-resource information about Ireland's forests from international and national bodies such as the Food and Agricultural Organisation/Economic Commission for Europe (FAO/ECE).

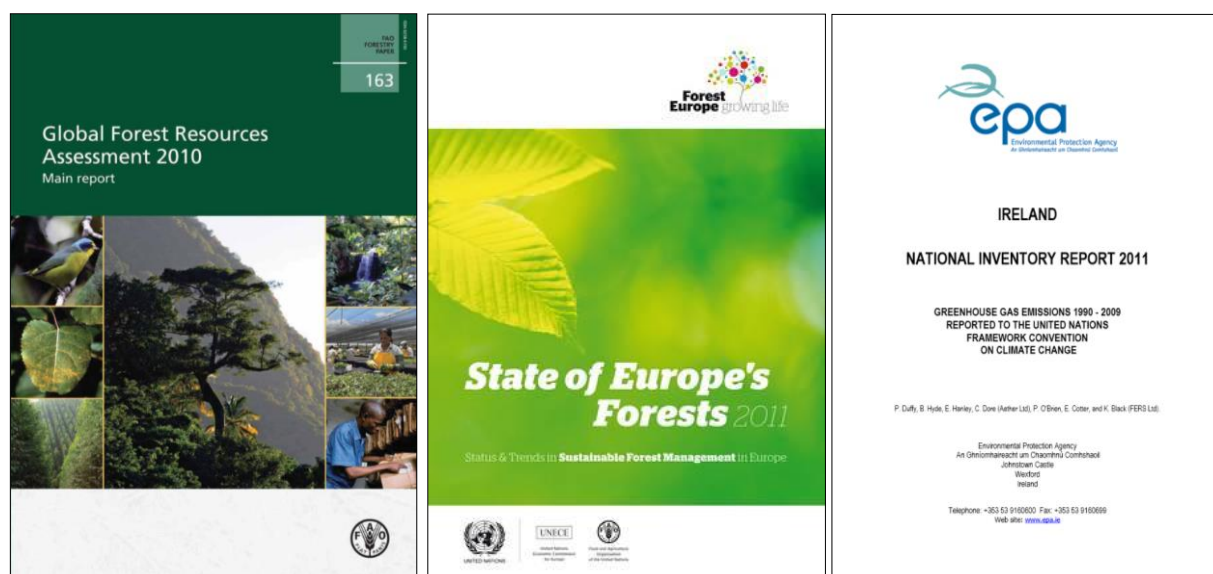


Figure 1. NFI international reporting obligations.

Between 2004 and 2006 the Forest Service carried out the first NFI of Ireland's forests, with results published in 2007. The 2006 NFI was the first purely statistical forest inventory undertaken in Ireland providing an assessment of growing stock in both the public and private national forest estates. In addition the 2006 NFI was the first multi-resource inventory of the national forest estate.

In order to assess changes in the state of Ireland's forests over time, Ireland's NFI was designed using permanent sample plots which facilitated repeat measurement programmes. This robust reporting strategy was adopted to provide credible information to address strategic objectives and reporting commitments (Figure 1). The fieldwork for the second cycle of the NFI began in 2009 and was completed in 2012

The underlying technology used in the NFI consisted of an integrated system of hardware and software developed by the Institute of Forest Ecosystem Research Ltd. (IFER), Czech Republic. It allowed for the preparation of a NFI database, background maps, and plot generation. This in turn allowed for the creation of projects for field teams, which facilitated the field data collection process.

In terms of design the NFI involved a detailed survey of permanent forest sample plots based on a randomised systematic grid sample design. A grid density of 2km x 2km provided sufficient forest plots to achieve a national estimate of volume with a precision of $\pm 5\%$, at the 95% confidence level. This grid density equated to 17,423 points nationally, each representing approximately 400 hectares (ha). Each circular NFI sample plot measures 25.24 metres (m) in diameter, comprising 500 m², and is permanent in nature to allow future re-sampling as required. Within each sample plot a variety of primary attributes were assessed, from the tree top to the soil underneath. For example, information was collected on: tree growth and development, the diversity of plant species and soil type.

To carry out the data collection work, the Forest Service recruited professional foresters, with six foresters working in the field at any one time. In total, 1,742 forest plots were assessed throughout the country in the 2006 NFI. Due to the expansion of the forest estate, additional plots were assessed in the 2012 NFI; bringing the total number of NFI plots to 1,827, with the number of plots in each county relative to the size of the county and the level of forest cover. Training, field team support, validation and other quality control procedures were undertaken by two staff to ensure data quality and the smooth running of field operations.

Following the completion of the field data collection and primary data pre-processing, data analyses were carried out. During data pre-processing, the validity of the data was checked and data values were amended where necessary. Secondary variables, such as volume increment, were also calculated. Data analysis involved the production of statistics which describe components of the national forest estate, e.g. volume of standing deadwood per hectare by ownership. Data analysis and results generation were undertaken by the Forest Service, in close collaboration with the IFER, and completed in 2013.

1.2 TECHNOLOGY FOR DATA PROCESSING

The Field-Map™ system has been designed for the whole NFI process, starting with the preparation of the data collection database, through to the field data collection and on to comprehensive data processing.

The data were stored directly into a computer database in the field. During the field data collection the data were automatically checked and verified. Thus, the field data could be processed without any intermediate steps. All the data processing was done using the original field database without conversion. During the data processing the secondary attributes were added to the database, but the database retained its original format which can easily be used for the next cycle of a repeat inventory.

A comprehensive set of data processing procedures, i.e. calculation of secondary attributes and statistical data processing, is incorporated in the Field-Map Inventory Analyst software. The software facilitates the step-by-step calculation of secondary attributes. The statistical data processing tasks are formulated and readily implemented.

1.3 PRESENTATION OF RESULTS

In this document, the main results from the NFI are presented. Statistical outputs that describe aspects of the national forest estate are included. Forest attributes (e.g. ownership) are used to classify evaluated variables (e.g. area) through the calculation of statistics (e.g. totals and/or means).

The analysis software (Field-Map Inventory Analyst) produces standardised tables and charts for reporting purposes (Figure 2). As errors are associated with all forms of sampling, most tables detail the calculated statistics with associated confidence intervals ($\alpha=0.05$). The confidence interval quantifies the uncertainty in measurement by specifying the range of values within which the true value for the whole population lies. As a 95% confidence interval is used for the NFI analysis, there is a 95% probability that the true value for the population lies within the range of values. Only sampling error is included in the confidence interval; modelling errors (e.g. volume estimation) and measurement errors (e.g. Dbh data) are not incorporated in the confidence intervals. Sub-totals are provided where a variable is classified by more than one attribute. The proportion of the variable in each classifier class is also included. Interpretation of the results is aided by the use of charts and graphs.

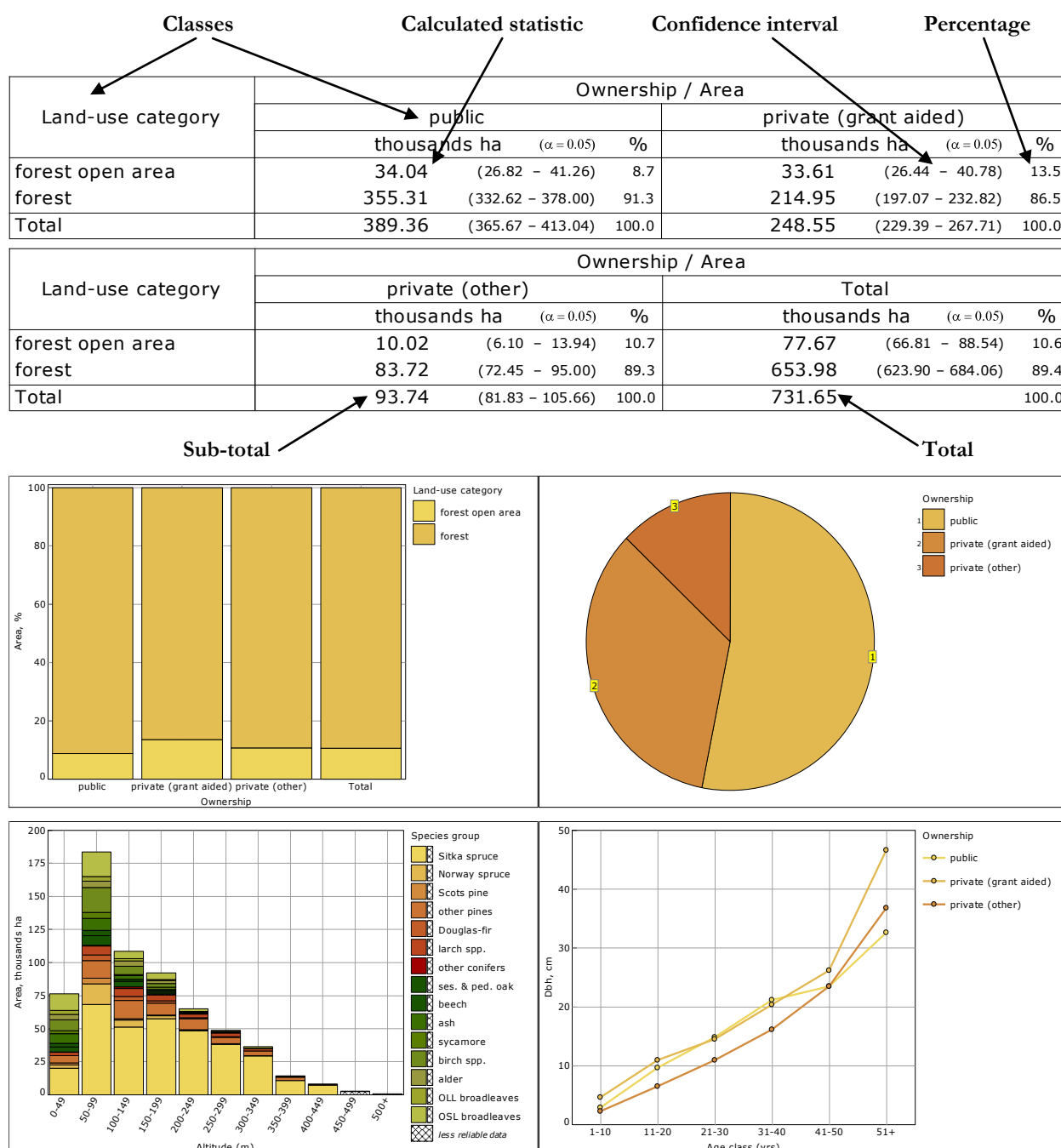


Figure 2. Example of standardised outputs.

The analysis of thirteen important forest variables is included. Each variable is presented in a separate chapter, which includes a range of statistical outputs describing the variable. For each statistical output, the attributes used for classification are defined. A brief methodology, which describes how the analysis was carried out, is also included with each analysis. The variables are commonly classified by ownership and by county.

The thirteen evaluated variables are:

1. Area
2. Structure
3. Species
4. Age
5. Forest Attributes: Dbh, Height and Basal area
6. Growing stock
7. Harvesting
8. Increment
9. Deadwood
10. Carbon
11. Health and vitality
12. Vegetation and lichens
13. Site

1.4 INTERPRETATION OF RESULTS

The following sub-sections provide guidelines to be used for results interpretation.

1.4.1 Species Composition

Careful consideration is needed in the interpretation of stocked areas of individual species presented, since many forests contain an intimate mixture of tree species. The total stocked area of a given species therefore does not represent distinct areas of land covered by pure stands of the species, but represent the sum of shares of areas of mixed forest apportioned to it.

Since the NFI used concentric circles not all trees present on the plot were assessed (Figure 3). Tree data on the inner sub-circles is expanded over the entire plot by weighting individual tree data by the respective concentric circle size. This expansion assumes that what is observed in the inner sub-circles for smaller Dbh trees, can be replicated over the whole plot.

In order to enable area related calculations, such as the determination of species composition, a procedure for the calculation of the so-called representative area of a tree is used. The area of each inventory plot was distributed among the trees proportionate to their size. Larger trees were allocated larger areas. The sum of all the individual tree representative areas within the plot is equal to the total plot area of 0.05ha. These tree representative areas are used to scale up from plot to national species composition estimates.

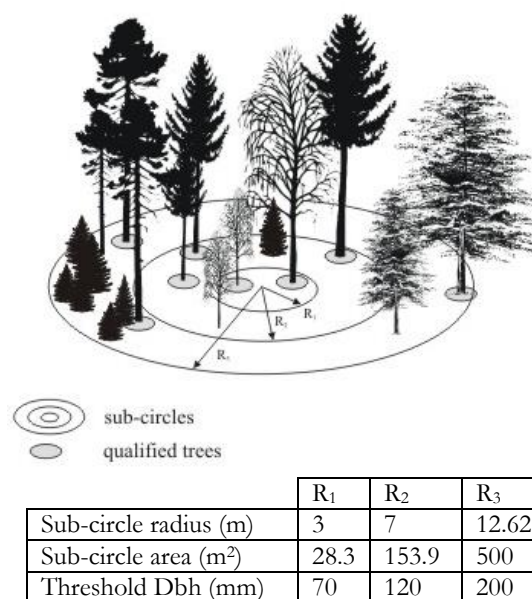


Figure 3. NFI plot design.

1.4.2 Forest Area

Forest area statistics are presented in three different ways in the results. As it is not possible to collect the same level of information on every plot (e.g. species) the total forest area is not always presented. For example, Forest Open Area plots will have no trees present, resulting in no species composition data for this plot. As a result there are three main types of forest area presented in the NFI (Figure 3):

1. Total Forest Area, 731,652 ha

Encompasses all forest land. Data collected at a plot level, such as altitude, can be presented.

2. Forest area, 653,980 ha

Excludes Forest Open Area. Data collected at a plot level, such as forest type, can be presented.

3. Stocked forest area, 637,133 ha

Excludes Forest Open Area and temporarily unstocked areas. Data that has been collected at tree level, such as species, can only be specified according to the stocked forest area.

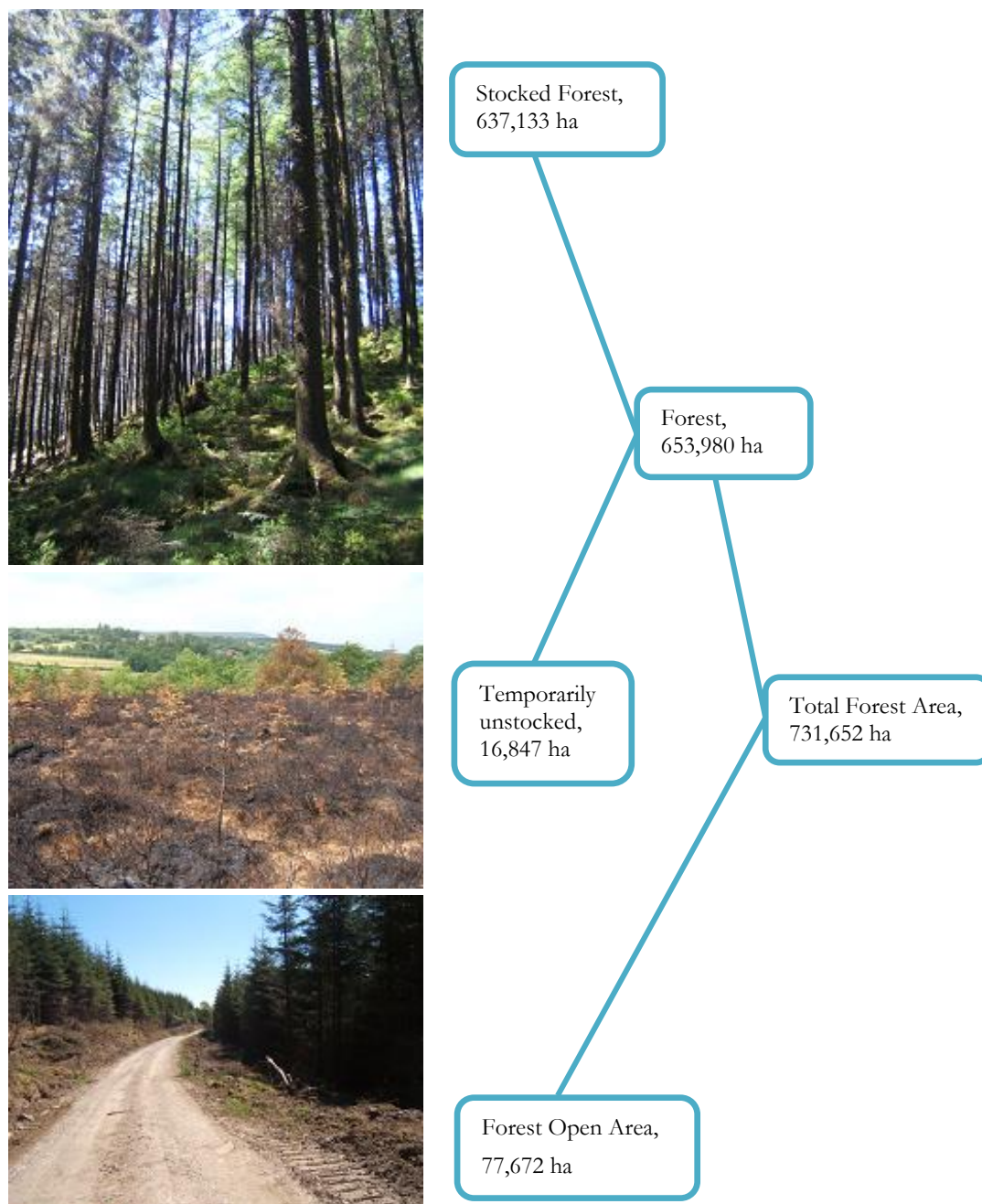


Figure 4. Forest area (ha) types reported in the NFI.

1.4.3 Accuracy of Results

The confidence interval quantifies the uncertainty in measurement by specifying the range of values within which the true value for the whole population lies. High levels of uncertainty may occur as a result of certain attributes occurring less frequently and level of classification. Particular care should be taken if the confidence interval includes zero or if the confidence interval has not been calculated. In both instances high levels of uncertainty exist around the generated statistic. Where the confidence interval has not been calculated it is indicated in the table using two hyphens and in the chart using hatched lines (Figure 5).

Species group	Ownership / Annual height increment			
	public	private (grant aided)	private (other)	All
	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)
Sitka spruce	0.54 (0.52 – 0.56)	0.69 (0.66 – 0.73)	0.42 (0.36 – 0.47)	0.59 (0.57 – 0.61)
Norway spruce	0.37 (0.33 – 0.41)	0.68 (0.65 – 0.72)	0.38 (0.12 – 0.64)	0.51 (0.42 – 0.60)
Scots pine	0.25 (0.21 – 0.30)	0.40 (0.31 – 0.49)	0.15 (0.11 – 0.18)	0.22 (0.17 – 0.27)
other pines	0.38 (0.00 – 0.88)	0.50 (0.40 – 0.60)	0.23 (0.00 – 0.46)	0.40 (0.00 – 0.89)
Douglas-fir	0.36 (0.32 – 0.40)	0.54 – –	0.44 (0.00 – 1.26)	0.41 (0.36 – 0.45)
larch spp.	0.56 (0.48 – 0.65)	0.79 (0.55 – 1.03)	0.08 (0.00 – 0.20)	0.58 (0.44 – 0.72)
other conifers	0.35 (0.00 – 0.72)	0.35 – –	0.31 (0.00 – 0.81)	0.32 (0.20 – 0.44)
ses. & ped. oak	0.17 (0.12 – 0.22)	0.28 – –	0.14 (0.00 – 0.28)	0.18 (0.14 – 0.23)
beech	0.25 (0.10 – 0.41)	– – –	0.24 (0.17 – 0.32)	0.24 (0.18 – 0.30)
ash	0.22 (0.09 – 0.36)	0.56 (0.52 – 0.60)	0.18 (0.14 – 0.22)	0.24 (0.19 – 0.30)
sycamore	0.21 (0.14 – 0.27)	0.70 – –	0.18 (0.09 – 0.27)	0.22 (0.16 – 0.28)
birch spp.	0.22 (0.16 – 0.28)	0.32 (0.00 – 1.29)	0.16 (0.11 – 0.22)	0.20 (0.17 – 0.24)
alder	0.25 (0.18 – 0.32)	0.35 (0.22 – 0.48)	0.15 (0.11 – 0.19)	0.19 (0.16 – 0.23)
OLL broadleaves	0.12 (0.06 – 0.18)	0.08 – –	0.14 (0.09 – 0.20)	0.14 (0.10 – 0.19)
OSL broadleaves	0.10 (0.06 – 0.14)	0.13 (0.00 – 0.42)	0.10 (0.06 – 0.14)	0.11 (0.08 – 0.13)
All	0.44 (0.42 – 0.46)	0.66 (0.61 – 0.70)	0.20 (0.16 – 0.24)	0.45 (0.44 – 0.47)

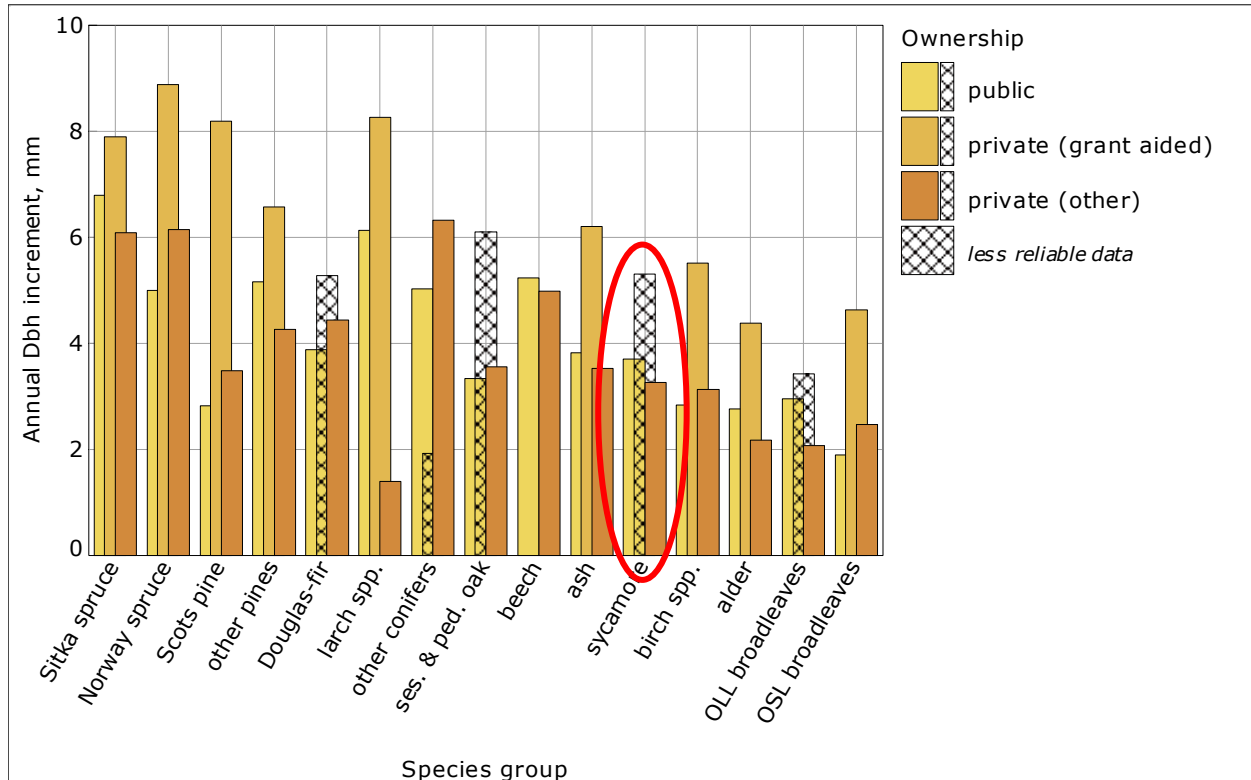


Figure 5. Forest area (ha) types reported in the NFI.

The frequency of which certain attributes occur in the forest varies. Attributes that occur less frequently tend to have poorer levels of accuracy. The problem can be exacerbated through classification. Classification by small geographic areas, results in higher error margins for those small counties. For example the mean annual volume increment per ha for Co. Dublin is $15.9\text{m}^3 \pm 8.9\text{m}^3$, while the figure for Co. Cork is $13.4\text{m}^3 \pm 1.8\text{m}^3$. As Co. Dublin has a much smaller area

of forest than Co. Cork, far fewer sample plots contribute to the result for Co. Dublin. In turn fewer plots result in a larger error margin.

Assessment of the NFI results should always be done in conjunction with the evaluation of the confidence interval presented with the statistic, which indicates the reliability of the results.

1.5 OTHER NFI PUBLICATIONS

To gain a full understanding of the results presented in this document, the NFI – *Republic of Ireland - Methodology* document should be reviewed first, and should also be referred to during the course of the interpretation of this Results document.

Two other NFI publications are available, namely:

- NFI Field Procedures and Methodology;
- NFI Main Findings.

Both documents are available at: <http://www.agriculture.gov.ie/nfi/>.

Chapter 2

AREA

The area of forest in Ireland in 2012 was 731,650 ha or 10.5% of the land area excluding inland water bodies. Since 2006, forest area has increased by 33,810 ha as a result of afforestation. Aerial photo interpretation of all 17,423 grid points was carried out in 2006 and again in 2012, with the primary aim of identifying forest plots. Other land-use types were also recorded allowing for trend analysis in land usage between these two points in time. In terms of tree cover; Other Woodland has decreased from 50,878 ha to 47,681 ha and the area of hedgerows has also decreased from 276,460 ha to 271,912 ha. The area of scrub (e.g. gorse and shrub) has decreased from 89,030 ha in 2006 to 82,606 ha in 2012. The total forest area has increased from 697,842 ha to 731,652 ha.

In terms of forest cover as a proportion of the total county land area, Co. Wicklow has the highest forest cover at 17.7%. Counties with the highest proportion of national forest area are primarily distributed along the western and south-western seaboard, with Co. Cork having the highest forest cover area at 83,619 ha or 11.6% of the national forest estate.

Forest Open Areas (e.g. firebreaks) are integral to the forest and constitute 10.6% of the total forest area. The Private (grant aided) estate has 13.5% Forest Open Area, compared to 8.7% in the Public forest. As the majority of the private estate has yet to be roaded, the Forest Open Area differential between the two ownership types will increase over time.

Forest ownership specifies land ownership. Over half (53.2%) of forests are in public ownership while 342,296 ha (46.8%) are in private ownership. The share of private forests in the national forest estate has increased by nearly 4% since 2006.

Since 2006, an additional 46,826 ha of forest has been assessed. The majority (76.1% or 35,615ha) of this area is composed of lands afforested since 2006. The remaining 11, 211 ha (23.9%) of the area should have been included in the first cycle but was not due to areas being visible on the aerial photographs used in 2006.

In the 2012 NFI, 11,612 ha of forest area that was assessed in the 2006 NFI were no longer present. The primary cause of this reduction was deforestation, amounting to 9,610 ha. It is important to state that the confidence interval on the estimate is wide (5,769-13,452 ha), ultimately reflecting the small sample size contributing to the estimate.

2.1 TOTAL AREA

The NFI is initially based on an aerial photography assessment of the entire land area, which is used to guide field sampling. An overview of the land classification system is presented in Figure 5 below.

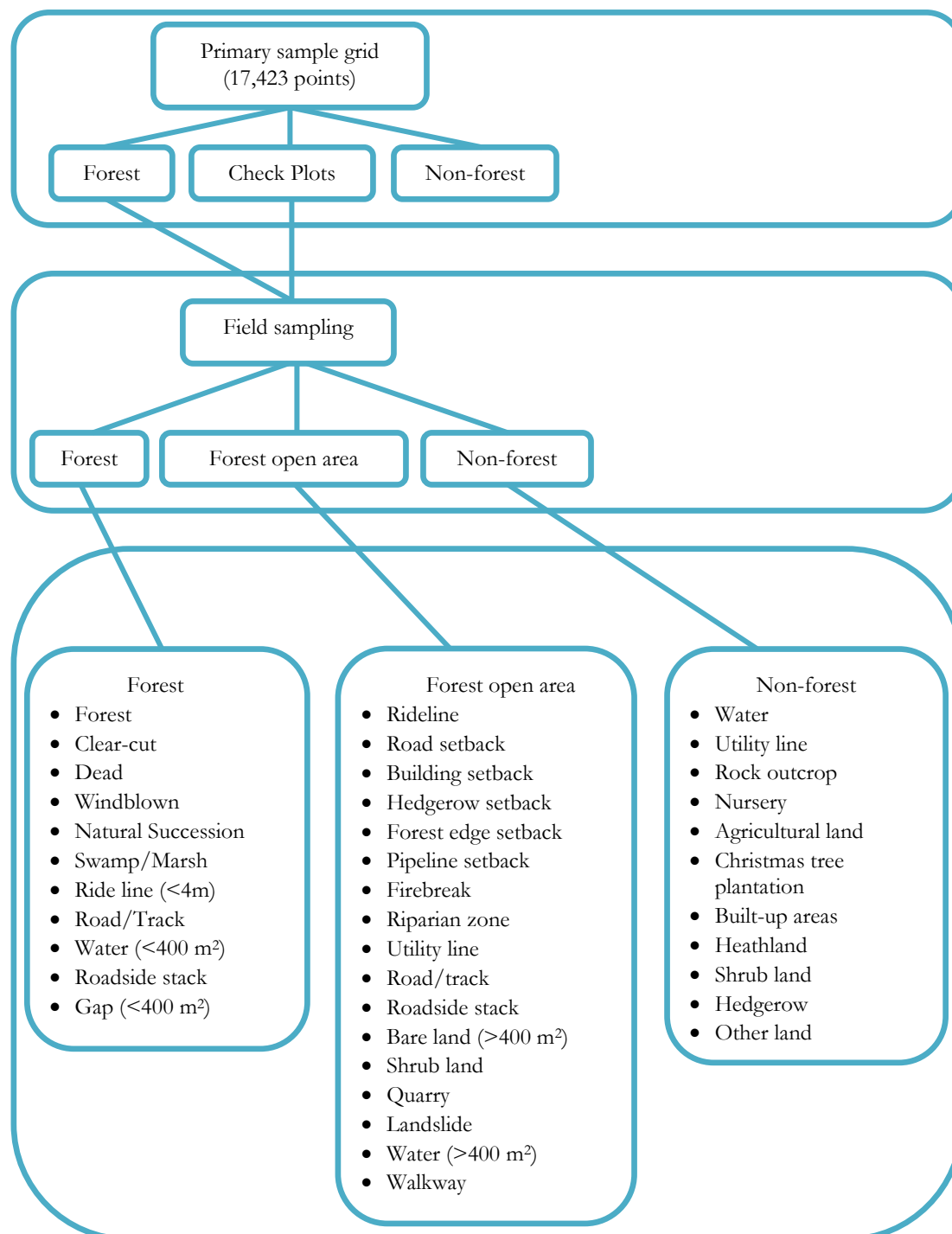


Figure 6. NFI land classification overview.

2.1.1 Total area of Ireland by land-use type summary

Definition

Forest

Land with a minimum area of 0.1 ha, a minimum width of 20 m, trees higher than 5 m and a canopy cover of more than 20% within the forest boundary, or trees able to reach these thresholds *in situ*.

Methodology

The entire land base of Ireland is represented by 17,423 NFI plots, each one representing approximately 400 ha. Land-use types were assigned to each NFI plot during an aerial photography interpretation exercise using colour aerial photographs that were obtained during 2006 and 2011 flight programmes. Plots classified as forest became the focus of the ground survey. This land-use classification is very important as it forms the basis by which future land-use change may be monitored.

The total area of Ireland classified by land-use class is summarised into the Forest and Non-Forest categories.

Land-use type	Area		
	thousands ha	($\alpha = 0.05$)	%
Forest	731.65	(700.05 – 763.25)	10.5
Non-forest	6,244.46	(6,212.86 – 6,276.06)	89.5
Total	6,976.11		100.0

2.1.2 Total area of Ireland by land-use type, 2nd cycle

Definition
Land-use type Categorises land-use into one of 19 classes.

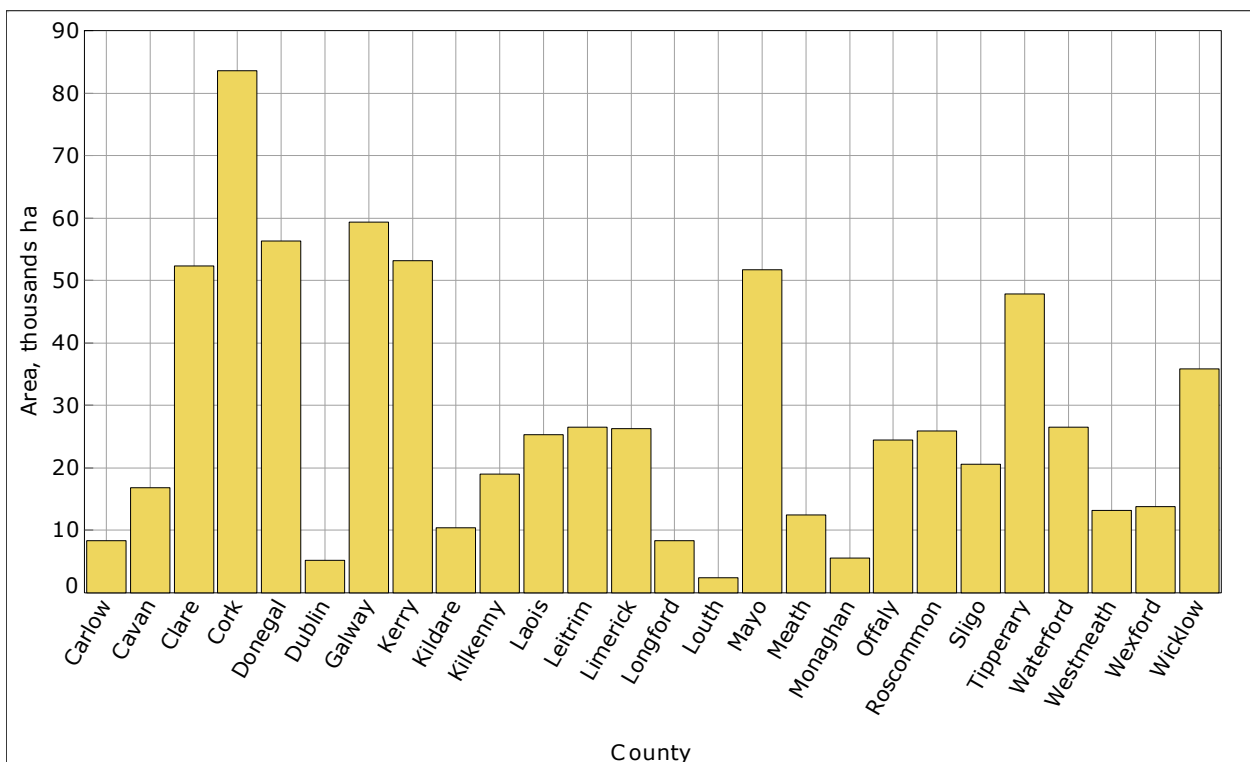
Methodology
The total area of Ireland classified by land-use type.

Land-use type	Area		
	thousands ha	($\alpha = 0.05$)	%
Forest	731.65	(700.05 - 763.25)	10.5
Hedgerow	271.91	(251.88 - 291.95)	3.9
Other Woodland	47.68	(39.15 - 56.22)	0.7
Scrub	82.61	(71.40 - 93.81)	1.2
Grassland	3,725.09	(3,674.82 - 3,775.36)	53.4
Cropland	352.26	(330.51 - 374.02)	5.0
Bog and Heath	916.41	(883.89 - 948.94)	13.1
Cutaway Peat (Domestic)	101.76	(89.41 - 114.11)	1.5
Cutaway Peat (Industrial)	67.71	(57.82 - 77.61)	1.0
Bare Rock	73.68	(63.19 - 84.18)	1.1
Quarry	12.02	(7.72 - 16.31)	0.2
Road (Paved)	92.10	(80.28 - 103.92)	1.3
Built Land (Rural)	128.85	(114.92 - 142.79)	1.8
Built Land (Urban)	70.60	(60.57 - 80.63)	1.0
Green Space (Rural)	84.56	(73.23 - 95.89)	1.2
Green Space (Urban)	28.03	(21.52 - 34.53)	0.4
Track (Unpaved Road)	22.81	(16.90 - 28.72)	0.3
Water Body	144.38	(129.75 - 159.01)	2.1
Sea & Coastal Complex	21.98	(16.19 - 27.77)	0.3
Total	6,976.11		100.0

2.1.3 Total area of forest by county

Methodology
The total forest area in Ireland is classified by county.

County	Area		
	thousands ha	($\alpha = 0.05$)	%
Carlow	8.40	(4.97 – 11.83)	1.1
Cavan	16.83	(11.96 – 21.70)	2.3
Clare	52.29	(44.06 – 60.52)	7.1
Cork	83.62	(72.93 – 94.30)	11.6
Donegal	56.34	(47.53 – 65.15)	7.7
Dublin	5.23	(2.46 – 8.00)	0.7
Galway	59.41	(50.34 – 68.48)	8.1
Kerry	53.17	(44.69 – 61.66)	7.3
Kildare	10.40	(6.52 – 14.27)	1.4
Kilkenny	19.02	(13.83 – 24.20)	2.6
Laois	25.26	(19.49 – 31.03)	3.5
Leitrim	26.50	(20.70 – 32.30)	3.6
Limerick	26.34	(20.30 – 32.38)	3.6
Longford	8.36	(4.92 – 11.81)	1.1
Louth	2.43	(0.51 – 4.35)	0.3
Mayo	51.73	(43.22 – 60.23)	7.1
Meath	12.50	(8.21 – 16.78)	1.7
Monaghan	5.60	(2.73 – 8.47)	0.8
Offaly	24.51	(18.74 – 30.28)	3.4
Roscommon	25.88	(19.87 – 31.90)	3.5
Sligo	20.58	(15.31 – 25.86)	2.8
Tipperary	47.85	(39.78 – 55.92)	6.5
Waterford	26.55	(20.62 – 32.48)	3.6
Westmeath	13.17	(8.83 – 17.50)	1.8
Wexford	13.83	(9.38 – 18.28)	1.9
Wicklow	35.86	(29.09 – 42.62)	4.9
Total	731.65		100.0



2.1.4 Total county area by land-use type summary

Methodology

The total of each county is classified into Forest and Non-Forest.

Land-use type	County / Area					
	Carlow			Cavan		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Forest	8.40	(4.97 - 11.83)	9.4	16.83	(11.96 - 21.70)	8.7
Non-forest	81.22	(77.80 - 84.65)	90.6	176.71	(171.84 - 181.58)	91.3
Total	89.63		100.0	193.54		100.0
Land-use type	County / Area					
	Clare			Cork		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Forest	52.29	(44.06 - 60.52)	16.4	83.62	(72.93 - 94.30)	11.2
Non-forest	267.48	(259.26 - 275.71)	83.6	662.95	(652.27 - 673.64)	88.8
Total	319.77		100.0	746.57		100.0
Land-use type	County / Area					
	Donegal			Dublin		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Forest	56.34	(47.53 - 65.15)	11.6	5.23	(2.46 - 8.00)	5.7
Non-forest	429.27	(420.46 - 438.08)	88.4	87.33	(84.57 - 90.10)	94.3
Total	485.62		100.0	92.57		100.0
Land-use type	County / Area					
	Galway			Kerry		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Forest	59.41	(50.34 - 68.48)	9.7	53.17	(44.69 - 61.66)	11.2
Non-forest	553.02	(543.95 - 562.09)	90.3	421.83	(413.34 - 430.31)	88.8
Total	612.43		100.0	475.00		100.0
Land-use type	County / Area					
	Kildare			Kilkenny		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Forest	10.40	(6.52 - 14.27)	6.1	19.02	(13.83 - 24.20)	9.2
Non-forest	159.14	(155.26 - 163.02)	93.9	187.32	(182.14 - 192.51)	90.8
Total	169.54		100.0	206.34		100.0
Land-use type	County / Area					
	Laois			Leitrim		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Forest	25.26	(19.49 - 31.03)	14.7	26.50	(20.70 - 32.30)	16.7
Non-forest	146.74	(140.97 - 152.51)	85.3	132.51	(126.71 - 138.31)	83.3
Total	172.00		100.0	159.01		100.0
Land-use type	County / Area					
	Limerick			Longford		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Forest	26.34	(20.30 - 32.38)	9.8	8.36	(4.92 - 11.81)	7.7
Non-forest	242.22	(236.18 - 248.26)	90.2	100.77	(97.32 - 104.21)	92.3
Total	268.56		100.0	109.13		100.0
Land-use type	County / Area					
	Louth			Mayo		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Forest	2.43	(0.51 - 4.35)	2.9	51.73	(43.22 - 60.23)	9.2
Non-forest	80.13	(78.21 - 82.05)	97.1	508.04	(499.53 - 516.54)	90.8
Total	82.56		100.0	559.76		100.0
Land-use type	County / Area					
	Meath			Monaghan		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Forest	12.50	(8.21 - 16.78)	5.3	5.60	(2.73 - 8.47)	4.3
Non-forest	221.71	(217.43 - 225.99)	94.7	123.95	(121.07 - 126.82)	95.7
Total	234.21		100.0	129.54		100.0

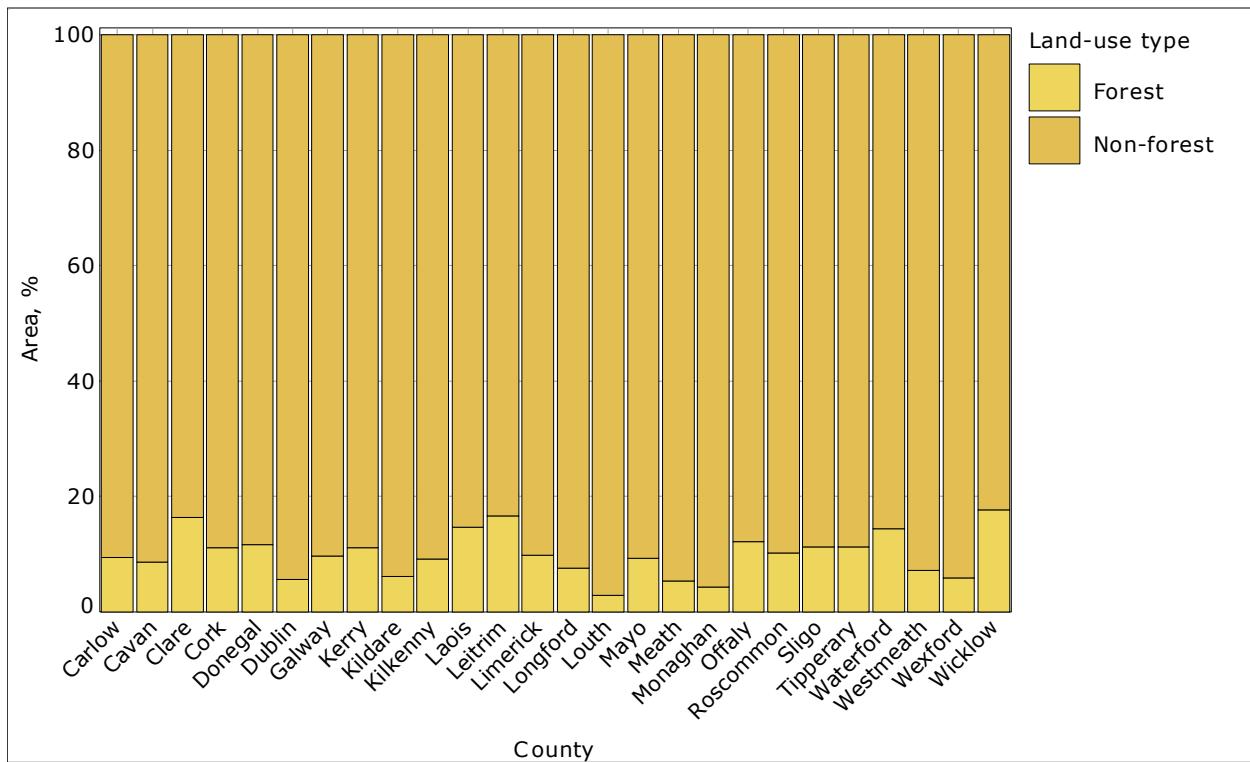
Land-use type	County / Area					
	Offaly			Roscommon		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Forest	24.51	(18.74 - 30.28)	12.2	25.88	(19.87 - 31.90)	10.2
Non-forest	175.59	(169.83 - 181.36)	87.8	228.92	(222.90 - 234.93)	89.8
Total	200.10		100.0	254.80		100.0

Land-use type	County / Area					
	Sligo			Tipperary		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Forest	20.58	(15.31 - 25.86)	11.2	47.85	(39.78 - 55.92)	11.2
Non-forest	163.09	(157.81 - 168.36)	88.8	377.61	(369.54 - 385.68)	88.8
Total	183.67		100.0	425.46		100.0

Land-use type	County / Area					
	Waterford			Westmeath		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Forest	26.55	(20.62 - 32.48)	14.4	13.17	(8.83 - 17.50)	7.2
Non-forest	157.27	(151.34 - 163.20)	85.6	170.78	(166.45 - 175.12)	92.8
Total	183.81		100.0	183.95		100.0

Land-use type	County / Area					
	Wexford			Wicklow		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Forest	13.83	(9.38 - 18.28)	5.9	35.86	(29.09 - 42.62)	17.7
Non-forest	222.06	(217.61 - 226.51)	94.1	166.80	(160.04 - 173.57)	82.3
Total	235.89		100.0	202.66		100.0

Land-use type	County / Area		
	Total		
	thousands ha	($\alpha = 0.05$)	%
Forest	731.65	(700.05 - 763.25)	10.5
Non-forest	6,244.46	(6,212.86 - 6,276.06)	89.5
Total	6,976.11		100.0



2.2 LAND-USE CLASS

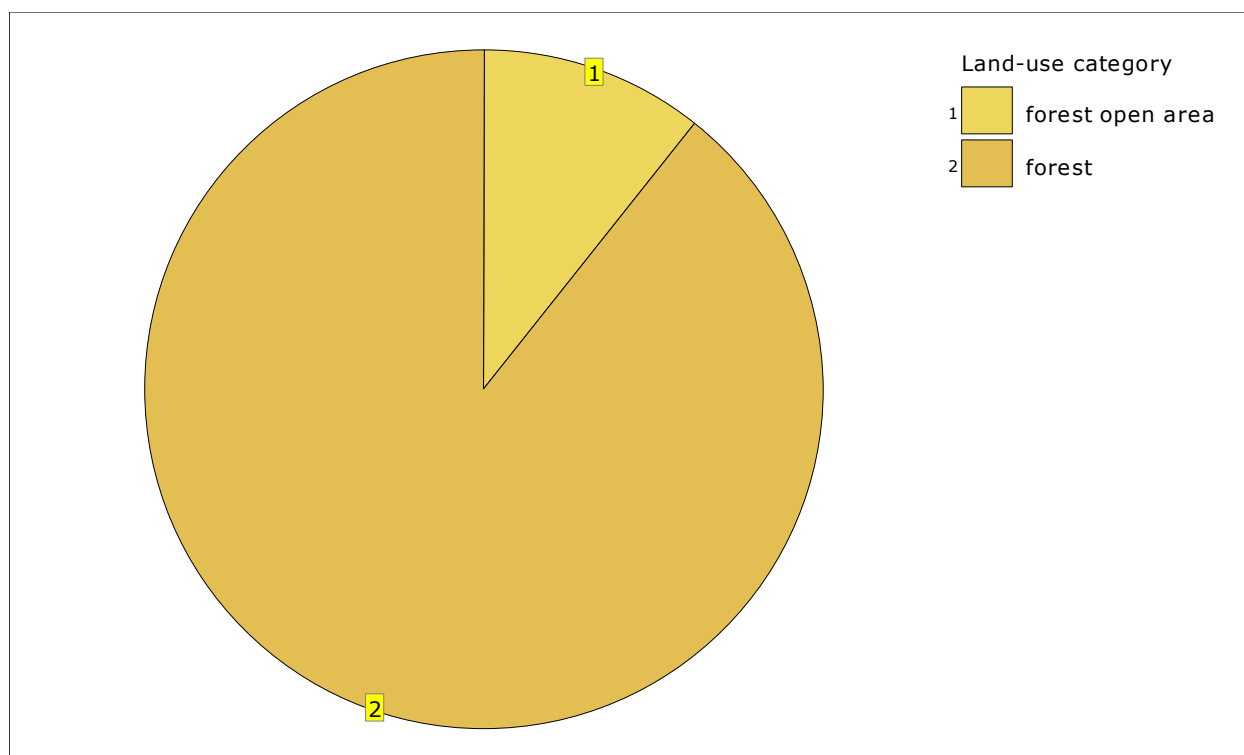
2.2.1 Total area of Ireland by land-use category

Definition
Land-use category
Classification of Forest land into, Forest and Forest Open Area.

Definition
Forest Open Area
Forest Open Area is a non-stocked forest area (>400 m ²) enclosed within the forest boundary. These areas are integral to the composition of Irish forests and can be readily verified by ground check.

Methodology
NFI plots classified as forest during an aerial photography interpretation exercise were verified by ground check and classified into land-use categories: Forest and Forest Open Area.

Land-use category	Area		
	thousands ha	($\alpha = 0.05$)	%
forest open area	77.67	(66.81 – 88.54)	10.6
forest	653.98	(623.90 – 684.06)	89.4
Total	731.65		100.0



2.2.2 Total forest area by land-use class

Definition

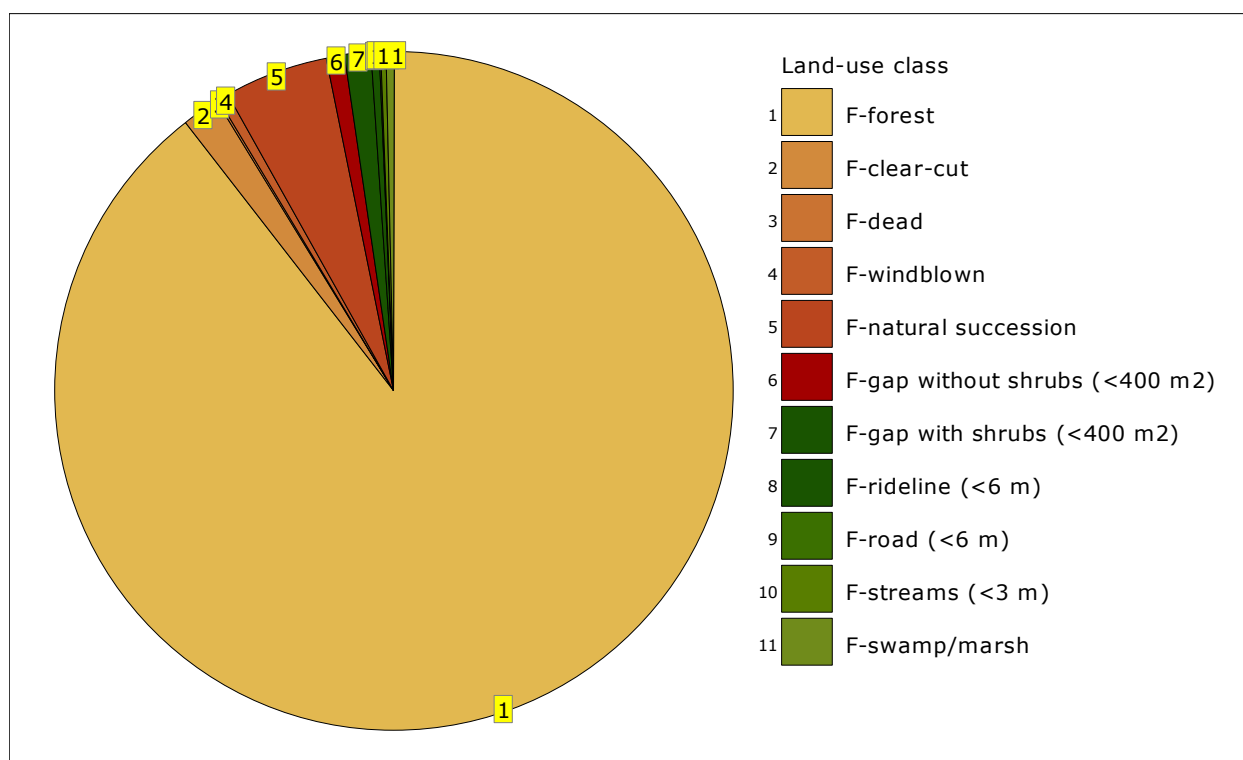
Land-use class

The sub-categorisation of the land-use categories, Forest and Forest Open Area, into classes that describe the forest estate in more specific terms.

Methodology

The total area in land-use category Forest is classified by land-use class.

Land-use class	Area		
	thousands ha	($\alpha = 0.05$)	%
F-forest	585.12	(575.47 – 594.77)	89.5
F-clear-cut	11.60	(7.43 – 15.77)	1.8
F-dead	0.81	(0.00 – 1.93)	0.1
F-windblown	3.20	(0.99 – 5.41)	0.5
F-natural succession	32.00	(25.24 – 38.76)	4.9
F-gap without shrubs (<400 m ²)	6.01	(2.99 – 9.04)	0.9
F-gap with shrubs (<400 m ²)	8.00	(4.54 – 11.47)	1.2
F-rideline (<6 m)	2.41	(0.49 – 4.34)	0.4
F-road (<6 m)	0.40	(0.00 – 1.19)	0.06
F-streams (<3 m)	1.61	(0.03 – 3.18)	0.2
F-swamp/marsh	2.81	(0.73 – 4.90)	0.4
Total	653.98		100.0

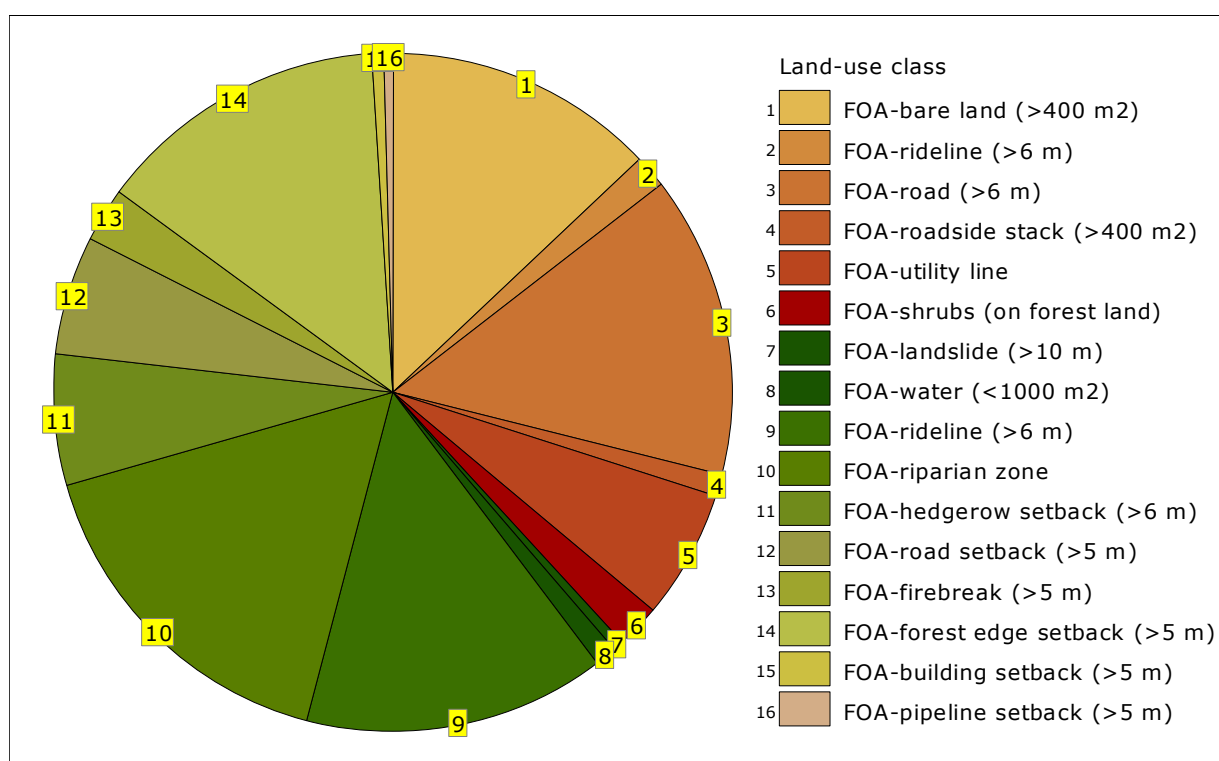


2.2.3 Total Forest Open Area by land-use class

Methodology

The total area in land-use category Forest Open Area (FOA) is classified by land-use class.

Land-use class	Area		
	thousands ha	($\alpha = 0.05$)	%
FOA-bare land (>400 m ²)	10.00	(6.08 – 13.91)	12.9
FOA-rideline (>6 m)	1.21	(0.00 – 2.58)	1.6
FOA-road (>6 m)	11.22	(7.06 – 15.37)	14.4
FOA-roadside stack (>400 m ²)	0.80	(0.00 – 1.92)	1.0
FOA-utility line	4.82	(2.09 – 7.54)	6.2
FOA-shrubs (on forest land)	1.61	(0.03 – 3.18)	2.1
FOA-landslide (>10 m)	0.40	(0.00 – 1.18)	0.5
FOA-water (<1000 m ²)	0.80	(0.00 – 1.91)	1.0
FOA-rideline (>6 m)	11.20	(7.05 – 15.34)	14.4
FOA-riparian zone	12.83	(8.39 – 17.27)	16.5
FOA-hedgerow setback (>6 m)	4.80	(2.09 – 7.52)	6.2
FOA-road setback (>5 m)	4.40	(1.80 – 7.00)	5.7
FOA-firebreak (>5 m)	2.00	(0.25 – 3.75)	2.6
FOA-forest edge setback (>5 m)	10.81	(6.73 – 14.88)	13.9
FOA-building setback (>5 m)	0.40	(0.00 – 1.18)	0.5
FOA-pipeline setback (>5 m)	0.40	(0.00 – 1.17)	0.5
Total	77.67		100.0



2.3 FOREST OWNERSHIP

2.3.1 Total forest area by ownership

Definition

Ownership

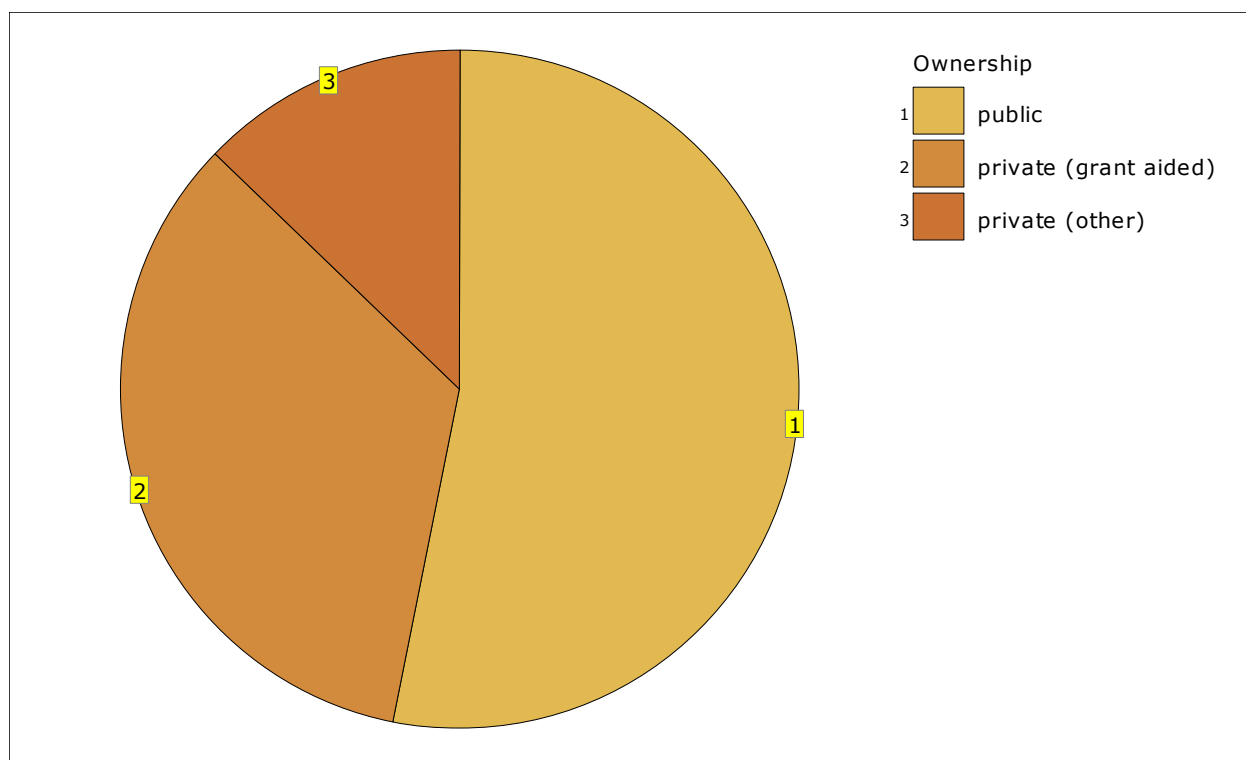
Specifies forest ownership.

1. **Public:** All state owned forests
2. **Private (grant aided):** Private afforested land in receipt of either grant and/or premium since 1980.
3. **Private (other):** Private non grant aided plantations or naturally regenerated forests.

Methodology

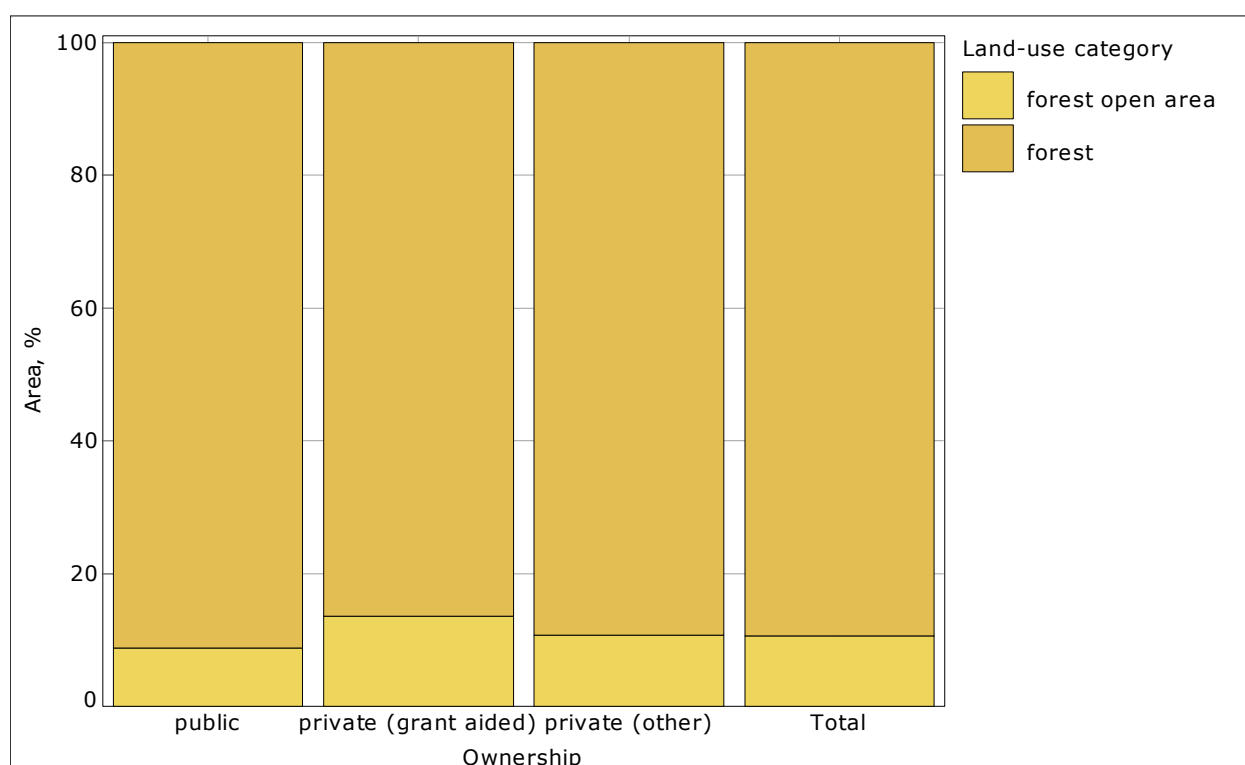
The total forest area (i.e. Forest and Forest Open Area) is classified by ownership.

Ownership	Area		
	thousands ha	($\alpha = 0.05$)	%
public	389.36	(365.67 – 413.04)	53.2
private (grant aided)	248.55	(229.39 – 267.71)	34.0
private (other)	93.74	(81.83 – 105.66)	12.8
Total	731.65		100.0



2.3.2 Total forest area by ownership and land-use category

Methodology						
The total forest area is classified by ownership and land-use category.						
Land-use category	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
forest open area	34.04	(26.82 – 41.26)	8.7	33.61	(26.44 – 40.78)	13.5
forest	355.31	(332.62 – 378.00)	91.3	214.95	(197.07 – 232.82)	86.5
Total	389.36	(365.67 – 413.04)	100.0	248.55	(229.39 – 267.71)	100.0
Land-use category	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
forest open area	10.02	(6.10 – 13.94)	10.7	77.67	(66.81 – 88.54)	10.6
forest	83.72	(72.45 – 95.00)	89.3	653.98	(623.90 – 684.06)	89.4
Total	93.74	(81.83 – 105.66)	100.0	731.65		100.0

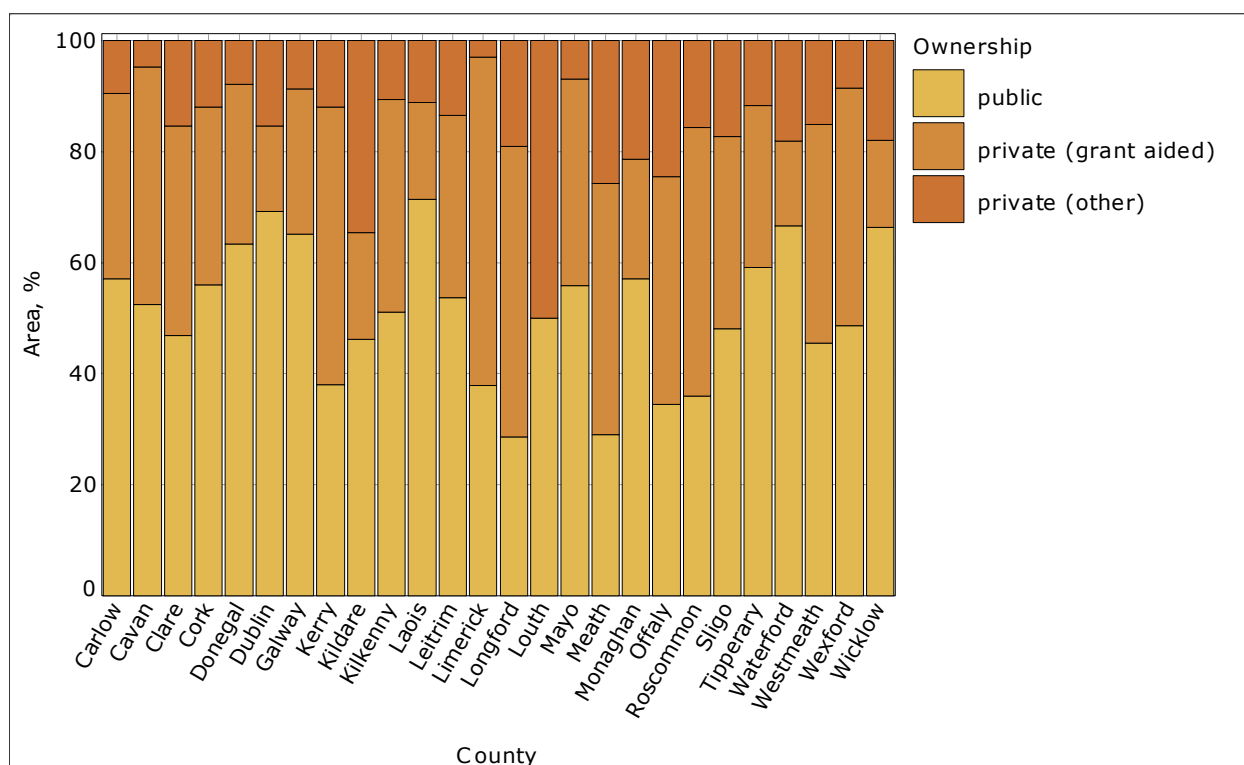


2.3.3 Total forest area by county and ownership.

Methodology						
The total forest area is classified by county and ownership.						
Ownership	County / Area					
	Carlow			Cavan		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
public	4.80	(2.15 – 7.45)	57.2	8.82	(5.21 – 12.42)	52.3
private (grant aided)	2.80	(0.75 – 4.85)	33.3	7.21	(3.94 – 10.49)	42.9
private (other)	0.80	(0.00 – 1.91)	9.5	0.80	(0.00 – 1.91)	4.8
Total	8.40		100.0	16.83		100.0

Ownership	County / Area			
	Clare		Cork	
	thousands ha	($\alpha = 0.05$) %	thousands ha	($\alpha = 0.05$) %
public	24.54	(18.62 – 30.46)	46.81	(38.60 – 55.02)
private (grant aided)	19.71	(14.36 – 25.06)	26.81	(20.50 – 33.11)
private (other)	8.04	(4.56 – 11.53)	10.00	(6.11 – 13.90)
Total	52.29	100.0	83.62	100.0
Ownership	County / Area			
	Donegal		Dublin	
	thousands ha	($\alpha = 0.05$) %	thousands ha	($\alpha = 0.05$) %
public	35.67	(28.49 – 42.85)	3.62	(1.30 – 5.95)
private (grant aided)	16.21	(11.27 – 21.16)	0.80	(0.00 – 1.92)
private (other)	4.46	(1.84 – 7.08)	0.80	(0.00 – 1.92)
Total	56.34	100.0	5.23	100.0
Ownership	County / Area			
	Galway		Kerry	
	thousands ha	($\alpha = 0.05$) %	thousands ha	($\alpha = 0.05$) %
public	38.68	(31.22 – 46.13)	20.24	(14.80 – 25.67)
private (grant aided)	15.55	(10.73 – 20.37)	26.59	(20.40 – 32.78)
private (other)	5.18	(2.38 – 7.99)	6.35	(3.26 – 9.44)
Total	59.41	100.0	53.17	100.0
Ownership	County / Area			
	Kildare		Kilkenny	
	thousands ha	($\alpha = 0.05$) %	thousands ha	($\alpha = 0.05$) %
public	4.80	(2.12 – 7.48)	9.71	(5.91 – 13.51)
private (grant aided)	2.00	(0.26 – 3.74)	7.28	(3.98 – 10.59)
private (other)	3.60	(1.27 – 5.93)	2.02	(0.26 – 3.79)
Total	10.40	100.0	19.02	100.0
Ownership	County / Area			
	Laois		Leitrim	
	thousands ha	($\alpha = 0.05$) %	thousands ha	($\alpha = 0.05$) %
public	18.04	(13.05 – 23.03)	14.24	(9.80 – 18.68)
private (grant aided)	4.41	(1.83 – 6.99)	8.70	(5.16 – 12.24)
private (other)	2.81	(0.74 – 4.87)	3.56	(1.26 – 5.86)
Total	25.26	100.0	26.50	100.0
Ownership	County / Area			
	Limerick		Longford	
	thousands ha	($\alpha = 0.05$) %	thousands ha	($\alpha = 0.05$) %
public	9.98	(6.14 – 13.82)	2.39	(0.50 – 4.28)
private (grant aided)	15.56	(10.82 – 20.31)	4.38	(1.84 – 6.92)
private (other)	0.80	(0.00 – 1.90)	1.59	(0.04 – 3.15)
Total	26.34	100.0	8.36	100.0
Ownership	County / Area			
	Louth		Mayo	
	thousands ha	($\alpha = 0.05$) %	thousands ha	($\alpha = 0.05$) %
public	1.21	(0.00 – 2.58)	28.87	(22.37 – 35.37)
private (grant aided)	–	–	19.25	(13.89 – 24.60)
private (other)	1.21	(0.00 – 2.58)	3.61	(1.26 – 5.96)
Total	2.43	100.0	51.73	100.0
Ownership	County / Area			
	Meath		Monaghan	
	thousands ha	($\alpha = 0.05$) %	thousands ha	($\alpha = 0.05$) %
public	3.63	(1.27 – 5.98)	3.20	(1.01 – 5.39)
private (grant aided)	5.64	(2.72 – 8.57)	1.20	(0.00 – 2.55)
private (other)	3.22	(1.00 – 5.45)	1.20	(0.00 – 2.55)
Total	12.50	100.0	5.60	100.0

Ownership	County / Area					
	Offaly			Roscommon		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
public	8.44	(4.90 – 11.97)	34.4	9.30	(5.57 – 13.04)	35.9
private (grant aided)	10.05	(6.20 – 13.89)	41.0	12.54	(8.23 – 16.84)	48.5
private (other)	6.03	(3.02 – 9.03)	24.6	4.04	(1.56 – 6.53)	15.6
Total	24.51		100.0	25.88		100.0
Ownership	County / Area					
	Sligo			Tipperary		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
public	9.90	(6.12 – 13.67)	48.1	28.31	(21.95 – 34.68)	59.1
private (grant aided)	7.13	(3.89 – 10.36)	34.6	13.96	(9.41 – 18.50)	29.2
private (other)	3.56	(1.26 – 5.87)	17.3	5.58	(2.68 – 8.49)	11.7
Total	20.58		100.0	47.85		100.0
Ownership	County / Area					
	Waterford			Westmeath		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
public	17.70	(12.72 – 22.67)	66.6	5.99	(3.00 – 8.97)	45.4
private (grant aided)	4.02	(1.55 – 6.49)	15.2	5.19	(2.40 – 7.97)	39.4
private (other)	4.83	(2.13 – 7.52)	18.2	2.00	(0.25 – 3.74)	15.2
Total	26.55		100.0	13.17		100.0
Ownership	County / Area					
	Wexford			Wicklow		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
public	6.72	(3.57 – 9.87)	48.5	23.77	(18.07 – 29.48)	66.3
private (grant aided)	5.93	(2.96 – 8.89)	42.9	5.64	(2.72 – 8.56)	15.7
private (other)	1.19	(0.00 – 2.52)	8.6	6.45	(3.34 – 9.56)	18.0
Total	13.83		100.0	35.86		100.0



2.4 STOCKING STATUS

2.4.1 Forest area by stocking status

Definition

Stocking status

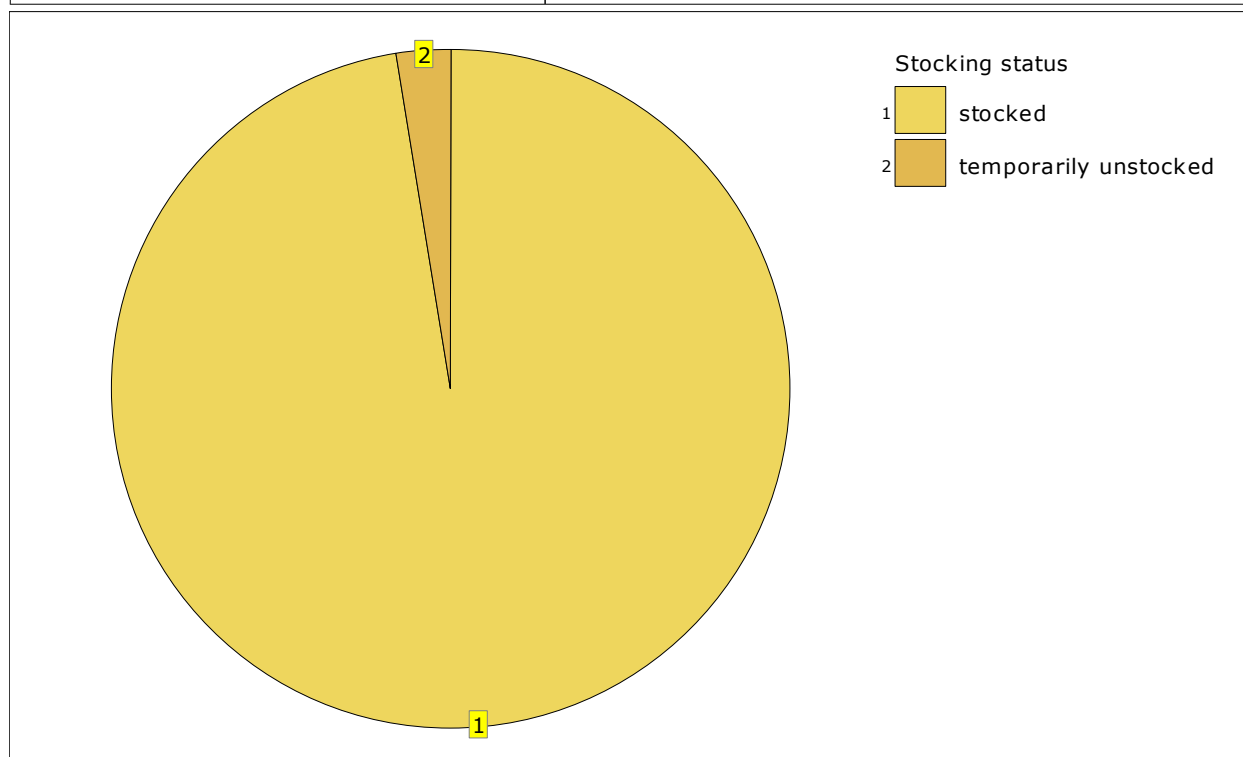
Classifies the forest area into stocked and unstocked areas.

1. **Stocked forest area:** Forest estate with trees present on site.
2. **Temporarily unstocked:** Forest area with no trees present, but will likely be replanted e.g. recently felled area.

Methodology

The total area in land-use category Forest is classified by stocking status.

Stocking status	Area		
	thousands ha	($\alpha = 0.05$)	%
stocked	637.13	(607.40 - 666.86)	97.4
temporarily unstocked	16.85	(11.76 - 21.93)	2.6
Total	653.98		100.0



2.5 FOREST AREA CHANGE

2.5.1 Total forest area increase since the first cycle

Definition

Plot status

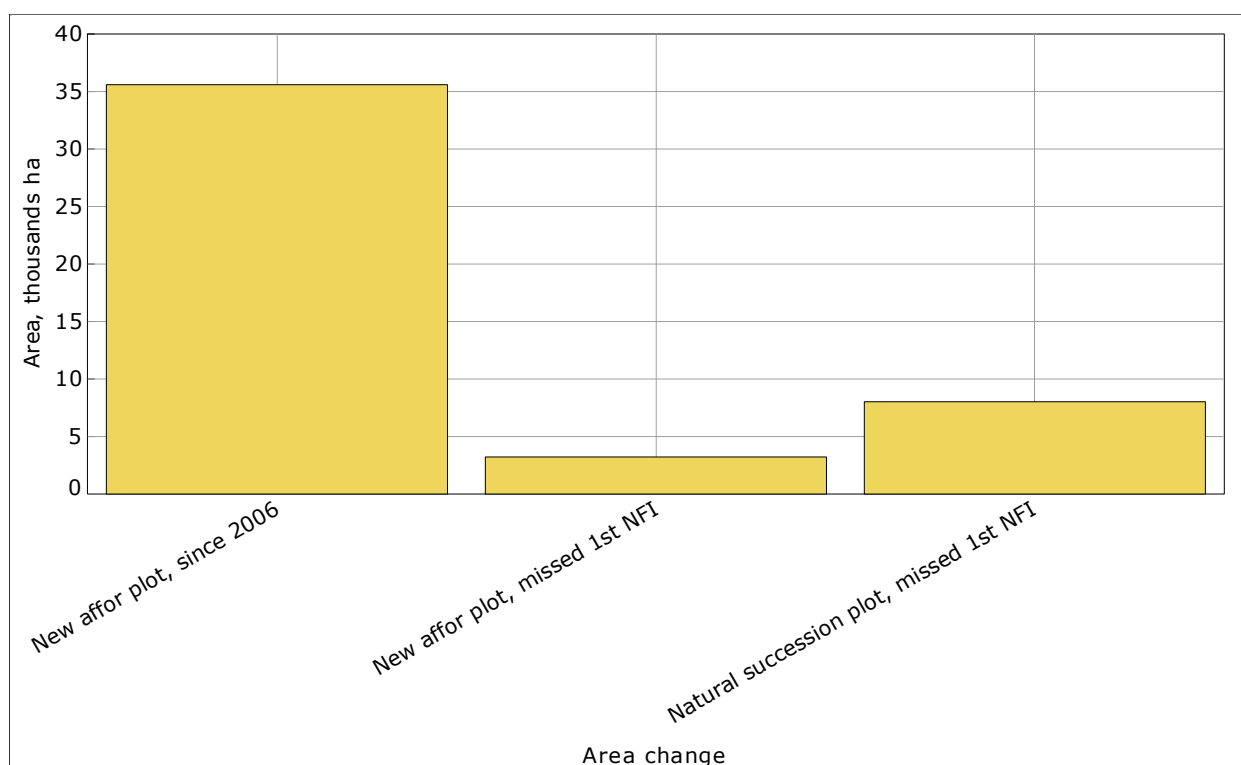
Details the status of the plot at each cycle.

1. **New afforestation plot:** A new plot centre is established, due to afforestation since 2006. This forest was not present during the first cycle.
2. **New natural succession plot:** A new plot centre is established, due to natural succession since 2006. This forest was not present during the first cycle.
3. **New afforestation plot, missed 1st NFI:** A new plot centre is established, due to afforestation pre-2006. This forest was present during the first cycle, but excluded in error at that time.
4. **Natural succession plot, forest missed 1st NFI:** A new plot centre is established, due to natural succession pre-2006. This forest was present during the first cycle, but excluded in error at that time.

Methodology

The total area of land that changed from Non-Forest to forest is presented.

Area change	Area		
	thousands ha	($\alpha = 0.05$)	%
New affor plot, since 2006	35.62	(28.24 – 42.99)	76.1
New affor plot, missed 1st NFI	3.21	(0.99 – 5.43)	6.8
Natural succession plot, missed 1st NFI	8.00	(4.50 – 11.51)	17.1
Total	46.83		100.0



2.5.2 Total forest area decrease since the first cycle

Definition

Plot status

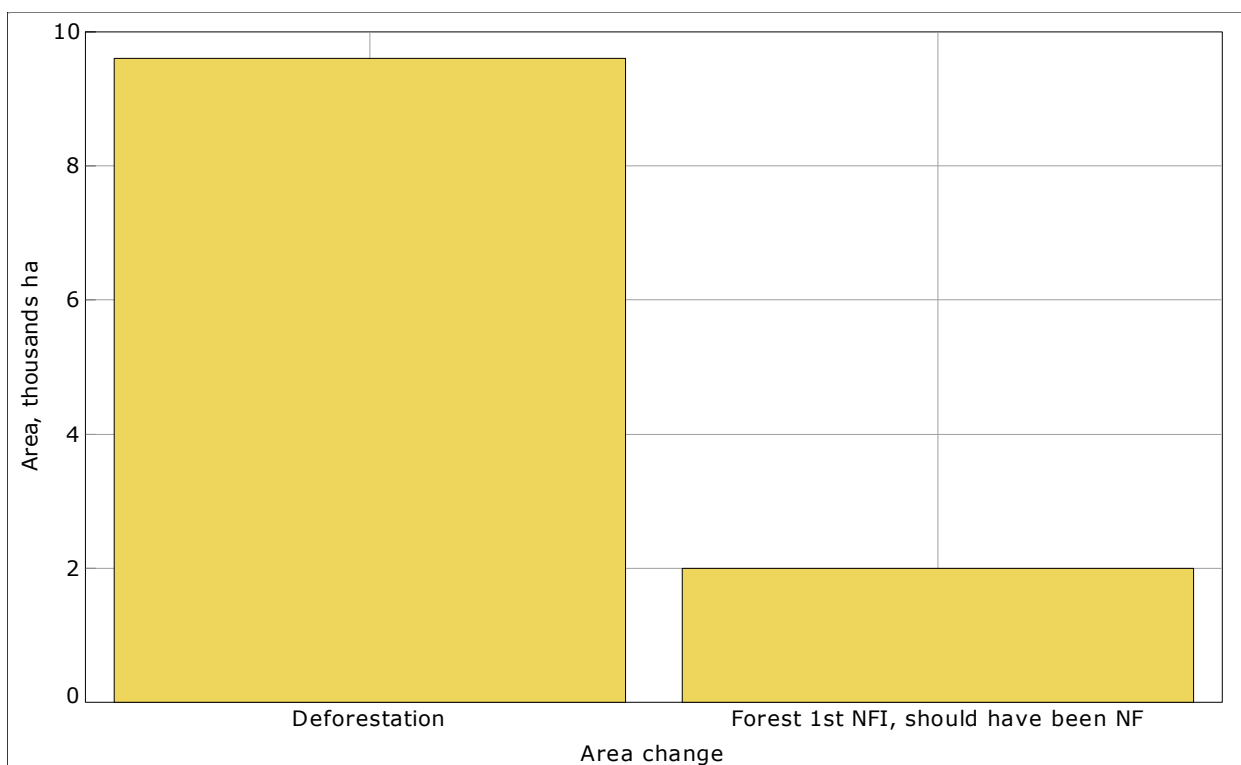
Details the status of the plot at each cycle.

- Forest 1st NFI, should have been Non-Forest:** Plot was classified as forest in first cycle in error. Should have been Non-Forest in both cycles.
- Deforestation:** There has been a change of land-use category on the plot from forest (1st cycle) to Non-Forest (2nd cycle).

Methodology

The total area of land that changed from Forest to Non-Forest is presented.

Area change	Area		
	thousands ha	($\alpha = 0.05$)	%
Deforestation	9.61	(5.77 – 13.45)	82.8
Forest 1st NFI, should have been NF	2.00	(0.25 – 3.76)	17.2
Total	11.61		100.0



2.5.3 Total area changes relating to Forest Open Area

Definition

Plot status

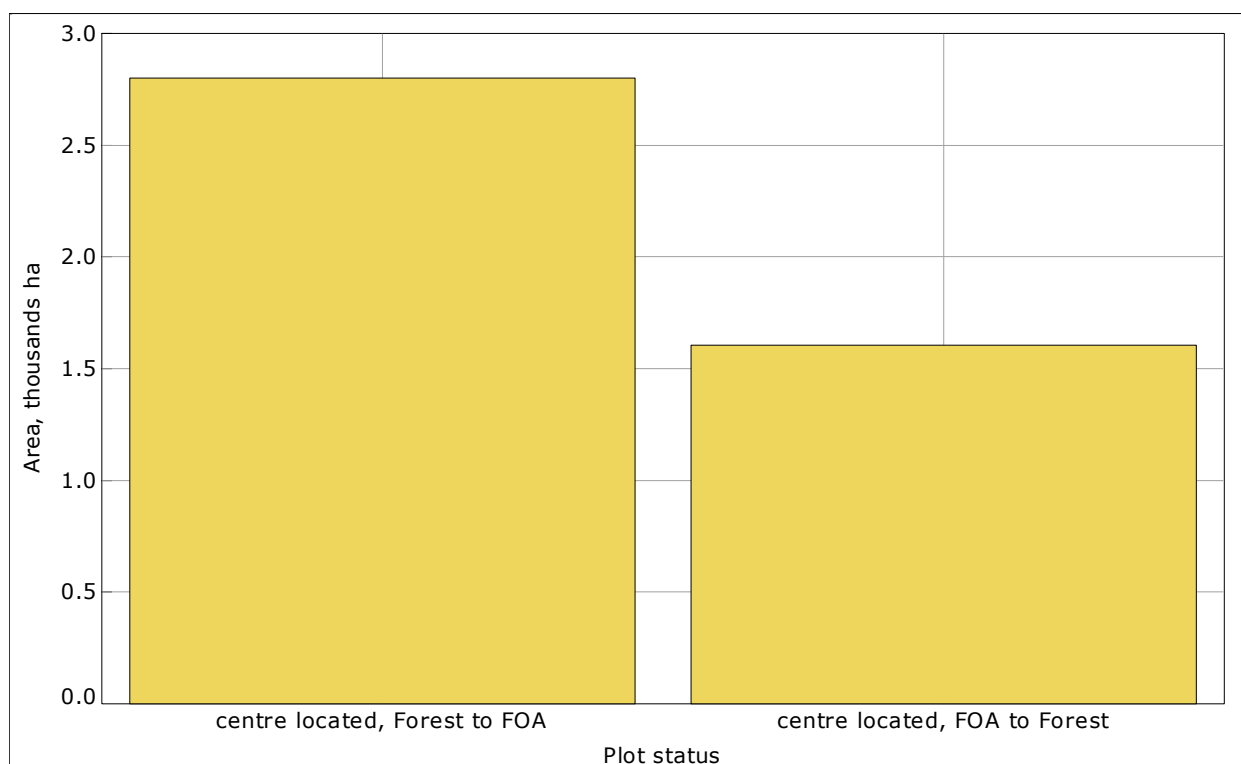
Details the status of the plot at each cycle.

1. **Centre located, Forest to FOA:** Plot centre from previous cycle is located, but land-use type has changed from Forest to Forest Open Area, e.g. forest road.
2. **Centre located, FOA to Forest:** Plot centre from previous cycle is located, but land-use type has changed from Forest Open Area to Forest, e.g. a rideline is replanted.

Methodology

The total area changes relating to the interaction of Forest and Forest Open Area is presented.

Plot status	Area		
	thousands ha	($\alpha = 0.05$)	%
centre located, Forest to FOA	2.80	(0.73 – 4.87)	63.6
centre located, FOA to Forest	1.61	(0.03 – 3.18)	36.4
Total	4.41		100.0



2.6 REVISIT INTERVAL

2.6.1 Forest area by revisit interval

Definition

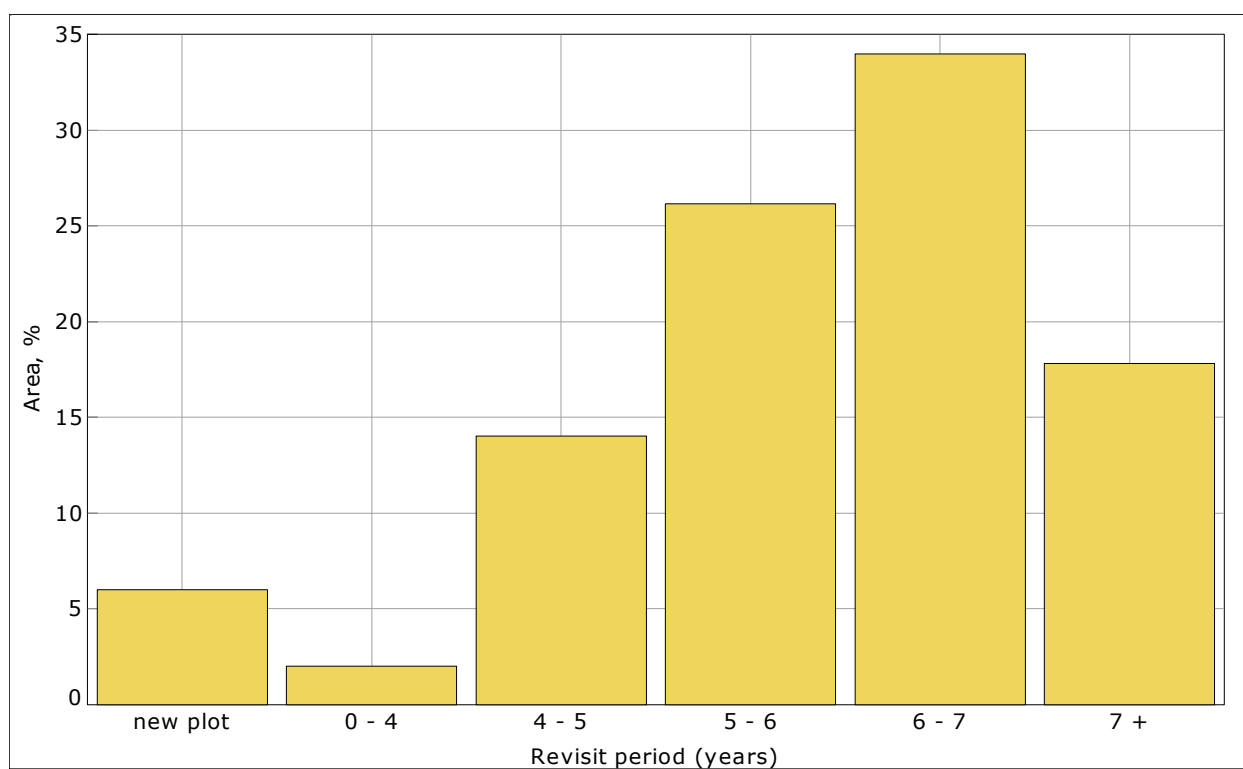
Revisit interval

The time period (years) taken to revisit the plot.

Methodology

The forest area is classified by the time period between field NFI plot visits.

Revisit period (years)	Area		
	thousands ha	($\alpha = 0.05$)	%
new plot	39.21	(31.74 – 46.68)	6.0
0 - 4	13.20	(8.89 – 17.50)	2.0
4 - 5	91.75	(81.17 – 102.33)	14.0
5 - 6	171.08	(158.84 – 183.31)	26.2
6 - 7	222.19	(209.11 – 235.27)	34.0
7 +	116.56	(106.49 – 126.63)	17.8
Total	653.98		100.0



Chapter 3

FOREST STRUCTURE

European Forest Type (EFT) applies a broad species class at forest level, categorising forests into Conifer, Broadleaf and Mixed types. Over two-thirds (68.6%) of the stocked forest area is composed of forests with conifer species predominating, 17.5% of forests are broadleaf and 13.9% are of mixed composition.

Afforestation is the man-made establishment of new forests on treeless lands which did not carry forest in contemporary history. Forests established through afforestation dominate as the main method by which forests have become regenerated with 64.2% of forests established in this way. Reforestation, the man-made establishment of trees on lands that have been cleared of forest within the relatively recent past, comprises 24.7% of forests. Semi-natural forest, which are forests established by natural regeneration, occupy 11.1% of forests.

Development stage primarily categorises the maturity classes of the forest estate. The stages range from young post establishment forests to overmature forests along with multistoried forests. In the ownership class Private (grant aided) a high proportion of small-pole and pole stage forests occur, indicating their readiness for thinning.

The classification of Forest Available for Wood Supply (FAWS) describes the relative importance of the estate in terms of timber supply. The majority (83.7%) of forests in Ireland have no restrictions on timber supply. A small portion (0.6%) of the estate is considered not available due to the National Parks and Nature Reserves designations. A significant portion (15.7%) of the estate is considered unlikely to contribute to wood supply, primarily due to the site constraints, physical productivity or wood quality limitations. Nearly two-thirds (64%) of the Private (other) estate is classified as unlikely to contribute to wood supply, primarily due to the significant presence of poorly performing broadleaf forests.

There are a number of environmental designations that affect forest management but do not necessarily restrict timber harvesting. Over half (51%) of the forest area had one or more environmental designation, compared to 43% in the 2006 NFI results. Eight environmental designations are included with some having greater affects than others in terms of restricting forest management operations. The increase in hen harrier SPA designations has resulted in 77,000 ha being designated since 2006. In addition 24,000 ha have been designated for the protection of the Fresh Water Pearl Mussel.

3.1 FOREST STRUCTURE

This section describes forest structure in the portion of the forest estate that has tree cover present.

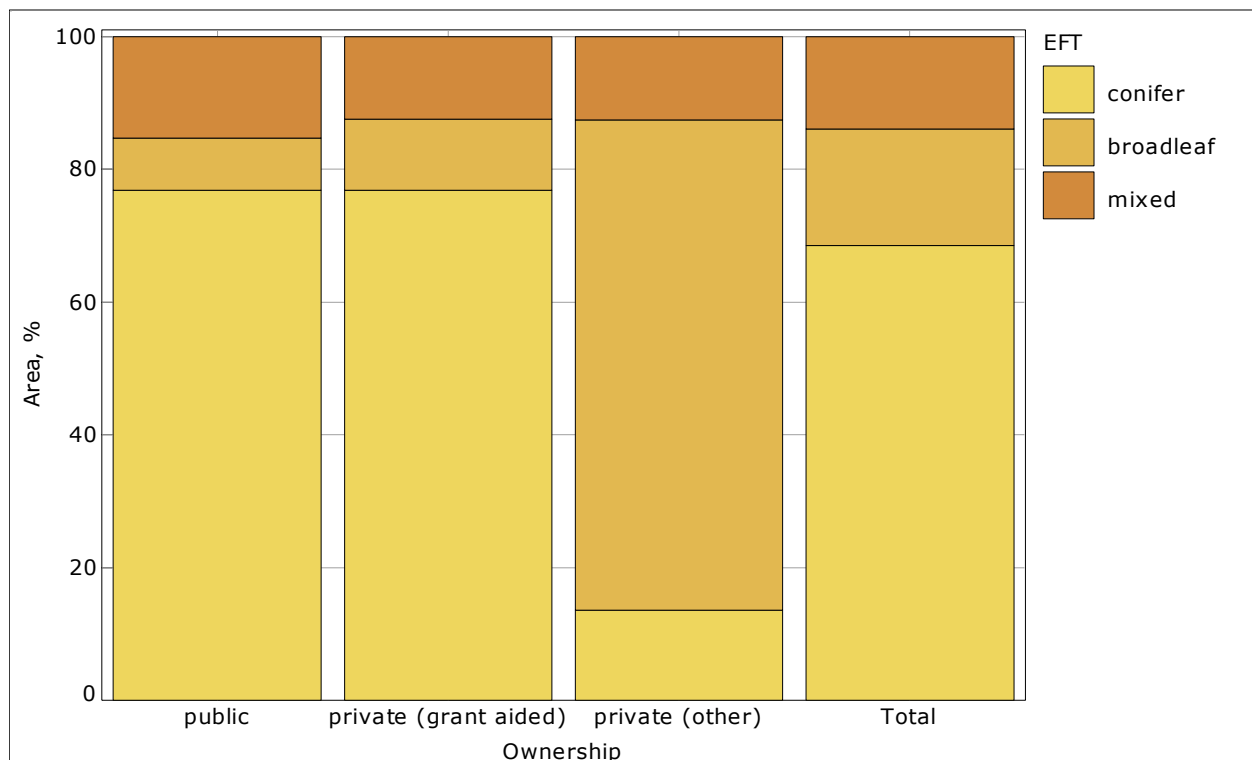
3.1.1 Stocked forest area by ownership and European Forest Type

Definition	
European Forest Type	
Broad forest type classification system based on species composition.	
1.	Conifer: More than 80% of coniferous tree species.
2.	Broadleaf: More than 80% of broadleaf tree species.
3.	Mixed: A forest composed of broadleaved and conifer species, the minor category making up at least 20% of the canopy.

Methodology
The stocked forest area is classified by ownership and European Forest Type.

EFT	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	262.45	(247.40 – 277.50)	76.8	163.32	(149.87 – 176.76)	76.9
broadleaf	27.23	(20.92 – 33.54)	8.0	22.81	(17.05 – 28.57)	10.7
mixed	52.01	(43.48 – 60.55)	15.2	26.40	(20.21 – 32.59)	12.4
Total	341.69	(326.35 – 357.03)	100.0	212.52	(198.06 – 226.99)	100.0

EFT	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	11.22	(7.13 – 15.31)	13.5	436.98	(422.79 – 451.18)	68.6
broadleaf	61.30	(52.09 – 70.52)	74.0	111.34	(99.60 – 123.08)	17.5
mixed	10.39	(6.44 – 14.35)	12.5	88.81	(78.09 – 99.52)	13.9
Total	82.92	(72.42 – 93.42)	100.0	637.13		100.0



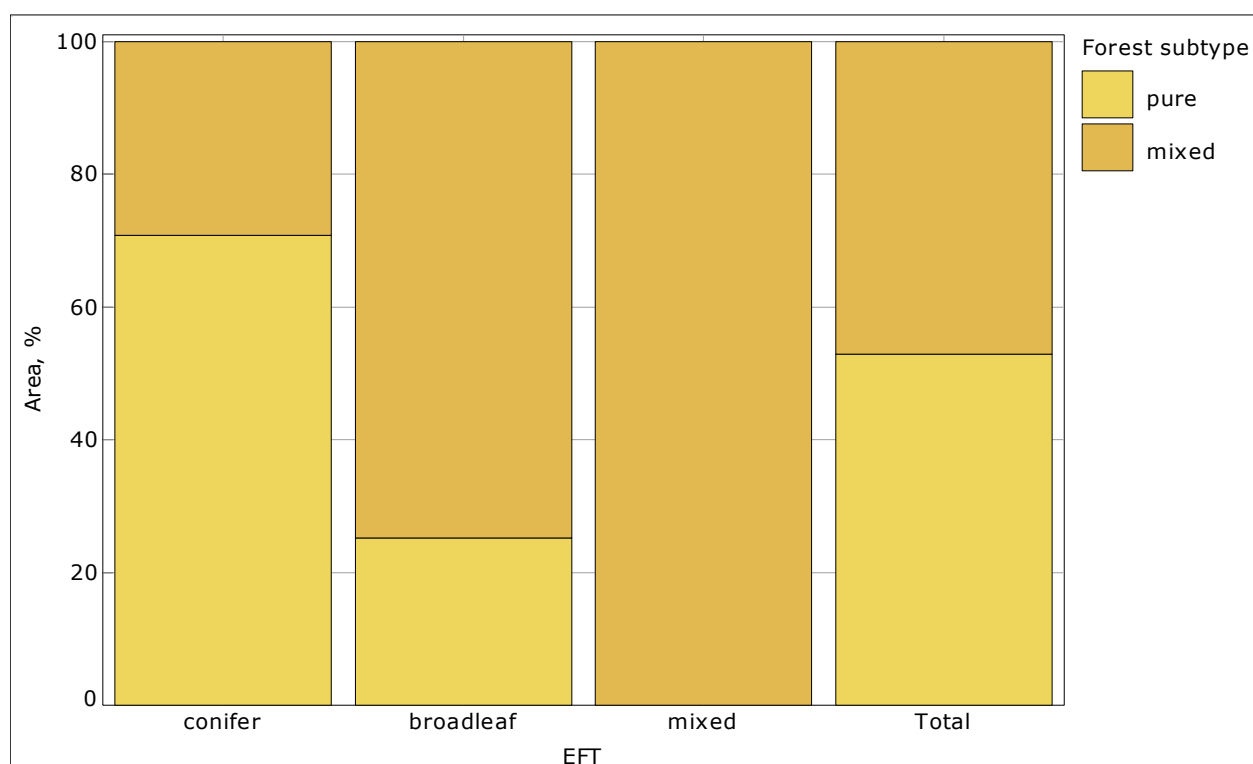
3.1.2 Stocked forest area by European Forest Type and forest sub-type

Definition
Forest sub-type
Describes if one or more species occur.
1. Pure: The dominant species occupies more than 80% of the canopy.
2. Mixed: The dominant species occupies less than 80% of the canopy.

Methodology
The stocked forest area is classified by European Forest Type and forest sub-type.

Forest subtype	EFT / Area					
	conifer			broadleaf		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
pure	309.25	(293.67 – 324.84)	70.8	28.02	(21.63 – 34.40)	25.2
mixed	127.73	(115.31 – 140.15)	29.2	83.33	(72.84 – 93.81)	74.8
Total	436.98	(422.79 – 451.18)	100.0	111.34	(99.60 – 123.08)	100.0

Forest subtype	EFT / Area					
	mixed			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
pure	–	–	–	337.27	(321.63 – 352.91)	52.9
mixed	88.81	(78.09 – 99.52)	100.0	299.86	(284.22 – 315.51)	47.1
Total	88.81	(78.09 – 99.52)	100.0	637.13		100.0



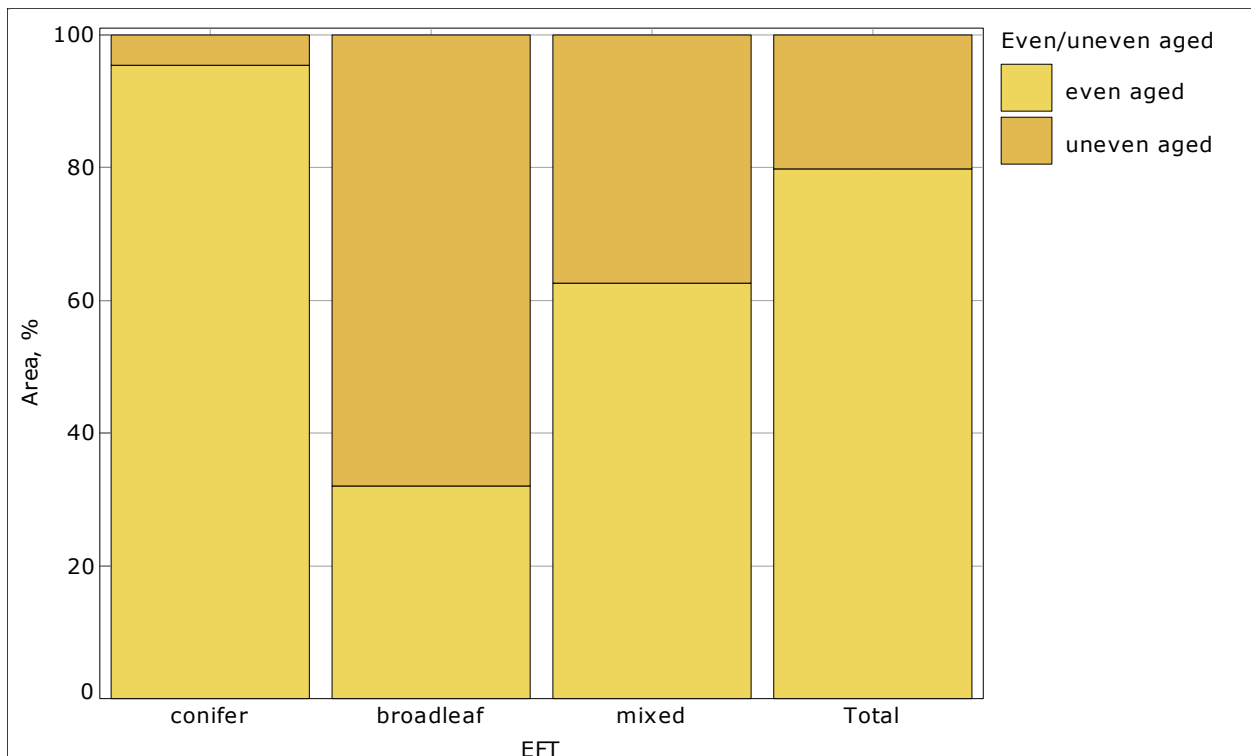
3.1.3 Stocked forest area by European Forest Type and even-uneven aged forest

Definition	
Even/uneven aged	
Uniformity of the age of the tree species in a forest.	
1.	Even aged: Greater than 80% of the canopy is made up of trees that have an age difference of 4 years or less.
2.	Uneven aged: Between 20-80% of the canopy is made up of trees that have an age difference of 5 years or more.

Methodology	
The stocked forest area is classified by European Forest Type and even/uneven aged.	

Even/uneven aged	EFT / Area					
	conifer			broadleaf		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
even aged	417.32	(402.73 - 431.91)	95.5	35.65	(28.50 - 42.79)	32.0
uneven aged	19.66	(14.23 - 25.09)	4.5	75.70	(65.64 - 85.75)	68.0
Total	436.98	(422.79 - 451.18)	100.0	111.34	(99.60 - 123.08)	100.0

Even/uneven aged	EFT / Area					
	mixed			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
even aged	55.58	(46.85 - 64.31)	62.6	508.55	(496.01 - 521.08)	79.8
uneven aged	33.23	(26.26 - 40.19)	37.4	128.59	(116.05 - 141.12)	20.2
Total	88.81	(78.09 - 99.52)	100.0	637.13		100.0



3.1.4 Stocked forest area by European Forest Type and tree distribution

Definition

Tree distribution

The distribution of trees in terms of their spatial arrangement.

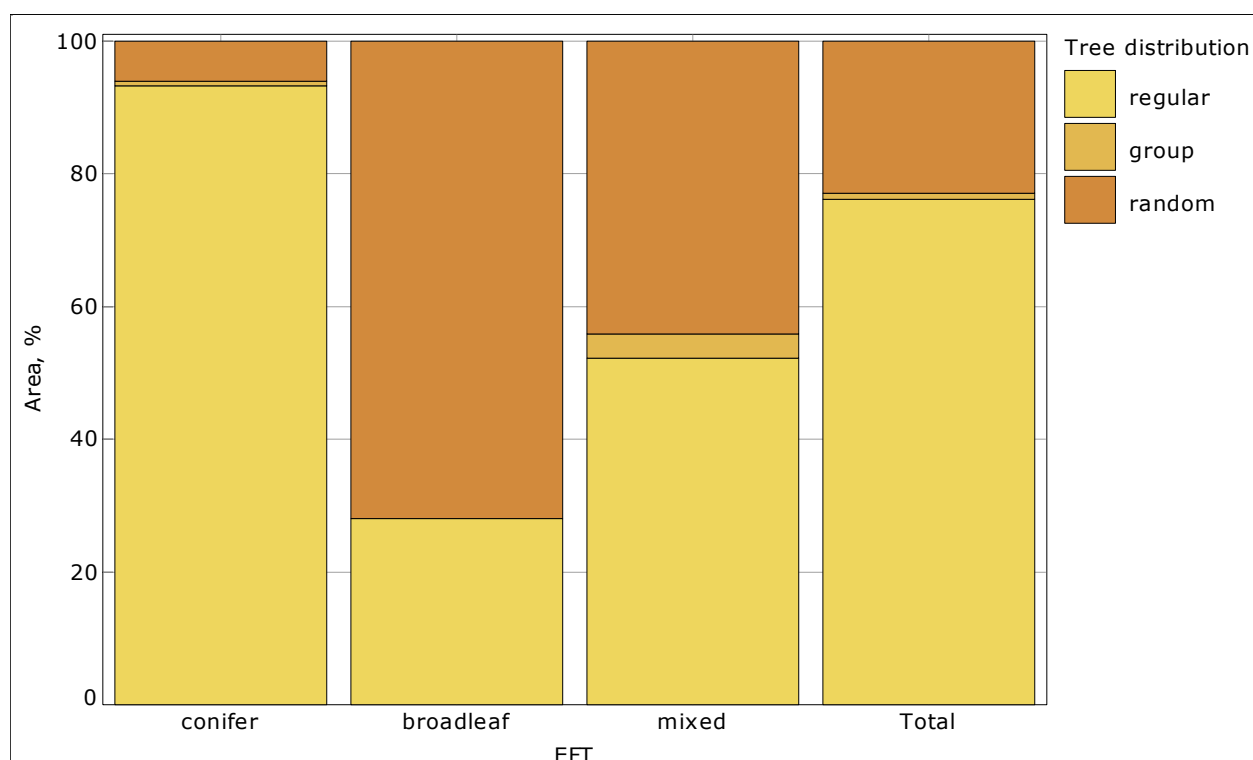
1. **Regular:** The trees are distributed uniformly, e.g. 2 m x 2 m square spacing.
2. **Group:** The trees are distributed in groups.
3. **Random:** The trees are distributed randomly with no particular pattern.

Methodology

The stocked forest area with regeneration present is classified by European Forest Type and distribution of regeneration.

Tree distribution	EFT / Area					
	conifer			broadleaf		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
regular	407.72	(393.04 – 422.41)	93.3	31.23	(24.54 – 37.92)	28.1
group	2.81	(0.74 – 4.88)	0.6	–	–	–
random	26.45	(20.20 – 32.70)	6.1	80.11	(69.78 – 90.44)	71.9
Total	436.98	(422.79 – 451.18)	100.0	111.34	(99.60 – 123.08)	100.0

Tree distribution	EFT / Area					
	mixed			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
regular	46.38	(38.32 – 54.44)	52.2	485.34	(472.13 – 498.54)	76.2
group	3.21	(1.00 – 5.41)	3.6	6.02	(2.99 – 9.04)	0.9
random	39.22	(31.73 – 46.71)	44.2	145.78	(132.77 – 158.79)	22.9
Total	88.81	(78.09 – 99.52)	100.0	637.13		100.0



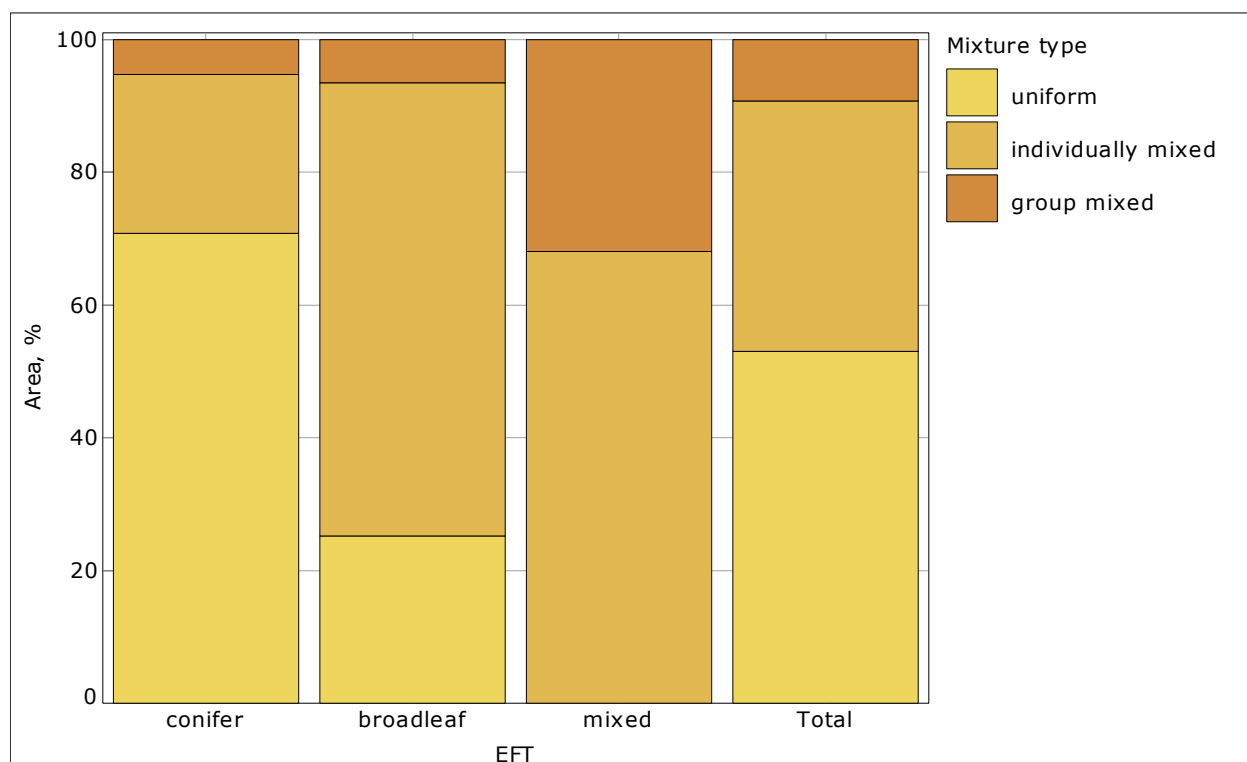
3.1.5 Stocked forest area by European Forest Type and mixture type

Definition
Species structure Mixture type describes the species distribution of trees. If there is more than one species present, the plant distribution may follow a predefined structure e.g. planting in groups. Uniform: Only one tree species is present. Individually mixed: More than one species present, with the species mixture occurring in a random manner. Group mixed: The structure is based on groups of trees of each species. Line mixtures are included in this category.

Methodology
The stocked forest area with regeneration present is classified by European Forest Type and mixture type.

Mixture type	EFT / Area					
	conifer			broadleaf		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
uniform	309.66	(294.08 – 325.24)	70.9	28.02	(21.63 – 34.40)	25.2
individually mixed	104.46	(92.97 – 115.96)	23.9	76.10	(66.01 – 86.20)	68.3
group mixed	22.86	(17.04 – 28.68)	5.2	7.22	(3.90 – 10.55)	6.5
Total	436.98	(422.79 – 451.18)	100.0	111.34	(99.60 – 123.08)	100.0

Mixture type	EFT / Area					
	mixed			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
uniform	–	–	–	337.67	(322.03 – 353.31)	53.0
individually mixed	60.41	(51.33 – 69.50)	68.0	240.98	(225.80 – 256.16)	37.8
group mixed	28.40	(21.95 – 34.84)	32.0	58.48	(49.43 – 67.53)	9.2
Total	88.81	(78.09 – 99.52)	100.0	637.13		100.0



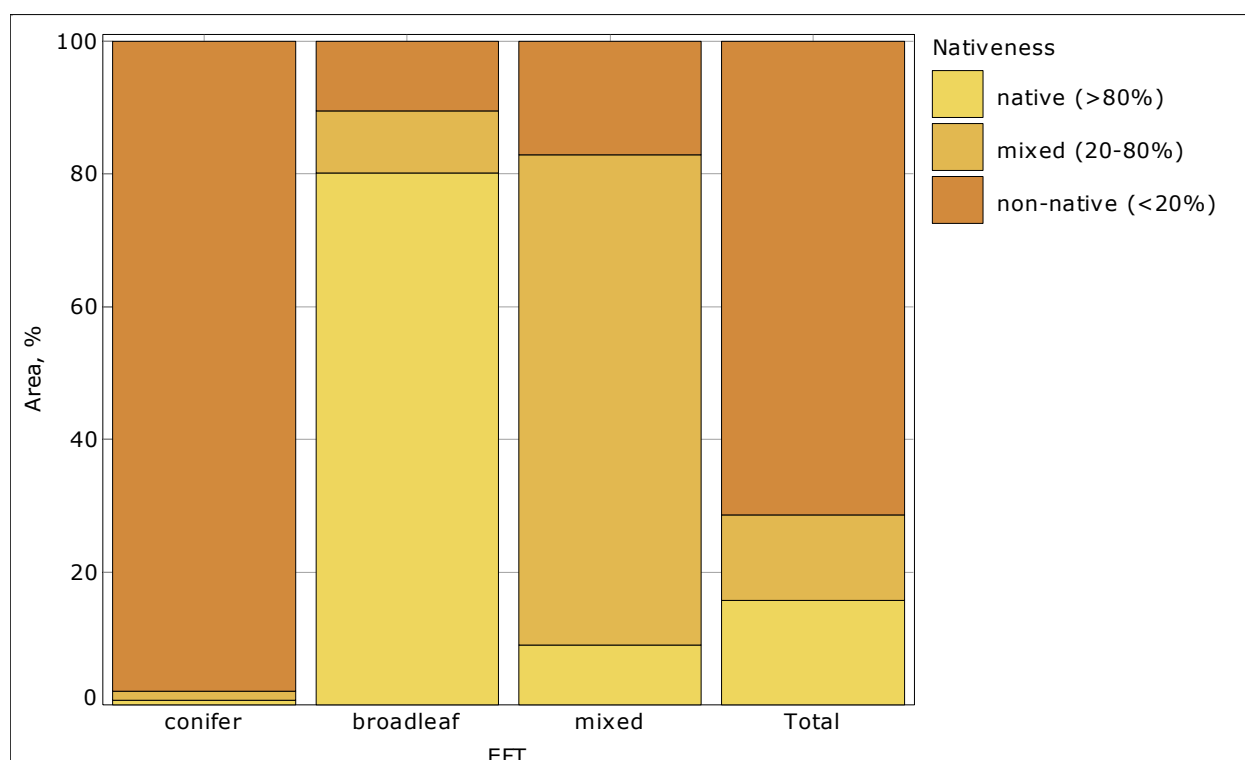
3.1.6 Stocked forest area by European Forest Type and nativeness

Definition
Nativeness Nativeness describes the origin of species. Native: More than 80% of the canopy is comprised of native species. Mixed: Between 20-80% of the canopy is comprised of native species. Non-native: More than 80% of the canopy is comprised of exotic species.

Methodology
The stocked forest area is classified by European Forest Type and nativeness.

Nativeness	EFT / Area					
	conifer			broadleaf		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
native (>80%)	3.20	(1.00 - 5.40)	0.7	89.31	(78.49 - 100.13)	80.2
mixed (20-80%)	6.00	(2.98 - 9.02)	1.4	10.43	(6.46 - 14.39)	9.4
non-native (<20%)	427.79	(413.44 - 442.13)	97.9	11.61	(7.45 - 15.77)	10.4
Total	436.98	(422.79 - 451.18)	100.0	111.34	(99.60 - 123.08)	100.0

Nativeness	EFT / Area					
	mixed			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
native (>80%)	8.00	(4.54 - 11.46)	9.0	100.51	(89.19 - 111.83)	15.8
mixed (20-80%)	65.58	(56.20 - 74.97)	73.9	82.01	(71.63 - 92.40)	12.9
non-native (<20%)	15.22	(10.43 - 20.01)	17.1	454.61	(440.72 - 468.50)	71.3
Total	88.81	(78.09 - 99.52)	100.0	637.13		100.0



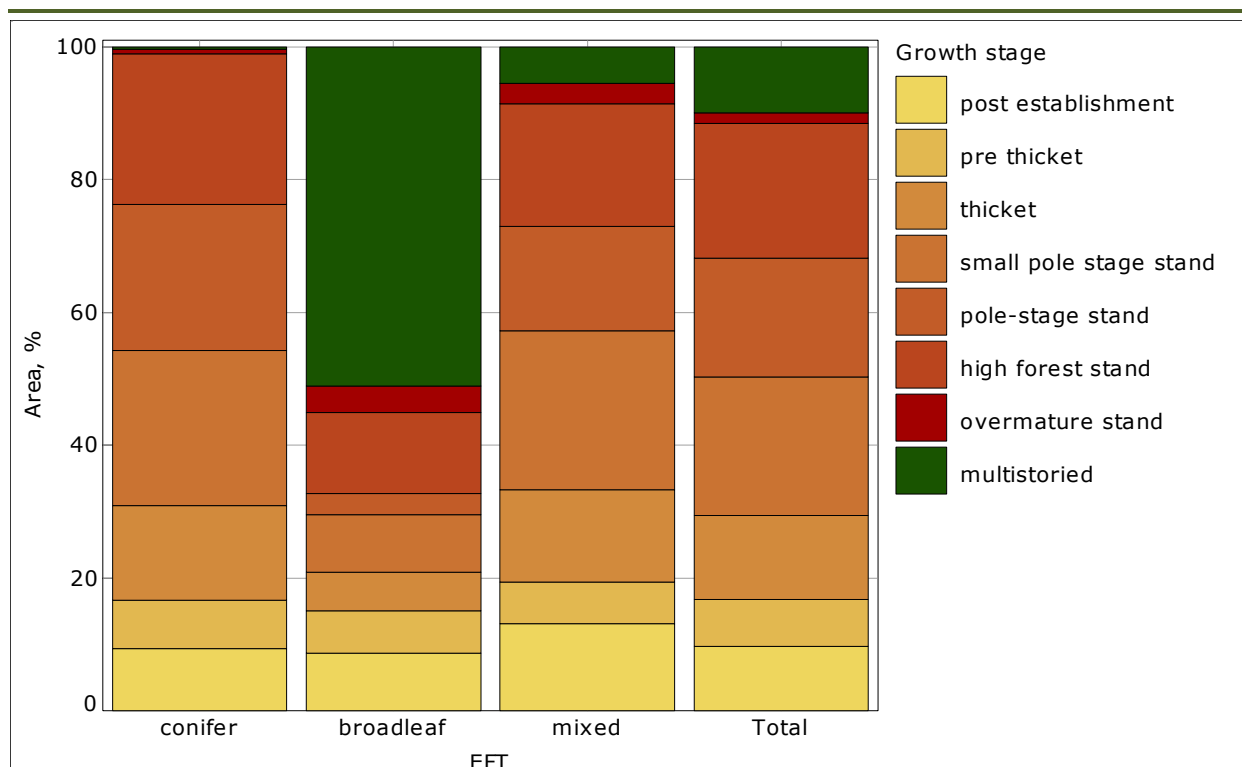
3.1.7 Stocked forest area by European Forest Type and development stage

Definition	
Development stage	
Describes the development stage of the forest.	
1.	Post establishment: An established storey up to and including 4 years of age.
2.	Pre-thicket: This covers storeys where the green branches are not yet touching, where the trees are older than 4 years.
3.	Thicket: This covers storeys where the canopy has closed but the lower branches are mainly green.
4.	Small pole: This covers storeys where the canopy has fully closed and the lower branches are dead. It may be unthinned.
5.	Pole: This covers storeys where it could be thinned or in the early stages of thinning.
6.	High forest: These storeys may be thinned or unthinned and have a high proportion of sawlog approaching or at normal rotation length.
7.	Overmature: Forest retained beyond normal rotation length, resulting in the presence of large trees.
8.	Multistoried: Forest with trees present at various stages of development, i.e. height.

Methodology
The stocked forest area is classified by European Forest Type and development stage.

Growth stage	EFT / Area					
	conifer			broadleaf		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
post establishment	40.83	(33.17 - 48.48)	9.3	9.61	(5.82 - 13.39)	8.6
pre thicket	32.07	(25.27 - 38.88)	7.3	7.20	(3.89 - 10.51)	6.5
thicket	62.09	(52.88 - 71.30)	14.2	6.42	(3.28 - 9.56)	5.8
small pole stage stand	102.14	(90.68 - 113.59)	23.5	9.60	(5.82 - 13.38)	8.6
pole-stage stand	96.48	(85.37 - 107.58)	22.1	3.60	(1.25 - 5.96)	3.2
high forest stand	98.98	(87.64 - 110.31)	22.6	13.63	(9.12 - 18.13)	12.2
overmature stand	3.20	(0.99 - 5.41)	0.7	4.42	(1.84 - 6.99)	4.0
multistoried	1.20	(0.00 - 2.58)	0.3	56.87	(47.99 - 65.75)	51.1
Total	436.98	(422.79 - 451.18)	100.0	111.34	(99.60 - 123.08)	100.0

Growth stage	EFT / Area					
	mixed			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
post establishment	11.60	(7.42 - 15.78)	13.1	62.04	(52.83 - 71.24)	9.7
pre thicket	5.57	(2.68 - 8.46)	6.3	44.84	(36.89 - 52.80)	7.0
thicket	12.42	(8.10 - 16.73)	14.0	80.93	(70.54 - 91.32)	12.7
small pole stage stand	21.23	(15.66 - 26.79)	23.9	132.96	(120.30 - 145.62)	21.0
pole-stage stand	13.99	(9.42 - 18.55)	15.7	114.06	(102.23 - 125.90)	17.9
high forest stand	16.38	(11.47 - 21.30)	18.4	128.98	(116.42 - 141.55)	20.2
overmature stand	2.81	(0.73 - 4.89)	3.2	10.43	(6.49 - 14.36)	1.6
multistoried	4.81	(2.12 - 7.51)	5.4	62.88	(53.59 - 72.18)	9.9
Total	88.81	(78.09 - 99.52)	100.0	637.13	□	100.0



3.1.8 Total stocked forest area by European Forest Type and forest establishment type

Definition

Forest establishment type

Describes the land type on which the forest has been established and how the storey was established (i.e. artificially or naturally).

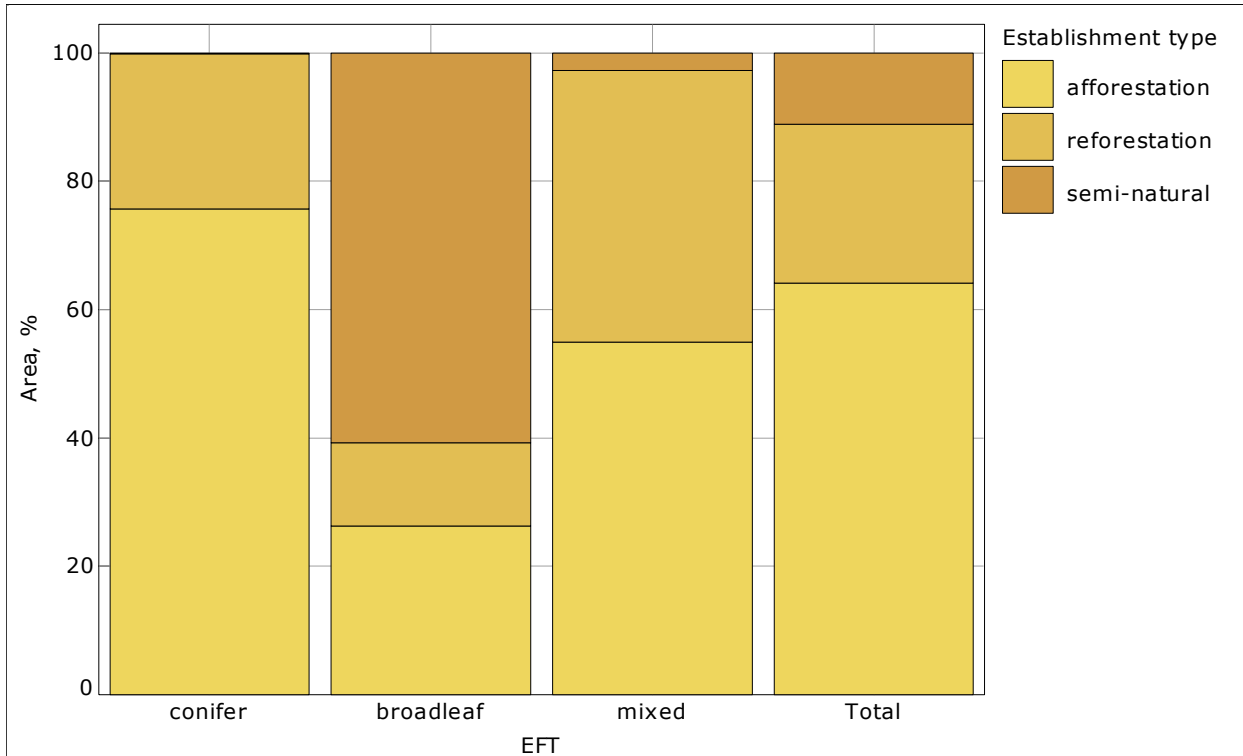
1. **Afforestation:** The man-made establishment of new forests on treeless lands which did not carry forest in contemporary history. Implies a transformation from Non-Forest to Forest.
2. **Reforestation:** The man-made establishment of trees on lands that have been cleared of forest within the relatively recent past. Generally identified by the presence of stumps and deadwood on the site.
3. **Semi-natural:** Forest land where greater than 80% of the tree species regenerated naturally. Native and non-native tree species are included. This forest land may not be managed in accordance with a formal or an informal plan applied regularly over a sufficiently long period (5 years or more). It generally indicates natural succession type forests.

Methodology

The total stocked forest area is classified by European Forest Type and forest establishment type.

Establishment type	EFT / Area					
	conifer			broadleaf		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
afforestation	330.80	(315.63 – 345.97)	75.7	29.24	(22.80 – 35.68)	26.3
reforestation	105.38	(94.06 – 116.70)	24.1	14.41	(9.76 – 19.07)	12.9
semi-natural	0.81	(0.00 – 1.94)	0.2	67.68	(58.08 – 77.29)	60.8
Total	436.98	(422.79 – 451.18)	100.0	111.34	(99.60 – 123.08)	100.0

Establishment type	EFT / Area				
	mixed			Total	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
afforestation	48.82	(40.53 - 57.11)	55.0	408.86	(394.18 - 423.53) 64.2
reforestation	37.59	(30.26 - 44.92)	42.3	157.38	(144.35 - 170.41) 24.7
semi-natural	2.40	(0.49 - 4.32)	2.7	70.89	(61.10 - 80.69) 11.1
Total	88.81	(78.09 - 99.52)	100.0	637.13	100.0



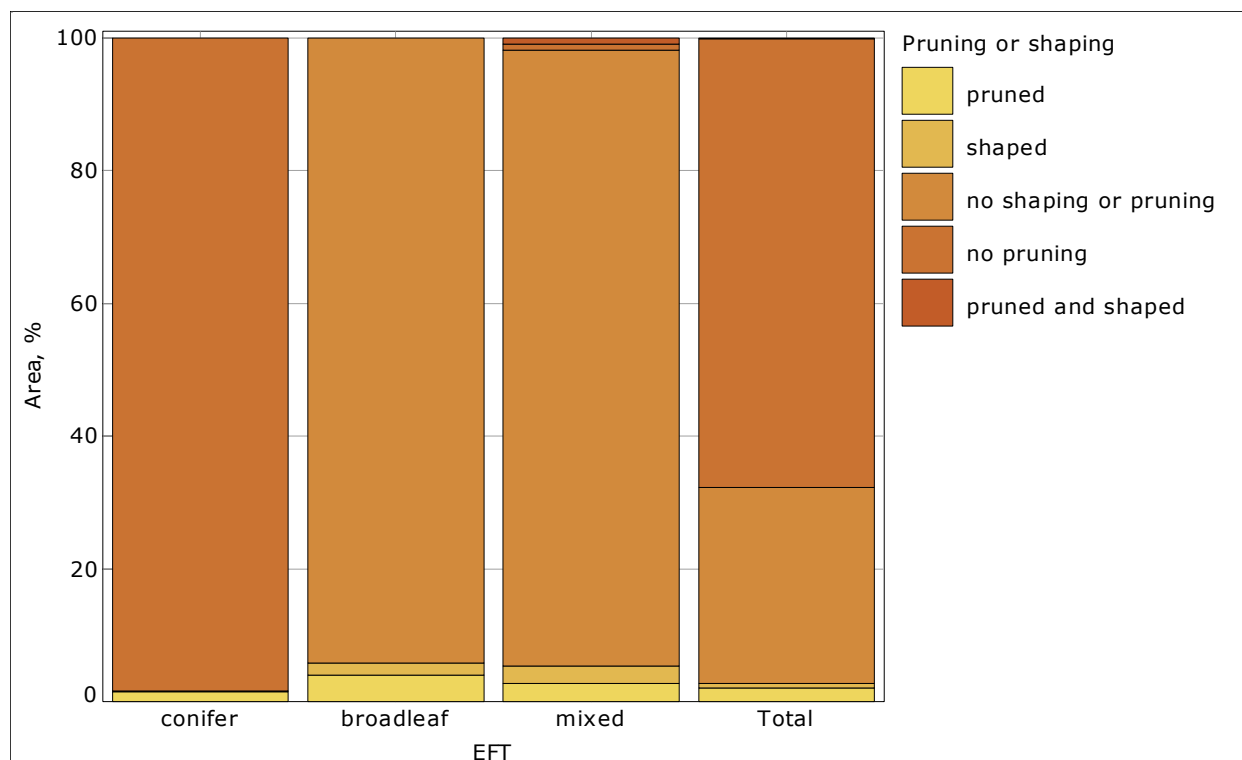
3.1.9 Stocked forest area by European Forest Type and pruning status

Definition
Pruning status
Indicates if the forest has been shaped or pruned.

Methodology
The stocked forest area is classified by European Forest Type and pruning status.

Pruning or shaping	EFT / Area				
	conifer			broadleaf	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
pruned	6.41	(3.28 - 9.54)	1.5	4.42	(1.87 - 6.97) 4.0
shaped	-	-	-	2.00	(0.24 - 3.75) 1.8
no shaping or pruning	0.40	(0.00 - 1.19)	0.09	104.92	(93.40 - 116.45) 94.2
no pruning	430.18	(415.84 - 444.52)	98.4	-	- - -
pruned and shaped	-	-	-	-	- - -
Total	436.98	(422.79 - 451.18)	100.0	111.34	(99.60 - 123.08) 100.0

Pruning or shaping	EFT / Area					
	mixed			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
pruned	2.40	(0.50 - 4.30)	2.7	13.23	(8.79 - 17.68)	2.1
shaped	2.40	(0.49 - 4.31)	2.7	4.40	(1.82 - 6.98)	0.7
no shaping or pruning	82.40	(71.99 - 92.82)	92.8	187.72	(173.65 - 201.79)	29.5
no pruning	0.80	(0.00 - 1.91)	0.9	430.98	(416.66 - 445.29)	67.6
pruned and shaped	0.80	(0.00 - 1.93)	0.9	0.80	(0.00 - 1.93)	0.1
Total	88.81	(78.09 - 99.52)	100.0	637.13		100.0



3.1.10 Stocked forest area by ownership and FAWS

Definition

Forest Available for Wood Supply (FAWS)

Describes the likely availability of the forest area in terms of supply of wood.

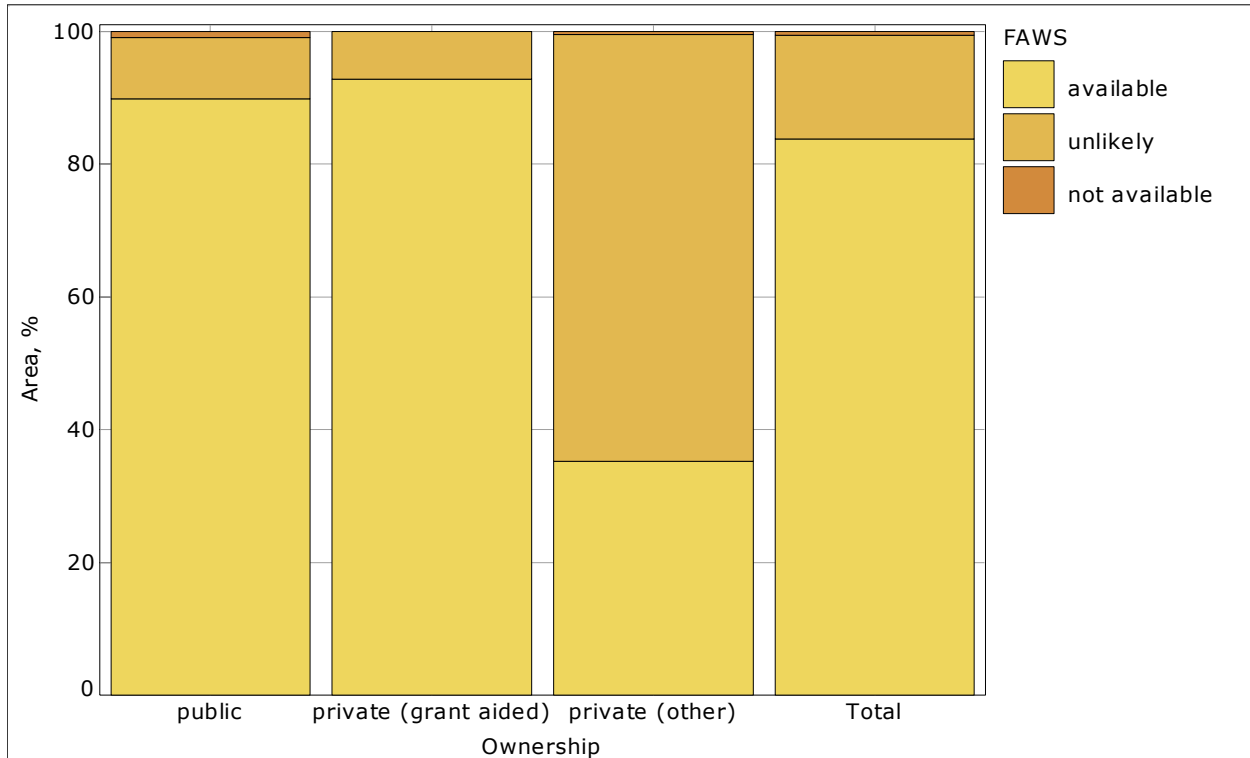
1. **Available:** Forest where any legal, economic, or specific environmental restrictions do not have a significant impact on the supply of wood. Includes: Areas where, although there are no such restrictions, harvesting is not taking place, for example areas included in long-term utilization plans or intentions.
2. **Unlikely:** Forest where physical productivity or wood quality is too low or harvesting and transport costs are too high to warrant wood harvesting, apart from occasional cuttings for autoconsumption.
3. **Not available:** Forest with legal restrictions or restrictions resulting from other political decisions, which totally exclude or severely limit wood supply, *inter alia* for reasons of environmental or biological diversity conservation, e.g. protection forest, national parks, nature reserves and other protected areas, such as those of special environmental, scientific, historical, cultural or spiritual interest. Areas classified as National Parks and Nature Reserves are included in this class.

Methodology

The stocked forest area is classified by ownership and FAWS.

FAWS	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
available	307.20	(291.79 – 322.60)	89.9	197.28	(183.12 – 211.45)	92.8
unlikely	31.30	(24.55 – 38.04)	9.2	15.24	(10.50 – 19.98)	7.2
not available	3.20	(1.01 – 5.38)	0.9	–	–	–
Total	341.69	(326.35 – 357.03)	100.0	212.52	(198.06 – 226.99)	100.0

FAWS	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
available	29.25	(22.74 – 35.76)	35.3	533.73	(522.30 – 545.17)	83.7
unlikely	53.27	(44.61 – 61.93)	64.2	99.81	(88.53 – 111.09)	15.7
not available	0.40	(0.00 – 1.18)	0.5	3.59	(1.28 – 5.90)	0.6
Total	82.92	(72.42 – 93.42)	100.0	637.13	□	100.0



3.2 ENVIRONMENTAL DESIGNATIONS

Definition
Environmental Designations Designation to a land area which is protected by Irish and/or EU law, as the area is of scientific or public interest. Forest management in these areas will be influenced by the type of designation. Designations include: • Special Protection Area (SPA); • National Heritage Area (NHA); • Special Area of Conservation (SAC); • Nature Reserves; • National Park; • Acid Sensitive; • Fisheries Sensitive areas; • Fresh Water Pearl Mussel (FWPM).

3.2.1 Forest area by designation type and status

Methodology

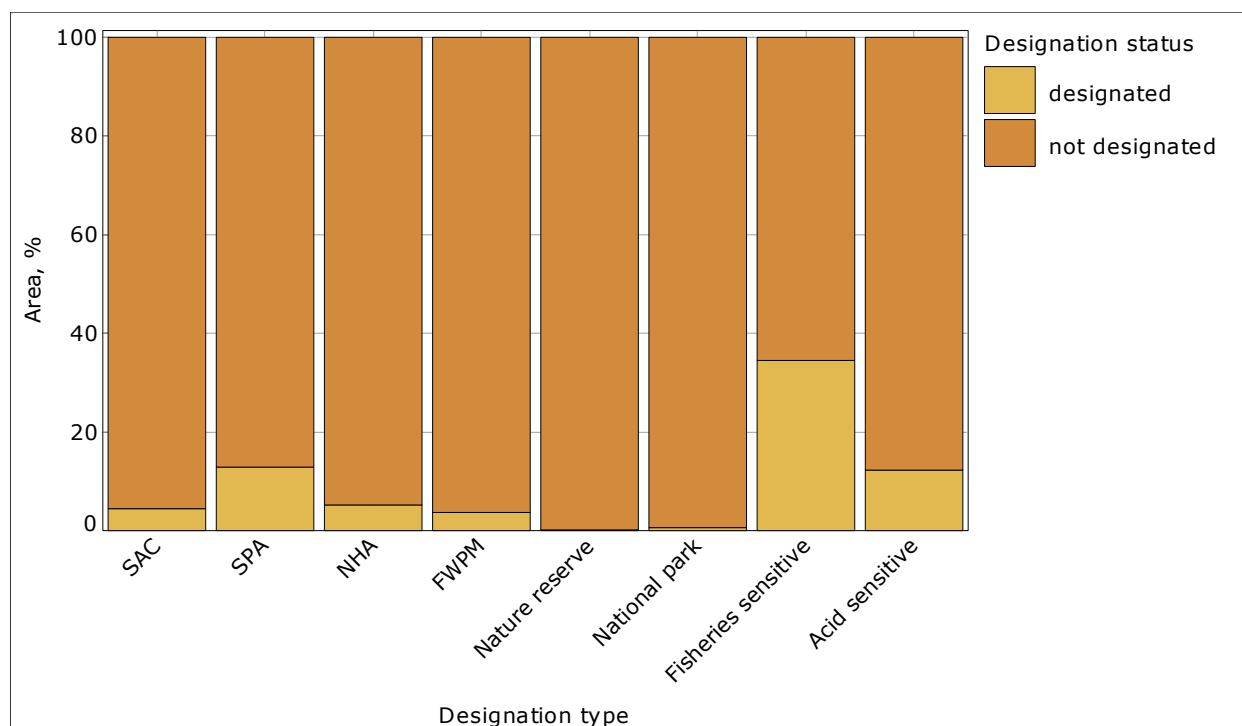
The forest area is classified by designation type and status.

Designation status	Designation type / Area					
	SAC			SPA		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
designated	29.19	(22.75 – 35.64)	4.5	83.92	(74.16 – 93.68)	12.8
not designated	624.79	(618.34 – 631.23)	95.5	570.06	(560.30 – 579.82)	87.2
Total	653.98	-	100.0	653.98	-	100.0

Designation status	Designation type / Area					
	NHA			FWPM		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
designated	33.59	(26.63 – 40.56)	5.1	24.03	(18.21 – 29.84)	3.7
not designated	620.39	(613.42 – 627.35)	94.9	629.95	(624.14 – 635.77)	96.3
Total	653.98	-	100.0	653.98	-	100.0

Designation status	Designation type / Area					
	Nature reserve			National park		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
designated	1.21	(0.00 – 2.57)	0.2	3.59	(1.28 – 5.89)	0.5
not designated	652.77	(651.41 – 654.14)	99.8	650.39	(648.09 – 652.70)	99.5
Total	653.98	-	100.0	653.98	-	100.0

Designation status	Designation type / Area					
	Fisheries sensitive			Acid sensitive		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
designated	226.14	(214.54 – 237.73)	34.6	79.83	(70.96 – 88.70)	12.2
not designated	427.84	(416.25 – 439.44)	65.4	574.15	(565.28 – 583.02)	87.8
Total	653.98	-	100.0	653.98	-	100.0



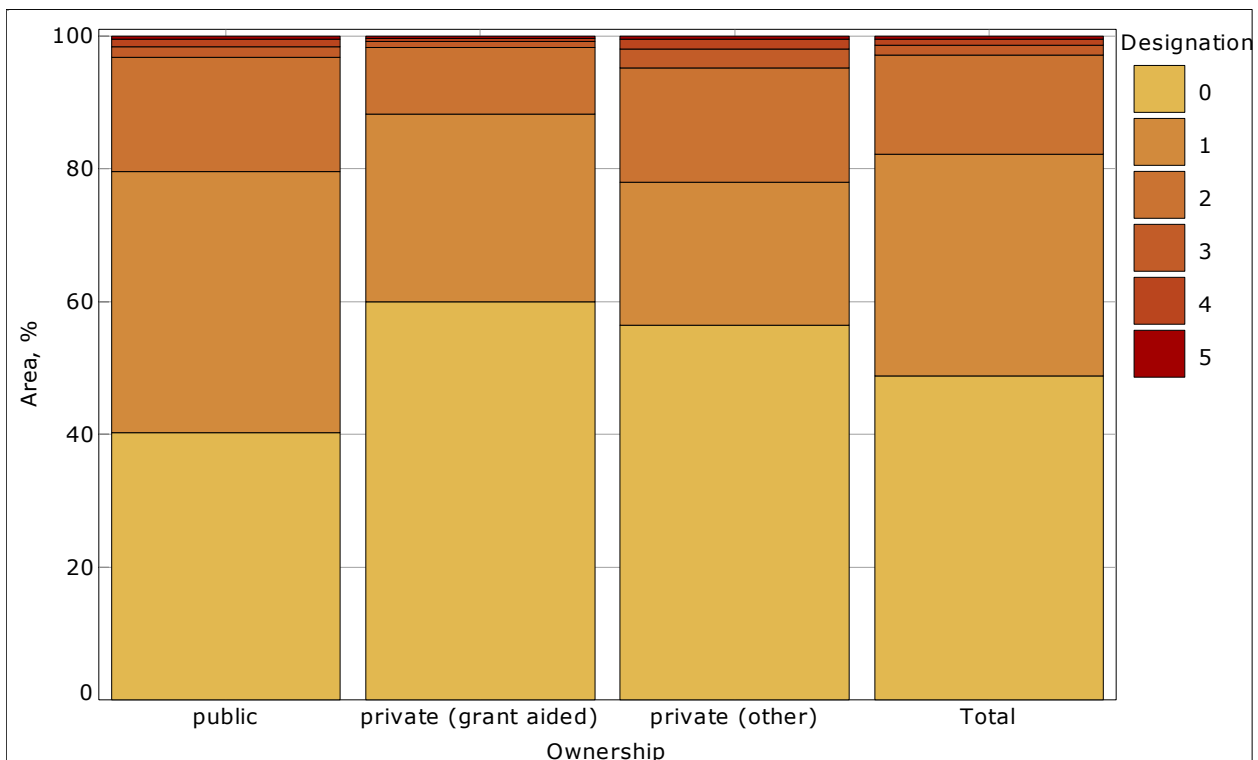
3.2.2 Forest area by ownership and number of environmental designations

Methodology

The forest area is classified by ownership and the number of environmental designations on the forest land in the 2nd NFI cycle (2012).

Designation	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	142.88	(130.55 – 155.20)	40.1	128.90	(116.72 – 141.08)	60.0
1	139.90	(127.51 – 152.28)	39.4	60.86	(51.87 – 69.84)	28.3
2	61.34	(52.56 – 70.11)	17.3	21.60	(16.06 – 27.13)	10.0
3	5.62	(2.75 – 8.49)	1.6	2.00	(0.25 – 3.75)	0.9
4	3.98	(1.56 – 6.40)	1.1	0.80	(0.00 – 1.90)	0.4
5	1.60	(0.04 – 3.17)	0.5	0.79	(0.00 – 1.90)	0.4
Total	355.31	(339.78 – 370.85)	100.0	214.95	(200.34 – 229.55)	100.0

Designation	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	47.24	(39.14 – 55.33)	56.4	319.02	(305.44 – 332.59)	48.8
1	18.03	(12.84 – 23.22)	21.5	218.78	(204.98 – 232.58)	33.5
2	14.46	(9.81 – 19.11)	17.3	97.39	(86.83 – 107.95)	14.9
3	2.40	(0.48 – 4.32)	2.9	10.03	(6.22 – 13.83)	1.5
4	1.20	(0.00 – 2.55)	1.4	5.97	(3.04 – 8.91)	0.9
5	0.40	(0.00 – 1.18)	0.5	2.79	(0.75 – 4.83)	0.4
Total	83.72	(73.16 – 94.29)	100.0	653.98		100.0



3.3 SMALL TREES

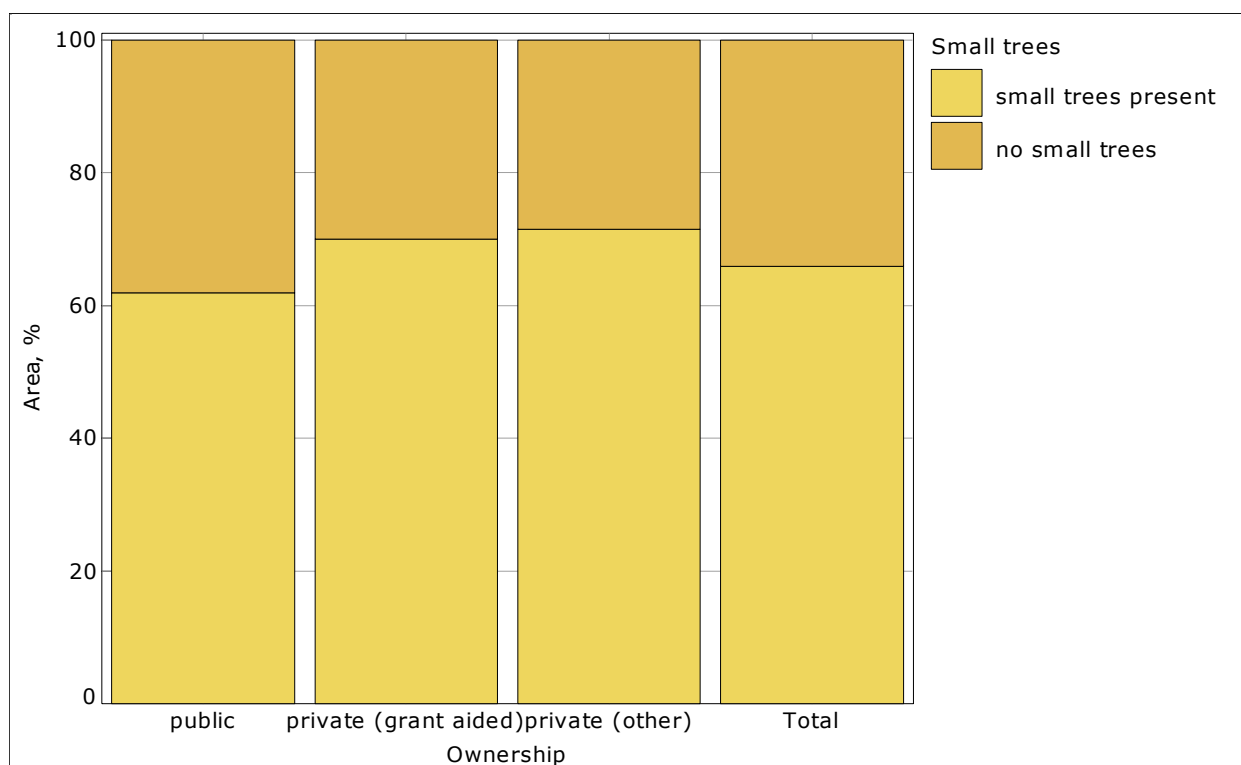
3.3.1 Stocked forest area by ownership and presence of small trees

Methodology

The stocked forest area is classified by ownership and presence or absence of small trees.

Small trees	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
small trees present	211.49	(196.89 – 226.08)	61.9	148.90	(135.86 – 161.94)	70.1
no small trees	130.21	(117.64 – 142.77)	38.1	63.62	(54.30 – 72.95)	29.9
Total	341.69	(326.35 – 357.03)	100.0	212.52	(198.06 – 226.99)	100.0

Small trees	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
small trees present	59.28	(50.21 – 68.35)	71.5	419.67	(404.98 – 434.36)	65.9
no small trees	23.64	(17.76 – 29.52)	28.5	217.47	(202.78 – 232.16)	34.1
Total	82.92	(72.42 – 93.42)	100.0	637.13		100.0



3.3.2 Stocked forest area with small trees present by ownership and presence of an overstorey

Definition

Presence of overstorey

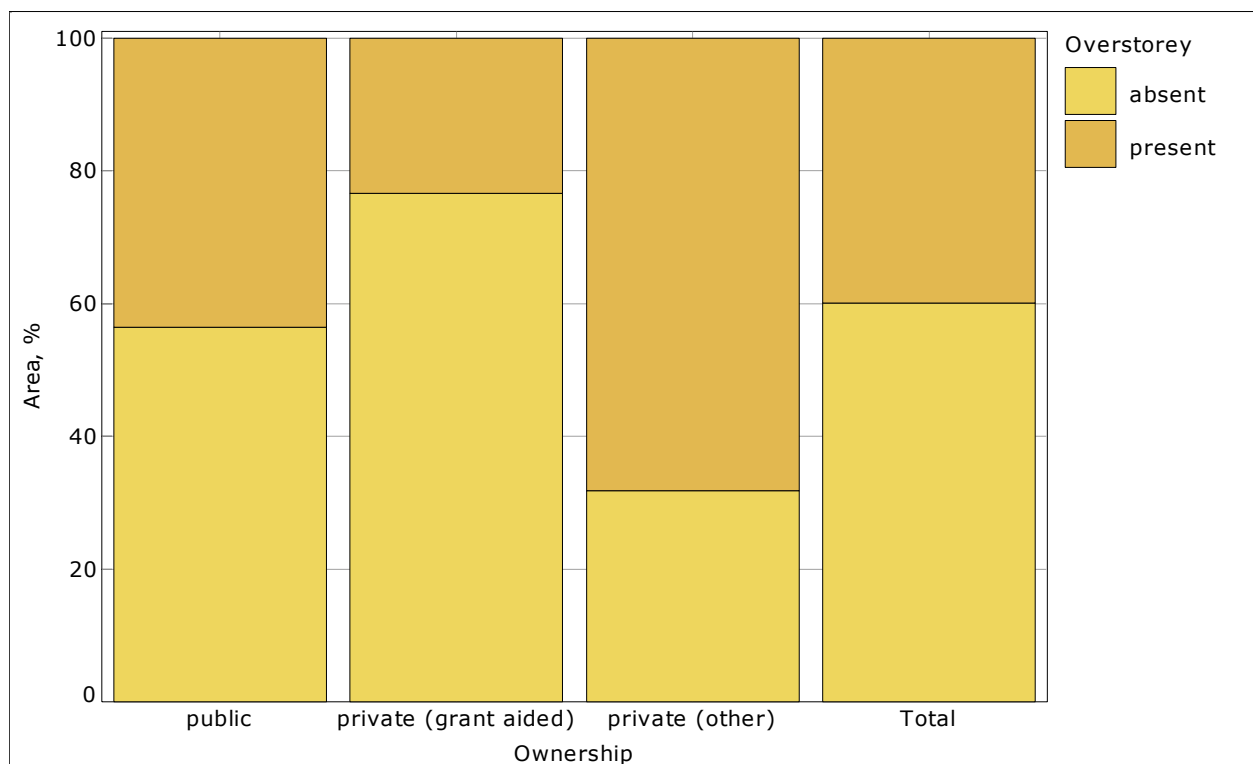
Indicates whether an overstorey is absent or present.

Methodology

The stocked forest area with small trees present is classified by ownership and presence of an overstorey.

Overstorey	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
absent	119.36	(107.30 - 131.41)	56.4	114.06	(102.27 - 125.84)	76.6
present	92.13	(81.22 - 103.04)	43.6	34.85	(27.75 - 41.94)	23.4
Total	211.49	(196.89 - 226.08)	100.0	148.90	(135.86 - 161.94)	100.0

Overstorey	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
absent	18.85	(13.57 - 24.13)	31.8	252.26	(237.22 - 267.31)	60.1
present	40.43	(32.77 - 48.08)	68.2	167.40	(153.78 - 181.03)	39.9
Total	59.28	(50.21 - 68.35)	100.0	419.67		100.0



3.3.3 Stocked forest area with regeneration present by ownership and origin of regeneration

Definition

Origin of regeneration

Origin of regeneration describes whether a tree was artificially introduced or else regenerated naturally.

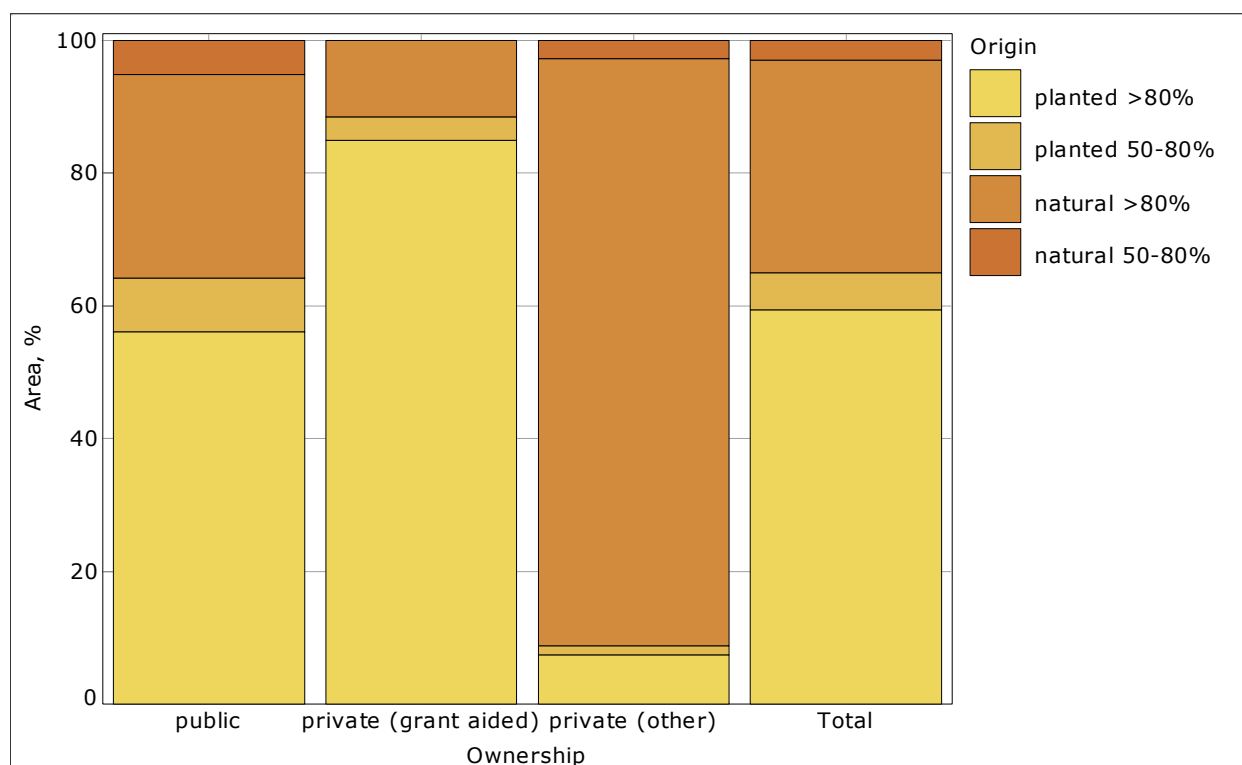
1. **Planting >80%:** The majority of small tree canopy, i.e. $\geq 80\%$, is the result of planting.
2. **Planting 50-80%:** The majority of small tree canopy, i.e. 50-80%, is a result of planting.
3. **Natural >80%:** The majority of small tree canopy, i.e. $\geq 80\%$, is the result of natural regeneration.
4. **Natural 50-80%:** The majority of tree canopy, i.e. 50-80%, is a result of natural regeneration.

Methodology

The stocked forest area with regeneration present is classified by ownership and origin of regeneration.

Origin	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
planted >80%	118.63	(106.56 – 130.70)	56.2	126.50	(114.18 – 138.82)	85.0
planted 50-80%	17.23	(12.16 – 22.31)	8.1	5.21	(2.41 – 8.02)	3.5
natural >80%	64.82	(55.40 – 74.24)	30.6	17.19	(12.11 – 22.28)	11.5
natural 50-80%	10.81	(6.78 – 14.83)	5.1	–	–	–
Total	211.49	(196.89 – 226.08)	100.0	148.90	(135.86 – 161.94)	100.0

Origin	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
planted >80%	4.42	(1.82 – 7.01)	7.4	249.54	(234.33 – 264.76)	59.5
planted 50-80%	0.80	(0.00 – 1.93)	1.4	23.25	(17.39 – 29.11)	5.5
natural >80%	52.46	(43.88 – 61.04)	88.5	134.47	(121.80 – 147.14)	32.0
natural 50-80%	1.60	(0.03 – 3.17)	2.7	12.41	(8.10 – 16.72)	3.0
Total	59.28	(50.21 – 68.35)	100.0	419.67	□	100.0



Chapter 4

SPECIES

In this chapter, the species composition within the forest estate is analysed. The portion of the forest estate that has tree cover or is available for planting is 653,980 ha. At any one time a portion of this will be temporarily un-stocked due to events such as felling or fire. The removal of these temporarily unstocked areas leaves 637,133 ha that has tree cover present. Conifer forest is the dominant forest type representing 74.2% of all forests. Broadleaved forests represent 25.8%.

Both Public and Private (grant aided) forests comprise similar proportions of conifers and broadleaves, 82-83 % conifer to 18-17% broadleaf. The opposite is true for the Private (other) forest estate where the proportion of broadleaves is 81%. Native and mixed forests comprise 28.7% of Ireland's forests. Native tree species predominate in Private (other) forests while non-native tree species predominate in both Private (grant aided) and Public forests.

The NFI enumerates a list of 51 tree species in the forest estate. Not surprisingly, the confidence bands on area estimates for minor species are wide. The main tree species is Sitka spruce occupying 334,560 ha or 52.4% of all species. Other pines, composed primarily of Lodgepole pine, accounted for 9.7%. The most common broadleaf species present include Other short living broadleaves (OSL), such as willow and hazel, representing 7.3% of the forest estate. The two native Birch species, *Betula pubescens* and *B. pendula*, are the next most common broadleaf species occupying 5.9% of the forest estate.

A relatively high proportion of native broadleaf tree species are present in the national forest estate, occupying 24% of the total stocked forest area. Not unexpectedly, native species especially comprise a major proportion (76%) of the Private (other) forests.

Altitude statistics identify the limited range of species suitable to higher elevations. Only Sitka spruce, 'other pines', Larch, Birch, Oak and a small area of other broadleaves are to be found at elevations over 300 m. The occurrence of broadleaf tree species over 200 m is uncommon.

The number of tree species per unit area is higher than expected. Less than 30% of stands are identified as monocultures, with 44.2% consisting of at least three species. From a tree species diversity viewpoint, it is important to note that 14.2% of the forest estate contains five or more tree species.

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4.1 CONIFER/BROADLEAF

Definition

Representative area

Methods are used to apportion the constituent individual species from intimate mixtures into the total area covered by the forest. In order to enable area related calculations, such as the determination of species composition, a procedure for the calculation of the so-called representative area of a tree is used. The area of an inventory plot was distributed among the trees proportionate to their size. Larger trees were allocated larger areas. The sum of all the individual tree representative areas within the plot is equal to the total plot area of 0.05 ha.

Careful consideration is needed in the interpretation of stocked areas of individual species presented in this chapter, since many forests contain an intimate mixture of species. The total stocked area of a given species therefore does not represent distinct areas of land covered by pure stands of the species, but by and large may represent the sum of shares of areas of mixed forest apportioned to it by these methods.

Definition

Concentric circles

Since the NFI used concentric circles, all trees on the plot were not assessed. Tree data on the inner sub-circles is expanded over the entire plot by weighting individual tree data by the respective concentric circle size. This expansion assumes that what is observed in the inner sub-circles for smaller Dbh trees, can be replicated over the whole plot.



	R ₁	R ₂	R ₃
Sub-circle radius (m)	3	7	12.62
Sub-circle area (m ²)	28.3	153.9	500
Threshold Dbh (mm)	70	120	200

4.1.1 Stocked forest area by ownership and species group (conifer/broadleaf)

Definition

Conifer/broadleaf

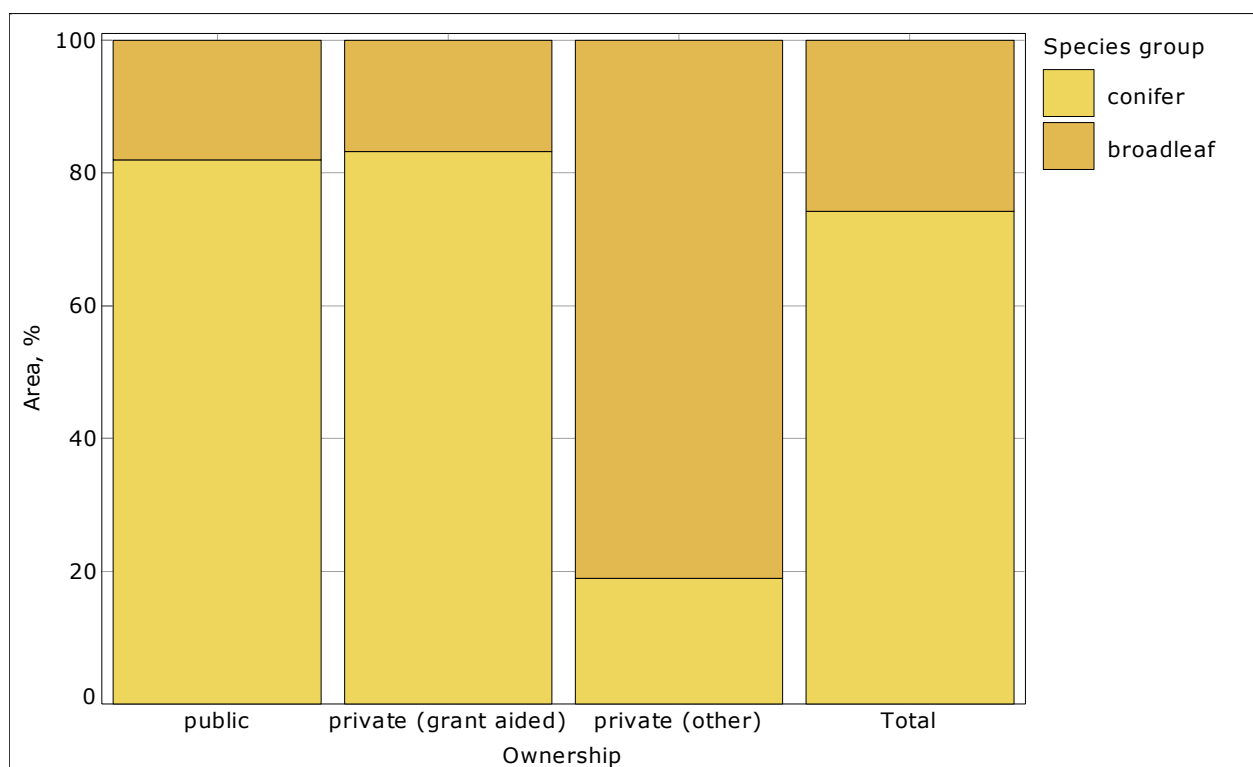
Classification of tree species into broad species groups: conifer and broadleaf.

Methodology

Stocked forest area is classified by ownership and species group (conifer/broadleaf).

Species group	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	280.19	(275.03 – 285.34)	82.0	176.94	(173.82 – 180.06)	83.3
broadleaf	61.50	(56.47 – 66.53)	18.0	35.59	(31.87 – 39.30)	16.7
Total	341.69	(326.35 – 357.03)	100.0	212.52	(198.06 – 226.99)	100.0

Species group	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	15.70	(13.74 – 17.65)	18.9	472.82	(466.17 – 479.48)	74.2
broadleaf	67.22	(64.17 – 70.27)	81.1	164.31	(156.35 – 172.27)	25.8
Total	82.92	(72.42 – 93.42)	100.0	637.13		100.0



4.1.2 Stocked forest area by county and species group (conifer/broadleaf)

Methodology
Stocked forest area is classified by county and species group (conifer/broadleaf).

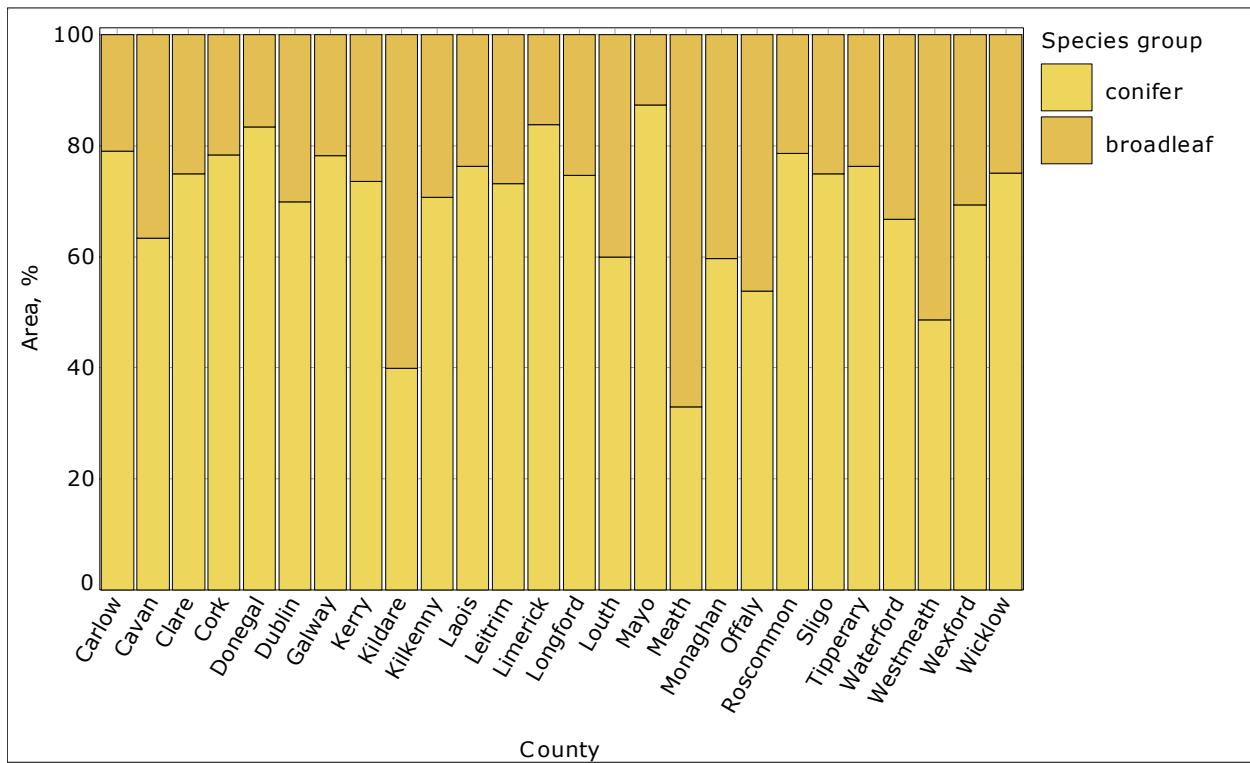
Species group	County / Area					
	Carlow			Cavan		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	5.05	(3.91 – 6.20)	78.9	8.88	(7.65 – 10.10)	63.3
broadleaf	1.35	(0.71 – 1.99)	21.1	5.15	(3.72 – 6.57)	36.7
Total	6.40		100.0	14.02		100.0
Species group	County / Area					
	Clare			Cork		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	32.84	(31.16 – 34.53)	74.9	57.99	(56.34 – 59.64)	78.3
broadleaf	11.00	(9.10 – 12.90)	25.1	16.03	(13.37 – 18.68)	21.7
Total	43.84		100.0	74.02		100.0
Species group	County / Area					
	Donegal			Dublin		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	41.22	(39.64 – 42.81)	83.4	3.37	(2.39 – 4.36)	69.9
broadleaf	8.23	(5.99 – 10.47)	16.6	1.45	(1.15 – 1.76)	30.1
Total	49.45		100.0	4.83		100.0
Species group	County / Area					
	Galway			Kerry		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	42.74	(40.63 – 44.85)	78.2	32.41	(30.72 – 34.10)	73.6
broadleaf	11.88	(9.50 – 14.27)	21.8	11.64	(9.55 – 13.73)	26.4
Total	54.62		100.0	44.05		100.0
Species group	County / Area					
	Kildare			Kilkenny		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	3.83	(2.57 – 5.09)	39.9	12.30	(11.04 – 13.57)	70.7
broadleaf	5.77	(4.54 – 7.00)	60.1	5.09	(3.59 – 6.59)	29.3
Total	9.60		100.0	17.40		100.0
Species group	County / Area					
	Laois			Leitrim		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	17.74	(16.20 – 19.28)	76.3	16.79	(15.45 – 18.13)	73.2
broadleaf	5.51	(3.94 – 7.08)	23.7	6.15	(4.39 – 7.92)	26.8
Total	23.25		100.0	22.94		100.0
Species group	County / Area					
	Limerick			Longford		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	20.06	(18.93 – 21.20)	83.8	5.65	(4.83 – 6.46)	74.6
broadleaf	3.88	(2.44 – 5.33)	16.2	1.92	(1.12 – 2.72)	25.4
Total	23.94		100.0	7.57		100.0
Species group	County / Area					
	Louth			Mayo		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	1.21		60.0	37.13	(36.05 – 38.21)	87.4
broadleaf	0.81		40.0	5.37	(3.54 – 7.21)	12.6
Total	2.02		100.0	42.50		100.0
Species group	County / Area					
	Meath			Monaghan		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	3.33	(2.20 – 4.45)	33.0	2.87	(2.07 – 3.66)	59.7
broadleaf	6.75	(5.79 – 7.71)	67.0	1.93	(0.87 – 3.00)	40.3
Total	10.08		100.0	4.80		100.0

Species group	County / Area					
	Offaly			Roscommon		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	11.90	(10.40 - 13.41)	53.9	17.50	(16.17 - 18.83)	78.7
broadleaf	10.20	(8.24 - 12.16)	46.1	4.75	(3.14 - 6.35)	21.3
Total	22.10		100.0	22.24		100.0

Species group	County / Area					
	Sligo			Tipperary		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	13.65	(12.69 - 14.60)	74.9	31.02	(29.23 - 32.80)	76.3
broadleaf	4.56	(3.01 - 6.12)	25.1	9.65	(7.40 - 11.90)	23.7
Total	18.21		100.0	40.67		100.0

Species group	County / Area					
	Waterford			Westmeath		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	15.30	(13.65 - 16.95)	66.7	5.43	(4.15 - 6.70)	48.6
broadleaf	7.63	(6.03 - 9.22)	33.3	5.75	(4.85 - 6.64)	51.4
Total	22.93		100.0	11.17		100.0

Species group	County / Area					
	Wexford			Wicklow		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	9.04	(7.88 - 10.20)	69.3	23.57	(22.17 - 24.98)	75.0
broadleaf	4.00	(2.65 - 5.35)	30.7	7.85	(5.76 - 9.94)	25.0
Total	13.04		100.0	31.43		100.0



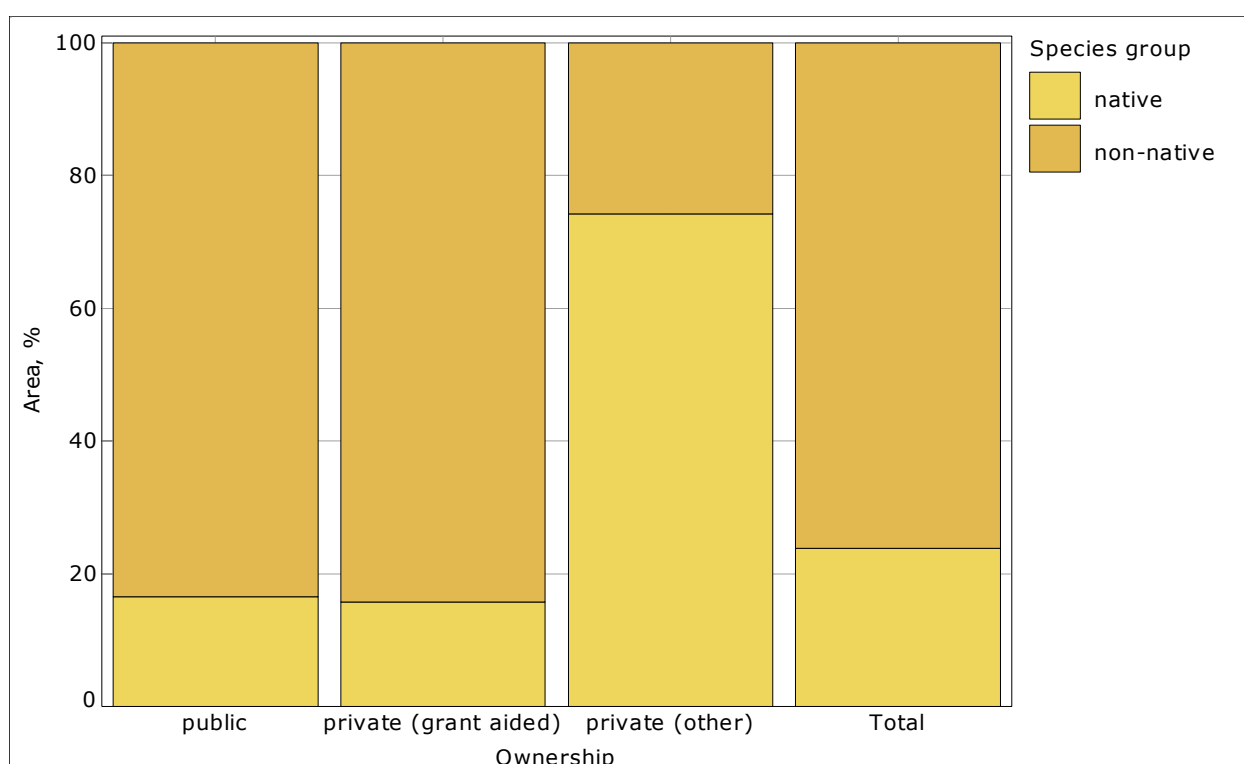
4.1.3 Stocked forest area by ownership and species type (native/non-native)

Definition			
Native/non-native			
Classification of tree species into broad species types: native and non-native.			
Native tree species:			
Common Name	Botanical Name	Common Name	Botanical Name
Alder	<i>Alnus glutinosa</i>	Crab apple	<i>Malus sylvestris</i>
Silver birch	<i>Betula pendula</i>	Aspen	<i>Populus tremula</i>
Downy birch	<i>Betula pubescens</i>	Wild cherry	<i>Prunus avium</i>
Ash	<i>Fraxinus excelsior</i>	Eared willow	<i>Salix aurita</i>
Sessile Oak	<i>Quercus petraea</i>	Goat willow	<i>Salix caprea</i>
Pedunculate Oak	<i>Quercus robur</i>	Rusty willow	<i>Salix cinerea</i> ssp. <i>Oleifolia</i>
Scots pine	<i>Pinus sylvestris</i>	Rowan	<i>Sorbus aucuparia</i>
Hazel	<i>Corylus avellana</i>	Yew	<i>Taxus baccata</i>
Holly	<i>Ilex aquifolium</i>		

Methodology
Stocked forest area is classified by ownership and species type (native/non-native).

Species group	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
native	56.62	(51.67 – 61.58)	16.6	33.46	(29.66 – 37.26)	15.7
non-native	285.07	(279.90 – 290.24)	83.4	179.06	(176.01 – 182.12)	84.3
Total	341.69	(326.35 – 357.03)	100.0	212.52	(198.06 – 226.99)	100.0

Species group	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
native	61.55	(58.50 – 64.61)	74.2	151.64	(143.72 – 159.55)	23.8
non-native	21.37	(18.84 – 23.89)	25.8	485.50	(478.42 – 492.58)	76.2
Total	82.92	(72.42 – 93.42)	100.0	637.13		100.0



4.1.4 Stocked forest area by county and species group (native/non-native)

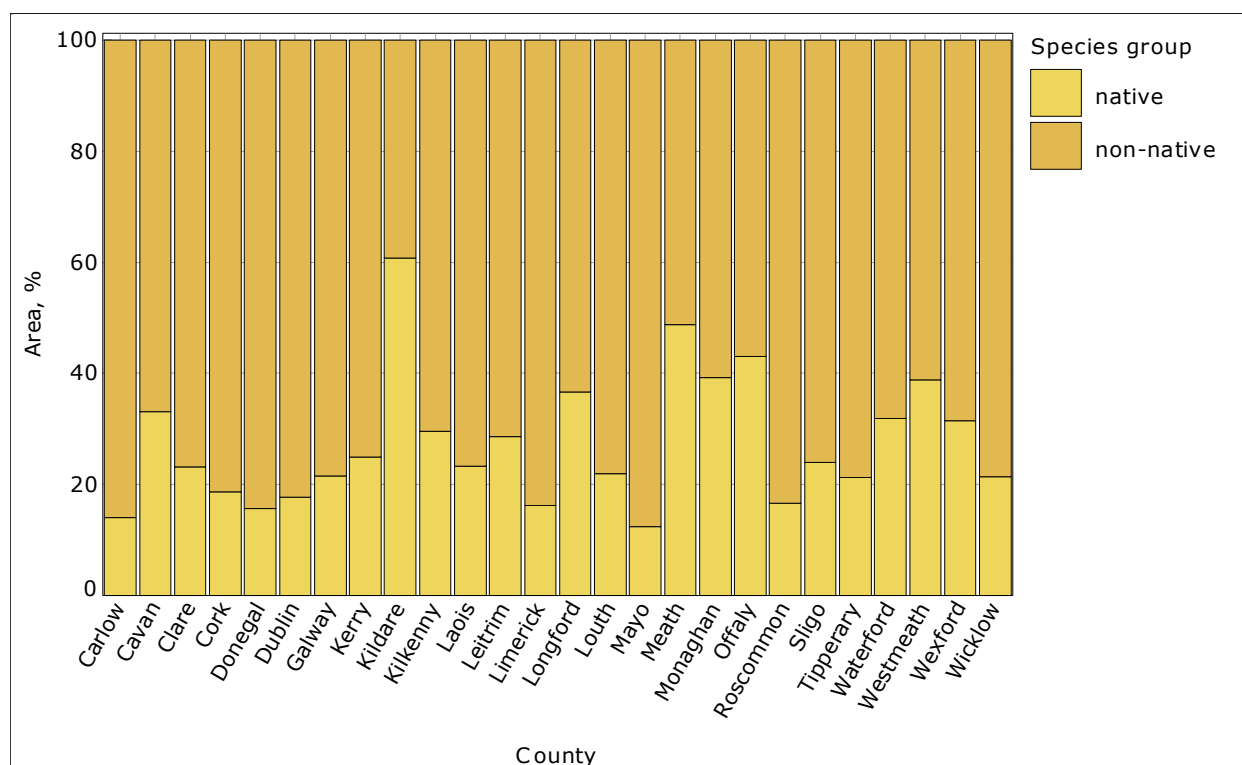
Methodology						
Stocked forest area is classified by county and species group (native/non-native).						
Species group	County / Area					
	Carlow			Cavan		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
native	0.90	(0.00 - 2.19)	14.1	4.64	(3.18 - 6.09)	33.1
non-native	5.50	(5.35 - 5.65)	85.9	9.39	(8.07 - 10.70)	66.9
Total	6.40		100.0	14.02		100.0
Species group	County / Area					
	Clare			Cork		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
native	10.17	(8.31 - 12.02)	23.2	13.79	(11.22 - 16.35)	18.6
non-native	33.68	(32.03 - 35.32)	76.8	60.23	(57.90 - 62.57)	81.4
Total	43.84		100.0	74.02		100.0
Species group	County / Area					
	Donegal			Dublin		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
native	7.78	(5.59 - 9.98)	15.7	0.85	(0.00 - 1.85)	17.7
non-native	41.67	(40.16 - 43.19)	84.3	3.98	(3.34 - 4.62)	82.3
Total	49.45		100.0	4.83		100.0
Species group	County / Area					
	Galway			Kerry		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
native	11.75	(9.40 - 14.11)	21.5	10.96	(8.89 - 13.03)	24.9
non-native	42.87	(40.61 - 45.13)	78.5	33.09	(31.27 - 34.92)	75.1
Total	54.62		100.0	44.05		100.0
Species group	County / Area					
	Kildare			Kilkenny		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
native	5.83	(4.66 - 7.00)	60.7	5.13	(3.66 - 6.60)	29.5
non-native	3.77	(2.43 - 5.11)	39.3	12.26	(10.82 - 13.71)	70.5
Total	9.60		100.0	17.40		100.0
Species group	County / Area					
	Laois			Leitrim		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
native	5.41	(3.89 - 6.93)	23.3	6.57	(4.75 - 8.39)	28.6
non-native	17.85	(16.11 - 19.59)	76.7	16.37	(14.78 - 17.96)	71.4
Total	23.25		100.0	22.94		100.0
Species group	County / Area					
	Limerick			Longford		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
native	3.88	(2.41 - 5.36)	16.2	2.77	(1.65 - 3.89)	36.6
non-native	20.06	(19.16 - 20.96)	83.8	4.80	(4.06 - 5.53)	63.4
Total	23.94		100.0	7.57		100.0
Species group	County / Area					
	Louth			Mayo		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
native	0.44	(0.00 - 1.29)	21.9	5.30	(3.49 - 7.10)	12.5
non-native	1.58	(0.81 - 2.35)	78.1	37.21	(35.71 - 38.70)	87.5
Total	2.02		100.0	42.50		100.0
Species group	County / Area					
	Meath			Monaghan		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
native	4.91	(3.47 - 6.35)	48.7	1.88	(0.81 - 2.95)	39.2
non-native	5.17	(4.03 - 6.31)	51.3	2.92	(2.18 - 3.65)	60.8
Total	10.08		100.0	4.80		100.0

Species group	County / Area				
	Offaly			Roscommon	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
native	9.51	(7.52 – 11.50)	43.0	3.71	(2.27 – 5.14) 16.7
non-native	12.59	(11.06 – 14.11)	57.0	18.54	(17.36 – 19.72) 83.3
Total	22.10		100.0	22.24	100.0

Species group	County / Area				
	Sligo			Tipperary	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
native	4.37	(2.87 – 5.86)	24.0	8.65	(6.62 – 10.68) 21.3
non-native	13.84	(12.76 – 14.92)	76.0	32.02	(30.08 – 33.96) 78.7
Total	18.21		100.0	40.67	100.0

Species group	County / Area				
	Waterford			Westmeath	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
native	7.29	(5.90 – 8.69)	31.8	4.34	(3.10 – 5.58) 38.8
non-native	15.63	(13.84 – 17.43)	68.2	6.83	(5.54 – 8.13) 61.2
Total	22.93		100.0	11.17	100.0

Species group	County / Area				
	Wexford			Wicklow	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
native	4.09	(2.67 – 5.52)	31.4	6.72	(4.83 – 8.60) 21.4
non-native	8.94	(7.93 – 9.96)	68.6	24.71	(23.30 – 26.12) 78.6
Total	13.04		100.0	31.43	100.0



4.2 SPECIES COMPOSITION

4.2.1 Stocked forest area by species

Methodology			
Stocked forest area is classified by individual tree species.			
Species	Area		
	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	334.56	(321.08 – 348.04)	52.3
lodgepole pine v SC	51.49	(44.17 – 58.81)	8.1
Norway spruce	26.34	(21.04 – 31.63)	4.1
Japanese larch	25.98	(21.02 – 30.95)	4.1
Douglas-fir	10.38	(7.00 – 13.76)	1.6
Scots pine	8.01	(5.45 – 10.57)	1.3
lodgepole pine v. NC	7.49	(4.83 – 10.16)	1.2
noble fir	1.65	(0.36 – 2.95)	0.3
European larch	1.53	(0.40 – 2.66)	0.2
lodgepole pine v. inland	1.30	(0.00 – 2.63)	0.2
lodgepole pine v. lulu	1.12	(0.00 – 2.25)	0.2
grand fir	0.59	(0.08 – 1.10)	0.09
western hemlock	0.57	(0.00 – 1.26)	0.09
Lawson cypress	0.36	(0.00 – 0.82)	0.06
silver fir	0.36	(0.00 – 1.02)	0.06
Austrian pine v. maritima	0.30	(0.00 – 0.83)	0.05
Monterey pine	0.24	(0.00 – 0.72)	0.04
horse chestnut	0.24	(0.00 – 0.59)	0.04
cedar of Lebanon	0.19	(0.00 – 0.56)	0.03
yew	0.05	(0.00 – 0.15)	0.008
western redcedar	0.04	(0.00 – 0.10)	0.007
coast redwood	0.03	(0.00 – 0.10)	0.005
goat willow	30.95	(26.34 – 35.55)	4.9
ash	20.61	(16.35 – 24.87)	3.2
silver birch	19.08	(15.03 – 23.13)	3.0
downy birch	18.28	(14.38 – 22.19)	2.9
alder	15.08	(11.21 – 18.96)	2.4
hazel	10.55	(7.33 – 13.78)	1.7
pedunculate oak	10.48	(7.40 – 13.57)	1.6
beech	9.50	(6.80 – 12.20)	1.5
sycamore	9.25	(6.22 – 12.27)	1.5
holly	7.03	(5.08 – 8.99)	1.1
sessile oak	6.35	(4.05 – 8.66)	1.0
mountain ash	4.04	(2.55 – 5.53)	0.6
wych elm	0.61	(0.00 – 1.28)	0.1
small-leaved lime	0.56	(0.00 – 1.40)	0.09
sweet chestnut	0.46	(0.00 – 1.11)	0.07
white willow	0.19	(0.00 – 0.58)	0.03
notofagus sp.	0.14	(0.00 – 0.42)	0.02
large-leaved lime	0.13	(0.00 – 0.40)	0.02
Strawberry tree	0.12	(0.00 – 0.31)	0.02
field maple	0.12	(0.00 – 0.30)	0.02
cherry	0.11	(0.00 – 0.26)	0.02
English elm	0.10	(0.00 – 0.31)	0.02
aspen	0.05	(0.00 – 0.14)	0.007
crab apple	0.04	(0.00 – 0.12)	0.007
whitebeam	0.04	(0.00 – 0.14)	0.007
eastern balsam	0.03	(0.00 – 0.09)	0.004
red oak	0.02	(0.00 – 0.06)	0.004
hybrid larch	0.23	(0.00 – 0.68)	0.04
Turkey oak	0.12	(0.00 – 0.35)	0.02
Total	637.13		100.0

4.3 SPECIES GROUP COMPOSITION

Definition

Species group

Classification of less common tree species into groups of species, on the basis of similarity in growth rate and form.

Methodology

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 is outlined below.

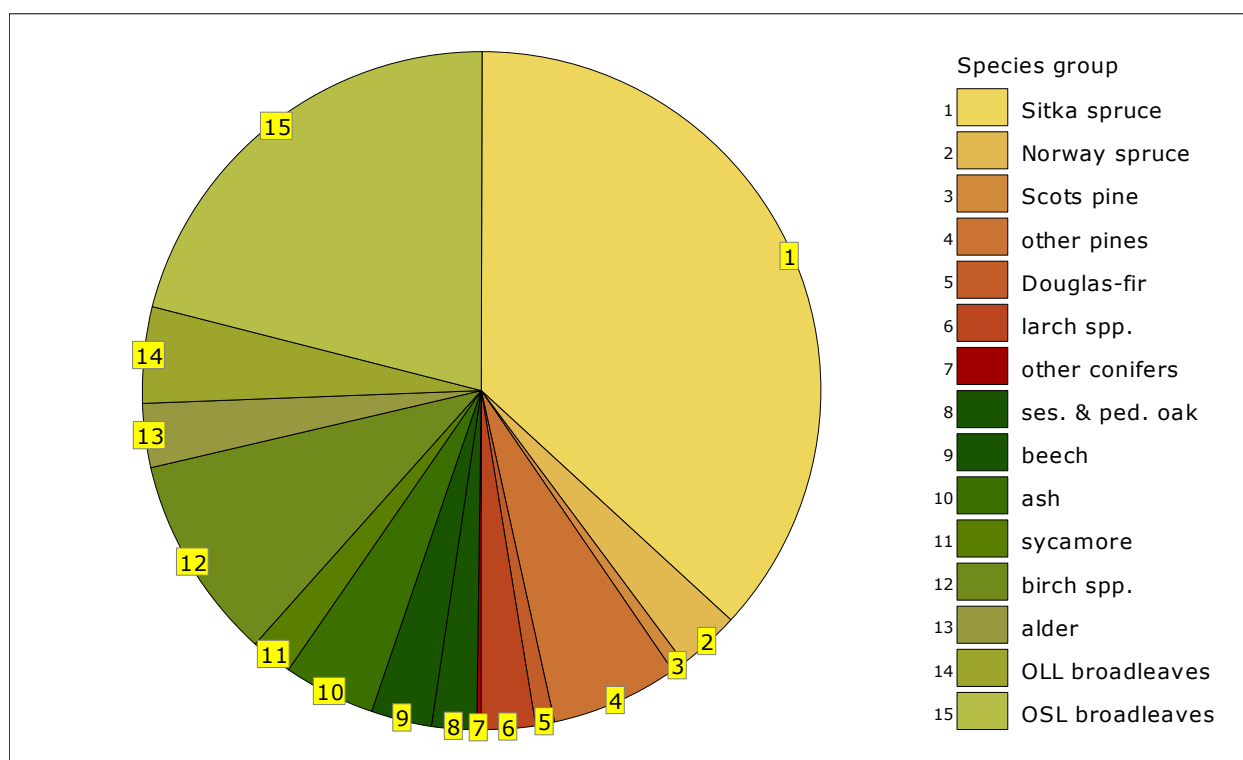
Species	Species group	Species	Species group
Sitka spruce	Sitka spruce	silver birch	birch spp.
Norway spruce	Norway spruce	downy birch	
Scots pine	Scots pine	alder	alder spp.
lodgepole pine v. inland	other pine spp.	field maple	other long living broadleaves (OLL)
lodgepole pine v. lulu		maple	
lodgepole pine v. NC		horse chestnut	
lodgepole pine v SC		strawberry tree	
Austrian pine v. maritima		hornbeam	
Monterey pine		sweet chestnut	
Douglas fir	Douglas fir	holly	
European larch	larch spp.	notofagus sp.	
Japanese larch		white poplar	
other larches		black poplar	
silver fir	other conifers	Turkey oak	
grand fir		red oak	
noble fir		whitebeam	
cedar of Lebanon		small-leaved lime	
Lawson cypress		large-leaved lime	
coast redwood		wych elm	
yew		crab apple	other short living broadleaves (OSL)
western redcedar		aspen	
western hemlock		cherry	
sessile oak	sessile and	blackthorn	
pedunculate oak	pedunculate oak	goat willow	
beech	beech	other willows	
ash	ash	mountain ash	
sycamore	sycamore	hazel	

4.3.1 Total number of trees by species group

Methodology

The total number of trees is classified by species group.

Species group	Tree number		
	thousands	($\alpha = 0.05$)	%
Sitka spruce	782,790	(753,866 – 811,714)	37.0
Norway spruce	63,878	(54,492 – 73,265)	3.0
Scots pine	13,485	(8,700 – 18,269)	0.6
other pines	130,223	(114,857 – 145,590)	6.1
Douglas-fir	18,928	(13,683 – 24,173)	0.9
larch spp.	55,242	(46,457 – 64,028)	2.6
other conifers	4,566	(0 – 23,538)	0.2
ses. & ped. oak	45,232	(32,212 – 58,252)	2.1
beech	61,044	(51,103 – 70,986)	2.9
ash	94,252	(73,017 – 115,488)	4.4
sycamore	41,350	(22,591 – 60,109)	1.9
birch spp.	207,129	(168,680 – 245,577)	9.7
alder	64,470	(43,341 – 85,599)	3.0
OLL broadleaves	96,967	(73,929 – 120,004)	4.6
OSL broadleaves	446,313	(375,507 – 517,120)	21.0
Total	2,125,870	(1,991,912 – 2,259,828)	100.0

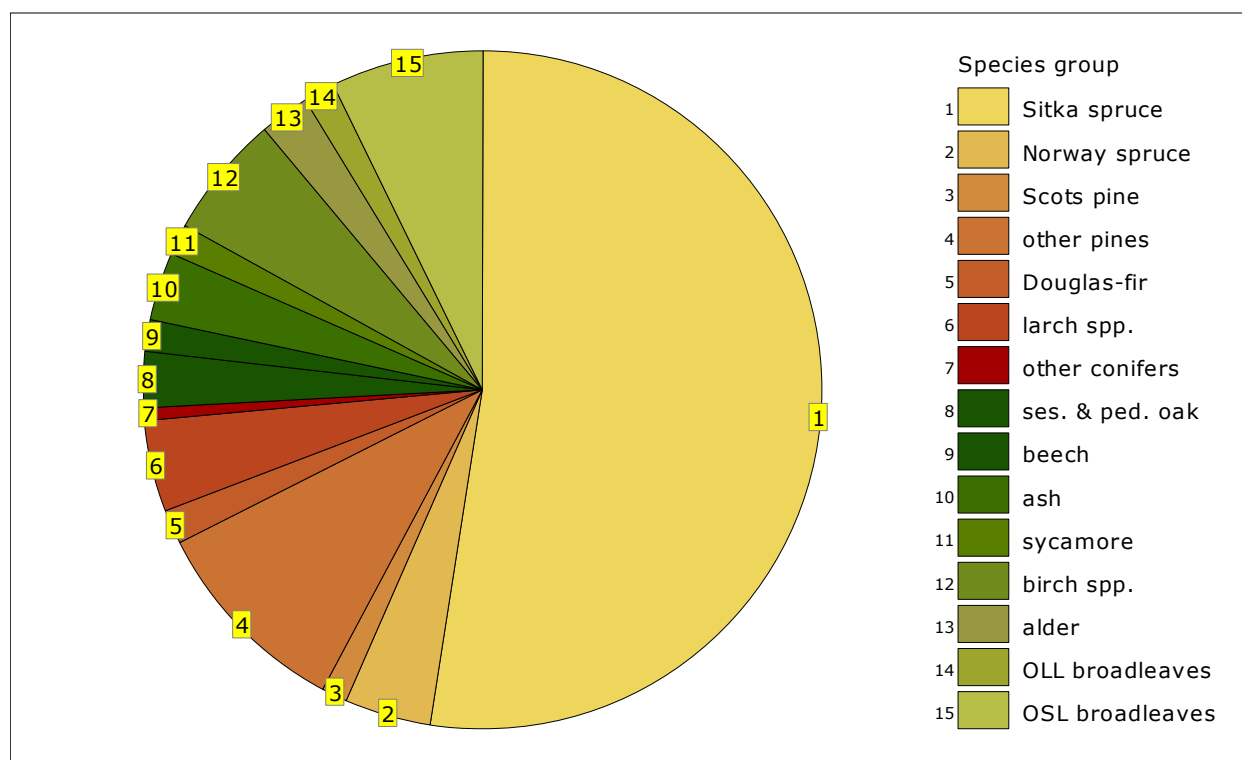


4.3.2 Stocked forest area by species group

Methodology

The stocked forest area is classified by species group.

Species group	Area		
	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	334.56	(327.48 – 341.65)	52.4
Norway spruce	26.34	(23.46 – 29.21)	4.1
Scots pine	8.01	(6.24 – 9.78)	1.3
other pines	61.95	(57.05 – 66.84)	9.7
Douglas-fir	10.38	(9.08 – 11.67)	1.6
larch spp.	27.74	(24.32 – 31.16)	4.4
other conifers	3.85	(2.46 – 5.24)	0.6
ses. & ped. oak	16.84	(13.95 – 19.72)	2.6
beech	9.50	(7.57 – 11.43)	1.5
ash	20.61	(17.27 – 23.95)	3.2
sycamore	9.25	(7.08 – 11.42)	1.5
birch spp.	37.37	(33.65 – 41.08)	5.9
alder	15.08	(12.63 – 17.53)	2.4
OLL broadleaves	9.44	(7.53 – 11.35)	1.5
OSL broadleaves	46.22	(41.74 – 50.71)	7.3
Total	637.13		100.0



4.3.3 Stocked forest area by county and species group

Methodology

The stocked forest area is classified by county and species group.

Species group	County / Area					
	Carlow			Cavan		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	3.49	(2.34 - 4.64)	54.5	6.95	(5.75 - 8.14)	49.4
Norway spruce	0.08		1.3	0.95	(0.05 - 1.85)	6.8
Scots pine	0.02	(0.02 - 0.03)	0.4	-	-	-
other pines	-	-	-	0.39	(0.00 - 2.52)	2.8
Douglas-fir	0.79	(0.66 - 0.92)	12.3	-	-	-
larch spp.	0.46	(0.19 - 0.73)	7.2	0.55	(0.11 - 0.99)	3.9
other conifers	0.20		3.2	0.04		0.3
ses. & ped. oak	0.39		6.1	0.70	(0.00 - 1.61)	5.0
beech	-	-	-	0.00		0.006
ash	0.43	(0.00 - 5.16)	6.7	0.65	(0.00 - 1.56)	4.6
sycamore	0.03		0.4	0.41	(0.00 - 5.24)	2.9
birch spp.	0.05		0.9	1.05	(0.30 - 1.81)	7.5
alder	-	-	-	0.83	(0.00 - 1.91)	5.9
OLL broadleaves	0.44	(0.00 - 3.58)	6.9	0.12	(0.00 - 0.37)	0.9
OSL broadleaves	0.01		0.1	1.40	(0.35 - 2.44)	10.0
Total	6.40		100.0	14.02		100.0

Species group	County / Area					
	Clare			Cork		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	26.92	(25.22 - 28.61)	61.4	47.08	(44.88 - 49.28)	63.6
Norway spruce	0.56	(0.00 - 1.69)	1.3	0.55	(0.00 - 1.47)	0.7
Scots pine	0.08		0.2	0.87	(0.43 - 1.31)	1.2
other pines	3.52	(2.10 - 4.94)	8.0	4.36	(2.89 - 5.83)	5.9
Douglas-fir	-	-	-	1.20	(0.33 - 2.07)	1.6
larch spp.	1.77	(0.88 - 2.65)	4.0	3.62	(2.11 - 5.13)	4.9
other conifers	-	-	-	0.30	(0.00 - 1.11)	0.4
ses. & ped. oak	0.13	(0.00 - 0.26)	0.3	1.51	(0.76 - 2.27)	2.0
beech	0.62	(0.00 - 1.37)	1.4	1.51	(0.48 - 2.54)	2.0
ash	2.56	(1.40 - 3.72)	5.8	2.05	(0.85 - 3.25)	2.8
sycamore	0.29	(0.00 - 0.78)	0.7	1.51	(0.34 - 2.67)	2.0
birch spp.	1.46	(0.47 - 2.45)	3.3	2.26	(1.18 - 3.35)	3.1
alder	0.80	(0.00 - 1.73)	1.8	3.22	(2.18 - 4.26)	4.4
OLL broadleaves	0.47	(0.00 - 1.18)	1.1	1.02	(0.40 - 1.64)	1.4
OSL broadleaves	4.67	(3.10 - 6.24)	10.7	2.95	(1.95 - 3.95)	4.0
Total	43.84		100.0	74.02		100.0

Species group	County / Area					
	Donegal			Dublin		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	31.10	(28.69 – 33.51)	62.7	2.24	(1.95 – 2.54)	46.6
Norway spruce	0.29		0.6	–	–	–
Scots pine	–	–	–	0.06		1.2
other pines	8.07	(6.55 – 9.59)	16.3	0.78	(0.00 – 1.76)	16.2
Douglas-fir	–	–	–	0.10		2.0
larch spp.	1.32	(0.36 – 2.27)	2.7	0.15	(0.00 – 1.89)	3.0
other conifers	0.44	(0.00 – 1.82)	0.9	0.05		0.9
ses. & ped. oak	0.44	(0.00 – 1.96)	0.9	0.36	(0.00 – 4.54)	7.4
beech	0.33	(0.04 – 0.61)	0.7	0.10	(0.00 – 0.94)	2.1
ash	0.48	(0.10 – 0.87)	1.0	0.22	(0.14 – 0.30)	4.5
sycamore	0.12		0.3	0.20	(0.00 – 1.53)	4.2
birch spp.	1.93	(0.92 – 2.93)	3.9	–	–	–
alder	0.66	(0.27 – 1.06)	1.3	0.15		3.1
OLL broadleaves	0.29	(0.00 – 0.82)	0.6	0.37	(0.00 – 4.78)	7.7
OSL broadleaves	3.98	(2.56 – 5.41)	8.1	0.05	(0.00 – 0.47)	1.1
Total	49.45		100.0	4.83		100.0

Species group	County / Area					
	Galway			Kerry		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	27.59	(25.17 – 30.02)	50.6	27.07	(25.05 – 29.09)	61.4
Norway spruce	1.61	(0.68 – 2.54)	2.9	0.40		0.9
Scots pine	0.82	(0.00 – 1.77)	1.5	0.05		0.1
other pines	11.44	(9.24 – 13.63)	20.9	3.37	(2.14 – 4.60)	7.7
Douglas-fir	–	–	–	–	–	–
larch spp.	1.21	(0.70 – 1.72)	2.2	1.18	(0.09 – 2.27)	2.7
other conifers	0.07	(0.00 – 0.33)	0.1	0.33	(0.00 – 3.32)	0.8
ses. & ped. oak	0.62	(0.00 – 1.60)	1.1	1.27	(0.60 – 1.93)	2.9
beech	0.53	(0.15 – 0.90)	1.0	0.27	(0.00 – 0.91)	0.6
ash	1.30	(0.42 – 2.17)	2.4	0.44	(0.21 – 0.67)	1.0
sycamore	0.43	(0.00 – 1.07)	0.8	0.40		0.9
birch spp.	2.90	(1.96 – 3.85)	5.3	3.36	(2.07 – 4.65)	7.6
alder	0.58	(0.00 – 1.35)	1.1	1.70	(0.66 – 2.74)	3.9
OLL broadleaves	0.45	(0.03 – 0.87)	0.8	2.00	(1.38 – 2.63)	4.5
OSL broadleaves	5.08	(3.59 – 6.58)	9.3	2.21	(1.22 – 3.19)	5.0
Total	54.62		100.0	44.05		100.0

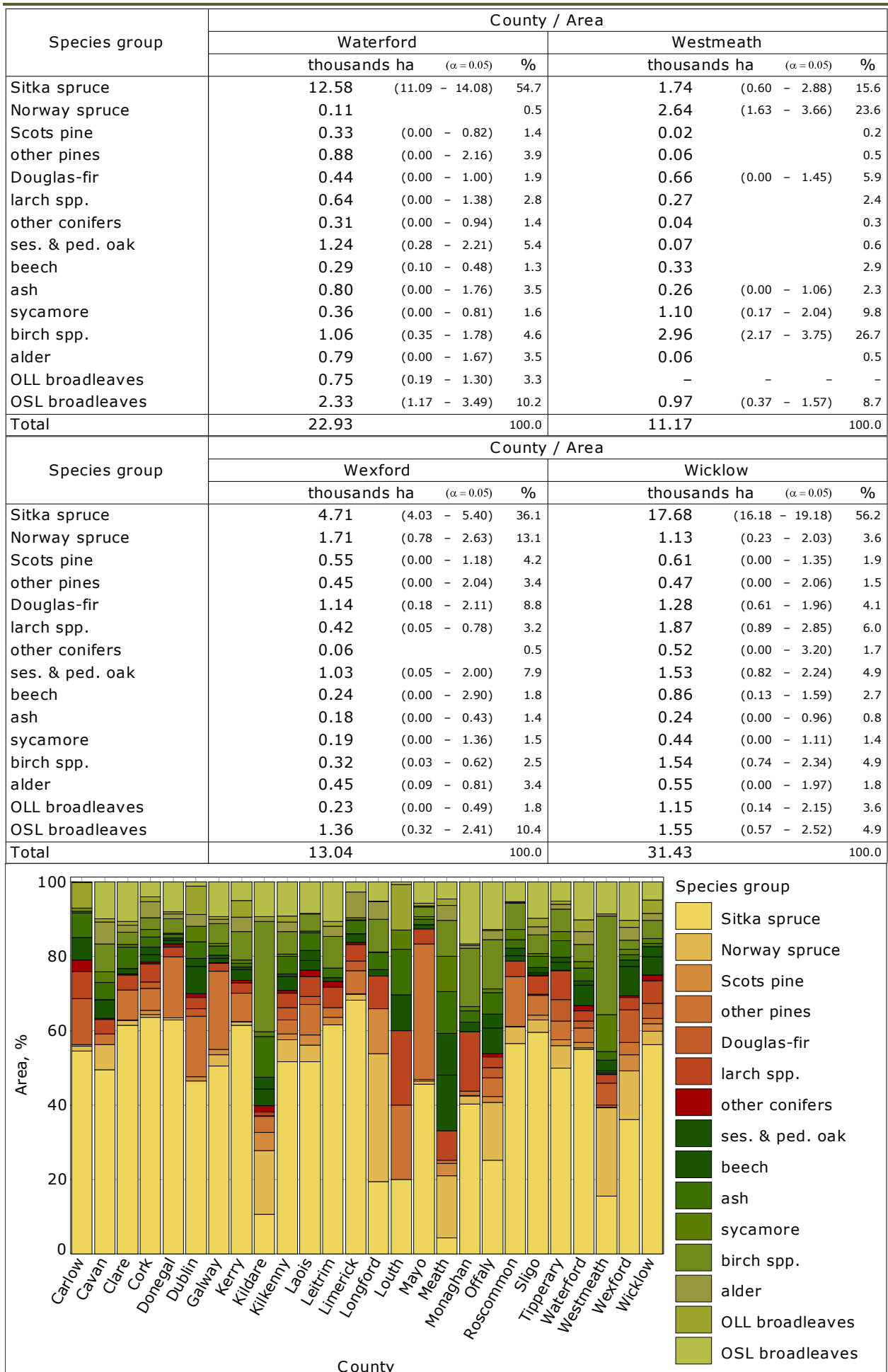
Species group	County / Area					
	Kildare			Kilkenny		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	1.02	(0.00 – 2.11)	10.7	8.99	(7.78 – 10.20)	51.6
Norway spruce	1.64	(0.82 – 2.45)	17.1	1.03	(0.00 – 2.12)	5.9
Scots pine	0.48	(0.00 – 1.74)	5.0	0.26		1.5
other pines	0.41	(0.00 – 5.36)	4.3	0.66	(0.00 – 1.76)	3.8
Douglas-fir	0.02		0.2	0.59	(0.00 – 1.86)	3.4
larch spp.	0.09	(0.00 – 0.95)	1.0	0.66	(0.00 – 1.72)	3.8
other conifers	0.17		1.7	0.12	(0.00 – 0.30)	0.7
ses. & ped. oak	0.43	(0.00 – 2.08)	4.5	0.66	(0.10 – 1.22)	3.8
beech	0.30	(0.19 – 0.40)	3.1	0.12	(0.00 – 0.26)	0.7
ash	1.05	(0.34 – 1.77)	11.0	0.82	(0.00 – 1.72)	4.7
sycamore	0.12	(0.00 – 0.27)	1.3	0.10		0.6
birch spp.	2.84	(1.60 – 4.08)	29.4	1.06	(0.43 – 1.69)	6.1
alder	0.13	(0.00 – 1.46)	1.3	0.46	(0.00 – 4.91)	2.6
OLL broadleaves	–	–	–	0.27	(0.08 – 0.46)	1.6
OSL broadleaves	0.90	(0.34 – 1.46)	9.4	1.60	(0.65 – 2.55)	9.2
Total	9.60		100.0	17.40		100.0

Species group	County / Area					
	Laois			Leitrim		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	12.01	(10.49 - 13.53)	51.6	14.14	(12.87 - 15.41)	61.6
Norway spruce	1.04	(0.00 - 2.17)	4.5	-	-	-
Scots pine	0.62	(0.00 - 1.64)	2.7	0.43	(0.00 - 1.37)	1.9
other pines	1.92	(0.78 - 3.07)	8.3	0.60	(0.00 - 1.45)	2.6
Douglas-fir	0.51	(0.01 - 1.01)	2.2	-	-	-
larch spp.	1.25	(0.17 - 2.33)	5.4	1.26	(0.55 - 1.97)	5.5
other conifers	0.40	(0.00 - 1.36)	1.7	0.36	-	1.6
ses. & ped. oak	0.61	(0.15 - 1.07)	2.6	0.25	(0.00 - 3.25)	1.1
beech	0.62	(0.33 - 0.90)	2.6	0.01	-	0.03
ash	1.11	(0.39 - 1.82)	4.8	0.59	(0.00 - 1.74)	2.6
sycamore	0.11	(0.00 - 0.25)	0.5	-	-	-
birch spp.	1.06	(0.45 - 1.67)	4.5	1.93	(0.80 - 3.06)	8.4
alder	0.02	-	0.1	0.64	(0.00 - 1.65)	2.8
OLL broadleaves	0.01	-	0.04	0.28	(0.03 - 0.53)	1.2
OSL broadleaves	1.99	(1.03 - 2.94)	8.5	2.45	(1.42 - 3.48)	10.7
Total	23.25	-	100.0	22.94	-	100.0
Species group	County / Area					
	Limerick			Longford		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	16.32	(15.02 - 17.62)	68.2	1.47	(0.32 - 2.62)	19.4
Norway spruce	0.38	-	1.6	2.60	(1.70 - 3.50)	34.3
Scots pine	0.04	-	0.2	0.91	(0.00 - 1.86)	12.1
other pines	1.46	(0.41 - 2.52)	6.1	-	-	-
Douglas-fir	0.64	(0.00 - 2.59)	2.7	-	-	-
larch spp.	1.06	(0.51 - 1.62)	4.4	0.66	(0.00 - 2.37)	8.8
other conifers	0.14	(0.00 - 0.33)	0.6	-	-	-
ses. & ped. oak	0.52	(0.00 - 2.03)	2.2	0.13	-	1.8
beech	0.02	-	0.1	-	-	-
ash	0.86	(0.00 - 2.12)	3.6	0.35	(0.00 - 0.97)	4.6
sycamore	0.02	-	0.08	0.01	-	0.1
birch spp.	0.16	(0.08 - 0.24)	0.6	0.66	(0.14 - 1.18)	8.7
alder	1.64	(0.62 - 2.66)	6.8	0.36	(0.00 - 1.26)	4.8
OLL broadleaves	-	-	-	0.01	-	0.2
OSL broadleaves	0.66	(0.19 - 1.13)	2.8	0.39	(0.05 - 0.73)	5.2
Total	23.94	-	100.0	7.57	-	100.0
Species group	County / Area					
	Louth			Mayo		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	0.40	-	20.0	19.41	(17.33 - 21.49)	45.9
Norway spruce	-	-	-	0.32	(0.00 - 2.81)	0.7
Scots pine	-	-	-	0.22	(0.03 - 0.40)	0.5
other pines	0.40	-	20.0	15.44	(13.37 - 17.52)	36.3
Douglas-fir	-	-	-	-	-	-
larch spp.	0.40	-	20.0	1.74	(0.80 - 2.68)	4.1
other conifers	-	-	-	-	-	-
ses. & ped. oak	-	-	-	0.49	(0.16 - 0.81)	1.1
beech	0.19	(0.00 - 1.51)	9.6	0.01	-	0.01
ash	0.25	(0.00 - 3.22)	12.2	0.60	(0.09 - 1.10)	1.4
sycamore	0.10	-	5.2	0.29	(0.00 - 0.70)	0.7
birch spp.	-	-	-	1.12	(0.27 - 1.97)	2.6
alder	-	-	-	0.09	-	0.2
OLL broadleaves	0.25	-	12.3	0.31	(0.07 - 0.55)	0.7
OSL broadleaves	0.01	-	0.7	2.47	(1.30 - 3.65)	5.8
Total	2.02	-	100.0	42.50	-	100.0

Species group	County / Area				
	Meath			Monaghan	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
Sitka spruce	0.44	(0.00 – 5.11)	4.4	1.93	(0.96 – 2.90) 40.3
Norway spruce	1.67	(0.80 – 2.54)	16.5	0.10	2.2
Scots pine	0.35	(0.00 – 0.97)	3.4	0.01	0.1
other pines	0.08		0.8	0.06	(0.00 – 0.58) 1.2
Douglas-fir	–	–	–	–	–
larch spp.	0.79	(0.00 – 2.33)	7.8	0.76	(0.31 – 1.22) 15.9
other conifers	–	–	–	–	–
ses. & ped. oak	1.51	(0.69 – 2.33)	15.0	0.12	2.6
beech	1.13	(0.30 – 1.96)	11.2	–	–
ash	1.13	(0.00 – 2.30)	11.3	0.14	(0.00 – 1.45) 3.0
sycamore	0.95	(0.00 – 2.06)	9.5	0.06	1.2
birch spp.	0.97	(0.54 – 1.41)	9.7	0.75	(0.33 – 1.17) 15.6
alder	0.40		4.0	0.04	0.8
OLL broadleaves	0.19	(0.00 – 1.52)	1.9	0.02	0.4
OSL broadleaves	0.46	(0.00 – 1.23)	4.5	0.80	(0.02 – 1.58) 16.7
Total	10.08		100.0	4.80	100.0

Species group	County / Area				
	Offaly			Roscommon	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
Sitka spruce	5.55	(4.38 – 6.73)	25.0	12.57	(11.14 – 14.00) 56.4
Norway spruce	3.43	(2.63 – 4.23)	15.5	0.99	(0.29 – 1.69) 4.5
Scots pine	0.35	(0.00 – 3.80)	1.6	0.04	0.2
other pines	1.13	(0.37 – 1.90)	5.1	2.96	(1.73 – 4.19) 13.3
Douglas-fir	0.61	(0.00 – 1.58)	2.8	–	–
larch spp.	0.63	(0.00 – 1.70)	2.9	0.93	(0.08 – 1.79) 4.2
other conifers	0.19	(0.00 – 2.50)	0.9	–	–
ses. & ped. oak	1.52	(0.42 – 2.62)	6.9	0.33	(0.00 – 1.42) 1.5
beech	0.81	(0.00 – 2.13)	3.7	0.46	(0.00 – 1.28) 2.1
ash	1.27	(0.39 – 2.15)	5.8	0.49	(0.17 – 0.81) 2.2
sycamore	0.23	(0.00 – 1.12)	1.0	0.62	(0.00 – 2.09) 2.8
birch spp.	2.94	(1.88 – 4.01)	13.3	1.56	(0.67 – 2.45) 7.0
alder	0.54	(0.00 – 1.60)	2.4	0.08	(0.00 – 0.24) 0.4
OLL broadleaves	0.05	(0.00 – 0.18)	0.2	0.02	(0.00 – 0.18) 0.09
OSL broadleaves	2.84	(1.69 – 4.00)	12.9	1.18	(0.41 – 1.96) 5.3
Total	22.10		100.0	22.24	100.0

Species group	County / Area				
	Sligo			Tipperary	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
Sitka spruce	10.84	(9.61 – 12.06)	59.3	20.29	(19.07 – 21.51) 49.9
Norway spruce	0.62	(0.00 – 2.81)	3.4	2.49	(1.46 – 3.52) 6.1
Scots pine	0.23		1.3	0.65	(0.22 – 1.08) 1.6
other pines	0.98	(0.23 – 1.73)	5.4	2.03	(0.92 – 3.15) 5.0
Douglas-fir	0.05		0.3	2.34	(1.92 – 2.76) 5.8
larch spp.	0.89	(0.14 – 1.65)	4.9	3.16	(1.66 – 4.65) 7.8
other conifers	0.04		0.2	0.06	(0.00 – 0.20) 0.2
ses. & ped. oak	0.11	(0.00 – 0.98)	0.6	0.87	(0.00 – 1.74) 2.1
beech	0.27	(0.00 – 0.79)	1.5	0.51	(0.00 – 1.16) 1.3
ash	0.53	(0.00 – 1.38)	2.9	1.81	(0.76 – 2.85) 4.4
sycamore	0.15		0.8	1.01	(0.00 – 2.09) 2.5
birch spp.	0.92	(0.01 – 1.83)	5.1	2.49	(1.29 – 3.70) 6.1
alder	0.40		2.2	0.50	(0.00 – 1.26) 1.2
OLL broadleaves	0.41	(0.00 – 0.99)	2.3	0.33	(0.02 – 0.64) 0.8
OSL broadleaves	1.78	(0.75 – 2.80)	9.8	2.13	(1.05 – 3.22) 5.2
Total	18.21		100.0	40.67	100.0



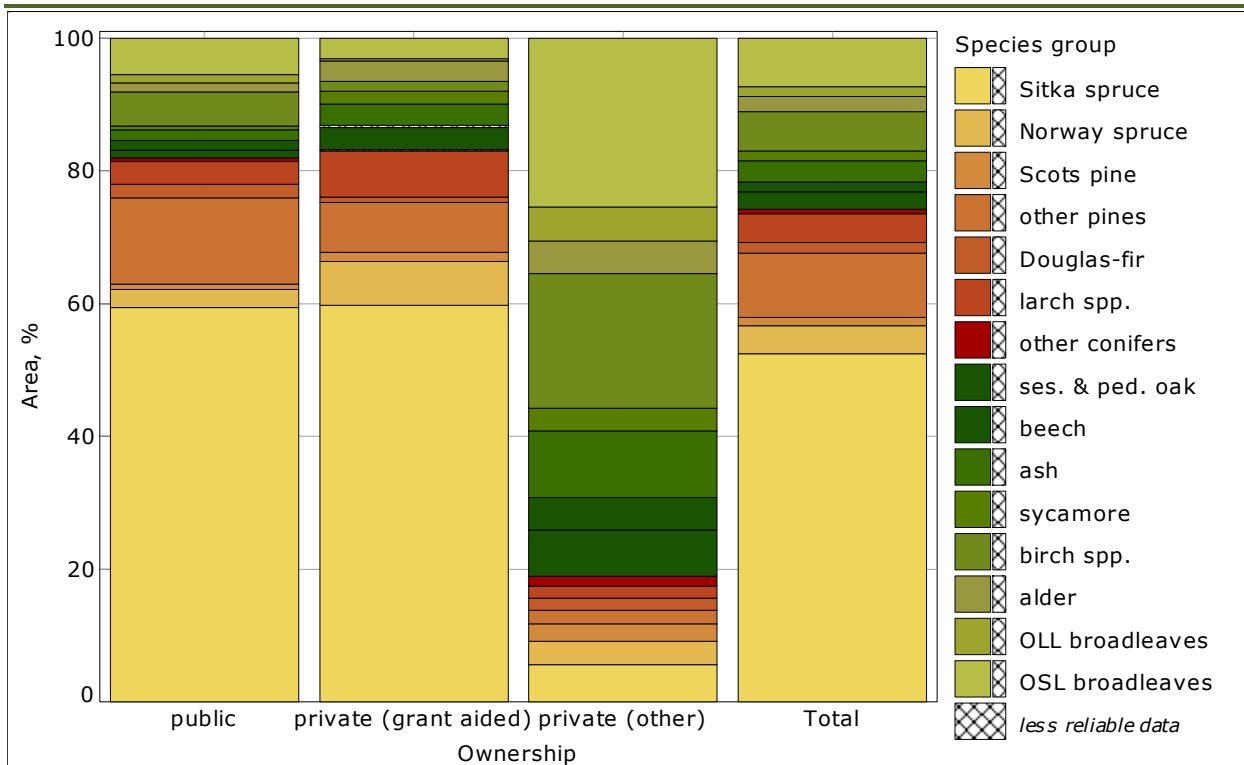
4.3.4 Stocked forest area by ownership and species group

Methodology

The stocked forest area is classified by ownership and species group.

Species group	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	203.03	(197.52 – 208.54)	59.4	126.89	(122.86 – 130.92)	59.7
Norway spruce	9.17	(7.56 – 10.78)	2.7	14.21	(12.64 – 15.78)	6.7
Scots pine	3.03	(1.77 – 4.29)	0.9	2.86	(1.83 – 3.90)	1.3
other pines	44.16	(39.95 – 48.38)	12.9	16.12	(13.92 – 18.32)	7.6
Douglas-fir	7.27	(6.23 – 8.32)	2.1	1.50	(1.11 – 1.89)	0.7
larch spp.	11.46	(9.20 – 13.71)	3.4	14.86	(12.55 – 17.17)	7.0
other conifers	2.08	(0.86 – 3.29)	0.6	0.50	–	0.2
ses. & ped. oak	4.02	(2.56 – 5.48)	1.2	7.01	(5.17 – 8.85)	3.3
beech	4.73	(3.20 – 6.26)	1.4	0.75	–	0.4
ash	5.47	(3.85 – 7.08)	1.6	6.82	(5.00 – 8.65)	3.2
sycamore	2.26	(0.84 – 3.68)	0.7	4.16	(2.94 – 5.38)	2.0
birch spp.	17.44	(14.91 – 19.97)	5.1	3.04	(1.98 – 4.10)	1.4
alder	4.49	(2.95 – 6.02)	1.3	6.55	(5.19 – 7.91)	3.1
OLL broadleaves	4.49	(3.13 – 5.85)	1.3	0.73	(0.52 – 0.93)	0.3
OSL broadleaves	18.61	(16.03 – 21.19)	5.4	6.52	(4.95 – 8.10)	3.1
Total	341.69	(326.35 – 357.03)	100.0	212.52	(198.06 – 226.99)	100.0

Species group	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	4.65	(3.05 – 6.25)	5.6	334.56	(327.48 – 341.65)	52.4
Norway spruce	2.96	(1.29 – 4.63)	3.6	26.34	(23.46 – 29.21)	4.1
Scots pine	2.12	(0.00 – 5.35)	2.6	8.01	(6.24 – 9.78)	1.3
other pines	1.67	(1.14 – 2.20)	2.0	61.95	(57.05 – 66.84)	9.7
Douglas-fir	1.60	(0.94 – 2.26)	1.9	10.38	(9.08 – 11.67)	1.6
larch spp.	1.42	(0.42 – 2.43)	1.7	27.74	(24.32 – 31.16)	4.4
other conifers	1.27	(0.00 – 2.84)	1.5	3.85	(2.46 – 5.24)	0.6
ses. & ped. oak	5.81	(4.48 – 7.13)	7.0	16.84	(13.95 – 19.72)	2.6
beech	4.02	(2.87 – 5.17)	4.8	9.50	(7.57 – 11.43)	1.5
ash	8.32	(6.52 – 10.12)	10.0	20.61	(17.27 – 23.95)	3.2
sycamore	2.83	(1.39 – 4.26)	3.4	9.25	(7.08 – 11.42)	1.5
birch spp.	16.89	(14.53 – 19.24)	20.4	37.37	(33.65 – 41.08)	5.9
alder	4.05	(3.39 – 4.71)	4.9	15.08	(12.63 – 17.53)	2.4
OLL broadleaves	4.23	(3.11 – 5.35)	5.1	9.44	(7.53 – 11.35)	1.5
OSL broadleaves	21.09	(18.33 – 23.86)	25.5	46.22	(41.74 – 50.71)	7.3
Total	82.92	(72.42 – 93.42)	100.0	637.13		100.0



4.3.5 Stocked forest area by species group and altitude

Methodology
The stocked forest area is classified by species group and altitude.

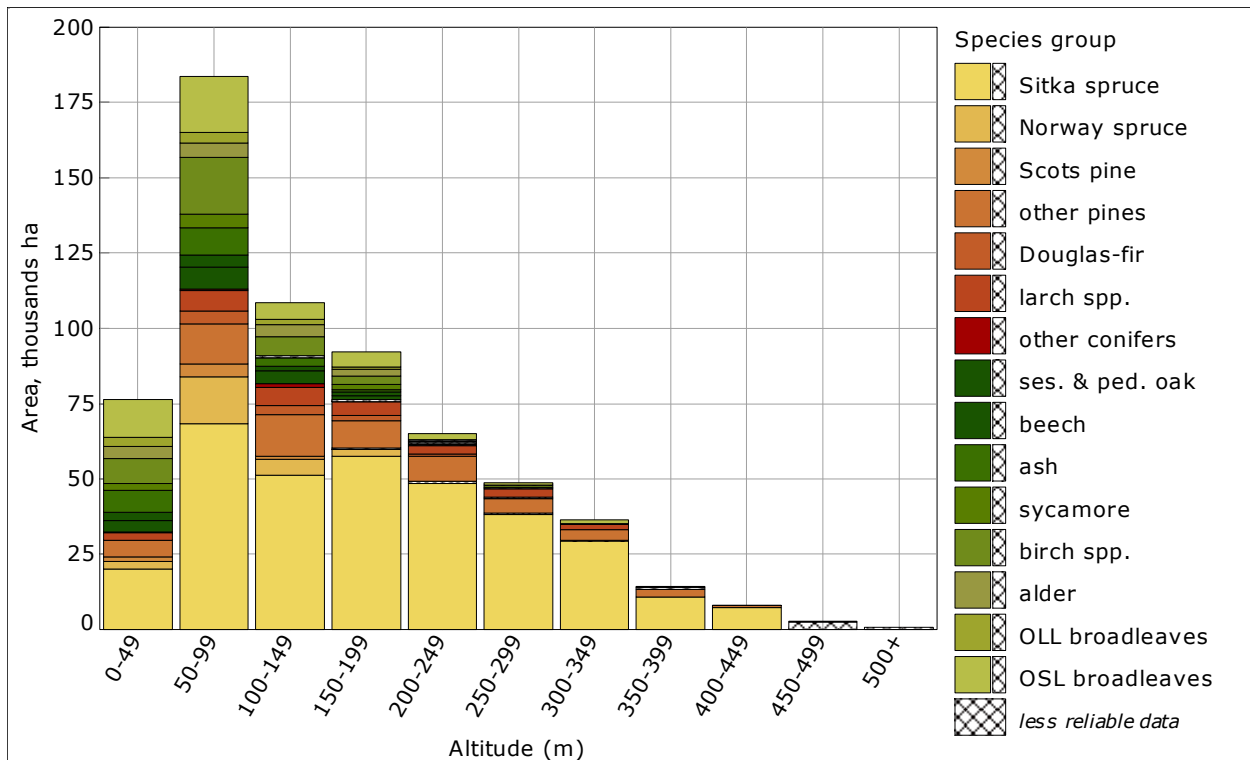
Altitude (m)	Species group / Area					
	Sitka spruce			Norway spruce		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0-49	20.11	(17.74 - 22.47)	6.0	2.46	(1.85 - 3.07)	9.4
50-99	68.36	(64.55 - 72.17)	20.5	15.44	(13.24 - 17.65)	58.6
100-149	51.22	(48.01 - 54.44)	15.3	5.19	(3.84 - 6.54)	19.7
150-199	57.65	(55.09 - 60.21)	17.2	2.15	(0.00 - 5.08)	8.2
200-249	48.48	(46.46 - 50.50)	14.5	0.64	-	2.4
250-299	38.16	(36.59 - 39.73)	11.4	0.44	-	1.7
300-349	29.28	(28.00 - 30.55)	8.8	-	-	-
350-399	10.85	(9.99 - 11.72)	3.2	-	-	-
400-449	7.24	(3.25 - 11.24)	2.2	-	-	-
450-499	2.40	-	0.7	-	-	-
500+	0.81	-	0.2	-	-	-
Total	334.56	(327.48 - 341.65)	100.0	26.34	(23.46 - 29.21)	100.0

Altitude (m)	Species group / Area					
	Scots pine			other pines		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0-49	1.56	(0.56 - 2.56)	19.5	5.50	(4.28 - 6.71)	8.9
50-99	4.37	(2.92 - 5.81)	54.5	13.29	(10.91 - 15.66)	21.4
100-149	1.20	(0.71 - 1.69)	15.0	13.67	(11.47 - 15.87)	22.0
150-199	0.46	-	5.8	8.98	(7.07 - 10.88)	14.5
200-249	0.13	-	1.6	8.31	(7.03 - 9.59)	13.4
250-299	-	-	-	4.94	(3.14 - 6.74)	8.0
300-349	0.29	-	3.6	3.51	(2.33 - 4.68)	5.7
350-399	-	-	-	2.57	(0.93 - 4.22)	4.2
400-449	-	-	-	0.78	(0.00 - 2.47)	1.3
450-499	-	-	-	0.40	-	0.6
500+	-	-	-	-	-	-
Total	8.01	(6.24 - 9.78)	100.0	61.95	(57.05 - 66.84)	100.0

Altitude (m)	Species group / Area					
	Douglas-fir			larch spp.		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0-49	0.10	-	-	2.32	(0.22 - 4.41)	8.4
50-99	4.29	(3.25 - 5.33)	41.4	6.69	(5.40 - 7.98)	24.0
100-149	3.01	(2.39 - 3.63)	29.0	6.09	(4.67 - 7.51)	22.0
150-199	1.93	(1.19 - 2.67)	18.6	4.35	(2.83 - 5.88)	15.7
200-249	0.65	(0.14 - 1.17)	6.3	2.93	(1.98 - 3.89)	10.6
250-299	0.40	-	-	2.87	(1.25 - 4.50)	10.4
300-349	-	-	-	1.94	(0.55 - 3.33)	7.0
350-399	-	-	-	0.53	-	1.9
400-449	-	-	-	0.00	-	0.02
450-499	-	-	-	-	-	-
500+	-	-	-	-	-	-
Total	10.38	(9.08 - 11.67)	100.0	27.74	(24.32 - 31.16)	100.0
Altitude (m)	Species group / Area					
	other conifers			ses. & ped. oak		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0-49	0.39	(0.00 - 3.38)	10.2	3.62	(2.53 - 4.71)	21.5
50-99	0.69	(0.00 - 3.02)	18.1	7.32	(5.41 - 9.23)	43.5
100-149	1.19	(0.00 - 2.62)	31.0	4.41	(2.67 - 6.16)	26.2
150-199	0.85	-	-	1.34	(0.73 - 1.95)	8.0
200-249	0.41	-	-	0.02	-	0.1
250-299	0.31	-	-	0.05	-	0.3
300-349	-	-	-	0.04	-	0.3
350-399	-	-	-	0.02	-	0.1
400-449	-	-	-	-	-	-
450-499	-	-	-	-	-	-
500+	-	-	-	-	-	-
Total	3.85	(2.46 - 5.24)	100.0	16.84	(13.95 - 19.72)	100.0
Altitude (m)	Species group / Area					
	beech			ash		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0-49	2.86	(1.68 - 4.04)	30.1	7.34	(5.30 - 9.38)	35.6
50-99	4.01	(2.69 - 5.34)	42.3	9.02	(6.75 - 11.30)	43.8
100-149	1.34	(1.15 - 1.54)	14.1	2.82	(1.67 - 3.96)	13.7
150-199	1.20	(0.41 - 1.99)	12.6	0.85	(0.22 - 1.48)	4.1
200-249	0.09	-	-	0.57	-	2.7
250-299	-	-	-	0.01	-	0.05
300-349	-	-	-	0.00	-	0.01
350-399	-	-	-	-	-	-
400-449	-	-	-	-	-	-
450-499	-	-	-	-	-	-
500+	-	-	-	-	-	-
Total	9.50	(7.57 - 11.43)	100.0	20.61	(17.27 - 23.95)	100.0
Altitude (m)	Species group / Area					
	sycamore			birch spp.		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0-49	2.24	(0.97 - 3.52)	24.3	8.27	(6.58 - 9.96)	22.1
50-99	4.43	(2.81 - 6.04)	47.8	18.93	(16.34 - 21.52)	50.6
100-149	0.91	-	-	6.16	(4.52 - 7.80)	16.5
150-199	1.53	(0.00 - 6.22)	16.5	2.98	(1.50 - 4.46)	8.0
200-249	0.06	-	-	0.27	(0.19 - 0.36)	0.7
250-299	0.04	-	-	0.69	(0.00 - 4.26)	1.9
300-349	0.03	-	-	0.06	-	0.2
350-399	-	-	-	-	-	-
400-449	-	-	-	-	-	-
450-499	-	-	-	-	-	-
500+	-	-	-	-	-	-
Total	9.25	(7.08 - 11.42)	100.0	37.37	(33.65 - 41.08)	100.0

Altitude (m)	Species group / Area					
	alder			OLL broadleaves		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0-49	3.99	(2.47 - 5.52)	26.5	3.15	(1.71 - 4.59)	33.4
50-99	4.77	(3.61 - 5.94)	31.6	3.34	(2.18 - 4.50)	35.5
100-149	4.02	(3.03 - 5.01)	26.7	1.89	(0.81 - 2.97)	20.0
150-199	2.18	(0.00 - 5.47)	14.4	0.71	(0.20 - 1.22)	7.5
200-249	0.06	- -	0.4	0.34	- -	3.6
250-299	0.07	- -	0.4	-	- -	-
300-349	-	- -	-	0.00	- -	0.03
350-399	-	- -	-	-	- -	-
400-449	-	- -	-	-	- -	-
450-499	-	- -	-	-	- -	-
500+	-	- -	-	-	- -	-
Total	15.08	(12.63 - 17.53)	100.0	9.44	(7.53 - 11.35)	100.0

Altitude (m)	Species group / Area					
	OSL broadleaves			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0-49	12.51	(10.34 - 14.68)	27.1	76.42	(66.52 - 86.32)	12.0
50-99	18.77	(15.96 - 21.58)	40.5	183.74	(170.97 - 196.51)	28.8
100-149	5.39	(3.94 - 6.83)	11.7	108.53	(96.82 - 120.23)	17.0
150-199	5.00	(3.63 - 6.37)	10.8	92.16	(81.33 - 103.00)	14.5
200-249	1.99	(0.00 - 4.24)	4.3	64.96	(55.59 - 74.32)	10.2
250-299	0.87	(0.52 - 1.21)	1.9	48.86	(40.66 - 57.05)	7.7
300-349	1.28	(0.21 - 2.35)	2.8	36.44	(29.28 - 43.60)	5.7
350-399	0.41	- -	0.9	14.39	(9.81 - 18.98)	2.3
400-449	-	- -	-	8.03	(4.62 - 11.43)	1.3
450-499	-	- -	-	2.81	(0.74 - 4.88)	0.4
500+	-	- -	-	0.81	(0.00 - 1.96)	0.1
Total	46.22	(41.74 - 50.71)	100.0	637.13		100.0



4.4 NUMBER OF TREE SPECIES

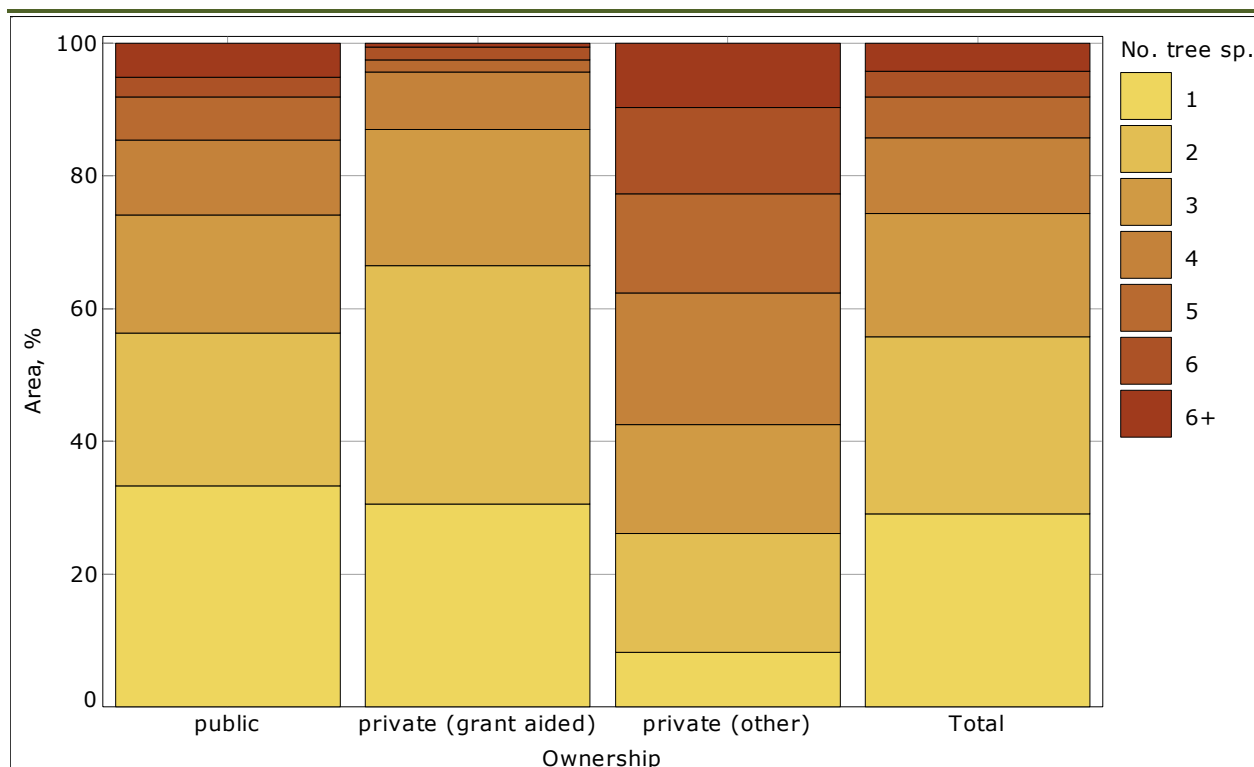
4.4.1 Stocked forest area by ownership and number of tree species

Definition
Number of tree species
The total number of unique tree species present.

Methodology
The stocked forest area is classified by ownership and number of tree species recorded in the plot.
Note: In the first NFI cycle the number of trees species for each plot was calculated by counting the number of tree species assessed for Dbh or height . The second NFI cycle calculated the number of trees species for each plot was calculated by counting the number of tree species present on the plot . Due to the concentric plot design, some trees were present on the plot but not assessed for Dbh or height. The methodology used to calculate number of tree species was changed to capture all tree species occurring on the plot.

No. tree sp.	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1	113.86	(101.98 – 125.75)	33.2	64.89	(55.51 – 74.28)	30.5
2	78.51	(68.27 – 88.75)	23.0	76.44	(66.33 – 86.55)	35.9
3	60.84	(51.65 – 70.02)	17.8	43.60	(35.74 – 51.46)	20.5
4	38.46	(31.02 – 45.90)	11.3	18.38	(13.15 – 23.62)	8.7
5	22.39	(16.62 – 28.16)	6.6	4.00	(1.53 – 6.47)	1.9
6	10.00	(6.12 – 13.88)	2.9	4.01	(1.54 – 6.49)	1.9
6+	17.62	(12.50 – 22.75)	5.2	1.19	(0.00 – 2.54)	0.6
Total	341.69	(326.35 – 357.03)	100.0	212.52	(198.06 – 226.99)	100.0

No. tree sp.	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1	6.81	(3.58 – 10.04)	8.2	185.57	(171.48 – 199.65)	29.2
2	14.81	(10.11 – 19.52)	17.9	169.77	(155.94 – 183.60)	26.6
3	13.64	(9.13 – 18.16)	16.5	118.08	(105.92 – 130.24)	18.5
4	16.43	(11.45 – 21.41)	19.8	73.28	(63.30 – 83.26)	11.5
5	12.38	(8.11 – 16.66)	14.9	38.78	(31.31 – 46.24)	6.1
6	10.83	(6.77 – 14.89)	13.1	24.84	(18.77 – 30.92)	3.9
6+	8.00	(4.53 – 11.47)	9.6	26.82	(20.56 – 33.08)	4.2
Total	82.92	(72.42 – 93.42)	100.0	637.13		100.0



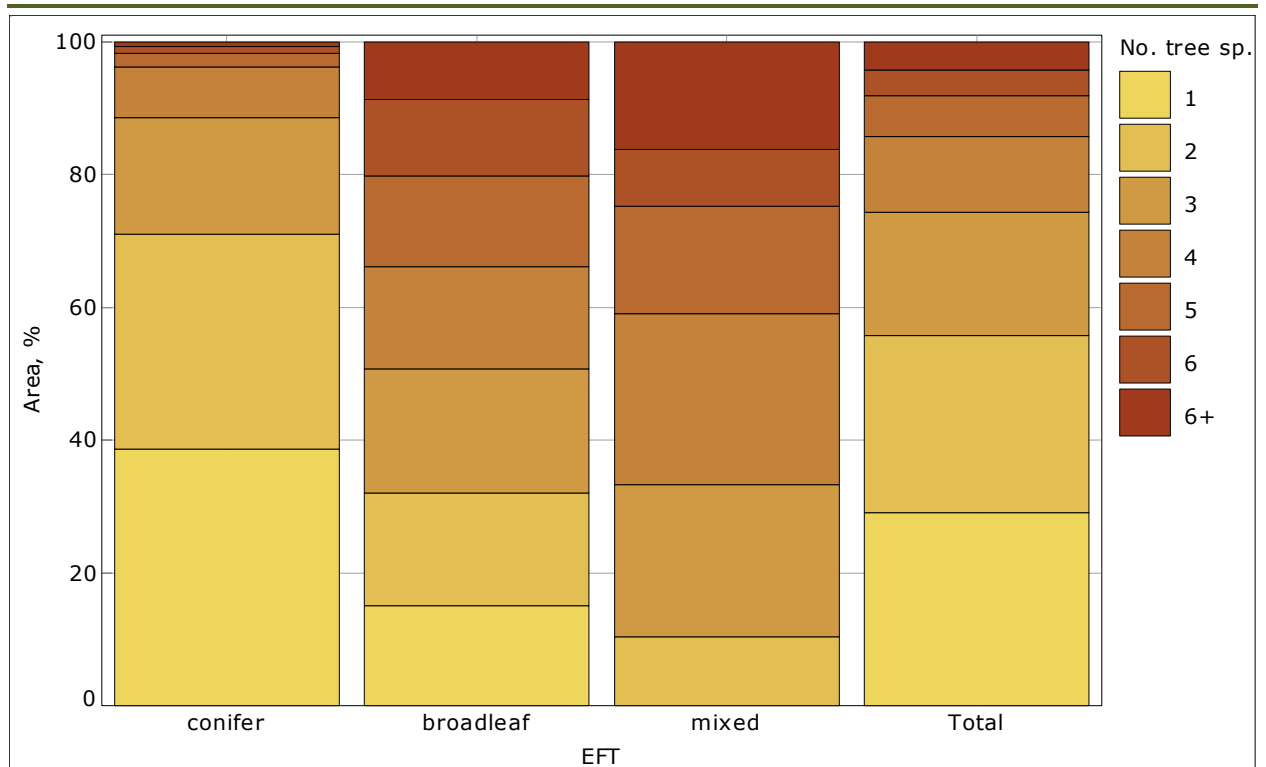
4.4.2 Stocked forest area by European Forest Type and number of tree species

Methodology

The stocked forest area is classified by European Forest Type and number of tree species occurring on the plot.

No. tree sp.	EFT / Area					
	conifer			broadleaf		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1	168.75	(155.12 - 182.37)	38.7	16.82	(11.81 - 21.83)	15.1
2	141.75	(128.79 - 154.71)	32.4	18.82	(13.51 - 24.14)	16.9
3	76.85	(66.67 - 87.04)	17.6	20.81	(15.26 - 26.36)	18.8
4	33.24	(26.29 - 40.19)	7.6	17.24	(12.16 - 22.32)	15.5
5	9.22	(5.48 - 12.95)	2.1	15.18	(10.45 - 19.91)	13.6
6	4.40	(1.80 - 6.99)	1.0	12.84	(8.42 - 17.26)	11.5
6+	2.79	(0.73 - 4.85)	0.6	9.62	(5.80 - 13.45)	8.6
Total	436.98	(422.79 - 451.18)	100.0	111.34	(99.60 - 123.08)	100.0

No. tree sp.	EFT / Area					
	mixed			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1	-	-	-	185.57	(171.48 - 199.65)	29.2
2	9.20	(5.49 - 12.90)	10.4	169.77	(155.94 - 183.60)	26.6
3	20.41	(14.92 - 25.91)	23.0	118.08	(105.92 - 130.24)	18.5
4	22.80	(17.02 - 28.58)	25.6	73.28	(63.30 - 83.26)	11.5
5	14.38	(9.72 - 19.04)	16.2	38.78	(31.31 - 46.24)	6.1
6	7.61	(4.21 - 11.00)	8.6	24.84	(18.77 - 30.92)	3.9
6+	14.41	(9.78 - 19.04)	16.2	26.82	(20.56 - 33.08)	4.2
Total	88.81	(78.09 - 99.52)	100.0	637.13		100.0



Chapter 5

AGE

The age of a forest is described as the number of growing seasons since initial planting or natural regeneration. The national forest estate is quite young, average tree age is just 20 years and over half (56%) of the stocked forest estate less than 20 years of age, reflecting both species choice and the successful uptake of private afforestation since 1985.

The private forest estate has a younger age profile compared to the public estate, with 67% aged 20 years or less in the former. The Private (grant aided) forests are predominantly less than 30 years old. Private (other) forests are evenly distributed across the range of age classes with a slight dominance in the 51 years plus category, reflecting their partial composition of the older private estates.

In terms of the main conifer species, the average age of Sitka spruce is 20 years across the entire forest estate, but there is variation in age between ownership categories; in Public forests it is 23 years, Private (grant aided) 15 years and Private (other) 36 years. Amongst the broadleaf species the variation is even greater with for example, Sessile and Pedunculate oak averaging 66, 15 and 94 years of age in Public, Private (grant aided) and Private (other) respectively.

In general, there is a higher proportion of broadleaves in young forests due to higher levels of broadleaf afforestation and natural regeneration.

The proportion of conifer to broadleaf tree species across the age class distribution is similar, with the exception of the 51+ age class where mature broadleaves predominate. The oldest forest stands consist mainly of oak, beech, birch and Scots pine.

5.1 AGE CLASSES

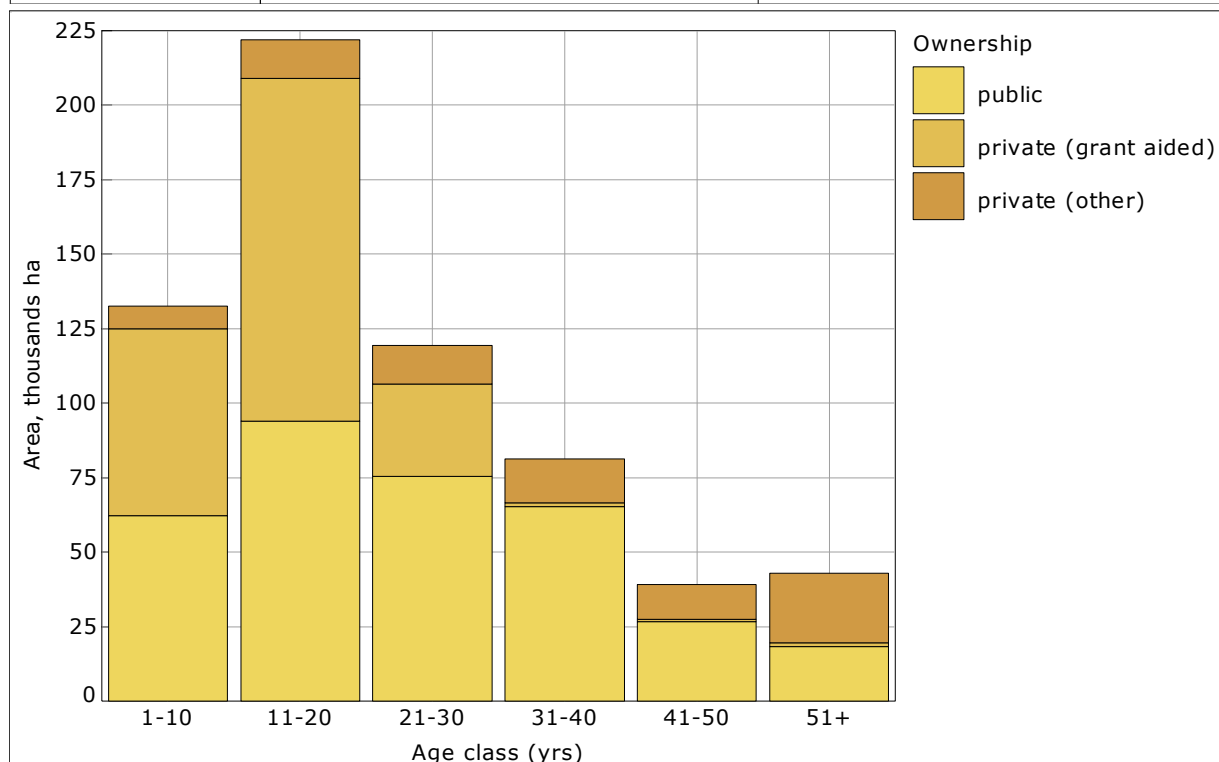
5.1.1 Stocked forest area by ownership and age class (10 yr)

Methodology

The stocked forest area is classified by ownership and age class (10 yr).

Age class (yrs)	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1-10	62.16	(56.74 – 67.58)	18.2	62.81	(58.71 – 66.92)	29.6
11-20	93.98	(88.94 – 99.03)	27.5	115.13	(112.52 – 117.74)	54.0
21-30	75.30	(71.27 – 79.33)	22.0	31.15	(29.28 – 33.02)	14.7
31-40	65.23	(61.49 – 68.98)	19.1	1.41	(0.00 – 3.36)	0.7
41-50	26.71	(23.47 – 29.95)	7.8	0.84	(0.00 – 4.33)	0.4
51+	18.30	(16.03 – 20.56)	5.4	1.17	(0.00 – 2.39)	0.6
Total	341.69	(326.35 – 357.03)	100.0	212.52	(198.06 – 226.99)	100.0

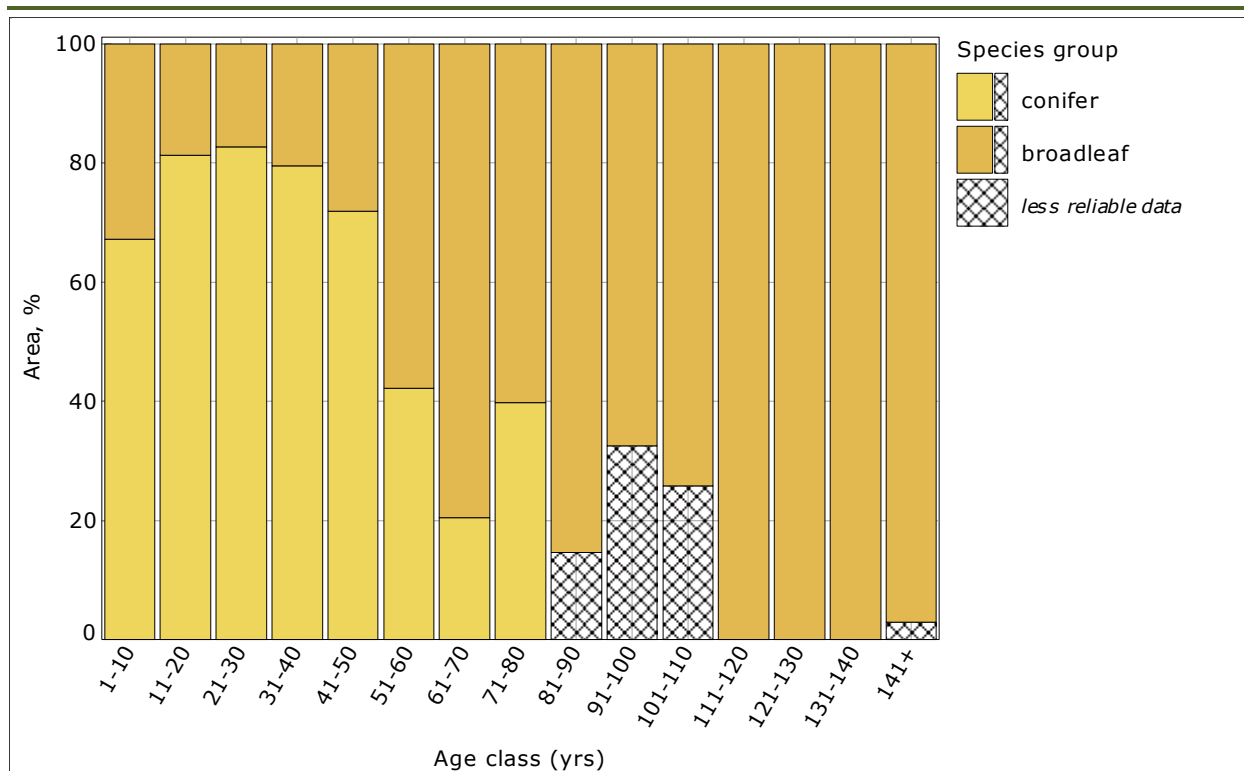
Age class (yrs)	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1-10	7.67	(5.69 – 9.64)	9.2	132.64	(124.48 – 140.80)	20.8
11-20	12.83	(10.61 – 15.05)	15.5	221.95	(214.47 – 229.42)	35.0
21-30	13.01	(10.78 – 15.24)	15.7	119.46	(113.60 – 125.32)	18.7
31-40	14.50	(12.13 – 16.87)	17.5	81.15	(75.79 – 86.50)	12.7
41-50	11.52	(9.08 – 13.97)	13.9	39.08	(34.52 – 43.63)	6.1
51+	23.39	(20.73 – 26.05)	28.2	42.86	(39.06 – 46.66)	6.7
Total	82.92	(72.42 – 93.42)	100.0	637.13		100.0



5.1.2 Stocked forest area by age class (10 yr) and species group (broadleaf/conifer)

Methodology					
The stocked forest area is classified by species group (broadleaf/conifer) and age class (10 yr).					

Species group	Age class (yrs) / Area					
	1-10			11-20		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	89.13	(84.19 - 94.08)	67.2	180.47	(175.64 - 185.29)	81.3
broadleaf	43.51	(38.58 - 48.44)	32.8	41.48	(37.33 - 45.64)	18.7
Total	132.64	(124.48 - 140.80)	100.0	221.95	(214.47 - 229.42)	100.0
Species group	Age class (yrs) / Area					
	21-30			31-40		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	98.78	(95.41 - 102.15)	82.7	64.51	(61.07 - 67.96)	79.5
broadleaf	20.68	(17.92 - 23.43)	17.3	16.63	(14.04 - 19.23)	20.5
Total	119.46	(113.60 - 125.32)	100.0	81.15	(75.79 - 86.50)	100.0
Species group	Age class (yrs) / Area					
	41-50			51-60		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	28.08	(25.33 - 30.84)	71.9	6.37	(5.02 - 7.72)	42.1
broadleaf	11.00	(8.75 - 13.25)	28.1	8.75	(6.89 - 10.61)	57.9
Total	39.08	(34.52 - 43.63)	100.0	15.12	(12.44 - 17.81)	100.0
Species group	Age class (yrs) / Area					
	61-70			71-80		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	1.67	(1.20 - 2.14)	20.4	1.92	(0.43 - 3.41)	39.8
broadleaf	6.49	(4.46 - 8.53)	79.6	2.90	(2.15 - 3.65)	60.2
Total	8.16	(5.91 - 10.41)	100.0	4.82	(3.54 - 6.09)	100.0
Species group	Age class (yrs) / Area					
	81-90			91-100		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	0.61	-	14.6	0.37	-	32.5
broadleaf	3.56	(2.41 - 4.71)	85.4	0.77	(0.75 - 0.79)	67.5
Total	4.17	(2.88 - 5.45)	100.0	1.14	(0.00 - 2.55)	100.0
Species group	Age class (yrs) / Area					
	101-110			111-120		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	0.78	-	25.8	-	-	-
broadleaf	2.24	(1.15 - 3.33)	74.2	0.59	(0.00 - 3.36)	100.0
Total	3.01	(1.86 - 4.17)	100.0	0.59	(0.00 - 3.36)	100.0
Species group	Age class (yrs) / Area					
	121-130			131-140		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	-	-	-	-	-	-
broadleaf	0.65	(0.16 - 1.13)	100.0	0.69	(0.11 - 1.28)	100.0
Total	0.65	(0.16 - 1.13)	100.0	0.69	(0.11 - 1.28)	100.0
Species group	Age class (yrs) / Area					
	141+			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
conifer	0.13	-	2.9	472.82	(466.17 - 479.48)	74.2
broadleaf	4.37	(3.64 - 5.10)	97.1	164.31	(156.35 - 172.27)	25.8
Total	4.50	(3.73 - 5.27)	100.0	637.13		100.0



5.1.3 Stocked forest area by age class (10 yr) and species group

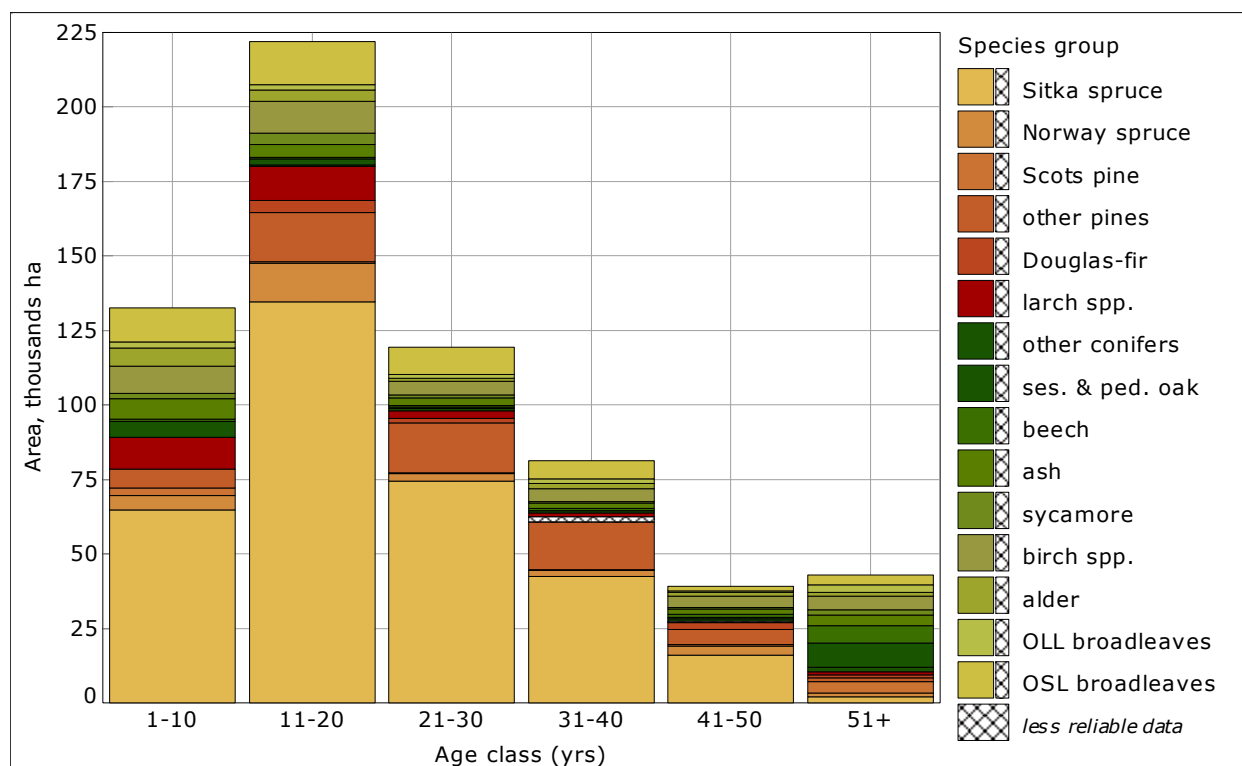
Methodology

The stocked forest area is classified by age class (10 yr) and species group.

Species group	Age class (yrs) / Area					
	1-10			11-20		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	64.74	(60.72 - 68.75)	48.7	134.63	(129.99 - 139.27)	60.5
Norway spruce	4.92	(3.25 - 6.60)	3.7	12.81	(10.99 - 14.63)	5.8
Scots pine	2.36	(1.49 - 3.22)	1.8	0.74	(0.49 - 1.00)	0.3
other pines	6.48	(4.46 - 8.50)	4.9	16.44	(13.86 - 19.02)	7.4
Douglas-fir	-	-	-	4.00	(3.03 - 4.97)	1.8
larch spp.	10.63	(8.81 - 12.45)	8.0	11.45	(9.34 - 13.55)	5.2
other conifers	0.01	-	0.006	0.40	(0.00 - 2.65)	0.2
ses. & ped. oak	5.31	(3.79 - 6.82)	4.0	2.12	(0.50 - 3.74)	1.0
beech	0.82	(0.00 - 5.48)	0.6	0.60	(0.00 - 4.97)	0.3
ash	6.85	(4.47 - 9.22)	5.2	4.12	(2.78 - 5.46)	1.9
sycamore	1.68	(0.37 - 2.99)	1.3	3.82	(2.61 - 5.04)	1.7
birch spp.	9.29	(7.27 - 11.30)	7.0	10.86	(9.04 - 12.69)	4.9
alder	5.94	(4.36 - 7.52)	4.5	3.70	(2.54 - 4.86)	1.7
OLL broadleaves	2.01	(1.57 - 2.45)	1.5	1.85	(0.57 - 3.13)	0.8
OSL broadleaves	11.62	(9.64 - 13.60)	8.8	14.41	(12.27 - 16.55)	6.5
Total	132.64	(124.48 - 140.80)	100.0	221.95	(214.47 - 229.42)	100.0

Species group	Age class (yrs) / Area					
	21-30			31-40		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	74.51	(71.04 - 77.98)	62.6	42.48	(39.37 - 45.59)	52.3
Norway spruce	2.45	(0.00 - 7.32)	2.0	2.00	(1.21 - 2.78)	2.5
Scots pine	0.27	-	0.2	0.33	-	0.4
other pines	16.75	(14.52 - 18.98)	14.0	15.95	(13.93 - 17.97)	19.7
Douglas-fir	1.60	(1.37 - 1.82)	1.3	1.59	-	2.0
larch spp.	2.55	(1.44 - 3.67)	2.1	1.49	(0.63 - 2.35)	1.8
other conifers	0.65	(0.03 - 1.28)	0.5	0.67	(0.00 - 4.98)	0.8
ses. & ped. oak	0.54	(0.00 - 5.24)	0.5	0.10	(0.09 - 0.11)	0.1
beech	0.45	(0.00 - 2.31)	0.4	0.63	(0.00 - 2.44)	0.8
ash	2.62	(1.97 - 3.28)	2.2	1.71	(1.24 - 2.18)	2.1
sycamore	0.87	(0.00 - 3.58)	0.7	0.52	(0.00 - 5.42)	0.6
birch spp.	4.58	(3.36 - 5.79)	3.8	4.46	(3.42 - 5.51)	5.5
alder	1.18	(0.00 - 3.76)	1.0	1.67	(0.88 - 2.46)	2.1
OLL broadleaves	1.24	(0.49 - 1.99)	1.0	1.51	(0.78 - 2.24)	1.9
OSL broadleaves	9.20	(7.42 - 10.98)	7.7	6.02	(4.27 - 7.77)	7.4
Total	119.46	(113.60 - 125.32)	100.0	81.15	(75.79 - 86.50)	100.0

Species group	Age class (yrs) / Area					
	41-50			51+		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	16.06	(14.50 – 17.63)	41.1	2.15	(0.00 – 6.42)	5.0
Norway spruce	3.11	(1.33 – 4.88)	8.0	1.05	(0.90 – 1.20)	2.5
Scots pine	0.46	(0.00 – 1.17)	1.2	3.86	(2.67 – 5.04)	9.0
other pines	4.88	(3.51 – 6.25)	12.5	1.45	(0.00 – 4.10)	3.4
Douglas-fir	2.29	(1.48 – 3.10)	5.9	0.90	(0.74 – 1.05)	2.1
larch spp.	0.60	–	1.5	1.02	(0.00 – 5.06)	2.4
other conifers	0.67	(0.00 – 4.53)	1.7	1.44	(0.00 – 5.16)	3.4
ses. & ped. oak	0.52	(0.29 – 0.76)	1.3	8.24	(6.73 – 9.75)	19.0
beech	1.16	(0.26 – 2.06)	3.0	5.84	(4.38 – 7.31)	13.6
ash	1.85	(0.30 – 3.40)	4.7	3.46	(2.49 – 4.43)	8.1
sycamore	0.40	(0.00 – 2.86)	1.0	1.96	(1.22 – 2.71)	4.6
birch spp.	3.84	(2.56 – 5.13)	9.8	4.33	(2.94 – 5.73)	10.1
alder	1.24	(0.00 – 2.85)	3.2	1.36	(0.72 – 2.00)	3.2
OLL broadleaves	0.38	(0.16 – 0.61)	1.0	2.44	(1.39 – 3.50)	5.7
OSL broadleaves	1.61	(0.92 – 2.29)	4.1	3.37	(2.56 – 4.17)	7.9
Total	39.08	(34.52 – 43.63)	100.0	42.86	(39.06 – 46.66)	100.0



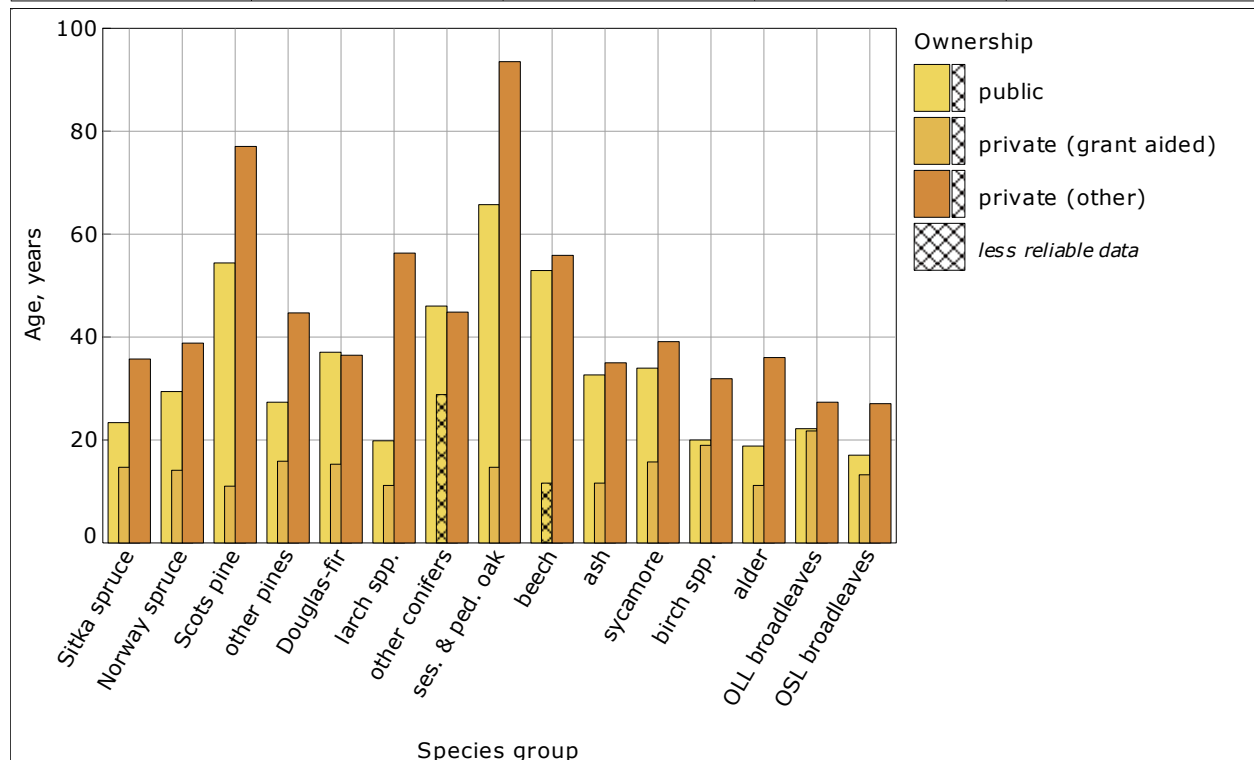
5.2 MEAN AGE

5.2.1 Mean tree age by ownership and species group (tree height ≥ 20 cm)

Methodology

Mean tree age is classified by ownership and species group. All trees with a minimum height of 20 cm were included in the analysis.

Species group	Ownership / Age			
	public	private (grant aided)	private (other)	All
	years ($\alpha = 0.05$)	years ($\alpha = 0.05$)	years ($\alpha = 0.05$)	years ($\alpha = 0.05$)
Sitka spruce	23 (22 - 24)	15 (14 - 15)	36 (34 - 38)	20 (20 - 21)
Norway spruce	29 (21 - 38)	14 (12 - 16)	39 (20 - 58)	22 (19 - 25)
Scots pine	54 (42 - 67)	11 (0 - 26)	77 (70 - 84)	49 (41 - 57)
other pines	27 (25 - 30)	16 (14 - 17)	45 (32 - 57)	24 (23 - 26)
Douglas-fir	37 (33 - 41)	15 (5 - 26)	36 (5 - 68)	35 (31 - 39)
larch spp.	20 (18 - 22)	11 (10 - 12)	56 (47 - 66)	16 (14 - 18)
other conifers	46 (21 - 71)	29 - -	45 (39 - 50)	46 (27 - 65)
ses. & ped. oak	66 (60 - 72)	15 (0 - 93)	94 (77 - 110)	61 (51 - 70)
beech	53 (45 - 61)	12 - -	56 (48 - 64)	49 (44 - 54)
ash	33 (21 - 45)	12 (9 - 14)	35 (30 - 40)	23 (20 - 26)
sycamore	34 (2 - 66)	16 (12 - 20)	39 (29 - 49)	30 (24 - 36)
birch spp.	20 (17 - 23)	19 (15 - 23)	32 (28 - 36)	25 (23 - 28)
alder	19 (13 - 24)	11 (7 - 15)	36 (29 - 43)	19 (15 - 22)
OLL broadleaves	22 (18 - 26)	22 (19 - 25)	27 (22 - 33)	29 (24 - 34)
OSL broadleaves	17 (15 - 19)	13 (11 - 16)	27 (24 - 30)	21 (20 - 23)
All	22 (21 - 23)	14 (13 - 14)	30 (27 - 34)	20 (20 - 21)



5.2.2 Mean tree age by species group and dimension class (tree height ≥ 20 cm)

Definition
Dimension class
Dimension class is used to describe trees all trees assessed on the plot in terms of Dbh.

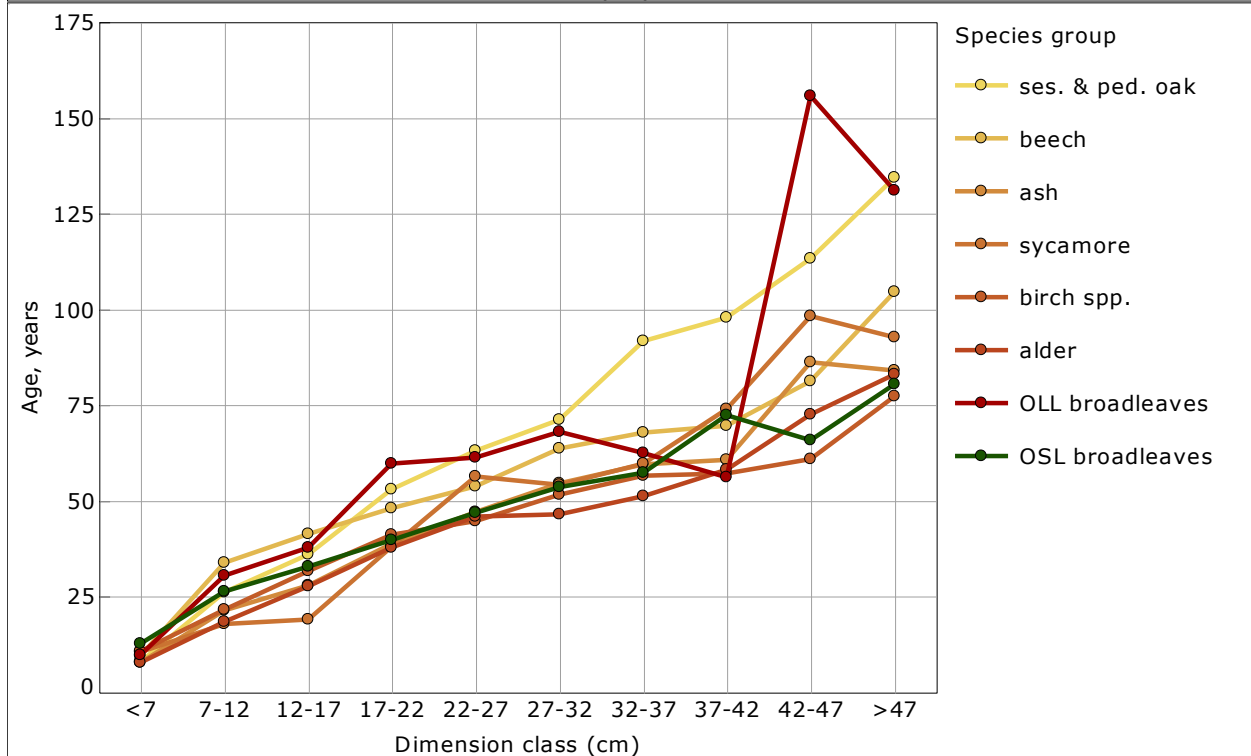
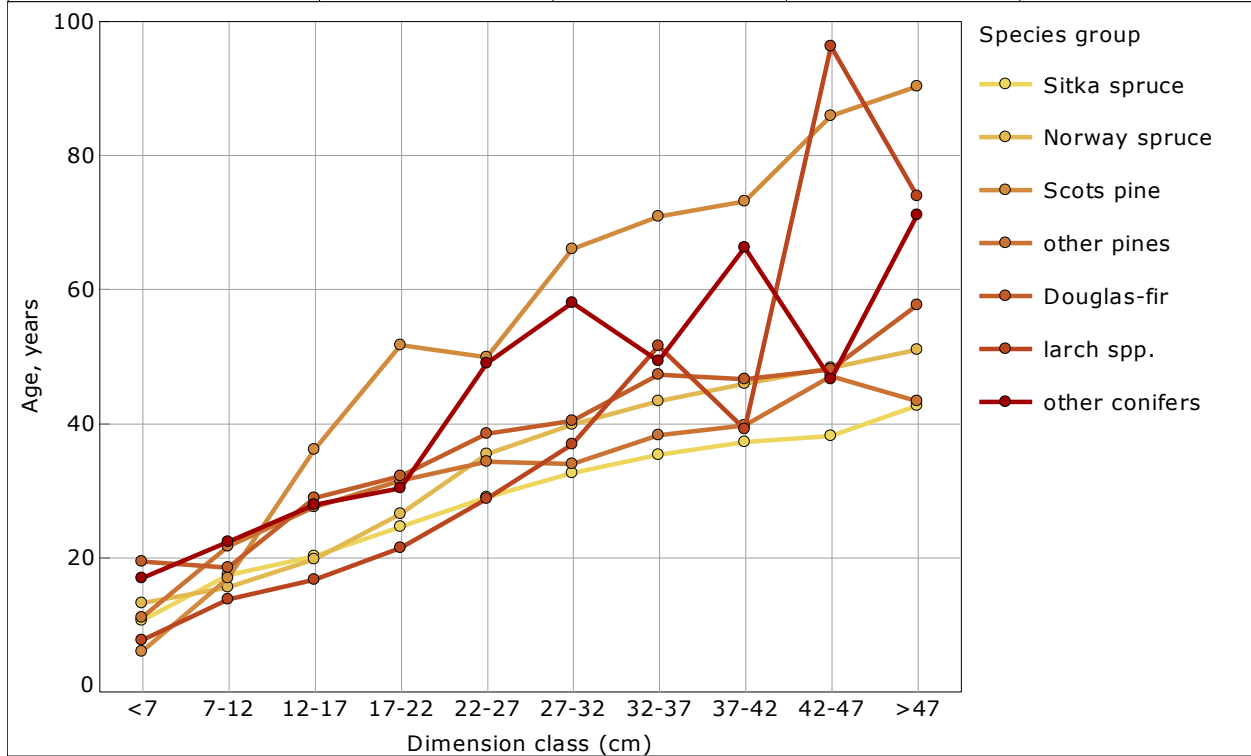
Methodology
Mean tree age is classified by species group and dimension class. All trees with a minimum height of 20 cm were included.

Dimension class (cm)	Species group / Age			
	Sitka spruce	Norway spruce	Scots pine	other pines
	years ($\alpha = 0.05$)	years ($\alpha = 0.05$)	years ($\alpha = 0.05$)	years ($\alpha = 0.05$)
<7	11 (10 – 11)	13 (12 – 15)	6 (4 – 7)	11 (10 – 12)
7-12	17 (17 – 18)	16 (14 – 17)	17 – –	22 (20 – 23)
12-17	20 (20 – 21)	20 (16 – 23)	36 (0 – 73)	27 (25 – 29)
17-22	25 (24 – 25)	26 (23 – 30)	52 (18 – 85)	31 (30 – 33)
22-27	29 (28 – 30)	35 (31 – 40)	50 (46 – 54)	34 (33 – 36)
27-32	33 (31 – 34)	40 (37 – 42)	66 (61 – 71)	34 (32 – 35)
32-37	35 (34 – 36)	43 (39 – 47)	71 (42 – 99)	38 (29 – 47)
37-42	37 (36 – 39)	46 (38 – 53)	73 (42 – 104)	40 (39 – 40)
42-47	38 (37 – 39)	48 – –	86 (78 – 94)	47 (40 – 54)
>47	43 (41 – 44)	51 – –	90 (74 – 106)	43 (38 – 48)

Dimension class (cm)	Species group / Age			
	Douglas-fir	larch spp.	other conifers	ses. & ped. oak
	years ($\alpha = 0.05$)	years ($\alpha = 0.05$)	years ($\alpha = 0.05$)	years ($\alpha = 0.05$)
<7	19 (17 – 21)	8 (6 – 9)	17 (11 – 23)	8 (6 – 10)
7-12	18 (17 – 20)	14 (12 – 15)	22 – –	26 (25 – 27)
12-17	29 (24 – 34)	17 (15 – 19)	28 (26 – 29)	36 (32 – 40)
17-22	32 (27 – 37)	21 (19 – 24)	30 (29 – 32)	53 (38 – 68)
22-27	38 (29 – 47)	29 (24 – 33)	49 (47 – 51)	63 (57 – 69)
27-32	40 (32 – 49)	37 (28 – 45)	58 (0 – 203)	71 (62 – 81)
32-37	47 (42 – 53)	51 (41 – 62)	49 – –	92 (86 – 97)
37-42	46 (43 – 50)	39 (38 – 40)	66 – –	98 (70 – 126)
42-47	48 (43 – 53)	96 (94 – 98)	47 (30 – 63)	113 (63 – 163)
>47	58 (54 – 61)	74 – –	71 (50 – 92)	134 (127 – 142)

Dimension class (cm)	Species group / Age			
	beech	ash	sycamore	birch spp.
	years ($\alpha = 0.05$)	years ($\alpha = 0.05$)	years ($\alpha = 0.05$)	years ($\alpha = 0.05$)
<7	9 (8 – 11)	8 (7 – 9)	10 (9 – 12)	11 (10 – 12)
7-12	34 (7 – 61)	21 (19 – 23)	18 (17 – 19)	22 (19 – 24)
12-17	41 (36 – 47)	28 (26 – 30)	19 (18 – 20)	32 (29 – 34)
17-22	48 (42 – 54)	39 (36 – 41)	38 (0 – 114)	41 (38 – 44)
22-27	54 (43 – 65)	47 (44 – 50)	56 (36 – 77)	45 (42 – 47)
27-32	64 (54 – 73)	55 (47 – 62)	54 (0 – 127)	51 (48 – 55)
32-37	68 (54 – 81)	59 (56 – 63)	60 (0 – 142)	57 (52 – 61)
37-42	69 (0 – 140)	61 (56 – 66)	74 – –	57 (49 – 65)
42-47	81 (74 – 88)	86 – –	98 – –	61 (32 – 89)
>47	105 (98 – 111)	84 – –	93 (88 – 97)	77 (61 – 93)

Dimension class (cm)	Species group / Age				
	alder	OLL broadleaves	OSL broadleaves	All	
	years $(\alpha = 0.05)$	years $(\alpha = 0.05)$	years $(\alpha = 0.05)$	years $(\alpha = 0.05)$	
<7	8 (7 - 9)	10 (9 - 11)	13 (12 - 13)	10 (9 - 10)	
7-12	18 (13 - 24)	30 (27 - 34)	26 (24 - 29)	19 (18 - 19)	
12-17	28 (24 - 32)	38 (34 - 41)	33 (31 - 35)	23 (22 - 23)	
17-22	38 (35 - 40)	60 (54 - 65)	40 (36 - 43)	28 (27 - 29)	
22-27	46 (43 - 49)	61 (57 - 65)	47 (42 - 52)	34 (33 - 35)	
27-32	46 (43 - 50)	68 (47 - 89)	54 (43 - 64)	39 (38 - 41)	
32-37	51 (34 - 68)	62 (46 - 79)	57 (54 - 60)	45 (43 - 47)	
37-42	58 (0 - 246)	56 (0 - 208)	72 (29 - 115)	52 (49 - 54)	
42-47	73 - -	156 - -	66 - -	61 (56 - 66)	
>47	83 - -	131 - -	80 (71 - 90)	93 (86 - 100)	



Chapter 6

FOREST ATTRIBUTES: DBH, HEIGHT AND BASAL AREA

In this chapter, tree diameter at breast height (Dbh), height and basal area are assessed. The forest estate is firstly described in terms of Dbh and height. The statistics are presented using classification with species group and age class.

Sitka spruce trees in the oldest age-class (51+) have smaller dbhs and heights than those of other conifer species groups. In fact, higher Dbh and height values are recorded for Sitka spruce in the 41-50 year age class than in the older 51+ age class. This could indicate that the most vigorous stands are being felled before trees reach the older age class, leaving mainly less productive stands in the 51+ category.

Douglas fir, and ‘other conifer’ trees, reach the largest diameters and heights, while the older broadleaf trees also reach substantial diameters. When height and dimension class are combined, Sitka spruce shows average vigour among the conifers. On an ownership basis, the oldest trees are found in the Private (other) forests, across the range of species and dimension classes.

Basal area is the term used in forest management that defines the area of a given section of land that is occupied by the cross-section of tree stems at height of 1.3 m from the tree base. The average basal area for all Irish forests is 25 m² per ha. The Private (grant aided) estate basal area increased from 11 m² per ha to 21 m² per ha between 2006 and 2012, due to the rapid growth phase of these forests and the low levels of removals (harvesting).

6.1 DIAMETER AT BREAST HEIGHT (DBH)

Definition
Diameter at breast height (Dbh)
Diameter of a tree at 1.3 m above ground level.

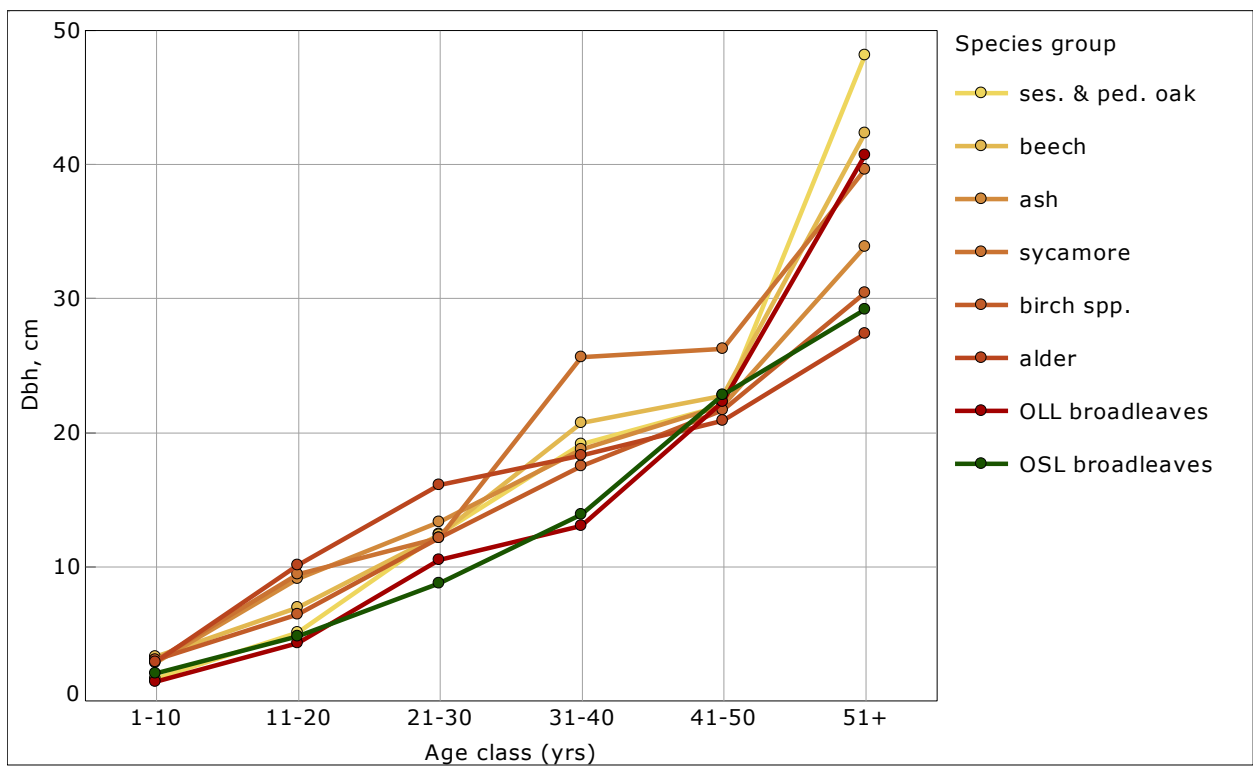
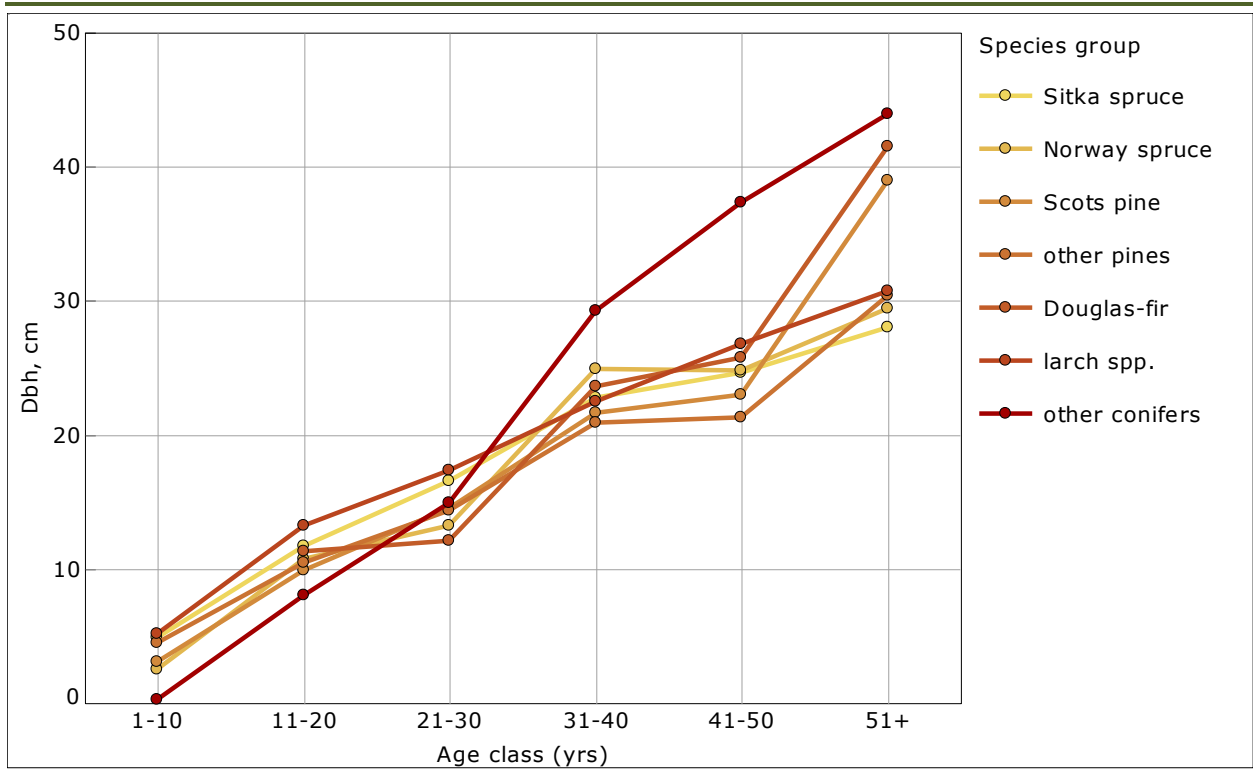
6.1.1 Mean tree Dbh by species group and age class (10 yr)

Methodology
Weighted mean tree Dbh is classified by species group and age class. All trees with a Dbh were included in the analysis, i.e. minimum height of 130 cm.
The evaluated variable, Dbh, is weighted by representative tree number. Weighting by the representative tree number removes the effect of the concentric circles. However in the 2006 NFI results this task weights Dbh by representative area, which gave larger trees a higher weight. Weighting by representative area is most effective where there are large numbers of natural regeneration. Due to the absence of large numbers of natural regeneration in Ireland's forests, mean Dbh was calculated using the representative tree number as a weight.

Age class (yrs)	Species group / Dbh				
	Sitka spruce	Norway spruce	Scots pine	other pines	Douglas-fir
	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)
1-10	5 (4 - 5)	2 (2 - 3)	3 (2 - 4)	4 (3 - 6)	- - -
11-20	12 (11 - 12)	11 (8 - 13)	10 (9 - 10)	10 (9 - 12)	11 (10 - 12)
21-30	17 (16 - 17)	13 (3 - 23)	15 - -	14 (13 - 16)	12 (7 - 17)
31-40	23 (21 - 24)	25 (23 - 27)	22 - -	21 (19 - 22)	24 - -
41-50	25 (22 - 27)	25 (22 - 27)	23 (19 - 27)	21 (18 - 24)	26 (22 - 30)
51+	28 (27 - 29)	29 (28 - 31)	39 (36 - 42)	30 (0 - 83)	42 (29 - 54)
All	15 (14 - 15)	15 (13 - 17)	29 (25 - 32)	15 (14 - 16)	22 (20 - 25)

Age class (yrs)	Species group / Dbh				
	larch spp.	other conifers	ses. & ped. oak	beech	ash
	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)
1-10	5 (4 - 6)	0 - -	2 (1 - 2)	3 - -	3 (2 - 3)
11-20	13 (12 - 14)	8 (0 - 16)	5 (5 - 5)	7 (4 - 10)	9 (8 - 10)
21-30	17 (16 - 18)	15 (12 - 18)	12 (8 - 16)	12 (12 - 13)	13 (11 - 15)
31-40	22 (6 - 39)	29 (27 - 32)	19 (0 - 41)	21 (14 - 27)	19 (17 - 20)
41-50	27 - -	37 (34 - 41)	22 (20 - 24)	23 (19 - 26)	22 (21 - 23)
51+	31 (28 - 34)	44 (41 - 47)	48 (44 - 52)	42 (38 - 47)	34 (31 - 36)
All	12 (11 - 13)	30 (16 - 44)	28 (24 - 32)	28 (25 - 31)	13 (11 - 15)

Age class (yrs)	Species group / Dbh				
	sycamore	birch spp.	alder	OLL broadleaves	OSL broadleaves
	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)
1-10	3 (1 - 5)	3 (2 - 4)	3 (2 - 4)	1 (1 - 2)	2 (2 - 2)
11-20	9 (5 - 13)	6 (5 - 8)	10 (9 - 11)	4 (3 - 5)	5 (4 - 5)
21-30	12 (10 - 14)	12 (11 - 13)	16 (15 - 17)	10 (7 - 14)	9 (8 - 9)
31-40	26 (18 - 33)	17 (16 - 19)	18 (13 - 23)	13 (12 - 14)	14 (12 - 15)
41-50	26 (20 - 32)	22 (19 - 24)	21 (17 - 24)	22 (19 - 25)	23 (20 - 26)
51+	40 (29 - 50)	30 (26 - 35)	27 (5 - 50)	41 (38 - 43)	29 (27 - 31)
All	19 (16 - 21)	12 (10 - 13)	10 (8 - 11)	14 (3 - 26)	8 (7 - 9)



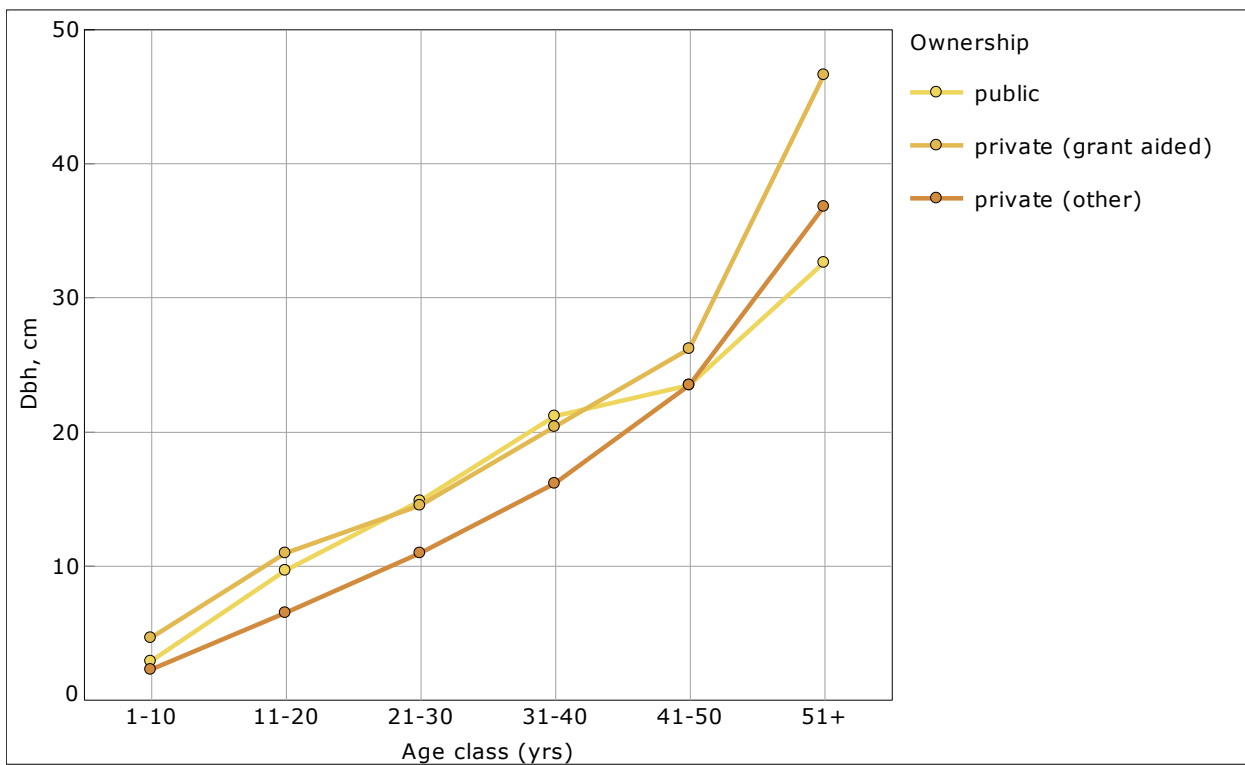
6.1.2 Mean tree Dbh by ownership and age class (10 yr)

Methodology

Weighted mean tree Dbh is classified by ownership and age class. All trees with a Dbh were included in the analysis, i.e. minimum height of 130 cm.

The evaluated variable, Dbh, is weighted by representative tree number. Weighting by the representative tree number removes the effect of the concentric circles. However in the 2006 NFI results this task weights Dbh by representative area, which gave larger trees a higher weight. Weighting by representative area is most effective where there are large numbers of natural regeneration. Due to the absence of large numbers of natural regeneration in Ireland's forests, mean Dbh was calculated using the representative tree number as a weight.

Age class (yrs)	Ownership / Dbh			
	public	private (grant aided)	private (other)	All
	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)	cm ($\alpha = 0.05$)
1-10	3 (3 - 3)	5 (4 - 5)	2 (2 - 3)	4 (3 - 4)
11-20	10 (9 - 10)	11 (10 - 11)	6 (5 - 7)	10 (10 - 10)
21-30	15 (14 - 16)	14 (13 - 16)	11 (10 - 12)	14 (14 - 15)
31-40	21 (20 - 22)	20 (19 - 22)	16 (15 - 17)	20 (19 - 21)
41-50	23 (22 - 25)	26 (24 - 28)	23 (22 - 25)	24 (23 - 25)
51+	33 (30 - 35)	47 (42 - 51)	37 (34 - 39)	36 (34 - 38)
All	14 (13 - 14)	10 (9 - 11)	15 (13 - 16)	13 (12 - 13)



6.2 HEIGHT

Definition
Height The height of a tree is the vertical distance between the base of the tree and its tip.

6.2.1 Mean tree height by species group and age class (10 yr)

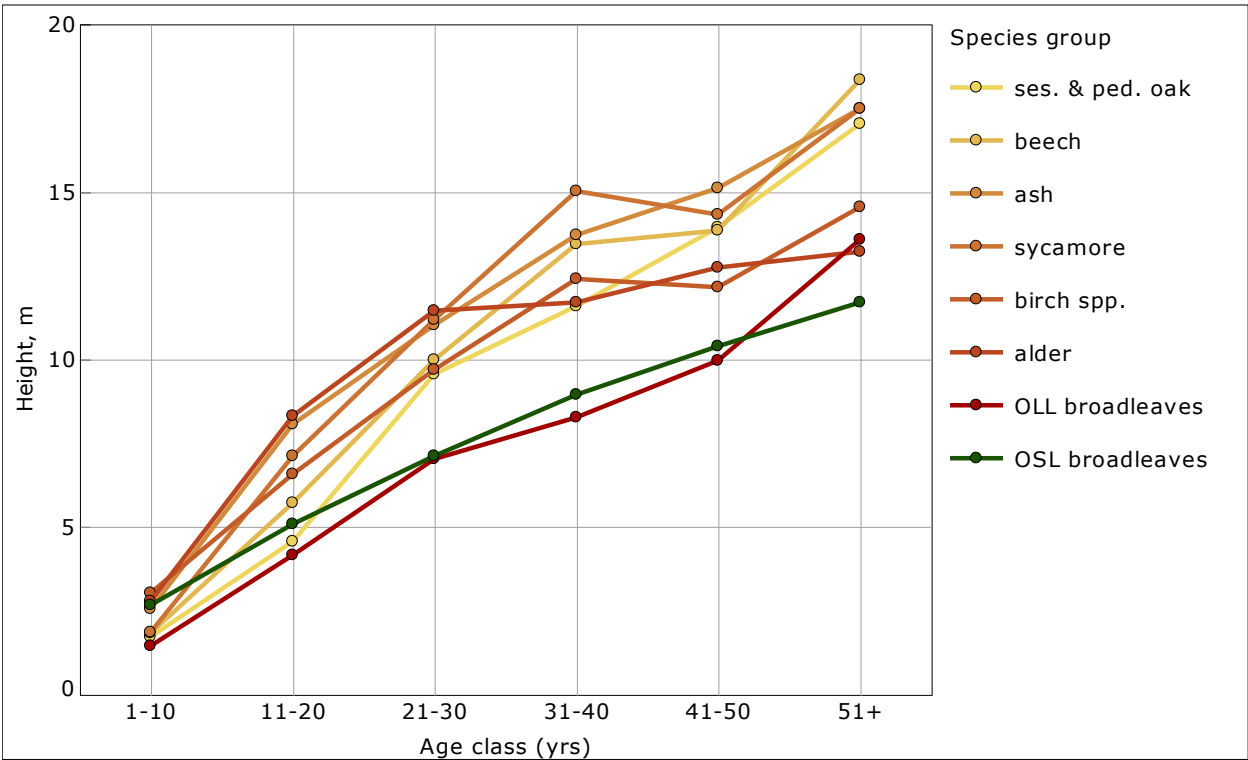
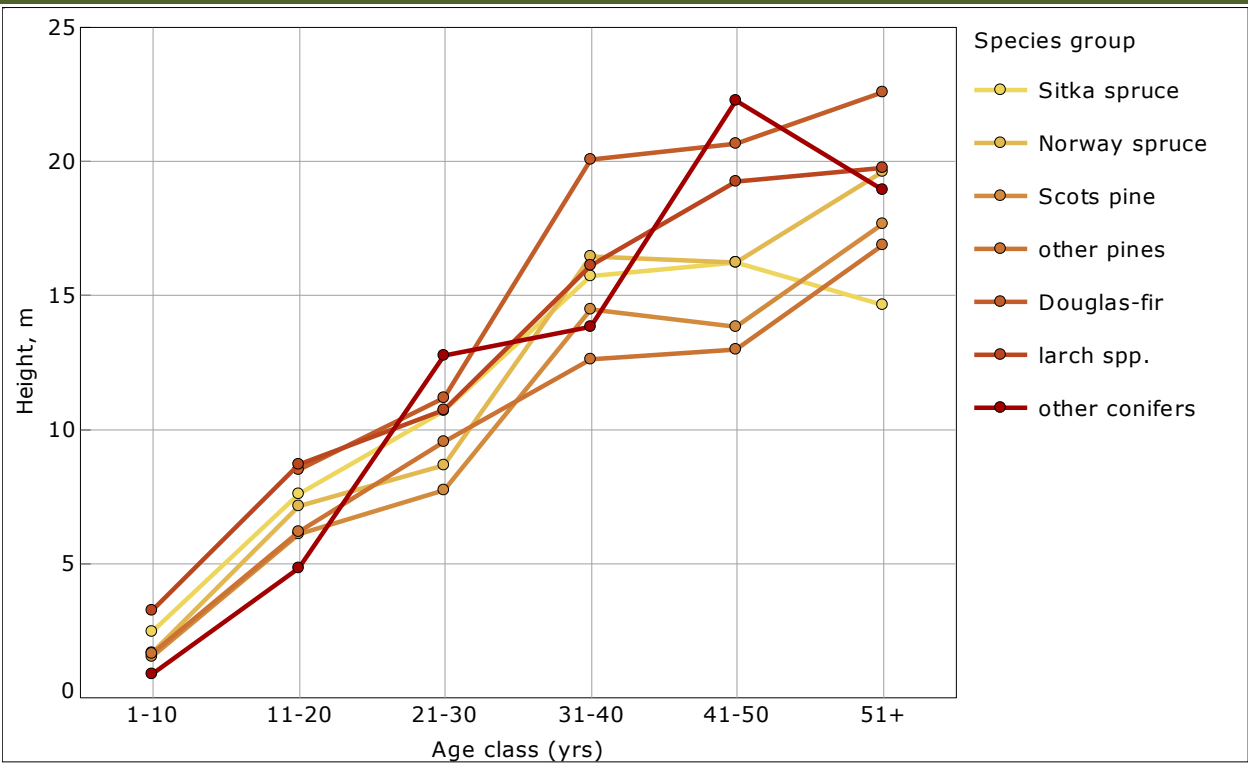
Definition
Mean tree height The average tree height (m).

Methodology
Mean tree height is classified by species group and age class. All trees assessed for height were included in the analysis, i.e. a minimum height of 20 cm.
The evaluated variable, height, is weighted by representative tree number. Weighting by the representative tree number removes the effect of the concentric circles.

Age class (yrs)	Species group / Height				
	Sitka spruce	Norway spruce	Scots pine	other pines	Douglas-fir
	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)
1-10	2.4 (2.2 - 2.7)	1.6 (1.2 - 2.0)	1.5 (1.4 - 1.6)	1.6 (1.2 - 2.0)	- - -
11-20	7.6 (7.2 - 7.9)	7.1 (6.4 - 7.8)	6.1 (5.1 - 7.0)	6.2 (5.6 - 6.7)	8.5 (7.5 - 9.4)
21-30	10.7 (10.1 - 11.2)	8.6 (4.1 - 13.2)	7.7 - -	9.5 (8.3 - 10.7)	11.1 (5.8 - 16.5)
31-40	15.7 (14.9 - 16.5)	16.4 (15.5 - 17.3)	14.4 - -	12.6 (11.7 - 13.5)	20.0 - -
41-50	16.2 (14.8 - 17.5)	16.2 (15.5 - 16.9)	13.8 (12.0 - 15.6)	13.0 (12.1 - 13.8)	20.6 (9.1 - 32.1)
51+	14.6 (11.4 - 17.9)	19.6 (18.9 - 20.3)	17.6 (16.7 - 18.6)	16.8 (0.0 - 50.9)	22.5 (18.8 - 26.3)
All	9.0 (8.7 - 9.4)	9.7 (8.4 - 11.0)	12.0 (10.6 - 13.5)	8.0 (7.5 - 8.6)	16.5 (14.5 - 18.4)

Age class (yrs)	Species group / Height				
	larch spp.	other conifers	ses. & ped. oak	beech	ash
	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)
1-10	3.2 (2.7 - 3.7)	0.8 - -	1.7 (1.6 - 1.9)	1.8 (1.6 - 2.1)	2.5 (2.3 - 2.8)
11-20	8.7 (8.1 - 9.2)	4.8 (0.3 - 9.3)	4.6 (4.5 - 4.7)	5.7 (4.1 - 7.3)	8.1 (7.5 - 8.6)
21-30	10.7 (10.2 - 11.2)	12.7 (10.7 - 14.8)	9.6 (8.6 - 10.5)	10.0 (9.0 - 11.0)	11.0 (9.5 - 12.6)
31-40	16.1 (2.3 - 29.8)	13.8 (10.6 - 17.0)	11.6 (0.0 - 24.9)	13.4 (11.8 - 15.0)	13.7 (12.8 - 14.6)
41-50	19.2 - -	22.2 (16.6 - 27.8)	13.9 (12.5 - 15.4)	13.8 (11.1 - 16.6)	15.1 (14.3 - 15.9)
51+	19.7 (17.2 - 22.2)	18.9 (17.2 - 20.6)	17.0 (16.2 - 17.8)	18.3 (17.4 - 19.2)	17.5 (16.8 - 18.2)
All	7.9 (7.1 - 8.6)	15.0 (10.4 - 19.6)	10.5 (9.5 - 11.5)	11.8 (10.8 - 12.8)	8.6 (7.7 - 9.5)

Age class (yrs)	Species group / Height				
	sycamore	birch spp.	alder	OLL broadleaves	OSL broadleaves
	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)
1-10	1.8 (1.5 - 2.2)	3.0 (2.4 - 3.6)	2.8 (2.2 - 3.4)	1.4 (1.2 - 1.6)	2.7 (2.4 - 2.9)
11-20	7.1 (0.5 - 13.8)	6.6 (5.6 - 7.6)	8.3 (7.8 - 8.8)	4.2 (2.7 - 5.6)	5.1 (4.7 - 5.5)
21-30	11.2 (6.9 - 15.4)	9.7 (9.0 - 10.3)	11.4 (11.4 - 11.5)	7.0 (6.0 - 8.1)	7.1 (6.7 - 7.5)
31-40	15.0 (14.9 - 15.1)	12.4 (11.5 - 13.3)	11.7 (9.8 - 13.6)	8.3 (7.9 - 8.6)	8.9 (8.5 - 9.4)
41-50	14.3 (12.3 - 16.4)	12.2 (11.6 - 12.7)	12.7 (11.4 - 14.1)	10.0 (7.9 - 12.0)	10.4 (9.6 - 11.2)
51+	17.5 (5.7 - 29.3)	14.5 (13.8 - 15.3)	13.2 (11.3 - 15.1)	13.6 (12.6 - 14.5)	11.7 (10.9 - 12.4)
All	9.0 (7.8 - 10.2)	7.7 (7.2 - 8.3)	6.7 (5.9 - 7.6)	5.3 (4.5 - 6.1)	5.6 (5.3 - 5.9)



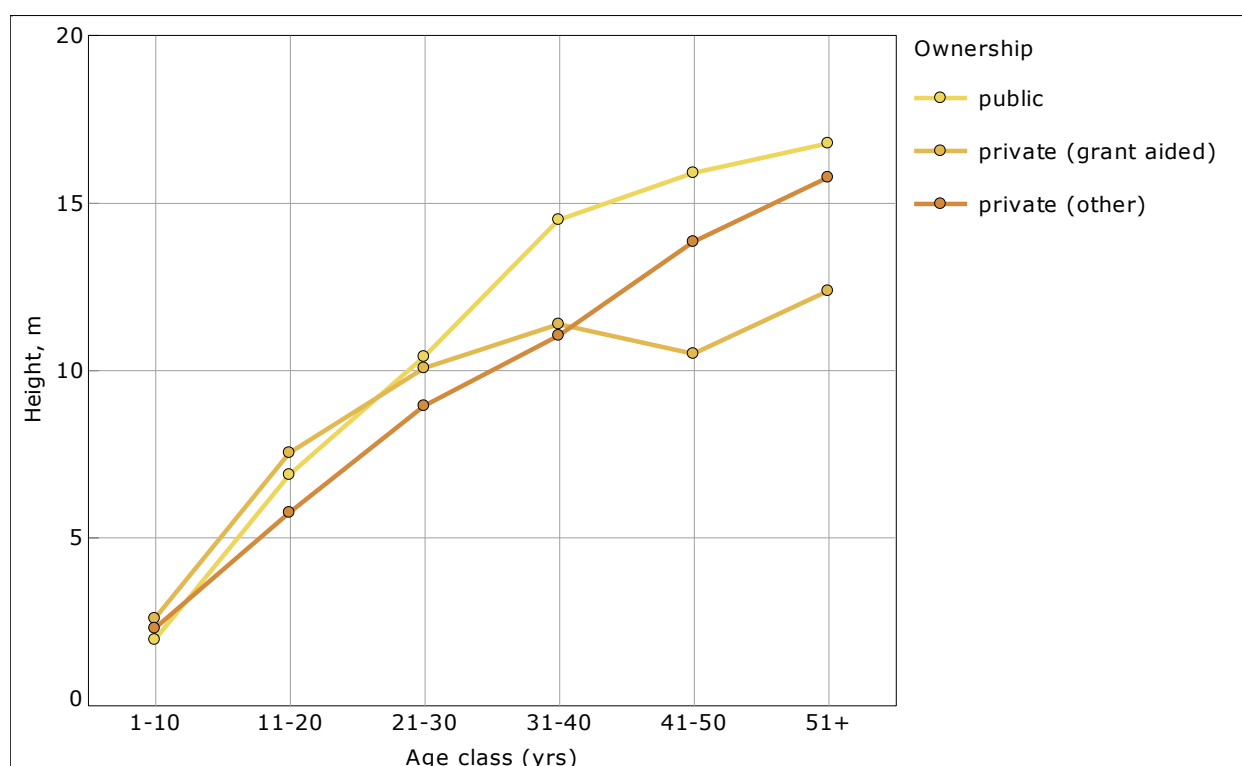
6.2.2 Mean tree height by ownership and age class (10 yr)

Methodology

Mean tree height is classified by ownership and age class (10 yr). All trees with a minimum height of 20 cm were included.

The evaluated variable, height, is weighted by representative tree number. Weighting by the representative tree number removes the effect of the concentric circles.

Age class (yrs)	Ownership / Height			
	public	private (grant aided)	private (other)	All
	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)	m ($\alpha = 0.05$)
1-10	1.9 (1.7 - 2.1)	2.6 (2.3 - 2.9)	2.3 (2.0 - 2.6)	2.3 (2.2 - 2.5)
11-20	6.9 (6.5 - 7.2)	7.5 (7.1 - 7.9)	5.7 (5.2 - 6.3)	7.1 (6.9 - 7.4)
21-30	10.4 (9.8 - 10.9)	10.1 (9.2 - 10.9)	8.9 (8.3 - 9.5)	10.1 (9.7 - 10.5)
31-40	14.5 (13.8 - 15.2)	11.3 (10.4 - 12.3)	11.0 (10.2 - 11.8)	13.8 (13.3 - 14.3)
41-50	15.9 (15.1 - 16.7)	10.5 (8.2 - 12.8)	13.8 (12.9 - 14.7)	15.4 (14.7 - 16.0)
51+	16.7 (15.8 - 17.7)	12.3 (10.8 - 13.9)	15.7 (15.0 - 16.5)	16.3 (15.7 - 17.0)
All	8.4 (8.0 - 8.8)	6.3 (5.9 - 6.7)	7.7 (7.1 - 8.3)	7.6 (7.3 - 7.8)



6.3 BASAL AREA

Definition

Basal area

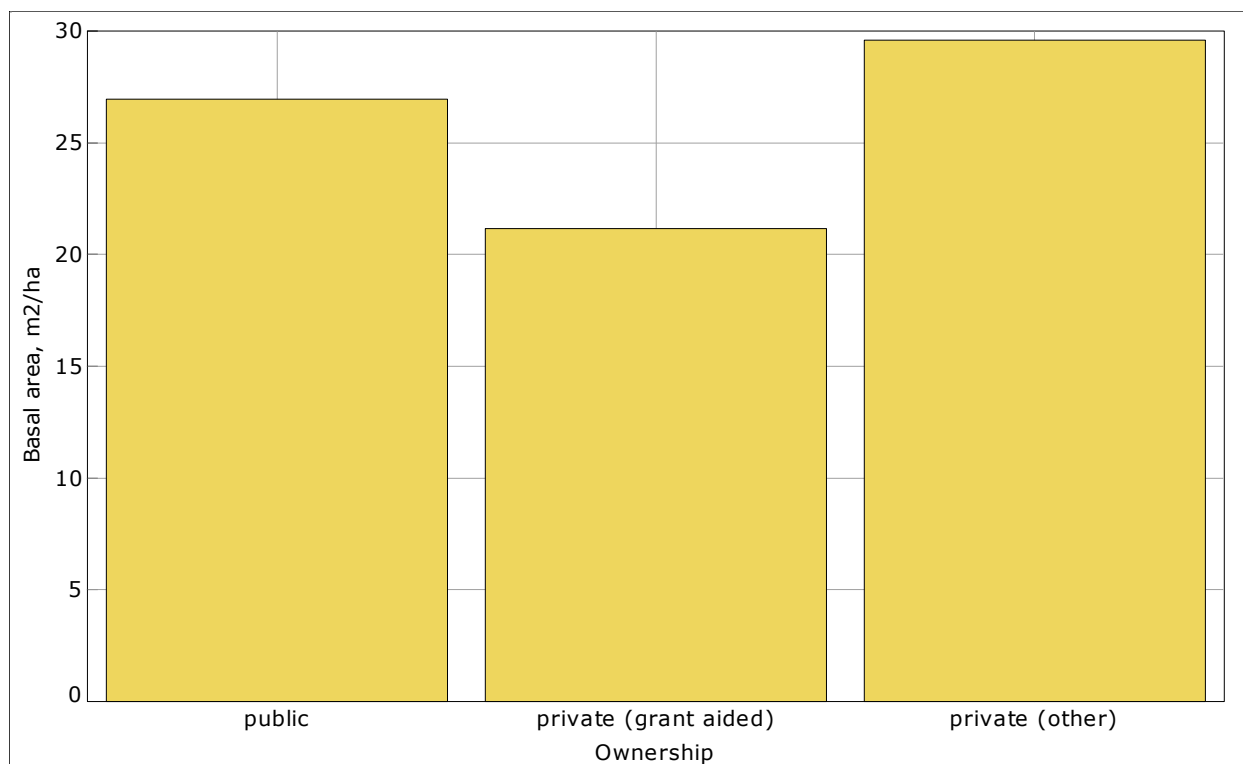
The overbark cross-sectional area of the tree stem at breast height (1.3m).

6.3.1 Mean basal area per hectare by ownership

Methodology

Mean basal area per hectare is classified by ownership. All trees assessed for Dbh were included.

Ownership	Basal area	
	m ² /ha	($\alpha = 0.05$)
public	27	(26 – 28)
private (grant aided)	21	(20 – 23)
private (other)	30	(27 – 32)
All	25	(24 – 26)



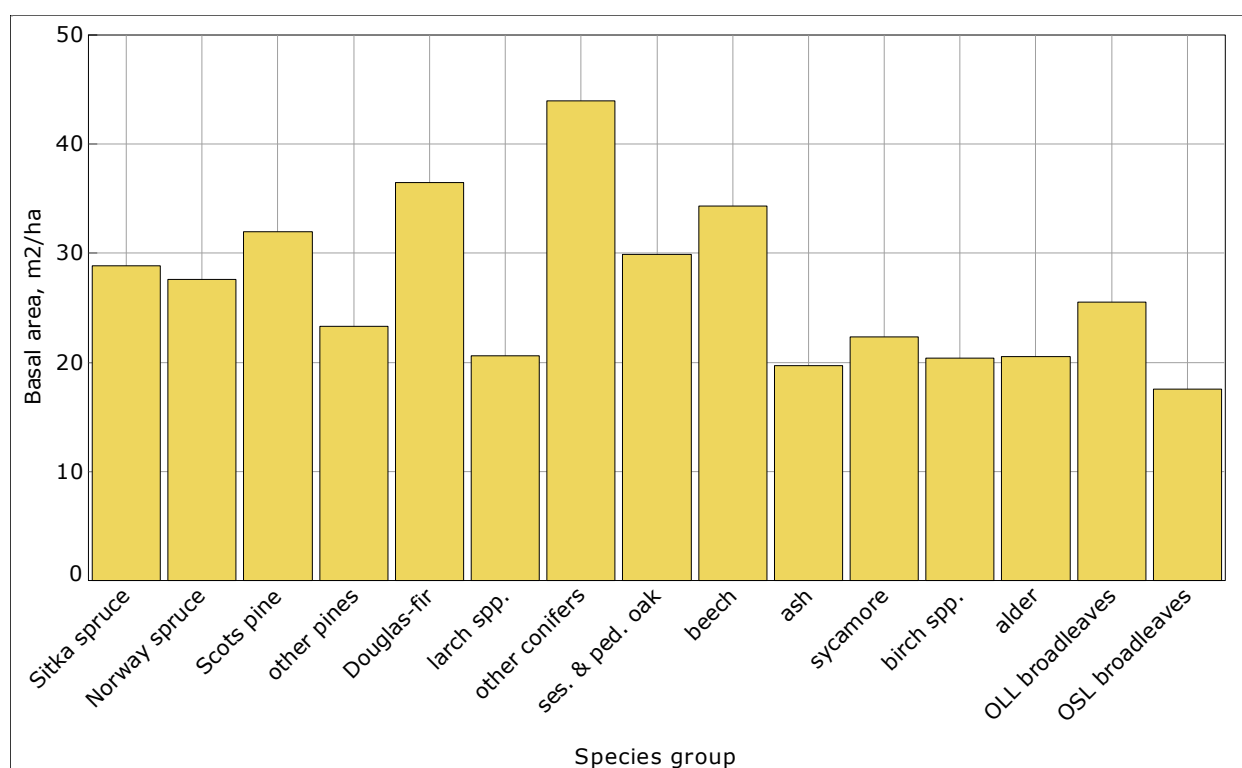
6.3.2 Normalised mean basal area per hectare by ownership and species group

Methodology

The normalised mean basal area per hectare is classified by species group and ownership.

The calculated value of the variable under consideration for a plot (i.e. basal area) is divided not by the whole plot area, but by the area of the part of the plot where the given variable is present. Therefore the sum of basal area for a plot is related only to the area occupied by those trees, not to the whole plot.

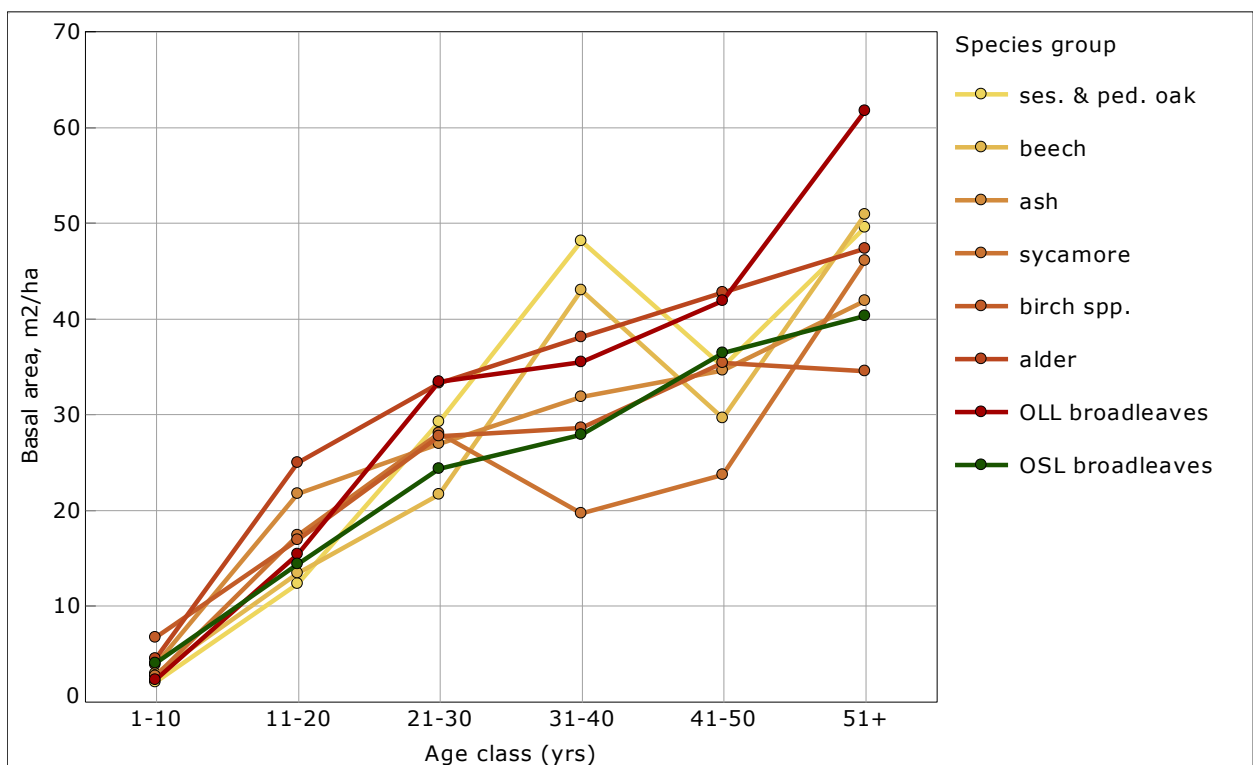
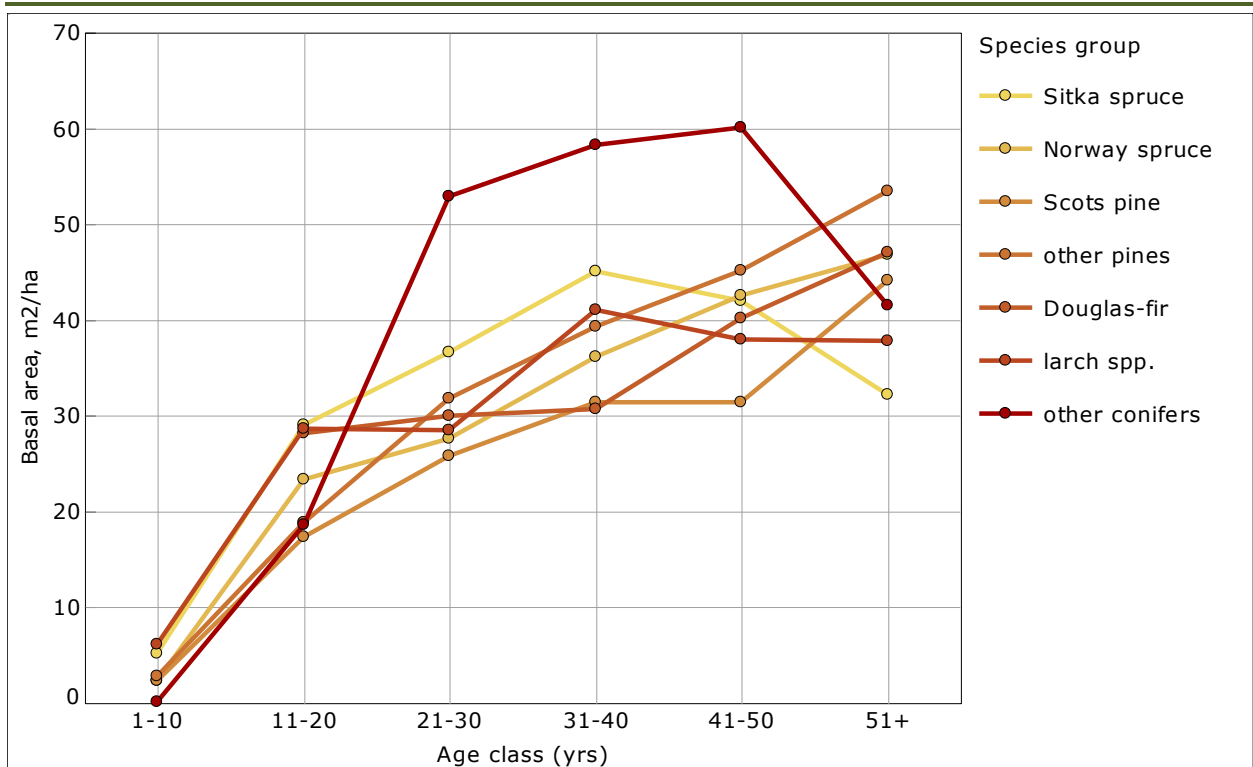
Species group	Ownership / Basal area			
	public	private (grant aided)	private (other)	All
	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)
Sitka spruce	31 (29 - 33)	25 (23 - 27)	50 (47 - 54)	29 (28 - 30)
Norway spruce	34 (17 - 50)	21 (16 - 26)	44 (39 - 50)	28 (23 - 32)
Scots pine	31 (22 - 41)	8 (0 - 17)	49 (0 - 112)	32 (27 - 37)
other pines	27 (25 - 29)	19 (14 - 23)	56 (43 - 70)	23 (21 - 26)
Douglas-fir	36 (29 - 44)	30 (25 - 36)	39 (0 - 140)	36 (32 - 41)
larch spp.	26 (23 - 30)	19 (16 - 22)	35 (33 - 38)	21 (18 - 23)
other conifers	43 (33 - 54)	20 - -	41 (27 - 56)	44 (27 - 61)
ses. & ped. oak	43 (40 - 45)	10 (0 - 25)	42 (33 - 52)	30 (25 - 35)
beech	37 (30 - 44)	7 - -	40 (36 - 44)	34 (31 - 38)
ash	20 (11 - 29)	15 (10 - 20)	29 (26 - 32)	20 (17 - 22)
sycamore	28 (16 - 39)	19 (17 - 22)	28 (22 - 33)	22 (19 - 26)
birch spp.	20 (15 - 24)	21 (17 - 24)	22 (19 - 24)	20 (18 - 23)
alder	21 (17 - 26)	14 (7 - 22)	34 (29 - 40)	21 (17 - 24)
OLL broadleaves	17 (12 - 22)	11 (2 - 20)	27 (20 - 34)	26 (21 - 30)
OSL broadleaves	14 (12 - 16)	13 (8 - 17)	22 (20 - 24)	18 (16 - 19)
All	28 (27 - 29)	22 (20 - 23)	30 (27 - 33)	26 (25 - 27)



6.3.3 Normalised mean basal area per hectare by species group and age class (10yr)

Methodology
The normalised mean basal area per hectare is classified by species group and age class (10yr).
The calculated value of the variable under consideration for a plot (i.e. basal area) is divided not by the whole plot area, but by the area of the part of the plot where the given variable is present. Therefore the sum of basal area for a plot is related only to the area occupied by those trees, not to the whole plot.

Age class (yrs)	Species group / Basal area				
	Sitka spruce	Norway spruce	Scots pine	other pines	Douglas-fir
	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)
1-10	5 (4 - 6)	2 (1 - 3)	2 (2 - 3)	3 (1 - 4)	- - -
11-20	29 (27 - 31)	23 (21 - 25)	17 (9 - 26)	19 (16 - 22)	28 (26 - 31)
21-30	37 (34 - 39)	28 (0 - 59)	26 - -	32 (27 - 37)	30 (20 - 40)
31-40	45 (42 - 48)	36 (24 - 49)	31 - -	39 (35 - 43)	31 - -
41-50	42 (38 - 46)	43 (36 - 49)	31 (24 - 38)	45 (36 - 54)	40 (29 - 51)
51+	32 (19 - 45)	47 (38 - 56)	44 (36 - 52)	53 (0 - 331)	47 (28 - 66)
All	29 (28 - 30)	28 (23 - 32)	32 (27 - 37)	23 (21 - 26)	36 (32 - 41)
Age class (yrs)	Species group / Basal area				
	larch spp.	other conifers	ses. & ped. oak	beech	ash
	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)
1-10	6 (4 - 8)	0 - -	2 (2 - 2)	3 (0 - 5)	4 (3 - 4)
11-20	29 (25 - 32)	19 (0 - 53)	12 (10 - 14)	13 (11 - 16)	22 (19 - 24)
21-30	28 (27 - 30)	53 (40 - 66)	29 (23 - 35)	22 (17 - 26)	27 (24 - 30)
31-40	41 (8 - 74)	58 (40 - 76)	48 (24 - 72)	43 (29 - 56)	32 (22 - 41)
41-50	38 - -	60 (47 - 73)	35 (30 - 40)	30 (15 - 44)	35 (29 - 40)
51+	38 (0 - 90)	42 (39 - 44)	49 (44 - 55)	51 (46 - 55)	42 (37 - 47)
All	21 (18 - 23)	44 (27 - 61)	30 (25 - 35)	34 (31 - 38)	20 (17 - 22)
Age class (yrs)	Species group / Basal area				
	sycamore	birch spp.	alder	OLL broadleaves	OSL broadleaves
	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)	m ² /ha ($\alpha = 0.05$)
1-10	3 (1 - 4)	7 (4 - 9)	4 (2 - 7)	2 (1 - 3)	4 (3 - 5)
11-20	17 (0 - 51)	17 (13 - 20)	25 (21 - 28)	15 (13 - 18)	14 (12 - 16)
21-30	28 (23 - 33)	28 (24 - 31)	33 (32 - 34)	33 (25 - 41)	24 (21 - 27)
31-40	20 (9 - 30)	29 (25 - 32)	38 (28 - 48)	35 (32 - 39)	28 (21 - 35)
41-50	24 (0 - 58)	35 (31 - 39)	43 (29 - 56)	42 (23 - 61)	36 (33 - 40)
51+	46 (27 - 65)	34 (29 - 40)	47 (5 - 90)	62 (58 - 65)	40 (36 - 45)
All	22 (19 - 26)	20 (18 - 23)	21 (17 - 24)	26 (21 - 30)	18 (16 - 19)
Age class (yrs)	Species group / Basal area				
	All				
	m ² /ha ($\alpha = 0.05$)				
1-10	4 (4 - 5)				
11-20	26 (25 - 27)				
21-30	33 (31 - 35)				
31-40	40 (38 - 42)				
41-50	38 (35 - 40)				
51+	41 (38 - 44)				
All	26 (25 - 27)				



Chapter 7

GROWING STOCK

The total standing growing stock of Irish forests is estimated to be over 97 million m³, an increase of over 25 million m³ on the 2006 standing volume; while growing stock volume has nearly tripled in the Private (grant aided) forests over this same time period. Public forests contain nearly twice the growing stock volume of private forests.

In terms of broad species groups, 81.9% of growing stock volume refers to conifer species, while 18.1% is contained in broadleaf species. Sitka spruce contains 59% of the growing stock, followed by other pines at 9.7%. With regard to broadleaves Sessile and Pedunculate oak contain 3.6% of total growing stock volume followed by Birch species at 3.2% and Beech at 2.8%. Some 72.5% of the growing stock volume is contained within forests between 11 and 40 years of age.

Counties in the west of Ireland have the highest proportion of growing stock, with Co. Cork having the highest volume at 12.5 million m³.

The mean growing stock per hectare for the national forest estate is 148 m³. In terms of forest ownership categories the average growing stock in Public forests is 169m³ per hectare, 185m³ per hectare in Private (other) forests and 99 m³ per hectare in Private (other) forests. Average growing stock in Private (other) forests is significantly less in relative terms owing to the young age structure of these forests.

In terms of timber quality of the growing stock, Norway spruce has the highest proportion of straight logs, with 77.9% of trees having at least 5 m of straight log in the first 6 m from ground level. Sitka spruce had the next highest proportion of straight logs at 64%.

Definition
Growing stock Volume over bark of all living trees from stump to 7cm top diameter with Dbh greater than 7 cm. The British Forestry Commission (BFC) single tree volume equations were used in the first NFI cycle to estimate the standing volume of conifer and broadleaf species. The stem volume was measured from the ground to 70 mm top diameter overbark for conifers and from the ground to timber height overbark for broadleaves. Since the first cycle, single tree stem profile models were generated using Irish data. Models for six conifer and four broadleaf species were produced, which use the explanatory variables of Dbh and height to generate volume. Funded by the National Council for Forest Research and Development (COFORD), the TREEMODEL project¹ developed models for six conifer species; Sitka spruce, Lodgepole pine, Japanese larch, Douglas-fir, Norway spruce, and Scots pine. Following the completion of the second cycle field-work, NFI field-staff non-destructively collected stem diameter data from broadleaf forests across Ireland. Single tree stem profile models were developed for four broadleaf species; oak, ash, beech and birch. Estimates for the first NFI were recalculated to allow for valid comparisons.

¹<http://www.coford.ie/researchprogramme/thematicareaestablishingandgrowingforests/forestplanningandmanagement/treemodel/>

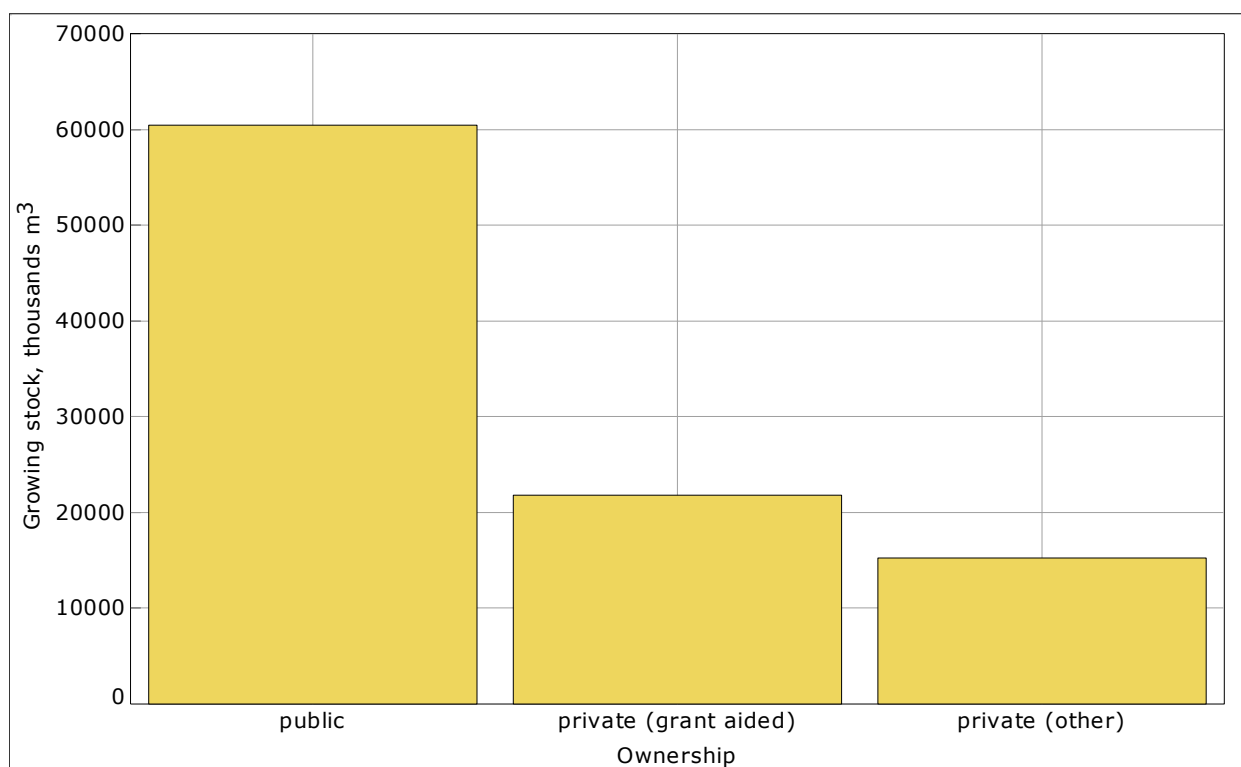
7.1 OWNERSHIP

7.1.1 Total growing stock by ownership

Methodology

The total growing stock is classified by ownership.

Ownership	Growing stock		
	thousands m ³	($\alpha = 0.05$)	%
public	60,405.3	(56,794.3 – 64,016.3)	62.0
private (grant aided)	21,824.3	(20,078.5 – 23,570.1)	22.4
private (other)	15,246.7	(13,321.7 – 17,171.7)	15.6
Total	97,476.3	(92,906.4 – 102,046.1)	100.0

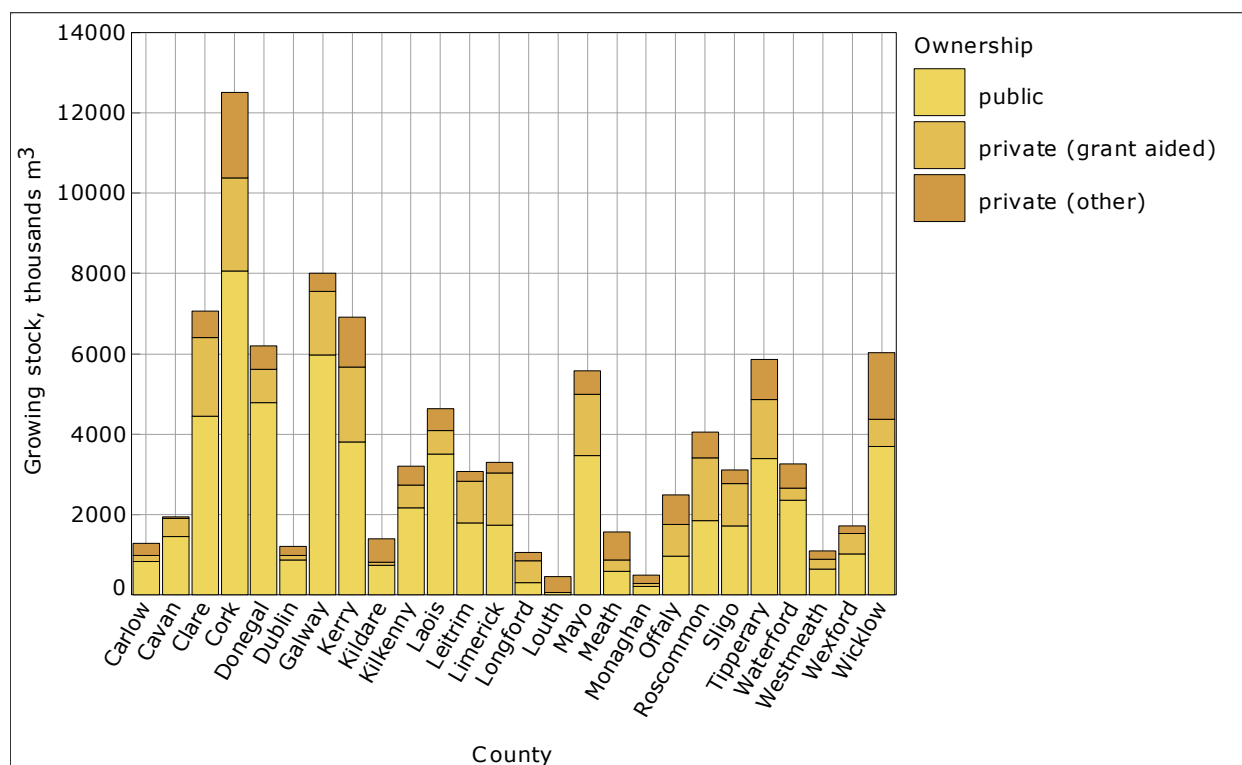


7.1.2 Total growing stock by ownership and county

Methodology
The total growing stock is classified by ownership and county.

County	Ownership / Growing stock					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Carlow	833.9	(238.3 - 1,429.4)	1.4	136.7	(0.0 - 342.4)	0.6
Cavan	1,453.0	(736.0 - 2,169.9)	2.4	459.2	(113.6 - 804.9)	2.1
Clare	4,449.9	(3,522.6 - 5,377.3)	7.4	1,949.3	(1,225.6 - 2,672.9)	8.9
Cork	8,073.0	(6,767.0 - 9,378.9)	13.3	2,306.7	(1,754.6 - 2,858.8)	10.5
Donegal	4,778.3	(3,595.0 - 5,961.5)	7.9	831.5	(448.9 - 1,214.0)	3.8
Dublin	861.6	(180.1 - 1,543.1)	1.4	126.3	(0.0 - 310.4)	0.6
Galway	5,981.3	(5,047.8 - 6,914.7)	9.9	1,573.2	(1,179.3 - 1,967.0)	7.2
Kerry	3,814.5	(2,816.2 - 4,812.7)	6.3	1,850.2	(1,310.3 - 2,390.2)	8.5
Kildare	728.1	(423.6 - 1,032.6)	1.2	89.7	(0.0 - 256.7)	0.4
Kilkenny	2,170.7	(1,598.3 - 2,743.1)	3.6	552.3	(139.5 - 965.1)	2.5
Laois	3,507.0	(2,626.0 - 4,388.0)	5.8	577.6	(177.6 - 977.6)	2.6
Leitrim	1,792.7	(1,043.3 - 2,542.1)	3.0	1,037.3	(752.5 - 1,322.1)	4.8
Limerick	1,727.0	(1,125.0 - 2,329.0)	2.9	1,305.6	(826.8 - 1,784.4)	6.0
Longford	308.4	(18.2 - 598.6)	0.5	544.8	(294.8 - 794.9)	2.5
Louth	52.2	(0.0 - 191.6)	0.09	-	-	-
Mayo	3,470.1	(2,752.2 - 4,187.9)	5.7	1,527.1	(1,001.2 - 2,053.0)	7.0
Meath	586.7	(271.1 - 902.2)	1.0	278.3	(98.3 - 458.2)	1.3
Monaghan	198.3	(0.0 - 417.9)	0.3	88.1	(0.0 - 928.6)	0.4
Offaly	954.5	(506.3 - 1,402.7)	1.6	793.0	(481.5 - 1,104.5)	3.6
Roscommon	1,838.1	(942.9 - 2,733.4)	3.0	1,574.2	(1,065.8 - 2,082.7)	7.2
Sligo	1,723.3	(1,109.1 - 2,337.4)	2.9	1,040.4	(565.7 - 1,515.2)	4.8
Tipperary	3,399.6	(2,620.9 - 4,178.2)	5.6	1,462.9	(1,061.1 - 1,864.7)	6.7
Waterford	2,350.4	(1,563.4 - 3,137.4)	3.9	298.9	(207.1 - 390.8)	1.4
Westmeath	639.9	(254.8 - 1,025.0)	1.1	237.4	(30.7 - 444.2)	1.1
Wexford	1,021.2	(715.6 - 1,326.8)	1.7	495.8	(159.0 - 832.6)	2.3
Wicklow	3,691.9	(2,447.8 - 4,935.9)	6.1	687.6	(480.3 - 895.0)	3.2
Total	60,405.3	(56,794.3 - 64,016.3)	100.0	21,824.3	(20,078.5 - 23,570.1)	100.0

County	Ownership / Growing stock					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Carlow	301.4	(0.0 – 744.6)	2.0	1,272.0	(667.9 – 1,876.1)	1.3
Cavan	19.4	(0.0 – 206.8)	0.1	1,931.6	(1,147.9 – 2,715.2)	2.0
Clare	672.2	(378.8 – 965.6)	4.4	7,071.4	(5,836.4 – 8,306.4)	7.3
Cork	2,134.0	(1,516.3 – 2,751.7)	14.1	12,513.7	(10,958.4 – 14,068.9)	12.6
Donegal	592.5	(283.7 – 901.2)	3.9	6,202.2	(4,897.3 – 7,507.1)	6.4
Dublin	210.0	(181.5 – 238.4)	1.4	1,197.8	(569.9 – 1,825.8)	1.2
Galway	449.1	(183.5 – 714.8)	2.9	8,003.5	(6,962.3 – 9,044.8)	8.2
Kerry	1,256.4	(261.4 – 2,251.4)	8.2	6,921.1	(5,396.2 – 8,446.0)	7.1
Kildare	575.7	(128.4 – 1,023.0)	3.8	1,393.5	(901.9 – 1,885.1)	1.4
Kilkenny	486.2	(14.7 – 957.8)	3.2	3,209.3	(2,427.6 – 3,991.0)	3.3
Laois	547.8	(146.6 – 949.0)	3.6	4,632.4	(3,653.0 – 5,611.8)	4.8
Leitrim	241.3	(66.2 – 416.4)	1.6	3,071.3	(2,272.7 – 3,870.0)	3.2
Limerick	262.9	(0.0 – 1,381.1)	1.7	3,295.5	(2,480.9 – 4,110.1)	3.4
Longford	205.8	(0.0 – 502.1)	1.3	1,059.0	(708.1 – 1,409.8)	1.1
Louth	402.9	(0.0 – 3,586.7)	2.6	455.1	(0.0 – 1,292.2)	0.5
Mayo	586.5	(182.8 – 990.2)	3.8	5,583.7	(4,631.7 – 6,535.7)	5.7
Meath	701.2	(240.7 – 1,161.6)	4.6	1,566.1	(936.0 – 2,196.2)	1.6
Monaghan	195.6	(8.9 – 382.3)	1.3	482.1	(268.0 – 696.2)	0.5
Offaly	739.1	(204.1 – 1,274.0)	4.8	2,486.6	(1,782.1 – 3,191.0)	2.6
Roscommon	647.9	(19.2 – 1,276.6)	4.2	4,060.2	(2,970.5 – 5,150.0)	4.2
Sligo	344.3	(67.0 – 621.7)	2.3	3,108.0	(2,281.8 – 3,934.3)	3.2
Tipperary	1,002.7	(421.3 – 1,584.1)	6.6	5,865.2	(4,859.5 – 6,870.9)	6.0
Waterford	617.7	(402.6 – 832.8)	4.1	3,267.1	(2,467.6 – 4,066.5)	3.4
Westmeath	207.5	(21.8 – 393.2)	1.4	1,084.9	(641.7 – 1,528.0)	1.1
Wexford	188.6	(0.0 – 590.1)	1.2	1,705.5	(1,262.7 – 2,148.3)	1.7
Wicklow	1,658.1	(920.2 – 2,396.0)	10.9	6,037.6	(4,585.5 – 7,489.6)	6.2
Total	15,246.7	(13,321.7 – 17,171.7)	100.0	97,476.3	(92,906.4 – 102,046.1)	100.0



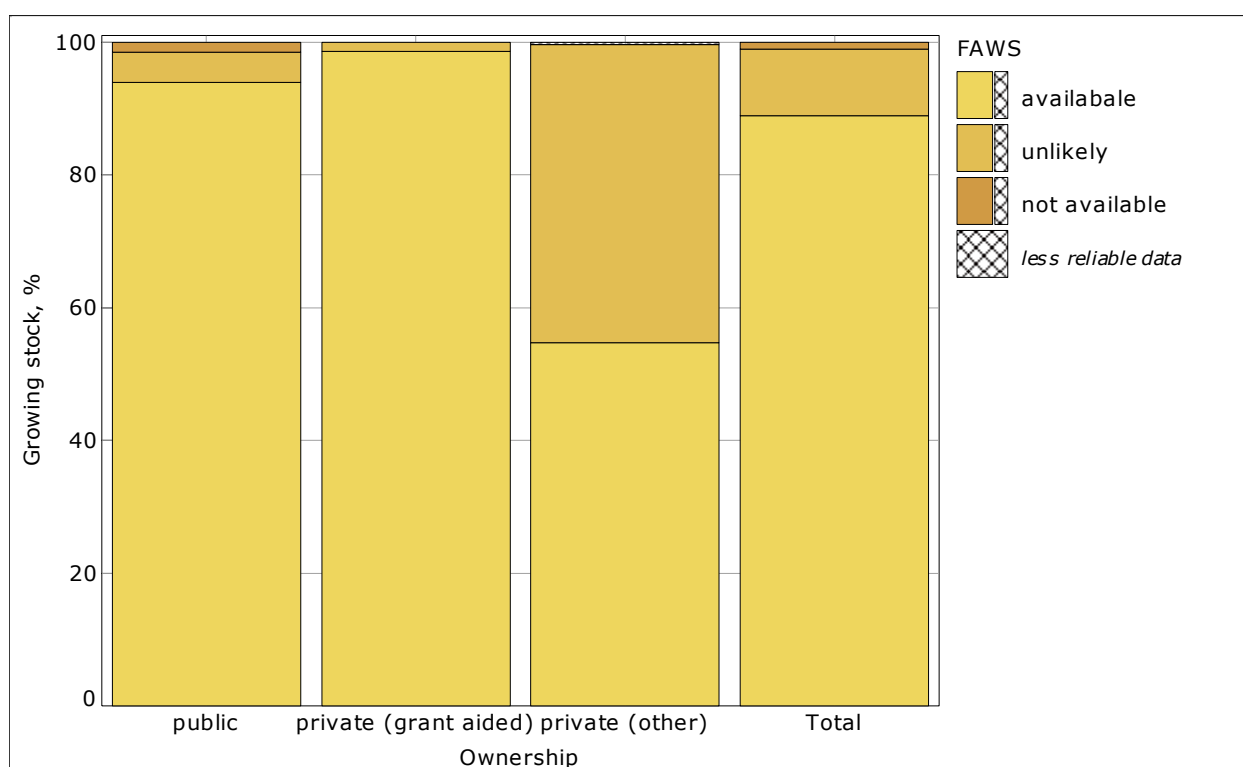
7.1.3 Total growing stock by ownership and Forest Available for Wood Supply

Methodology

The total growing stock is classified by ownership and Forest Available for Wood Supply.

FAWS	Ownership / Growing stock					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
available	56,792.4	(53,369.1 - 60,215.7)	94.0	21,534.1	(19,827.0 - 23,241.3)	98.7
unlikely	2,709.1	(1,567.8 - 3,850.5)	4.5	290.1	(0.0 - 2,055.1)	1.3
not available	903.7	(492.4 - 1,315.0)	1.5	-	-	-
Total	60,405.3	(56,794.3 - 64,016.3)	100.0	21,824.3	(20,078.5 - 23,570.1)	100.0

FAWS	Ownership / Growing stock					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
available	8,340.2	(6,683.1 - 9,997.2)	54.7	86,666.8	(82,422.5 - 90,911.0)	88.9
unlikely	6,852.5	(5,798.8 - 7,906.1)	44.9	9,851.7	(8,417.6 - 11,285.9)	10.1
not available	54.1	-	0.4	957.7	(562.2 - 1,353.3)	1.0
Total	15,246.7	(13,321.7 - 17,171.7)	100.0	97,476.3	(92,906.4 - 102,046.1)	100.0



7.2 SPECIES

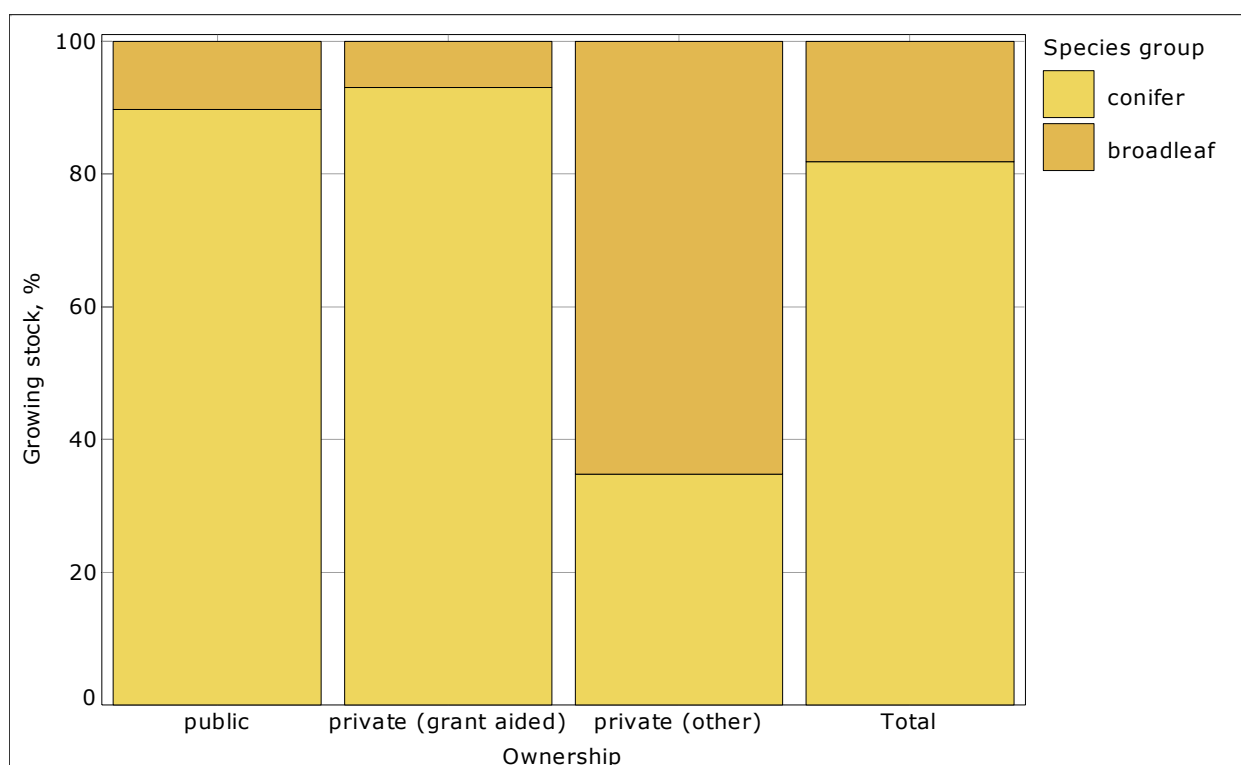
7.2.1 Total growing stock by ownership and species group (broadleaf/conifer)

Methodology

The total growing stock is classified by ownership and species group (broadleaf/conifer).

Species group	Ownership / Growing stock					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
conifer	54,180.5	(50,647.9 - 57,713.1)	89.7	20,309.0	(18,601.9 - 22,016.1)	93.1
broadleaf	6,224.7	(4,972.3 - 7,477.2)	10.3	1,515.2	(1,151.6 - 1,878.9)	6.9
Total	60,405.3	(56,794.3 - 64,016.3)	100.0	21,824.3	(20,078.5 - 23,570.1)	100.0

Species group	Ownership / Growing stock					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
conifer	5,299.8	(4,206.6 - 6,392.9)	34.8	79,789.3	(75,563.2 - 84,015.5)	81.9
broadleaf	9,946.9	(8,564.9 - 11,329.0)	65.2	17,686.9	(15,802.7 - 19,571.2)	18.1
Total	15,246.7	(13,321.7 - 17,171.7)	100.0	97,476.3	(92,906.4 - 102,046.1)	100.0



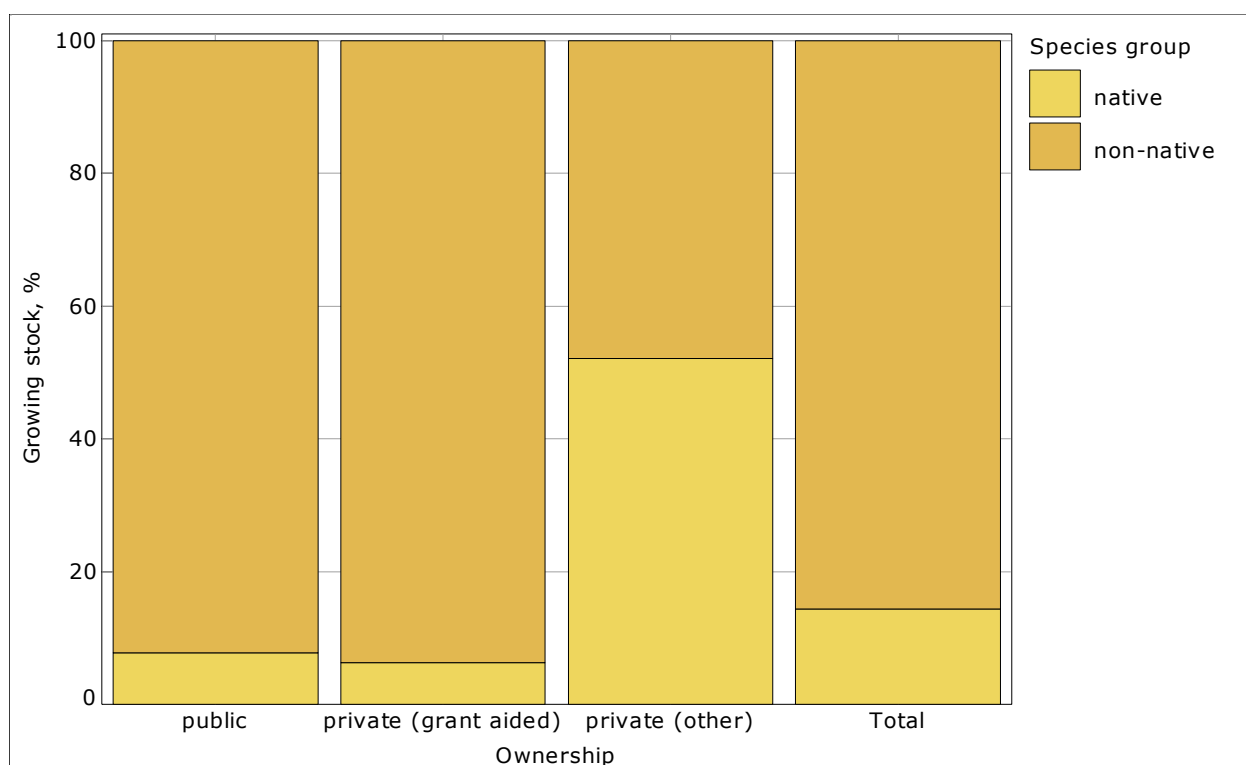
7.2.2 Total growing stock by ownership and species type (native/non-native)

Methodology

The total growing stock is classified by ownership and species group (native/non-native).

Species group	Ownership / Growing stock					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
native	4,698.0	(3,945.9 - 5,450.1)	7.8	1,379.7	(1,030.3 - 1,729.1)	6.3
non-native	55,707.3	(52,134.0 - 59,280.6)	92.2	20,444.6	(18,720.8 - 22,168.3)	93.7
Total	60,405.3	(56,794.3 - 64,016.3)	100.0	21,824.3	(20,078.5 - 23,570.1)	100.0

Species group	Ownership / Growing stock					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
native	7,938.3	(6,957.6 - 8,919.0)	52.1	14,016.0	(12,666.9 - 15,365.0)	14.4
non-native	7,308.4	(5,727.5 - 8,889.4)	47.9	83,460.3	(79,100.7 - 87,819.9)	85.6
Total	15,246.7	(13,321.7 - 17,171.7)	100.0	97,476.3	(92,906.4 - 102,046.1)	100.0

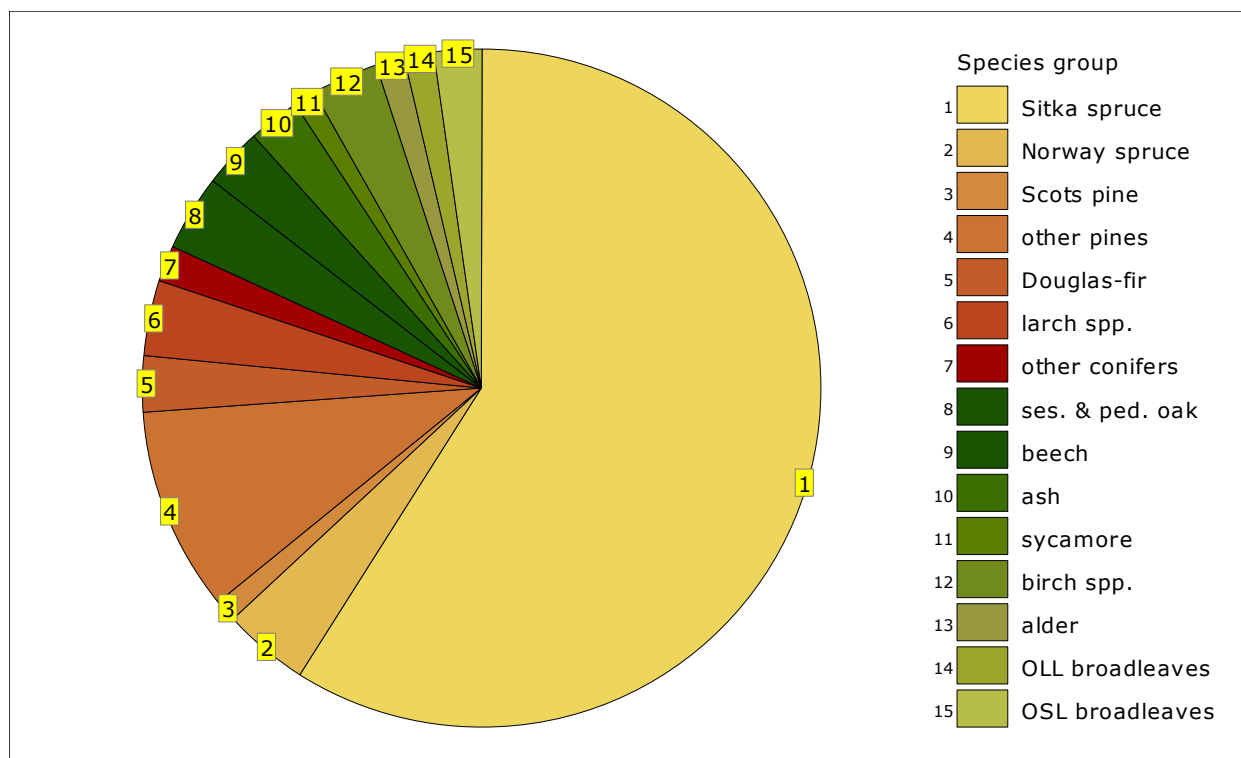


7.2.3 Total growing stock by species groups

Methodology

The total growing stock is classified by species group.

Species group	Growing stock		
	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	57,555.2	(53,902.5 – 61,207.9)	59.0
Norway spruce	3,981.6	(3,194.7 – 4,768.6)	4.1
Scots pine	1,056.4	(777.3 – 1,335.4)	1.1
other pines	9,457.6	(7,968.1 – 10,947.1)	9.7
Douglas-fir	2,621.5	(2,051.8 – 3,191.2)	2.7
larch spp.	3,440.8	(2,621.4 – 4,260.2)	3.5
other conifers	1,676.2	(711.3 – 2,641.2)	1.7
ses. & ped. oak	3,509.8	(2,647.6 – 4,372.0)	3.6
beech	2,775.1	(1,891.4 – 3,658.8)	2.8
ash	2,393.0	(1,958.5 – 2,827.6)	2.5
sycamore	1,019.8	(578.5 – 1,461.1)	1.0
birch spp.	3,073.2	(2,609.5 – 3,537.0)	3.2
alder	1,332.1	(974.0 – 1,690.2)	1.4
OLL broadleaves	1,379.3	(0.0 – 2,910.3)	1.4
OSL broadleaves	2,204.5	(1,815.9 – 2,593.2)	2.3
Total	97,476.3	(92,906.4 – 102,046.1)	100.0



7.2.4 Total growing stock by county and species group

Methodology						
The total growing stock is classified by county and species group.						
Species group	County / Growing stock					
	Carlow			Cavan		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	436.5	(73.3 - 799.8)	34.3	1,425.8	(668.3 - 2,183.4)	73.9
Norway spruce	42.0		3.3	92.1	(0.0 - 185.3)	4.8
Scots pine	8.3		0.7	-	-	-
other pines	-	-	-	11.3		0.6
Douglas-fir	180.5	(0.0 - 1,195.1)	14.2	-	-	-
larch spp.	203.7	(0.0 - 763.4)	16.0	75.2	(0.0 - 213.1)	3.9
other conifers	173.3		13.6	2.8		0.1
ses. & ped. oak	-	-	-	87.5	(0.0 - 787.1)	4.5
beech	-	-	-	-	-	-
ash	90.7	(0.0 - 730.3)	7.1	41.5	(0.0 - 86.2)	2.2
sycamore	-	-	-	31.9	(0.0 - 354.0)	1.6
birch spp.	7.1		0.6	66.5	(5.4 - 127.7)	3.4
alder	-	-	-	66.6	(0.0 - 233.3)	3.4
OLL broadleaves	127.4	(0.0 - 1,699.7)	10.0	-	-	-
OSL broadleaves	2.6		0.2	30.2	(0.0 - 62.8)	1.6
Total	1,272.0	(667.9 - 1,876.1)	100.0	1,931.6	(1,147.9 - 2,715.2)	100.0
Species group	County / Growing stock					
	Clare			Cork		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	5,039.3	(3,936.4 - 6,142.2)	71.2	9,200.2	(7,827.3 - 10,573.1)	73.5
Norway spruce	163.9	(0.0 - 424.4)	2.3	126.6	(0.0 - 349.2)	1.0
Scots pine	41.6		0.6	99.4	(2.3 - 196.5)	0.8
other pines	477.0	(207.2 - 746.7)	6.7	459.1	(299.6 - 618.7)	3.7
Douglas-fir	-	-	-	448.5	(113.8 - 783.2)	3.6
larch spp.	175.0	(25.5 - 324.5)	2.5	319.6	(21.9 - 617.2)	2.6
other conifers	-	-	-	10.0	(0.0 - 34.2)	0.08
ses. & ped. oak	43.3	(0.4 - 86.2)	0.6	423.2	(206.5 - 640.0)	3.4
beech	258.3	(0.0 - 560.1)	3.7	412.9	(0.0 - 847.6)	3.3
ash	323.6	(86.7 - 560.5)	4.6	124.1	(47.7 - 200.5)	1.0
sycamore	25.1	(0.0 - 54.4)	0.4	127.0	(0.0 - 258.7)	1.0
birch spp.	199.8	(48.7 - 350.9)	2.8	205.8	(126.0 - 285.6)	1.6
alder	33.7	(0.1 - 67.3)	0.5	312.0	(120.0 - 504.0)	2.5
OLL broadleaves	35.1	(0.0 - 87.5)	0.5	102.3	(53.0 - 151.6)	0.8
OSL broadleaves	255.8	(132.4 - 379.3)	3.6	143.0	(76.8 - 209.3)	1.1
Total	7,071.4	(5,836.4 - 8,306.4)	100.0	12,513.7	(10,958.4 - 14,068.9)	100.0

Species group	County / Growing stock					
	Donegal			Dublin		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	4,007.3	(2,887.9 – 5,126.7)	64.6	405.5	(218.1 – 592.9)	33.8
Norway spruce	9.6		0.2	–	–	–
Scots pine	–	–	–	14.4		1.2
other pines	945.5	(461.4 – 1,429.6)	15.2	219.0	(0.0 – 693.9)	18.3
Douglas-fir	–	–	–	43.3		3.6
larch spp.	136.0	(0.0 – 371.9)	2.2	47.0	(0.0 – 606.5)	3.9
other conifers	316.8	(0.0 – 1,479.7)	5.1	18.5		1.5
ses. & ped. oak	83.9	(0.0 – 314.1)	1.4	89.5		7.5
beech	130.2	(0.0 – 268.8)	2.1	4.2		0.4
ash	77.8	(0.0 – 171.7)	1.3	33.5		2.8
sycamore	39.5		0.6	21.5		1.8
birch spp.	163.5	(68.2 – 258.8)	2.6	–	–	–
alder	51.9	(0.0 – 109.7)	0.8	6.4		0.5
OLL broadleaves	24.1	(0.0 – 261.2)	0.4	286.9	(0.0 – 3,881.2)	24.0
OSL broadleaves	216.0	(89.7 – 342.4)	3.5	8.0	(0.0 – 73.5)	0.7
Total	6,202.2	(4,897.3 – 7,507.1)	100.0	1,197.8	(569.9 – 1,825.8)	100.0

Species group	County / Growing stock					
	Galway			Kerry		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	4,497.9	(3,632.6 – 5,363.1)	56.1	4,066.3	(3,020.7 – 5,111.8)	58.6
Norway spruce	215.6	(49.5 – 381.7)	2.7	24.9		0.4
Scots pine	149.1	(0.0 – 367.0)	1.9	60.0		0.9
other pines	2,111.7	(1,463.5 – 2,759.9)	26.4	1,132.1	(198.5 – 2,065.8)	16.4
Douglas-fir	–	–	–	–	–	–
larch spp.	214.5	(0.0 – 518.9)	2.7	14.0	(8.6 – 19.4)	0.2
other conifers	18.8	(3.5 – 34.1)	0.2	162.2	(0.0 – 1,941.0)	2.3
ses. & ped. oak	54.9	(0.0 – 147.0)	0.7	377.3	(131.7 – 622.9)	5.5
beech	196.7	(67.4 – 325.9)	2.5	53.3	(0.0 – 107.1)	0.8
ash	111.9	(30.0 – 193.8)	1.4	68.7	(28.8 – 108.5)	1.0
sycamore	58.6	(0.0 – 122.8)	0.7	4.8		0.07
birch spp.	220.8	(123.8 – 317.8)	2.8	403.6	(127.0 – 680.3)	5.8
alder	55.3	(0.0 – 120.6)	0.7	144.3	(0.4 – 288.2)	2.1
OLL broadleaves	19.3	(0.0 – 41.7)	0.2	269.3	(95.7 – 442.9)	3.9
OSL broadleaves	78.5	(51.3 – 105.8)	1.0	140.3	(52.2 – 228.4)	2.0
Total	8,003.5	(6,962.3 – 9,044.8)	100.0	6,921.1	(5,396.2 – 8,446.0)	100.0

Species group	County / Growing stock					
	Kildare			Kilkenny		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	230.5	(56.7 – 404.2)	16.5	1,874.7	(1,225.1 – 2,524.4)	58.5
Norway spruce	326.6	(19.4 – 633.7)	23.2	186.7	(0.0 – 401.0)	5.8
Scots pine	52.4	(0.0 – 174.2)	3.8	43.5		1.4
other pines	126.5	(0.0 – 1,700.0)	9.1	109.5	(0.0 – 283.0)	3.4
Douglas-fir	5.3		0.4	195.3	(0.0 – 1,518.7)	6.1
larch spp.	25.2	(0.0 – 182.2)	1.8	40.3	(0.0 – 127.2)	1.3
other conifers	37.2		2.7	39.9	(0.0 – 82.8)	1.2
ses. & ped. oak	23.1	(0.0 – 93.9)	1.7	286.9	(0.0 – 753.2)	8.9
beech	77.4	(9.6 – 145.2)	5.6	28.1	(4.1 – 52.2)	0.9
ash	231.6	(0.0 – 479.8)	16.6	55.0	(19.4 – 90.5)	1.7
sycamore	24.6	(18.5 – 30.6)	1.8	13.2		0.4
birch spp.	188.9	(98.7 – 279.1)	13.6	174.5	(10.4 – 338.7)	5.4
alder	27.2	(0.0 – 329.1)	2.0	4.2		0.1
OLL broadleaves	–	–	–	2.7		0.08
OSL broadleaves	17.1	(0.0 – 98.7)	1.2	154.7	(0.0 – 387.7)	4.8
Total	1,393.5	(901.9 – 1,885.1)	100.0	3,209.3	(2,427.6 – 3,991.0)	100.0

Species group	County / Growing stock					
	Laois			Leitrim		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	2,913.8	(2,101.3 - 3,726.4)	62.8	2,248.5	(1,525.3 - 2,971.7)	73.1
Norway spruce	166.8	(0.0 - 400.2)	3.6	-	-	-
Scots pine	53.9	(0.0 - 218.7)	1.2	62.4	(0.0 - 634.7)	2.0
other pines	174.7	(30.3 - 319.1)	3.8	47.6	(0.0 - 190.2)	1.6
Douglas-fir	130.1	(0.0 - 293.3)	2.8	-	-	-
larch spp.	311.5	(0.0 - 877.9)	6.7	125.5	(28.4 - 222.7)	4.1
other conifers	172.9	(0.0 - 835.4)	3.7	205.6		6.7
ses. & ped. oak	170.8	(0.0 - 441.6)	3.7	2.1		0.07
beech	129.0	(42.9 - 215.2)	2.8	2.7		0.09
ash	213.4	(81.8 - 345.0)	4.6	23.4	(0.0 - 66.0)	0.8
sycamore	16.7	(0.0 - 144.9)	0.4	-	-	-
birch spp.	109.4	(0.0 - 227.7)	2.4	175.5	(50.1 - 300.9)	5.7
alder	4.1		0.09	82.1	(0.0 - 826.0)	2.7
OLL broadleaves	1.3		0.03	6.3		0.2
OSL broadleaves	63.9	(0.0 - 135.4)	1.4	89.5	(0.0 - 194.8)	2.9
Total	4,632.4	(3,653.0 - 5,611.8)	100.0	3,071.3	(2,272.7 - 3,870.0)	100.0

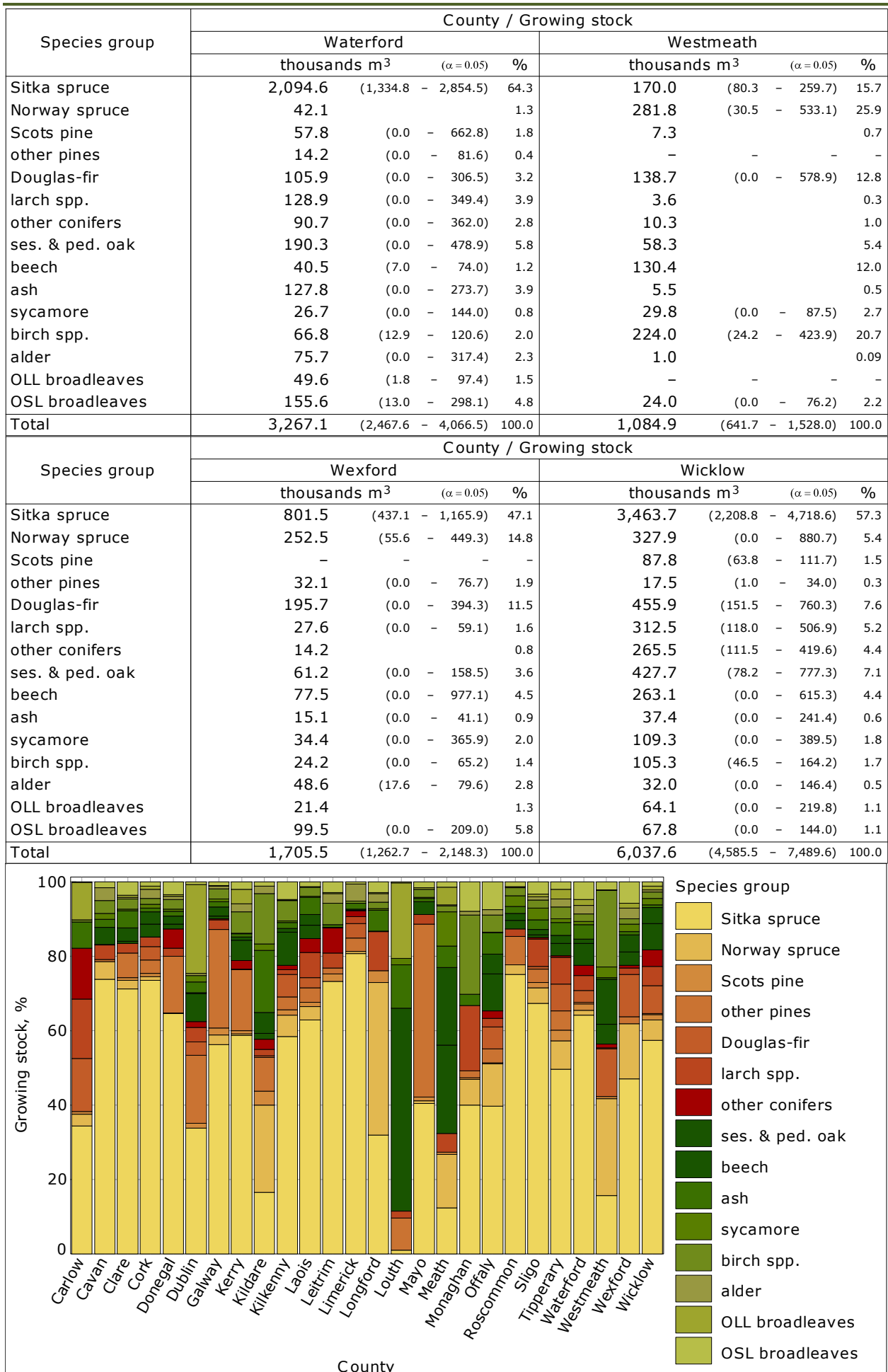
Species group	County / Growing stock					
	Limerick			Longford		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	2,661.3	(1,897.2 - 3,425.4)	80.7	338.1	(24.6 - 651.5)	31.9
Norway spruce	15.2		0.5	434.0	(198.8 - 669.2)	41.1
Scots pine	-	-	-	33.8	(0.0 - 94.7)	3.2
other pines	122.2	(0.0 - 314.2)	3.7	-	-	-
Douglas-fir	126.1	(110.2 - 142.0)	3.8	-	-	-
larch spp.	64.3	(16.6 - 112.0)	2.0	111.3	(0.0 - 629.1)	10.5
other conifers	50.3	(0.0 - 249.9)	1.5	-	-	-
ses. & ped. oak	2.6		0.08	1.1		0.1
beech	13.3		0.4	-	-	-
ash	48.3	(0.0 - 131.6)	1.5	59.3	(0.0 - 156.9)	5.6
sycamore	3.5		0.1	4.7		0.4
birch spp.	16.6		0.5	18.2	(1.9 - 34.5)	1.7
alder	151.9	(0.0 - 363.2)	4.6	24.9		2.4
OLL broadleaves	-	-	-	2.4		0.2
OSL broadleaves	20.0	(0.0 - 112.3)	0.6	31.2	(0.0 - 84.4)	2.9
Total	3,295.5	(2,480.9 - 4,110.1)	100.0	1,059.0	(708.1 - 1,409.8)	100.0

Species group	County / Growing stock					
	Louth			Mayo		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	4.7		1.0	2,254.9	(1,578.0 - 2,931.8)	40.4
Norway spruce	-	-	-	40.3	(0.0 - 496.8)	0.7
Scots pine	-	-	-	57.9	(0.0 - 464.5)	1.0
other pines	38.9		8.5	2,594.7	(1,912.9 - 3,276.4)	46.5
Douglas-fir	-	-	-	-	-	-
larch spp.	8.6		1.9	143.3	(44.2 - 242.4)	2.6
other conifers	-	-	-	-	-	-
ses. & ped. oak	-	-	-	196.3	(0.0 - 608.1)	3.5
beech	248.1	(0.0 - 2,979.0)	54.6	-	-	-
ash	53.1	(0.0 - 648.8)	11.7	44.7	(5.3 - 84.1)	0.8
sycamore	8.2		1.8	19.7	(0.0 - 182.1)	0.4
birch spp.	-	-	-	118.4	(29.1 - 207.6)	2.1
alder	-	-	-	-	-	-
OLL broadleaves	92.1		20.2	24.5	(0.0 - 139.3)	0.4
OSL broadleaves	1.4		0.3	89.1	(0.0 - 180.2)	1.6
Total	455.1	(0.0 - 1,292.2)	100.0	5,583.7	(4,631.7 - 6,535.7)	100.0

Species group	County / Growing stock					
	Meath			Monaghan		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	192.8	(0.0 - 2,478.2)	12.3	192.6	(0.0 - 420.9)	39.9
Norway spruce	226.8	(122.9 - 330.8)	14.5	33.6		7.0
Scots pine	7.4	(0.0 - 37.3)	0.5	2.0		0.4
other pines	–	–	–	9.2		1.9
Douglas-fir	–	–	–	–	–	–
larch spp.	78.8	(0.0 - 302.9)	5.0	84.6	(0.0 - 880.5)	17.6
other conifers	–	–	–	–	–	–
ses. & ped. oak	373.4	(0.0 - 777.4)	23.9	–	–	–
beech	325.2	(31.3 - 619.2)	20.8	–	–	–
ash	91.5	(0.0 - 196.4)	5.8	14.1		2.9
sycamore	144.5	(0.0 - 319.8)	9.2	–	–	–
birch spp.	23.8	(0.0 - 156.8)	1.5	103.0	(0.0 - 235.9)	21.4
alder	5.0		0.3	4.8		1.0
OLL broadleaves	74.6		4.8	–	–	–
OSL broadleaves	22.2	(0.0 - 61.5)	1.4	38.1		7.9
Total	1,566.1	(936.0 - 2,196.2)	100.0	482.1	(268.0 - 696.2)	100.0

Species group	County / Growing stock					
	Offaly			Roscommon		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	986.9	(493.3 - 1,480.4)	39.7	3,047.4	(2,045.5 - 4,049.3)	75.0
Norway spruce	284.2	(84.2 - 484.2)	11.4	105.4	(7.7 - 203.0)	2.6
Scots pine	4.5		0.2	–	–	–
other pines	92.9	(16.2 - 169.6)	3.7	313.8	(43.1 - 584.4)	7.7
Douglas-fir	149.6	(0.0 - 957.1)	6.0	–	–	–
larch spp.	57.0	(0.0 - 159.8)	2.3	77.9	(0.0 - 212.9)	1.9
other conifers	48.5		2.0	–	–	–
ses. & ped. oak	249.1	(0.0 - 870.2)	10.0	92.3	(0.0 - 300.1)	2.3
beech	129.2	(0.0 - 522.9)	5.2	80.1	(0.0 - 286.9)	2.0
ash	144.4	(13.2 - 275.6)	5.8	76.0	(40.7 - 111.3)	1.9
sycamore	4.6	(0.0 - 9.5)	0.2	113.3	(0.0 - 1,479.5)	2.8
birch spp.	112.1	(24.4 - 199.7)	4.5	91.4	(29.7 - 153.2)	2.3
alder	38.9		1.6	9.1		0.2
OLL broadleaves	–	–	–	1.2		0.03
OSL broadleaves	184.6	(22.3 - 346.9)	7.4	52.4	(5.4 - 99.3)	1.3
Total	2,486.6	(1,782.1 - 3,191.0)	100.0	4,060.2	(2,970.5 - 5,150.0)	100.0

Species group	County / Growing stock					
	Sligo			Tipperary		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	2,092.7	(1,407.7 - 2,777.7)	67.4	2,907.6	(2,251.7 - 3,563.5)	49.6
Norway spruce	131.7	(0.0 - 637.1)	4.2	451.2	(0.6 - 901.8)	7.7
Scots pine	42.2		1.4	170.7	(80.5 - 260.9)	2.9
other pines	110.4	(0.0 - 287.8)	3.6	297.8	(43.6 - 551.9)	5.1
Douglas-fir	24.9		0.8	421.7	(172.1 - 671.3)	7.2
larch spp.	227.3	(0.0 - 608.4)	7.3	427.4	(171.8 - 683.0)	7.3
other conifers	13.6		0.4	25.1		0.4
ses. & ped. oak	23.0	(0.0 - 272.3)	0.7	192.0	(33.8 - 350.2)	3.3
beech	44.3	(0.0 - 90.9)	1.4	130.7	(0.0 - 303.0)	2.2
ash	78.2	(7.0 - 149.4)	2.5	202.3	(45.8 - 358.8)	3.4
sycamore	99.7		3.2	58.6	(0.0 - 162.3)	1.0
birch spp.	67.5	(23.5 - 111.4)	2.2	186.4	(33.5 - 339.2)	3.2
alder	28.8		0.9	123.7	(0.0 - 360.9)	2.1
OLL broadleaves	19.6	(0.0 - 66.6)	0.6	155.0	(0.0 - 1,977.3)	2.6
OSL broadleaves	104.1	(56.1 - 152.2)	3.4	115.1	(67.4 - 162.9)	2.0
Total	3,108.0	(2,281.8 - 3,934.3)	100.0	5,865.2	(4,859.5 - 6,870.9)	100.0



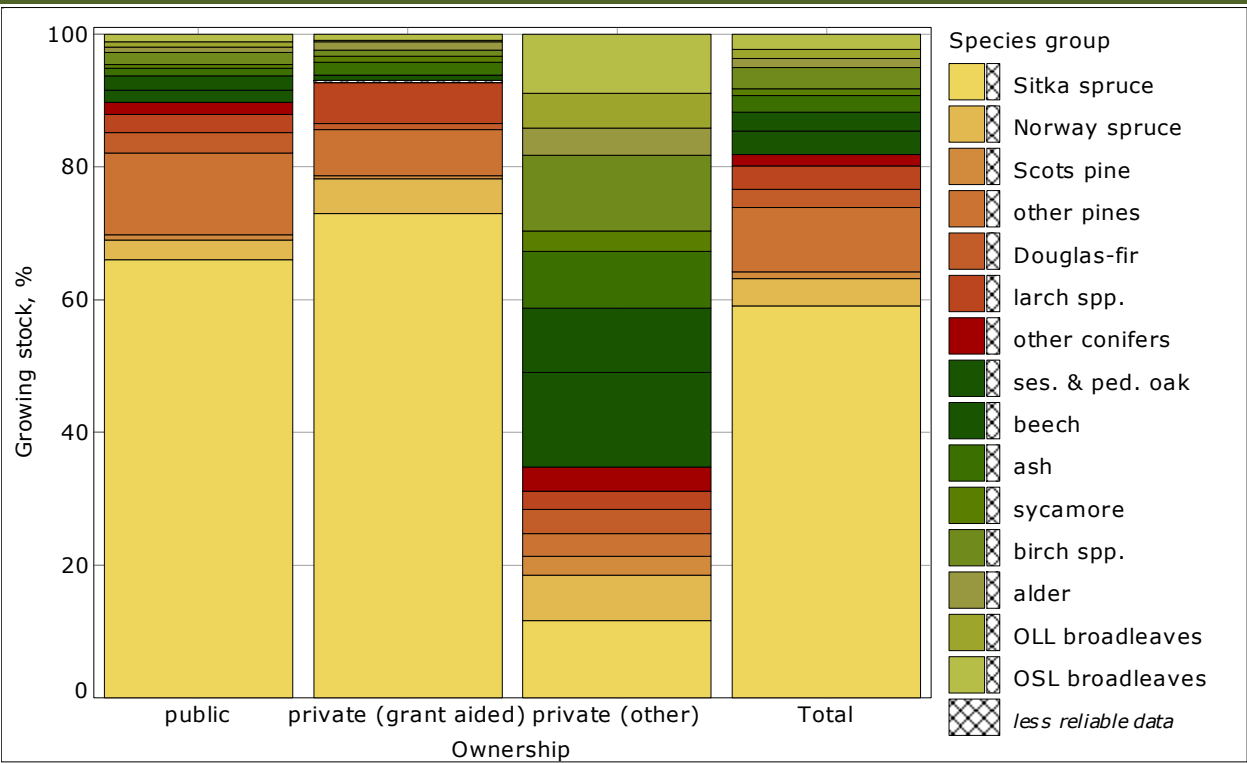
7.2.5 Total growing stock by ownership and species group

Methodology

The total growing stock is classified by ownership and species group.

Species group	Ownership / Growing stock					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	39,861.0	(36,689.4 – 43,032.7)	66.0	15,923.3	(14,346.7 – 17,500.0)	72.9
Norway spruce	1,782.0	(1,264.2 – 2,299.8)	3.0	1,159.6	(905.0 – 1,414.2)	5.3
Scots pine	526.4	(233.4 – 819.4)	0.9	90.4	(43.7 – 137.2)	0.4
other pines	7,435.6	(6,279.5 – 8,591.7)	12.3	1,508.0	(1,026.9 – 1,989.1)	6.9
Douglas-fir	1,841.5	(1,393.2 – 2,289.9)	3.0	210.8	(167.5 – 254.0)	1.0
larch spp.	1,680.9	(997.3 – 2,364.5)	2.8	1,344.1	(947.6 – 1,740.6)	6.2
other conifers	1,053.0	(0.0 – 3,004.8)	1.7	72.8	– –	0.3
ses. & ped. oak	1,157.3	(706.2 – 1,608.4)	1.9	174.0	(0.0 – 472.9)	0.8
beech	1,293.7	(783.3 – 1,804.0)	2.1	8.2	– –	0.04
ash	667.1	(245.1 – 1,089.2)	1.1	414.4	(272.1 – 556.7)	1.9
sycamore	351.3	(165.0 – 537.6)	0.6	211.9	(0.0 – 880.7)	1.0
birch spp.	1,137.6	(898.9 – 1,376.2)	1.9	191.2	(0.0 – 831.8)	0.9
alder	427.5	(244.8 – 610.2)	0.7	274.8	(98.1 – 451.5)	1.3
OLL broadleaves	543.0	(370.1 – 715.9)	0.9	38.2	(0.0 – 92.9)	0.2
OSL broadleaves	647.3	(467.5 – 827.1)	1.1	202.5	(153.3 – 251.7)	0.9
Total	60,405.3	(56,794.3 – 64,016.3)	100.0	21,824.3	(20,078.5 – 23,570.1)	100.0

Species group	Ownership / Growing stock					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	1,770.8	(1,210.7 – 2,331.0)	11.6	57,555.2	(53,902.5 – 61,207.9)	59.0
Norway spruce	1,040.0	(0.0 – 3,999.3)	6.8	3,981.6	(3,194.7 – 4,768.6)	4.1
Scots pine	439.5	(341.1 – 538.0)	2.9	1,056.4	(777.3 – 1,335.4)	1.1
other pines	514.0	(232.7 – 795.2)	3.4	9,457.6	(7,968.1 – 10,947.1)	9.7
Douglas-fir	569.2	(397.2 – 741.2)	3.7	2,621.5	(2,051.8 – 3,191.2)	2.7
larch spp.	415.8	(160.2 – 671.4)	2.7	3,440.8	(2,621.4 – 4,260.2)	3.5
other conifers	550.4	(0.0 – 2,452.6)	3.6	1,676.2	(711.3 – 2,641.2)	1.7
ses. & ped. oak	2,178.5	(1,542.0 – 2,815.0)	14.4	3,509.8	(2,647.6 – 4,372.0)	3.6
beech	1,473.3	(627.2 – 2,319.4)	9.7	2,775.1	(1,891.4 – 3,658.8)	2.8
ash	1,311.5	(1,020.8 – 1,602.1)	8.6	2,393.0	(1,958.5 – 2,827.6)	2.5
sycamore	456.5	(0.0 – 1,063.5)	3.0	1,019.8	(578.5 – 1,461.1)	1.0
birch spp.	1,744.5	(1,370.0 – 2,119.0)	11.4	3,073.2	(2,609.5 – 3,537.0)	3.2
alder	629.8	(503.4 – 756.2)	4.1	1,332.1	(974.0 – 1,690.2)	1.4
OLL broadleaves	798.1	(145.4 – 1,450.8)	5.2	1,379.3	(0.0 – 2,910.3)	1.4
OSL broadleaves	1,354.7	(979.5 – 1,730.0)	8.9	2,204.5	(1,815.9 – 2,593.2)	2.3
Total	15,246.7	(13,321.7 – 17,171.7)	100.0	97,476.3	(92,906.4 – 102,046.1)	100.0



7.2.6 Total growing stock by conifer species groups and Dbh class

Methodology

The total growing stock for conifer species is classified by species group and Dbh class.

Species group	DBH class	Growing stock		
		thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	20 cm +	32,651.0	(29,664.2 – 35,637.9)	72.1
	12-19.9 cm	20,817.5	(19,513.9 – 22,121.1)	
	7-11.9 cm	4,086.7	(3,829.0 – 4,344.3)	
	All	57,555.2	(54,286.1 – 60,824.3)	
Norway spruce	20 cm +	2,264.8	(1,560.5 – 2,969.1)	5.0
	12-19.9 cm	1,302.9	(1,055.0 – 1,550.8)	
	7-11.9 cm	414.0	(298.7 – 529.3)	
	All	3,981.6	(3,226.1 – 4,737.1)	
Scots pine	20 cm +	952.6	(705.6 – 1,199.6)	1.3
	12-19.9 cm	75.0	(0.0 – 207.5)	
	7-11.9 cm	28.8	- -	
	All	1,056.4	(776.1 – 1,336.7)	
other pines	20 cm +	5,249.9	(4,107.1 – 6,392.7)	11.9
	12-19.9 cm	3,422.2	(2,873.8 – 3,970.6)	
	7-11.9 cm	785.5	(688.4 – 882.5)	
	All	9,457.6	(8,186.3 – 10,728.8)	
Douglas-fir	20 cm +	1,731.2	(1,179.3 – 2,283.0)	3.3
	12-19.9 cm	679.1	(509.7 – 848.5)	
	7-11.9 cm	211.2	(164.4 – 258.0)	
	All	2,621.5	(2,042.3 – 3,200.6)	
larch spp.	20 cm +	1,684.2	(998.1 – 2,370.2)	4.3
	12-19.9 cm	1,427.8	(1,088.5 – 1,767.2)	
	7-11.9 cm	328.8	(276.4 – 381.3)	
	All	3,440.8	(2,673.6 – 4,208.0)	
other conifers	20 cm +	1,509.5	(625.9 – 2,393.1)	2.1
	12-19.9 cm	145.3	(134.2 – 156.3)	
	7-11.9 cm	21.5	- -	
	All	1,676.2	(792.5 – 2,560.0)	
Total	20 cm +	46,043.1	(42,467.4 – 49,618.8)	100.0
	12-19.9 cm	27,869.8	(26,397.8 – 29,341.7)	
	7-11.9 cm	5,876.5	(5,560.7 – 6,192.3)	
	All	79,789.3	(75,909.6 – 83,669.1)	

7.2.7 Total growing stock by broadleaf species groups and Dbh class

Methodology
The total growing stock for broadleaf species is classified by species group and Dbh class.

Species group	DBH class	Growing stock		
		thousands m ³	($\alpha = 0.05$)	%
ses. & ped. oak	20 cm +	3,285.8	(2,450.9 – 4,120.7)	19.8
	12-19.9 cm	173.2	(31.6 – 314.7)	
	7-11.9 cm	50.8	(0.0 – 132.5)	
	All	3,509.8	(2,659.0 – 4,360.5)	
beech	20 cm +	2,582.0	(1,720.4 – 3,443.6)	15.7
	12-19.9 cm	157.5	(102.2 – 212.9)	
	7-11.9 cm	35.6	(18.1 – 53.2)	
	All	2,775.1	(1,911.6 – 3,638.7)	
ash	20 cm +	1,422.3	(1,082.1 – 1,762.5)	13.5
	12-19.9 cm	714.6	(545.2 – 884.0)	
	7-11.9 cm	256.1	(199.6 – 312.7)	
	All	2,393.0	(2,008.8 – 2,777.2)	
sycamore	20 cm +	732.3	(240.2 – 1,224.4)	5.8
	12-19.9 cm	130.8	(0.0 – 385.4)	
	7-11.9 cm	156.7	(84.5 – 228.9)	
	All	1,019.8	(461.0 – 1,578.5)	
birch spp.	20 cm +	1,393.9	(1,067.3 – 1,720.5)	17.4
	12-19.9 cm	1,061.6	(878.2 – 1,245.0)	
	7-11.9 cm	617.8	(508.9 – 726.6)	
	All	3,073.2	(2,683.2 – 3,463.3)	
alder	20 cm +	613.2	(402.2 – 824.1)	7.5
	12-19.9 cm	459.3	(348.5 – 570.1)	
	7-11.9 cm	259.6	(176.9 – 342.4)	
	All	1,332.1	(1,079.9 – 1,584.4)	
OLL broadleaves	20 cm +	991.2	(0.0 – 4,789.3)	7.8
	12-19.9 cm	230.2	(59.5 – 400.9)	
	7-11.9 cm	157.9	(113.4 – 202.4)	
	All	1,379.3	(0.0 – 5,181.5)	
OSL broadleaves	20 cm +	840.2	(540.2 – 1,140.2)	12.5
	12-19.9 cm	665.1	(546.4 – 783.8)	
	7-11.9 cm	699.2	(551.7 – 846.7)	
	All	2,204.5	(1,849.8 – 2,559.3)	
Total	20 cm +	11,860.9	(10,204.9 – 13,516.9)	100.0
	12-19.9 cm	3,592.2	(3,225.2 – 3,959.3)	
	7-11.9 cm	2,233.8	(1,999.7 – 2,467.8)	
	All	17,686.9	(15,974.7 – 19,399.1)	

7.2.8 Total growing stock by species group and age class (10yr)

Methodology						
The total growing stock is classified by species group and age class (10 yr).						

Age class (yrs)	Species group / Growing stock					
	Sitka spruce			Norway spruce		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	697.4	(545.1 - 849.6)	1.2	6.4	-	0.2
11-20	18,922.0	(17,296.9 - 20,547.1)	32.9	1,462.2	(1,156.6 - 1,767.8)	36.6
21-30	16,708.6	(15,047.6 - 18,369.5)	29.0	385.7	(0.0 - 1,063.9)	9.7
31-40	14,561.6	(12,730.1 - 16,393.1)	25.3	560.5	(284.7 - 836.2)	14.1
41-50	5,747.4	(4,791.2 - 6,703.6)	10.0	990.9	(708.1 - 1,273.8)	24.9
51+	918.2	(0.0 - 2,577.6)	1.6	576.0	(499.3 - 652.7)	14.5
Total	57,555.2	(53,902.5 - 61,207.9)	100.0	3,981.6	(3,194.7 - 4,768.6)	100.0

Age class (yrs)	Species group / Growing stock					
	Scots pine			other pines		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	10.8	-	1.0	25.9	(4.5 - 47.2)	0.3
11-20	59.7	(0.0 - 189.9)	5.7	1,086.8	(782.4 - 1,391.2)	11.5
21-30	6.9	-	0.7	2,853.3	(2,157.4 - 3,549.2)	30.2
31-40	21.1	-	2.0	3,746.5	(3,084.1 - 4,409.0)	39.5
41-50	94.3	(0.0 - 237.3)	8.9	1,048.4	(506.4 - 1,590.3)	11.1
51+	863.5	(621.8 - 1,105.2)	81.7	696.8	(0.0 - 6,298.5)	7.4
Total	1,056.4	(777.3 - 1,335.4)	100.0	9,457.6	(7,968.1 - 10,947.1)	100.0

Age class (yrs)	Species group / Growing stock					
	Douglas-fir			larch spp.		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	-	-	-	185.1	(147.3 - 222.8)	5.4
11-20	520.5	(382.6 - 658.5)	19.9	1,559.2	(1,088.1 - 2,030.2)	45.3
21-30	310.2	(0.0 - 685.5)	11.8	468.5	(214.0 - 723.0)	13.6
31-40	488.7	-	18.6	491.2	(0.0 - 2,165.4)	14.3
41-50	847.3	(571.4 - 1,123.1)	32.4	225.2	-	6.5
51+	454.8	(212.2 - 697.4)	17.3	511.6	(0.0 - 3,327.4)	14.9
Total	2,621.5	(2,051.8 - 3,191.2)	100.0	3,440.8	(2,621.4 - 4,260.2)	100.0

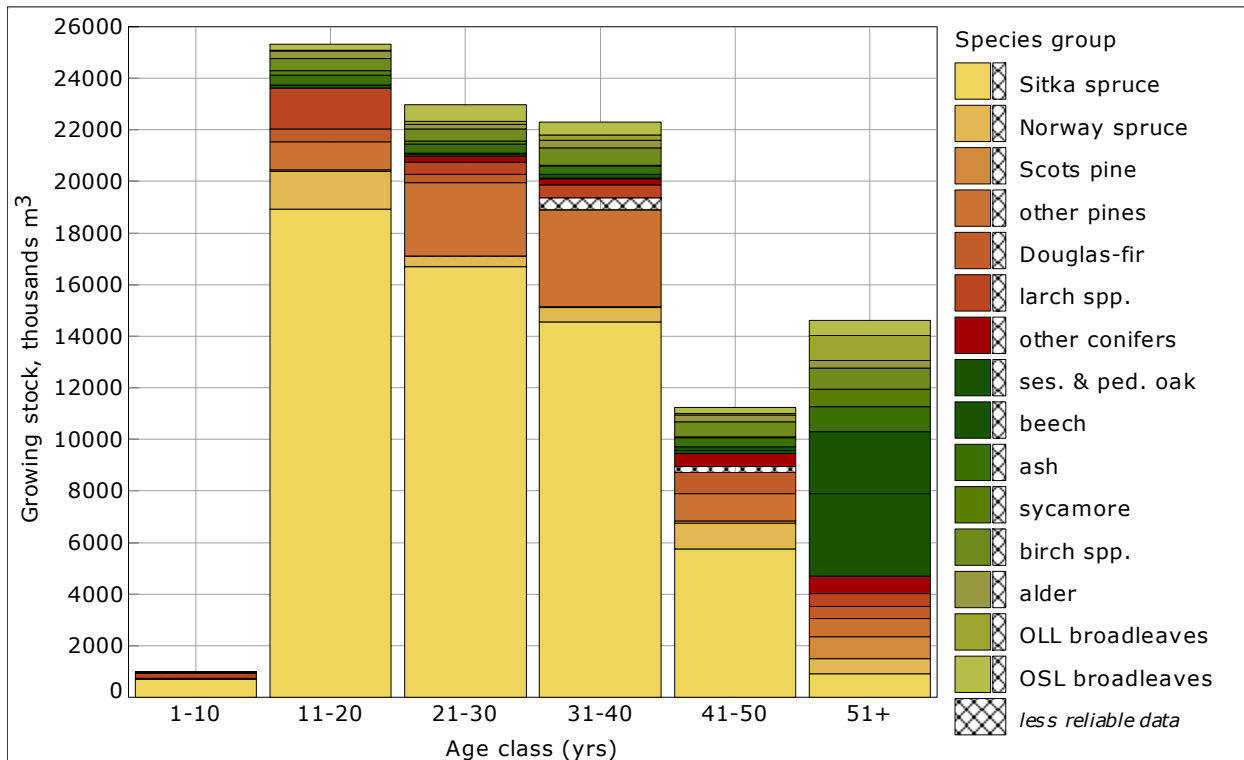
Age class (yrs)	Species group / Growing stock					
	other conifers			ses. & ped. oak		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	-	-	-	2.0	-	0.06
11-20	27.1	(0.0 - 104.2)	1.6	94.7	(0.0 - 260.9)	2.7
21-30	249.4	(0.0 - 520.7)	14.9	79.0	(0.0 - 830.0)	2.3
31-40	233.7	(0.0 - 1,721.5)	13.9	21.4	(0.0 - 75.8)	0.6
41-50	484.3	(0.0 - 3,426.6)	28.9	116.2	(74.1 - 158.3)	3.3
51+	681.7	(0.0 - 2,577.6)	40.7	3,196.6	(2,371.6 - 4,021.6)	91.0
Total	1,676.2	(711.3 - 2,641.2)	100.0	3,509.8	(2,647.6 - 4,372.0)	100.0

Age class (yrs)	Species group / Growing stock					
	beech			ash		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	2.2	-	0.08	10.8	(0.0 - 25.5)	0.5
11-20	12.7	(2.8 - 22.6)	0.5	372.7	(93.6 - 651.7)	15.6
21-30	40.7	(0.0 - 87.9)	1.5	352.8	(232.2 - 473.4)	14.7
31-40	157.1	(0.0 - 574.0)	5.7	330.5	(208.6 - 452.4)	13.8
41-50	152.8	(65.3 - 240.2)	5.5	367.9	(0.0 - 772.7)	15.4
51+	2,409.6	(1,564.3 - 3,254.9)	86.7	958.4	(645.4 - 1,271.4)	40.0
Total	2,775.1	(1,891.4 - 3,658.8)	100.0	2,393.0	(1,958.5 - 2,827.6)	100.0

Age class (yrs)	Species group / Growing stock					
	sycamore			birch spp.		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	2.3	-	-	36.3	-	-
11-20	191.9	(108.8 - 275.1)	18.8	466.1	(365.2 - 567.0)	15.2
21-30	99.9	(0.0 - 522.1)	9.8	493.0	(357.7 - 628.2)	16.0
31-40	23.6	(0.0 - 94.9)	2.3	672.3	(491.4 - 853.3)	21.9
41-50	34.2	(0.0 - 79.4)	3.4	587.1	(329.0 - 845.3)	19.1
51+	667.8	(166.9 - 1,168.8)	65.5	818.4	(536.0 - 1,100.8)	26.6
Total	1,019.8	(578.5 - 1,461.1)	100.0	3,073.2	(2,609.5 - 3,537.0)	100.0

Age class (yrs)	Species group / Growing stock					
	alder			OLL broadleaves		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	21.3	-	-	-	-	-
11-20	278.7	(110.0 - 447.4)	20.9	42.0	(36.1 - 47.8)	3.0
21-30	164.1	(0.0 - 504.9)	12.3	120.4	(8.4 - 232.3)	8.7
31-40	304.0	(118.0 - 490.0)	22.8	198.9	(128.9 - 268.9)	14.4
41-50	256.4	(82.2 - 430.7)	19.2	61.1	(8.8 - 113.4)	4.4
51+	307.5	(137.2 - 477.9)	23.2	956.9	(747.3 - 1,166.5)	69.5
Total	1,332.1	(974.0 - 1,690.2)	100.0	1,379.3	(0.0 - 2,910.3)	100.0

Age class (yrs)	Species group / Growing stock					
	OSL broadleaves			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	9.6	-	-	1,010.0	(806.9 - 1,213.1)	1.0
11-20	237.7	(167.5 - 307.9)	10.8	25,334.0	(23,494.7 - 27,173.3)	26.0
21-30	634.5	(441.5 - 827.5)	28.8	22,966.8	(20,742.4 - 25,191.3)	23.6
31-40	502.1	(348.4 - 655.8)	22.8	22,313.3	(19,731.2 - 24,895.3)	22.9
41-50	211.8	(131.2 - 292.3)	9.6	11,225.3	(9,197.8 - 13,252.9)	11.5
51+	608.9	(460.1 - 757.7)	27.6	14,626.8	(12,406.5 - 16,847.1)	15.0
Total	2,204.5	(1,815.9 - 2,593.2)	100.0	97,476.3	(92,906.4 - 102,046.1)	100.0



7.2.9 Total growing stock by species group and diameter class (5cm)

Methodology						
The total growing stock is classified by species group and Dbh class (5cm).						

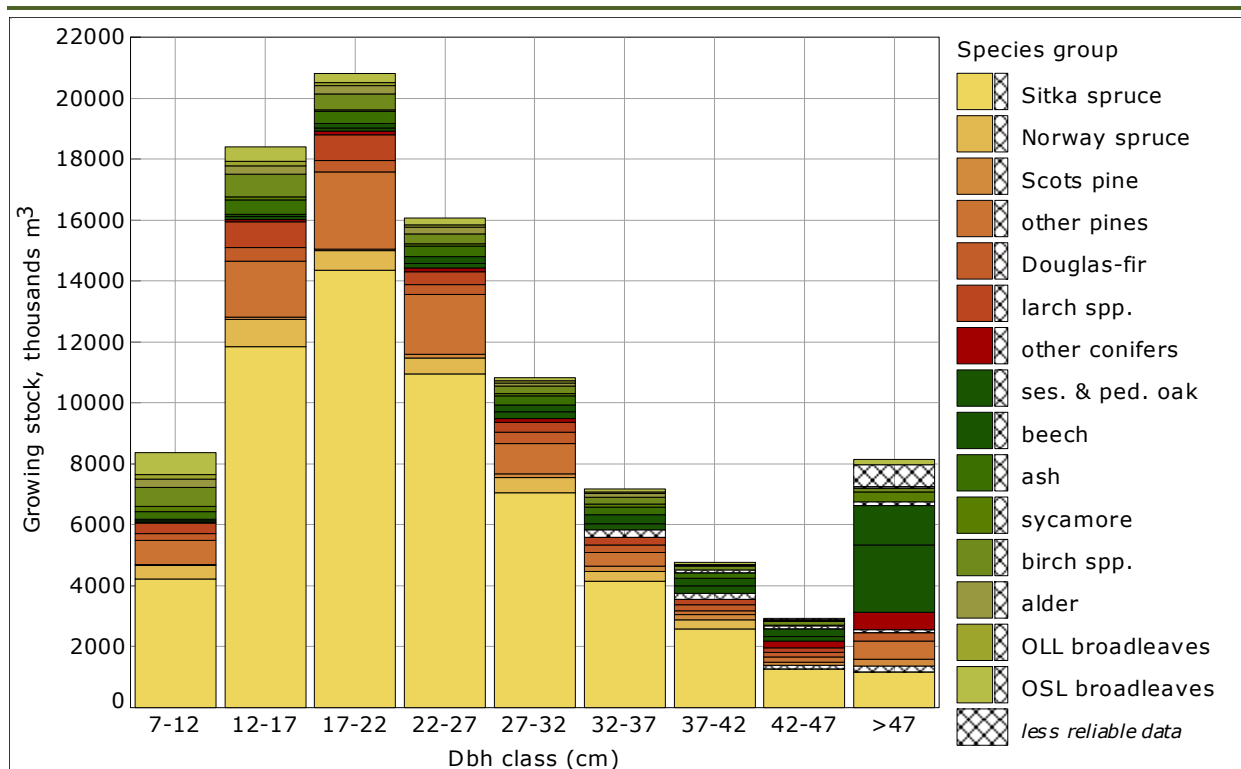
Dbh class (cm)	Species group / Growing stock					
	Sitka spruce			Norway spruce		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	4,232.7	(3,962.0 – 4,503.3)	7.4	426.5	(309.1 – 543.9)	10.7
12-17	11,840.1	(11,082.7 – 12,597.6)	20.6	896.9	(715.1 – 1,078.7)	22.5
17-22	14,358.1	(13,342.7 – 15,373.6)	24.9	637.0	(455.3 – 818.7)	16.0
22-27	10,946.6	(10,016.9 – 11,876.3)	19.0	530.7	(381.8 – 679.6)	13.3
27-32	7,041.6	(6,341.2 – 7,742.0)	12.2	511.4	(364.2 – 658.6)	12.8
32-37	4,134.3	(3,649.8 – 4,618.8)	7.2	342.3	(196.1 – 488.4)	8.6
37-42	2,574.1	(2,110.7 – 3,037.6)	4.5	312.8	(75.7 – 550.0)	7.9
42-47	1,265.1	(910.9 – 1,619.2)	2.2	118.5	–	3.0
>47	1,162.5	(691.9 – 1,633.2)	2.0	205.7	–	5.2
Total	57,555.2	(53,902.5 – 61,207.9)	100.0	3,981.6	(3,194.7 – 4,768.6)	100.0

Dbh class (cm)	Species group / Growing stock					
	Scots pine			other pines		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	28.8	–	2.7	807.7	(704.1 – 911.3)	8.5
12-17	66.2	(0.0 – 150.7)	6.3	1,849.8	(1,525.6 – 2,174.1)	19.6
17-22	43.5	(29.6 – 57.5)	4.1	2,545.4	(2,155.4 – 2,935.3)	27.0
22-27	127.9	(84.2 – 171.7)	12.1	1,951.6	(1,639.0 – 2,264.2)	20.6
27-32	120.6	(98.7 – 142.5)	11.4	980.4	(790.8 – 1,170.0)	10.4
32-37	172.0	(97.8 – 246.1)	16.3	438.7	(295.4 – 582.1)	4.6
37-42	167.9	(0.0 – 356.3)	15.9	116.9	(94.6 – 139.1)	1.2
42-47	107.7	(0.0 – 281.6)	10.2	167.2	(24.9 – 309.6)	1.8
>47	221.6	(151.1 – 292.1)	21.0	599.9	(0.0 – 1,723.2)	6.3
Total	1,056.4	(777.3 – 1,335.4)	100.0	9,457.6	(7,968.1 – 10,947.1)	100.0

Dbh class (cm)	Species group / Growing stock					
	Douglas-fir			larch spp.		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	220.3	(175.2 – 265.5)	8.4	345.8	(278.5 – 413.2)	10.1
12-17	445.7	(310.9 – 580.6)	17.1	854.4	(688.7 – 1,020.2)	24.9
17-22	379.0	(277.3 – 480.6)	14.5	833.9	(543.5 – 1,124.4)	24.2
22-27	315.0	(245.3 – 384.7)	12.0	433.8	(270.5 – 597.1)	12.6
27-32	388.0	(293.3 – 482.7)	14.8	307.6	(174.4 – 440.7)	8.9
32-37	244.9	(0.0 – 730.6)	9.3	252.4	(237.5 – 267.3)	7.3
37-42	200.2	(122.9 – 277.5)	7.6	170.2	(0.0 – 407.6)	4.9
42-47	157.6	(40.3 – 274.8)	6.0	137.4	(79.0 – 195.7)	4.0
>47	270.8	(90.3 – 451.2)	10.3	105.3	–	3.1
Total	2,621.5	(2,051.8 – 3,191.2)	100.0	3,440.8	(2,621.4 – 4,260.2)	100.0

Dbh class (cm)	Species group / Growing stock					
	other conifers			ses. & ped. oak		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	22.5	(0.0 – 71.6)	1.3	54.3	(0.0 – 136.0)	1.5
12-17	56.9	(44.8 – 69.0)	3.4	113.0	(0.9 – 225.1)	3.2
17-22	129.8	(10.4 – 249.2)	7.7	103.6	(70.0 – 137.1)	3.0
22-27	111.7	(0.0 – 271.9)	6.7	169.8	(106.6 – 233.0)	4.8
27-32	125.5	(0.0 – 585.5)	7.5	243.9	(186.9 – 300.9)	6.9
32-37	239.8	–	14.3	199.7	(138.4 – 261.1)	5.7
37-42	217.3	–	13.0	241.8	(65.7 – 417.9)	6.9
42-47	220.7	(0.0 – 879.0)	13.2	167.8	(0.0 – 378.7)	4.8
>47	552.0	(0.0 – 1,554.7)	32.9	2,215.9	(1,489.6 – 2,942.1)	63.2
Total	1,676.2	(711.3 – 2,641.2)	100.0	3,509.8	(2,647.6 – 4,372.0)	100.0

Dbh class (cm)	Species group / Growing stock					
	beech			ash		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	35.6	(18.1 - 53.2)	1.3	269.2	(192.2 - 346.1)	11.2
12-17	76.7	(39.9 - 113.4)	2.8	459.1	(307.1 - 611.1)	19.2
17-22	151.3	(124.0 - 178.6)	5.5	391.8	(310.4 - 473.2)	16.4
22-27	202.5	(147.7 - 257.2)	7.3	361.2	(281.5 - 441.0)	15.1
27-32	202.4	(0.0 - 567.8)	7.3	299.1	(201.3 - 396.9)	12.5
32-37	315.8	(99.8 - 531.7)	11.4	237.9	(76.5 - 399.4)	9.9
37-42	249.5	(0.0 - 510.0)	9.0	157.1	(134.2 - 180.0)	6.6
42-47	244.4	(155.0 - 333.8)	8.8	85.5	-	3.6
>47	1,297.0	(256.7 - 2,337.4)	46.6	132.1	-	5.5
Total	2,775.1	(1,891.4 - 3,658.8)	100.0	2,393.0	(1,958.5 - 2,827.6)	100.0
Dbh class (cm)	Species group / Growing stock					
	sycamore			birch spp.		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	156.7	(84.5 - 228.9)	15.4	630.3	(516.5 - 744.2)	20.5
12-17	110.4	(0.0 - 275.1)	10.8	728.6	(615.9 - 841.3)	23.7
17-22	32.5	(27.2 - 37.7)	3.2	533.6	(410.0 - 657.2)	17.4
22-27	79.5	(0.0 - 297.3)	7.8	323.6	(248.8 - 398.5)	10.5
27-32	74.4	(34.7 - 114.0)	7.3	267.4	(208.7 - 326.1)	8.7
32-37	112.4	(0.0 - 486.2)	11.0	223.4	(160.7 - 286.2)	7.3
37-42	109.9	-	10.8	117.9	(110.2 - 125.6)	3.8
42-47	42.1	-	4.1	112.5	(71.3 - 153.7)	3.7
>47	301.9	(247.6 - 356.2)	29.6	135.8	(123.9 - 147.8)	4.4
Total	1,019.8	(578.5 - 1,461.1)	100.0	3,073.2	(2,609.5 - 3,537.0)	100.0
Dbh class (cm)	Species group / Growing stock					
	alder			OLL broadleaves		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	263.4	(178.3 - 348.5)	19.8	159.0	(115.3 - 202.7)	11.5
12-17	269.4	(191.8 - 347.1)	20.2	164.4	(56.6 - 272.2)	11.9
17-22	270.2	(191.8 - 348.5)	20.1	111.6	(88.6 - 134.6)	8.1
22-27	222.0	(135.1 - 308.9)	16.7	76.5	(53.5 - 99.5)	5.5
27-32	99.7	(59.2 - 140.1)	7.5	53.2	(18.2 - 88.2)	3.9
32-37	103.3	(59.2 - 147.5)	7.8	54.9	(43.1 - 66.6)	4.0
37-42	31.8	(0.0 - 95.1)	2.4	18.8	(0.0 - 74.3)	1.4
42-47	26.3	-	2.0	21.3	-	1.5
>47	46.0	-	3.5	719.7	-	52.2
Total	1,332.1	(974.0 - 1,690.2)	100.0	1,379.3	(0.0 - 2,910.3)	100.0
Dbh class (cm)	Species group / Growing stock					
	OSL broadleaves			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	713.5	(560.7 - 866.2)	32.4	8,366.2	(7,957.8 - 8,774.6)	8.6
12-17	474.4	(384.4 - 564.3)	21.5	18,406.2	(17,467.1 - 19,345.2)	18.9
17-22	277.6	(230.3 - 325.0)	12.6	20,798.8	(19,594.1 - 22,003.6)	21.2
22-27	212.5	(153.0 - 272.0)	9.6	16,065.0	(14,986.4 - 17,143.6)	16.5
27-32	112.9	(89.8 - 136.0)	5.1	10,828.0	(9,958.2 - 11,697.7)	11.1
32-37	101.3	(68.3 - 134.3)	4.6	7,173.2	(6,549.2 - 7,797.2)	7.4
37-42	74.8	(69.9 - 79.7)	3.4	4,760.9	(4,192.7 - 5,329.1)	4.9
42-47	62.1	-	2.8	2,936.3	(2,536.8 - 3,335.7)	3.0
>47	175.5	(148.1 - 202.9)	8.0	8,141.7	(6,624.0 - 9,659.4)	8.4
Total	2,204.5	(1,815.9 - 2,593.2)	100.0	97,476.3	(92,906.4 - 102,046.1)	100.0



7.3 TIMBER QUALITY

7.3.1 Total growing stock by species group and stem straightness

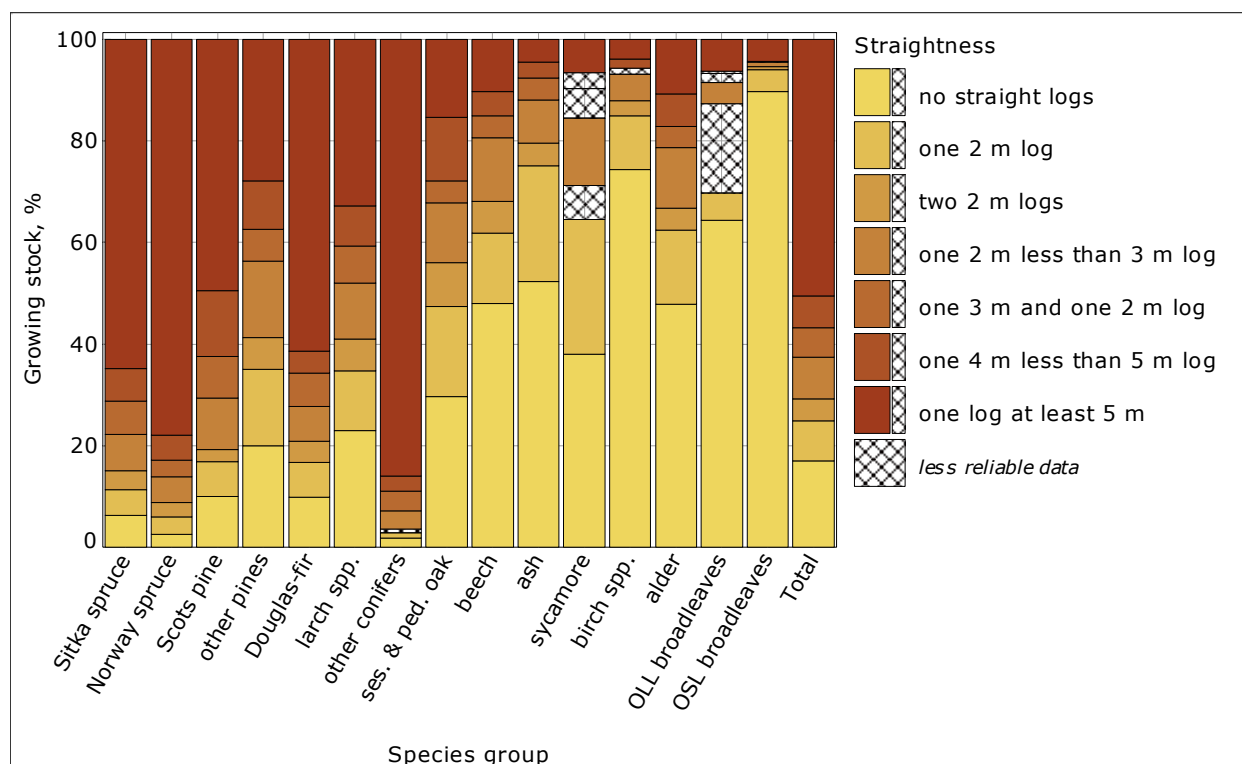
Definition
Potential log length Describes the straightness of the first 6 m of a tree's stem in terms of straight log lengths. Greater than or equal to 5 m: A log with a minimum length of 5 m. One 4-5 m log: A log with a minimum length of 4 m and maximum length of 5 m. One 3 m and one 2 m log: One log 3 m in length and one log 2 m in length. One 2-3 m log: A log with a minimum length of 2 m and maximum length of 3 m. Two 2 m logs: Two logs with a minimum length of 2 m. One 2 m log: A log with a minimum length of 2 m. No straight logs: There are no straight logs present.
Methodology
The total growing stock is classified by species group and potential log length.

Straightness	Species group / Growing stock					
	Sitka spruce			Norway spruce		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no straight logs	3,606	(3,279 - 3,933)	6.3	98	(75 - 121)	2.5
one 2 m log	2,902	(2,651 - 3,153)	5.0	141	(98 - 183)	3.5
two 2 m logs	2,157	(1,917 - 2,397)	3.7	108	(52 - 165)	2.7
one 2 m less than 3 m log	4,156	(3,825 - 4,486)	7.2	202	(166 - 238)	5.1
one 3 m and one 2 m log	3,773	(3,415 - 4,131)	6.6	130	(69 - 192)	3.3
one 4 m less than 5 m log	3,623	(3,276 - 3,969)	6.3	199	(148 - 250)	5.0
one log at least 5 m	37,339	(34,653 - 40,026)	64.9	3,103	(2,369 - 3,837)	77.9
Total	57,555	(53,903 - 61,208)	100.0	3,982	(3,195 - 4,769)	100.0
Straightness	Species group / Growing stock					
	Scots pine			other pines		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no straight logs	106	(29 - 182)	10.0	1,892	(1,611 - 2,172)	20.0
one 2 m log	72	(0 - 149)	6.9	1,417	(1,204 - 1,629)	15.0
two 2 m logs	25	(1 - 48)	2.3	597	(474 - 720)	6.3
one 2 m less than 3 m log	107	(77 - 138)	10.2	1,418	(1,206 - 1,630)	15.0
one 3 m and one 2 m log	87	(63 - 111)	8.2	598	(460 - 735)	6.3
one 4 m less than 5 m log	136	(20 - 252)	12.9	900	(752 - 1,049)	9.5
one log at least 5 m	523	(305 - 741)	49.5	2,636	(1,719 - 3,552)	27.9
Total	1,056	(777 - 1,335)	100.0	9,458	(7,968 - 10,947)	100.0
Straightness	Species group / Growing stock					
	Douglas-fir			larch spp.		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no straight logs	258	(153 - 364)	9.9	788	(634 - 942)	22.9
one 2 m log	179	(106 - 251)	6.8	407	(312 - 501)	11.8
two 2 m logs	108	(75 - 142)	4.1	213	(132 - 293)	6.2
one 2 m less than 3 m log	182	(140 - 224)	6.9	381	(264 - 499)	11.1
one 3 m and one 2 m log	171	(125 - 217)	6.5	251	(114 - 389)	7.3
one 4 m less than 5 m log	115	(72 - 158)	4.4	272	(220 - 324)	7.9
one log at least 5 m	1,609	(1,113 - 2,105)	61.4	1,128	(628 - 1,628)	32.8
Total	2,621	(2,052 - 3,191)	100.0	3,441	(2,621 - 4,260)	100.0
Straightness	Species group / Growing stock					
	other conifers			ses. & ped. oak		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no straight logs	29	(0 - 60)	1.7	1,039	(733 - 1,345)	29.6
one 2 m log	19	(2 - 36)	1.1	621	(304 - 939)	17.7
two 2 m logs	11	-	0.6	305	(71 - 539)	8.7
one 2 m less than 3 m log	61	(47 - 75)	3.6	415	(96 - 735)	11.8
one 3 m and one 2 m log	65	(0 - 242)	3.9	148	(0 - 321)	4.2
one 4 m less than 5 m log	50	(19 - 80)	3.0	442	(276 - 607)	12.6
one log at least 5 m	1,442	(242 - 2,641)	86.1	539	(197 - 882)	15.4
Total	1,676	(711 - 2,641)	100.0	3,510	(2,648 - 4,372)	100.0
Straightness	Species group / Growing stock					
	beech			ash		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no straight logs	1,330	(975 - 1,685)	47.9	1,250	(1,046 - 1,455)	52.2
one 2 m log	387	(165 - 610)	14.0	545	(390 - 701)	22.8
two 2 m logs	173	(65 - 281)	6.2	109	(62 - 157)	4.6
one 2 m less than 3 m log	348	(81 - 614)	12.5	201	(134 - 268)	8.4
one 3 m and one 2 m log	121	(100 - 142)	4.4	105	(37 - 173)	4.4
one 4 m less than 5 m log	130	(0 - 328)	4.7	74	(0 - 151)	3.1
one log at least 5 m	286	(0 - 641)	10.3	108	(59 - 157)	4.5
Total	2,775	(1,891 - 3,659)	100.0	2,393	(1,958 - 2,828)	100.0

Straightness	Species group / Growing stock					
	sycamore			birch spp.		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no straight logs	388	(201 - 574)	38.0	2,284	(1,955 - 2,612)	74.3
one 2 m log	271	(203 - 339)	26.6	329	(239 - 419)	10.7
two 2 m logs	67	-	6.6	91	(0 - 543)	3.0
one 2 m less than 3 m log	136	(0 - 378)	13.3	156	(84 - 228)	5.1
one 3 m and one 2 m log	59	-	5.8	37	-	1.2
one 4 m less than 5 m log	31	-	3.1	55	(5 - 105)	1.8
one log at least 5 m	67	(21 - 114)	6.6	121	(98 - 144)	3.9
Total	1,020	(578 - 1,461)	100.0	3,073	(2,609 - 3,537)	100.0

Straightness	Species group / Growing stock					
	alder			OLL broadleaves		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no straight logs	636	(408 - 865)	47.8	888	(0 - 2,846)	64.5
one 2 m log	195	(132 - 259)	14.7	75	(73 - 78)	5.4
two 2 m logs	59	(6 - 111)	4.4	241	-	17.4
one 2 m less than 3 m log	158	(65 - 250)	11.8	59	(32 - 87)	4.3
one 3 m and one 2 m log	56	(0 - 144)	4.2	24	-	1.7
one 4 m less than 5 m log	85	(58 - 112)	6.4	7	-	0.5
one log at least 5 m	143	(56 - 230)	10.7	86	(0 - 929)	6.2
Total	1,332	(974 - 1,690)	100.0	1,379	(0 - 2,910)	100.0

Straightness	Species group / Growing stock					
	OSL broadleaves			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no straight logs	1,977	(1,640 - 2,314)	89.6	16,569	(15,275 - 17,862)	17.0
one 2 m log	96	(0 - 214)	4.4	7,656	(7,121 - 8,192)	7.9
two 2 m logs	12	(0 - 28)	0.6	4,276	(3,777 - 4,776)	4.4
one 2 m less than 3 m log	19	(0 - 45)	0.9	8,000	(7,453 - 8,546)	8.2
one 3 m and one 2 m log	-	-	-	5,625	(5,178 - 6,073)	5.8
one 4 m less than 5 m log	5	-	0.2	6,125	(5,639 - 6,610)	6.3
one log at least 5 m	95	(80 - 110)	4.3	49,225	(45,983 - 52,467)	50.4
Total	2,205	(1,816 - 2,593)	100.0	97,476	(92,906 - 102,046)	100.0



7.3.2 Total growing stock by species group and branchiness

Definition
Branchiness Describes the relative size and number of branches present on a tree, where the trees have not been high pruned (>3m). Light: Small diameter branches or medium sized branches which occur infrequently. This may occur on trees that are growing at high densities or in stands where an understorey is present. Medium: Branches are present in a quantity and size that is deemed not to be either light or heavy. Heavy: Large diameter branches which occur frequently. Common where a tree has had an unrestricted growing space e.g. an edge tree.

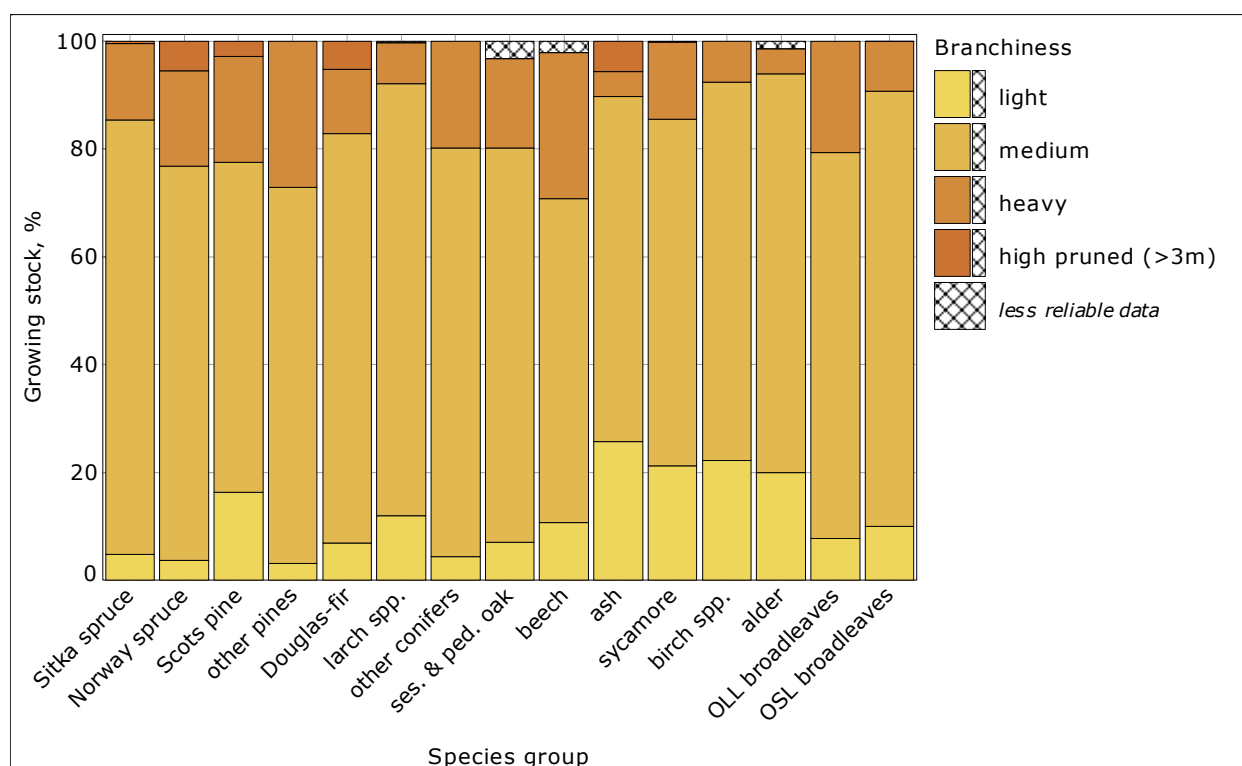
Methodology
The total growing stock is classified by species group and branchiness.

Branchiness	Species group / Growing stock					
	Sitka spruce			Norway spruce		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
light	2,773	(1,429 - 4,116)	4.8	147	(92 - 203)	3.7
medium	46,392	(43,366 - 49,418)	80.6	2,912	(2,253 - 3,571)	73.1
heavy	8,103	(7,102 - 9,104)	14.1	702	(478 - 925)	17.6
high pruned (>3m)	288	(38 - 538)	0.5	221	(0 - 1,045)	5.6
Total	57,555	(53,903 - 61,208)	100.0	3,982	(3,195 - 4,769)	100.0
Branchiness	Species group / Growing stock					
	Scots pine			other pines		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
light	172	(142 - 202)	16.3	294	(91 - 498)	3.1
medium	648	(371 - 924)	61.3	6,594	(5,343 - 7,845)	69.7
heavy	206	(86 - 327)	19.5	2,569	(2,001 - 3,137)	27.2
high pruned (>3m)	30	(0 - 368)	2.9	-	-	-
Total	1,056	(777 - 1,335)	100.0	9,458	(7,968 - 10,947)	100.0
Branchiness	Species group / Growing stock					
	Douglas-fir			larch spp.		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
light	179	(57 - 302)	6.8	410	(331 - 489)	11.9
medium	1,993	(1,565 - 2,421)	76.1	2,760	(2,172 - 3,348)	80.3
heavy	313	(132 - 494)	11.9	259	(83 - 434)	7.5
high pruned (>3m)	137	(0 - 334)	5.2	12	-	0.3
Total	2,621	(2,052 - 3,191)	100.0	3,441	(2,621 - 4,260)	100.0
Branchiness	Species group / Growing stock					
	other conifers			ses. & ped. oak		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
light	72	(0 - 177)	4.3	249	(33 - 464)	7.1
medium	1,271	(446 - 2,096)	75.8	2,565	(1,745 - 3,386)	73.1
heavy	333	(0 - 1,899)	19.9	580	(370 - 789)	16.5
high pruned (>3m)	-	-	-	116	-	3.3
Total	1,676	(711 - 2,641)	100.0	3,510	(2,648 - 4,372)	100.0
Branchiness	Species group / Growing stock					
	beech			ash		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
light	297	(0 - 1,291)	10.7	614	(378 - 851)	25.7
medium	1,666	(791 - 2,542)	60.0	1,532	(1,217 - 1,847)	64.0
heavy	751	(297 - 1,204)	27.1	113	(0 - 515)	4.7
high pruned (>3m)	60	-	2.2	133	(0 - 328)	5.6
Total	2,775	(1,891 - 3,659)	100.0	2,393	(1,958 - 2,828)	100.0

Branchiness	Species group / Growing stock					
	sycamore			birch spp.		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
light	217	(77 - 357)	21.3	683	(48 - 1,318)	22.2
medium	656	(284 - 1,027)	64.3	2,156	(1,847 - 2,464)	70.2
heavy	145	(102 - 188)	14.2	234	(126 - 342)	7.6
high pruned (>3m)	2	- -	0.2	-	- -	-
Total	1,020	(578 - 1,461)	100.0	3,073	(2,609 - 3,537)	100.0

Branchiness	Species group / Growing stock					
	alder			OLL broadleaves		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
light	266	(41 - 490)	19.9	107	(0 - 721)	7.8
medium	987	(697 - 1,276)	74.2	988	(228 - 1,748)	71.6
heavy	61	(44 - 77)	4.5	284	(234 - 334)	20.6
high pruned (>3m)	19	- -	1.4	-	- -	-
Total	1,332	(974 - 1,690)	100.0	1,379	(0 - 2,910)	100.0

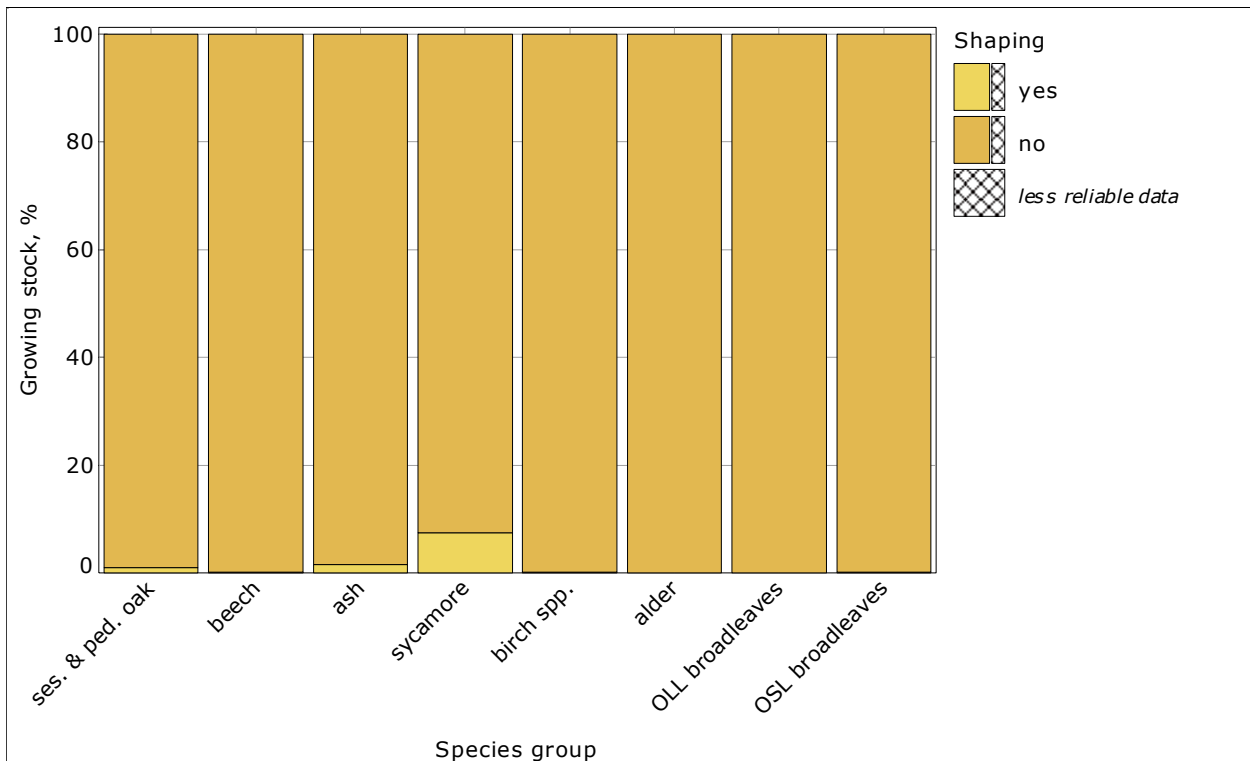
Branchiness	Species group / Growing stock					
	OSL broadleaves			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
light	220	(102 - 339)	10.0	6,701	(5,167 - 8,236)	6.9
medium	1,780	(1,416 - 2,144)	80.7	74,900	(71,045 - 78,755)	76.9
heavy	202	(138 - 267)	9.2	14,855	(13,483 - 16,226)	15.2
high pruned (>3m)	2	- -	0.07	1,021	(664 - 1,378)	1.0
Total	2,205	(1,816 - 2,593)	100.0	97,476	(92,906 - 102,046)	100.0



7.3.3 Total growing stock by species group and shaping

Definition
Shaping Shaping is the removal of competing tree leaders and side branches in order to improve the stem quality of a broadleaf tree.
Methodology The total growing stock is classified by species group and shaping.

Shaping	Species group / Growing stock					
	ses. & ped. oak			beech		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
yes	33.4	(0.0 - 100.7)	1.0	3.1	-	0.1
no	3,476.4	(2,619.8 - 4,333.0)	99.0	2,772.0	(1,890.1 - 3,653.9)	99.9
Total	3,509.8	(2,647.6 - 4,372.0)	100.0	2,775.1	(1,891.4 - 3,658.8)	100.0
Shaping	Species group / Growing stock					
	ash			sycamore		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
yes	35.5	(1.0 - 70.0)	1.5	75.9	(0.0 - 251.6)	7.4
no	2,357.5	(1,928.4 - 2,786.7)	98.5	943.8	(515.8 - 1,371.8)	92.6
Total	2,393.0	(1,958.5 - 2,827.6)	100.0	1,019.8	(578.5 - 1,461.1)	100.0
Shaping	Species group / Growing stock					
	birch spp.			alder		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
yes	3.8	-	0.1	-	-	-
no	3,069.4	(2,605.5 - 3,533.3)	99.9	1,332.1	(974.0 - 1,690.2)	100.0
Total	3,073.2	(2,609.5 - 3,537.0)	100.0	1,332.1	(974.0 - 1,690.2)	100.0
Shaping	Species group / Growing stock					
	OLL broadleaves			OSL broadleaves		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
yes	-	-	-	4.6	-	0.2
no	1,379.3	(0.0 - 2,910.3)	100.0	2,200.0	(1,811.0 - 2,588.9)	99.8
Total	1,379.3	(0.0 - 2,910.3)	100.0	2,204.5	(1,815.9 - 2,593.2)	100.0
Shaping	Species group / Growing stock					
	Total					
	thousands m ³	($\alpha = 0.05$)	%			
yes	156.4	(0.0 - 327.1)	0.9			
no	17,530.6	(15,660.3 - 19,400.9)	99.1			
Total	17,686.9	(15,802.7 - 19,571.2)	100.0			



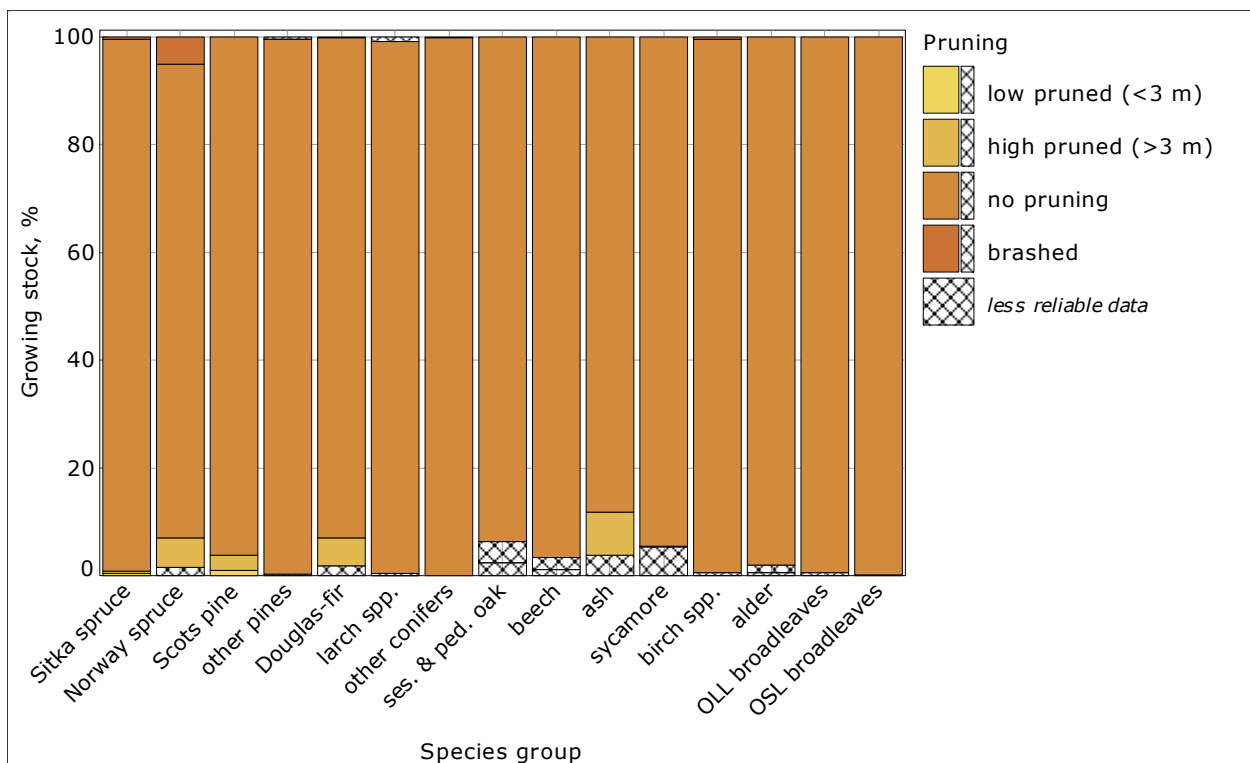
7.3.4 Total growing stock by species group and pruning

Definition
Pruning Pruning is the manual removal of branches from the stem of a tree. Low pruned (up to 3 m): Branches have been manually removed up to a height of 3 m. High pruned (more than 3 m): Branches have been manually removed up to a height greater than 3 metres No pruning: No pruning has been carried out. Indeterminable: Difficult to determine if pruning has been carried out. Brashed: Tree has been brashed to provide access. Normally occurs on one side of the trees in straight lines through the forest.

Methodology
The total growing stock is classified by species group and pruning.

Pruning	Species group / Growing stock					
	Sitka spruce			Norway spruce		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
low pruned (<3 m)	226.2	(0.0 - 1,304.6)	0.4	62.0	-	1.6
high pruned (>3 m)	288.0	(37.8 - 538.1)	0.5	220.3	(0.0 - 1,044.2)	5.5
no pruning	56,823.4	(53,196.3 - 60,450.5)	98.7	3,498.2	(2,810.7 - 4,185.8)	87.8
brashed	217.6	(142.9 - 292.2)	0.4	201.1	(0.0 - 493.2)	5.1
Total	57,555.2	(53,902.5 - 61,207.9)	100.0	3,981.6	(3,194.7 - 4,768.6)	100.0
Pruning	Species group / Growing stock					
	Scots pine			other pines		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
low pruned (<3 m)	10.0	(0.0 - 60.7)	0.9	24.6	-	0.3
high pruned (>3 m)	30.3	(0.0 - 367.6)	2.9	-	-	-
no pruning	1,016.1	(740.5 - 1,291.7)	96.2	9,395.7	(7,911.3 - 10,880.1)	99.3
brashed	-	-	-	37.3	-	0.4
Total	1,056.4	(777.3 - 1,335.4)	100.0	9,457.6	(7,968.1 - 10,947.1)	100.0
Pruning	Species group / Growing stock					
	Douglas-fir			larch spp.		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
low pruned (<3 m)	46.2	-	1.8	2.0	-	0.06
high pruned (>3 m)	136.8	(0.0 - 333.9)	5.2	11.7	-	0.3
no pruning	2,436.2	(1,941.4 - 2,931.0)	92.9	3,397.1	(2,578.0 - 4,216.2)	98.7
brashed	2.3	-	0.09	30.1	-	0.9
Total	2,621.5	(2,051.8 - 3,191.2)	100.0	3,440.8	(2,621.4 - 4,260.2)	100.0
Pruning	Species group / Growing stock					
	other conifers			ses. & ped. oak		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
low pruned (<3 m)	-	-	-	85.0	-	2.4
high pruned (>3 m)	-	-	-	135.0	-	3.8
no pruning	1,674.2	(709.4 - 2,639.0)	99.9	3,289.7	(2,448.0 - 4,131.4)	93.8
brashed	2.0	-	0.1	-	-	-
Total	1,676.2	(711.3 - 2,641.2)	100.0	3,509.8	(2,647.6 - 4,372.0)	100.0
Pruning	Species group / Growing stock					
	beech			ash		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
low pruned (<3 m)	32.2	-	1.2	91.1	-	3.8
high pruned (>3 m)	60.5	-	2.2	190.4	(0.0 - 582.2)	8.0
no pruning	2,682.4	(1,806.5 - 3,558.3)	96.6	2,111.4	(1,742.7 - 2,480.2)	88.2
brashed	-	-	-	-	-	-
Total	2,775.1	(1,891.4 - 3,658.8)	100.0	2,393.0	(1,958.5 - 2,827.6)	100.0

Pruning	Species group / Growing stock					
	sycamore			birch spp.		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
low pruned (<3 m)	54.1	-	-	16.5	-	0.5
high pruned (>3 m)	2.1	-	-	-	-	-
no pruning	963.5	(533.1 - 1,394.0)	94.5	3,044.1	(2,581.1 - 3,507.1)	99.1
brashed	-	-	-	12.6	(0.0 - 47.2)	0.4
Total	1,019.8	(578.5 - 1,461.1)	100.0	3,073.2	(2,609.5 - 3,537.0)	100.0
Pruning	Species group / Growing stock					
	alder			OLL broadleaves		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
low pruned (<3 m)	7.8	-	-	7.6	-	0.6
high pruned (>3 m)	19.2	-	-	-	-	-
no pruning	1,305.2	(945.5 - 1,664.8)	98.0	1,371.7	(0.0 - 2,898.2)	99.4
brashed	-	-	-	-	-	-
Total	1,332.1	(974.0 - 1,690.2)	100.0	1,379.3	(0.0 - 2,910.3)	100.0
Pruning	Species group / Growing stock					
	OSL broadleaves			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
low pruned (<3 m)	2.8	-	-	668.2	(296.2 - 1,040.2)	0.7
high pruned (>3 m)	1.6	-	-	1,095.9	(715.0 - 1,476.7)	1.1
no pruning	2,200.1	(1,811.3 - 2,588.9)	99.8	95,209.1	(90,703.8 - 99,714.5)	97.7
brashed	-	-	-	503.1	(258.3 - 747.9)	0.5
Total	2,204.5	(1,815.9 - 2,593.2)	100.0	97,476.3	(92,906.4 - 102,046.1)	100.0



7.4 MEAN GROWING STOCK

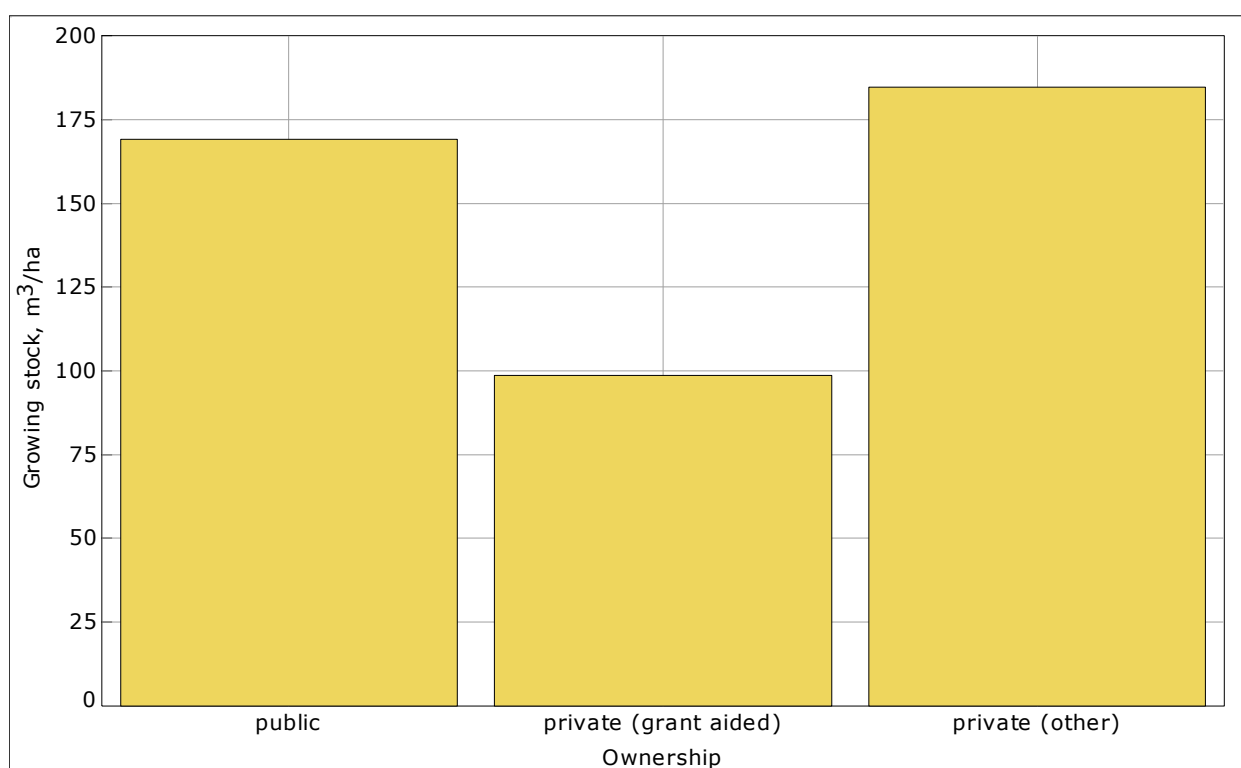
7.4.1 Mean growing stock per hectare by ownership

Methodology

The mean of plot sums per hectare – growing stock per hectare is classified by ownership.

The calculated value of the variable under consideration for a plot (i.e. growing stock) is divided by the whole plot area. Both stocked and temporarily unstocked plots are included in the analysis.

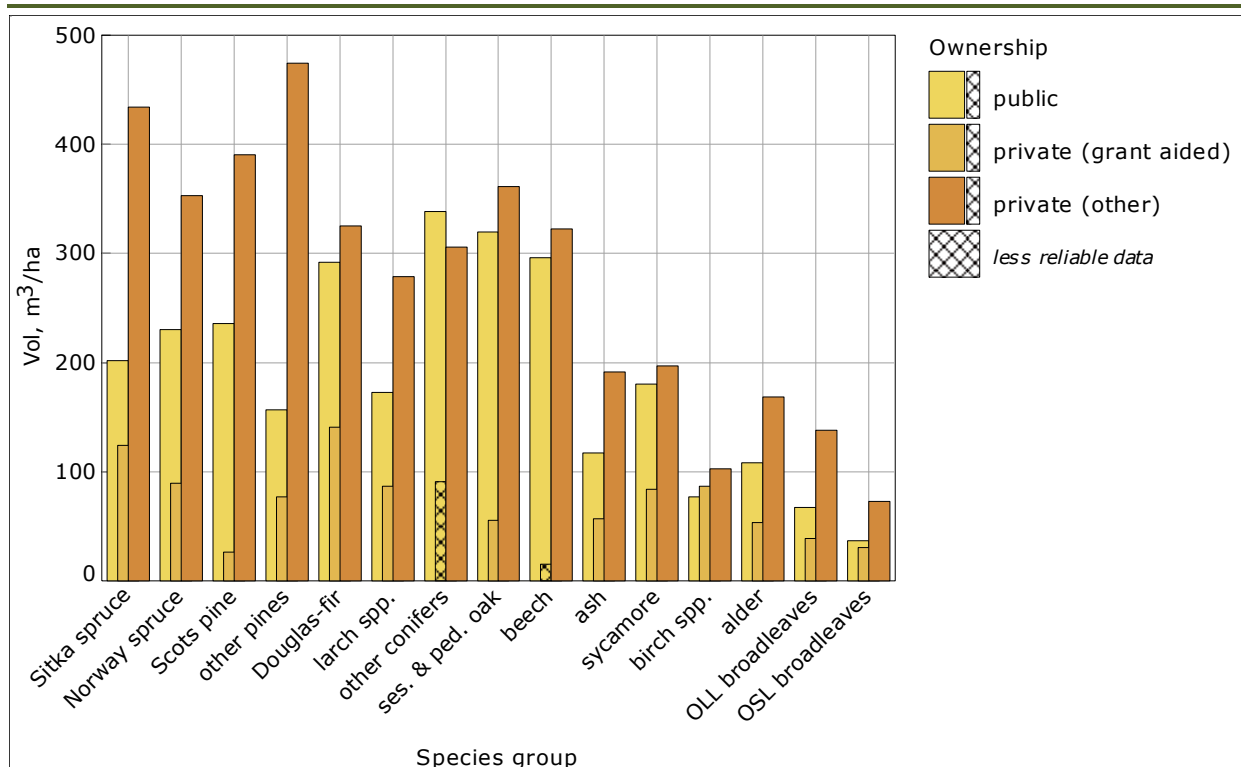
Ownership	Growing stock	
	m ³ /ha	($\alpha = 0.05$)
public	169	(158 – 180)
private (grant aided)	99	(89 – 108)
private (other)	185	(161 – 208)
All	148	(140 – 156)



7.4.2 Normalised mean of growing stock per hectare by ownership and species group

Methodology
The normalised mean growing stock per hectare is classified by ownership and species group.
The calculated value of the variable under consideration (i.e. growing stock) is divided not by the whole plot area, but by the area of the part of the plot where the given variable is present. Therefore the sum of the species tree volume for a plot is related only to the area occupied by those trees, not to the whole plot.
The information in this section was revised in April 2017. The original data presented was for tree volume, from ground to 7cm top diameter. In line with other tree volume derived statistics presented in Chapter 7, the data now refers to tree volume from stump to 7cm top diameter.

Species group	Ownership / Vol					
	public		private (grant aided)		private (other)	
	m ³ /ha	($\alpha = 0.05$)	m ³ /ha	($\alpha = 0.05$)	m ³ /ha	($\alpha = 0.05$)
Sitka spruce	202	(186 - 218)	124	(111 - 137)	434	(391 - 477)
Norway spruce	230	(0 - 844)	89	(61 - 118)	353	(76 - 630)
Scots pine	236	(153 - 319)	27	(0 - 70)	390	(0 - 829)
other pines	157	(139 - 175)	77	(50 - 104)	474	(263 - 686)
Douglas-fir	292	(225 - 358)	141	(129 - 152)	325	(0 - 1,223)
larch spp.	173	(132 - 213)	87	(67 - 107)	279	(253 - 305)
other conifers	338	(285 - 392)	91	-	306	(106 - 505)
ses. & ped. oak	320	(297 - 342)	56	(0 - 183)	361	(279 - 444)
beech	296	(222 - 370)	15	-	323	(284 - 361)
ash	117	(52 - 183)	57	(29 - 84)	191	(171 - 212)
sycamore	181	(53 - 308)	84	(57 - 111)	197	(153 - 240)
birch spp.	77	(57 - 97)	87	(64 - 110)	102	(87 - 118)
alder	108	(80 - 135)	54	(18 - 89)	169	(114 - 223)
OLL broadleaves	67	(0 - 139)	39	(0 - 79)	138	(82 - 194)
OSL broadleaves	37	(27 - 47)	30	(7 - 53)	73	(55 - 91)
All	176	(164 - 188)	101	(91 - 111)	186	(162 - 211)
Species group	Ownership / Vol					
	All					
	m ³ /ha	($\alpha = 0.05$)				
Sitka spruce	176	(165 - 187)				
Norway spruce	162	(112 - 211)				
Scots pine	244	(204 - 284)				
other pines	132	(113 - 152)				
Douglas-fir	288	(241 - 336)				
larch spp.	119	(97 - 140)				
other conifers	341	(224 - 458)				
ses. & ped. oak	229	(186 - 271)				
beech	273	(240 - 306)				
ash	111	(92 - 130)				
sycamore	138	(106 - 171)				
birch spp.	88	(75 - 101)				
alder	88	(69 - 107)				
OLL broadleaves	128	(85 - 171)				
OSL broadleaves	52	(46 - 58)				
All	152	(144 - 160)				



7.4.3 Normalised mean of growing stock per hectare by species group and age class (10 yr)

Methodology

The normalised mean growing stock per hectare is classified by species group and age class (10yr).

The calculated value of the variable under consideration (i.e. growing stock) is divided not by the whole plot area, but by the area of the part of the plot where the given variable is present. Therefore the sum of species tree volume, at a given age class, for a plot is related only to the area occupied by those trees, not to the whole plot.

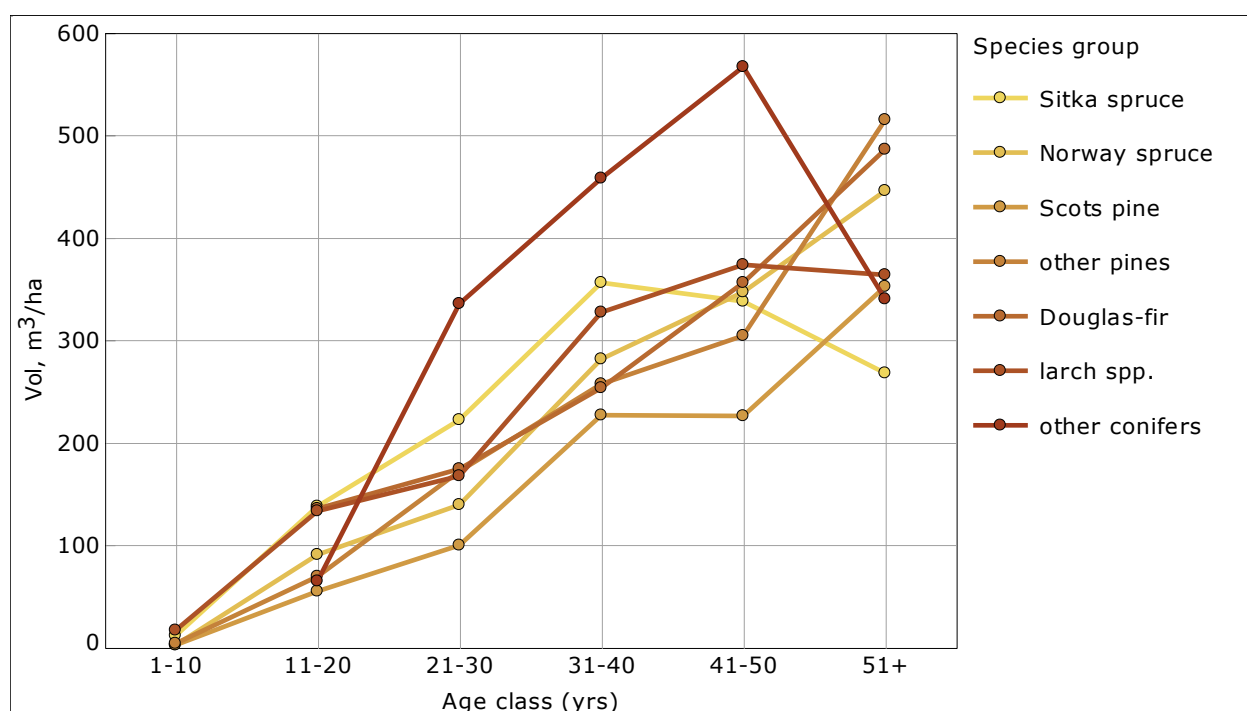
The information in this section was revised in April 2017. The original data presented was for tree volume, from ground to 7cm top diameter. In line with other tree volume derived statistics presented in Chapter 7, the data now refers to tree volume from stump to 7cm top diameter.

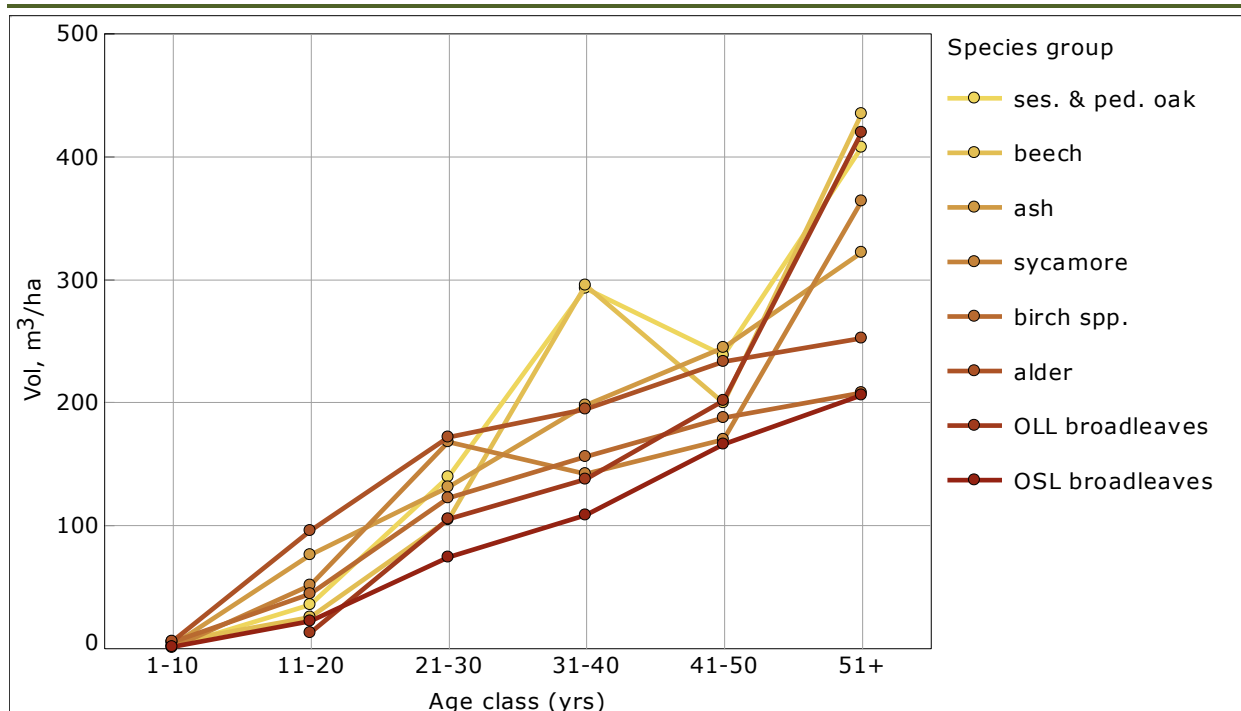
Age class (yrs)	Species group / Vol							
	Sitka spruce		Norway spruce		Scots pine		other pines	
	m³/ha	($\alpha=0.05$)	m³/ha	($\alpha=0.05$)	m³/ha	($\alpha=0.05$)	m³/ha	($\alpha=0.05$)
1-10	11	(7 - 15)	3	(2 - 3)	2	(1 - 4)	4	(1 - 7)
11-20	138	(127 - 149)	90	(72 - 109)	55	(6 - 103)	69	(56 - 82)
21-30	222	(202 - 242)	139	(0 - 345)	100	-	172	(141 - 203)
31-40	356	(319 - 392)	281	(192 - 370)	227	-	257	(225 - 290)
41-50	337	(297 - 378)	347	(269 - 424)	226	(155 - 296)	305	(251 - 358)
51+	267	(69 - 466)	446	(363 - 528)	352	(293 - 411)	515	(0 - 3,688)
All	176	(165 - 187)	162	(112 - 211)	244	(204 - 284)	132	(113 - 152)

Age class (yrs)	Species group / Vol							
	Douglas-fir		larch spp.		other conifers		ses. & ped. oak	
	m³/ha	($\alpha=0.05$)	m³/ha	($\alpha=0.05$)	m³/ha	($\alpha=0.05$)	m³/ha	($\alpha=0.05$)
1-10	-	-	17	(6 - 28)	-	-	0	(0 - 0)
11-20	135	(115 - 155)	133	(113 - 153)	65	(0 - 335)	35	(22 - 48)
21-30	174	(83 - 266)	168	(154 - 181)	335	(233 - 437)	139	(6 - 271)
31-40	253	-	327	(0 - 791)	458	(248 - 667)	292	(0 - 625)
41-50	356	(262 - 449)	373	-	566	(482 - 651)	238	(203 - 272)
51+	486	(304 - 669)	363	(39 - 688)	340	(310 - 370)	407	(351 - 463)
All	288	(241 - 336)	119	(97 - 140)	341	(224 - 458)	229	(186 - 271)

Age class (yrs)	Species group / Vol			
	beech	ash	sycamore	birch spp.
	m ³ /ha ($\alpha = 0.05$)	m ³ /ha ($\alpha = 0.05$)	m ³ /ha ($\alpha = 0.05$)	m ³ /ha ($\alpha = 0.05$)
1-10	4 - -	2 (1 - 3)	0 (0 - 0)	4 (0 - 12)
11-20	25 (0 - 63)	75 (59 - 91)	51 (0 - 263)	43 (26 - 61)
21-30	104 (80 - 128)	131 (105 - 156)	167 (134 - 200)	122 (102 - 142)
31-40	294 (219 - 370)	197 (144 - 250)	141 (81 - 202)	155 (133 - 178)
41-50	199 (89 - 308)	244 (183 - 304)	169 (0 - 438)	187 (165 - 209)
51+	434 (392 - 476)	321 (280 - 362)	363 (170 - 556)	207 (171 - 243)
All	273 (240 - 306)	111 (92 - 130)	138 (106 - 171)	88 (75 - 101)

Age class (yrs)	Species group / Vol			
	alder	OLL broadleaves	OSL broadleaves	All
	m ³ /ha ($\alpha = 0.05$)	m ³ /ha ($\alpha = 0.05$)	m ³ /ha ($\alpha = 0.05$)	m ³ /ha ($\alpha = 0.05$)
1-10	5 (0 - 12)	- - -	1 (0 - 1)	8 (6 - 9)
11-20	95 (75 - 115)	12 (0 - 24)	21 (12 - 30)	112 (105 - 120)
21-30	171 (169 - 173)	104 (0 - 257)	74 (63 - 84)	189 (176 - 203)
31-40	194 (127 - 260)	137 (121 - 152)	107 (75 - 140)	284 (264 - 304)
41-50	233 (150 - 316)	201 (41 - 360)	165 (150 - 181)	286 (262 - 309)
51+	252 (0 - 522)	419 (397 - 441)	205 (181 - 229)	328 (296 - 361)
All	88 (69 - 107)	128 (85 - 171)	52 (46 - 58)	152 (144 - 160)





7.4.4 Mean tree volume by species group and diameter class (5 cm)

Methodology

The weighted mean tree volume is classified by species group and diameter class (5 cm). Each tree volume is weighted by the representative number of trees, which is determined by the concentric circle where the tree is located.

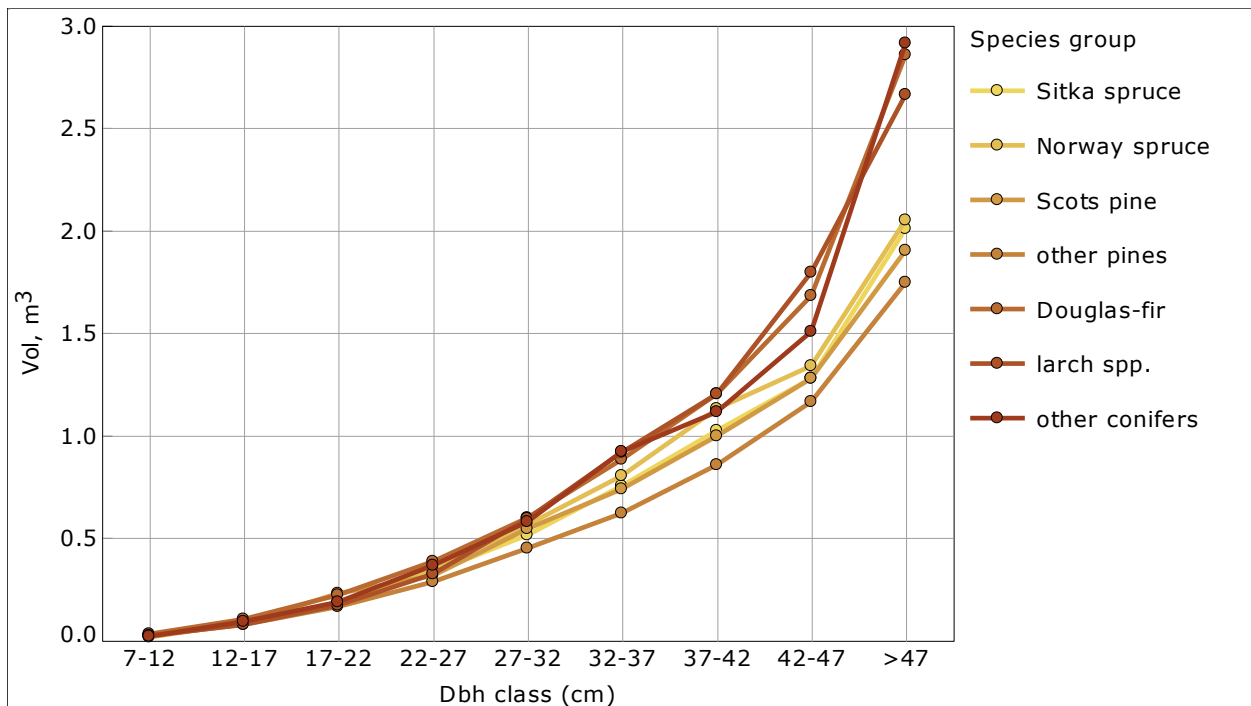
The information in this section was revised in April 2017. The original data presented was for tree volume, from ground to 7cm top diameter. In line with other tree volume derived statistics presented in Chapter 7, the data now refers to tree volume from stump to 7cm top diameter.

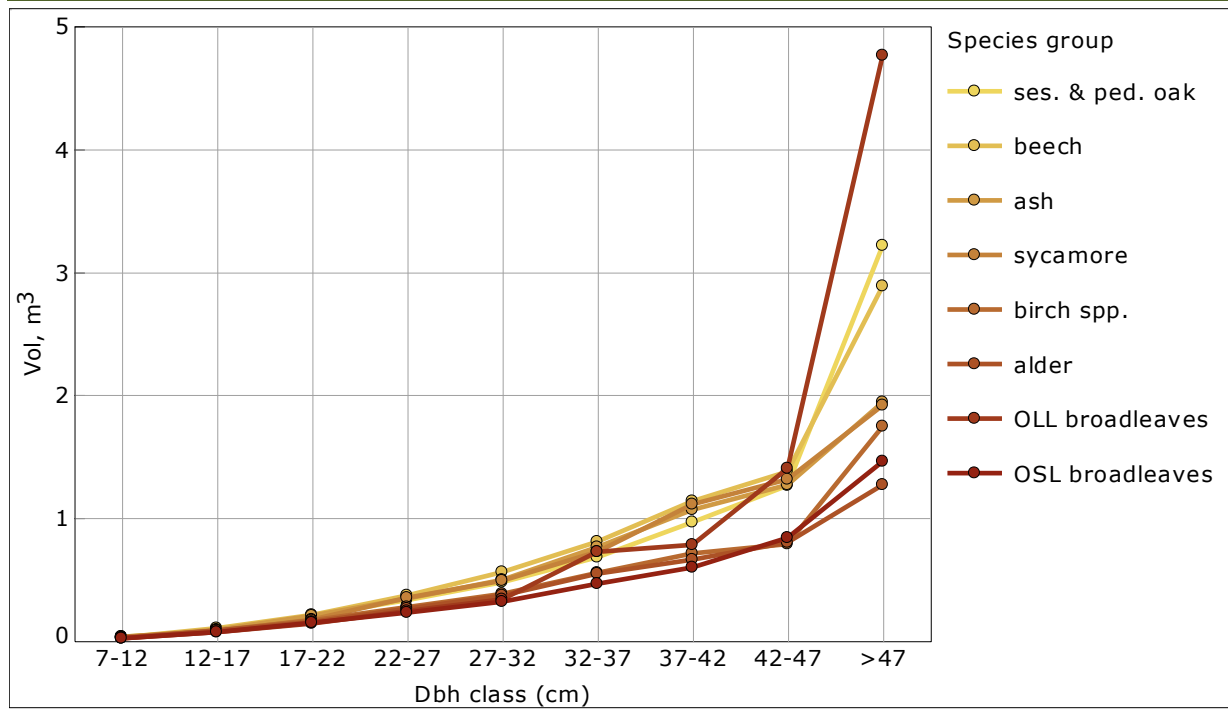
Dbh class (cm)	Species group / Vol			
	Sitka spruce	Norway spruce	Scots pine	other pines
	m ³ (α = 0.05)	m ³ (α = 0.05)	m ³ (α = 0.05)	m ³ (α = 0.05)
7-12	0.024 (0.023 – 0.025)	0.021 (0.019 – 0.024)	0.016 – –	0.023 (0.021 – 0.025)
12-17	0.081 (0.079 – 0.083)	0.080 (0.074 – 0.087)	0.083 (0.000 – 0.169)	0.076 (0.073 – 0.080)
17-22	0.182 (0.176 – 0.188)	0.182 (0.159 – 0.205)	0.230 (0.165 – 0.295)	0.162 (0.156 – 0.168)
22-27	0.331 (0.324 – 0.338)	0.351 (0.327 – 0.375)	0.317 (0.303 – 0.331)	0.285 (0.275 – 0.294)
27-32	0.514 (0.502 – 0.527)	0.563 (0.537 – 0.589)	0.545 (0.413 – 0.677)	0.448 (0.431 – 0.466)
32-37	0.754 (0.730 – 0.777)	0.801 (0.769 – 0.832)	0.738 (0.723 – 0.753)	0.619 (0.551 – 0.688)
37-42	1.024 (0.990 – 1.058)	1.129 (1.065 – 1.193)	0.995 (0.875 – 1.115)	0.854 (0.810 – 0.897)
42-47	1.276 (1.211 – 1.341)	1.340 – –	1.279 (1.123 – 1.435)	1.164 (0.999 – 1.329)
>47	2.009 (1.801 – 2.218)	2.049 – –	1.902 (0.000 – 4.051)	1.745 (1.457 – 2.032)
All	0.213 (0.194 – 0.233)	0.233 (0.123 – 0.343)	0.799 (0.666 – 0.933)	0.189 (0.146 – 0.231)

Dbh class (cm)	Species group / Vol			
	Douglas-fir	larch spp.	other conifers	ses. & ped. oak
	m ³ (α = 0.05)	m ³ (α = 0.05)	m ³ (α = 0.05)	m ³ (α = 0.05)
7-12	0.031 (0.026 – 0.037)	0.024 (0.023 – 0.026)	0.020 (0.000 – 0.068)	0.030 (0.029 – 0.032)
12-17	0.104 (0.092 – 0.115)	0.075 (0.070 – 0.080)	0.092 (0.073 – 0.110)	0.085 (0.058 – 0.113)
17-22	0.220 (0.198 – 0.242)	0.171 (0.160 – 0.183)	0.187 (0.101 – 0.273)	0.204 (0.188 – 0.220)
22-27	0.384 (0.353 – 0.414)	0.322 (0.296 – 0.347)	0.364 (0.363 – 0.365)	0.328 (0.314 – 0.342)
27-32	0.598 (0.580 – 0.617)	0.595 (0.565 – 0.625)	0.579 (0.498 – 0.661)	0.476 (0.455 – 0.497)
32-37	0.883 (0.853 – 0.913)	0.918 (0.819 – 1.018)	0.922 – –	0.680 (0.637 – 0.723)
37-42	1.203 (1.128 – 1.278)	1.202 (1.153 – 1.252)	1.113 – –	0.963 (0.905 – 1.021)
42-47	1.682 (1.301 – 2.062)	1.793 (1.634 – 1.952)	1.506 (1.302 – 1.709)	1.263 (1.125 – 1.401)
>47	2.856 (2.201 – 3.511)	2.661 – –	2.913 (2.546 – 3.281)	3.215 (2.531 – 3.899)
All	0.541 (0.438 – 0.645)	0.160 (0.119 – 0.200)	1.013 (0.837 – 1.190)	1.510 (1.159 – 1.862)

Dbh class (cm)	Species group / Vol			
	beech	ash	sycamore	birch spp.
	m ³ ($\alpha = 0.05$)	m ³ ($\alpha = 0.05$)	m ³ ($\alpha = 0.05$)	m ³ ($\alpha = 0.05$)
7-12	0.022 (0.011 – 0.034)	0.025 (0.020 – 0.030)	0.030 (0.000 – 0.068)	0.028 (0.026 – 0.031)
12-17	0.100 (0.087 – 0.113)	0.089 (0.084 – 0.094)	0.078 (0.075 – 0.082)	0.080 (0.076 – 0.084)
17-22	0.207 (0.197 – 0.217)	0.201 (0.190 – 0.212)	0.169 (0.121 – 0.216)	0.162 (0.154 – 0.171)
22-27	0.371 (0.363 – 0.378)	0.344 (0.329 – 0.358)	0.351 (0.224 – 0.479)	0.275 (0.262 – 0.287)
27-32	0.555 (0.505 – 0.605)	0.494 (0.456 – 0.532)	0.489 (0.388 – 0.590)	0.378 (0.359 – 0.396)
32-37	0.807 (0.771 – 0.843)	0.757 (0.705 – 0.810)	0.724 (0.537 – 0.912)	0.554 (0.517 – 0.592)
37-42	1.132 (0.994 – 1.271)	1.067 (0.942 – 1.193)	1.109 –	0.712 (0.648 – 0.777)
42-47	1.376 (0.856 – 1.896)	1.267 –	1.312 –	0.785 (0.719 – 0.852)
>47	2.882 (2.533 – 3.231)	1.938 –	1.916 (1.833 – 1.999)	1.746 (1.653 – 1.838)
All	1.109 (0.956 – 1.262)	0.268 (0.215 – 0.321)	0.463 (0.297 – 0.628)	0.155 (0.128 – 0.181)

Dbh class (cm)	Species group / Vol			
	alder	OLL broadleaves	OSL broadleaves	All
	m ³ ($\alpha = 0.05$)	m ³ ($\alpha = 0.05$)	m ³ ($\alpha = 0.05$)	m ³ ($\alpha = 0.05$)
7-12	0.022 (0.020 – 0.025)	0.019 (0.017 – 0.021)	0.022 (0.017 – 0.027)	0.024 (0.023 – 0.025)
12-17	0.080 (0.062 – 0.099)	0.068 (0.063 – 0.073)	0.069 (0.067 – 0.072)	0.080 (0.079 – 0.082)
17-22	0.154 (0.144 – 0.164)	0.136 (0.123 – 0.149)	0.146 (0.138 – 0.154)	0.177 (0.174 – 0.180)
22-27	0.262 (0.246 – 0.278)	0.239 (0.208 – 0.270)	0.225 (0.213 – 0.238)	0.322 (0.317 – 0.328)
27-32	0.370 (0.359 – 0.382)	0.337 (0.252 – 0.421)	0.320 (0.298 – 0.341)	0.503 (0.493 – 0.512)
32-37	0.544 (0.530 – 0.559)	0.721 (0.666 – 0.776)	0.465 (0.444 – 0.486)	0.732 (0.715 – 0.750)
37-42	0.661 (0.549 – 0.773)	0.781 (0.000 – 2.819)	0.598 (0.574 – 0.622)	1.016 (0.985 – 1.047)
42-47	0.799 –	1.398 –	0.838 –	1.260 (1.202 – 1.319)
>47	1.269 –	4.761 –	1.457 (1.366 – 1.548)	2.697 (2.501 – 2.892)
All	0.116 (0.093 – 0.140)	0.926 (0.000 – 4.942)	0.108 (0.093 – 0.123)	0.243 (0.220 – 0.267)





Chapter 8

HARVESTING

Thin status describes the progression of thinning operations or absence of thinning operations in the national forest estate. In terms of the area of thinnings, 15.1% of forests have been thinned or re-spaced at least once. Nearly two-thirds (61.8%) of forests are juvenile (i.e. at a maturity stage where they could not be thinned) and 23.1% of forests are categorised as “no thin”. For the latter category the forest is theoretically at a development stage where it could be thinned but has not been thinned due to a variety of factors such as high windthrow risk, economic factors/considerations or thinning may be imminent. The area of thinning has increased by over 22,000 hectares to over 96,000 hectares; while the area of “no thin” has decreased by nearly 20,000 hectares and now stands at just over 147,000 hectares showing greater utilisation of the forest resource since 2006.

The mean annual standing volume harvested between 2006 and 2012 was 3.6 million m³. Harvest volumes are concentrated in Public forests which accounted for 87% of mean annual harvest volumes between 2006 and 2012. In terms of broad species categories 96.8% of the annual harvest volume comes from coniferous species. Sitka spruce accounted for 78.7% of the share of the mean annual harvest volume, followed by others pines at 11.7% and Norway spruce comprising 3.5%.

Clearfelling, the felling of a continuous block of trees, is the dominant harvest type, accounting for 76.6% of the timber felled. First thinning is the dominant harvest type in Private (grant aided) forests compared to clearfelling in the Public forest, reflecting their very different age structures.

The mean tree volume harvested in Irish forests is 0.36 m³. The mean tree harvested according to harvest type ranges from 0.20 m³ in first thinning operations to 0.54 m³ in final clearfells. The mean tree harvest volume associated with first thinning operations is higher than expected due to the incidence of first thinnings in older crops (30+ years of age).

8.1 THIN STATUS

Definition
Thin status Describes the progression of thinning operations. Juvenile forest: This is a forest that has not reached the development stage for first thinning. Respacing/pre-commercial thinning: The spacing of the forest has been altered prior to the first thin stage. Mainly associated with overstocked naturally regenerated forest. First thinning: The forest has received a first thinning, generally identified by the presence of extraction racks, and stumps arising from selective thinning may be present. All stumps have the same state of decomposition. Second thinning: The forest has received a second thinning, generally identified by the presence of extraction racks and stumps arising from selective thinning. The stumps are grouped into two different stages of decomposition. Subsequent thinning: Any thinning post second thinning. Generally the forest is well opened up and the decomposition of the stumps is grouped into a number of different stages. No thinning: No thinning has taken place. These areas remain unthinned due to numerous reasons such as; high windthrow risk, economic considerations or thinning may be imminent.

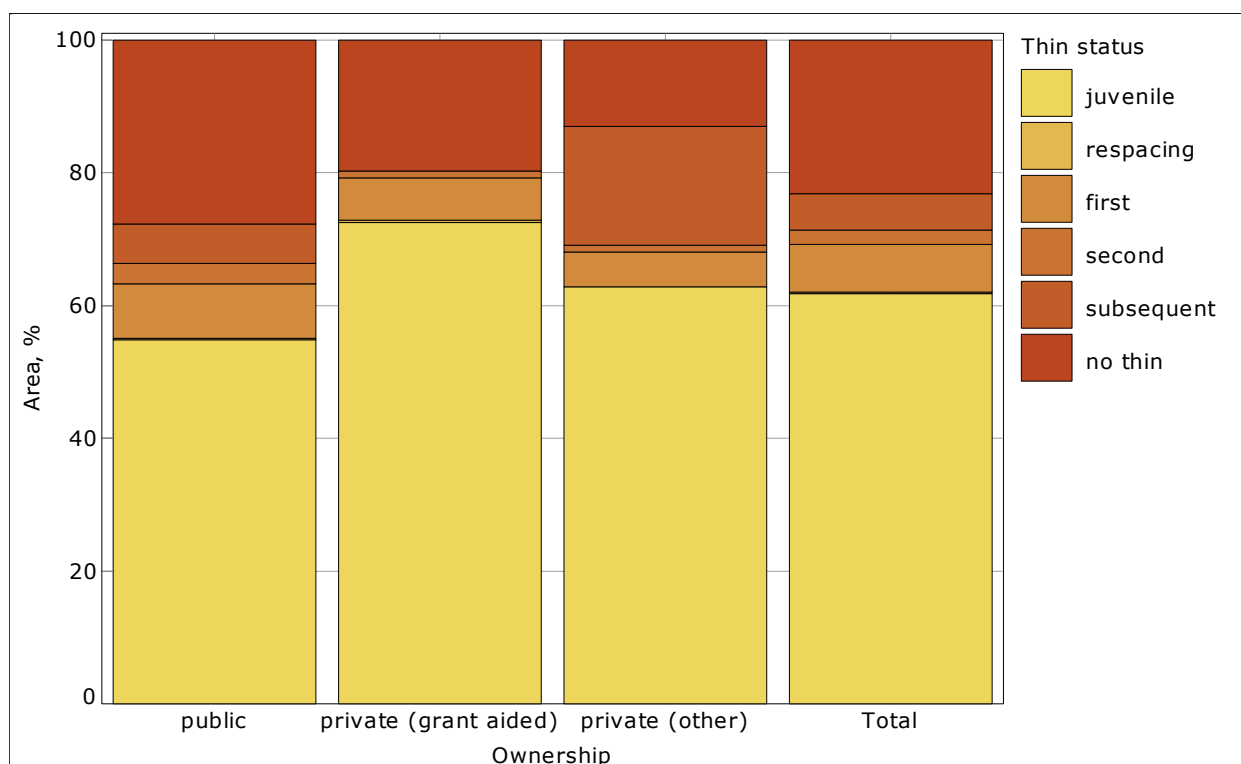
8.1.1 Stocked forest area by ownership and thin status

Methodology

The stocked forest area is classified by ownership and thin status.

Thin status	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
juvenile	187.46	(173.30 – 201.62)	54.9	154.10	(140.92 – 167.28)	72.5
respacing	0.80	(0.00 – 1.92)	0.2	0.80	(0.00 – 1.91)	0.4
first	28.01	(21.60 – 34.42)	8.2	13.62	(9.09 – 18.15)	6.4
second	10.42	(6.46 – 14.38)	3.0	1.99	(0.25 – 3.73)	0.9
subsequent	20.41	(14.96 – 25.85)	6.0	–	–	–
no thin	94.59	(83.54 – 105.65)	27.7	42.01	(34.27 – 49.75)	19.8
Total	341.69	(326.35 – 357.03)	100.0	212.52	(198.06 – 226.99)	100.0

Thin status	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
juvenile	52.07	(43.51 – 60.62)	62.8	393.63	(378.43 – 408.83)	61.8
respacing	–	–	–	1.60	(0.03 – 3.17)	0.3
first	4.41	(1.82 – 6.99)	5.3	46.04	(37.94 – 54.13)	7.2
second	0.80	(0.00 – 1.93)	1.0	13.22	(8.77 – 17.66)	2.1
subsequent	14.83	(10.13 – 19.53)	17.9	35.24	(28.18 – 42.29)	5.5
no thin	10.81	(6.75 – 14.87)	13.0	147.41	(134.26 – 160.57)	23.1
Total	82.92	(72.42 – 93.42)	100.0	637.13		100.0



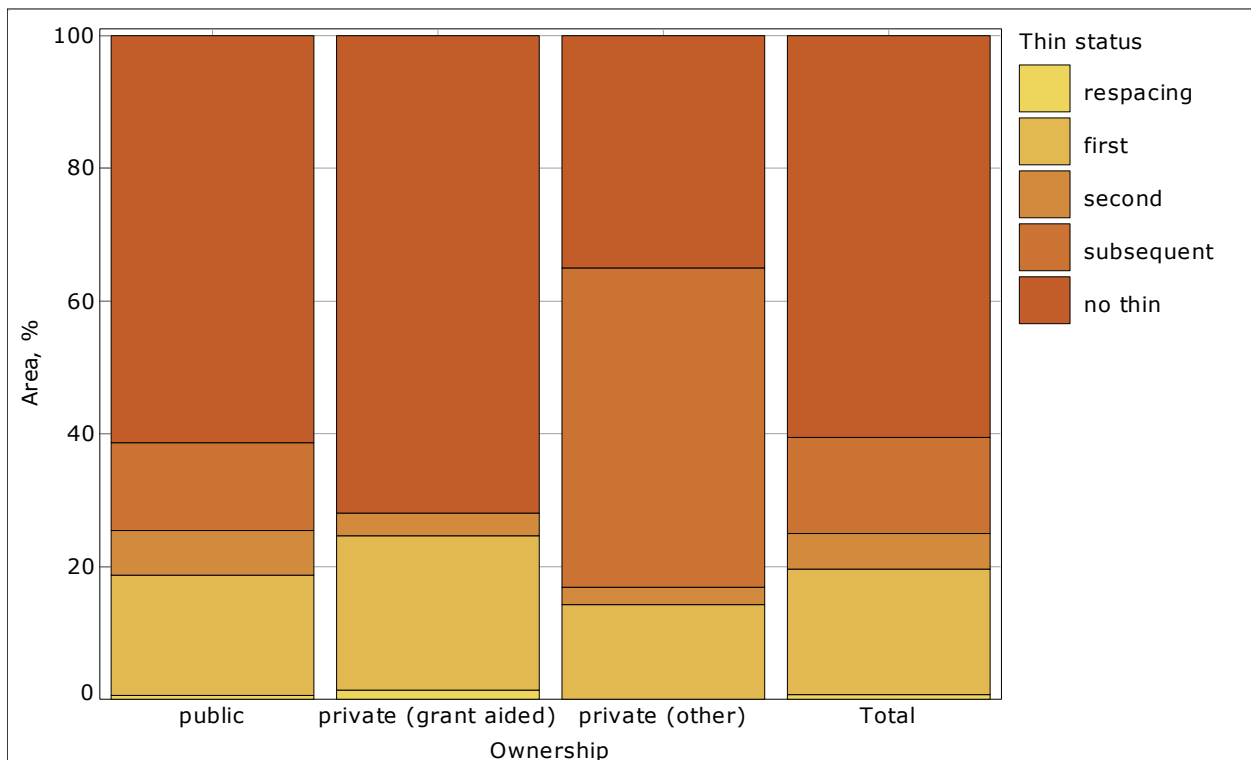
8.1.2 Stocked forest area by ownership and thin status (excl. Juvenile)

Definition
Thin status (excl. Juvenile) The difference between this sub-section and the previous is that the 'Juvenile forest' has been removed from the analysis, thereby concentrating on the portion of the estate that is at a development stage where thinning could have taken place. The development stage is assessed using threshold basal area.

Methodology
The stocked forest area is classified by ownership and thin status (excl. Juvenile).

Thin status	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
respacing	0.80	(0.00 - 1.92)	0.5	0.80	(0.00 - 1.91)	1.4
first	28.01	(21.60 - 34.42)	18.2	13.62	(9.09 - 18.15)	23.3
second	10.42	(6.46 - 14.38)	6.8	1.99	(0.25 - 3.73)	3.4
subsequent	20.41	(14.96 - 25.85)	13.2	-	-	-
no thin	94.59	(83.54 - 105.65)	61.3	42.01	(34.27 - 49.75)	71.9
Total	154.23	(140.83 - 167.63)	100.0	58.42	(49.42 - 67.43)	100.0

Thin status	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
respacing	-	-	-	1.60	(0.03 - 3.17)	0.7
first	4.41	(1.82 - 6.99)	14.3	46.04	(37.94 - 54.13)	18.9
second	0.80	(0.00 - 1.93)	2.6	13.22	(8.77 - 17.66)	5.4
subsequent	14.83	(10.13 - 19.53)	48.1	35.24	(28.18 - 42.29)	14.5
no thin	10.81	(6.75 - 14.87)	35.0	147.41	(134.26 - 160.57)	60.5
Total	30.85	(24.16 - 37.54)	100.0	243.51		100.0



8.1.3 Stocked forest area by development stage and thin status (excl. Juvenile)

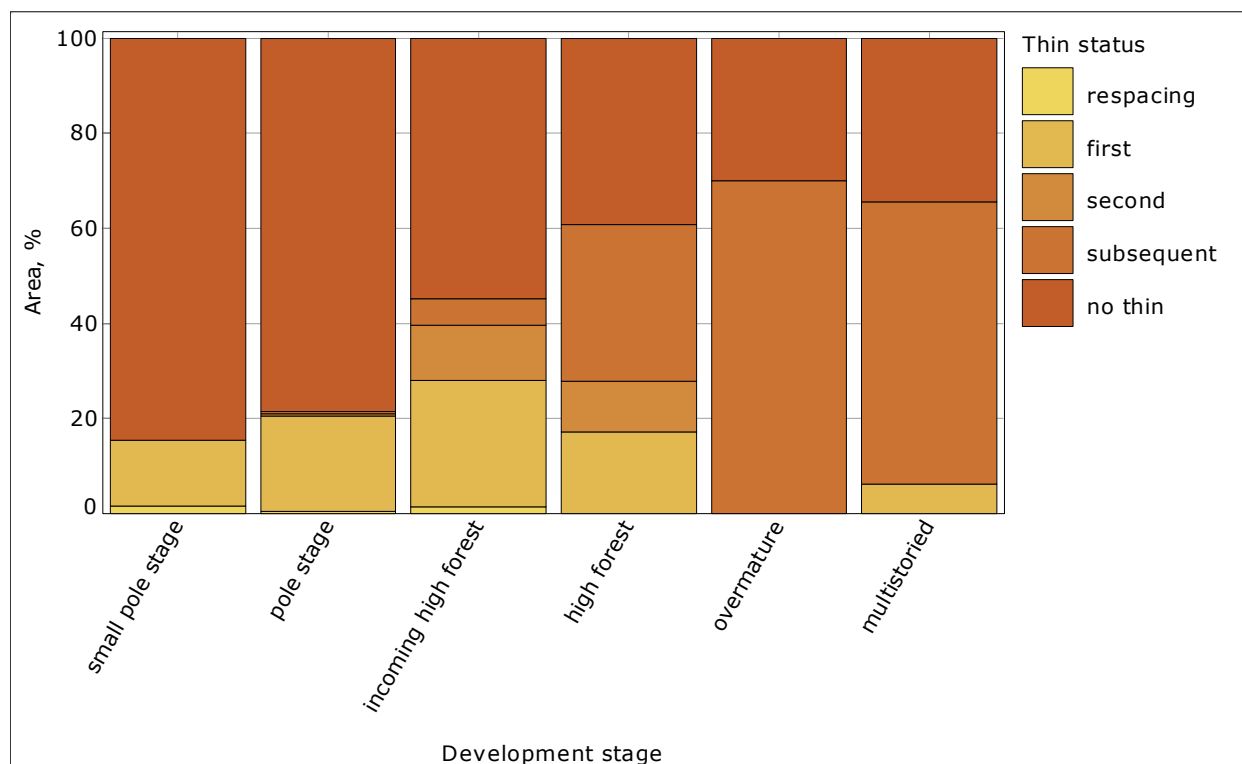
Methodology

The stocked forest area is classified by development stage and thin status (excl. Juvenile).

Thin status	Development stage / Area					
	small pole stage			pole stage		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
respacing	0.41	(0.00 – 1.20)	1.6	0.40	(0.00 – 1.20)	0.5
first	3.61	(1.25 – 5.96)	13.9	16.40	(11.47 – 21.34)	20.0
second	–	–	–	0.40	(0.00 – 1.20)	0.5
subsequent	–	–	–	0.40	(0.00 – 1.53)	0.5
no thin	22.02	(16.29 – 27.75)	84.5	64.46	(55.11 – 73.80)	78.5
Total	26.03	(19.83 – 32.24)	100.0	82.06	(71.67 – 92.45)	100.0

Thin status	Development stage / Area					
	incoming high forest			high forest		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
respacing	0.80	(0.00 – 1.91)	1.4	–	–	–
first	15.62	(10.77 – 20.47)	26.7	9.60	(5.81 – 13.40)	17.1
second	6.80	(3.59 – 10.01)	11.6	6.02	(3.00 – 9.04)	10.7
subsequent	3.19	(0.99 – 5.40)	5.5	18.43	(13.27 – 23.59)	32.9
no thin	32.10	(25.27 – 38.93)	54.8	22.02	(16.32 – 27.72)	39.3
Total	58.51	(49.47 – 67.55)	100.0	56.07	(47.30 – 64.85)	100.0

Thin status	Development stage / Area					
	overmature			multistoried		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
respacing	–	–	–	–	–	–
first	–	–	–	0.80	(0.00 – 1.90)	6.2
second	–	–	–	–	–	–
subsequent	5.62	(2.69 – 8.55)	70.0	7.59	(4.20 – 10.99)	59.4
no thin	2.41	(0.48 – 4.34)	30.0	4.41	(1.81 – 7.00)	34.4
Total	8.03	(4.54 – 11.52)	100.0	12.80	(8.43 – 17.17)	100.0



8.2 HARVEST VOLUME (2006-2012)

Definition

Harvest volume

Standing overbark volume of living trees (Dbh>7 cm) from stump to 7 cm top diameter felled.

8.2.1 Mean annual standing volume harvested by ownership

Definition

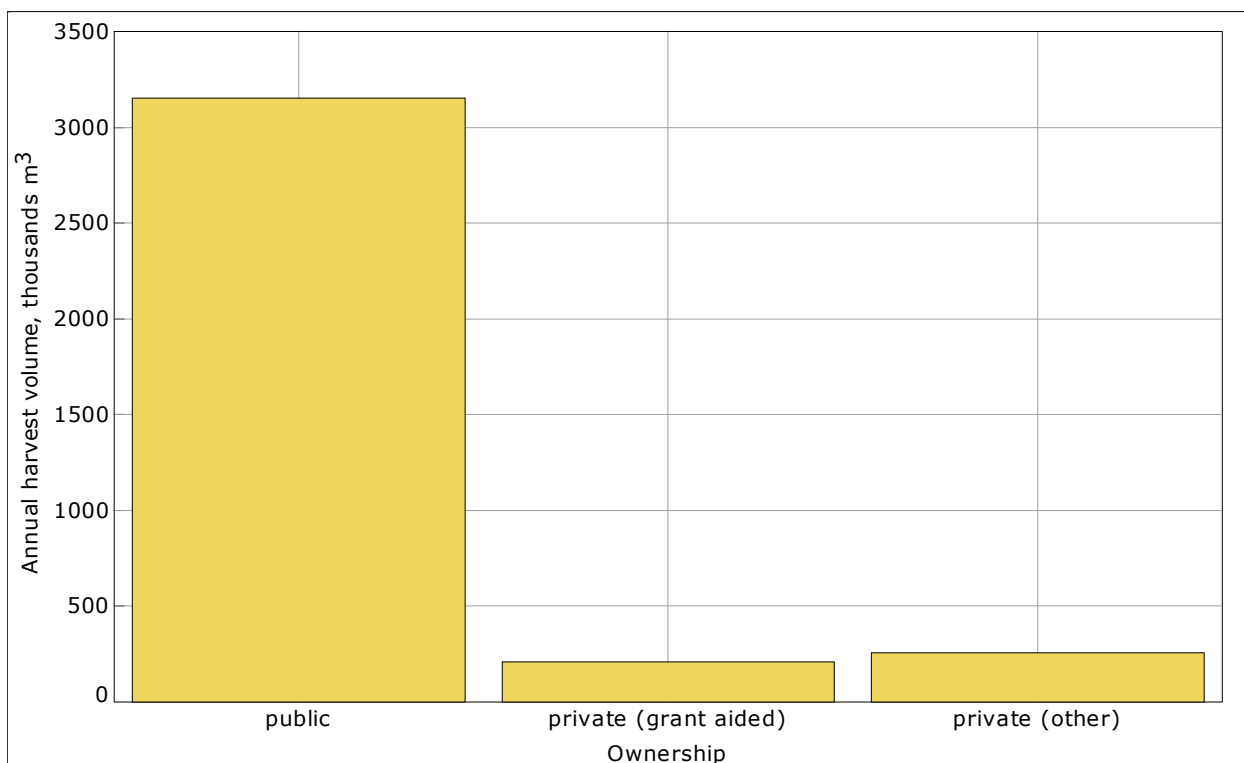
Mean annual volume

The total standing overbark volume of living trees from stump to 7cm top diameter that have been felled. This in turn is divided by the time interval between the NFI cycles.

Methodology

The mean annual harvest volume is classified by ownership.

Ownership	Annual harvest volume		
	thousands m ³	($\alpha = 0.05$)	%
public	3,152.2	(2,521.5 – 3,782.9)	87.1
private (grant aided)	208.0	(103.1 – 313.0)	5.8
private (other)	255.5	(108.7 – 402.4)	7.1
Total	3,615.8	(2,960.3 – 4,271.2)	100.0

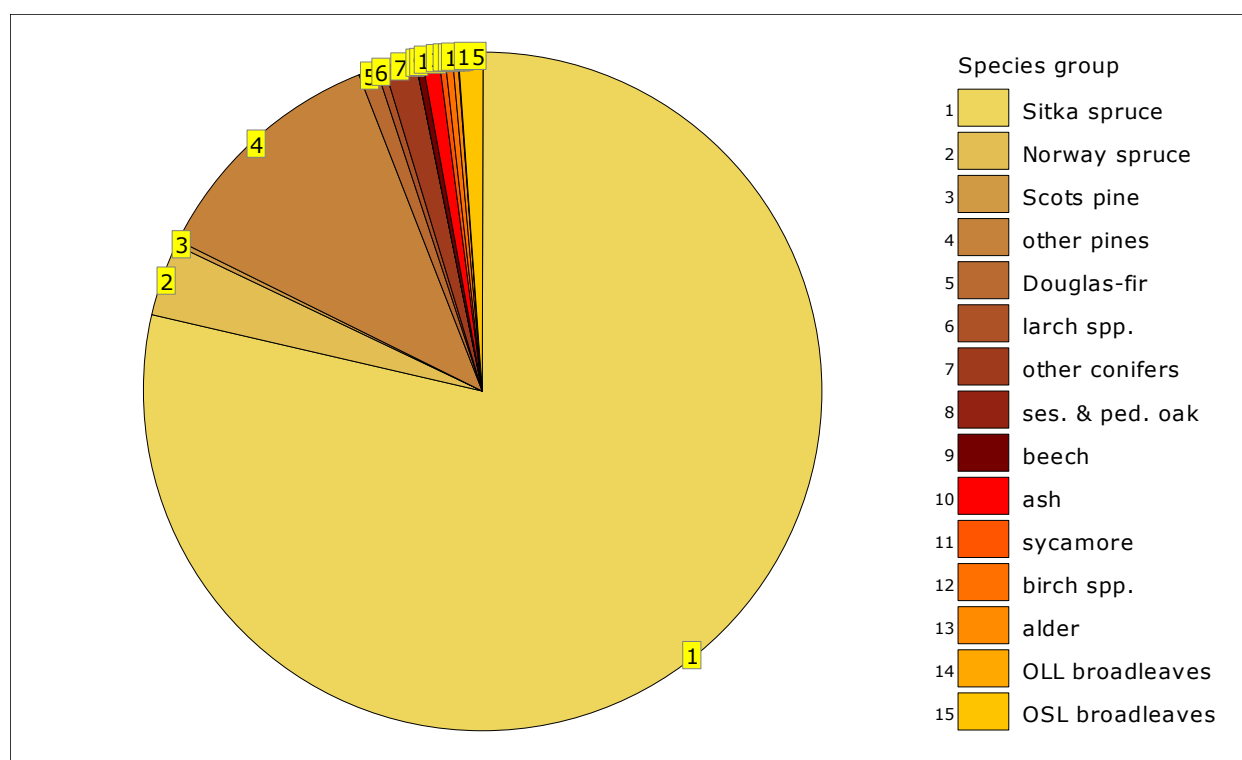


8.2.2 Mean annual standing volume harvested by species group

Methodology

The mean annual harvest volume is classified by species group.

Species group	Annual harvest volume		
	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	2,843.1	(2,239.1 – 3,447.1)	78.7
Norway spruce	125.4	(41.8 – 208.9)	3.5
Scots pine	8.6	(0.0 – 19.0)	0.2
other pines	424.6	(251.6 – 597.7)	11.7
Douglas-fir	30.3	(1.8 – 58.8)	0.8
larch spp.	13.2	(1.7 – 24.7)	0.4
other conifers	52.9	(16.8 – 89.1)	1.5
ses. & ped. oak	1.6	(0.0 – 3.3)	0.04
beech	11.0	(0.0 – 26.6)	0.3
ash	28.7	(5.5 – 51.9)	0.8
sycamore	11.3	(0.0 – 24.4)	0.3
birch spp.	11.9	(3.1 – 20.7)	0.3
alder	7.7	(0.1 – 15.2)	0.2
OLL broadleaves	2.2	(0.0 – 5.7)	0.06
OSL broadleaves	43.2	(3.8 – 82.6)	1.2
Total	3,615.8	(2,960.3 – 4,271.2)	100.0

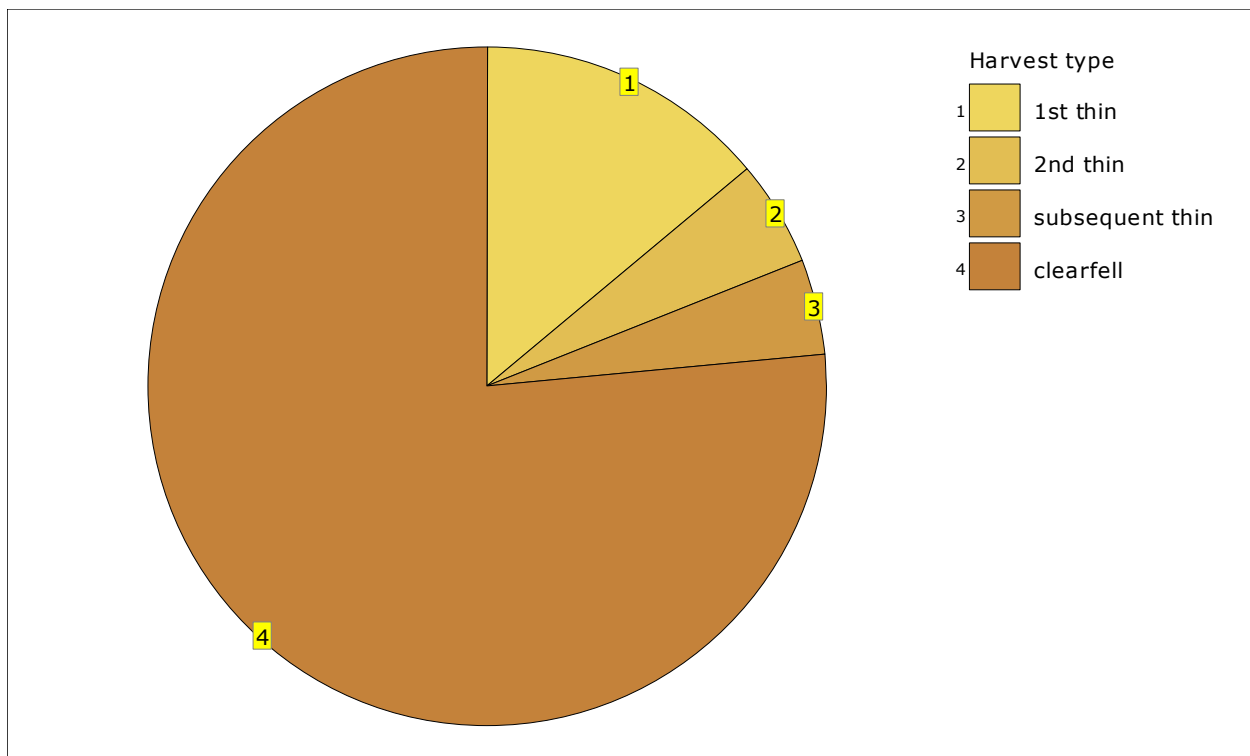


8.2.3 Mean annual standing volume harvested by harvest type

Methodology

The mean annual harvest volume is classified by harvest type.

Harvest type	Annual harvest volume		
	thousands m ³	($\alpha = 0.05$)	%
1st thin	500.6	(368.1 – 633.0)	13.8
2nd thin	182.7	(97.9 – 267.6)	5.1
subsequent thin	164.1	(100.0 – 228.2)	4.5
clearfell	2,768.3	(2,135.8 – 3,400.9)	76.6
Total	3,615.8	(2,960.3 – 4,271.2)	100.0



8.2.4 Mean annual standing volume harvested by harvest type and age class (10yr)

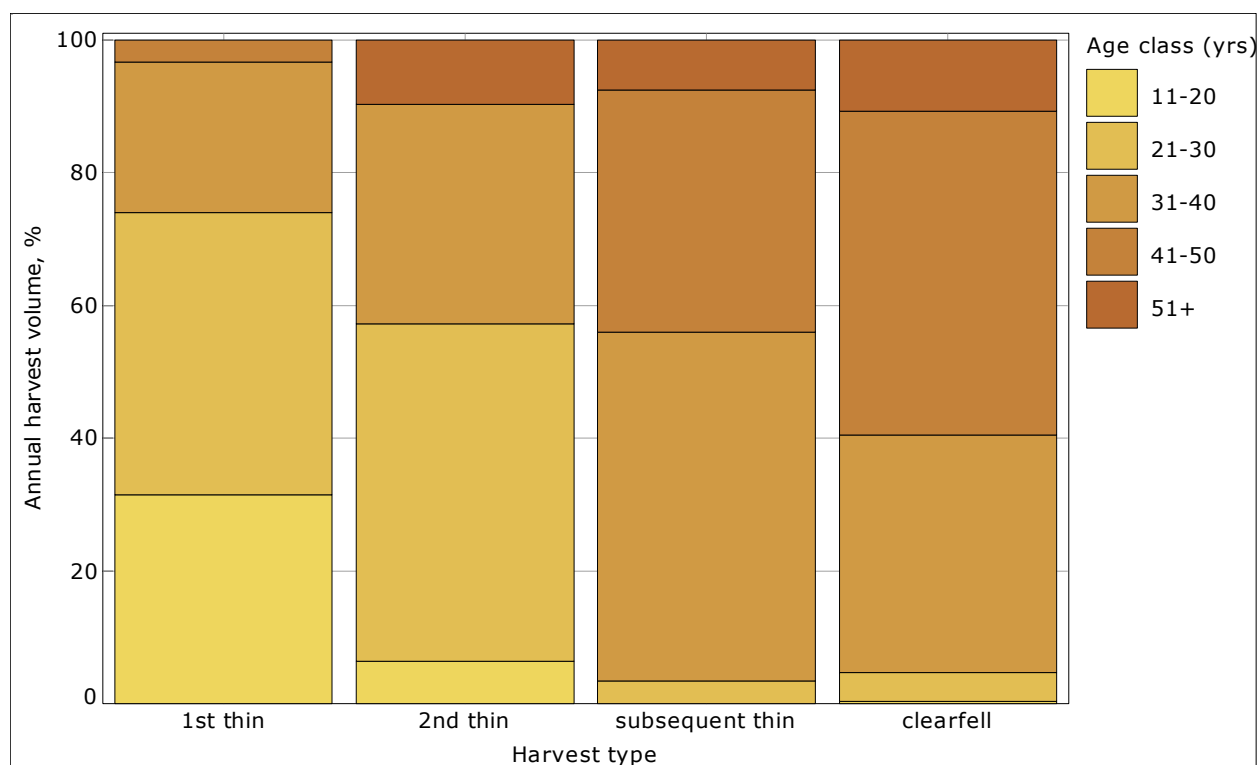
Methodology

The mean annual harvest volume is classified by harvest type and age class (10yrs).

Age class (yrs)	Harvest type / Annual harvest volume					
	1st thin			2nd thin		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
11-20	157.6	(96.2 – 219.1)	31.5	11.6	(0.0 – 31.1)	6.3
21-30	213.1	(123.0 – 303.2)	42.6	93.1	(40.3 – 145.8)	51.0
31-40	113.6	(43.7 – 183.4)	22.7	60.4	(8.3 – 112.5)	33.0
41-50	16.2	(0.0 – 44.0)	3.2	–	–	–
51+	–	–	–	17.7	(0.0 – 52.5)	9.7
Total	500.6	(368.1 – 633.0)	100.0	182.7	(97.9 – 267.6)	100.0

Age class (yrs)	Harvest type / Annual harvest volume					
	subsequent thin			clearfell		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
11-20	–	–	–	10.9	(0.0 – 25.0)	0.4
21-30	5.7	(0.0 – 12.5)	3.5	119.4	(5.0 – 233.8)	4.3
31-40	86.2	(40.5 – 132.0)	52.5	989.4	(611.9 – 1,366.9)	35.7
41-50	59.8	(18.7 – 100.9)	36.5	1,352.9	(914.7 – 1,791.2)	48.9
51+	12.4	(1.7 – 23.0)	7.5	295.7	(67.7 – 523.7)	10.7
Total	164.1	(100.0 – 228.2)	100.0	2,768.3	(2,135.8 – 3,400.9)	100.0

Age class (yrs)	Harvest type / Annual harvest volume		
	Total		
	thousands m ³	($\alpha = 0.05$)	%
11-20	180.2	(114.0 – 246.3)	5.0
21-30	431.3	(274.3 – 588.2)	11.9
31-40	1,249.6	(858.9 – 1,640.2)	34.6
41-50	1,429.0	(988.0 – 1,870.0)	39.5
51+	325.8	(94.9 – 556.6)	9.0
Total	3,615.8	(2,960.3 – 4,271.2)	100.0



8.3 HARVEST TREE SIZE

Definition

Mean tree volume

The mean standing overbark volume of living trees from stump to 7cm top diameter which, have been felled.

8.3.1 Mean annual standing volume harvested by harvest type and mean tree volume

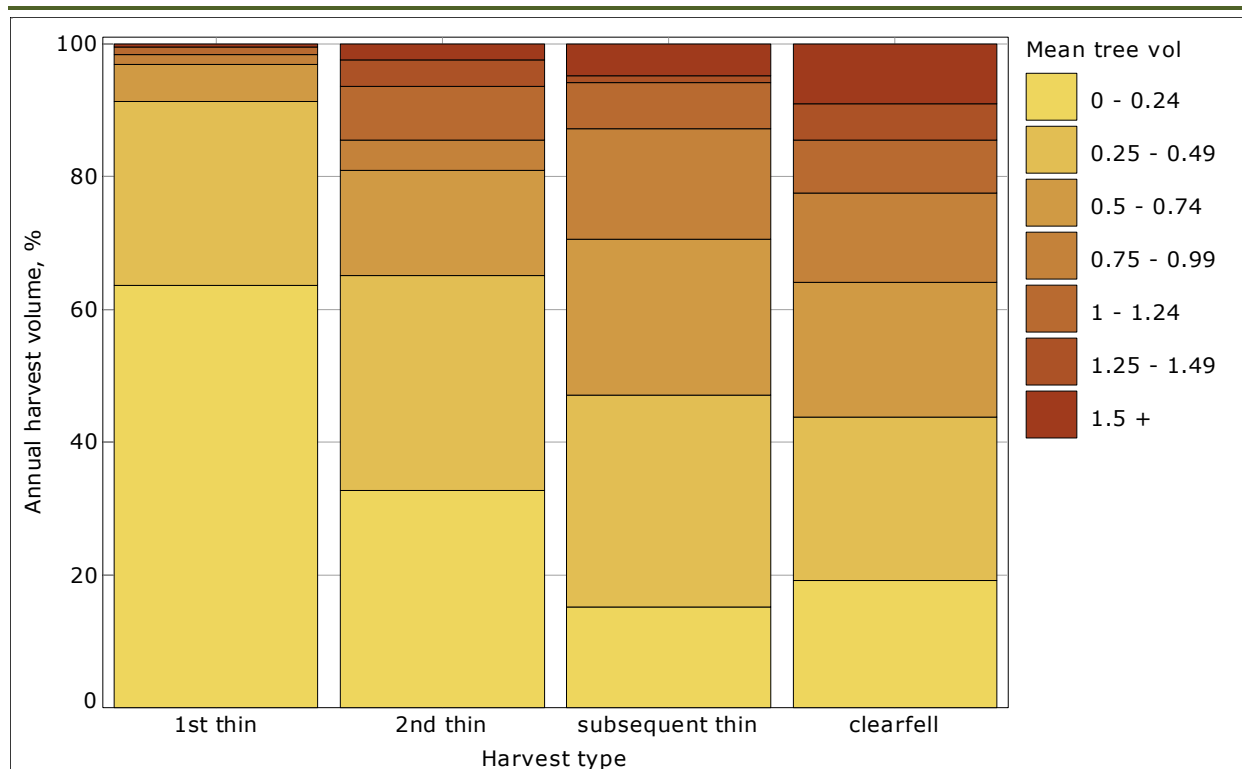
Methodology

The mean annual harvest volume is classified by harvest type and mean tree volume class.

Mean tree vol	Harvest type / Annual harvest volume					
	1st thin			2nd thin		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
0 - 0.24	318.3	(237.0 - 399.5)	63.6	59.7	(28.2 - 91.3)	32.6
0.25 - 0.49	138.8	(88.2 - 189.4)	27.7	59.2	(27.2 - 91.1)	32.4
0.5 - 0.74	28.2	(10.6 - 45.8)	5.6	29.0	(10.9 - 47.1)	15.9
0.75 - 0.99	7.4	(0.6 - 14.2)	1.5	8.3	(0.0 - 17.5)	4.6
1 - 1.24	5.9	(0.0 - 13.0)	1.2	14.8	(0.0 - 34.2)	8.1
1.25 - 1.49	-	-	-	7.3	(0.0 - 18.9)	4.0
1.5 +	2.0	(0.0 - 5.8)	0.4	4.3	(0.0 - 12.8)	2.4
Total	500.6	(368.1 - 633.0)	100.0	182.7	(97.9 - 267.6)	100.0

Mean tree vol	Harvest type / Annual harvest volume					
	subsequent thin			clearfell		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
0 - 0.24	25.0	(9.9 - 40.0)	15.2	530.8	(378.2 - 683.5)	19.2
0.25 - 0.49	52.4	(30.5 - 74.2)	32.0	682.8	(508.2 - 857.4)	24.7
0.5 - 0.74	38.5	(19.1 - 57.8)	23.4	560.2	(397.9 - 722.4)	20.2
0.75 - 0.99	27.4	(9.7 - 45.2)	16.7	374.2	(258.5 - 489.9)	13.5
1 - 1.24	11.3	(0.0 - 22.7)	6.9	220.3	(133.7 - 306.9)	8.0
1.25 - 1.49	1.7	(0.0 - 5.1)	1.0	149.7	(84.6 - 214.8)	5.4
1.5 +	7.9	(0.0 - 16.9)	4.8	250.3	(104.2 - 396.4)	9.0
Total	164.1	(100.0 - 228.2)	100.0	2,768.3	(2,135.8 - 3,400.9)	100.0

Mean tree vol	Harvest type / Annual harvest volume		
	Total		
	thousands m ³	($\alpha = 0.05$)	%
0 - 0.24	933.8	(756.9 - 1,110.8)	25.9
0.25 - 0.49	933.1	(746.8 - 1,119.5)	25.8
0.5 - 0.74	655.9	(490.6 - 821.1)	18.1
0.75 - 0.99	417.3	(299.8 - 534.9)	11.5
1 - 1.24	252.3	(162.6 - 342.1)	7.0
1.25 - 1.49	158.7	(92.5 - 224.9)	4.4
1.5 +	264.5	(117.8 - 411.2)	7.3
Total	3,615.8	(2,960.3 - 4,271.2)	100.0



8.3.2 Mean tree volume harvested by species group

Methodology

The harvest mean tree volume is classified by species group.

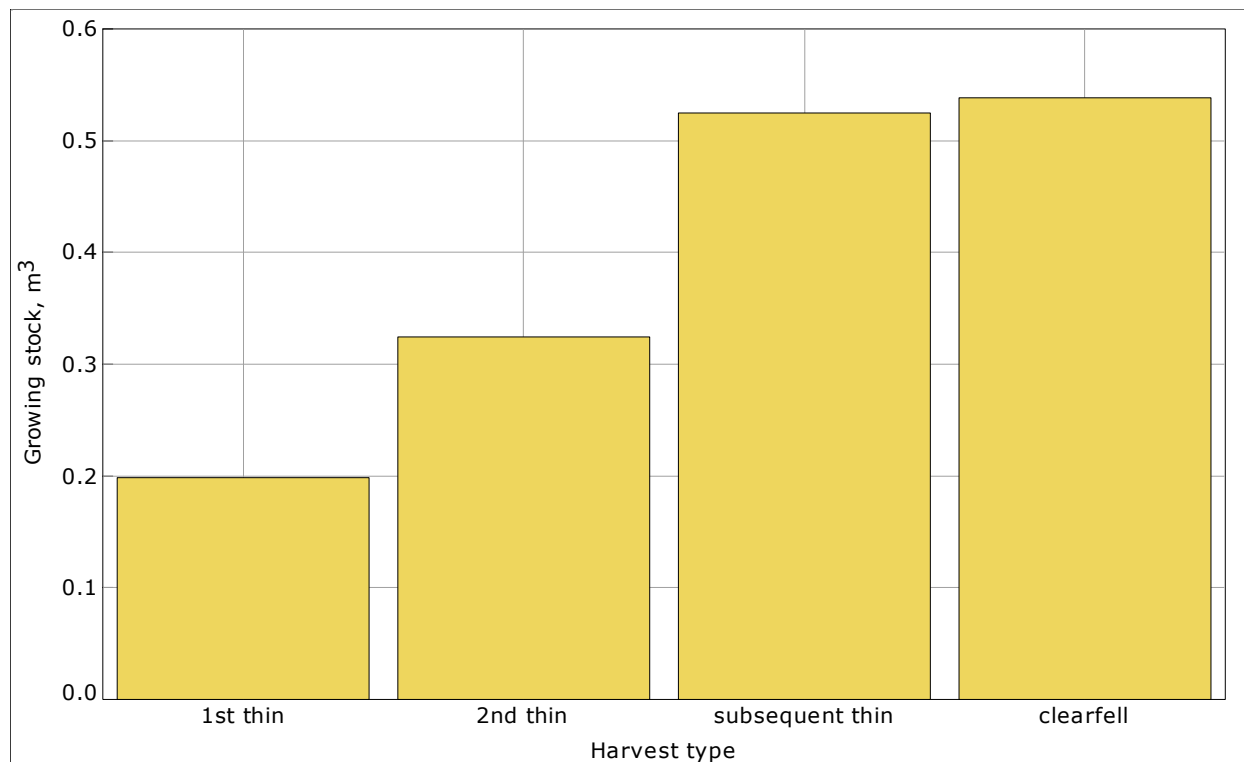
Species group	Growing stock	
	m ³	($\alpha = 0.05$)
Sitka spruce	0.357	(0.317 – 0.397)
Norway spruce	0.489	(0.270 – 0.708)
Scots pine	0.225	(0.016 – 0.434)
other pines	0.314	(0.263 – 0.365)
Douglas-fir	0.949	– –
larch spp.	0.348	(0.291 – 0.405)
other conifers	1.022	(0.814 – 1.231)
ses. & ped. oak	0.129	– –
beech	0.199	– –
ash	0.470	– –
sycamore	0.805	– –
birch spp.	0.126	(0.079 – 0.174)
alder	0.225	(0.000 – 1.212)
OSL broadleaves	0.179	– –
All	0.364	(0.322 – 0.406)

8.3.3 Mean tree volume harvested by harvest type

Methodology

The mean harvested tree volume is classified by harvest type.

Harvest type	Growing stock	
	m ³	($\alpha = 0.05$)
1st thin	0.198	(0.169 – 0.228)
2nd thin	0.324	(0.286 – 0.363)
subsequent thin	0.525	(0.408 – 0.642)
clearfell	0.539	(0.454 – 0.623)
All	0.364	(0.322 – 0.406)

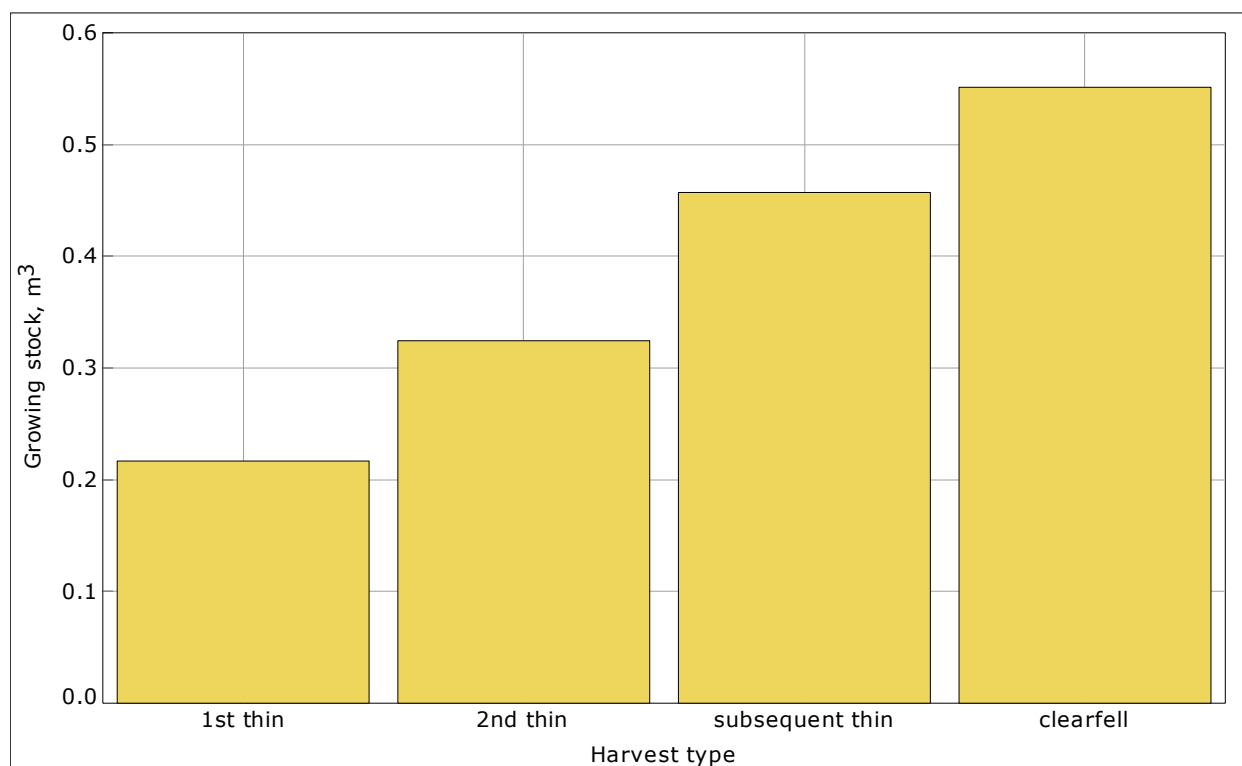


8.3.4 Mean Sitka spruce tree volume harvested by harvest type

Methodology

The mean Sitka spruce harvested tree volume is classified by harvest type.

Harvest type	Growing stock	
	m ³	($\alpha = 0.05$)
1st thin	0.217	(0.195 – 0.239)
2nd thin	0.324	(0.288 – 0.361)
subsequent thin	0.457	(0.219 – 0.696)
clearfell	0.551	(0.466 – 0.636)
All	0.357	(0.317 – 0.397)



Chapter 9

INCREMENT (2006-2012)

The balance between increment and fellings is an important indicator of SFM in a country as it describes the sustainability of wood production over time, the current availability of wood and the potential for the future. Completing both the 2006 and 2012 NFI's allows, for the first time, a field-based assessment of forest increment in Ireland for the entire forest estate. Overall, nearly half (47%) of the gross annual increment was harvested indicating sustainable harvesting in Ireland's forests. In the public forest estate 67% of the gross annual increment was harvested.

Gross annual volume increment between 2006 and 2012 was 7.685 million m³. Nearly two-thirds of the increment occurred in the Public forest estate.

Sitka spruce dominates the volume increment in terms of species groups comprising 70% of the annual volume increment followed by other pines at 9 %. The counties with most significant growing stock increment are distributed on the western and south western seaboard.

The mean annual increment is 11.5 m³/ha/year in the whole forest estate. Public forests average 13 m³/ha/year and Private (grant aided) 11 m³/ha/year, with Private (other) significantly lower at 7 m³/ha/year. The differences are due to a combination of age, species composition and soil type.

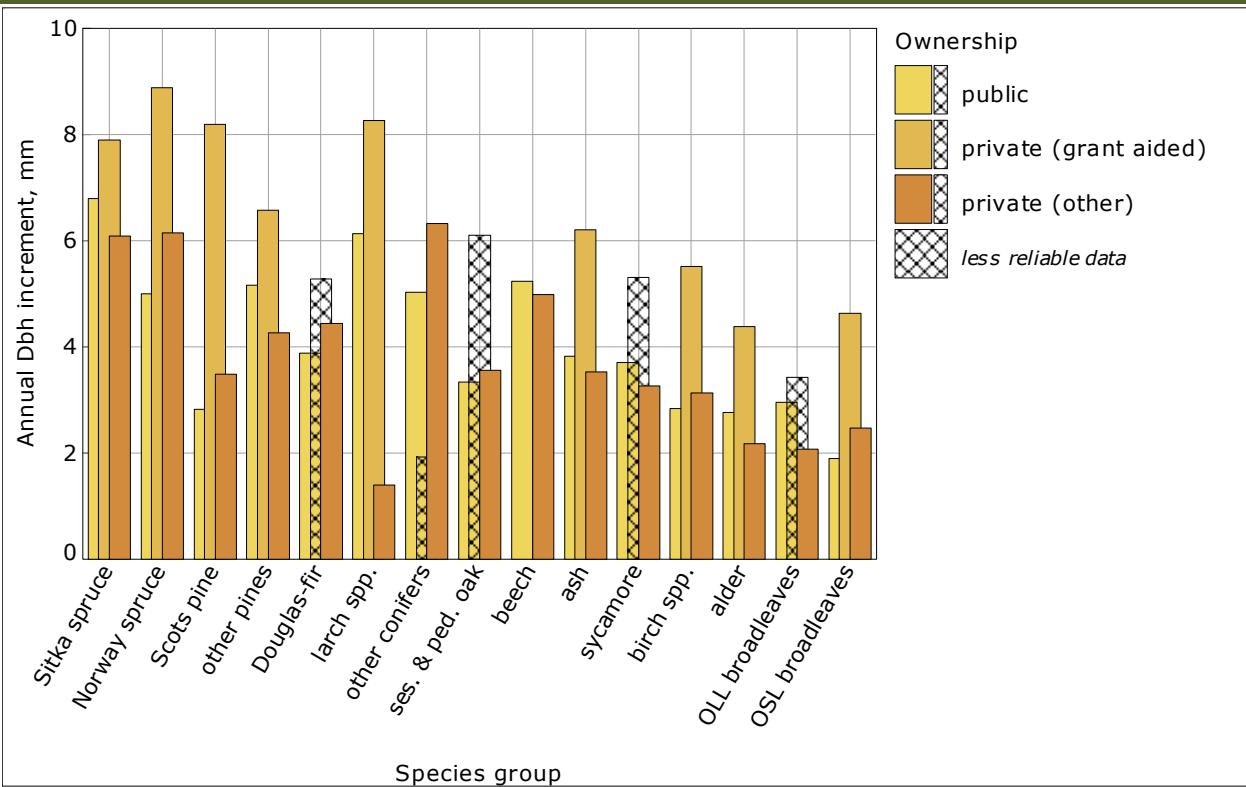
9.1 DIAMETER AT BREAST HEIGHT

Definition
Dbh increment
The mean annual tree diameter growth of a stem at 1.3 m from ground level between NFI cycles.

9.1.1 Weighted mean tree Dbh increment by species group and ownership

Methodology
Mean annual Dbh increment is classified by species group and ownership.
The evaluated variable, Dbh, is weighted by representative tree number. Weighting by the representative tree number removes the effect of the concentric circles.

Species group	Ownership / Annual Dbh increment			
	public	private (grant aided)	private (other)	All
	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)
Sitka spruce	7 (6 - 7)	8 (7 - 8)	6 (5 - 7)	7 (7 - 7)
Norway spruce	5 (5 - 5)	9 (7 - 10)	6 (5 - 7)	7 (6 - 8)
Scots pine	3 (2 - 4)	8 (3 - 14)	3 (0 - 11)	3 (2 - 4)
other pines	5 (0 - 15)	7 (6 - 8)	4 (0 - 11)	5 (0 - 15)
Douglas-fir	4 (3 - 5)	5 - -	4 (0 - 10)	4 (4 - 5)
larch spp.	6 (4 - 8)	8 (4 - 13)	1 (0 - 3)	6 (5 - 8)
other conifers	5 (0 - 10)	2 - -	6 (1 - 12)	5 (4 - 6)
ses. & ped. oak	3 (2 - 4)	6 - -	4 (2 - 5)	4 (3 - 4)
beech	5 (4 - 6)	- - -	5 (4 - 6)	5 (4 - 6)
ash	4 (3 - 4)	6 (4 - 8)	4 (3 - 4)	4 (3 - 5)
sycamore	4 (0 - 19)	5 - -	3 (2 - 5)	4 (3 - 5)
birch spp.	3 (2 - 3)	6 (0 - 18)	3 (2 - 4)	3 (3 - 4)
alder	3 (2 - 3)	4 (4 - 5)	2 (1 - 3)	3 (2 - 3)
OLL broadleaves	3 (2 - 4)	3 - -	2 (2 - 2)	3 (3 - 3)
OSL broadleaves	2 (1 - 3)	5 (2 - 7)	2 (2 - 3)	2 (2 - 3)
All	5 (5 - 6)	8 (7 - 8)	3 (3 - 4)	6 (5 - 6)



9.1.2 Weighted mean tree Dbh increment by species group and age class (10yr)

Methodology

Mean annual Dbh increment is classified by species group and age class.

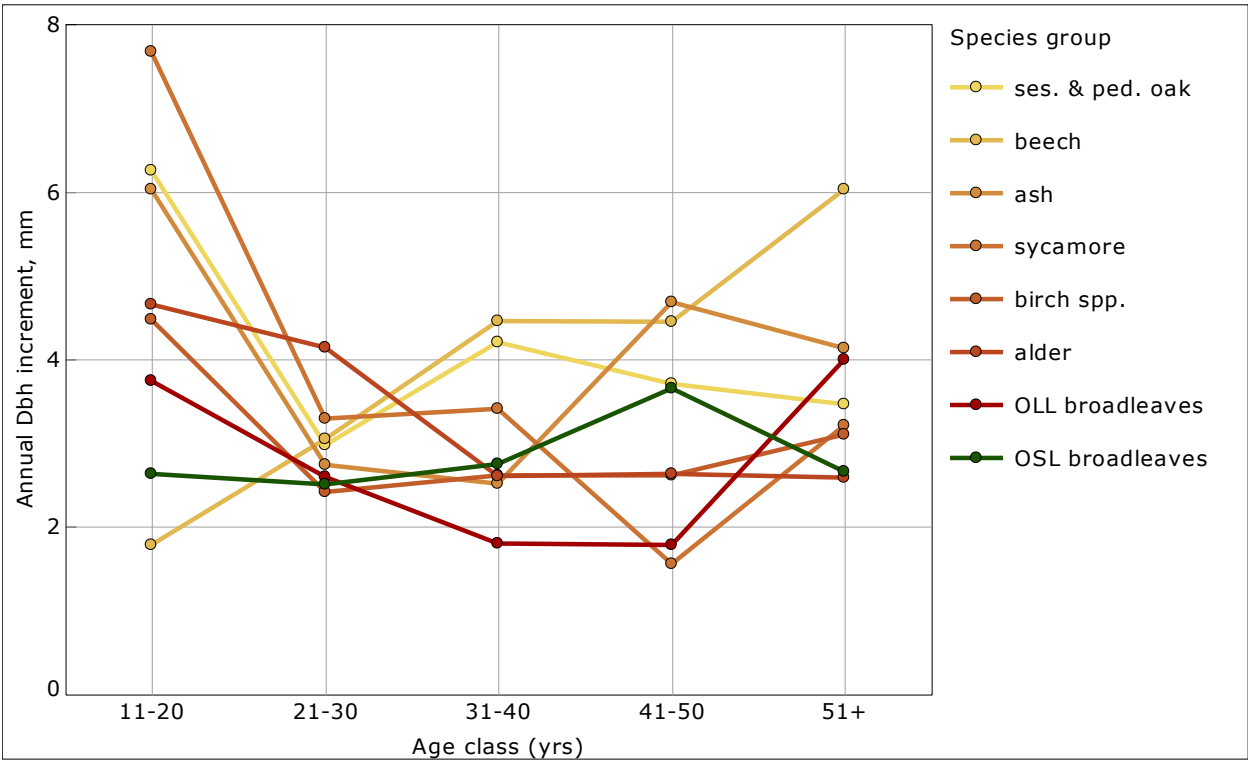
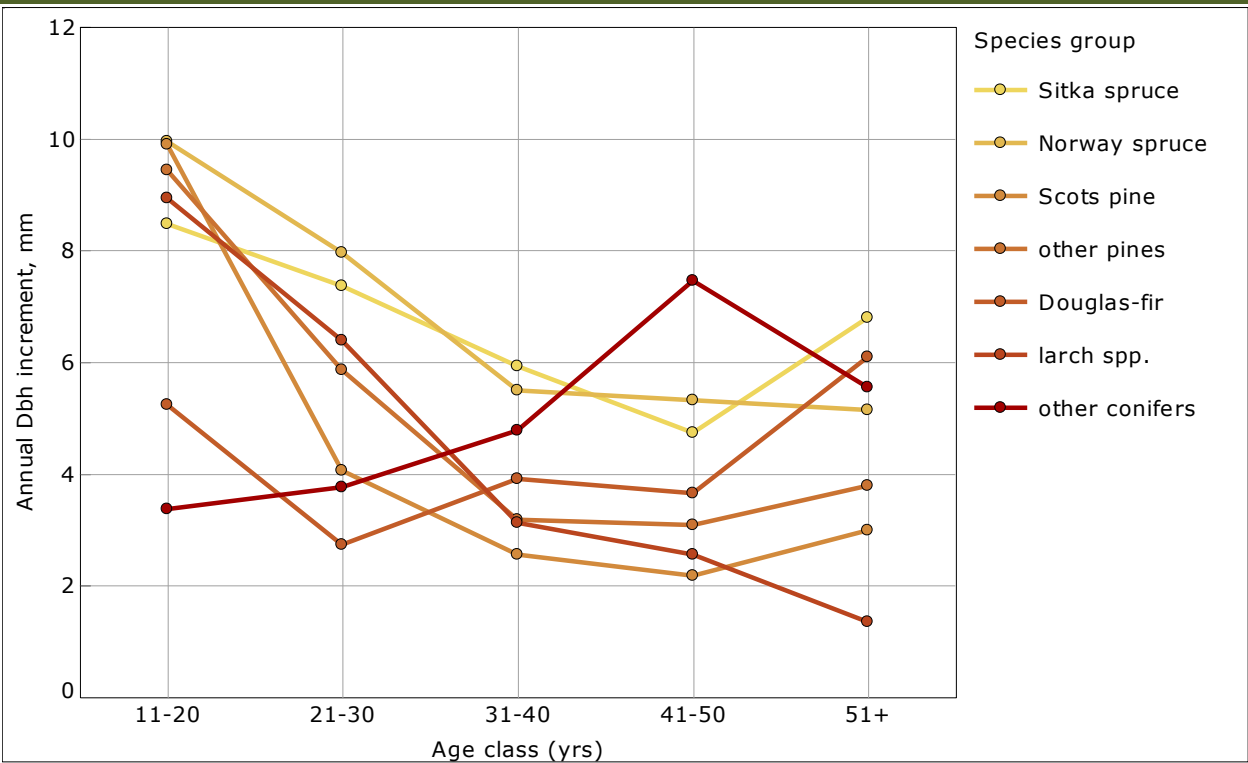
The evaluated variable, Dbh, is weighted by representative tree number. Weighting by the representative tree number removes the effect of the concentric circles.

Age class (yrs)	Species group / Annual Dbh increment			
	Sitka spruce	Norway spruce	Scots pine	other pines
	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)
11-20	8 (8 - 9)	10 (10 - 10)	10 (2 - 17)	9 (8 - 11)
21-30	7 (7 - 8)	8 (3 - 13)	4 - -	6 (5 - 6)
31-40	6 (5 - 6)	5 (5 - 6)	3 - -	3 (3 - 4)
41-50	5 (4 - 5)	5 (5 - 6)	2 (2 - 2)	3 (2 - 4)
51+	7 (0 - 20)	5 (4 - 6)	3 (2 - 3)	4 (0 - 27)
All	7 (7 - 7)	7 (6 - 8)	3 (2 - 4)	5 (0 - 15)

Age class (yrs)	Species group / Annual Dbh increment			
	Douglas-fir	larch spp.	other conifers	ses. & ped. oak
	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)
11-20	5 (4 - 6)	9 (8 - 10)	3 - -	6 - -
21-30	3 (0 - 5)	6 (0 - 19)	4 (1 - 7)	3 (0 - 6)
31-40	4 - -	3 (0 - 7)	5 (4 - 6)	4 - -
41-50	4 (2 - 6)	3 - -	7 (0 - 18)	4 (3 - 5)
51+	6 (3 - 9)	1 (0 - 4)	6 (2 - 9)	3 (3 - 4)
All	4 (4 - 5)	6 (5 - 8)	5 (4 - 6)	4 (3 - 4)

Age class (yrs)	Species group / Annual Dbh increment			
	beech	ash	sycamore	birch spp.
	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)
11-20	2 - -	6 (6 - 7)	8 - -	4 (3 - 5)
21-30	3 (0 - 11)	3 (1 - 4)	3 (2 - 5)	2 (1 - 3)
31-40	4 (2 - 7)	3 (2 - 3)	3 (0 - 26)	3 (2 - 3)
41-50	4 (3 - 6)	5 (0 - 10)	2 (0 - 12)	3 (2 - 3)
51+	6 (5 - 7)	4 (3 - 5)	3 (0 - 15)	3 (3 - 4)
All	5 (4 - 6)	4 (3 - 5)	4 (3 - 5)	3 (3 - 4)

Age class (yrs)	Species group / Annual Dbh increment			
	alder	OLL broadleaves	OSL broadleaves	All
	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)	mm ($\alpha = 0.05$)
11-20	5 (2 - 7)	4 - -	3 (1 - 4)	8 (8 - 9)
21-30	4 - -	3 (2 - 3)	3 (0 - 6)	5 (5 - 5)
31-40	3 (0 - 8)	2 (0 - 3)	3 (2 - 4)	4 (4 - 4)
41-50	3 (1 - 4)	2 (0 - 3)	4 (2 - 6)	4 (3 - 4)
51+	3 (2 - 3)	4 (4 - 4)	3 (0 - 8)	4 (4 - 5)
All	3 (2 - 3)	3 (3 - 3)	2 (2 - 3)	6 (5 - 6)



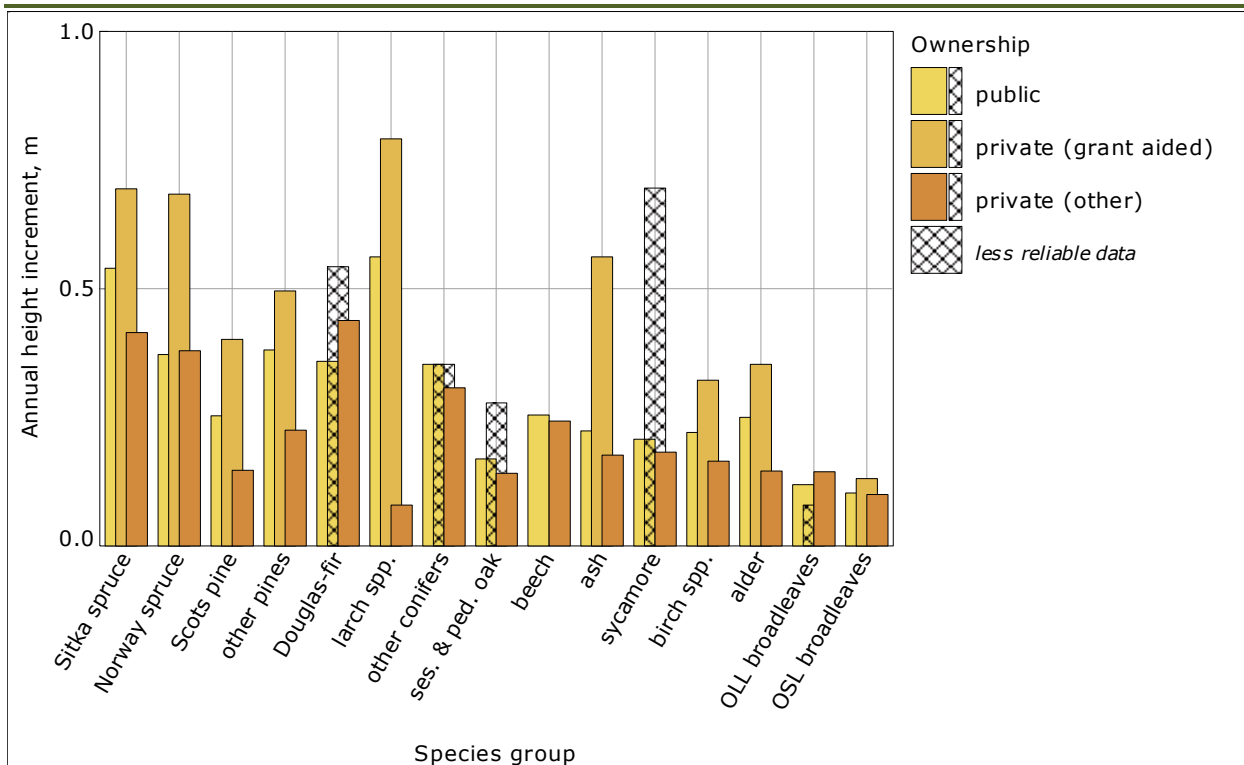
9.2 HEIGHT

Definition
Height increment The mean annual tree height growth.

9.2.1 Weighted mean tree height increment by species group and ownership

Methodology
Mean annual height increment is classified by species group and ownership.
The evaluated variable, height, is weighted by representative tree number. Weighting by the representative tree number removes the effect of the concentric circles.

Species group	Ownership / Annual height increment			
	public	private (grant aided)	private (other)	All
	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)
Sitka spruce	0.54 (0.52 – 0.56)	0.69 (0.66 – 0.73)	0.42 (0.36 – 0.47)	0.59 (0.57 – 0.61)
Norway spruce	0.37 (0.33 – 0.41)	0.68 (0.65 – 0.72)	0.38 (0.12 – 0.64)	0.51 (0.42 – 0.60)
Scots pine	0.25 (0.21 – 0.30)	0.40 (0.31 – 0.49)	0.15 (0.11 – 0.18)	0.22 (0.17 – 0.27)
other pines	0.38 (0.00 – 0.88)	0.50 (0.40 – 0.60)	0.23 (0.00 – 0.46)	0.40 (0.00 – 0.89)
Douglas-fir	0.36 (0.32 – 0.40)	0.54 – –	0.44 (0.00 – 1.26)	0.41 (0.36 – 0.45)
larch spp.	0.56 (0.48 – 0.65)	0.79 (0.55 – 1.03)	0.08 (0.00 – 0.20)	0.58 (0.44 – 0.72)
other conifers	0.35 (0.00 – 0.72)	0.35 – –	0.31 (0.00 – 0.81)	0.32 (0.20 – 0.44)
ses. & ped. oak	0.17 (0.12 – 0.22)	0.28 – –	0.14 (0.00 – 0.28)	0.18 (0.14 – 0.23)
beech	0.25 (0.10 – 0.41)	– – –	0.24 (0.17 – 0.32)	0.24 (0.18 – 0.30)
ash	0.22 (0.09 – 0.36)	0.56 (0.52 – 0.60)	0.18 (0.14 – 0.22)	0.24 (0.19 – 0.30)
sycamore	0.21 (0.14 – 0.27)	0.70 – –	0.18 (0.09 – 0.27)	0.22 (0.16 – 0.28)
birch spp.	0.22 (0.16 – 0.28)	0.32 (0.00 – 1.29)	0.16 (0.11 – 0.22)	0.20 (0.17 – 0.24)
alder	0.25 (0.18 – 0.32)	0.35 (0.22 – 0.48)	0.15 (0.11 – 0.19)	0.19 (0.16 – 0.23)
OLL broadleaves	0.12 (0.06 – 0.18)	0.08 – –	0.14 (0.09 – 0.20)	0.14 (0.10 – 0.19)
OSL broadleaves	0.10 (0.06 – 0.14)	0.13 (0.00 – 0.42)	0.10 (0.06 – 0.14)	0.11 (0.08 – 0.13)
All	0.44 (0.42 – 0.46)	0.66 (0.61 – 0.70)	0.20 (0.16 – 0.24)	0.45 (0.44 – 0.47)

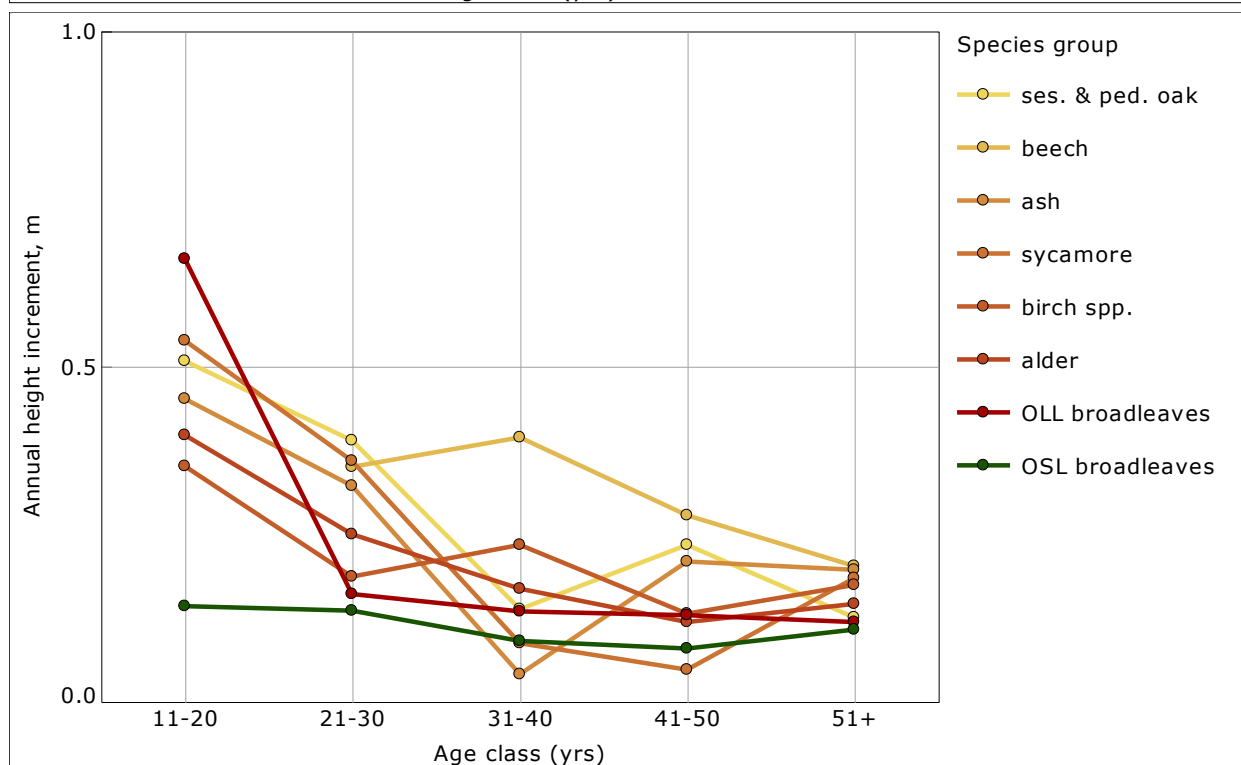
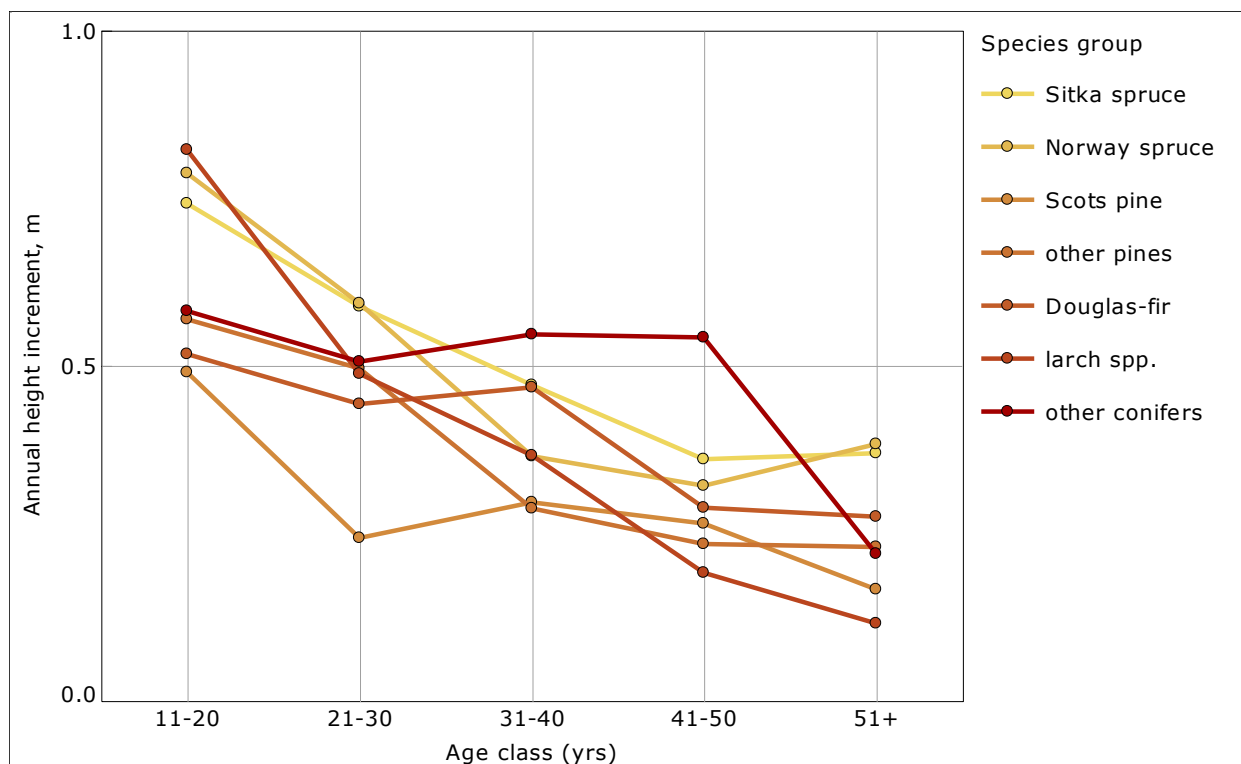


9.2.2 Weighted mean tree height increment by species group and age class (10yr)

Methodology
Mean annual height increment is classified by species group and age class.
The evaluated variable, height, is weighted by representative tree number. Weighting by the representative tree number removes the effect of the concentric circles.

Age class (yrs)	Species group / Annual height increment					
	Sitka spruce	Norway spruce	Scots pine	other pines	Douglas-fir	
	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)
11-20	0.74 (0.70 – 0.78)	0.79 (0.77 – 0.81)	0.49 (0.37 – 0.61)	0.57 (0.52 – 0.62)	0.52 (0.47 – 0.56)	
21-30	0.59 (0.56 – 0.62)	0.59 (0.24 – 0.94)	0.24 – –	0.50 (0.41 – 0.58)	0.44 (0.01 – 0.87)	
31-40	0.47 (0.43 – 0.51)	0.36 (0.34 – 0.39)	0.30 – –	0.29 (0.25 – 0.32)	0.47 – –	
41-50	0.36 (0.33 – 0.39)	0.32 (0.09 – 0.55)	0.26 (0.06 – 0.46)	0.23 (0.19 – 0.28)	0.29 (0.19 – 0.39)	
51+	0.37 (0.37 – 0.37)	0.38 (0.34 – 0.42)	0.17 (0.13 – 0.21)	0.23 (0.00 – 0.94)	0.27 (0.24 – 0.31)	
All	0.59 (0.57 – 0.61)	0.51 (0.42 – 0.60)	0.22 (0.17 – 0.27)	0.40 (0.00 – 0.89)	0.41 (0.36 – 0.45)	
Age class (yrs)	Species group / Annual height increment					
	larch spp.	other conifers	ses. & ped. oak	beech	ash	
	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)
11-20	0.82 (0.60 – 1.04)	0.58 – –	0.51 – –	– – –	0.45 (0.18 – 0.72)	
21-30	0.49 (0.01 – 0.96)	0.51 (0.44 – 0.58)	0.39 (0.02 – 0.76)	0.35 (0.13 – 0.57)	0.32 (0.21 – 0.44)	
31-40	0.37 (0.23 – 0.51)	0.55 (0.53 – 0.57)	0.14 – –	0.39 (0.33 – 0.46)	0.04 (0.00 – 0.09)	
41-50	0.19 – –	0.54 (0.00 – 1.39)	0.23 (0.01 – 0.46)	0.28 (0.00 – 1.39)	0.21 (0.01 – 0.41)	
51+	0.11 (0.00 – 0.35)	0.22 (0.21 – 0.23)	0.13 (0.09 – 0.16)	0.20 (0.15 – 0.25)	0.20 (0.16 – 0.24)	
All	0.58 (0.44 – 0.72)	0.32 (0.20 – 0.44)	0.18 (0.14 – 0.23)	0.24 (0.18 – 0.30)	0.24 (0.19 – 0.30)	
Age class (yrs)	Species group / Annual height increment					
	sycamore	birch spp.	alder	OLL broadleaves	OSL broadleaves	
	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)	m (α = 0.05)
11-20	0.54 – –	0.35 (0.23 – 0.47)	0.40 (0.26 – 0.54)	0.66 – –	0.14 (0.04 – 0.24)	
21-30	0.36 (0.00 – 0.87)	0.19 (0.15 – 0.22)	0.25 – –	0.16 (0.13 – 0.19)	0.13 (0.11 – 0.16)	
31-40	0.09 (0.00 – 0.63)	0.23 (0.17 – 0.30)	0.17 (0.10 – 0.23)	0.13 (0.04 – 0.22)	0.09 (0.06 – 0.12)	
41-50	0.05 (0.04 – 0.06)	0.13 (0.09 – 0.17)	0.12 (0.03 – 0.21)	0.13 (0.02 – 0.24)	0.08 (0.00 – 0.17)	
51+	0.18 (0.13 – 0.24)	0.17 (0.13 – 0.22)	0.15 (0.10 – 0.20)	0.12 (0.04 – 0.20)	0.11 (0.00 – 0.23)	
All	0.22 (0.16 – 0.28)	0.20 (0.17 – 0.24)	0.19 (0.16 – 0.23)	0.14 (0.10 – 0.19)	0.11 (0.08 – 0.13)	

Age class (yrs)	Species group / Annual height increment	
	All	
	m	($\alpha = 0.05$)
11-20	0.68	(0.65 – 0.72)
21-30	0.43	(0.40 – 0.45)
31-40	0.32	(0.29 – 0.34)
41-50	0.22	(0.20 – 0.25)
51+	0.17	(0.15 – 0.20)
All	0.45	(0.44 – 0.47)



9.3 GROSS ANNUAL VOLUME INCREMENT

Definition

Gross annual volume increment

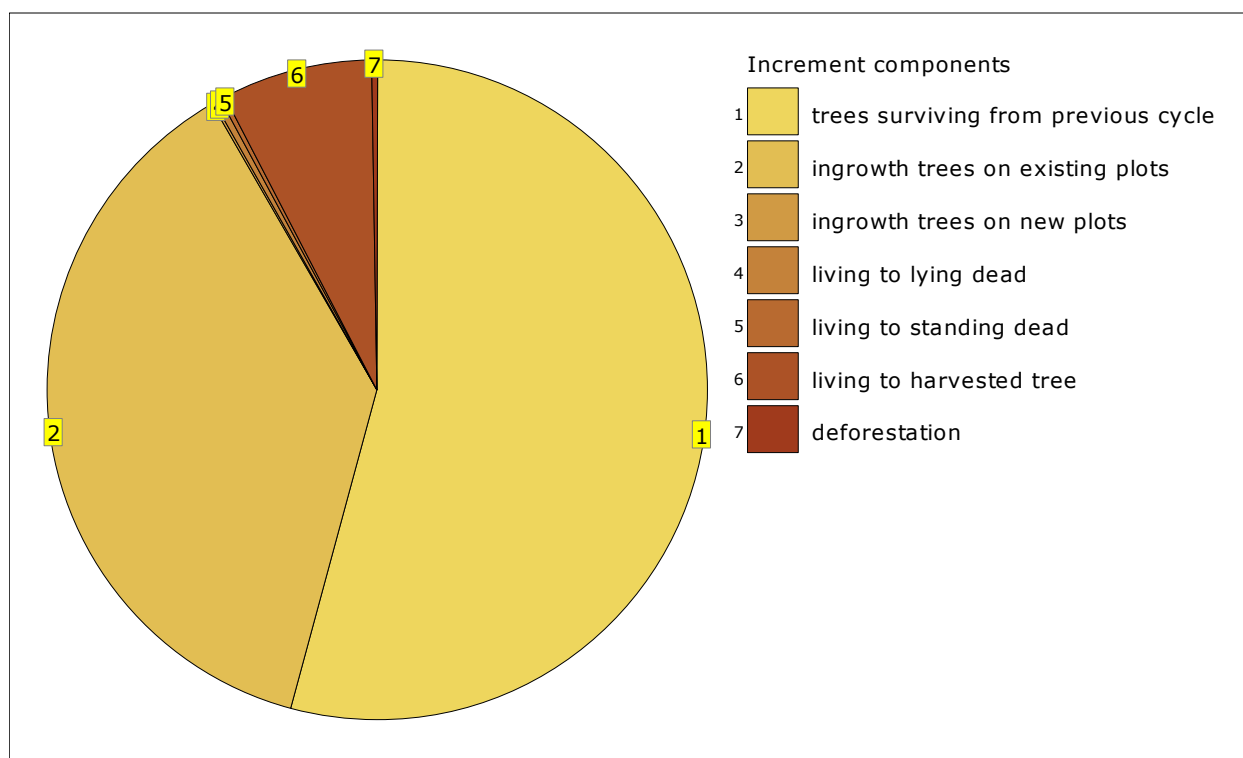
Average annual volume of increment over the period 2002-2012 of trees ≥ 7 cm Dbh. Includes the increment of trees which have been felled or have died during the reference period.

9.3.1 Gross annual volume increment by increment components

Methodology

Gross annual volume increment is classified into components to facilitate the calculation of net annual increment.

Increment components	Annual volume increment		
	thousands m ³	($\alpha = 0.05$)	%
trees surviving from previous cycle	4,171.5	(3,944.4 – 4,398.6)	54.4
ingrowth trees on existing plots	2,874.0	(2,701.1 – 3,047.0)	37.4
ingrowth trees on new plots	10.5	(0.0 – 71.9)	0.1
living to lying dead	24.2	(17.8 – 30.6)	0.3
living to standing dead	17.9	(14.0 – 21.7)	0.2
living to harvested tree	561.8	(492.7 – 630.8)	7.3
deforestation	25.5	(3.0 – 47.9)	0.3
Total	7,685.3	(7,339.2 – 8,031.5)	100.0

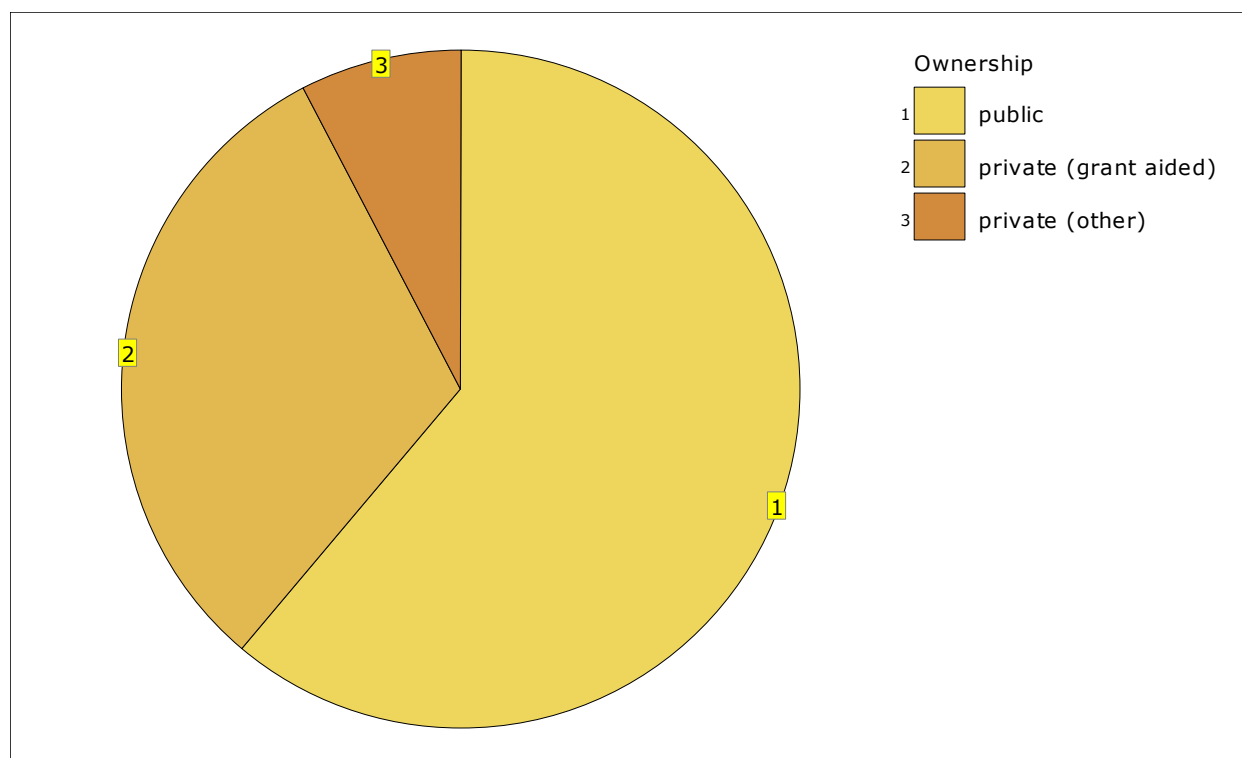


9.3.2 Gross annual volume increment by ownership

Methodology

Gross annual volume increment is classified by ownership.

Ownership	Annual volume increment		
	thousands m ³	($\alpha = 0.05$)	%
public	4,702.4	(4,436.4 – 4,968.3)	61.2
private (grant aided)	2,392.4	(2,205.6 – 2,579.1)	31.1
private (other)	590.6	(509.3 – 671.9)	7.7
Total	7,685.3	(7,339.2 – 8,031.5)	100.0



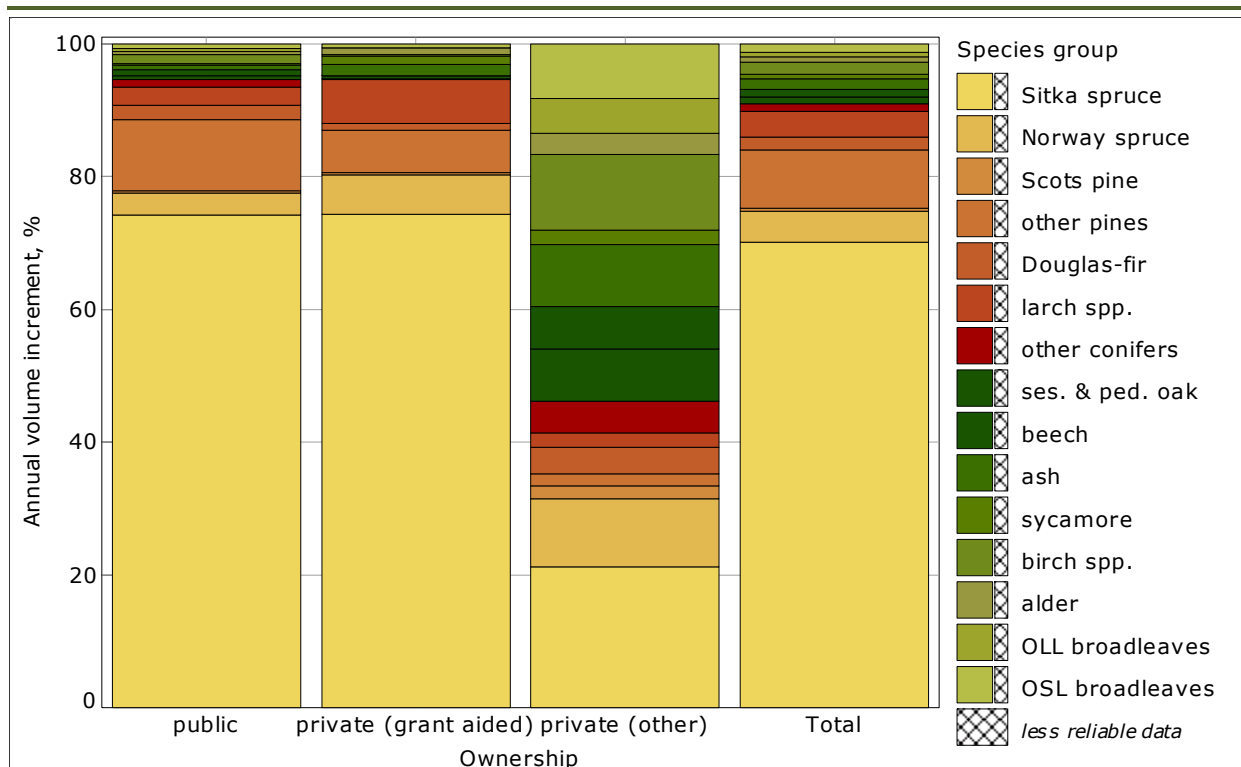
9.3.3 Gross annual volume increment by species group and ownership

Methodology

Gross annual volume increment is classified by species group and ownership.

Species group	Ownership / Annual volume increment					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	3,489.1	(3,244.2 - 3,734.0)	74.4	1,778.8	(1,608.3 - 1,949.4)	74.2
Norway spruce	155.2	(114.9 - 195.5)	3.3	142.8	(111.8 - 173.7)	6.0
Scots pine	15.6	(7.1 - 24.2)	0.3	7.8	(0.0 - 24.5)	0.3
other pines	508.6	(435.1 - 582.0)	10.8	152.7	(111.9 - 193.5)	6.4
Douglas-fir	100.7	(80.9 - 120.4)	2.1	23.6	(16.8 - 30.3)	1.0
larch spp.	128.5	(95.8 - 161.1)	2.7	159.1	(118.7 - 199.5)	6.7
other conifers	52.8	(21.0 - 84.6)	1.1	1.6	-	0.07
ses. & ped. oak	27.1	(14.4 - 39.9)	0.6	12.0	(4.5 - 19.5)	0.5
beech	44.6	(30.0 - 59.3)	0.9	0.8	-	0.03
ash	30.5	(18.8 - 42.2)	0.6	40.1	(23.9 - 56.2)	1.7
sycamore	11.7	(7.2 - 16.3)	0.2	28.6	(0.0 - 109.0)	1.2
birch spp.	64.7	(50.3 - 79.0)	1.4	7.7	(0.0 - 22.1)	0.3
alder	18.1	(13.1 - 23.1)	0.4	22.9	(11.5 - 34.4)	1.0
OLL broadleaves	23.4	(20.8 - 26.1)	0.5	1.8	(0.4 - 3.3)	0.08
OSL broadleaves	31.5	(17.6 - 45.5)	0.7	12.1	(9.0 - 15.1)	0.5
Total	4,702.4	(4,436.4 - 4,968.3)	100.0	2,392.4	(2,205.6 - 2,579.1)	100.0

Species group	Ownership / Annual volume increment					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Sitka spruce	125.4	(81.9 - 169.0)	21.1	5,393.4	(5,090.7 - 5,696.0)	70.2
Norway spruce	60.3	(0.0 - 129.4)	10.2	358.3	(299.5 - 417.1)	4.7
Scots pine	11.8	(2.2 - 21.4)	2.0	35.2	(23.0 - 47.5)	0.5
other pines	10.7	(0.0 - 29.5)	1.8	671.9	(588.7 - 755.1)	8.7
Douglas-fir	23.6	(14.3 - 33.0)	4.0	147.9	(121.5 - 174.3)	1.9
larch spp.	12.7	(6.0 - 19.4)	2.2	300.3	(238.3 - 362.3)	3.9
other conifers	28.1	(0.0 - 57.3)	4.8	82.6	(41.2 - 124.0)	1.1
ses. & ped. oak	46.4	(29.3 - 63.5)	7.9	85.5	(63.2 - 107.9)	1.1
beech	38.0	(22.4 - 53.5)	6.4	83.4	(65.3 - 101.4)	1.1
ash	55.4	(42.1 - 68.7)	9.4	126.0	(98.8 - 153.2)	1.6
sycamore	12.5	(4.8 - 20.1)	2.1	52.9	(33.4 - 72.4)	0.7
birch spp.	67.1	(51.6 - 82.6)	11.4	139.4	(118.5 - 160.4)	1.8
alder	19.4	(13.7 - 25.2)	3.3	60.5	(45.6 - 75.5)	0.8
OLL broadleaves	30.5	(0.0 - 142.9)	5.2	55.8	(0.0 - 170.7)	0.7
OSL broadleaves	48.6	(35.2 - 62.0)	8.2	92.2	(74.4 - 110.0)	1.2
Total	590.6	(509.3 - 671.9)	100.0	7,685.3	(7,339.2 - 8,031.5)	100.0



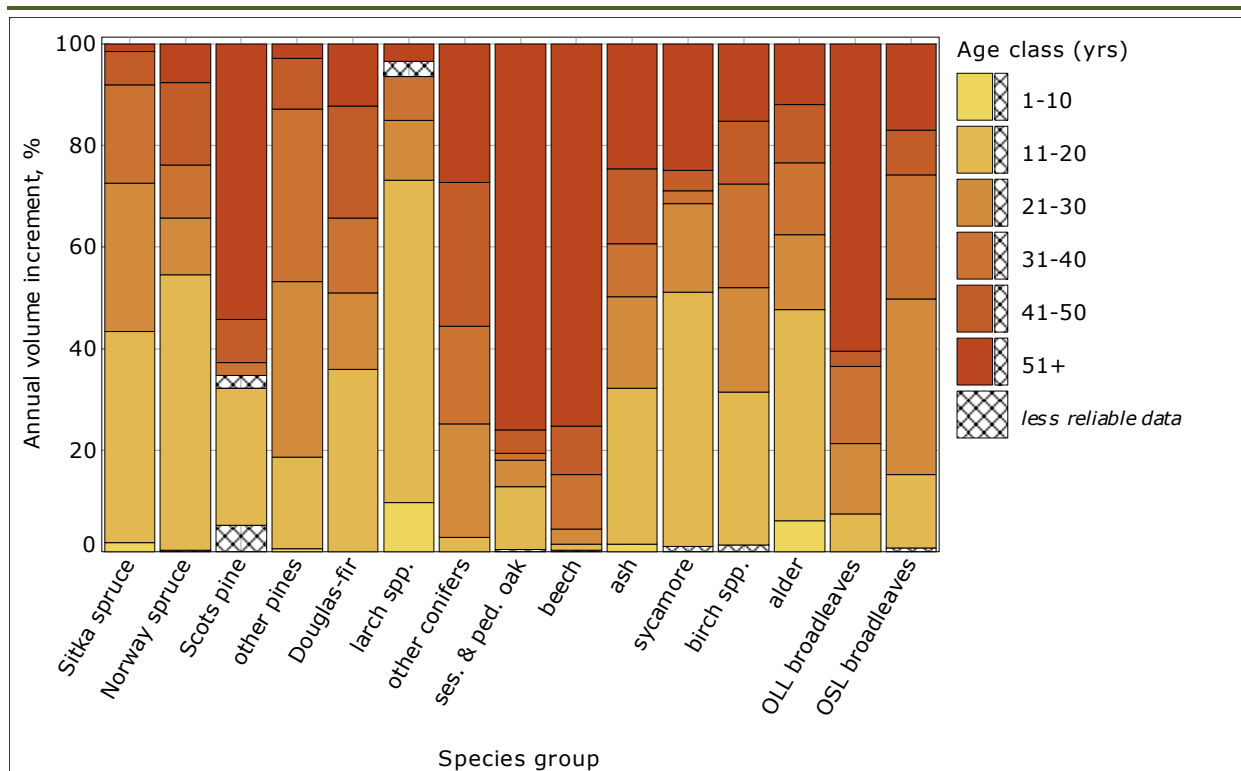
9.3.4 Gross annual volume increment by species group and age class (10yr)

Methodology

Gross annual volume increment is classified by species group and age class (10yr).

Age class (yrs)	Species group / Annual volume increment					
	Sitka spruce			Norway spruce		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	99.2	(77.8 - 120.6)	1.8	1.0	-	0.3
11-20	2,242.1	(2,050.5 - 2,433.7)	41.7	194.4	(153.4 - 235.5)	54.3
21-30	1,573.3	(1,404.2 - 1,742.5)	29.2	40.2	(0.0 - 126.1)	11.2
31-40	1,047.6	(915.8 - 1,179.4)	19.4	37.1	(8.7 - 65.5)	10.3
41-50	353.2	(289.2 - 417.1)	6.5	58.3	(37.1 - 79.6)	16.3
51+	78.0	(0.0 - 162.0)	1.4	27.3	(23.8 - 30.8)	7.6
Total	5,393.4	(5,090.7 - 5,696.0)	100.0	358.3	(299.5 - 417.1)	100.0
Age class (yrs)	Species group / Annual volume increment					
	Scots pine			other pines		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	1.8	-	5.2	3.5	(0.9 - 6.1)	0.5
11-20	9.5	(0.0 - 23.0)	27.1	121.5	(87.0 - 156.1)	18.1
21-30	0.9	-	2.5	232.8	(176.2 - 289.5)	34.7
31-40	0.9	(0.0 - 5.1)	2.5	228.0	(184.8 - 271.2)	33.9
41-50	3.0	(0.0 - 6.7)	8.5	66.6	(39.6 - 93.6)	9.9
51+	19.1	(11.9 - 26.4)	54.2	19.4	(0.0 - 161.6)	2.9
Total	35.2	(23.0 - 47.5)	100.0	671.9	(588.7 - 755.1)	100.0
Age class (yrs)	Species group / Annual volume increment					
	Douglas-fir			larch spp.		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	-	-	-	29.2	(21.6 - 36.8)	9.7
11-20	53.2	(42.1 - 64.2)	36.0	190.5	(138.3 - 242.7)	63.5
21-30	22.2	(0.0 - 44.5)	15.0	35.5	(15.2 - 55.8)	11.8
31-40	21.7	(13.0 - 30.3)	14.7	26.0	(0.0 - 133.3)	8.6
41-50	32.7	(17.7 - 47.7)	22.1	8.8	-	2.9
51+	18.1	(11.9 - 24.3)	12.2	10.4	(0.0 - 54.6)	3.5
Total	147.9	(121.5 - 174.3)	100.0	300.3	(238.3 - 362.3)	100.0

Age class (yrs)	Species group / Annual volume increment					
	other conifers			ses. & ped. oak		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	–	–	–	0.3	–	0.4
11-20	2.3	(0.0 – 4.7)	2.8	10.6	(0.0 – 27.0)	12.4
21-30	18.5	(0.0 – 39.1)	22.3	4.4	(0.0 – 45.2)	5.2
31-40	15.9	(0.0 – 133.5)	19.2	1.2	(0.7 – 1.6)	1.4
41-50	23.4	(0.0 – 157.8)	28.4	3.9	(2.8 – 5.1)	4.6
51+	22.6	(0.0 – 83.9)	27.3	65.0	(46.0 – 83.9)	76.0
Total	82.6	(41.2 – 124.0)	100.0	85.5	(63.2 – 107.9)	100.0
Age class (yrs)	Species group / Annual volume increment					
	beech			ash		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	0.3	–	0.3	1.8	(1.7 – 1.9)	1.4
11-20	1.0	(0.0 – 2.2)	1.1	38.6	(14.8 – 62.4)	30.8
21-30	2.5	(0.0 – 6.3)	3.0	22.8	(9.8 – 35.8)	18.1
31-40	9.0	(0.0 – 33.3)	10.8	13.1	(7.3 – 18.9)	10.4
41-50	7.9	(0.0 – 24.3)	9.4	18.7	(9.3 – 28.1)	14.8
51+	62.8	(47.4 – 78.2)	75.4	30.9	(18.0 – 43.8)	24.5
Total	83.4	(65.3 – 101.4)	100.0	126.0	(98.8 – 153.2)	100.0
Age class (yrs)	Species group / Annual volume increment					
	sycamore			birch spp.		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	0.6	–	1.1	1.8	–	1.3
11-20	26.5	(12.2 – 40.8)	50.2	42.1	(31.1 – 53.2)	30.1
21-30	9.2	(0.0 – 59.0)	17.3	28.5	(19.5 – 37.5)	20.5
31-40	1.3	(0.0 – 6.5)	2.5	28.6	(16.7 – 40.4)	20.5
41-50	2.2	(0.0 – 6.2)	4.1	17.3	(3.2 – 31.4)	12.4
51+	13.1	(7.4 – 18.9)	24.8	21.2	(13.1 – 29.2)	15.2
Total	52.9	(33.4 – 72.4)	100.0	139.4	(118.5 – 160.4)	100.0
Age class (yrs)	Species group / Annual volume increment					
	alder			OLL broadleaves		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	3.7	(1.5 – 5.9)	6.1	–	–	–
11-20	25.2	(13.8 – 36.6)	41.7	4.1	(2.9 – 5.3)	7.4
21-30	8.9	(0.0 – 28.3)	14.7	7.8	(0.0 – 35.3)	13.9
31-40	8.5	(5.4 – 11.6)	14.1	8.5	(5.9 – 11.1)	15.2
41-50	7.0	(1.5 – 12.4)	11.5	1.7	(0.0 – 3.6)	3.0
51+	7.2	(3.0 – 11.4)	11.9	33.8	(30.5 – 37.1)	60.5
Total	60.5	(45.6 – 75.5)	100.0	55.8	(0.0 – 170.7)	100.0
Age class (yrs)	Species group / Annual volume increment					
	OSL broadleaves			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
1-10	0.7	–	0.7	143.8	(115.5 – 172.1)	1.9
11-20	13.4	(9.0 – 17.8)	14.5	2,975.1	(2,755.7 – 3,194.6)	38.7
21-30	31.9	(18.4 – 45.5)	34.6	2,039.4	(1,823.4 – 2,255.4)	26.5
31-40	22.5	(14.7 – 30.2)	24.4	1,469.7	(1,297.4 – 1,642.0)	19.1
41-50	8.0	(2.5 – 13.6)	8.7	612.6	(516.5 – 708.7)	8.0
51+	15.7	(4.2 – 27.3)	17.1	444.7	(361.3 – 528.1)	5.8
Total	92.2	(74.4 – 110.0)	100.0	7,685.3	(7,339.2 – 8,031.5)	100.0



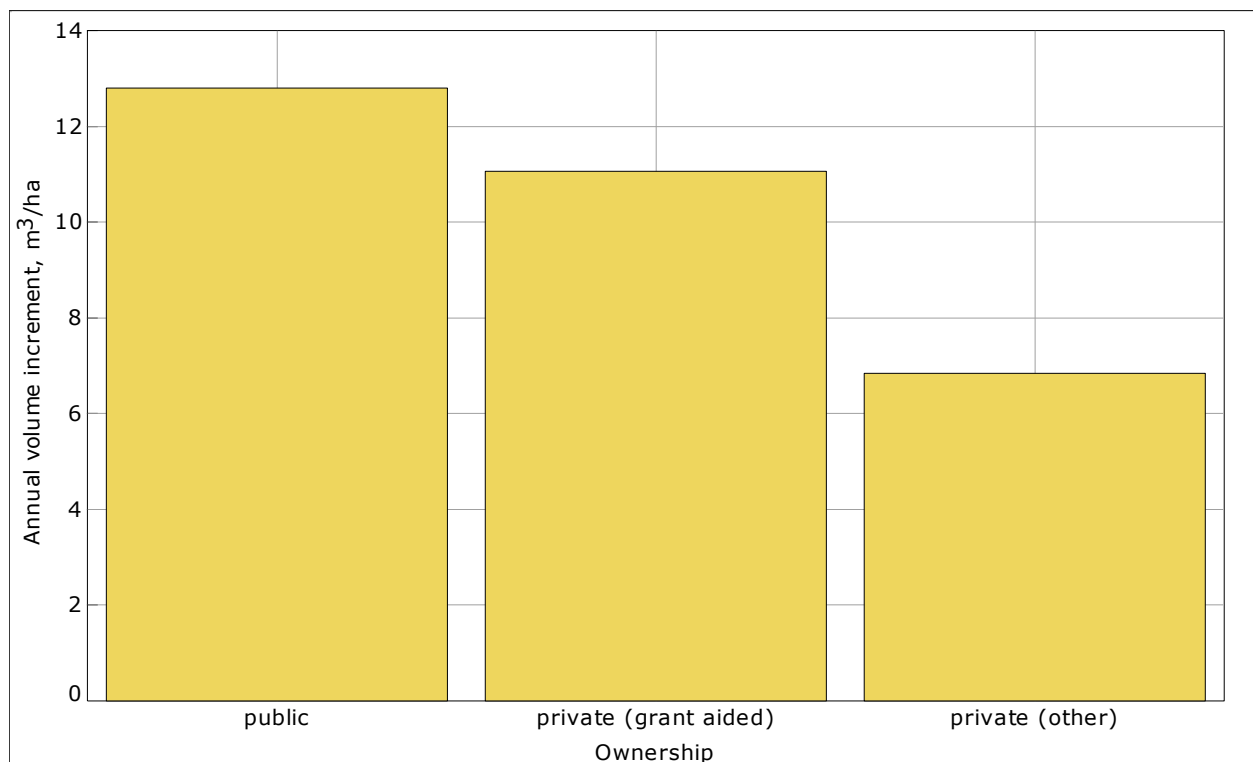
9.4 NET ANNUAL VOLUME INCREMENT PER HECTARE IN THE STOCKED FOREST

Definition
Net annual volume increment per hectare Average annual volume increment per hectare over the period 2006-2012 of trees ≥ 7 cm Dbh, including the increment of all living trees and trees that were harvested during the reference period. The increment during the reference period from the following trees is excluded; living to standing dead, living to lying dead and trees that were deforested.

9.4.1 Weighted net annual volume increment per hectare by ownership

Methodology
Net annual volume increment per hectare is classified by ownership.

Ownership	Annual volume increment	
	m ³ /ha	(a = 0.05)
public	12.8	(12.0 – 13.6)
private (grant aided)	11.1	(10.0 – 12.1)
private (other)	6.8	(5.9 – 7.8)
All	11.4	(10.8 – 12.0)



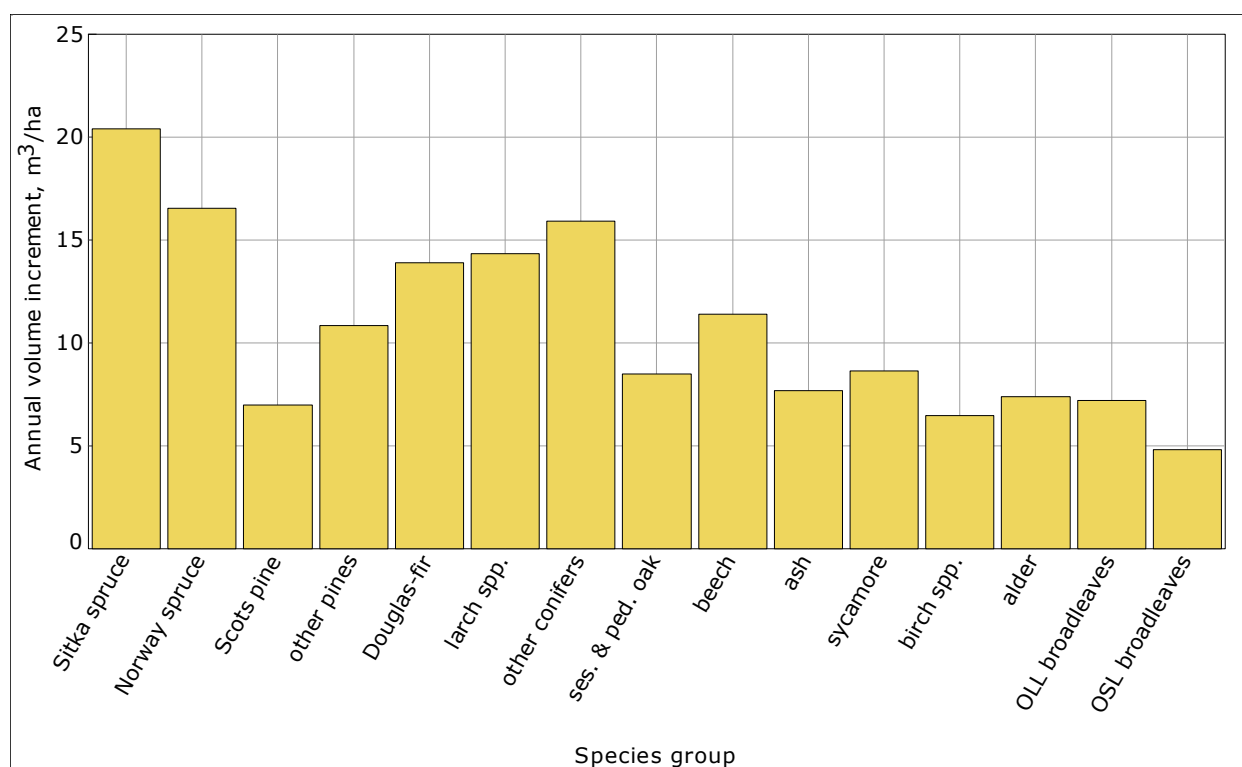
9.4.2 Normalised mean net annual volume increment per hectare by species group

Methodology

The normalised net annual volume increment per hectare is classified by species group.

The calculated value of the variable under consideration for a plot (i.e. volume increment) is divided not by the whole plot area, but by the area of the part of the plot where the given variable is present. Therefore the sum of volume increment for a plot is related only to the area occupied by those trees, not to the whole plot.

Species group	Annual volume increment	
	m ³ /ha	(a = 0.05)
Sitka spruce	20.4	(19.5 – 21.3)
Norway spruce	16.5	(13.3 – 19.7)
Scots pine	7.0	(5.9 – 8.1)
other pines	10.8	(9.7 – 12.0)
Douglas-fir	13.9	(12.0 – 15.8)
larch spp.	14.3	(12.7 – 15.9)
other conifers	15.9	(12.6 – 19.2)
ses. & ped. oak	8.5	(6.9 – 10.1)
beech	11.4	(9.8 – 13.0)
ash	7.7	(6.6 – 8.7)
sycamore	8.6	(7.1 – 10.2)
birch spp.	6.5	(5.8 – 7.1)
alder	7.4	(6.6 – 8.2)
OLL broadleaves	7.2	(6.7 – 7.8)
OSL broadleaves	4.8	(4.1 – 5.5)



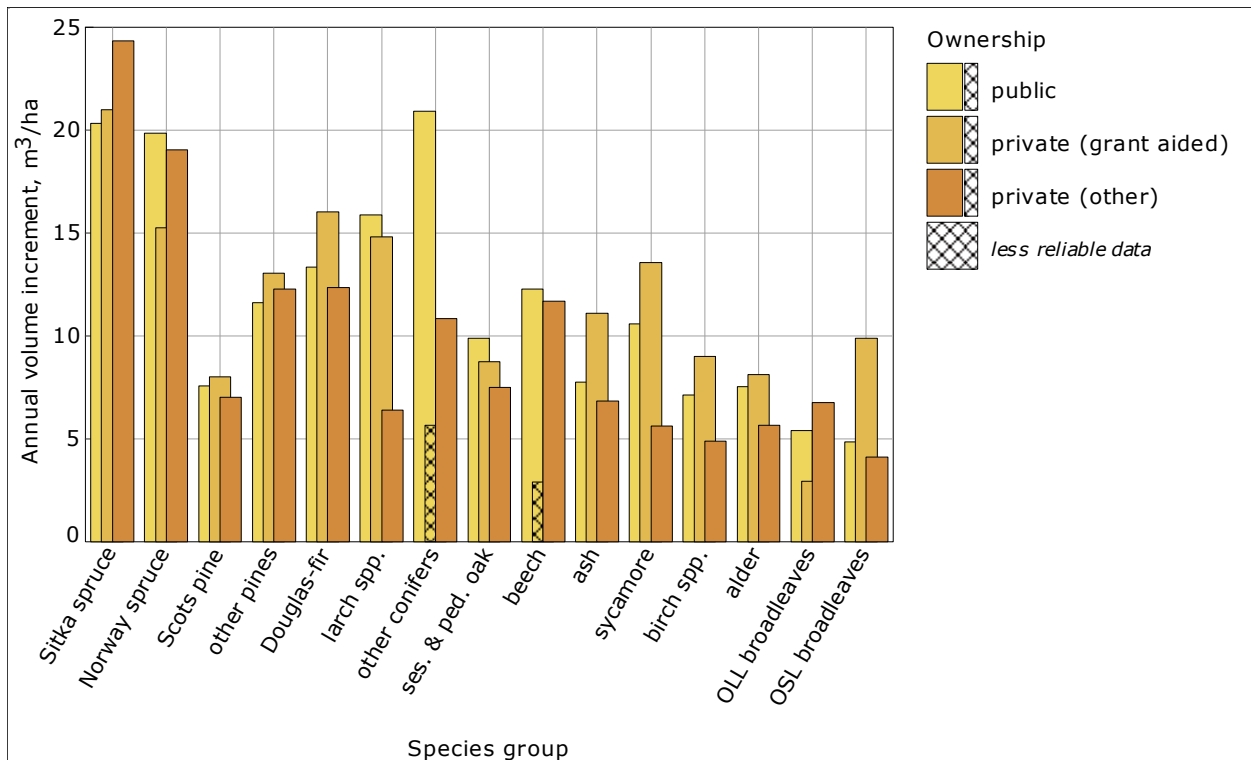
9.4.3 Normalised mean net annual volume increment per hectare by species group and ownership

Methodology

The normalised net annual volume increment per hectare is classified by species group and ownership.

The calculated value of the variable under consideration for a plot (i.e. volume increment) is divided not by the whole plot area, but by the area of the part of the plot where the given variable is present. Therefore the sum of volume increment for a plot is related only to the area occupied by those trees, not to the whole plot.

Species group	Ownership / Annual volume increment					
	public		private (grant aided)		private (other)	
	m ³ /ha	(a = 0.05)	m ³ /ha	(a = 0.05)	m ³ /ha	(a = 0.05)
Sitka spruce	20.3	(19.1 – 21.6)	21.0	(19.6 – 22.4)	24.3	(21.8 – 26.9)
Norway spruce	19.8	(16.6 – 23.0)	15.3	(13.5 – 17.1)	19.1	(0.0 – 39.0)
Scots pine	7.6	(5.5 – 9.6)	8.0	(0.0 – 16.7)	7.0	(0.0 – 20.3)
other pines	11.6	(8.9 – 14.3)	13.0	(11.1 – 15.0)	12.3	(0.0 – 30.0)
Douglas-fir	13.3	(11.3 – 15.4)	16.0	(12.3 – 19.8)	12.4	(9.6 – 15.1)
larch spp.	15.9	(12.0 – 19.7)	14.8	(12.9 – 16.7)	6.4	(4.8 – 8.0)
other conifers	20.9	(16.7 – 25.1)	5.6	–	10.9	(0.0 – 33.6)
ses. & ped. oak	9.9	(8.6 – 11.2)	8.8	(8.6 – 8.9)	7.5	(5.2 – 9.8)
beech	12.3	(9.7 – 14.8)	2.9	–	11.7	(9.5 – 13.9)
ash	7.8	(6.5 – 9.0)	11.1	(0.0 – 44.6)	6.8	(5.7 – 8.0)
sycamore	10.6	(6.8 – 14.4)	13.6	(0.0 – 28.2)	5.6	(3.2 – 8.1)
birch spp.	7.1	(6.1 – 8.1)	9.0	(7.3 – 10.6)	4.9	(3.9 – 5.9)
alder	7.5	(5.7 – 9.4)	8.1	(6.8 – 9.5)	5.6	(3.5 – 7.8)
OLL broadleaves	5.4	(2.1 – 8.7)	2.9	(0.0 – 8.0)	6.8	(6.1 – 7.4)
OSL broadleaves	4.8	(3.2 – 6.5)	9.9	(7.4 – 12.3)	4.1	(3.5 – 4.8)



9.4.4 Normalised mean net annual volume increment per hectare by species group and age class (10 yrs)

Methodology

The normalised net annual volume increment per hectare is classified by ownership and age class (10 yrs).

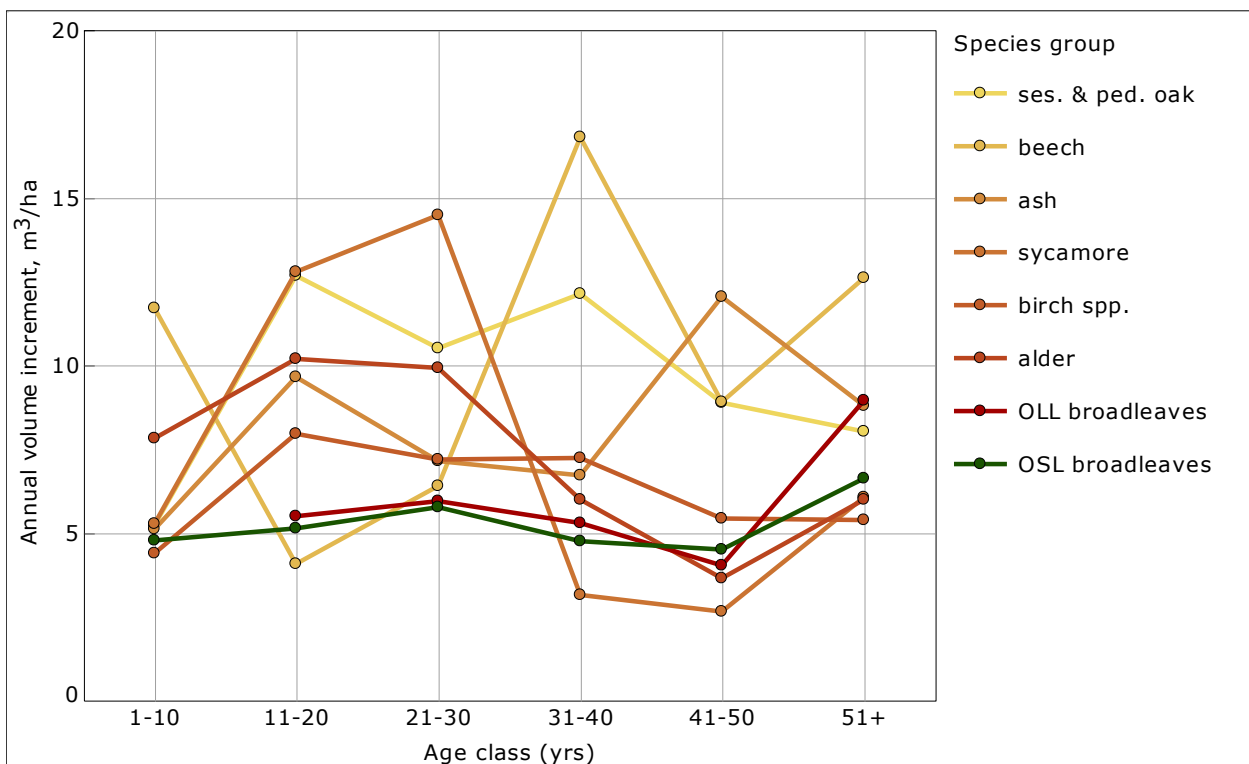
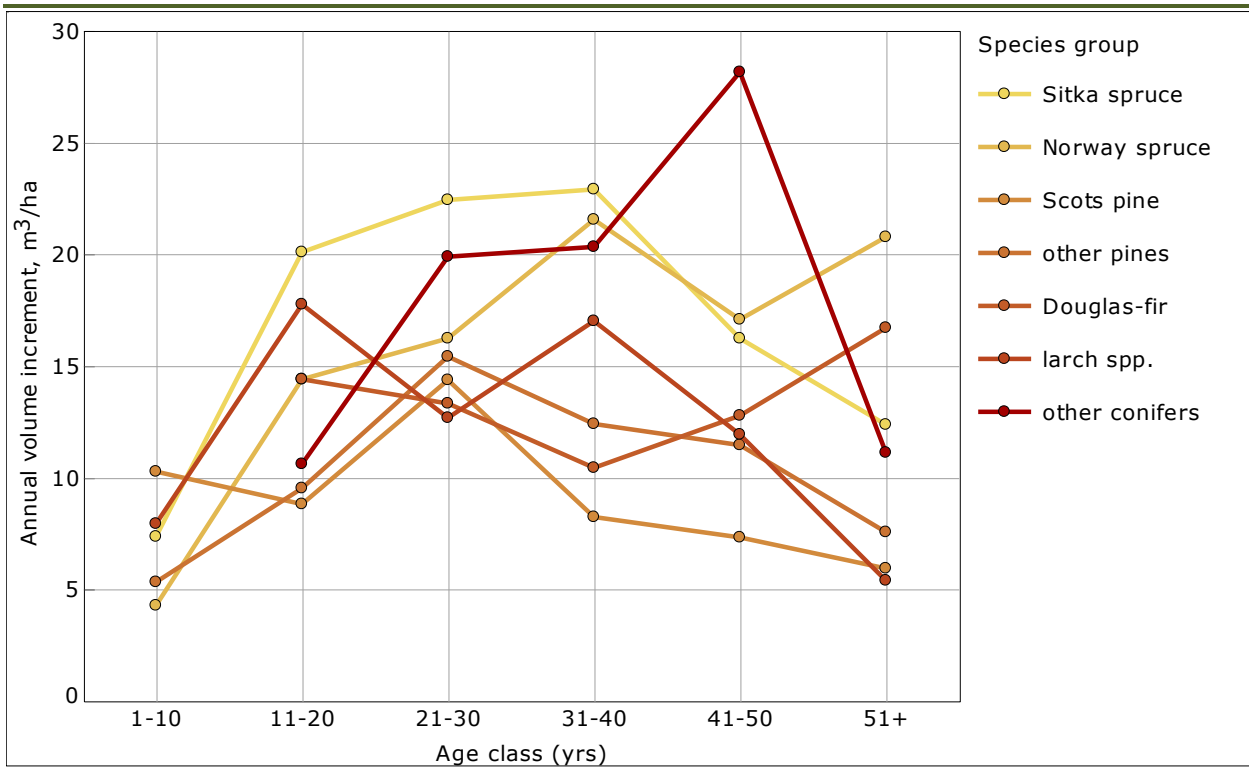
The calculated value of the variable under consideration for a plot (i.e. volume increment) is divided not by the whole plot area, but by the area of the part of the plot where the given variable is present. Therefore the sum of volume increment for a plot is related only to the area occupied by those trees, not to the whole plot.

Age class (yrs)	Species group / Annual volume increment			
	Sitka spruce	Norway spruce	Scots pine	other pines
	m ³ /ha (a = 0.05)	m ³ /ha (a = 0.05)	m ³ /ha (a = 0.05)	m ³ /ha (a = 0.05)
1-10	7.4 (6.1 – 8.6)	4.3 – –	10.3 – –	5.3 (4.5 – 6.1)
11-20	20.1 (18.8 – 21.4)	14.4 (13.1 – 15.7)	8.8 (2.5 – 15.1)	9.5 (7.4 – 11.7)
21-30	22.4 (20.6 – 24.3)	16.2 (0.0 – 34.4)	14.4 – –	15.4 (12.7 – 18.1)
31-40	22.9 (20.0 – 25.8)	21.5 (18.9 – 24.1)	8.2 – –	12.4 (11.0 – 13.8)
41-50	16.2 (13.5 – 18.9)	17.1 (14.8 – 19.3)	7.3 (2.6 – 12.0)	11.5 (9.4 – 13.5)
51+	12.3 (0.0 – 27.6)	20.7 (17.3 – 24.2)	5.9 (4.3 – 7.5)	7.6 (1.2 – 13.9)

Age class (yrs)	Species group / Annual volume increment			
	Douglas-fir	larch spp.	other conifers	ses. & ped. oak
	m ³ /ha (a = 0.05)	m ³ /ha (a = 0.05)	m ³ /ha (a = 0.05)	m ³ /ha (a = 0.05)
1-10	– – –	7.9 (6.6 – 9.3)	– – –	5.2 – –
11-20	14.4 (12.8 – 16.0)	17.7 (15.9 – 19.5)	10.6 (6.4 – 14.8)	12.7 (12.4 – 12.9)
21-30	13.3 (0.0 – 36.4)	12.7 (11.3 – 14.0)	19.9 (8.2 – 31.6)	10.5 (7.2 – 13.8)
31-40	10.4 – –	17.0 (0.0 – 42.8)	20.3 (16.6 – 24.0)	12.1 (8.1 – 16.1)
41-50	12.8 (10.4 – 15.1)	11.9 – –	28.1 (22.1 – 34.1)	8.9 (6.8 – 10.9)
51+	16.7 (13.8 – 19.5)	5.4 (4.5 – 6.2)	11.1 (10.9 – 11.3)	8.0 (6.1 – 9.9)

Age class (yrs)	Species group / Annual volume increment			
	beech	ash	sycamore	birch spp.
	m ³ /ha (a = 0.05)	m ³ /ha (a = 0.05)	m ³ /ha (a = 0.05)	m ³ /ha (a = 0.05)
1-10	11.7 – –	5.1 (0.0 – 18.2)	5.3 – –	4.4 – –
11-20	4.1 (0.0 – 17.9)	9.6 (7.5 – 11.8)	12.8 (12.1 – 13.4)	7.9 (6.7 – 9.2)
21-30	6.4 (5.1 – 7.7)	7.1 (4.0 – 10.3)	14.5 (5.6 – 23.4)	7.2 (6.4 – 8.0)
31-40	16.8 (14.1 – 19.5)	6.7 (5.3 – 8.1)	3.1 (1.9 – 4.3)	7.2 (5.9 – 8.5)
41-50	8.9 (0.0 – 39.4)	12.0 (10.5 – 13.6)	2.6 (0.0 – 15.6)	5.4 (4.7 – 6.1)
51+	12.6 (10.5 – 14.7)	8.8 (7.3 – 10.3)	6.1 (2.7 – 9.4)	5.4 (4.0 – 6.7)

Age class (yrs)	Species group / Annual volume increment			
	alder	OLL broadleaves	OSL broadleaves	All
	m ³ /ha (a = 0.05)	m ³ /ha (a = 0.05)	m ³ /ha (a = 0.05)	m ³ /ha (a = 0.05)
1-10	7.8 – –	– – –	4.8 – –	6.7 (5.7 – 7.6)
11-20	10.2 (9.1 – 11.3)	5.5 (4.2 – 6.7)	5.1 (4.1 – 6.1)	17.3 (16.4 – 18.3)
21-30	9.9 (9.7 – 10.1)	5.9 (4.5 – 7.4)	5.8 (4.7 – 6.9)	18.2 (16.9 – 19.5)
31-40	6.0 (0.0 – 17.9)	5.3 (4.6 – 6.0)	4.7 (3.7 – 5.8)	17.0 (15.7 – 18.3)
41-50	3.6 (0.0 – 7.9)	4.0 (0.0 – 10.0)	4.5 (3.7 – 5.3)	12.6 (11.4 – 13.7)
51+	6.0 (4.5 – 7.5)	9.0 (7.8 – 10.1)	6.6 (5.4 – 7.8)	8.7 (7.7 – 9.6)



Chapter 10

DEADWOOD

The NFI provides a comprehensive assessment of deadwood in the Irish forest estate. The total deadwood is broken down into three primary categories: stumps, standing deadwood and lying deadwood.

Overall, deadwood is present in over half (52%) of the forest estate. The absence of deadwood in nearly half of the estate is due to the young age structure and the absence of harvesting. Considerable amounts of deadwood are present in Public and Private (other) forests, while not surprisingly, considerably less deadwood is found in the younger Private (grant aided) forests. The total deadwood volume, at over 6.9 million m³, represents an important resource for biodiversity. The greatest volumes of lying deadwood are found in counties Cork, Wicklow, Galway, and Leitrim, making up 2.452 million m³ or 35% of the total deadwood volume in Ireland.

The greatest proportion of the total deadwood volume is lying deadwood (46%), with 33% present as standing deadwood and the remainder (20.9%) in the form of stump deadwood.

The mean deadwood volume per hectare is 10.9 m³ for the entire forest estate, with the Public, Private (grant aided) and Private (other) forest estates having a mean of 16.2 m³, 1.1m³ and 12.8 m³, respectively. When the area of the forest with no deadwood is excluded, the mean deadwood volume per hectare is 22.8 m³, with the Public, Private (grant aided) and private (other) forest estates having a mean of 25.5 m³, 7.8 m³ and 17.9 m³, respectively.

In terms of species group, the majority of deadwood comes from conifer tree species; including 82.8% of the lying deadwood, 77.9% of standing deadwood and 94.4% of stump deadwood.

10.1 SUMMARY

Definition

Deadwood

Solid or rotting standing dead trees, logs, stumps, and branches.

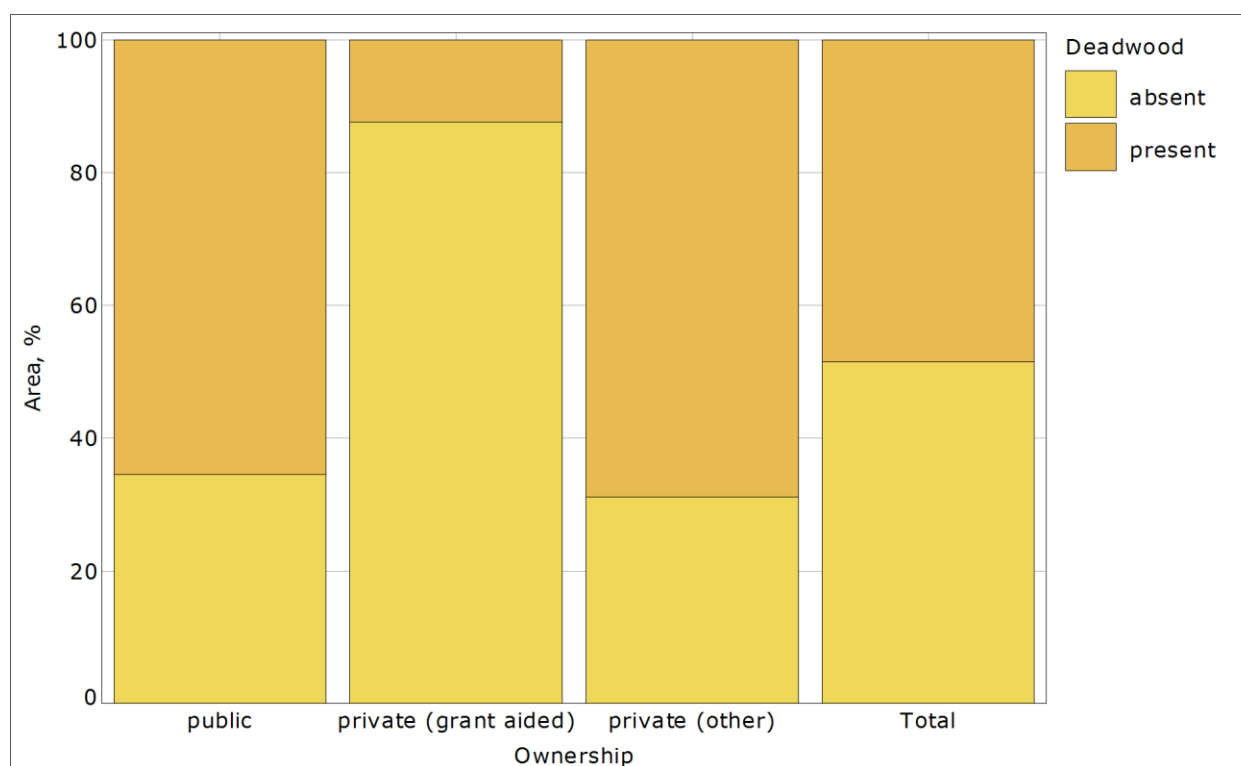
10.1.1 Forest area by ownership and deadwood presence

Methodology

The total forest area with deadwood present or absent is classified by ownership.

Deadwood	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
absent	122.66	(110.40 – 134.91)	34.5	188.52	(174.44 – 202.60)	87.7
present	232.66	(217.81 – 247.50)	65.5	26.43	(20.16 – 32.69)	12.3
Total	355.31	(339.78 – 370.85)	100.0	214.95	(200.34 – 229.55)	100.0

Deadwood	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
absent	26.04	(19.85 – 32.23)	31.1	337.21	(321.76 – 352.67)	51.6
present	57.68	(48.71 – 66.66)	68.9	316.77	(301.31 – 332.22)	48.4
Total	83.72	(73.16 – 94.29)	100.0	653.98		100.0



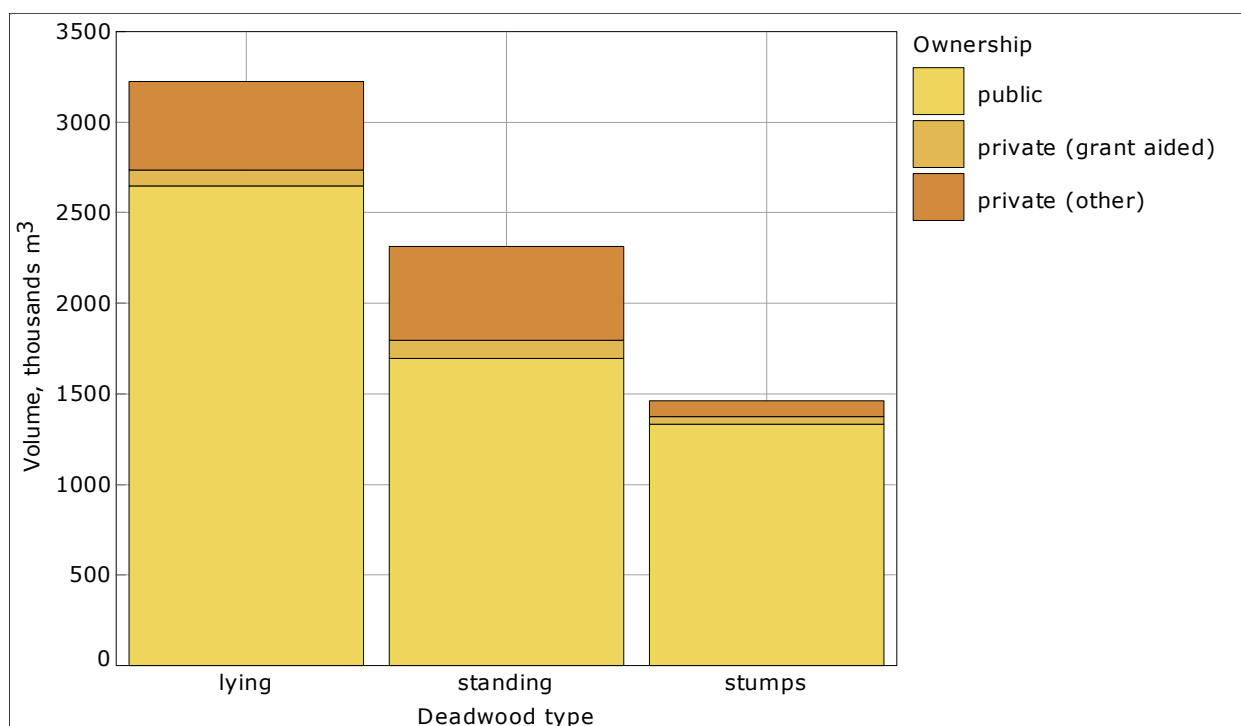
10.1.2 Total deadwood volume by ownership and deadwood type

Methodology

The total deadwood volume is classified by ownership and deadwood type.

Deadwood type	Ownership / Volume					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
lying	2,647.2	(2,202.0 – 3,092.4)	46.6	87.6	(57.1 – 118.1)	37.5
standing	1,695.1	(1,350.9 – 2,039.4)	29.9	100.8	(62.2 – 139.3)	43.1
stumps	1,330.7	(1,184.5 – 1,476.8)	23.5	45.4	(34.1 – 56.7)	19.4
Total	5,673.0	(4,988.3 – 6,357.7)	100.0	233.7	(182.1 – 285.4)	100.0

Deadwood type	Ownership / Volume					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
lying	490.5	(270.2 – 710.9)	44.9	3,225.3	(2,731.4 – 3,719.2)	46.1
standing	516.8	(409.9 – 623.7)	47.3	2,312.7	(1,956.9 – 2,668.5)	33.0
stumps	85.5	(52.6 – 118.4)	7.8	1,461.6	(1,309.2 – 1,614.0)	20.9
Total	1,092.9	(818.6 – 1,367.2)	100.0	6,999.6	(6,260.5 – 7,738.7)	100.0

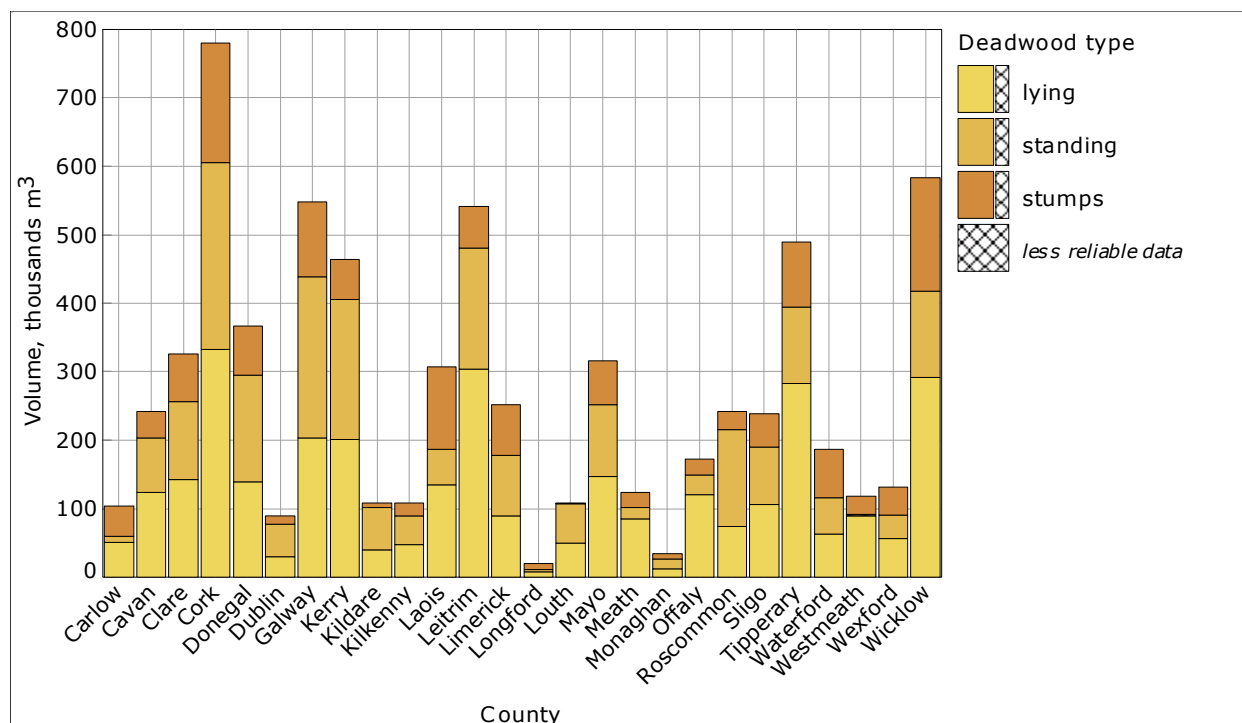


10.1.3 Total deadwood volume by deadwood type and county**Methodology**

The total deadwood volume includes: standing, lying and stump deadwood. The total deadwood volume is classified by deadwood type and county.

County	Deadwood type / Volume					
	lying			standing		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Carlow	51.0	(12.5 - 89.6)	1.6	8.4	(0.0 - 67.8)	0.4
Cavan	123.6	(38.8 - 208.4)	3.8	79.5	(0.0 - 318.4)	3.4
Clare	142.6	(81.4 - 203.8)	4.4	113.5	(70.1 - 156.8)	4.9
Cork	332.5	(218.0 - 446.9)	10.3	272.6	(196.3 - 348.8)	11.9
Donegal	138.9	(67.3 - 210.5)	4.3	156.5	(61.3 - 251.7)	6.8
Dublin	29.6	(6.0 - 53.1)	0.9	47.4	(18.2 - 76.5)	2.0
Galway	203.2	(140.9 - 265.5)	6.3	235.6	(140.4 - 330.9)	10.2
Kerry	201.2	(19.9 - 382.5)	6.2	204.1	(123.6 - 284.6)	8.8
Kildare	39.9	(0.0 - 83.3)	1.2	61.4	(11.1 - 111.6)	2.7
Kilkenny	48.0	(3.7 - 92.4)	1.5	41.3	(14.3 - 68.3)	1.8
Laois	135.3	(89.5 - 181.1)	4.2	51.5	(8.0 - 95.0)	2.2
Leitrim	304.2	(80.4 - 527.9)	9.4	176.9	(0.0 - 397.7)	7.7
Limerick	90.0	(47.0 - 133.0)	2.8	88.0	(32.0 - 144.0)	3.8
Longford	7.5	(0.0 - 20.4)	0.2	3.2	(0.0 - 18.2)	0.1
Louth	49.2	(0.0 - 162.6)	1.5	58.0	(0.0 - 202.5)	2.5
Mayo	146.8	(83.5 - 210.1)	4.6	104.9	(72.8 - 137.0)	4.5
Meath	85.6	(0.0 - 196.8)	2.7	15.9	(0.8 - 31.0)	0.7
Monaghan	11.7	(0.0 - 24.1)	0.4	14.8	(0.0 - 76.4)	0.6
Offaly	120.2	(0.0 - 283.4)	3.7	28.7	(12.1 - 45.4)	1.2
Roscommon	74.2	(18.3 - 130.0)	2.3	141.3	(0.0 - 304.4)	6.1
Sligo	106.2	(44.7 - 167.8)	3.3	83.4	(2.4 - 164.3)	3.6
Tipperary	283.3	(123.8 - 442.9)	8.8	110.8	(49.2 - 172.4)	4.8
Waterford	63.1	(32.1 - 94.2)	2.0	53.1	(0.0 - 115.7)	2.3
Westmeath	89.5	(0.0 - 183.0)	2.8	1.8	- -	0.08
Wexford	55.9	(1.3 - 110.4)	1.7	35.0	(22.4 - 47.7)	1.5
Wicklow	291.9	(67.2 - 516.7)	9.1	125.2	(40.3 - 210.2)	5.4
Total	3,225.3	(2,731.4 - 3,719.2)	100.0	2,312.7	(1,956.9 - 2,668.5)	100.0

County	Deadwood type / Volume					
	stumps			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
Carlow	44.6	(11.4 – 77.7)	3.0	104.0	(47.2 – 160.8)	1.5
Cavan	38.6	(18.7 – 58.5)	2.6	241.8	(36.4 – 447.1)	3.5
Clare	70.1	(24.2 – 115.9)	4.8	326.2	(220.3 – 432.0)	4.7
Cork	175.2	(130.8 – 219.7)	12.2	780.2	(603.1 – 957.4)	11.1
Donegal	71.1	(44.2 – 98.0)	4.9	366.5	(217.2 – 515.9)	5.2
Dublin	12.0	(0.0 – 25.0)	0.8	89.0	(30.4 – 147.5)	1.3
Galway	109.4	(56.9 – 161.9)	7.5	548.2	(401.6 – 694.9)	7.8
Kerry	59.3	(14.5 – 104.1)	4.1	464.6	(210.8 – 718.4)	6.6
Kildare	7.2	(0.7 – 13.7)	0.5	108.5	(26.5 – 190.4)	1.5
Kilkenny	18.8	(9.5 – 28.2)	1.3	108.2	(52.4 – 164.0)	1.5
Laois	120.0	(82.6 – 157.5)	8.2	306.8	(227.2 – 386.3)	4.4
Leitrim	59.8	(36.8 – 82.8)	4.1	540.9	(186.5 – 895.3)	7.7
Limerick	74.5	(19.2 – 129.7)	5.1	252.4	(132.5 – 372.4)	3.6
Longford	9.2	(1.3 – 17.1)	0.6	19.8	(2.7 – 36.9)	0.3
Louth	0.8	– –	0.05	108.1	(0.0 – 285.0)	1.5
Mayo	64.5	(28.8 – 100.2)	4.4	316.2	(226.4 – 406.1)	4.5
Meath	21.9	(8.1 – 35.7)	1.5	123.4	(10.1 – 236.7)	1.8
Monaghan	7.5	(0.0 – 17.1)	0.5	34.0	(7.3 – 60.7)	0.5
Offaly	23.1	(10.3 – 35.9)	1.6	172.0	(9.0 – 335.1)	2.5
Roscommon	26.7	(11.3 – 42.0)	1.8	242.1	(47.8 – 436.4)	3.5
Sligo	48.7	(28.0 – 69.3)	3.3	238.3	(121.6 – 355.0)	3.4
Tipperary	95.4	(58.5 – 132.2)	6.5	489.5	(296.0 – 683.0)	7.0
Waterford	70.0	(31.5 – 108.5)	4.8	186.2	(109.7 – 262.7)	2.7
Westmeath	27.4	(10.9 – 43.8)	1.9	118.6	(14.8 – 222.4)	1.7
Wexford	40.1	(20.9 – 59.3)	2.7	131.0	(69.1 – 192.9)	1.9
Wicklow	165.8	(106.0 – 225.6)	11.3	583.0	(318.0 – 848.0)	8.3
Total	1,461.6	(1,309.2 – 1,614.0)	100.0	6,999.6	(6,260.5 – 7,738.7)	100.0



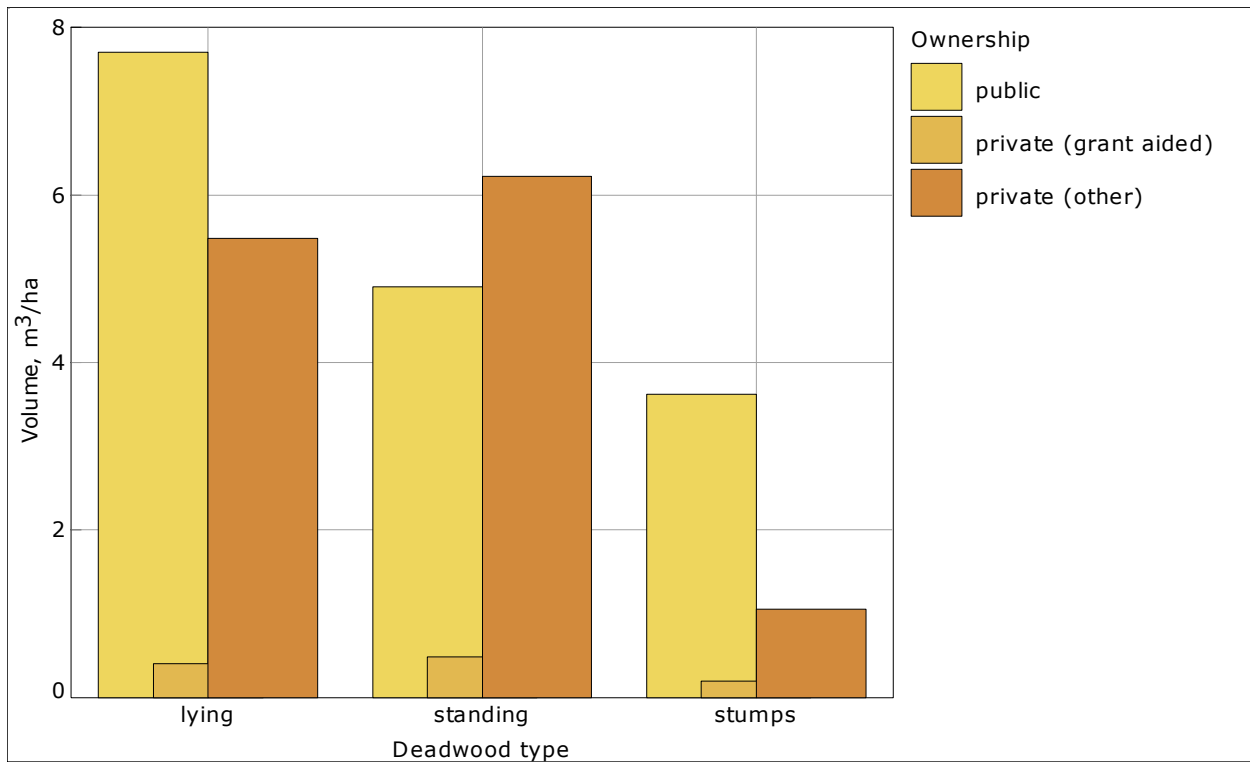
10.1.4 Mean deadwood volume stock per hectare by ownership and deadwood type

Methodology

The mean volume of deadwood per hectare is classified by ownership and deadwood type. This mean is calculated using the forest area, i.e. stocked and unstocked.

Deadwood type	Ownership / Volume					
	public		private (grant aided)		private (other)	
	m ³ /ha ($\alpha = 0.05$)		m ³ /ha ($\alpha = 0.05$)		m ³ /ha ($\alpha = 0.05$)	
lying	7.7	(6.4 – 9.0)	0.4	(0.2 – 0.6)	5.5	(2.8 – 8.1)
standing	4.9	(3.8 – 6.0)	0.5	(0.2 – 0.7)	6.2	(4.3 – 8.2)
stumps	3.6	(3.2 – 4.1)	0.2	(0.1 – 0.3)	1.1	(0.6 – 1.5)
All	16.2	(14.2 – 18.3)	1.1	(0.7 – 1.4)	12.8	(9.3 – 16.2)

Deadwood type	Ownership / Volume	
	All	
	m ³ /ha ($\alpha = 0.05$)	
lying	5.0	(4.2 – 5.8)
standing	3.7	(3.1 – 4.4)
stumps	2.1	(1.9 – 2.4)
All	10.9	(9.6 – 12.1)

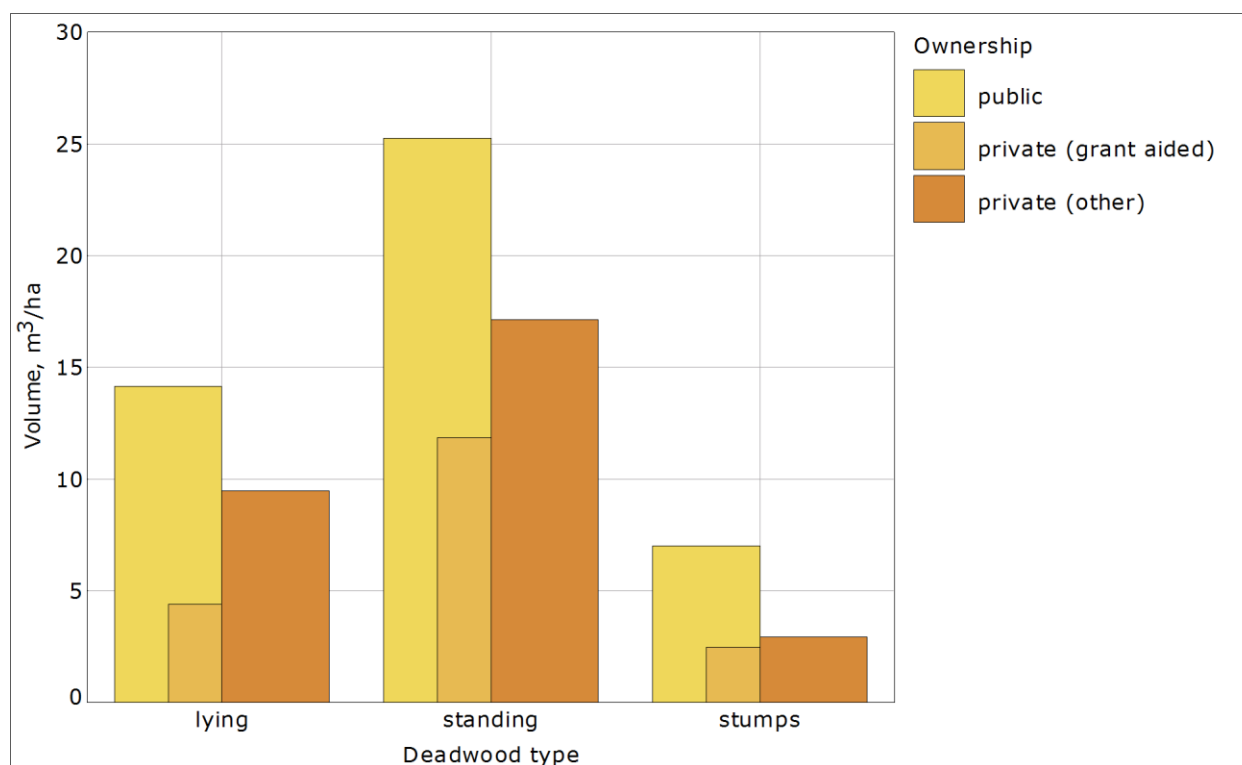


10.1.5 Mean deadwood volume per hectare by ownership and deadwood type, excluding areas with no deadwood

Methodology

The mean volume of deadwood per hectare is classified by ownership and deadwood type. This mean is calculated by excluding areas that have no deadwood present.

Deadwood type	Ownership / Volume			
	public	private (grant aided)	private (other)	All
	m ³ /ha ($\alpha = 0.05$)	m ³ /ha ($\alpha = 0.05$)	m ³ /ha ($\alpha = 0.05$)	m ³ /ha ($\alpha = 0.05$)
lying	14.2 (11.9 – 16.4)	4.4 (2.8 – 5.9)	9.5 (4.9 – 14.1)	12.5 (10.6 – 14.3)
standing	25.2 (20.2 – 30.2)	11.9 (7.3 – 16.4)	17.1 (13.4 – 20.9)	22.1 (18.7 – 25.4)
stumps	7.0 (6.2 – 7.8)	2.5 (1.8 – 3.1)	2.9 (1.8 – 4.1)	6.1 (5.5 – 6.8)
All	25.5 (22.5 – 28.4)	8.4 (6.4 – 10.3)	18.3 (13.5 – 23.0)	22.7 (20.3 – 25.0)



10.2 LYING DEADWOOD

Definition

Lying deadwood

Lying dead logs (or parts thereof) with a minimum mid-diameter of 7 cm and minimum length of 1 m.

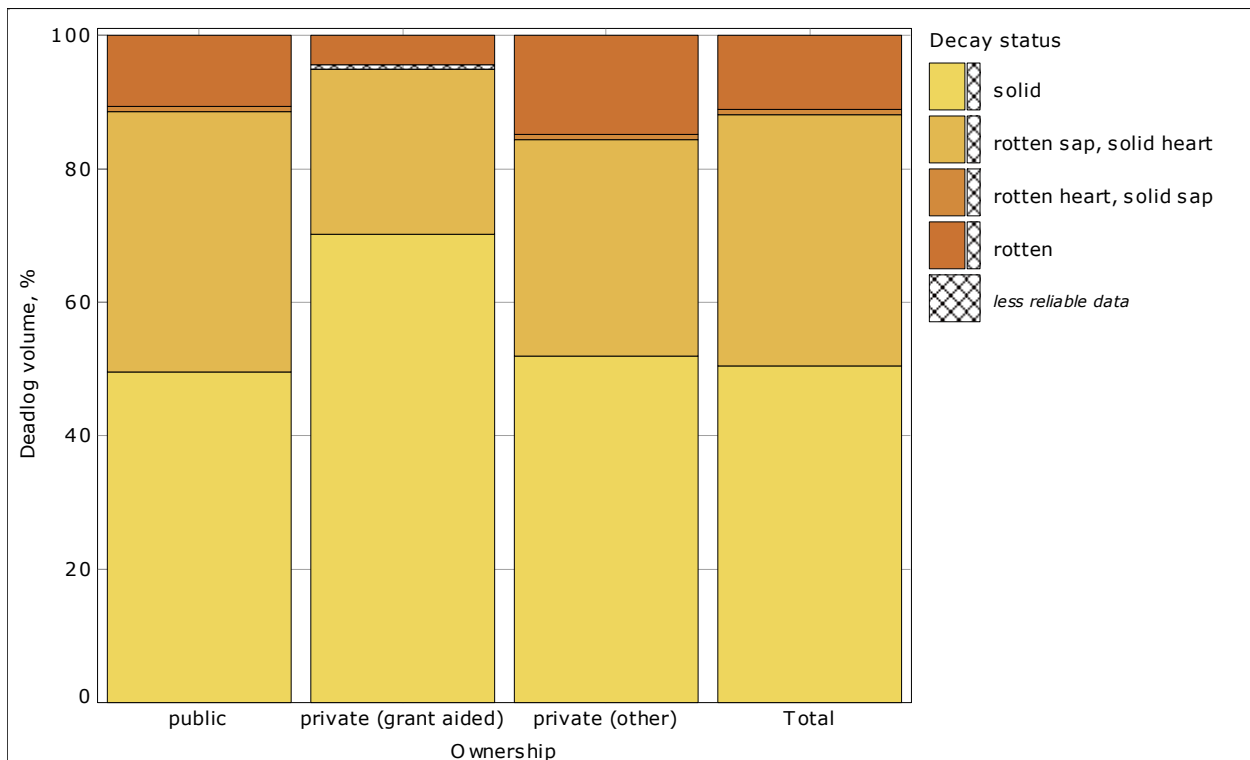
10.2.1 Total volume of lying deadwood by ownership and decay status

Definition
Decay status Decay status describes the level of decomposition of the dead wood. Solid wood: Wood is intact, no signs of decomposition. Rotten sapwood, solid heartwood: Outer wood is rotten, inner core is solid. Rotten heartwood, solid sapwood: Outer wood is solid, inner core is rotten. Rotten wood: Timber is rotten throughout, but maintains its original shape.

Methodology
The total volume of lying deadwood is classified by ownership and decay status.

Decay status	Ownership / Deadlog volume					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
solid	1,310.7	(973.7 - 1,647.8)	49.6	61.5	(32.7 - 90.3)	70.2
rotten sap, solid heart	1,033.4	(767.1 - 1,299.7)	39.0	21.7	(0.1 - 43.3)	24.7
rotten heart, solid sap	21.5	(10.4 - 32.5)	0.8	0.6	-	0.7
rotten	281.6	(220.5 - 342.7)	10.6	3.8	(0.0 - 25.6)	4.4
Total	2,647.2	(2,202.0 - 3,092.4)	100.0	87.6	(57.1 - 118.1)	100.0

Decay status	Ownership / Deadlog volume					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
solid	254.5	(21.1 - 487.8)	51.8	1,626.7	(1,238.0 - 2,015.4)	50.4
rotten sap, solid heart	159.3	(104.1 - 214.5)	32.5	1,214.4	(945.1 - 1,483.6)	37.7
rotten heart, solid sap	4.2	(3.9 - 4.5)	0.9	26.2	(16.8 - 35.7)	0.8
rotten	72.6	(38.4 - 106.7)	14.8	358.0	(290.4 - 425.6)	11.1
Total	490.5	(270.2 - 710.9)	100.0	3,225.3	(2,731.4 - 3,719.2)	100.0



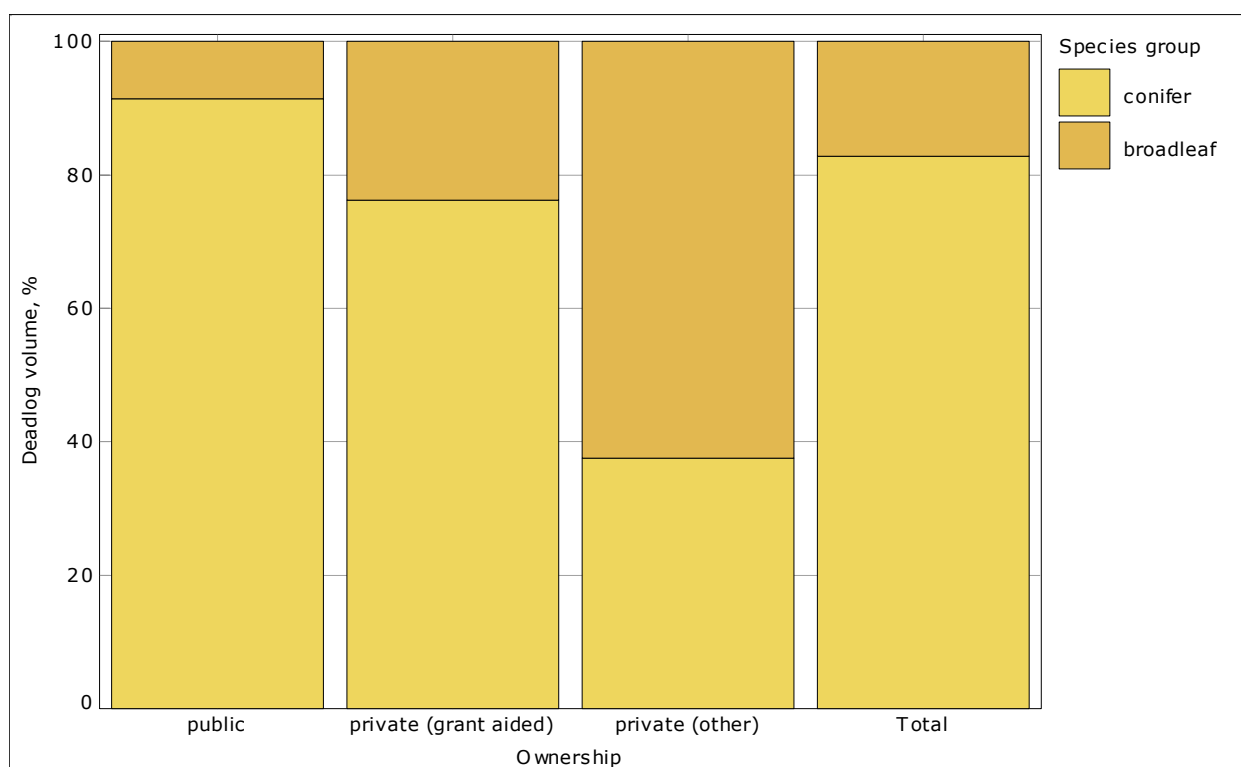
10.2.2 Total volume of lying deadwood by ownership and species group

Methodology

The total volume of lying deadwood is classified by ownership and species group (broadleaf/conifer).

Species group	Ownership / Deadlog volume					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
conifer	2,420.1	(1,989.4 – 2,850.8)	91.4	66.7	(37.1 – 96.4)	76.2
broadleaf	227.1	(77.8 – 376.4)	8.6	20.9	(5.9 – 35.8)	23.8
Total	2,647.2	(2,202.0 – 3,092.4)	100.0	87.6	(57.1 – 118.1)	100.0

Species group	Ownership / Deadlog volume					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
conifer	184.3	(109.8 – 258.8)	37.6	2,671.1	(2,231.1 – 3,111.2)	82.8
broadleaf	306.2	(80.1 – 532.4)	62.4	554.2	(320.6 – 787.8)	17.2
Total	490.5	(270.2 – 710.9)	100.0	3,225.3	(2,731.4 – 3,719.2)	100.0



10.3 STANDING DEADWOOD

10.3.1 Total standing deadwood volume by ownership and tree status

Definition
Standing deadwood Standing dead trees with a minimum Dbh of 7 cm and minimum height of 1.3 m. Recently dead tree: Tree has died in current or previous growing season. Dead tree from the past: The tree has been dead for more than 2 years.

Methodology
The total volume of standing deadwood is classified by ownership and tree status.

Tree status	Ownership / Volume					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
recently dead tree (1 yr)	234.9	(148.2 - 321.7)	13.9	25.5	-	25.3
dead tree from past (>2yr)	1,460.2	(1,149.9 - 1,770.5)	86.1	75.2	(26.2 - 124.3)	74.7
Total	1,695.1	(1,350.9 - 2,039.4)	100.0	100.8	(62.2 - 139.3)	100.0

Tree status	Ownership / Volume					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
recently dead tree (1 yr)	53.7	(0.0 - 162.4)	10.4	314.1	(237.4 - 390.9)	13.6
dead tree from past (>2yr)	463.1	(370.0 - 556.2)	89.6	1,998.6	(1,679.5 - 2,317.7)	86.4
Total	516.8	(409.9 - 623.7)	100.0	2,312.7	(1,956.9 - 2,668.5)	100.0



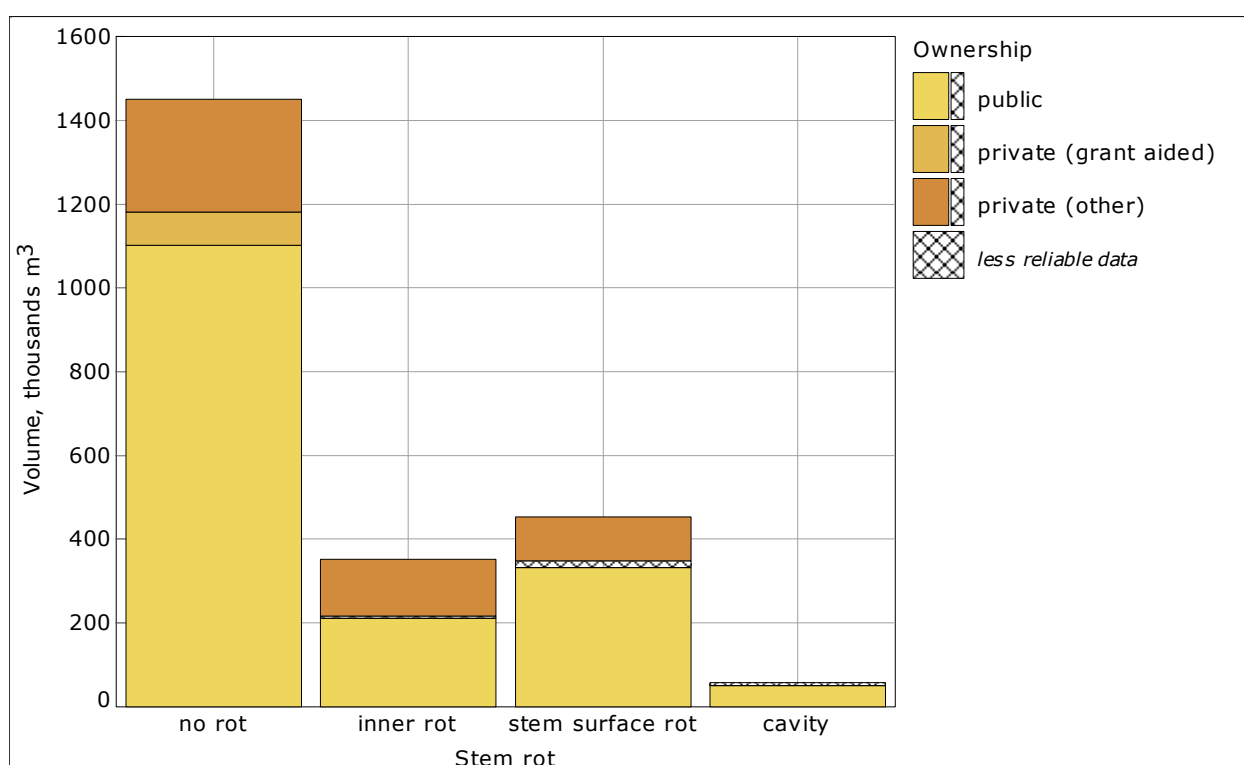
10.3.2 Total standing deadwood volume by ownership and stem rot

Definition
Stem rot Stem rot is the softening, discoloration, and often disintegration of plant tissue as a result of fungal or bacterial infection. 1. No rot: There are no signs of rot on the stem. 2. Inner rot: An inner section of the stem has suffered rot, which may be identified by butt-swelling and resin exudation. 3. Stem surface rot: Rot is present at the stem surface. 4. Cavity: The rot has created a stem cavity.

Methodology
The total volume of standing deadwood is classified by ownership and stem rot type.

Stem rot	Ownership / Volume					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no rot	1,101.9	(874.4 – 1,329.5)	65.0	79.3	(53.5 – 105.0)	78.7
inner rot	210.5	(0.0 – 690.9)	12.4	5.6	–	5.6
stem surface rot	332.1	(244.2 – 419.9)	19.6	15.9	–	15.7
cavity	50.7	(0.0 – 127.4)	3.0	–	–	–
Total	1,695.1	(1,350.9 – 2,039.4)	100.0	100.8	(62.2 – 139.3)	100.0

Stem rot	Ownership / Volume					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no rot	269.1	(182.5 – 355.6)	52.0	1,450.3	(1,215.8 – 1,684.7)	62.7
inner rot	135.8	(112.5 – 159.0)	26.3	351.8	(252.4 – 451.3)	15.2
stem surface rot	105.7	(54.9 – 156.6)	20.5	453.7	(335.5 – 571.9)	19.6
cavity	6.2	–	1.2	56.9	(0.0 – 141.9)	2.5
Total	516.8	(409.9 – 623.7)	100.0	2,312.7	(1,956.9 – 2,668.5)	100.0



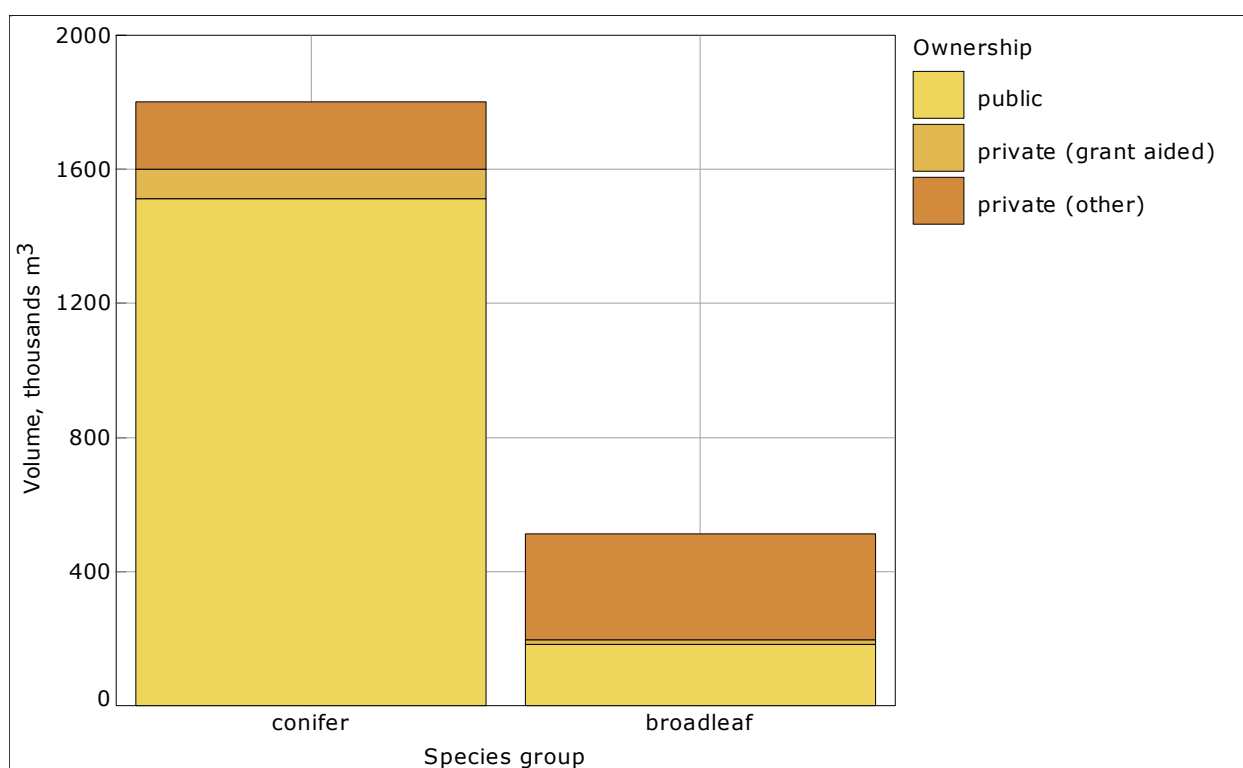
10.3.3 Total standing deadwood volume by ownership and species group

Methodology

The total number of standing dead trees is classified by species group.

Species group	Ownership / Volume					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
conifer	1,511.9	(1,176.1 – 1,847.8)	89.2	88.5	(57.1 – 119.8)	87.8
broadleaf	183.2	(48.3 – 318.1)	10.8	12.3	(8.1 – 16.5)	12.2
Total	1,695.1	(1,350.9 – 2,039.4)	100.0	100.8	(62.2 – 139.3)	100.0

Species group	Ownership / Volume					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
conifer	200.6	(150.3 – 250.9)	38.8	1,801.0	(1,463.4 – 2,138.7)	77.9
broadleaf	316.2	(253.1 – 379.3)	61.2	511.7	(405.5 – 617.9)	22.1
Total	516.8	(409.9 – 623.7)	100.0	2,312.7	(1,956.9 – 2,668.5)	100.0

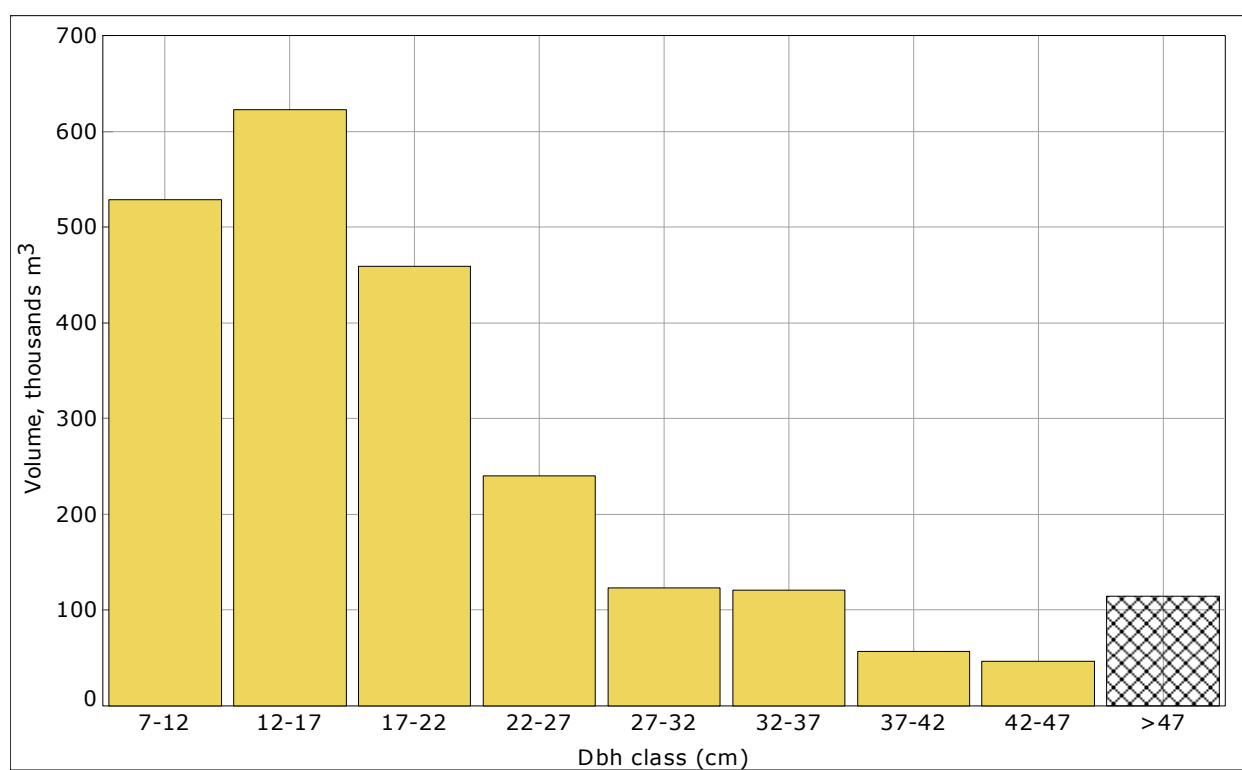


10.3.4 Total standing deadwood volume by Dbh class

Methodology

The total volume of standing deadwood is classified by Dbh class.

Dbh class (cm)	Volume		
	thousands m ³	($\alpha = 0.05$)	%
7-12	528.69	(441.16 – 616.23)	22.9
12-17	622.89	(482.19 – 763.59)	26.9
17-22	459.41	(384.27 – 534.54)	19.9
22-27	240.18	(129.55 – 350.81)	10.4
27-32	122.89	(0.00 – 351.25)	5.3
32-37	121.25	(101.25 – 141.26)	5.2
37-42	56.89	(41.32 – 72.46)	2.5
42-47	46.32	(0.00 – 123.09)	2.0
>47	114.18	– –	4.9
Total	2,312.71	(1,956.92 – 2,668.49)	100.0

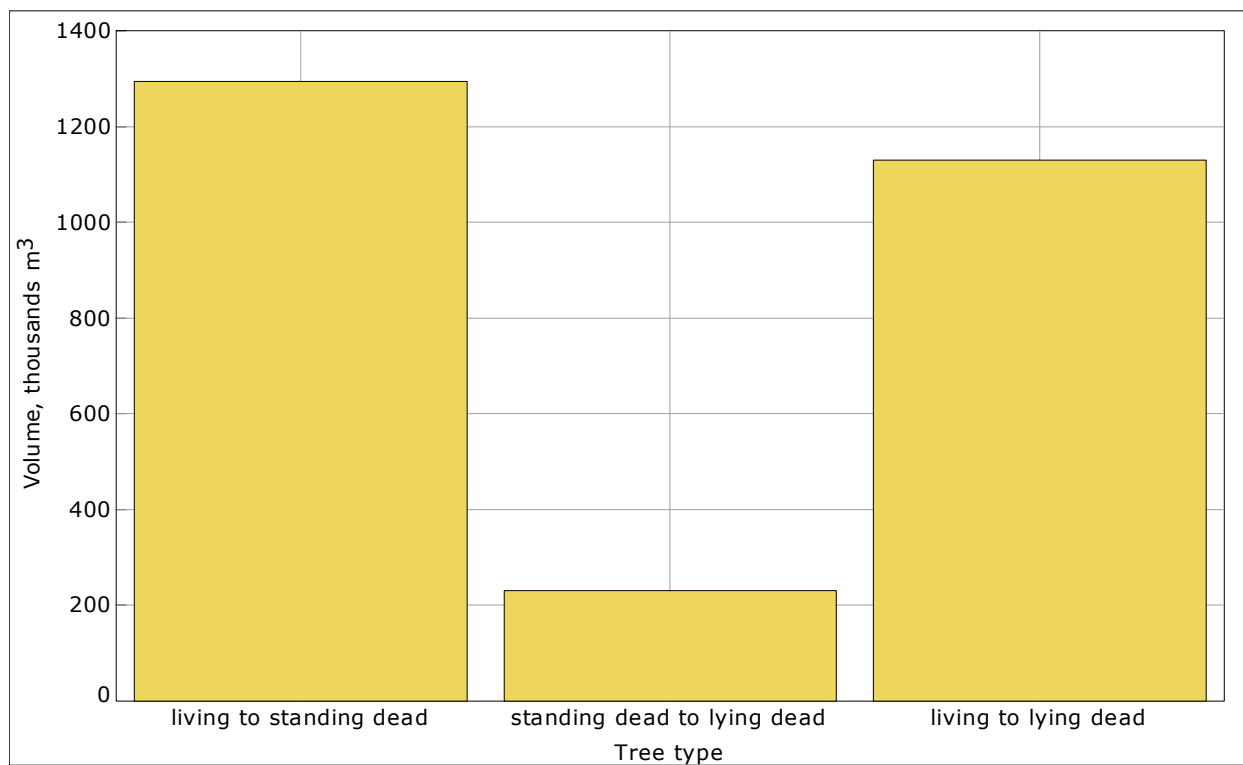


10.3.5 Total volume that went from living to dead and standing dead to lying dead, 2006-2012

Methodology

The total volume of standing deadwood is classified by tree type.

Tree type	Volume		
	thousands m ³	($\alpha = 0.05$)	%
living to standing dead	1,294.1	(1,082.6 – 1,505.6)	48.7
standing dead to lying dead	230.9	(194.9 – 267.0)	8.7
living to lying dead	1,130.4	(825.8 – 1,435.0)	42.6
Total	2,655.4	(2,215.7 – 3,095.1)	100.0

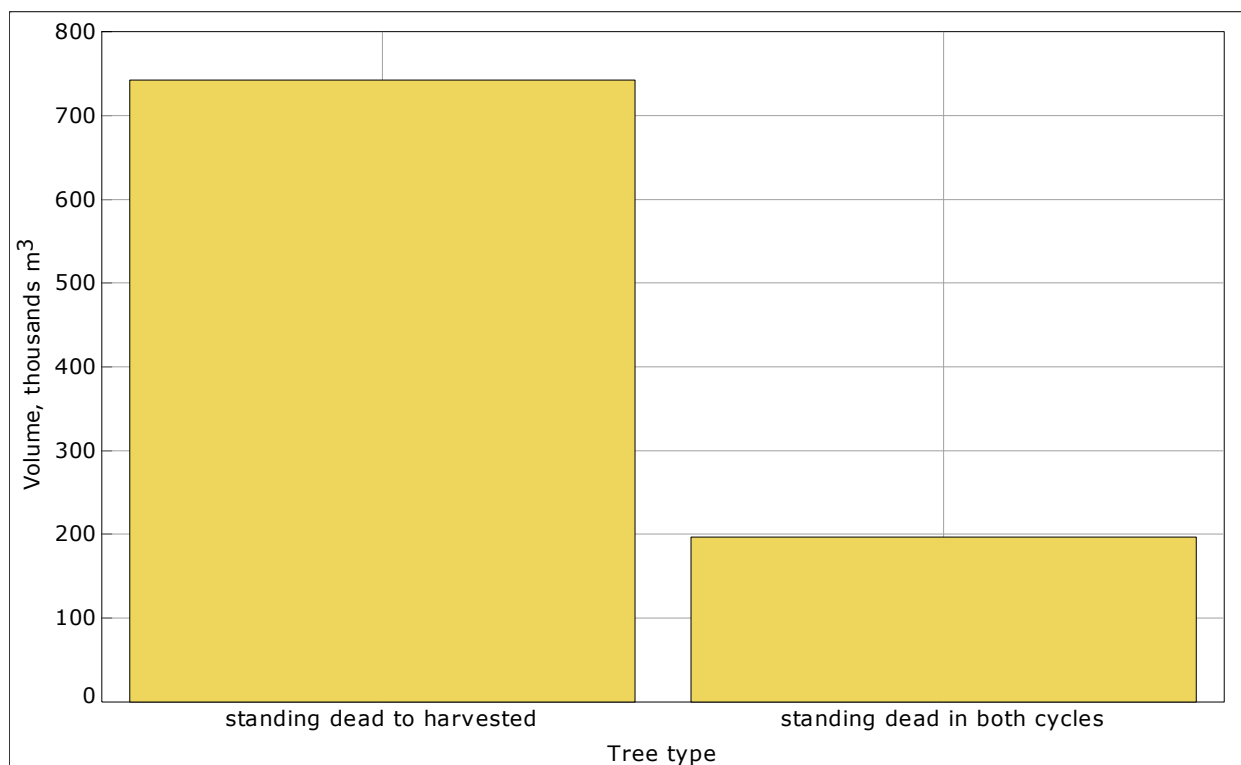


10.3.6 Total volume that was standing dead in both cycles and standing dead to harvested, 2006-2012

Methodology

The total volume of standing deadwood present in both cycles is presented. Also presented is volume of deadwood that was standing in the first cycle and not present in the second cycle due to harvesting.

Tree type	Volume		
	thousands m ³	($\alpha = 0.05$)	%
standing dead to harvested	742.2	(502.3 - 982.1)	79.0
standing dead in both cycles	196.8	(63.2 - 330.4)	21.0
Total	939.0	(698.2 - 1,179.8)	100.0



10.4 STUMP DEADWOOD

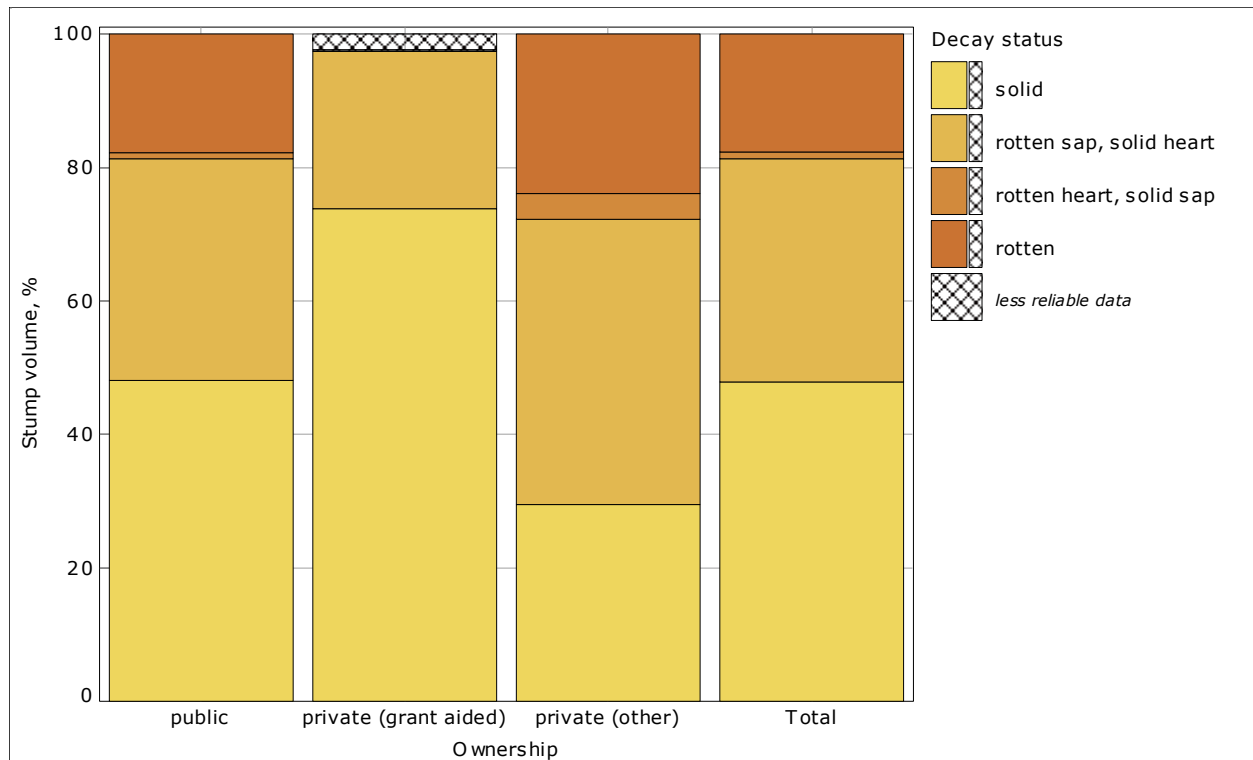
Definition
Stump The base of a tree remaining in the ground after most of the stem has been harvested. Stumps need to have a minimum top diameter of 10 cm and a height less than 1.3 m to be included. Stumps with a height greater than 1.3 m are recorded as standing dead trees. Only the above ground section of the stump is included.

10.4.1 Total volume of stump deadwood by ownership and decay status

Methodology
The total volume of stump deadwood is classified by ownership and decay status.

Decay status	Ownership / Stump volume					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
solid	640.0	(528.9 - 751.1)	48.1	33.5	(24.7 - 42.3)	73.8
rotten sap, solid heart	441.7	(367.5 - 515.8)	33.2	10.7	(0.0 - 31.0)	23.7
rotten heart, solid sap	12.2	(9.2 - 15.1)	0.9	0.1	-	0.2
rotten	236.9	(191.2 - 282.6)	17.8	1.1	-	2.3
Total	1,330.7	(1,184.5 - 1,476.8)	100.0	45.4	(34.1 - 56.7)	100.0

Decay status	Ownership / Stump volume					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
solid	25.2	(1.8 - 48.7)	29.5	698.7	(583.5 - 814.0)	47.7
rotten sap, solid heart	36.6	(1.3 - 71.8)	42.8	489.0	(410.0 - 567.9)	33.5
rotten heart, solid sap	3.3	(0.0 - 12.4)	3.8	15.5	(9.9 - 21.2)	1.1
rotten	20.5	(12.0 - 29.0)	23.9	258.4	(211.5 - 305.3)	17.7
Total	85.5	(52.6 - 118.4)	100.0	1,461.6	(1,309.2 - 1,614.0)	100.0



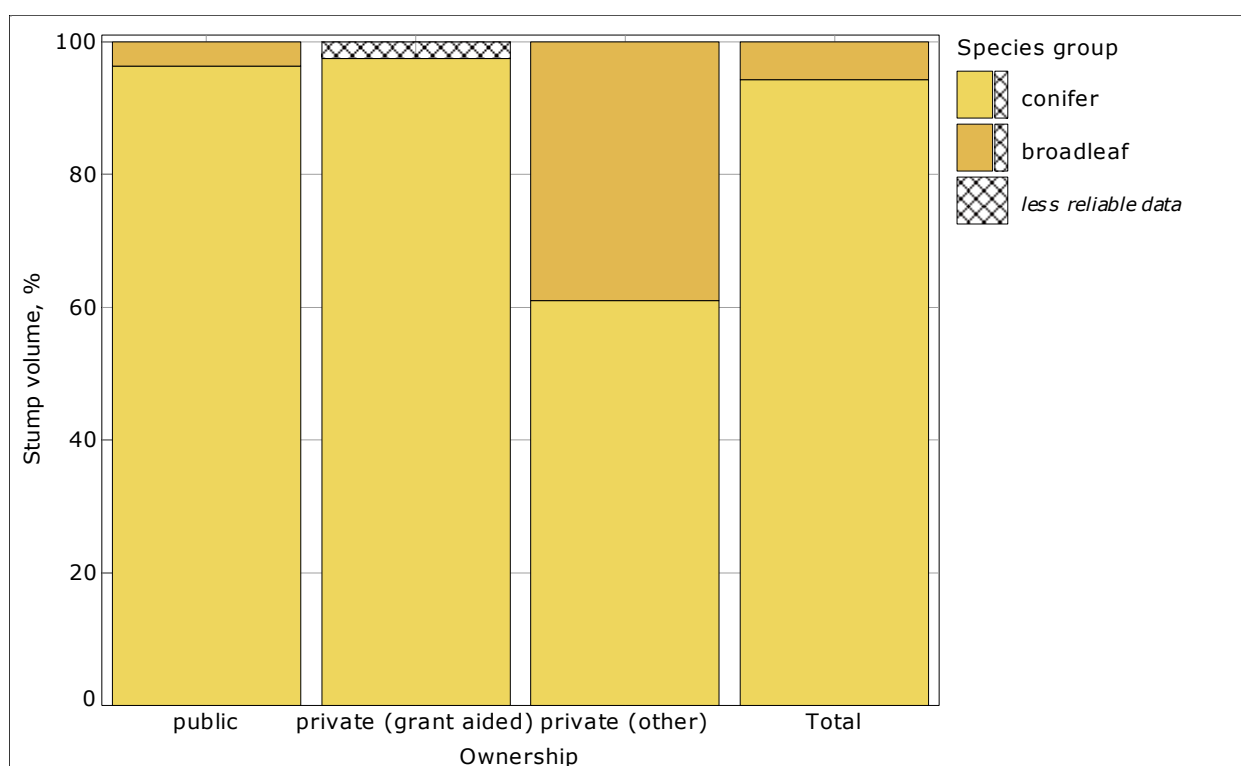
10.4.2 Total volume of stump deadwood by ownership and species group

Methodology

The total volume of stump deadwood is classified by ownership and species group (conifer/broadleaf)

Species group	Ownership / Stump volume					
	public			private (grant aided)		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
conifer	1,282.8	(1,138.9 – 1,426.7)	96.4	44.2	(33.1 – 55.4)	97.5
broadleaf	47.9	(19.0 – 76.7)	3.6	1.1	–	2.5
Total	1,330.7	(1,184.5 – 1,476.8)	100.0	45.4	(34.1 – 56.7)	100.0

Species group	Ownership / Stump volume					
	private (other)			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
conifer	52.1	(30.1 – 74.2)	61.0	1,379.2	(1,231.8 – 1,526.6)	94.4
broadleaf	33.4	(0.0 – 88.2)	39.0	82.4	(43.3 – 121.4)	5.6
Total	85.5	(52.6 – 118.4)	100.0	1,461.6	(1,309.2 – 1,614.0)	100.0



10.5 BRANCH DEADWOOD

Definition

Branch

Branch deadwood on the forest floor. Branches must be less than 7 cm at the largest end and have a minimum length of 1 m.

10.5.1 Forest area with branch cover by ownership

Definition

Branch coverage

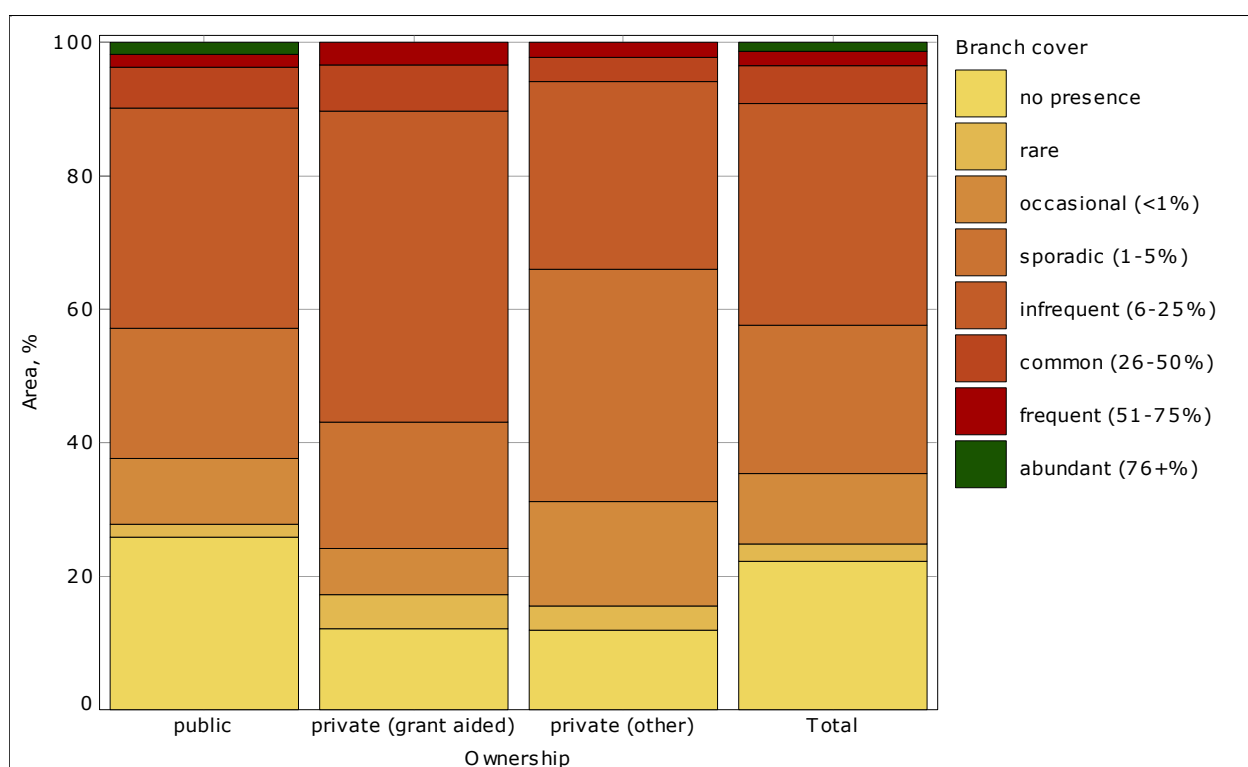
Quantifies the amount of branch deadwood present by assessing the area of the forest floor covered by branches.

Methodology

The forest area with branch cover is classified by ownership.

Branch cover	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	57.67	(48.78 - 66.56)	25.8	2.81	(0.73 - 4.89)	12.1
rare	4.41	(1.82 - 7.01)	2.0	1.20	(0.00 - 2.55)	5.2
occasional (<1%)	21.99	(16.30 - 27.68)	9.8	1.59	(0.03 - 3.15)	6.9
sporadic (1-5%)	43.61	(35.71 - 51.51)	19.5	4.39	(1.81 - 6.98)	18.9
infrequent (6-25%)	73.68	(63.73 - 83.62)	33.0	10.83	(6.78 - 14.87)	46.6
common (26-50%)	13.63	(9.10 - 18.15)	6.1	1.60	(0.03 - 3.16)	6.9
frequent (51-75%)	4.41	(1.81 - 7.01)	2.0	0.79	(0.00 - 1.90)	3.4
abundant (76+%)	4.01	(1.54 - 6.49)	1.8	-	-	-
Total	223.42	(208.73 - 238.11)	100.0	23.22	(17.34 - 29.09)	100.0

Branch cover	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	6.42	(3.28 - 9.56)	11.9	66.90	(57.39 - 76.41)	22.2
rare	2.00	(0.25 - 3.75)	3.7	7.61	(4.21 - 11.01)	2.5
occasional (<1%)	8.43	(4.84 - 12.02)	15.6	32.02	(25.19 - 38.84)	10.6
sporadic (1-5%)	18.82	(13.50 - 24.14)	34.8	66.83	(57.24 - 76.42)	22.2
infrequent (6-25%)	15.22	(10.46 - 19.99)	28.1	99.73	(88.45 - 111.00)	33.4
common (26-50%)	2.00	(0.25 - 3.75)	3.7	17.22	(12.16 - 22.29)	5.7
frequent (51-75%)	1.20	(0.00 - 2.58)	2.2	6.40	(3.27 - 9.53)	2.1
abundant (76+%)	-	-	-	4.01	(1.54 - 6.49)	1.3
Total	54.09	(45.38 - 62.80)	100.0	300.72		100.0



Chapter 11

CARBON

In this chapter, the analysis of the carbon pools in the forest estate is presented. Forests play an important role in mitigating climate change by sequestering and storing atmospheric carbon dioxide (CO₂). Sequestration is the net removal of CO₂ from the atmosphere, and storage in plant biomass, deadwood and harvested wood product pools. Trees absorb CO₂ through photosynthesis and release it through respiration; the difference is new biomass. Some of this biomass is transferred to the forest floor as litter (foliage, deadwood, etc.), which in due course decays and is either released back to the atmosphere or becomes part of soil carbon. The remainder accumulates as increment in the forest, mostly as stemwood, branches or roots. A proportion of this accumulated biomass is harvested, for wood products or fuel wood; this is either directly emitted back to the atmosphere or stored as long term harvested wood products and harvest residues on the forest floor; while the rest is a net increase in the living forest biomass.

In 1997, Ireland committed to reduce the national emissions of greenhouse gases by 13% above the 1990 level, in an effort to combat climate change under the Kyoto Protocol. Over the five years of the first commitment period of the Kyoto Agreement (i.e. 2008 to 2012), Ireland will meet its Kyoto obligations when the impact of approved *Forest Sinks* associated with afforestation, reforestation and deforestation *activities since 1990*, under article 3.3 are taken into account. The NFI has been instrumental in estimating the carbon stock in Irish forests and their contribution to national climate change mitigation. NFI data is a crucial component of the national forest reporting system (CARBWARE), which is used to estimate annual greenhouse gas emissions and removals as submitted to the United Nation Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. Reporting under Article 3.3 forests represented a net removal of over 16 Mt of CO₂ equivalents from the atmosphere between 2008 and 2012, offsetting circa. 5 % of all national emissions.

The NFI results indicate that the national estate is an important sink for carbon, at 381 million tonnes. The carbon stock in forest soils and litter is the dominant component, accounting for 86.7% of the carbon stock in the forest estate. Total living tree biomass represents 12.7% of the total carbon stock, while deadwood, including logs, stumps and standing dead trees, constitutes the remaining 0.6%. The Public forest estate contains 53.6% of the carbon stock in the total forest estate, the Private (grant aided) estate 33.1% and the Private (other) forests 13.3%.

The carbon stock in the living tree biomass is 48.5 million tonnes, with Sitka spruce and ‘other pine’ species the predominant contributors (62.4%). From an ownership perspective, the Public, Private (other) and Private (grant aided) forest estates account for 56.7%, 18.5% and 24.8% respectively of the carbon stock in the living tree biomass.

11.1 CARBON

Definition

Carbon stocks

Carbon estimation for the forest estate was completed for five stocks:

1. Tree aboveground
2. Tree belowground
3. Deadwood (lying, standing and stump)
4. Litter
5. Soil

The estimates of carbon stocks for each plot were calculated using Ireland's carbon reporting system, Carbware. The system was developed to meet reporting requirements to the United Nations Framework Convention on Climate Change by the National Council for Forest Research and Development. Carbware uses the NFI data as input variables.

Notes

1. Due to improved estimation techniques, in which biomass equations from other countries were replaced with nationally generated biomass equations, the original 2006 carbon estimates have been revised. This also allows for valid comparisons between 1st and 2nd cycle carbon estimates.
2. The forest carbon stock estimates were calculated using the CARBWARE model which used NFI data.
3. Direct estimation of stock changes, based on presented biomass, litter and deadwood carbon stocks are higher than those estimated derived based on the gain and loss approach used in the CARBWARE reporting system. This is because standard inventory approaches do not capture key processes such as emissions associated with drainage of soils, forest fires and residual affects following deforestation. Other factors include CARBWARE single tree growth model bias, where biomass increment is under estimated, particularly for less common broadleaf common species.
4. It is important to note that the increase in soil carbon stock is a direct result of the increase in forest area since 2006, so the calculated stock change does not reflect a 'real' removal of CO₂ from the atmosphere. Drained organic forest soils emit ca. 0.1 Mt CO₂ per year, but this is offset by a much larger removal of CO₂ due to accumulation of biomass, litter and deadwood.
5. The accumulation of carbon in the litter and deadwood pools is due to an increase in forest area and accumulation of harvest residues on the forest floor. These carbon pools decompose relatively slowly due to the presence of highly recalcitrant compounds, such as lignin, in these pools.

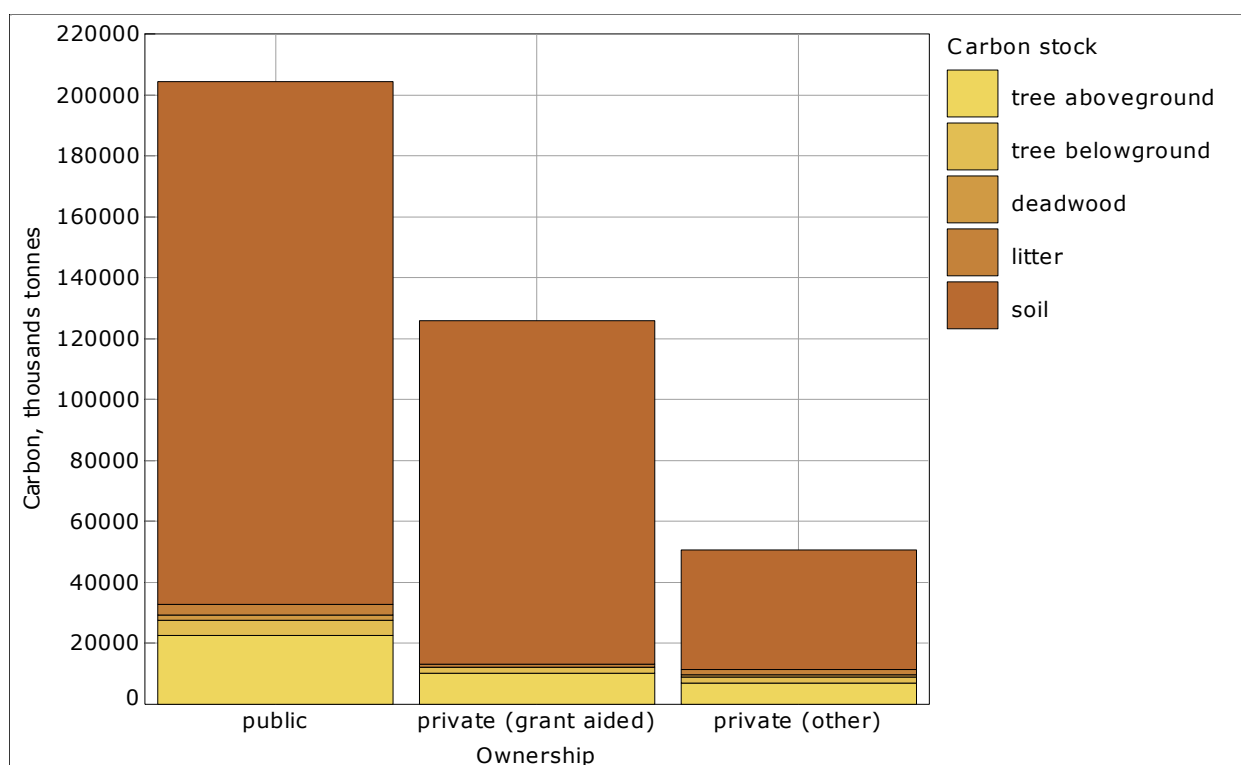
11.1.1 Total carbon stock by ownership and carbon pool

Methodology

Total carbon stock (tonnes) is classified by ownership and carbon pool.

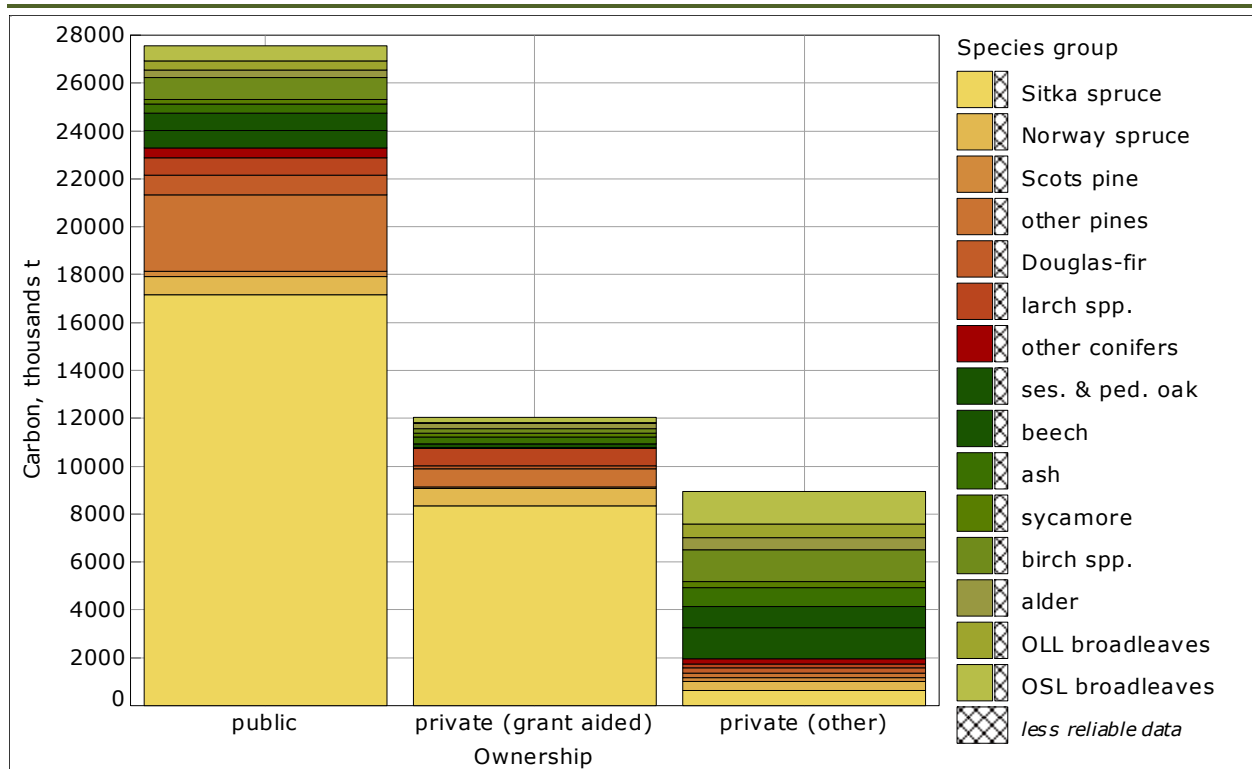
Carbon stock	Ownership / Carbon				
	public			private (grant aided)	
	thousands tonnes	($\alpha = 0.05$)	%	thousands tonnes	($\alpha = 0.05$) %
tree aboveground	22,621	(21,479 – 23,763)	11.1	10,114	(9,395 – 10,833) 8.0
tree belowground	4,928	(4,640 – 5,217)	2.4	1,933	(1,781 – 2,086) 1.5
deadwood	1,684	(1,454 – 1,913)	0.8	78	(60 – 95) 0.06
litter	3,638	(3,408 – 3,869)	1.8	993	(858 – 1,127) 0.8
soil	171,488	(163,463 – 179,514)	83.9	112,892	(105,851 – 119,933) 89.6
Total	204,360	(196,326 – 212,393)	100.0	126,009	(118,954 – 133,064) 100.0

Carbon stock	Ownership / Carbon				
	private (other)			Total	
	thousands tonnes	($\alpha = 0.05$)	%	thousands tonnes	($\alpha = 0.05$) %
tree aboveground	6,970	(6,290 – 7,650)	13.8	39,705	(38,142 – 41,268) 10.4
tree belowground	1,985	(1,788 – 2,181)	3.9	8,846	(8,438 – 9,254) 2.3
deadwood	714	(0 – 4,088)	1.4	2,475	(1,557 – 3,393) 0.6
litter	1,638	(1,473 – 1,802)	3.2	6,269	(5,925 – 6,612) 1.6
soil	39,358	(34,984 – 43,732)	77.7	323,738	(311,982 – 335,494) 85.1
Total	50,664	(46,355 – 54,974)	100.0	381,033	(369,252 – 392,813) 100.0



11.1.2 Total tree carbon stock by ownership and species group

Methodology						
Total carbon stock (tonnes) above and below ground is classified by ownership and carbon pool.						
Species group	Ownership / Carbon					
	public			private (grant aided)		
	thousands t	($\alpha = 0.05$)	%	thousands t	($\alpha = 0.05$)	%
Sitka spruce	17,150	(15,977 - 18,322)	62.4	8,341	(7,624 - 9,059)	69.2
Norway spruce	781	(583 - 979)	2.8	730	(581 - 879)	6.1
Scots pine	203	(94 - 313)	0.7	62	(36 - 87)	0.5
other pines	3,197	(2,697 - 3,698)	11.6	772	(567 - 977)	6.4
Douglas-fir	833	(656 - 1,009)	3.0	110	(81 - 138)	0.9
larch spp.	701	(488 - 913)	2.5	719	(522 - 916)	6.0
other conifers	425	(0 - 1,643)	1.5	46	-	0.4
ses. & ped. oak	717	(449 - 985)	2.6	149	(6 - 291)	1.2
beech	730	(466 - 994)	2.6	9	-	0.07
ash	373	(213 - 532)	1.4	282	(157 - 406)	2.3
sycamore	219	(158 - 280)	0.8	165	(70 - 261)	1.4
birch spp.	901	(713 - 1,089)	3.3	168	(51 - 285)	1.4
alder	305	(135 - 475)	1.1	233	(36 - 430)	1.9
OLL broadleaves	377	(278 - 476)	1.4	35	(0 - 86)	0.3
OSL broadleaves	637	(482 - 791)	2.3	227	(140 - 315)	1.9
Total	27,549	(26,132 - 28,966)	100.0	12,047	(11,183 - 12,911)	100.0
Species group	Ownership / Carbon					
	private (other)			Total		
	thousands t	($\alpha = 0.05$)	%	thousands t	($\alpha = 0.05$)	%
Sitka spruce	640	(404 - 875)	7.1	26,130	(24,725 - 27,536)	53.8
Norway spruce	362	(42 - 682)	4.0	1,873	(1,574 - 2,173)	3.9
Scots pine	180	(139 - 222)	2.0	445	(337 - 553)	0.9
other pines	185	(83 - 287)	2.1	4,154	(3,557 - 4,751)	8.6
Douglas-fir	228	(159 - 297)	2.5	1,170	(953 - 1,387)	2.4
larch spp.	155	(70 - 240)	1.7	1,575	(1,260 - 1,889)	3.2
other conifers	214	(0 - 792)	2.4	685	(273 - 1,098)	1.4
ses. & ped. oak	1,302	(890 - 1,714)	14.5	2,167	(1,651 - 2,684)	4.5
beech	866	(425 - 1,308)	9.7	1,605	(1,139 - 2,071)	3.3
ash	783	(608 - 959)	8.7	1,438	(1,179 - 1,696)	3.0
sycamore	282	(54 - 510)	3.1	666	(431 - 901)	1.4
birch spp.	1,323	(1,066 - 1,580)	14.8	2,392	(2,029 - 2,755)	4.9
alder	494	(402 - 586)	5.5	1,033	(743 - 1,323)	2.1
OLL broadleaves	581	(273 - 889)	6.5	993	(318 - 1,668)	2.0
OSL broadleaves	1,360	(1,069 - 1,652)	15.4	2,225	(1,842 - 2,607)	4.6
Total	8,955	(8,080 - 9,829)	100.0	48,551	(46,598 - 50,504)	100.0



Chapter 12

HEALTH AND VITALITY

The NFI is the only systematic national assessment of forest damage in Irish forests. Information is collected on forest damage at the individual tree level. Abiotic (e.g. wind), biotic (e.g. deer) and human induced (e.g. mechanical harvesting) factors affect forest health and vitality. It can increase forest susceptibility to disturbances or changes in the environment. Defoliation is a key variable used in monitoring forest health. The types of forest damage recorded are those which are most common or cause most damage to Ireland's forests. Over 15 different types of forest damage are recorded including windblow, frost, human induced, nutrient deficiency, browsing, peeling, squirrel, defoliators, decay and canker fungi.

Height growth on forests was assessed as an indication of the performance of forests. The majority of forests (88%) have satisfactory height growth. The remaining 12% of forests had height growth described as stagnating or decreasing, which is predominately due to nutrient deficiency and/or water-logging.

In general the main coniferous tree species are very healthy, displaying low levels of defoliation. Overall 16.8% of trees displayed some levels of defoliation. In terms of discolouration, 10.5% of conifer trees assessed displayed yellowing or browning of needles. The highest proportion of defoliated trees and discoloured trees occurred in pine species. The presence of *Chalara Fraxinea* or *Phytophthora ramorum* was not encountered in the NFI; showing that these pathogens are still at a small and highly localised occurrence in the national forest estate. The presence of both diseases in Ireland has been encountered only through targeted rather than systematic survey.

Deer are the main causative agent for tree peeling damage while mechanical harvesting also has a significant impact in tree stem damage. Broadleaf trees display a higher proportion of stem damage than coniferous trees. Approximately 6% of broadleaf trees examined displayed stem damage affecting at least up to 1/8 of the bark circumference with the comparable figure for coniferous trees less than 3%. In terms of peeling damage, again, the broadleaf species display greater damage than coniferous species due to their preference by biotic factors such as deer and squirrels.

Regarding windblow, just over 8,000ha or 1.2% of the stocked forest estate was recorded as windblown. Some 62% of the windblown area was composed of the species groups Sitka spruce and Other pines. In terms of growing stock just over 1.65 million m³, or 1.8% of total growing stock, was windblown.

Breakage to tree crown, stem or top occurred in only 1.8% of trees with a Dbh over 7 cm and represented 2.1 million m³ of growing stock.

Overall, conifers are regular in crown development, while broadleaves are more variable. The numbers of dominant trees by species group are consistent at around 0.5% of the number of trees in the species group, except for Oak and Beech where dominant trees make up circa 2% of the number of trees. As the majority (90%) of trees occur within the top canopy layer, this indicates a low level of structural diversity in the forest estate, which is a reflection of the even-aged nature of most Irish forests.

12.1 TREE VITALITY

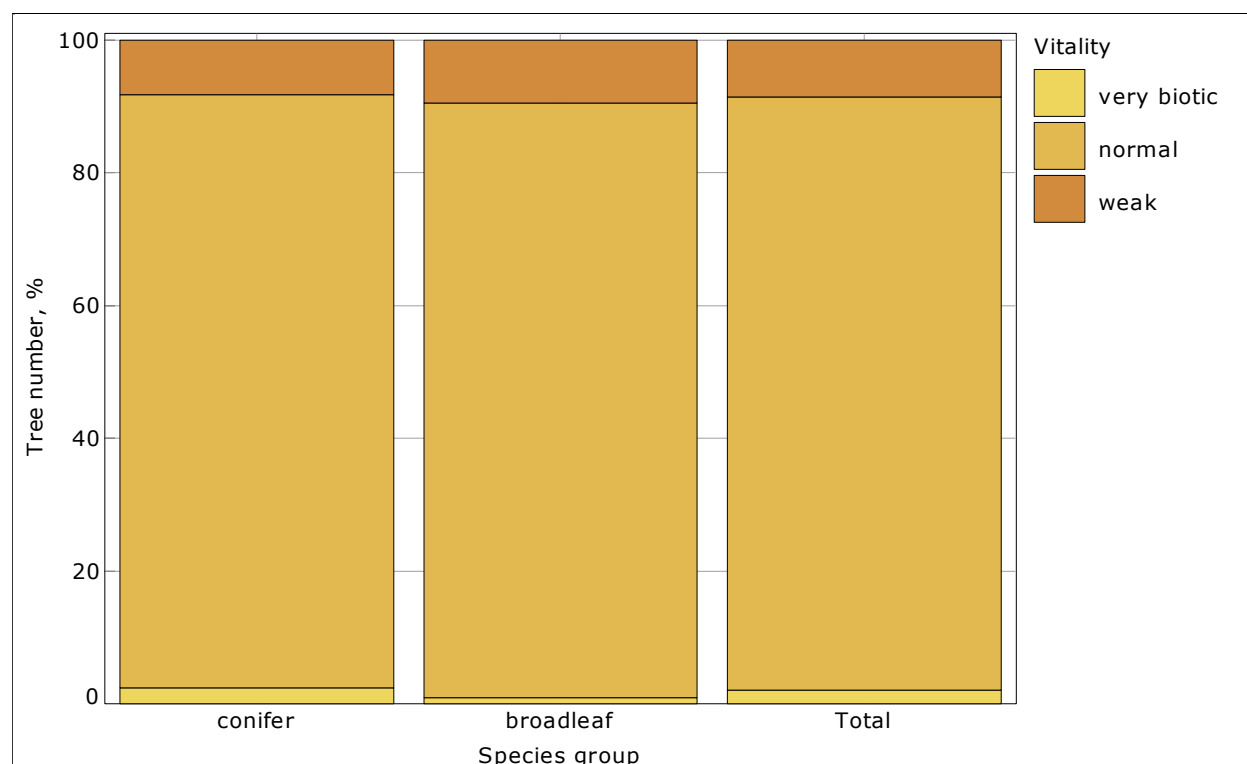
12.1.1 Total number of trees by species group and tree vitality (IUFRO) (Dbh ≥ 7 cm)

Definition
Tree vitality Tree vitality describes the capacity of a tree to survive and grow. Very Biotic: Vigorous growth with little or no defoliation. Normal: Regular tree with no serious defoliation or damage present in the crown. Weak: Poorly performing tree. Serious defoliation damage to the crown

Methodology
The total number of trees is classified by species group and vitality (IUFRO). All trees with a minimum Dbh of 7 cm were included in the analysis.

Vitality	Species group / Tree number					
	conifer			broadleaf		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
very biotic	14,716	(10,224 – 19,209)	2.4	1,462	(0 – 2,985)	0.9
normal	549,670	(527,580 – 571,759)	89.4	140,273	(127,115 – 153,430)	89.6
weak	50,590	(44,766 – 56,413)	8.2	14,883	(10,748 – 19,019)	9.5
Total	614,976	(592,024 – 637,927)	100.0	156,618	(142,372 – 170,865)	100.0

Vitality	Species group / Tree number		
	Total		
	thousands	($\alpha = 0.05$)	%
very biotic	16,179	(11,277 – 21,081)	2.1
normal	689,942	(665,337 – 714,547)	89.4
weak	65,473	(58,604 – 72,342)	8.5
Total	771,594	(745,836 – 797,352)	100.0



12.1.2 Total number of oak and beech trees assessed for height by broadleaf vitality (Dbh ≥ 7 cm)

Definition

Broadleaf vitality

Broadleaf vitality describes the capacity of a broadleaf tree species to continue to grow in a healthy condition. It describes in more detail IUFRO tree vitality in broadleaves.

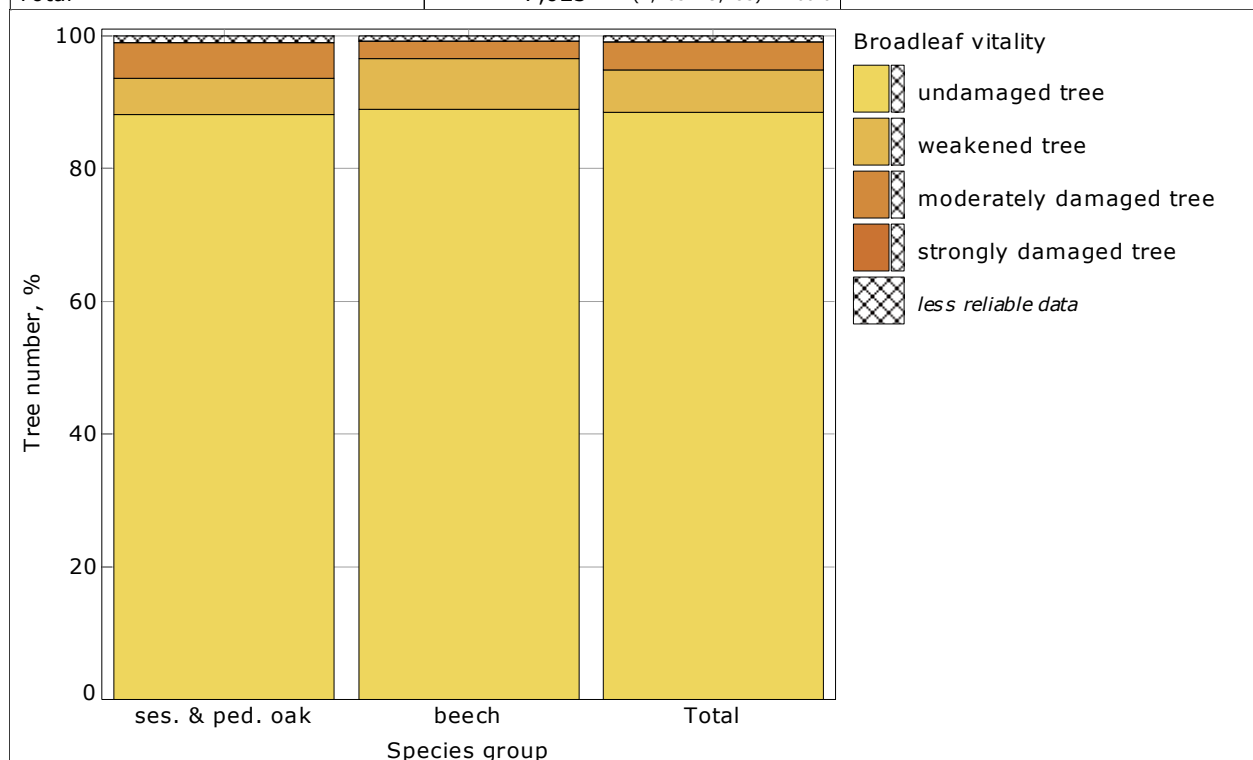
1. **Undamaged:** Tree is growing healthily.
2. **Weakened:** Tree growth is slightly affected due to minor stress, such as minimal stem damage.
3. **Moderately damaged:** Tree growth is moderately affected due to considerable stress, such as prolonged periods of drought or defoliation.
4. **Strongly damaged:** Tree is under severe stress, significantly affecting tree growth/survival. High levels of defoliation and/or dieback.

Methodology

Assessment is made on oak and beech trees that have been sampled for height measurement. The total numbers of these oak and beech are classified by vitality type. All trees with a minimum Dbh of 7 cm and assessed for height were included in the analysis.

Broadleaf vitality	Species group / Tree number					
	ses. & ped. oak			beech		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
undamaged tree	3,596	(1,689 – 5,504)	88.2	2,610	(1,130 – 4,090)	88.9
weakened tree	226	(111 – 340)	5.5	225	(94 – 356)	7.7
moderately damaged tree	216	(0 – 1,920)	5.3	76	(0 – 304)	2.6
strongly damaged tree	42	– –	1.0	24	– –	0.8
Total	4,088	(2,195 – 5,980)	100.0	2,935	(1,474 – 4,396)	100.0

Broadleaf vitality	Species group / Tree number		
	Total		
	thousands	($\alpha = 0.05$)	%
undamaged tree	6,207	(3,978 – 8,435)	88.5
weakened tree	450	(319 – 582)	6.4
moderately damaged tree	292	(0 – 2,010)	4.2
strongly damaged tree	66	– –	0.9
Total	7,023	(4,763 – 9,283)	100.0



12.2 DEFOLIATION

Definition
Defoliation Tree defoliation is the abnormal loss of tree foliage.

Methodology
Defoliation is assessed on spruce and pine species that have a minimum Dbh of 7 cm and have been sampled for height measurement. Therefore, the total number of trees for each species group is reduced when compared to previous analyses. Defoliation is firstly assessed on the whole tree and the top one-third of the crown. Assessments are made on spruce and pine trees that were sampled for height.

12.2.1 Total number of conifer trees by species group and degree of defoliation

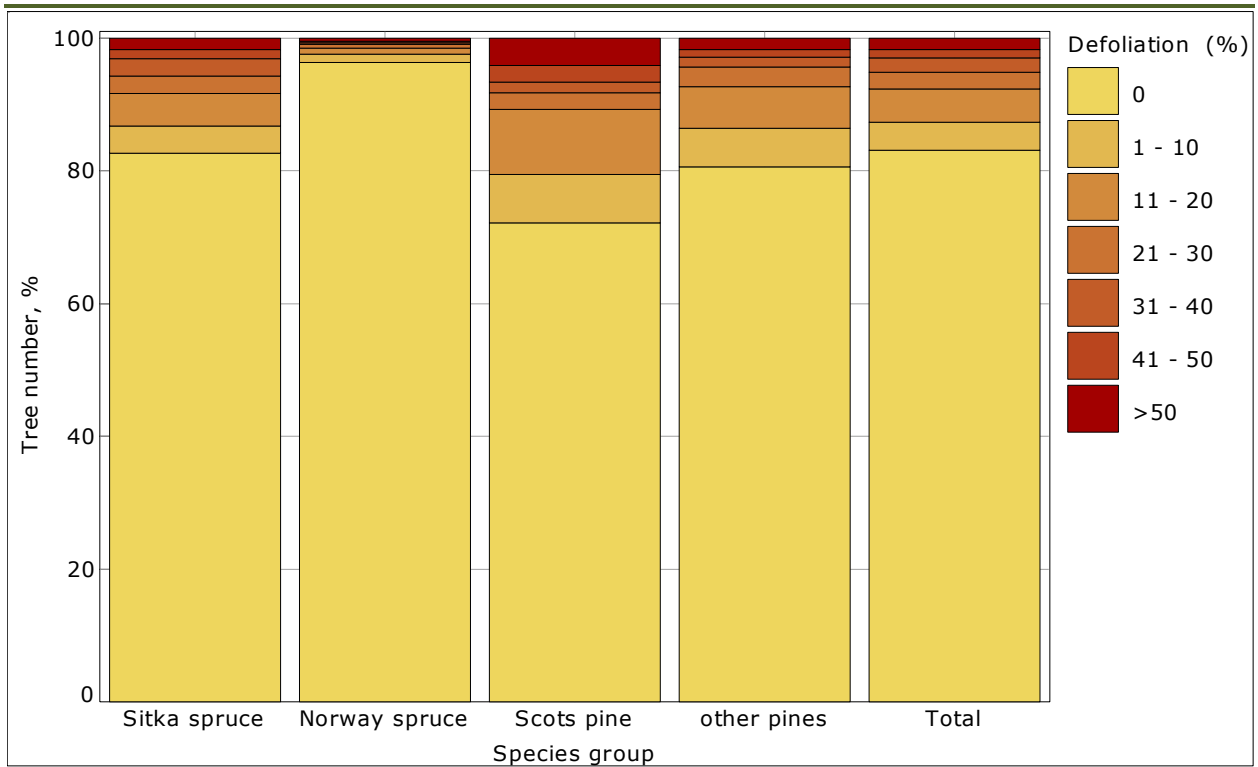
Definition
Degree of defoliation The percentage of needles or leaves lost.

Methodology
The total number of trees that were assessed for height is classified by species group and the defoliation percentage of the whole crown.

Defoliation (%)	Species group / Tree number					
	Sitka spruce			Norway spruce		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0	29,826	(27,877 – 31,775)	82.6	3,603	(2,819 – 4,387)	96.4
1 - 10	1,475	(1,077 – 1,872)	4.1	48	(0 – 121)	1.3
11 - 20	1,785	(1,384 – 2,186)	4.9	32	(1 – 64)	0.9
21 - 30	968	(729 – 1,207)	2.7	24	(0 – 61)	0.6
31 - 40	921	(649 – 1,193)	2.6	8	(0 – 24)	0.2
41 - 50	488	(282 – 694)	1.4	8	(0 – 24)	0.2
>50	625	(402 – 848)	1.7	16	(0 – 49)	0.4
Total	36,088	(34,041 – 38,136)	100.0	3,739	(2,935 – 4,544)	100.0

Defoliation (%)	Species group / Tree number					
	Scots pine			other pines		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0	704	(383 – 1,025)	72.1	6,334	(5,394 – 7,275)	80.8
1 - 10	72	(0 – 147)	7.4	456	(273 – 639)	5.8
11 - 20	96	(16 – 176)	9.8	487	(290 – 685)	6.2
21 - 30	24	(0 – 61)	2.5	231	(97 – 365)	2.9
31 - 40	16	(0 – 38)	1.6	120	(39 – 201)	1.5
41 - 50	24	(0 – 51)	2.5	88	(28 – 148)	1.1
>50	40	(0 – 92)	4.1	136	(34 – 238)	1.7
Total	976	(593 – 1,358)	100.0	7,853	(6,771 – 8,934)	100.0

Defoliation (%)	Species group / Tree number		
	Total		
	thousands	($\alpha = 0.05$)	%
0	40,467	(38,267 – 42,667)	83.2
1 - 10	2,051	(1,590 – 2,512)	4.2
11 - 20	2,401	(1,939 – 2,862)	4.9
21 - 30	1,248	(971 – 1,524)	2.6
31 - 40	1,065	(781 – 1,349)	2.2
41 - 50	608	(392 – 824)	1.2
>50	817	(563 – 1,071)	1.7
Total	48,656	(46,344 – 50,969)	100.0



12.2.2 Total number of trees by species group and degree of defoliation in the top third of the crown

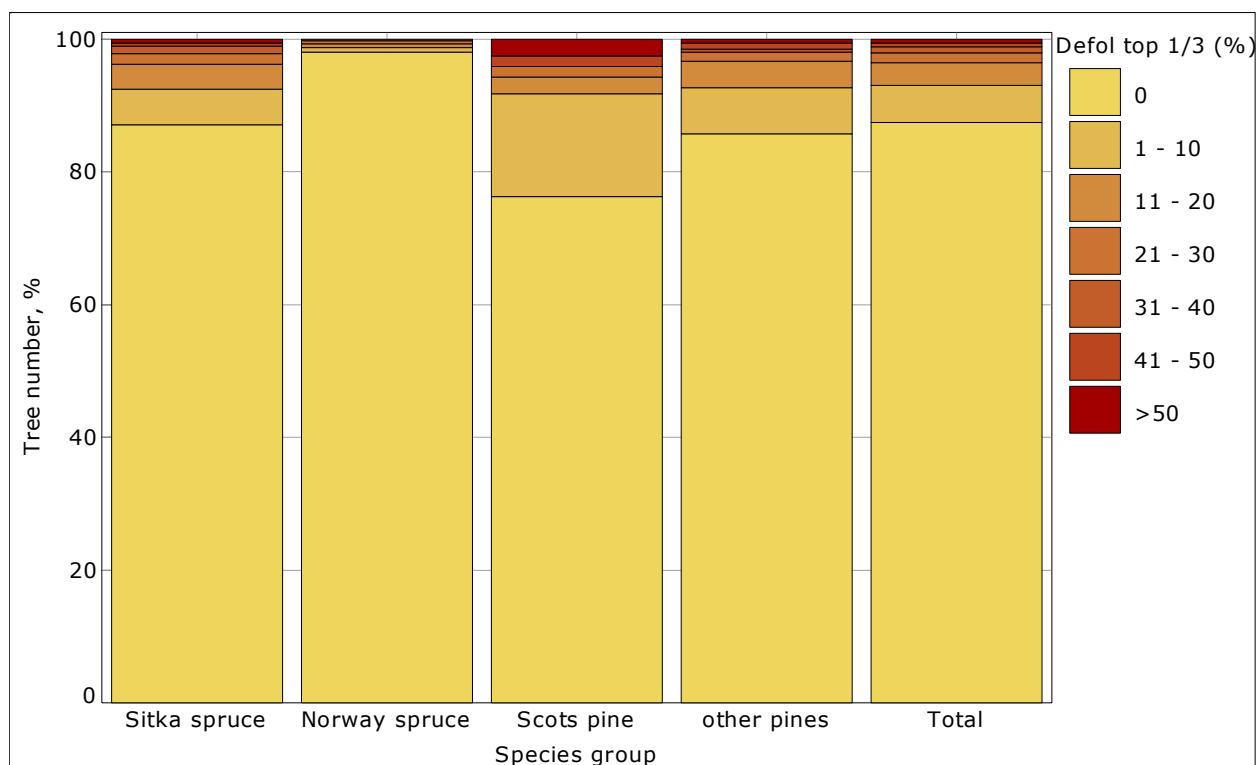
Methodology

Spruce and pine trees that were assessed for height are classified by species group and defoliation percentage in the top one third of the crown.

Defol top 1/3 (%)	Species group / Tree number					
	Sitka spruce			Norway spruce		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0	31,428	(29,461 - 33,395)	87.0	3,667	(2,877 - 4,457)	98.2
1 - 10	1,970	(1,497 - 2,442)	5.5	24	(0 - 61)	0.6
11 - 20	1,322	(956 - 1,689)	3.7	24	(0 - 51)	0.6
21 - 30	584	(403 - 766)	1.6	16	(0 - 38)	0.4
31 - 40	409	(238 - 580)	1.1	-	-	-
41 - 50	176	(88 - 264)	0.5	8	(0 - 24)	0.2
>50	200	(100 - 300)	0.6	-	-	-
Total	36,088	(34,041 - 38,136)	100.0	3,739	(2,935 - 4,544)	100.0

Defol top 1/3 (%)	Species group / Tree number					
	Scots pine			other pines		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0	744	(420 - 1,068)	76.3	6,734	(5,764 - 7,705)	85.8
1 - 10	152	(43 - 261)	15.6	544	(312 - 775)	6.9
11 - 20	24	(0 - 51)	2.4	319	(148 - 490)	4.1
21 - 30	16	(0 - 38)	1.6	104	(29 - 179)	1.3
31 - 40	-	-	-	32	(1 - 63)	0.4
41 - 50	16	(0 - 38)	1.6	72	(11 - 133)	0.9
>50	24	(0 - 59)	2.5	48	(10 - 86)	0.6
Total	976	(593 - 1,358)	100.0	7,853	(6,771 - 8,934)	100.0

Defol top 1/3 (%)	Species group / Tree number		
	Total		
	thousands	($\alpha = 0.05$)	%
0	42,573	(40,358 – 44,789)	87.4
1 - 10	2,689	(2,142 – 3,237)	5.5
11 - 20	1,689	(1,284 – 2,094)	3.5
21 - 30	720	(521 – 919)	1.5
31 - 40	441	(267 – 615)	0.9
41 - 50	272	(162 – 382)	0.6
>50	272	(160 – 385)	0.6
Total	48,656	(46,344 – 50,969)	100.0



12.3 DISCOLOURATION

Definition

Discolouration

Discolouration is a deviation from the usual colour of the living foliage for that species; dead or dying needles are excluded.

Methodology

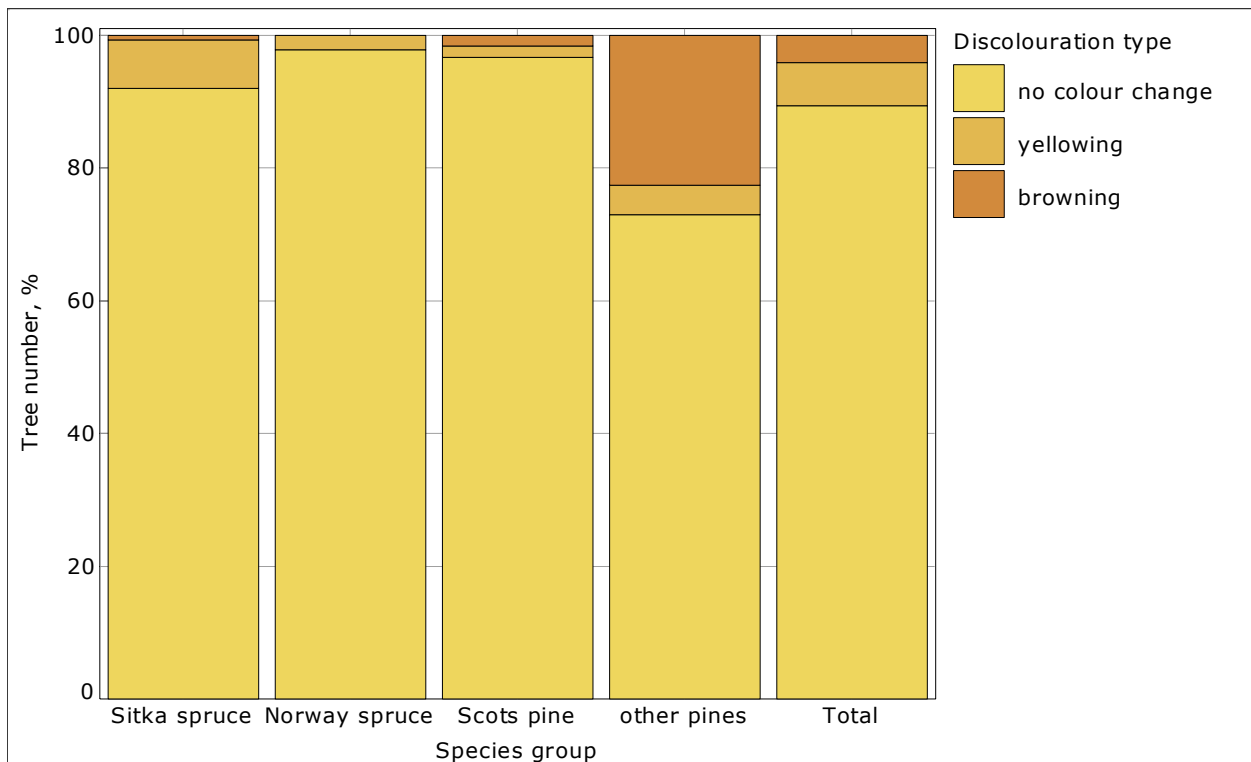
Discolouration is assessed on spruce and pine species that have a minimum Dbh of 7 cm and have been sampled for height measurement.

12.3.1 Total number of conifer trees by species group and discolouration type

Definition
Discolouration type
The colour change is recorded as yellowing or browning.

Methodology
The total number of trees that were assessed for height is classified by species group and discolouration type.

Discolouration type	Species group / Tree number					
	Sitka spruce			Norway spruce		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
no colour change	33,192	(31,181 - 35,204)	92.0	3,659	(2,865 - 4,453)	97.8
yellowing	2,673	(2,078 - 3,268)	7.4	81	(0 - 202)	2.2
browning	223	(50 - 396)	0.6	-	-	-
Total	36,088	(34,041 - 38,136)	100.0	3,739	(2,935 - 4,544)	100.0
Discolouration type	Species group / Tree number					
	Scots pine			other pines		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
no colour change	944	(566 - 1,321)	96.7	5,729	(4,813 - 6,645)	72.9
yellowing	16	(0 - 49)	1.7	352	(158 - 546)	4.5
browning	16	(0 - 39)	1.6	1,772	(1,272 - 2,272)	22.6
Total	976	(593 - 1,358)	100.0	7,853	(6,771 - 8,934)	100.0
Discolouration type	Species group / Tree number					
	Total					
	thousands	($\alpha = 0.05$)	%			
no colour change	43,524	(41,258 - 45,789)	89.5			
yellowing	3,122	(2,487 - 3,756)	6.4			
browning	2,011	(1,478 - 2,544)	4.1			
Total	48,656	(46,344 - 50,969)	100.0			



12.3.2 Total number of trees by species group and discolouration trend

Definition

Discolouration trend

The colour change is recorded as one of the following:

1. **From old to young:** The intensity of discolouration is more extreme in the old foliage
2. **From young to old:** The intensity of discolouration is more extreme in the young foliage.
3. **Evenly young and old:** Foliage age has no impact on the discolouration trend.

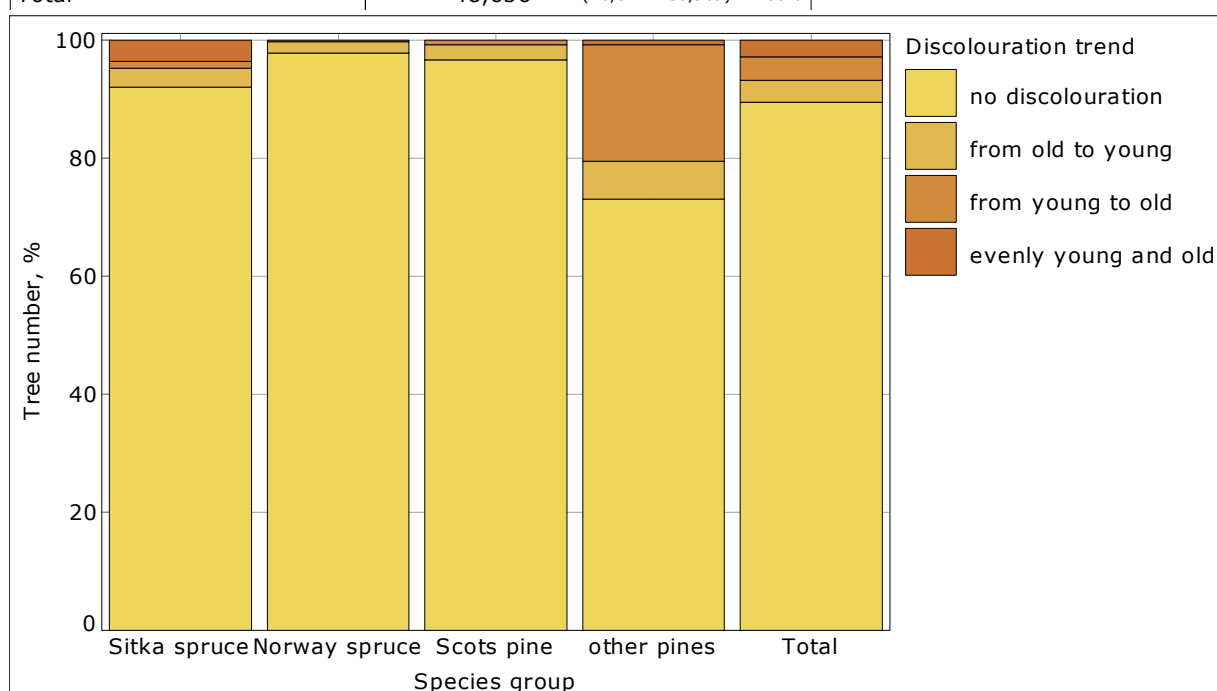
Methodology

The total number of spruce and pine trees that were assessed for height is classified by species group by species group and discolouration trend.

Discolouration trend	Species group / Tree number					
	Sitka spruce			Norway spruce		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
no discolouration	33,200	(31,189 – 35,212)	92.0	3,659	(2,865 – 4,453)	97.9
from old to young	1,192	(829 – 1,556)	3.3	73	(0 – 193)	1.9
from young to old	416	(201 – 631)	1.2	–	–	–
evenly young and old	1,280	(844 – 1,716)	3.5	8	(0 – 24)	0.2
Total	36,088	(34,041 – 38,136)	100.0	3,739	(2,935 – 4,544)	100.0

Discolouration trend	Species group / Tree number					
	Scots pine			other pines		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
no discolouration	944	(566 – 1,321)	96.7	5,737	(4,820 – 6,653)	73.1
from old to young	24	(0 – 60)	2.5	504	(237 – 771)	6.4
from young to old	8	(0 – 26)	0.8	1,548	(1,094 – 2,002)	19.7
evenly young and old	–	–	–	64	(15 – 114)	0.8
Total	976	(593 – 1,358)	100.0	7,853	(6,771 – 8,934)	100.0

Discolouration trend	Species group / Tree number		
	Total		
	thousands	($\alpha = 0.05$)	%
no discolouration	43,540	(41,274 – 45,805)	89.4
from old to young	1,793	(1,331 – 2,255)	3.7
from young to old	1,972	(1,478 – 2,465)	4.1
evenly young and old	1,352	(913 – 1,792)	2.8
Total	48,656	(46,344 – 50,969)	100.0

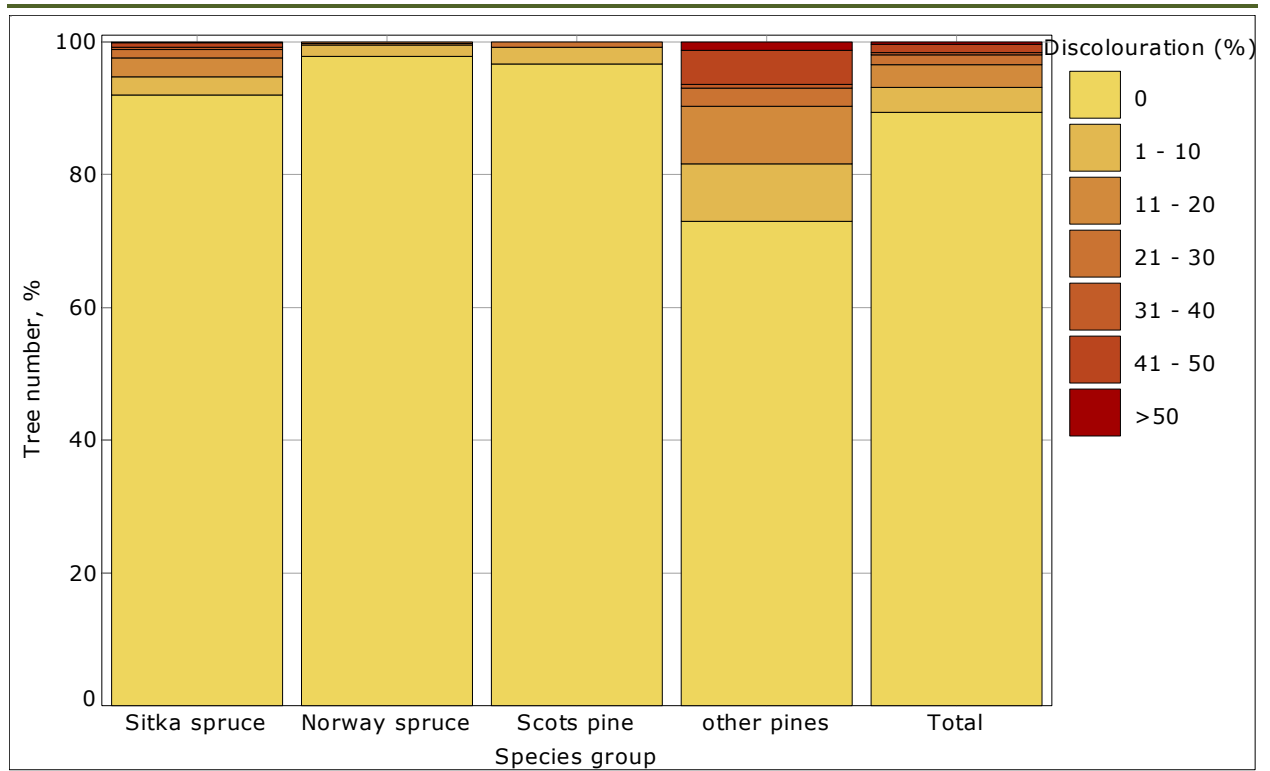


12.3.3 Total number of trees by species group and degree of discolouration

Definition
Discolouration intensity Describes the depth of the discolouration from a healthy colour for that species , with 0% indicative of healthy needles showing no discoloration.

Methodology
The total number of spruce and pine trees that were assessed for height is classified by species group and intensity of discolouration.

Discolouration (%)	Species group / Tree number					
	Sitka spruce			Norway spruce		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0	33,192	(31,181 - 35,204)	92.0	3,659	(2,865 - 4,453)	97.9
1 - 10	1,024	(699 - 1,350)	2.8	65	(0 - 182)	1.7
11 - 20	1,008	(668 - 1,348)	2.8	8	(0 - 24)	0.2
21 - 30	456	(212 - 700)	1.3	8	(0 - 24)	0.2
31 - 40	144	(31 - 257)	0.4	-	-	-
41 - 50	224	(62 - 386)	0.6	-	-	-
>50	40	(0 - 81)	0.1	-	-	-
Total	36,088	(34,041 - 38,136)	100.0	3,739	(2,935 - 4,544)	100.0
Discolouration (%)	Species group / Tree number					
	Scots pine			other pines		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0	944	(566 - 1,321)	96.7	5,729	(4,813 - 6,645)	72.9
1 - 10	24	(0 - 61)	2.5	687	(378 - 997)	8.8
11 - 20	-	-	-	674	(375 - 973)	8.6
21 - 30	8	(0 - 24)	0.8	217	(93 - 341)	2.8
31 - 40	-	-	-	48	(0 - 98)	0.6
41 - 50	-	-	-	402	(173 - 631)	5.1
>50	-	-	-	95	(0 - 220)	1.2
Total	976	(593 - 1,358)	100.0	7,853	(6,771 - 8,934)	100.0
Discolouration (%)	Species group / Tree number					
	Total					
	thousands	($\alpha = 0.05$)	%			
0	43,524	(41,258 - 45,789)	89.4			
1 - 10	1,800	(1,338 - 2,262)	3.7			
11 - 20	1,690	(1,218 - 2,161)	3.5			
21 - 30	689	(415 - 962)	1.4			
31 - 40	192	(69 - 315)	0.4			
41 - 50	626	(347 - 905)	1.3			
>50	135	(4 - 266)	0.3			
Total	48,656	(46,344 - 50,969)	100.0			



12.4 WINDBLOW

12.4.1 Total stocked forest area windblown by species group (Dbh>7cm)

Definition

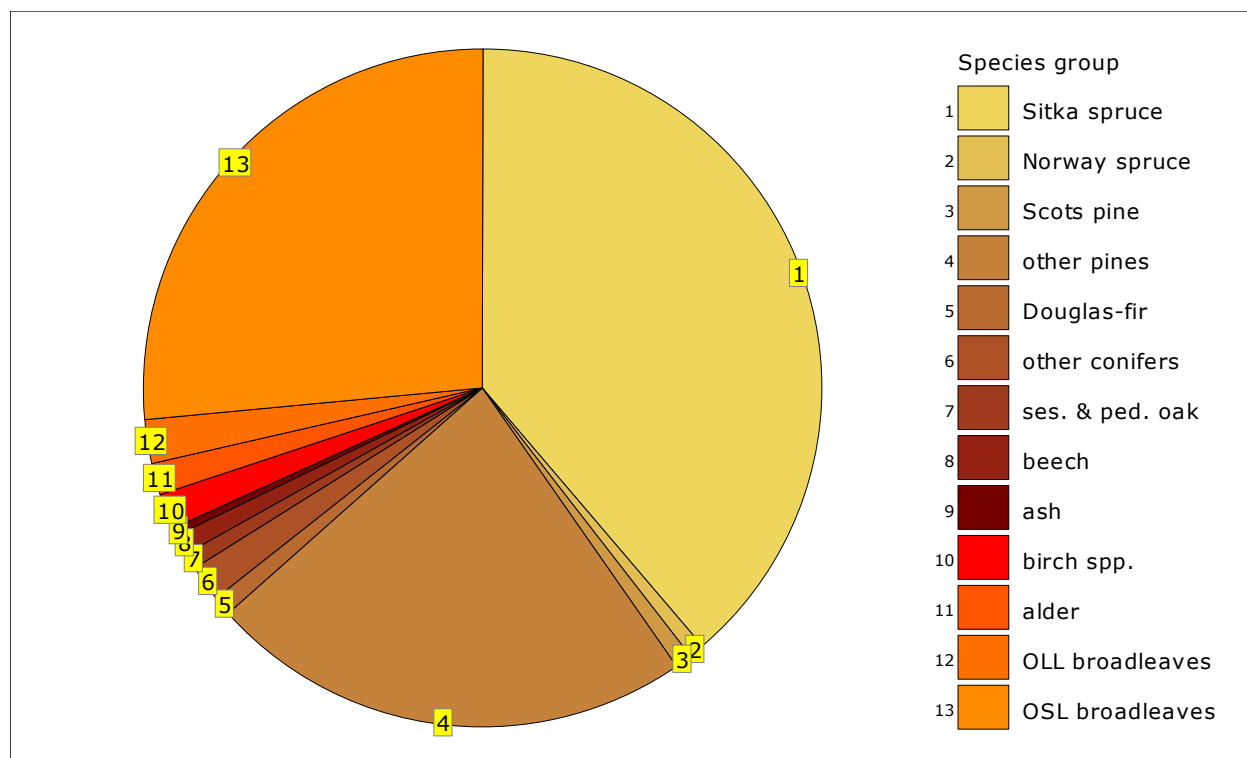
Windblow

Trees blown over by the wind, as a result of exposure and site factors.

Methodology

The total stocked forest area (Dbh $\geq$ 7 cm) windblown is classified by species group

Species group	Area		
	thousands ha	($\alpha = 0.05$)	%
Sitka spruce	3.11	(2.07 – 4.15)	38.8
Norway spruce	0.06	– –	0.7
Scots pine	0.07	– –	0.8
other pines	1.86	(1.22 – 2.50)	23.2
Douglas-fir	0.07	– –	0.9
other conifers	0.14	– –	1.7
ses. & ped. oak	0.06	– –	0.8
beech	0.07	– –	0.9
ash	0.03	– –	0.4
birch spp.	0.14	(0.00 – 0.33)	1.7
alder	0.12	(0.00 – 0.89)	1.5
OLL broadleaves	0.17	(0.00 – 0.55)	2.1
OSL broadleaves	2.12	(1.31 – 2.93)	26.5
Total	8.01	(6.35 – 9.68)	100.0



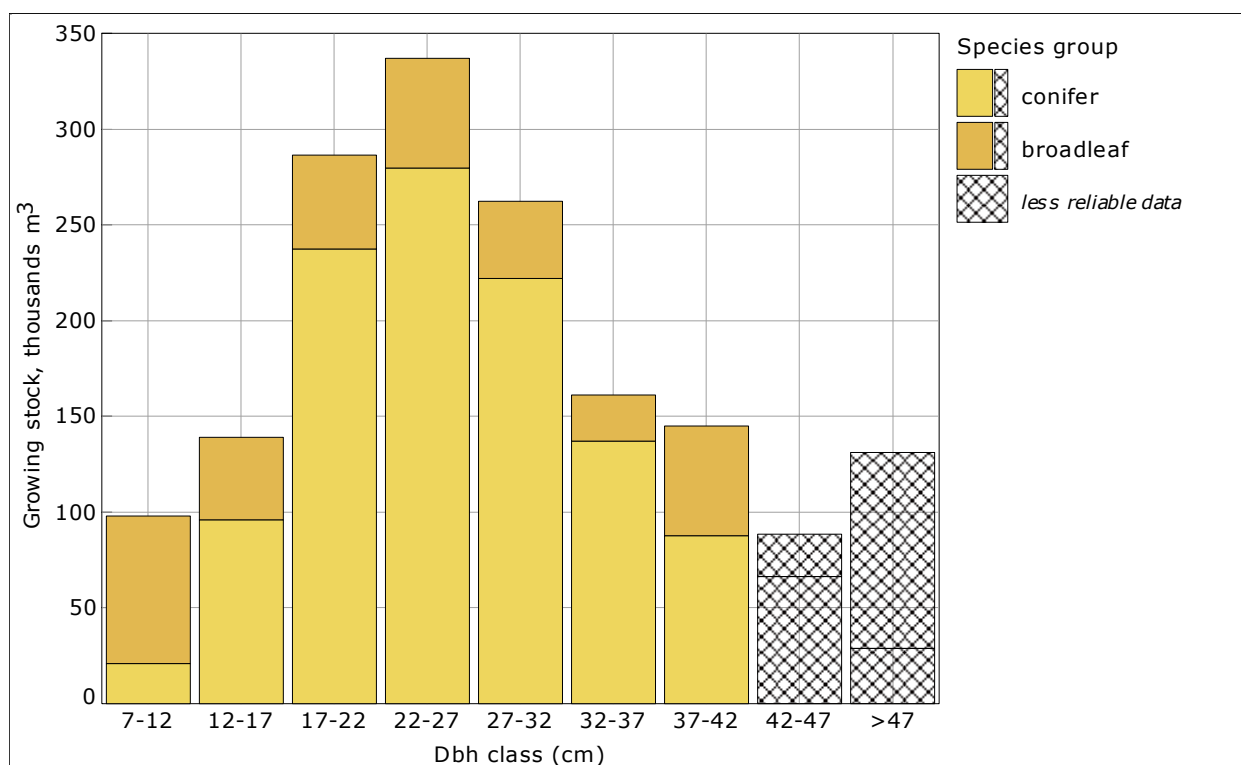
12.4.2 Total growing stock windblown by species group and Dbh class (Dbh>7cm)

Methodology

The total growing stock (Dbh ≥ 7 cm) windblown is classified by species group and Dbh class (5cm).

Dbh class (cm)	Species group / Growing stock					
	conifer			broadleaf		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	20.8	(6.3 – 35.3)	1.8	77.1	(39.0 – 115.1)	16.3
12-17	95.9	(50.2 – 141.7)	8.2	43.1	(22.3 – 63.8)	9.1
17-22	237.5	(170.7 – 304.3)	20.2	48.9	(36.4 – 61.3)	10.3
22-27	279.6	(209.6 – 349.6)	23.6	57.3	(5.3 – 109.2)	12.1
27-32	221.9	(178.7 – 265.0)	18.9	40.6	(13.4 – 67.7)	8.6
32-37	137.1	(88.8 – 185.5)	11.7	23.9	(0.0 – 58.5)	5.1
37-42	87.8	(12.6 – 163.1)	7.5	57.1	(10.2 – 104.0)	12.1
42-47	66.4	– –	5.6	21.9	– –	4.6
>47	28.9	– –	2.5	102.4	– –	21.8
Total	1,176.0	(895.0 – 1,457.0)	100.0	472.1	(282.1 – 662.1)	100.0

Dbh class (cm)	Species group / Growing stock		
	Total		
	thousands m ³	($\alpha = 0.05$)	%
7-12	97.9	(68.5 – 127.3)	5.9
12-17	139.0	(94.1 – 183.9)	8.4
17-22	286.3	(218.1 – 354.6)	17.4
22-27	336.9	(263.7 – 410.0)	20.4
27-32	262.4	(189.0 – 335.8)	15.9
32-37	161.1	(113.1 – 209.0)	9.8
37-42	144.9	(79.8 – 210.1)	8.8
42-47	88.3	(47.7 – 129.0)	5.4
>47	131.3	– –	8.0
Total	1,648.1	(1,300.5 – 1,995.7)	100.0



12.5 TREE BREAK

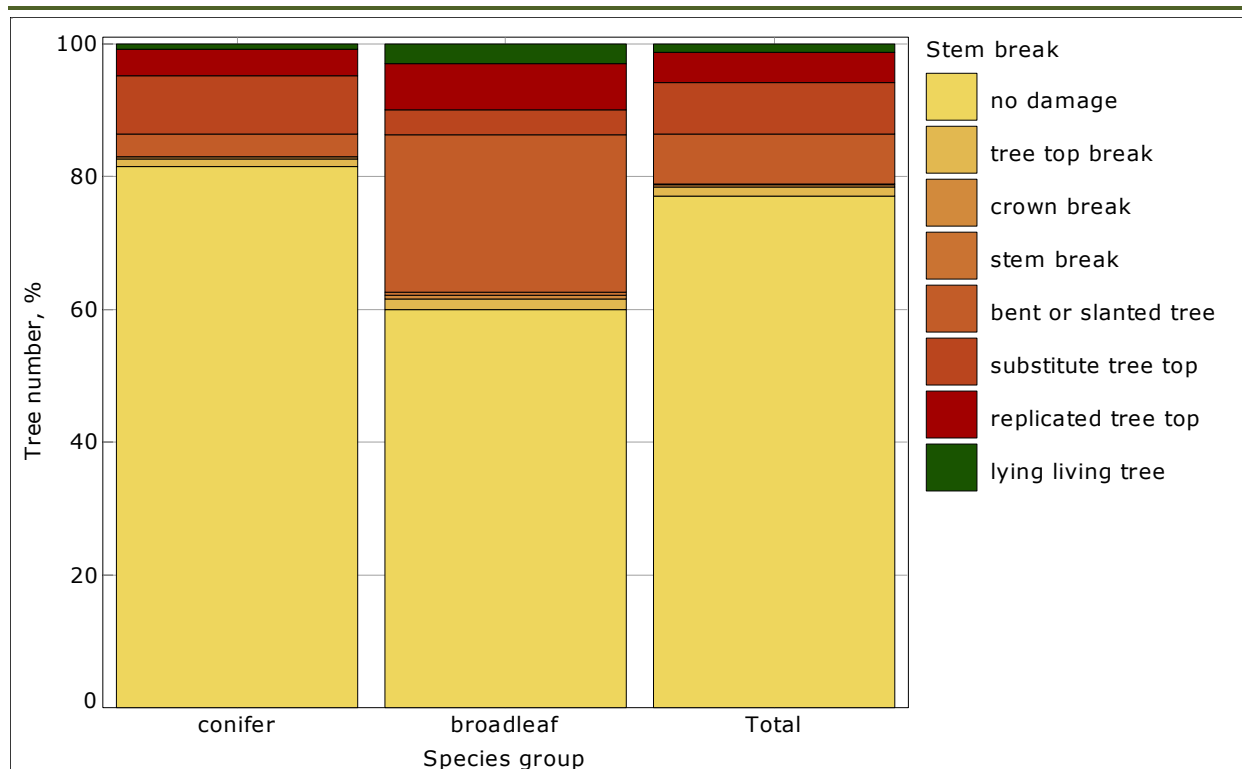
12.5.1 Total number of trees by species group and tree break ($Dbh \geq 7$ cm)

Definition
Stem break Stem break details the presence or absence of defects along the bole or in the crown of the tree. No break: No signs of the breakage or damage listed below. Tree top break: Less than two years leader growth has been broken off. Crown break: The crown of the tree is broken, more severe than tree top break, but still occurring in the live crown. Stem break: The stem below the live crown has broken or snapped. Note: the remaining stem must be greater than 1.3 m in height to be a tree, otherwise it is a stump. Bent or slanted tree: The tree is bent or slanted, e.g. basal sweep or partially windblown tree. The tree is not lying on the ground. Substitute tree top: The tree top has been broken off but has been replaced by a new leader. This results in a kink in the stem otherwise described as a 'bayonet' feature. Replicated tree top: Where a fork occurs with two or more main stems above 5 m from ground level. Lying living tree: The tree is lying on the ground and is still living, i.e. windblown tree. Trees that are obviously supported by another tree are also included in this category.

Methodology
The total number of trees ($Dbh \geq 7$ cm) is classified by species group and Stem break.

Stem break	Species group / Tree number					
	conifer			broadleaf		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
no damage	501,280	(480,302 – 522,258)	81.6	93,922	(83,910 – 103,933)	59.8
tree top break	7,393	(6,080 – 8,707)	1.2	2,448	(477 – 4,418)	1.6
crown break	1,839	(1,219 – 2,458)	0.3	915	(401 – 1,429)	0.6
stem break	156	(99 – 213)	0.03	771	(300 – 1,242)	0.5
bent or slanted tree	21,132	(17,608 – 24,656)	3.4	37,204	(31,284 – 43,124)	23.8
substitute tree top	53,479	(48,899 – 58,059)	8.7	5,926	(4,091 – 7,761)	3.8
replicated tree top	25,168	(22,247 – 28,089)	4.1	10,797	(6,303 – 15,291)	6.9
lying living tree	4,529	(3,368 – 5,689)	0.7	4,637	(2,234 – 7,039)	3.0
Total	614,976	(592,024 – 637,927)	100.0	156,618	(142,372 – 170,865)	100.0

Stem break	Species group / Tree number		
	Total		
	thousands	($\alpha = 0.05$)	%
no damage	595,202	(572,190 – 618,213)	77.0
tree top break	9,841	(7,884 – 11,798)	1.3
crown break	2,754	(2,021 – 3,486)	0.4
stem break	927	(468 – 1,386)	0.1
bent or slanted tree	58,336	(51,328 – 65,344)	7.6
substitute tree top	59,405	(54,531 – 64,278)	7.7
replicated tree top	35,965	(30,705 – 41,225)	4.7
lying living tree	9,165	(6,915 – 11,415)	1.2
Total	771,594	(745,836 – 797,352)	100.0



12.5.2 Total volume stock by stem break and Dbh class (Dbh >7 cm)

Methodology

The total number of trees (Dbh ≥ 7 cm) is classified by tree break and Dbh class (5 cm).

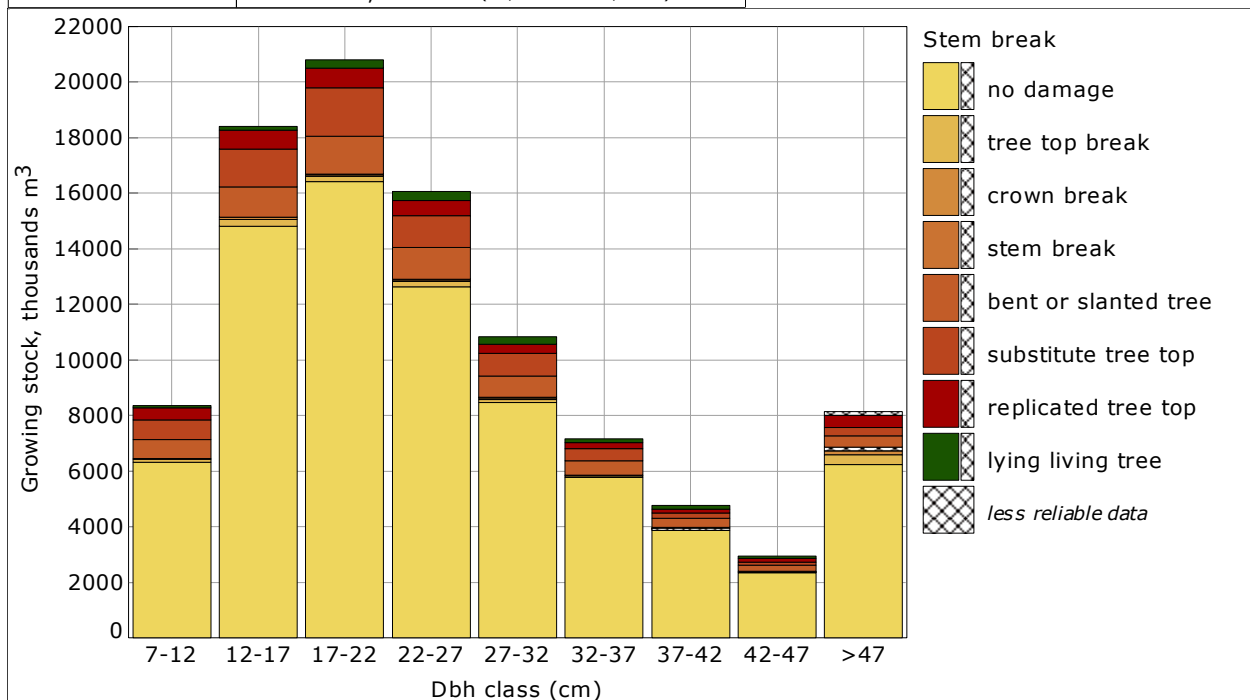
Dbh class (cm)	Stem break / Growing stock					
	no damage			tree top break		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	6,318.7	(5,979.5 - 6,657.9)	8.2	111.7	(78.1 - 145.2)	8.3
12-17	14,810.8	(13,975.2 - 15,646.4)	19.3	238.3	(205.4 - 271.2)	17.7
17-22	16,407.2	(15,383.4 - 17,431.1)	21.4	193.1	(159.4 - 226.8)	14.3
22-27	12,643.2	(11,719.2 - 13,567.3)	16.5	178.3	(144.5 - 212.2)	13.2
27-32	8,472.7	(7,740.3 - 9,205.1)	11.0	99.6	(64.9 - 134.2)	7.4
32-37	5,760.3	(5,211.8 - 6,308.8)	7.5	66.4	(30.4 - 102.4)	4.9
37-42	3,859.9	(3,339.8 - 4,380.0)	5.0	87.2	-	6.5
42-47	2,337.5	(1,973.2 - 2,701.7)	3.0	37.2	(15.1 - 59.2)	2.8
>47	6,242.6	(4,948.1 - 7,537.0)	8.1	334.8	(0.0 - 679.9)	24.9
Total	76,852.8	(72,867.1 - 80,838.6)	100.0	1,346.6	(1,098.8 - 1,594.3)	100.0

Dbh class (cm)	Stem break / Growing stock					
	crown break			stem break		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	22.3	(6.4 - 38.3)	4.3	8.2	-	3.3
12-17	80.8	(55.9 - 105.6)	15.6	19.2	(16.3 - 22.1)	7.6
17-22	64.3	(42.2 - 86.3)	12.4	24.8	(8.4 - 41.2)	9.9
22-27	66.4	(59.7 - 73.0)	12.8	23.8	(20.2 - 27.5)	9.5
27-32	62.3	(42.1 - 82.6)	12.1	19.6	-	7.8
32-37	27.6	(0.0 - 56.9)	5.4	4.0	-	1.6
37-42	23.5	-	4.5	-	-	-
42-47	27.5	-	5.3	-	-	-
>47	142.1	(92.1 - 192.1)	27.6	151.9	-	60.3
Total	516.8	(385.9 - 647.7)	100.0	251.6	(229.0 - 274.1)	100.0

Dbh class (cm)	Stem break / Growing stock					
	bent or slanted tree			substitute tree top		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	676.9	(563.6 - 790.1)	10.4	706.1	(630.4 - 781.8)	10.3
12-17	1,076.7	(974.1 - 1,179.4)	16.6	1,369.2	(1,250.1 - 1,488.3)	20.0
17-22	1,361.7	(1,211.6 - 1,511.7)	21.2	1,746.5	(1,567.6 - 1,925.5)	25.8
22-27	1,141.9	(1,012.9 - 1,270.9)	17.6	1,128.8	(1,000.0 - 1,257.7)	16.5
27-32	763.5	(667.7 - 859.3)	11.8	832.7	(697.6 - 967.9)	12.2
32-37	519.2	(460.5 - 577.9)	8.0	431.3	(365.6 - 497.0)	6.3
37-42	326.8	(281.3 - 372.3)	5.0	200.2	(164.3 - 236.1)	2.9
42-47	203.7	(174.6 - 232.8)	3.1	124.0	(100.6 - 147.4)	1.8
>47	408.4	(346.6 - 470.1)	6.3	290.1	(175.4 - 404.8)	4.2
Total	6,478.8	(5,922.7 - 7,034.9)	100.0	6,829.1	(6,234.2 - 7,424.0)	100.0

Dbh class (cm)	Stem break / Growing stock					
	replicated tree top			lying living tree		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	424.5	(357.7 - 491.2)	11.9	97.9	(68.5 - 127.3)	5.9
12-17	672.1	(584.2 - 760.0)	18.9	139.0	(94.1 - 183.9)	8.4
17-22	714.9	(631.4 - 798.4)	20.2	286.3	(218.1 - 354.6)	17.4
22-27	545.7	(471.6 - 619.7)	15.4	336.9	(263.7 - 410.0)	20.4
27-32	315.1	(258.7 - 371.6)	8.9	262.4	(189.0 - 335.8)	15.9
32-37	203.2	(183.4 - 223.1)	5.7	161.1	(113.1 - 209.0)	9.8
37-42	118.3	(76.7 - 159.9)	3.3	144.9	(79.8 - 210.1)	8.8
42-47	118.1	(0.0 - 352.3)	3.3	88.3	(47.7 - 129.0)	5.4
>47	440.6	(44.5 - 836.7)	12.4	131.3	-	8.0
Total	3,552.5	(3,103.4 - 4,001.5)	100.0	1,648.1	(1,300.5 - 1,995.7)	100.0

Dbh class (cm)	Stem break / Growing stock			
	Total			
	thousands m ³	($\alpha = 0.05$)	%	
7-12	8,366.2	(7,957.8 - 8,774.6)	8.6	
12-17	18,406.2	(17,467.1 - 19,345.2)	18.9	
17-22	20,798.8	(19,594.1 - 22,003.6)	21.2	
22-27	16,065.0	(14,986.4 - 17,143.6)	16.5	
27-32	10,828.0	(9,958.2 - 11,697.7)	11.1	
32-37	7,173.2	(6,549.2 - 7,797.2)	7.4	
37-42	4,760.9	(4,192.7 - 5,329.1)	4.9	
42-47	2,936.3	(2,536.8 - 3,335.7)	3.0	
>47	8,141.7	(6,624.0 - 9,659.4)	8.4	
Total	97,476.3	(92,906.4 - 102,046.1)	100.0	



12.6 STEM DAMAGE

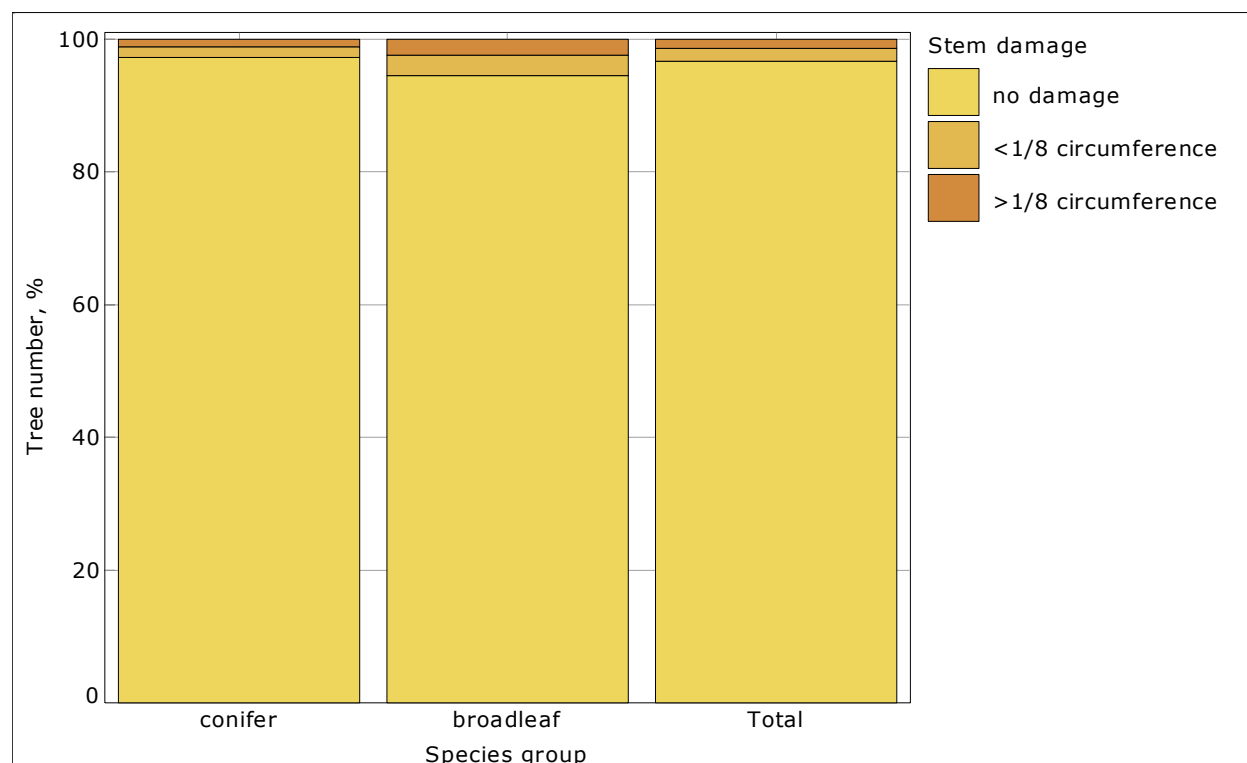
12.6.1 Total number of trees by species group and stem damage ($Dbh \geq 7$ cm)

Definition
Stem damage Damage to stems caused by abiotic (e.g. wind, harvesting or extraction machines). No damage: Damage is not present. Damage up to 1/8 of circumference: Up to 1/8 of the stem circumference has been damaged. Damage to more than 1/8 of circumference: More than 1/8 of the stem circumference of the stem has been damaged.

Methodology
The total number of trees ($Dbh \geq 7$ cm) is classified by species group and stem damage.

Stem damage	Species group / Tree number					
	conifer			broadleaf		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
no damage	598,497	(575,606 – 621,388)	97.3	148,110	(134,356 – 161,864)	94.5
<1/8 circumference	9,628	(8,099 – 11,157)	1.6	4,786	(3,078 – 6,493)	3.1
>1/8 circumference	6,851	(5,015 – 8,686)	1.1	3,723	(2,538 – 4,908)	2.4
Total	614,976	(592,024 – 637,927)	100.0	156,618	(142,372 – 170,865)	100.0

Stem damage	Species group / Tree number		
	Total		
	thousands	($\alpha = 0.05$)	%
no damage	746,607	(720,990 – 772,223)	96.7
<1/8 circumference	14,414	(12,360 – 16,468)	1.9
>1/8 circumference	10,573	(8,378 – 12,769)	1.4
Total	771,594	(745,836 – 797,352)	100.0

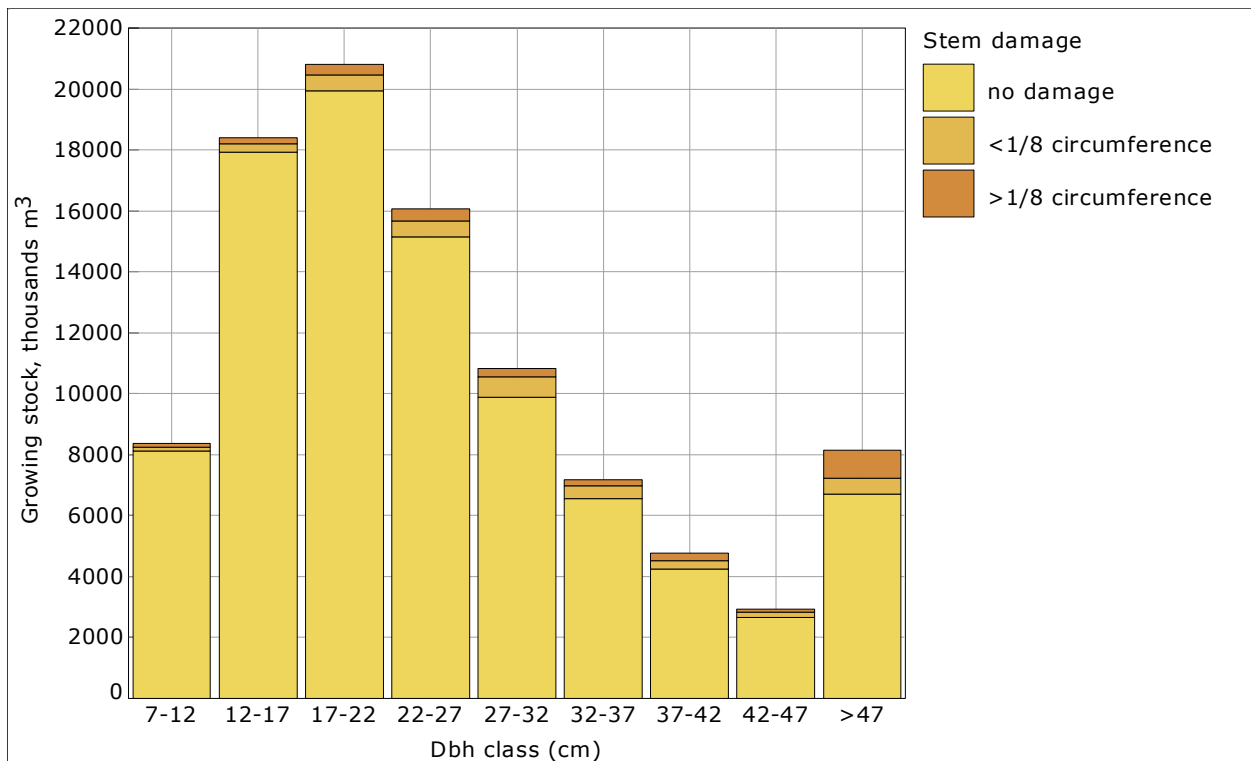


12.6.2 Total growing stock by stem damage and Dbh class (Dbh >7 cm)

Methodology
The total volume (Dbh ≥ 7 cm) is classified by stem damage and Dbh class (5 cm).

Dbh class (cm)	Stem damage / Growing stock					
	no damage			<1/8 circumference		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	8,119.9	(7,724.1 - 8,515.8)	8.9	131.1	(97.2 - 165.1)	3.7
12-17	17,923.3	(16,993.4 - 18,853.3)	19.7	270.2	(242.0 - 298.4)	7.6
17-22	19,937.3	(18,761.7 - 21,112.9)	21.8	518.6	(454.3 - 582.9)	14.6
22-27	15,146.1	(14,121.6 - 16,170.5)	16.6	532.3	(443.1 - 621.5)	15.0
27-32	9,871.8	(9,073.6 - 10,670.1)	10.8	693.2	(566.0 - 820.4)	19.6
32-37	6,544.2	(5,974.4 - 7,113.9)	7.2	423.6	(342.3 - 504.9)	11.9
37-42	4,247.3	(3,725.7 - 4,768.8)	4.7	275.1	(197.8 - 352.4)	7.7
42-47	2,646.1	(2,264.3 - 3,027.8)	2.9	190.9	(142.9 - 239.0)	5.4
>47	6,705.8	(5,517.4 - 7,894.2)	7.4	515.8	(318.9 - 712.7)	14.5
Total	91,141.8	(86,896.8 - 95,386.7)	100.0	3,550.9	(3,021.7 - 4,080.2)	100.0

Dbh class (cm)	Stem damage / Growing stock					
	>1/8 circumference			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	115.2	(76.0 - 154.3)	4.1	8,366.2	(7,957.8 - 8,774.6)	8.6
12-17	212.7	(180.4 - 244.9)	7.6	18,406.2	(17,467.1 - 19,345.2)	18.9
17-22	342.9	(297.1 - 388.7)	12.3	20,798.8	(19,594.1 - 22,003.6)	21.2
22-27	386.6	(336.7 - 436.6)	13.9	16,065.0	(14,986.4 - 17,143.6)	16.5
27-32	263.0	(225.8 - 300.1)	9.4	10,828.0	(9,958.2 - 11,697.7)	11.1
32-37	205.4	(181.0 - 229.8)	7.4	7,173.2	(6,549.2 - 7,797.2)	7.4
37-42	238.5	(191.6 - 285.3)	8.6	4,760.9	(4,192.7 - 5,329.1)	4.9
42-47	99.3	(32.9 - 165.7)	3.6	2,936.3	(2,536.8 - 3,335.7)	3.0
>47	920.1	(410.8 - 1,429.3)	33.1	8,141.7	(6,624.0 - 9,659.4)	8.4
Total	2,783.6	(2,198.7 - 3,368.4)	100.0	97,476.3	(92,906.4 - 102,046.1)	100.0

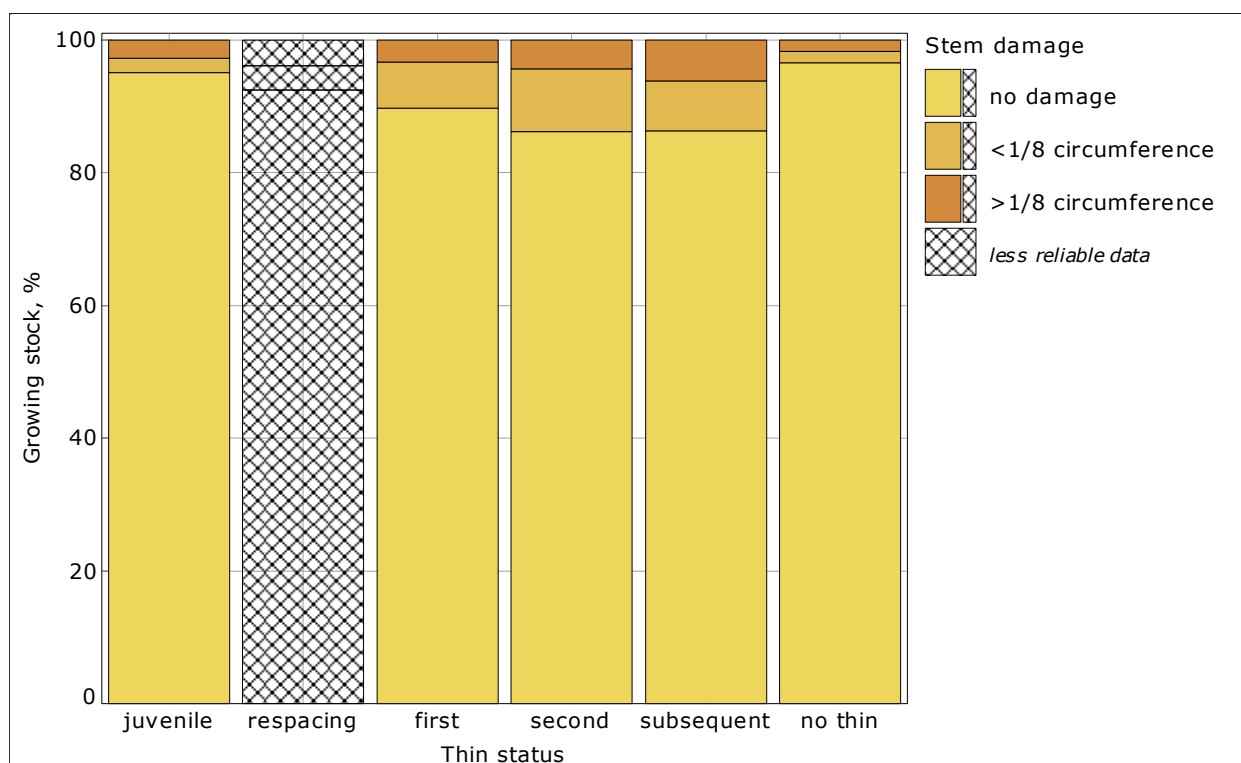


12.6.3 Total growing stock by thin status and stem damage ($Dbh \geq 7$ cm)

Methodology

The total volume ($Dbh \geq 7$ cm) is classified by thin status and stem damage.

Stem damage	Thin status / Growing stock					
	juvenile			respacing		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no damage	22,192.9	(20,868.6 – 23,517.2)	95.1	303.0	–	– 92.5
<1/8 circumference	504.2	(204.7 – 803.6)	2.2	12.0	–	– 3.7
>1/8 circumference	635.6	(90.0 – 1,181.2)	2.7	12.5	–	– 3.8
Total	23,332.7	(21,871.0 – 24,794.4)	100.0	327.6	–	– 100.0
Stem damage	Thin status / Growing stock					
	first			second		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no damage	12,409.1	(11,299.0 – 13,519.1)	89.8	4,282.8	(3,694.2 – 4,871.4)	86.3
<1/8 circumference	954.5	(662.4 – 1,246.6)	6.9	468.8	(260.6 – 676.9)	9.4
>1/8 circumference	458.3	(368.0 – 548.6)	3.3	213.5	(151.2 – 275.9)	4.3
Total	13,821.8	(12,564.8 – 15,078.9)	100.0	4,965.1	(4,323.7 – 5,606.5)	100.0
Stem damage	Thin status / Growing stock					
	subsequent			no thin		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no damage	10,253.4	(8,620.7 – 11,886.1)	86.4	41,700.5	(39,795.9 – 43,605.2)	96.6
<1/8 circumference	889.4	(641.1 – 1,137.8)	7.5	722.1	(497.3 – 946.9)	1.7
>1/8 circumference	729.4	(613.6 – 845.2)	6.1	734.1	(605.4 – 862.9)	1.7
Total	11,872.2	(10,228.0 – 13,516.5)	100.0	43,156.8	(41,142.2 – 45,171.4)	100.0
Stem damage	Thin status / Growing stock					
	Total					
	thousands m ³	($\alpha = 0.05$)	%			
no damage	91,141.8	(86,896.8 – 95,386.7)	93.5			
<1/8 circumference	3,550.9	(3,021.7 – 4,080.2)	3.6			
>1/8 circumference	2,783.6	(2,198.7 – 3,368.4)	2.9			
Total	97,476.3	(92,906.4 – 102,046.1)	100.0			



12.7 PEELING DAMAGE

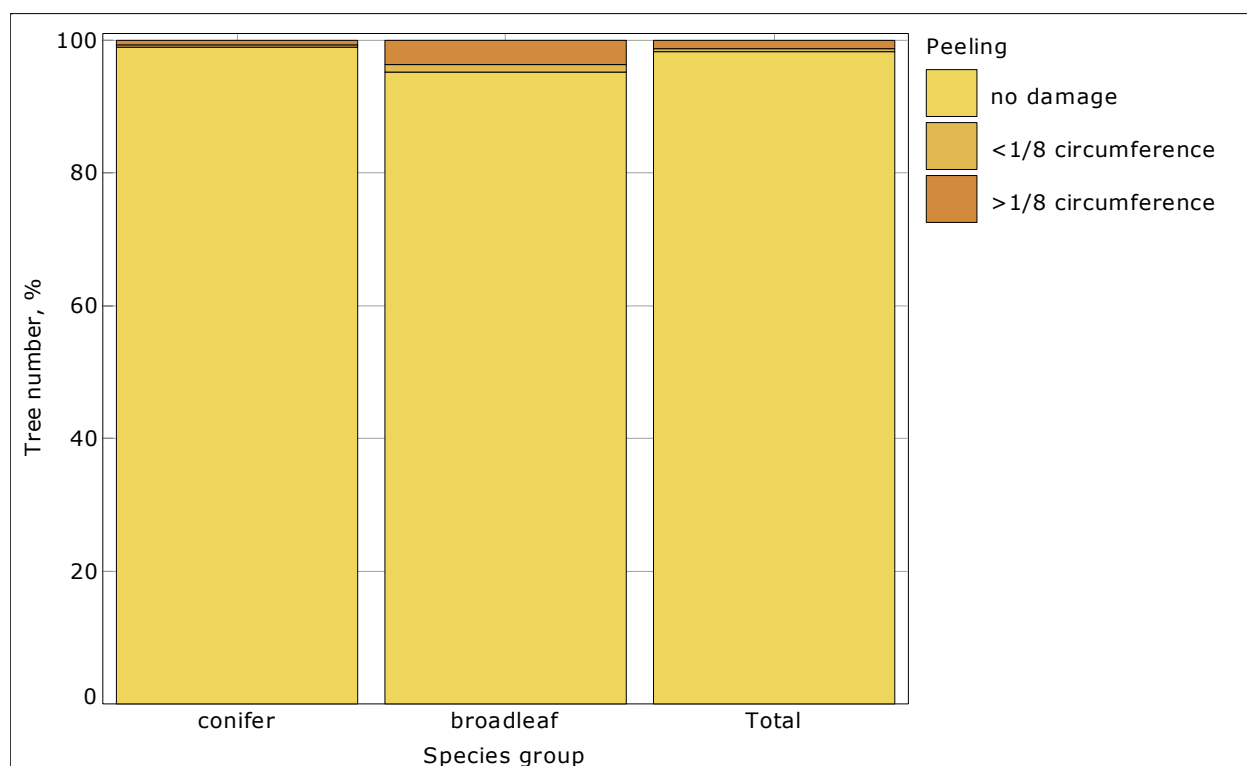
12.7.1 Total number of trees by species group and peeling damage ($Dbh \geq 7$ cm)

Definition
Peeling damage Damage to stems caused by biotic factors (e.g. deer). No damage: Damage is not present. Damage up to 1/8 of circumference: Up to 1/8 of the stem circumference has been damaged. Damage to more than 1/8 of circumference: More than 1/8 of the stem circumference of the tree has been damaged.

Methodology
The total number of trees ($Dbh \geq 7$ cm) is classified by species group and peeling damage.

Peeling	Species group / Tree number					
	conifer			broadleaf		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
no damage	609,052	(586,179 – 631,925)	99.1	149,072	(135,521 – 162,623)	95.1
<1/8 circumference	2,043	(1,128 – 2,959)	0.3	1,811	(0 – 5,615)	1.2
>1/8 circumference	3,880	(758 – 7,002)	0.6	5,736	(2,876 – 8,595)	3.7
Total	614,976	(592,024 – 637,927)	100.0	156,618	(142,372 – 170,865)	100.0

Peeling	Species group / Tree number		
	Total		
	thousands	($\alpha = 0.05$)	%
no damage	758,124	(732,735 – 783,513)	98.3
<1/8 circumference	3,854	(2,817 – 4,892)	0.5
>1/8 circumference	9,616	(6,288 – 12,944)	1.2
Total	771,594	(745,836 – 797,352)	100.0



12.7.2 Total number of trees by peeling damage and other damage (Dbh $\geq$ 7 cm)

Definition

Other damage

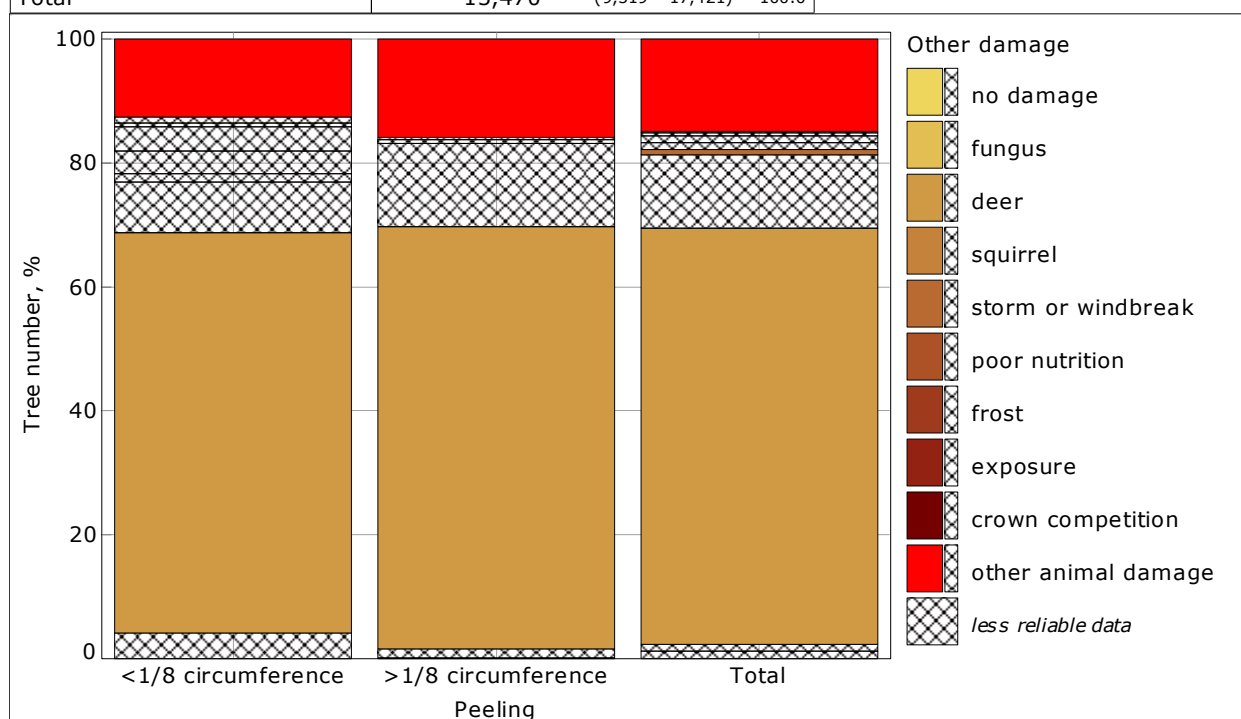
Other factors which can impact on tree growth.

Methodology

The total number of trees (Dbh $\geq$ 7 cm) is classified by peeling damage and other damage. Information from other damage identifies the damage source

Other damage	Peeling / Tree number							
	<1/8 circumference			>1/8 circumference				
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%		
no damage	158	-	-	4.1	8	-	-	0.08
fungus	-	-	-	-	141	-	-	1.5
deer	2,490	(1,760 - 3,220)	64.5	6,555	(3,462 - 9,647)	68.1		
squirrel	318	-	-	8.3	1,287	-	-	13.4
storm or windbreak	50	-	-	1.3	68	-	-	0.7
poor nutrition	141	-	-	3.7	-	-	-	-
frost	151	-	-	3.9	-	-	-	-
exposure	26	-	-	0.7	32	-	-	0.3
crown competition	34	-	-	0.9	-	-	-	-
other animal damage	485	(0 - 1,685)	12.6	1,525	(0 - 4,789)	15.9		
Total	3,854	(2,817 - 4,892)	100.0	9,616	(6,288 - 12,944)	100.0		

Other damage	Peeling / Tree number			
	Total			
	thousands	($\alpha = 0.05$)	%	
no damage	166	-	-	1.2
fungus	141	-	-	1.0
deer	9,045	(5,685 - 12,404)		67.3
squirrel	1,605	-	-	11.9
storm or windbreak	118	(41 - 195)		0.9
poor nutrition	141	-	-	1.0
frost	151	-	-	1.1
exposure	58	-	-	0.4
crown competition	34	-	-	0.3
other animal damage	2,011	(748 - 3,273)		14.9
Total	13,470	(9,519 - 17,421)		100.0



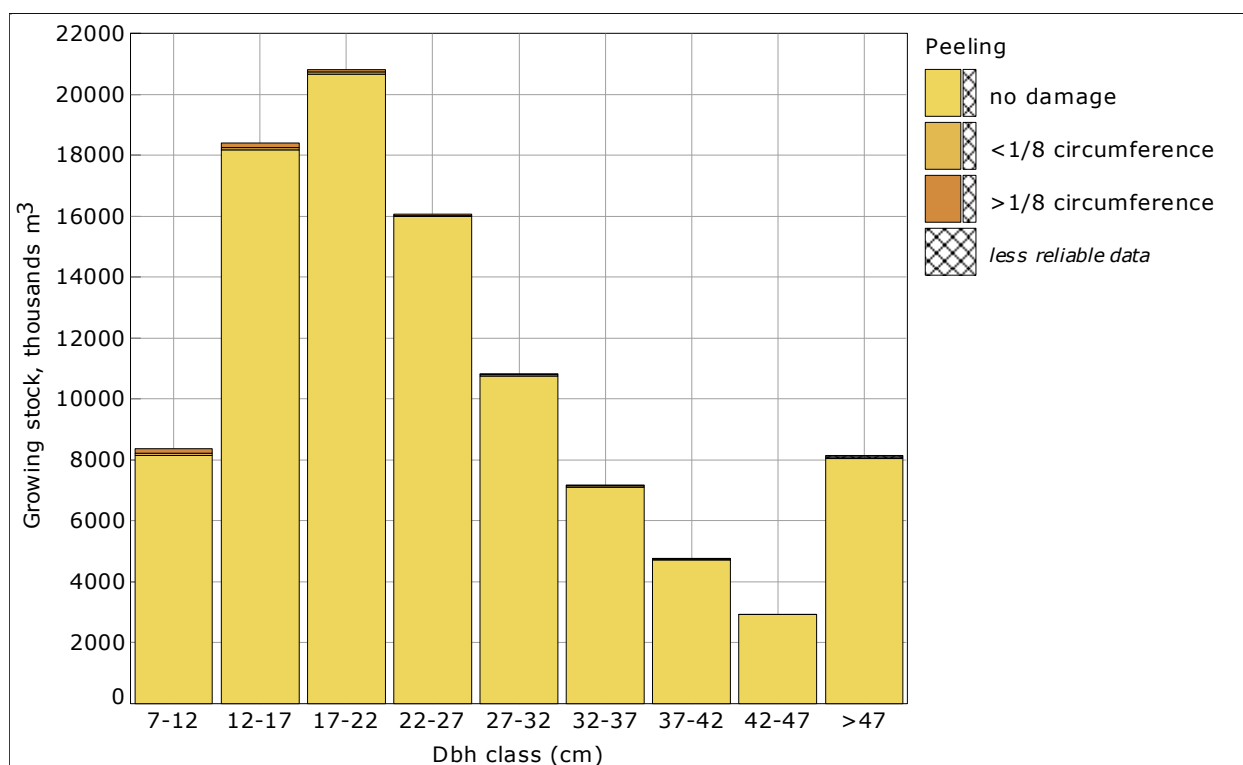
12.7.3 Total growing stock by peeling damage and Dbh class (Dbh >7 cm)

Methodology

The total growing stock (Dbh ≥ 7 cm) is classified by peeling damage and Dbh class (5 cm).

Dbh class (cm)	Peeling / Growing stock					
	no damage			<1/8 circumference		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	8,154.8	(7,753.1 - 8,556.5)	8.5	63.0	(40.0 - 86.0)	14.3
12-17	18,178.6	(17,241.4 - 19,115.7)	18.8	80.1	(47.9 - 112.4)	18.2
17-22	20,653.3	(19,456.5 - 21,850.1)	21.4	81.2	(66.9 - 95.5)	18.4
22-27	15,978.8	(14,903.4 - 17,054.2)	16.6	44.7	(27.4 - 62.0)	10.1
27-32	10,747.7	(9,883.1 - 11,612.3)	11.1	57.4	(0.0 - 372.1)	13.0
32-37	7,109.3	(6,489.5 - 7,729.1)	7.4	42.1	(3.9 - 80.3)	9.6
37-42	4,708.1	(4,167.2 - 5,249.0)	4.9	31.3	-	7.1
42-47	2,921.1	(2,525.9 - 3,316.3)	3.0	-	-	-
>47	8,050.4	(6,545.0 - 9,555.7)	8.3	40.8	-	9.3
Total	96,502.0	(92,006.8 - 100,997.2)	100.0	440.5	(163.2 - 717.8)	100.0

Dbh class (cm)	Peeling / Growing stock					
	>1/8 circumference			Total		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	148.4	(107.5 - 189.3)	27.8	8,366.2	(7,957.8 - 8,774.6)	8.6
12-17	147.5	(104.2 - 190.8)	27.6	18,406.2	(17,467.1 - 19,345.2)	18.9
17-22	64.4	(39.3 - 89.4)	12.1	20,798.8	(19,594.1 - 22,003.6)	21.2
22-27	41.5	(13.8 - 69.2)	7.8	16,065.0	(14,986.4 - 17,143.6)	16.5
27-32	22.9	(18.8 - 27.0)	4.3	10,828.0	(9,958.2 - 11,697.7)	11.1
32-37	21.8	(3.9 - 39.7)	4.1	7,173.2	(6,549.2 - 7,797.2)	7.4
37-42	21.5	(0.0 - 211.8)	4.0	4,760.9	(4,192.7 - 5,329.1)	4.9
42-47	15.2	-	2.8	2,936.3	(2,536.8 - 3,335.7)	3.0
>47	50.6	-	9.5	8,141.7	(6,624.0 - 9,659.4)	8.4
Total	533.7	(363.2 - 704.2)	100.0	97,476.3	(92,906.4 - 102,046.1)	100.0



12.8 ROOT DAMAGE

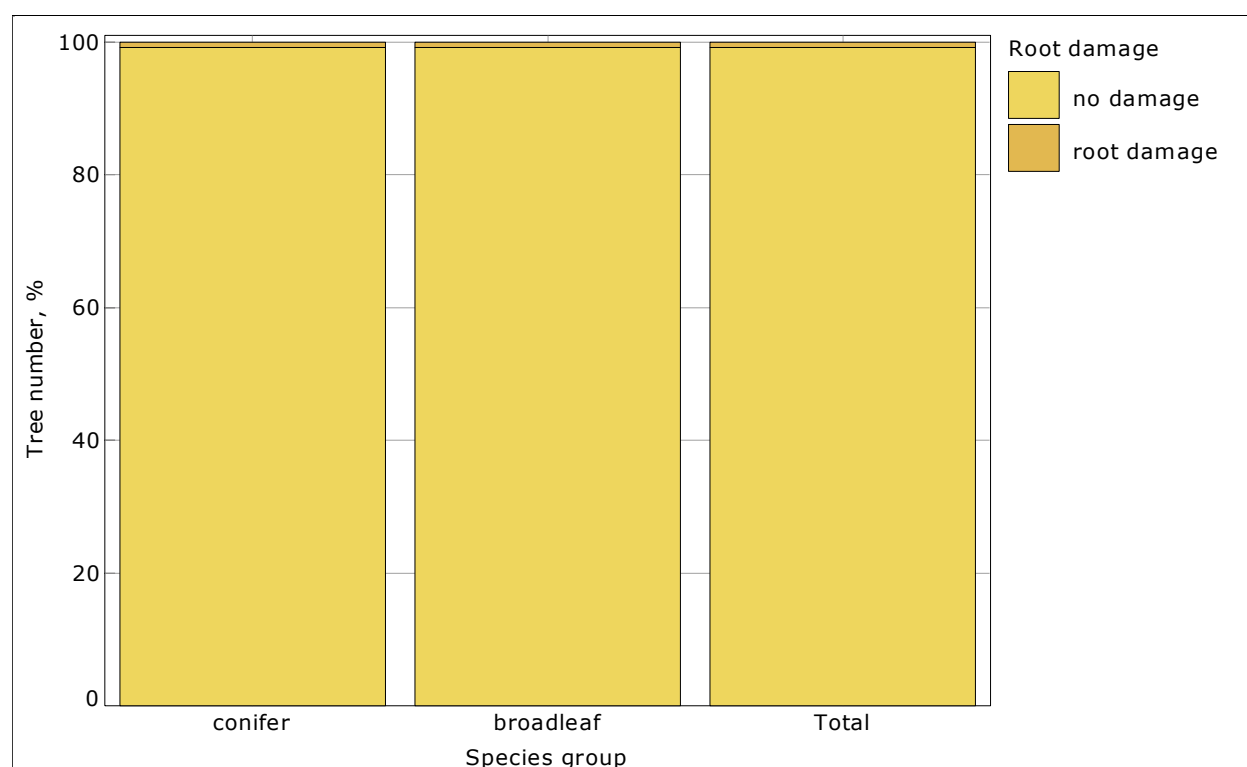
12.8.1 Total number of trees by species group and root damage ($Dbh \geq 7$ cm)

Definition
Root damage Damage to roots caused by abiotic (e.g. wind, harvesting or extraction machines). No root damage: No visible root damage present. Root damage: There is root damage present.

Methodology
The total number of trees ($Dbh \geq 7$ cm) is classified by species group and root damage.

Root damage	Species group / Tree number					
	conifer			broadleaf		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
no damage	609,939	(586,956 – 632,922)	99.2	155,450	(141,282 – 169,619)	99.3
root damage	5,036	(3,903 – 6,169)	0.8	1,168	(179 – 2,156)	0.7
Total	614,976	(592,024 – 637,927)	100.0	156,618	(142,372 – 170,865)	100.0

Root damage	Species group / Tree number		
	Total		
	thousands	($\alpha = 0.05$)	%
no damage	765,390	(739,634 – 791,145)	99.2
root damage	6,204	(4,711 – 7,698)	0.8
Total	771,594	(745,836 – 797,352)	100.0



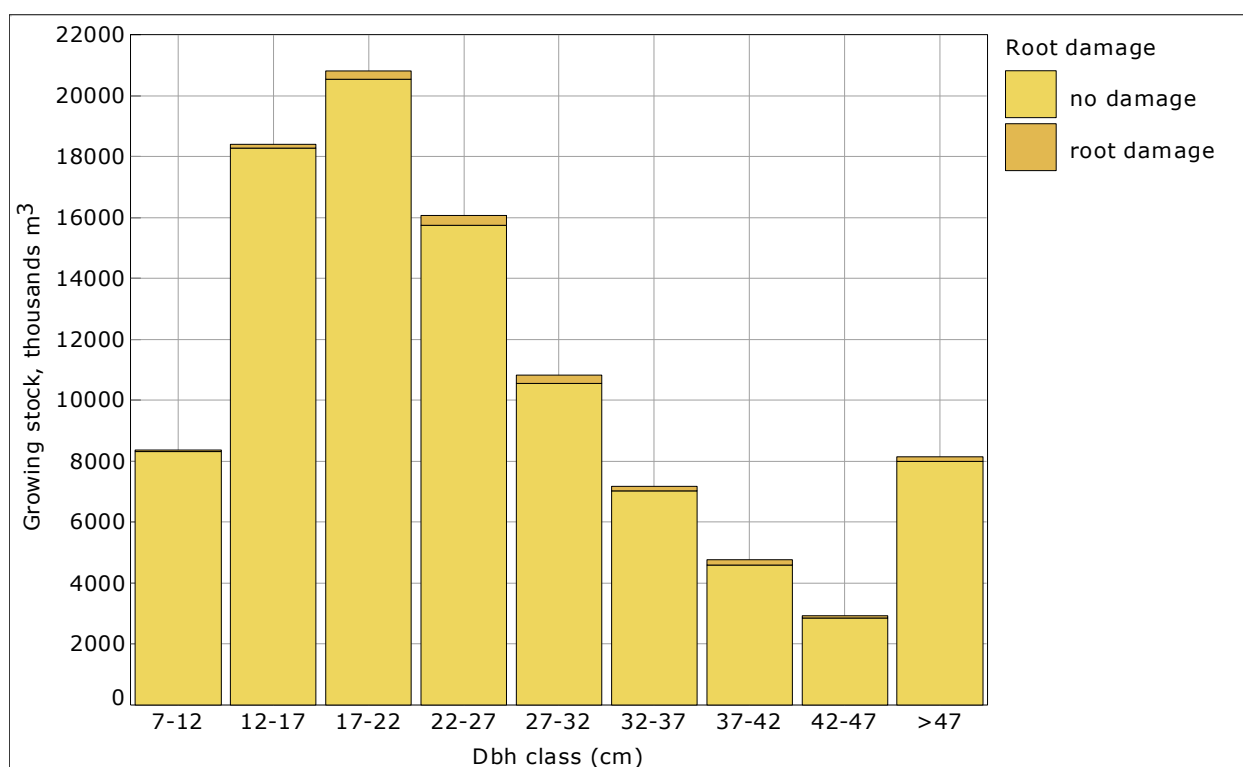
12.8.2 Total growing stock by root damage and Dbh class (Dbh >7 cm)

Methodology

The total growing stock (Dbh $\geq$ 7 cm) is classified by root damage and Dbh class (5 cm).

Dbh class (cm)	Root damage / Growing stock					
	no damage			root damage		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	8,321	(7,914 - 8,727)	8.7	46	(25 - 66)	2.9
12-17	18,267	(17,328 - 19,205)	19.1	139	(103 - 175)	8.7
17-22	20,528	(19,333 - 21,724)	21.4	271	(201 - 340)	17.0
22-27	15,753	(14,687 - 16,818)	16.4	312	(229 - 396)	19.6
27-32	10,550	(9,696 - 11,403)	11.0	278	(210 - 347)	17.5
32-37	7,018	(6,398 - 7,638)	7.3	155	(117 - 193)	9.7
37-42	4,598	(4,045 - 5,152)	4.8	163	(0 - 412)	10.2
42-47	2,853	(2,461 - 3,245)	3.0	83	(70 - 97)	5.2
>47	7,995	(6,481 - 9,510)	8.3	146	(70 - 223)	9.2
Total	95,882	(91,366 - 100,399)	100.0	1,594	(1,244 - 1,944)	100.0

Dbh class (cm)	Root damage / Growing stock		
	Total		
	thousands m ³	($\alpha = 0.05$)	%
7-12	8,366	(7,958 - 8,775)	8.6
12-17	18,406	(17,467 - 19,345)	18.9
17-22	20,799	(19,594 - 22,004)	21.2
22-27	16,065	(14,986 - 17,144)	16.5
27-32	10,828	(9,958 - 11,698)	11.1
32-37	7,173	(6,549 - 7,797)	7.4
37-42	4,761	(4,193 - 5,329)	4.9
42-47	2,936	(2,537 - 3,336)	3.0
>47	8,142	(6,624 - 9,659)	8.4
Total	97,476	(92,906 - 102,046)	100.0



12.8.3 Total growing stock by root damage and Dbh class (Dbh >7 cm)

Methodology

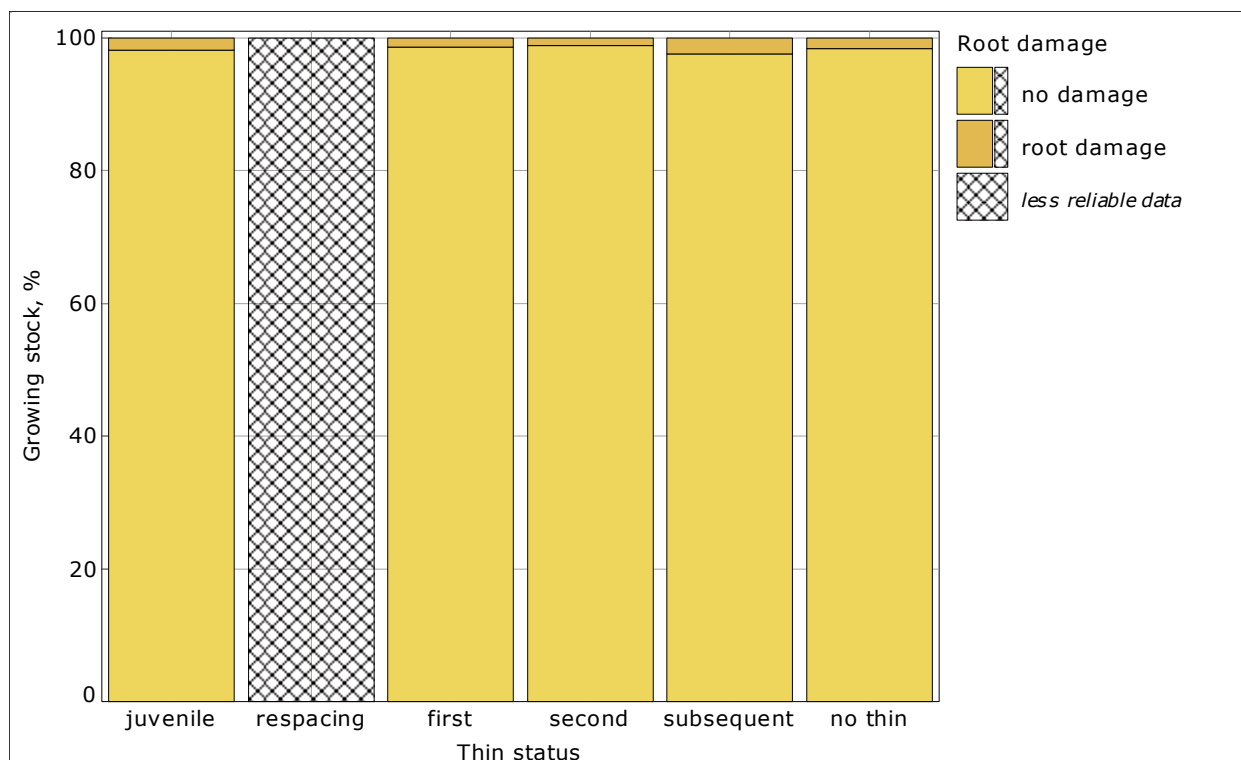
The total growing stock (Dbh ≥7 cm) is classified by thin status and root damage.

Root damage	Thin status / Growing stock					
	juvenile			respacing		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no damage	22,915	(21,479 - 24,352)	98.2	328	-	100.0
root damage	417	(178 - 657)	1.8	-	-	-
Total	23,333	(21,871 - 24,794)	100.0	328	-	100.0

Root damage	Thin status / Growing stock					
	first			second		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no damage	13,642	(12,375 - 14,909)	98.7	4,908	(4,263 - 5,554)	98.9
root damage	180	(0 - 942)	1.3	57	(0 - 157)	1.1
Total	13,822	(12,565 - 15,079)	100.0	4,965	(4,324 - 5,607)	100.0

Root damage	Thin status / Growing stock					
	subsequent			no thin		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
no damage	11,591	(9,954 - 13,229)	97.6	42,497	(40,511 - 44,483)	98.5
root damage	281	(211 - 351)	2.4	660	(425 - 894)	1.5
Total	11,872	(10,228 - 13,516)	100.0	43,157	(41,142 - 45,171)	100.0

Root damage	Thin status / Growing stock		
	Total		
	thousands m ³	($\alpha = 0.05$)	%
no damage	95,882	(91,366 - 100,399)	98.4
root damage	1,594	(1,244 - 1,944)	1.6
Total	97,476	(92,906 - 102,046)	100.0



12.9 OTHER DAMAGE

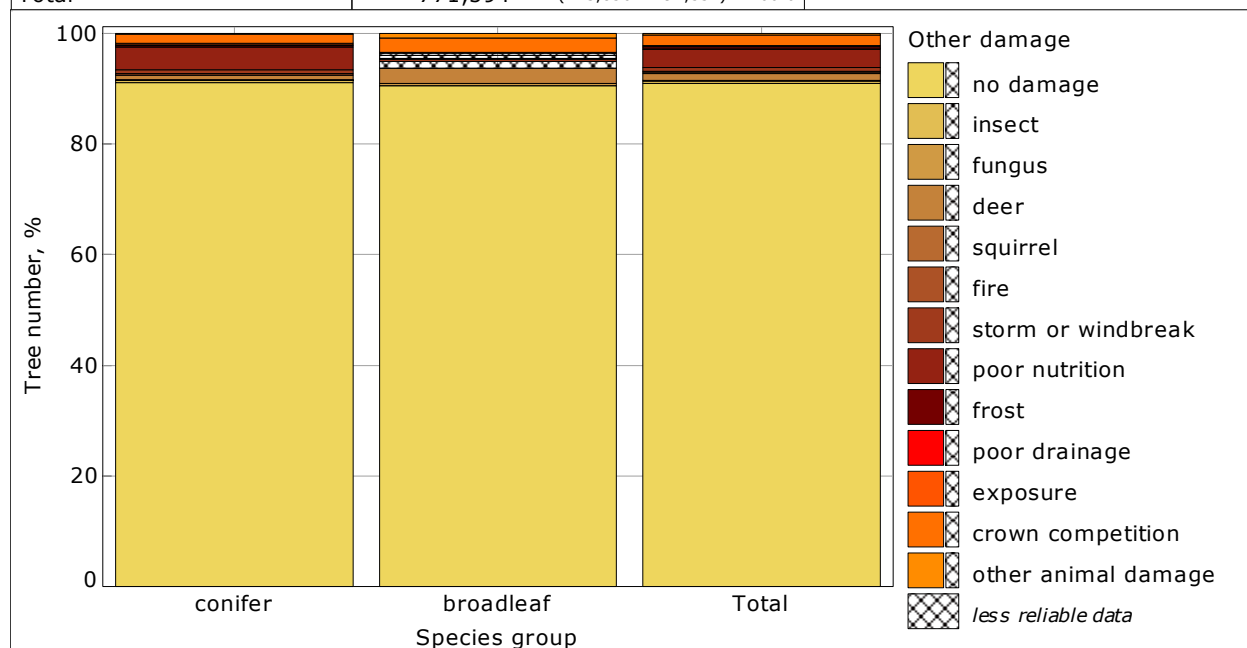
12.9.1 Total number of trees by other damage ($Dbh \geq 7$ cm)

Methodology

The total number of trees ($Dbh \geq 7$ cm) is classified by species group and other damage.

Other damage	Species group / Tree number					
	conifer			broadleaf		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
no damage	560,525	(537,863 – 583,187)	91.3	141,859	(128,674 – 155,044)	90.5
insect	2,659	(1,471 – 3,848)	0.4	8	–	0.005
fungus	52	–	0.008	628	(0 – 2,167)	0.4
deer	5,135	(2,194 – 8,075)	0.8	4,370	(0 – 13,744)	2.8
squirrel	207	(0 – 2,236)	0.03	1,887	–	1.2
fire	1,802	(0 – 4,045)	0.3	–	–	–
storm or windbreak	4,343	(3,095 – 5,592)	0.7	557	(381 – 734)	0.4
poor nutrition	24,968	(20,212 – 29,725)	4.1	300	–	0.2
frost	1,489	(992 – 1,986)	0.2	821	–	0.5
poor drainage	854	(708 – 1,000)	0.1	682	–	0.4
exposure	1,640	(0 – 8,352)	0.3	235	–	0.2
crown competition	10,546	(8,489 – 12,603)	1.7	3,889	(2,512 – 5,266)	2.5
other animal damage	755	(0 – 3,793)	0.1	1,382	(0 – 6,336)	0.9
Total	614,976	(592,024 – 637,927)	100.0	156,618	(142,372 – 170,865)	100.0

Other damage	Species group / Tree number		
	Total		
	thousands	($\alpha = 0.05$)	%
no damage	702,384	(677,290 – 727,478)	91.1
insect	2,667	(1,482 – 3,853)	0.3
fungus	680	(162 – 1,197)	0.09
deer	9,504	(6,152 – 12,857)	1.2
squirrel	2,094	(0 – 7,530)	0.3
fire	1,802	(0 – 4,045)	0.2
storm or windbreak	4,901	(3,625 – 6,176)	0.6
poor nutrition	25,269	(20,497 – 30,041)	3.3
frost	2,310	(1,379 – 3,241)	0.3
poor drainage	1,536	(1,390 – 1,682)	0.2
exposure	1,875	(0 – 8,587)	0.2
crown competition	14,435	(11,971 – 16,899)	1.9
other animal damage	2,137	(815 – 3,459)	0.3
Total	771,594	(745,836 – 797,352)	100.0



12.9.2 Total growing stock by other damage and Dbh class (Dbh >7 cm)

Methodology

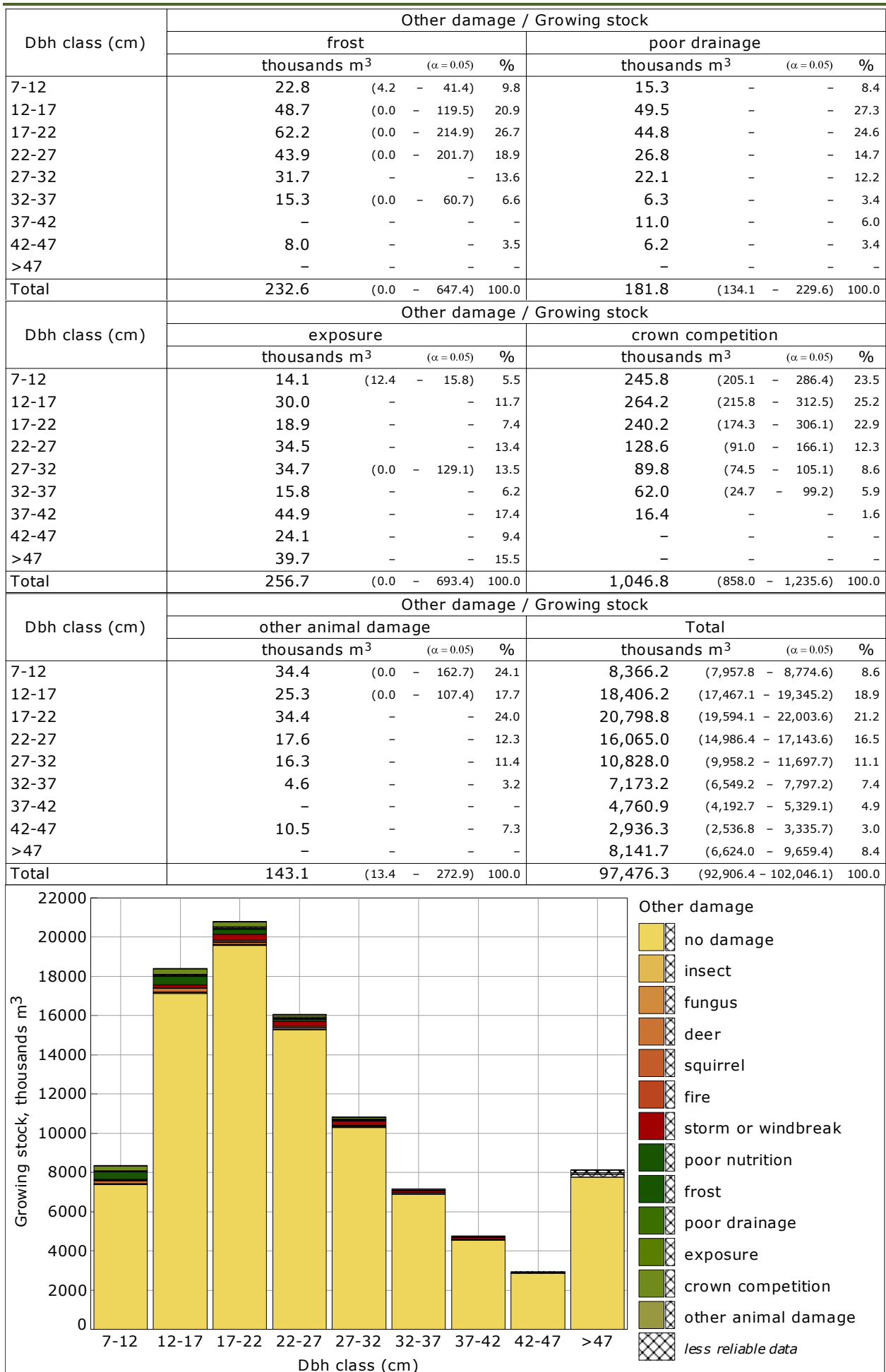
The total growing stock of trees (Dbh ≥ 7 cm) is classified by other damage and Dbh class (5 cm).

Dbh class (cm)	Other damage / Growing stock					
	no damage			insect		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	7,370.3	(6,986.2 – 7,754.5)	8.0	48.2	(26.0 – 70.4)	30.0
12-17	17,137.6	(16,219.6 – 18,055.7)	18.7	47.4	(0.0 – 205.1)	29.5
17-22	19,574.0	(18,401.8 – 20,746.2)	21.4	38.1	(3.6 – 72.6)	23.7
22-27	15,280.5	(14,230.4 – 16,330.7)	16.7	14.3	(0.5 – 28.2)	8.9
27-32	10,294.0	(9,447.7 – 11,140.4)	11.2	2.6	–	1.6
32-37	6,896.1	(6,284.8 – 7,507.4)	7.5	4.8	–	3.0
37-42	4,542.8	(4,013.7 – 5,071.9)	5.0	5.3	–	3.3
42-47	2,857.6	(2,463.0 – 3,252.2)	3.1	–	–	–
>47	7,748.0	(6,355.1 – 9,140.9)	8.4	–	–	–
Total	91,701.0	(87,357.7 – 96,044.4)	100.0	160.8	(105.2 – 216.3)	100.0

Dbh class (cm)	Other damage / Growing stock					
	fungus			deer		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	8.1	–	3.3	141.8	(115.9 – 167.6)	18.6
12-17	22.9	(14.6 – 31.1)	9.4	188.4	(146.2 – 230.5)	24.7
17-22	14.4	(11.0 – 17.8)	5.9	117.4	(85.5 – 149.4)	15.4
22-27	11.9	–	4.9	69.5	(25.0 – 113.9)	9.1
27-32	3.2	–	1.3	54.5	(0.0 – 345.2)	7.2
32-37	–	–	–	49.4	(31.5 – 67.3)	6.5
37-42	15.8	–	6.5	49.5	–	6.5
42-47	20.3	–	8.3	–	–	–
>47	147.7	–	60.4	91.4	–	12.0
Total	244.4	(0.0 – 750.1)	100.0	761.7	(360.0 – 1,163.5)	100.0

Dbh class (cm)	Other damage / Growing stock					
	squirrel			fire		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	33.3	–	43.5	18.6	–	6.6
12-17	10.4	–	13.5	28.5	(0.0 – 60.7)	10.1
17-22	13.0	–	16.9	101.4	(13.5 – 189.2)	35.8
22-27	5.7	–	7.5	90.2	(0.0 – 232.2)	31.8
27-32	14.3	(0.0 – 85.4)	18.6	35.5	(0.0 – 132.2)	12.5
32-37	–	–	–	9.1	–	3.2
37-42	–	–	–	–	–	–
42-47	–	–	–	–	–	–
>47	–	–	–	–	–	–
Total	76.6	(0.0 – 159.4)	100.0	283.2	(0.0 – 597.0)	100.0

Dbh class (cm)	Other damage / Growing stock					
	storm or windbreak			poor nutrition		
	thousands m ³	($\alpha = 0.05$)	%	thousands m ³	($\alpha = 0.05$)	%
7-12	20.8	(0.0 – 48.7)	1.7	392.7	(313.2 – 472.1)	32.9
12-17	121.1	(65.5 – 176.7)	10.1	432.3	(288.7 – 575.9)	36.2
17-22	283.2	(217.2 – 349.2)	23.8	257.0	(100.0 – 414.1)	21.6
22-27	251.2	(186.2 – 316.2)	21.0	90.3	(36.4 – 144.3)	7.6
27-32	208.9	(160.1 – 257.7)	17.5	20.3	–	1.7
32-37	109.9	(68.5 – 151.3)	9.2	–	–	–
37-42	75.1	(43.5 – 106.7)	6.3	–	–	–
42-47	9.5	–	0.8	–	–	–
>47	114.9	–	9.6	–	–	–
Total	1,194.7	(920.5 – 1,468.8)	100.0	1,192.7	(812.5 – 1,572.8)	100.0



12.10 SOCIAL STATUS AND COMPETITION

12.10.1 Total number of trees by social status (Kraft) and species group (Dbh > 7 cm)

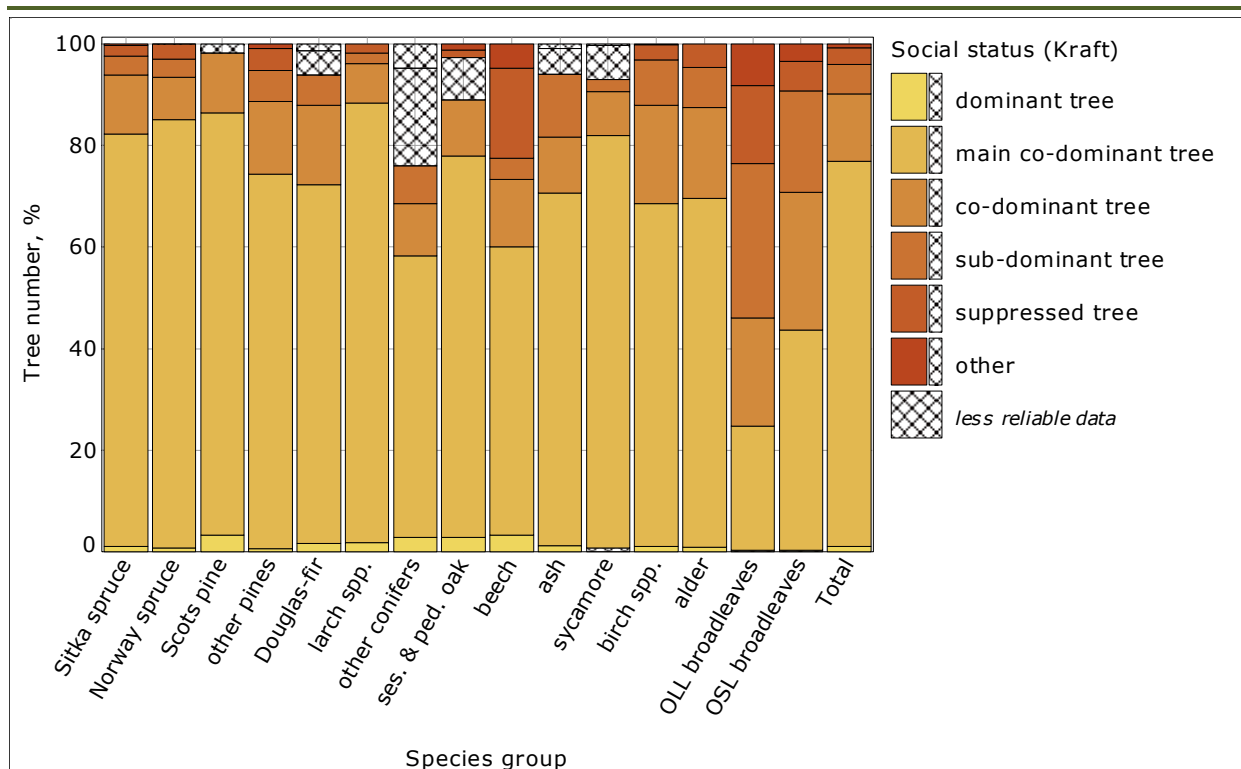
Definition	
Social status (Kraft)	
Social status (Kraft) describes the relative position of the trees in terms of their vertical distribution and their inter-relationships.	
1.	Dominant trees: Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the sides; larger than the average trees in the stand and with well-developed crowns.
2.	Main co-dominant: Trees with crowns present in the general level of the crown cover and receiving full light from above and partly from the sides; larger than the average trees in the stand and with crowns well developed but possibly somewhat crowded on the sides.
3.	Co-dominant trees: Trees with crowns forming the general level of the crown cover and receiving full light from above but comparatively little from the sides; usually with medium-sized crowns more or less crowded on the sides.
4.	Sub-dominant trees: Trees shorter than those in the three proceeding classes but with crowns extending into the crown cover formed by co-dominant and main co-dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides.
5.	Suppressed trees: Trees with crowns entirely below the general level of the crown cover, receiving no direct light either from above or from the sides.
6.	Other: Trees that cannot be accurately described by the above categories e.g. windblow trees.

Methodology
The total number of trees (Dbh ≥ 7 cm) are classified by species group and social status.

Social status (Kraft)	Species group / Tree number					
	Sitka spruce			Norway spruce		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
dominant tree	4,759	(4,246 – 5,272)	1.1	284	(156 – 413)	0.8
main co-dominant tree	357,407	(340,177 – 374,637)	81.2	30,248	(24,172 – 36,325)	84.4
co-dominant tree	51,615	(47,000 – 56,231)	11.7	2,979	(2,091 – 3,866)	8.3
sub-dominant tree	16,071	(13,571 – 18,571)	3.6	1,306	(0 – 2,641)	3.6
suppressed tree	9,285	(7,777 – 10,792)	2.1	1,046	(688 – 1,405)	2.9
other	1,462	(586 – 2,339)	0.3	8	–	0.02
Total	440,600	(421,055 – 460,144)	100.0	35,871	(29,128 – 42,615)	100.0

Social status (Kraft)	Species group / Tree number					
	Scots pine			other pines		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
dominant tree	128	(27 – 229)	3.3	492	(320 – 665)	0.6
main co-dominant tree	3,226	(0 – 6,494)	83.1	59,562	(53,077 – 66,047)	73.6
co-dominant tree	462	(0 – 1,110)	11.9	11,611	(9,350 – 13,873)	14.4
sub-dominant tree	68	–	1.7	4,903	(3,244 – 6,562)	6.1
suppressed tree	–	–	–	3,454	(2,346 – 4,563)	4.3
other	–	–	–	772	(175 – 1,368)	1.0
Total	3,883	(1,185 – 6,581)	100.0	80,794	(72,350 – 89,239)	100.0

Social status (Kraft)	Species group / Tree number					
	Douglas-fir			larch spp.		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
dominant tree	262	(208 - 316)	1.6	603	(75 - 1,131)	1.8
main co-dominant tree	11,379	(7,894 - 14,864)	70.6	29,439	(24,461 - 34,417)	86.5
co-dominant tree	2,508	(1,101 - 3,915)	15.6	2,648	(2,206 - 3,091)	7.8
sub-dominant tree	967	(285 - 1,649)	6.0	684	(97 - 1,270)	2.0
suppressed tree	772	-	-	630	(0 - 1,401)	1.9
other	219	-	-	-	-	-
Total	16,107	(11,525 - 20,689)	100.0	34,003	(28,161 - 39,845)	100.0
Social status (Kraft)	Species group / Tree number					
	other conifers			ses. & ped. oak		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
dominant tree	105	(0 - 309)	2.8	196	(87 - 305)	2.9
main co-dominant tree	2,062	(935 - 3,190)	55.5	5,134	(2,246 - 8,022)	75.0
co-dominant tree	381	(0 - 2,245)	10.2	746	(260 - 1,232)	10.9
sub-dominant tree	274	(0 - 2,284)	7.4	579	-	8.5
suppressed tree	716	-	-	100	(0 - 330)	1.5
other	179	-	-	80	(0 - 284)	1.2
Total	3,716	(0 - 22,038)	100.0	6,835	(3,128 - 10,542)	100.0
Social status (Kraft)	Species group / Tree number					
	beech			ash		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
dominant tree	178	(121 - 236)	3.3	250	(22 - 478)	1.2
main co-dominant tree	3,036	(1,574 - 4,497)	56.7	14,064	(9,334 - 18,795)	69.5
co-dominant tree	717	(582 - 852)	13.4	2,228	(1,062 - 3,394)	11.0
sub-dominant tree	219	(0 - 1,064)	4.1	2,514	(1,747 - 3,280)	12.4
suppressed tree	951	(307 - 1,595)	17.7	1,009	-	5.0
other	257	(53 - 461)	4.8	190	-	0.9
Total	5,358	(3,435 - 7,280)	100.0	20,255	(14,888 - 25,621)	100.0
Social status (Kraft)	Species group / Tree number					
	sycamore			birch spp.		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
dominant tree	72	-	-	418	(149 - 687)	1.0
main co-dominant tree	7,339	(3,154 - 11,524)	81.1	27,142	(22,282 - 32,001)	67.6
co-dominant tree	790	(465 - 1,114)	8.7	7,774	(5,527 - 10,021)	19.3
sub-dominant tree	217	(0 - 446)	2.4	3,562	(1,518 - 5,606)	8.9
suppressed tree	606	-	-	1,244	(722 - 1,766)	3.1
other	24	-	-	43	(0 - 274)	0.1
Total	9,048	(4,928 - 13,168)	100.0	40,183	(33,824 - 46,542)	100.0
Social status (Kraft)	Species group / Tree number					
	alder			OLL broadleaves		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
dominant tree	172	(112 - 232)	1.0	40	-	0.3
main co-dominant tree	12,229	(9,370 - 15,088)	68.6	2,817	(1,726 - 3,909)	24.4
co-dominant tree	3,190	(0 - 6,850)	17.9	2,450	(1,483 - 3,416)	21.2
sub-dominant tree	1,395	(339 - 2,450)	7.8	3,517	(1,010 - 6,023)	30.5
suppressed tree	835	(28 - 1,642)	4.7	1,761	(1,218 - 2,303)	15.3
other	-	-	-	952	(164 - 1,741)	8.3
Total	17,821	(12,836 - 22,805)	100.0	11,536	(7,457 - 15,615)	100.0
Social status (Kraft)	Species group / Tree number					
	OSL broadleaves			Total		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
dominant tree	134	-	-	8,094	(7,398 - 8,790)	1.0
main co-dominant tree	19,792	(14,661 - 24,924)	43.4	584,876	(562,514 - 607,238)	75.9
co-dominant tree	12,331	(8,008 - 16,653)	27.1	102,430	(94,453 - 110,406)	13.3
sub-dominant tree	9,124	(4,243 - 14,004)	20.0	45,398	(39,499 - 51,298)	5.9
suppressed tree	2,654	(1,297 - 4,010)	5.8	25,060	(22,171 - 27,950)	3.2
other	1,549	(485 - 2,613)	3.4	5,735	(3,998 - 7,473)	0.7
Total	45,584	(36,449 - 54,718)	100.0	771,594	(745,836 - 797,352)	100.0



12.10.2 Total number of trees by social status (IUFRO) and species group (Dbh > 7 cm)

Definition

Social status (IUFRO)

Social status (IUFRO) describes the vertical differentiation of the trees within the plot.

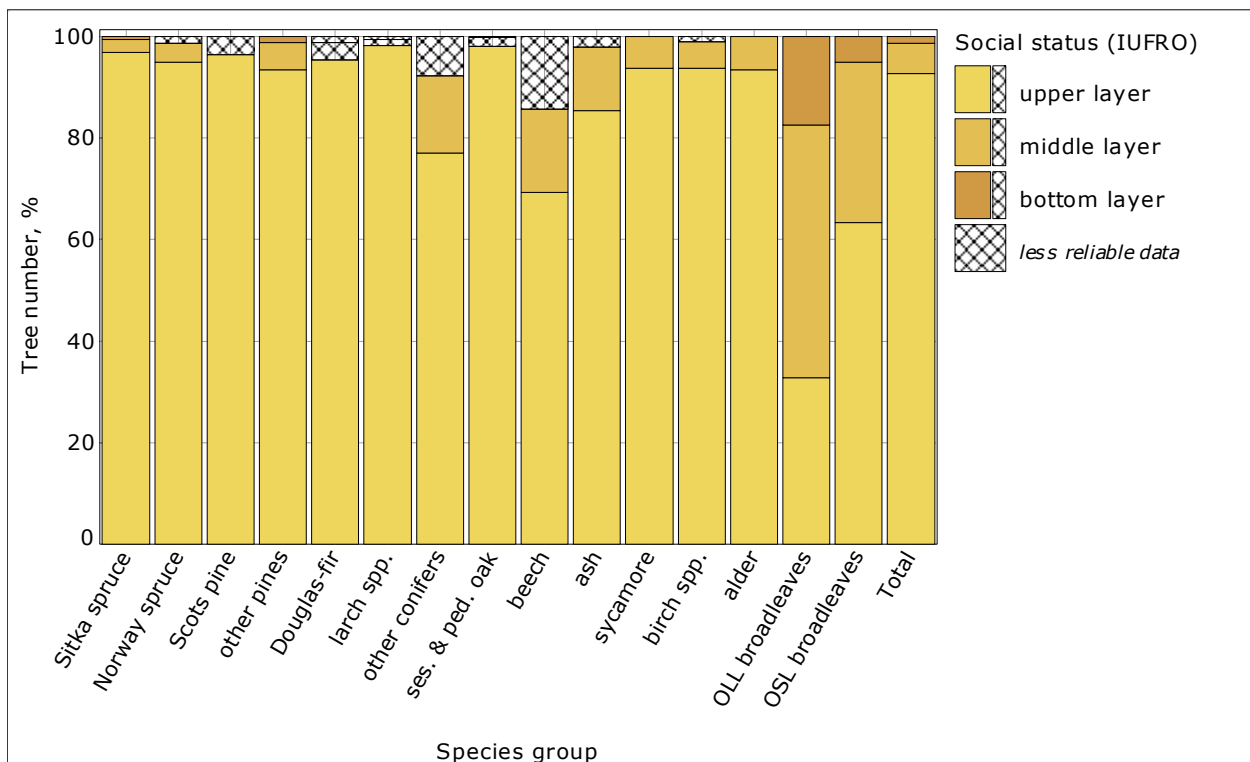
1. **Upper:** The height of the tree is at least two-thirds the height of the highest trees.
2. **Middle:** The height of the tree is at least one-third the height of the highest trees.
3. **Bottom:** The height of the tree is lower than one third of the highest trees.

Methodology

The total number of trees (Dbh ≥ 7 cm) are classified by species group and social status (IUFRO).

Social status (IUFRO)	Species group / Tree number					
	Sitka spruce			Norway spruce		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
upper layer	426,856	(407,387 – 446,325)	96.9	34,071	(27,349 – 40,793)	95.0
middle layer	11,232	(8,926 – 13,537)	2.5	1,292	(677 – 1,907)	3.6
bottom layer	2,512	(1,670 – 3,353)	0.6	509	–	1.4
Total	440,600	(421,055 – 460,144)	100.0	35,871	(29,128 – 42,615)	100.0
Social status (IUFRO)	Species group / Tree number					
	Scots pine			other pines		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
upper layer	3,741	(1,043 – 6,439)	96.3	75,529	(67,454 – 83,603)	93.5
middle layer	142	–	3.7	4,290	(3,050 – 5,529)	5.3
bottom layer	–	–	–	976	(422 – 1,530)	1.2
Total	3,883	(1,185 – 6,581)	100.0	80,794	(72,350 – 89,239)	100.0
Social status (IUFRO)	Species group / Tree number					
	Douglas-fir			larch spp.		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
upper layer	15,362	(10,866 – 19,858)	95.4	33,391	(27,618 – 39,164)	98.2
middle layer	544	–	3.4	393	–	1.2
bottom layer	201	–	1.2	219	–	0.6
Total	16,107	(11,525 – 20,689)	100.0	34,003	(28,161 – 39,845)	100.0

Social status (IUFRO)	Species group / Tree number					
	other conifers			ses. & ped. oak		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
upper layer	2,864	(1,724 - 4,003)	77.0	6,701	(3,002 - 10,401)	98.1
middle layer	564	(0 - 6,140)	15.2	118	- -	1.7
bottom layer	289	- -	7.8	16	- -	0.2
Total	3,716	(0 - 22,038)	100.0	6,835	(3,128 - 10,542)	100.0
Social status (IUFRO)	Species group / Tree number					
	beech			ash		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
upper layer	3,710	(2,222 - 5,198)	69.2	17,293	(12,241 - 22,346)	85.4
middle layer	878	(253 - 1,502)	16.4	2,528	(1,663 - 3,392)	12.5
bottom layer	770	- -	14.4	434	- -	2.1
Total	5,358	(3,435 - 7,280)	100.0	20,255	(14,888 - 25,621)	100.0
Social status (IUFRO)	Species group / Tree number					
	sycamore			birch spp.		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
upper layer	8,477	(4,389 - 12,564)	93.7	37,650	(31,573 - 43,727)	93.7
middle layer	571	(0 - 4,099)	6.3	2,122	(205 - 4,039)	5.3
bottom layer	-	- -	-	411	- -	1.0
Total	9,048	(4,928 - 13,168)	100.0	40,183	(33,824 - 46,542)	100.0
Social status (IUFRO)	Species group / Tree number					
	alder			OLL broadleaves		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
upper layer	16,656	(11,911 - 21,401)	93.5	3,784	(2,198 - 5,369)	32.8
middle layer	1,165	(0 - 2,383)	6.5	5,736	(2,297 - 9,176)	49.7
bottom layer	-	- -	-	2,016	(1,654 - 2,378)	17.5
Total	17,821	(12,836 - 22,805)	100.0	11,536	(7,457 - 15,615)	100.0
Social status (IUFRO)	Species group / Tree number					
	OSL broadleaves			Total		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
upper layer	28,835	(22,690 - 34,980)	63.3	714,918	(689,445 - 740,392)	92.6
middle layer	14,455	(8,803 - 20,107)	31.7	46,029	(39,053 - 53,004)	6.0
bottom layer	2,294	(1,247 - 3,340)	5.0	10,647	(8,662 - 12,632)	1.4
Total	45,584	(36,449 - 54,718)	100.0	771,594	(745,836 - 797,352)	100.0



12.10.3 Total number of trees by crown shape and species group (Dbh > 7 cm)

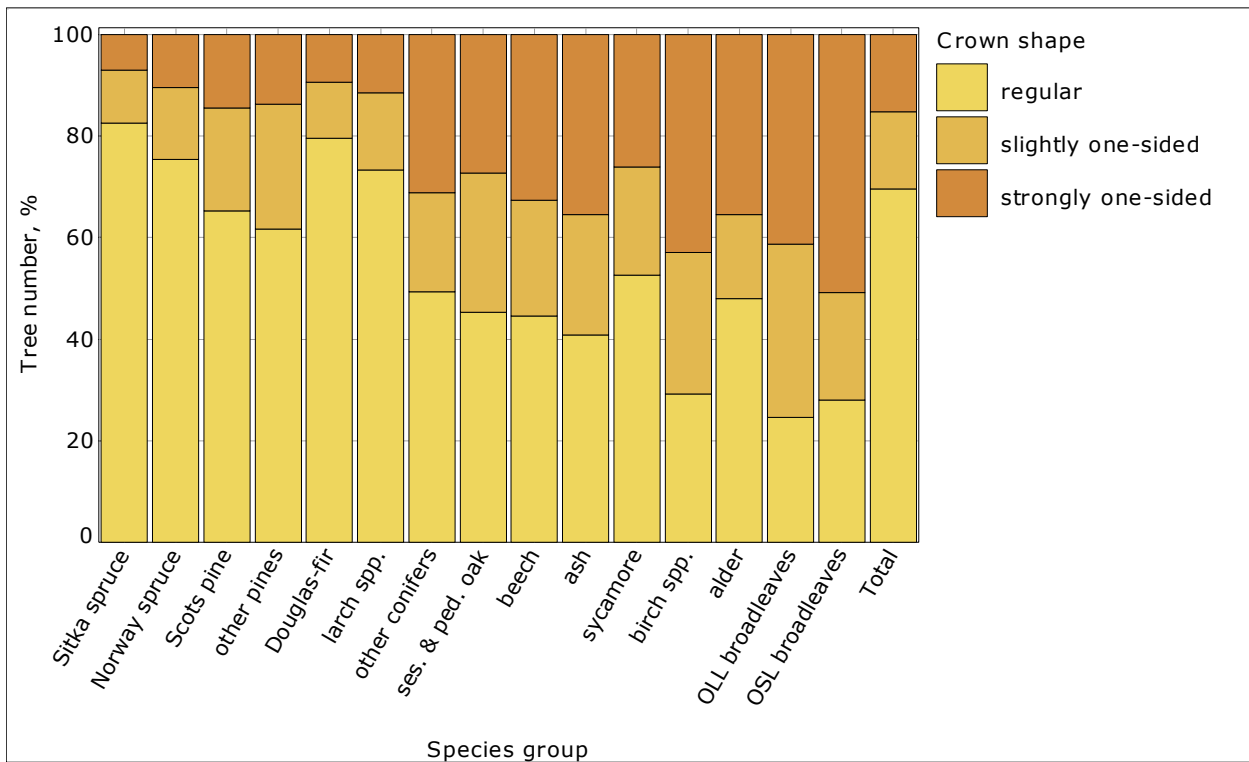
Definition	
Crown shape	The distribution of the crown around the axis of the stem.
1. Regular:	The distribution of the crown around the axis of the main stem is symmetrical.
2. Slightly one-sided:	The distribution of the crown around the axis of the main stem is slightly one-sided.
3. Strongly one-sided:	The distribution of the crown around the axis of the main stem is strongly one-sided.

Methodology
The total number of trees (Dbh ≥ 7 cm) are classified by species group and crown shape.

Crown shape	Species group / Tree number					
	Sitka spruce			Norway spruce		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
regular	363,579	(345,261 – 381,898)	82.5	27,037	(21,449 – 32,625)	75.4
slightly one-sided	45,925	(41,986 – 49,863)	10.4	5,110	(3,253 – 6,968)	14.2
strongly one-sided	31,096	(27,495 – 34,697)	7.1	3,724	(2,366 – 5,082)	10.4
Total	440,600	(421,055 – 460,144)	100.0	35,871	(29,128 – 42,615)	100.0
Crown shape	Species group / Tree number					
	Scots pine			other pines		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
regular	2,534	(0 – 5,362)	65.3	49,897	(43,955 – 55,838)	61.7
slightly one-sided	785	(232 – 1,337)	20.2	19,780	(16,593 – 22,967)	24.5
strongly one-sided	564	(500 – 628)	14.5	11,117	(8,874 – 13,361)	13.8
Total	3,883	(1,185 – 6,581)	100.0	80,794	(72,350 – 89,239)	100.0
Crown shape	Species group / Tree number					
	Douglas-fir			larch spp.		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
regular	12,820	(7,836 – 17,805)	79.6	24,906	(19,926 – 29,886)	73.2
slightly one-sided	1,768	(1,046 – 2,491)	11.0	5,168	(3,299 – 7,037)	15.2
strongly one-sided	1,519	(1,109 – 1,928)	9.4	3,929	(2,685 – 5,174)	11.6
Total	16,107	(11,525 – 20,689)	100.0	34,003	(28,161 – 39,845)	100.0
Crown shape	Species group / Tree number					
	other conifers			ses. & ped. oak		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
regular	1,831	(534 – 3,128)	49.3	3,098	(1,293 – 4,903)	45.3
slightly one-sided	725	(0 – 6,030)	19.5	1,870	(973 – 2,766)	27.4
strongly one-sided	1,160	(445 – 1,876)	31.2	1,868	(1,266 – 2,470)	27.3
Total	3,716	(0 – 22,038)	100.0	6,835	(3,128 – 10,542)	100.0
Crown shape	Species group / Tree number					
	beech			ash		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
regular	2,386	(976 – 3,795)	44.5	8,272	(4,649 – 11,896)	40.8
slightly one-sided	1,222	(556 – 1,888)	22.8	4,796	(1,638 – 7,955)	23.7
strongly one-sided	1,750	(913 – 2,587)	32.7	7,186	(4,815 – 9,557)	35.5
Total	5,358	(3,435 – 7,280)	100.0	20,255	(14,888 – 25,621)	100.0
Crown shape	Species group / Tree number					
	sycamore			birch spp.		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
regular	4,756	(2,134 – 7,379)	52.5	11,711	(8,981 – 14,441)	29.1
slightly one-sided	1,933	(1,371 – 2,496)	21.4	11,216	(8,716 – 13,715)	27.9
strongly one-sided	2,358	(768 – 3,948)	26.1	17,256	(13,337 – 21,175)	43.0
Total	9,048	(4,928 – 13,168)	100.0	40,183	(33,824 – 46,542)	100.0

Crown shape	Species group / Tree number					
	alder			OLL broadleaves		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
regular	8,551	(5,810 - 11,291)	48.0	2,845	(2,017 - 3,672)	24.7
slightly one-sided	2,959	(2,254 - 3,665)	16.6	3,929	(2,068 - 5,790)	34.1
strongly one-sided	6,311	(2,006 - 10,616)	35.4	4,762	(2,741 - 6,784)	41.2
Total	17,821	(12,836 - 22,805)	100.0	11,536	(7,457 - 15,615)	100.0

Crown shape	Species group / Tree number					
	OSL broadleaves			Total		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
regular	12,760	(7,090 - 18,430)	28.0	536,983	(513,439 - 560,527)	69.6
slightly one-sided	9,686	(6,339 - 13,032)	21.2	116,872	(108,903 - 124,841)	15.1
strongly one-sided	23,138	(17,742 - 28,534)	50.8	117,739	(107,719 - 127,759)	15.3
Total	45,584	(36,449 - 54,718)	100.0	771,594	(745,836 - 797,352)	100.0



12.10.4 Total number of trees by slenderness ratio and species group (Dbh > 7 cm)

Definition
Slenderness ratio Ratio of tree height (m) to its Dbh (mm). The higher the ratio the lower the taper on the tree

Methodology
The total number of trees is classified by species group and slenderness ratio.

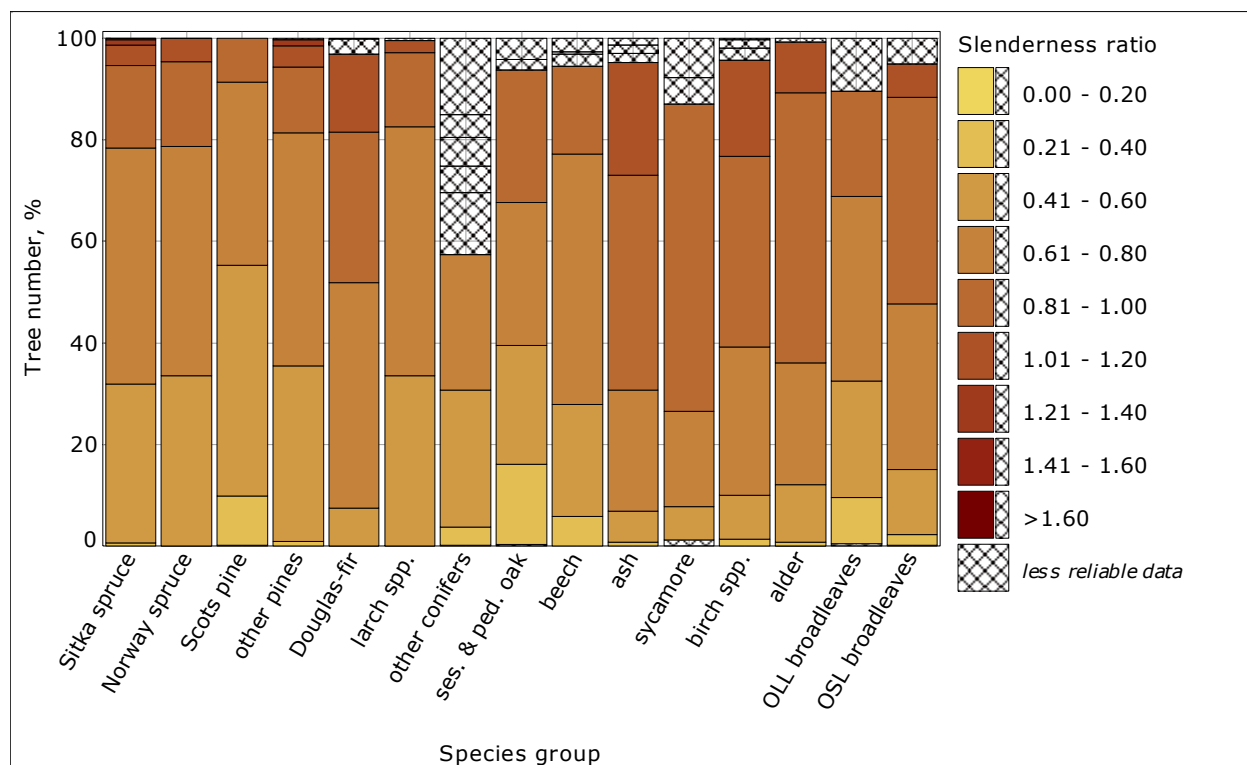
Slenderness ratio	Species group / Tree number					
	Sitka spruce			Norway spruce		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0.00 - 0.20	–	–	–	–	–	–
0.21 - 0.40	2,743	(1,402 - 4,085)	0.6	8	–	0.02
0.41 - 0.60	137,992	(126,329 - 149,655)	31.3	12,010	(7,948 - 16,071)	33.5
0.61 - 0.80	204,710	(192,347 - 217,074)	46.5	16,212	(12,591 - 19,834)	45.2
0.81 - 1.00	71,508	(65,006 - 78,011)	16.2	5,953	(3,989 - 7,917)	16.6
1.01 - 1.20	17,667	(15,384 - 19,949)	4.0	1,662	(0 - 8,821)	4.6
1.21 - 1.40	4,557	(0 - 16,353)	1.0	26	–	0.07
1.41 - 1.60	1,137	(0 - 2,605)	0.3	–	–	–
>1.60	285	–	0.06	–	–	–
Total	440,600	(421,055 - 460,144)	100.0	35,871	(29,128 - 42,615)	100.0

Slenderness ratio	Species group / Tree number					
	Scots pine			other pines		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0.00 - 0.20	8	–	0.2	–	–	–
0.21 - 0.40	375	(301 - 449)	9.7	763	(625 - 902)	0.9
0.41 - 0.60	1,762	(226 - 3,297)	45.4	27,920	(23,440 - 32,400)	34.6
0.61 - 0.80	1,403	(0 - 8,810)	36.1	37,076	(32,497 - 41,655)	45.9
0.81 - 1.00	335	(0 - 1,839)	8.6	10,500	(7,808 - 13,191)	13.0
1.01 - 1.20	–	–	–	3,261	(1,997 - 4,526)	4.0
1.21 - 1.40	–	–	–	991	(0 - 2,793)	1.2
1.41 - 1.60	–	–	–	283	–	0.4
>1.60	–	–	–	–	–	–
Total	3,883	(1,185 - 6,581)	100.0	80,794	(72,350 - 89,239)	100.0

Slenderness ratio	Species group / Tree number					
	Douglas-fir			larch spp.		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0.00 - 0.20	–	–	–	–	–	–
0.21 - 0.40	8	–	0.05	8	–	0.02
0.41 - 0.60	1,185	(519 - 1,852)	7.4	11,404	(8,544 - 14,264)	33.5
0.61 - 0.80	7,148	(2,495 - 11,802)	44.3	16,669	(13,491 - 19,846)	49.1
0.81 - 1.00	4,774	(697 - 8,852)	29.6	4,969	(3,088 - 6,850)	14.6
1.01 - 1.20	2,484	(0 - 11,044)	15.4	805	(0 - 2,925)	2.4
1.21 - 1.40	481	–	3.0	149	–	0.4
1.41 - 1.60	26	–	0.2	–	–	–
>1.60	–	–	–	–	–	–
Total	16,107	(11,525 - 20,689)	100.0	34,003	(28,161 - 39,845)	100.0

Slenderness ratio	Species group / Tree number					
	other conifers			ses. & ped. oak		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0.00 - 0.20	8	-	-	24	-	0.4
0.21 - 0.40	131	(0 - 439)	3.5	1,079	(441 - 1,717)	15.8
0.41 - 0.60	1,000	(3 - 1,998)	27.0	1,595	(1,317 - 1,873)	23.3
0.61 - 0.80	993	(623 - 1,362)	26.7	1,926	(1,182 - 2,670)	28.2
0.81 - 1.00	453	-	-	1,780	(0 - 7,015)	26.0
1.01 - 1.20	197	-	-	143	-	2.1
1.21 - 1.40	206	-	-	287	-	4.2
1.41 - 1.60	167	-	-	-	-	-
>1.60	561	-	-	-	-	-
Total	3,716	(0 - 22,038)	100.0	6,835	(3,128 - 10,542)	100.0
Slenderness ratio	Species group / Tree number					
	beech			ash		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0.00 - 0.20	-	-	-	-	-	-
0.21 - 0.40	313	(236 - 391)	5.8	138	(0 - 483)	0.7
0.41 - 0.60	1,177	(926 - 1,429)	22.0	1,240	(0 - 4,149)	6.1
0.61 - 0.80	2,646	(1,151 - 4,142)	49.4	4,831	(3,354 - 6,309)	23.9
0.81 - 1.00	925	(426 - 1,423)	17.3	8,580	(3,923 - 13,237)	42.4
1.01 - 1.20	128	-	-	4,484	(2,624 - 6,344)	22.1
1.21 - 1.40	26	-	-	388	-	1.9
1.41 - 1.60	142	-	-	309	-	1.5
>1.60	-	-	-	284	-	1.4
Total	5,358	(3,435 - 7,280)	100.0	20,255	(14,888 - 25,621)	100.0
Slenderness ratio	Species group / Tree number					
	sycamore			birch spp.		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0.00 - 0.20	-	-	-	-	-	-
0.21 - 0.40	104	-	-	559	(0 - 1,769)	1.4
0.41 - 0.60	593	(264 - 922)	6.6	3,479	(2,825 - 4,133)	8.7
0.61 - 0.80	1,700	(1,528 - 1,872)	18.8	11,707	(9,255 - 14,159)	29.1
0.81 - 1.00	5,479	(2,433 - 8,525)	60.5	15,070	(11,452 - 18,687)	37.5
1.01 - 1.20	464	-	-	7,627	(4,952 - 10,302)	19.0
1.21 - 1.40	707	-	-	981	-	2.4
1.41 - 1.60	-	-	-	617	-	1.5
>1.60	-	-	-	143	-	0.4
Total	9,048	(4,928 - 13,168)	100.0	40,183	(33,824 - 46,542)	100.0
Slenderness ratio	Species group / Tree number					
	alder			OLL broadleaves		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0.00 - 0.20	8	-	-	58	-	0.5
0.21 - 0.40	112	(68 - 156)	0.6	1,045	(428 - 1,663)	9.1
0.41 - 0.60	2,024	(1,566 - 2,482)	11.4	2,639	(1,777 - 3,501)	22.9
0.61 - 0.80	4,282	(2,875 - 5,688)	24.0	4,200	(2,719 - 5,681)	36.3
0.81 - 1.00	9,475	(6,988 - 11,963)	53.2	2,394	(0 - 7,489)	20.8
1.01 - 1.20	1,778	(0 - 3,816)	10.0	1,200	-	10.4
1.21 - 1.40	142	-	-	-	-	-
1.41 - 1.60	-	-	-	-	-	-
>1.60	-	-	-	-	-	-
Total	17,821	(12,836 - 22,805)	100.0	11,536	(7,457 - 15,615)	100.0

Slenderness ratio	Species group / Tree number					
	OSL broadleaves			Total		
	thousands	($\alpha = 0.05$)	%	thousands	($\alpha = 0.05$)	%
0.00 - 0.20	48	(0 - 151)	0.1	154	(100 - 209)	0.02
0.21 - 0.40	938	(722 - 1,154)	2.1	8,326	(6,688 - 9,964)	1.1
0.41 - 0.60	5,886	(3,261 - 8,511)	12.9	211,906	(197,525 - 226,287)	27.5
0.61 - 0.80	14,853	(11,317 - 18,389)	32.6	330,356	(314,690 - 346,023)	42.8
0.81 - 1.00	18,534	(13,545 - 23,522)	40.6	160,729	(149,298 - 172,161)	20.8
1.01 - 1.20	2,994	(787 - 5,201)	6.6	44,893	(39,541 - 50,245)	5.8
1.21 - 1.40	2,331	- -	5.1	11,274	(7,616 - 14,931)	1.5
1.41 - 1.60	-	- -	-	2,681	(2,113 - 3,248)	0.3
>1.60	-	- -	-	1,274	- -	0.2
Total	45,584	(36,449 - 54,718)	100.0	771,594	(745,836 - 797,352)	100.0



12.11 HEIGHT GROWTH STATUS

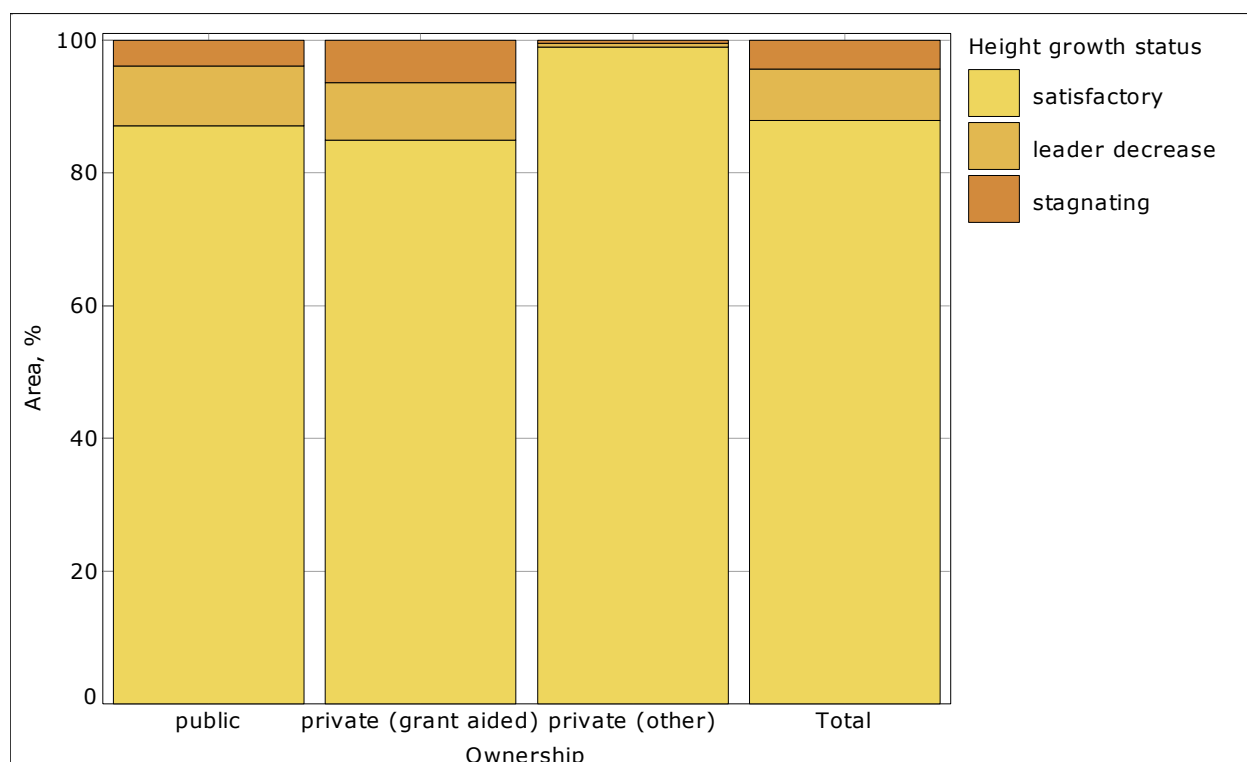
12.11.1 Stocked forest area by ownership and height growth status

Definition
Height growth status Indicates level of height growth on the plot. Growing satisfactorily: Trees are growing normally Leader growth decreasing: The leader growth increment is decreasing, when it should be increasing. Trees stagnating: Trees have very little height growth. In conifer trees, needles are short and trees are in check. Foliage maybe discoloured, yellow/brown in appearance.

Methodology
The stocked forest area is classified by ownership and height growth status.

Height growth status	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
satisfactory	297.57	(282.17 – 312.96)	87.1	180.47	(166.62 – 194.32)	84.9
leader decrease	30.85	(24.17 – 37.53)	9.0	18.41	(13.23 – 23.59)	8.7
stagnating	13.27	(8.81 – 17.73)	3.9	13.64	(9.16 – 18.12)	6.4
Total	341.69	(326.35 – 357.03)	100.0	212.52	(198.06 – 226.99)	100.0

Height growth status	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
satisfactory	82.12	(71.66 – 92.58)	99.0	560.16	(550.28 – 570.05)	87.9
leader decrease	0.40	(0.00 – 1.21)	0.5	49.67	(41.42 – 57.91)	7.8
stagnating	0.40	(0.00 – 1.20)	0.5	27.30	(21.06 – 33.54)	4.3
Total	82.92	(72.42 – 93.42)	100.0	637.13		100.0



Chapter 13

VEGETATION AND LICHENS

The assessment of plant diversity is an important indicator which can be used in the monitoring of SFM. The structure/range of the vegetation present will also be indicative of the insect diversity. In this chapter, the distribution of non-tree vegetation in the national forest estate is evaluated. The quantity and distribution of non-tree plant species in the national forest estate varies greatly. A primary factor influencing the non-tree vegetation is the stage of development of a forest, as it impacts on the growing space by regulating light. The soil, through factors such as fertility, moisture and previous land-use, also impacts on non-tree vegetation.

Both the Public and Private (grant aided) forests show similar levels of circa 60% abundant vegetation cover on the forest floor while the Private (other) cohort contains nearly 80% abundant vegetation.

In terms of the occurrence frequency of plant species in Irish forests, nearly two-thirds (63%) of forests have between 1 and 10 plant species present. A significant portion of the forest estate has (11.9%) has 16 or more plants available

Broadleaf forests tend to be the most diverse in terms of plant species. Both the early and late stages of development show higher numbers of plant species present compared to the mid development stages where canopy cover is dense. The removal of canopy cover in thinning increases the diversity of plants present by allowing more light to reach the forest floor.

Lichens, usually associated with a clean atmosphere, are present on 59.5% of the stocked forest estate. The age distribution and species structure in the private (grant aided) estate are less uniform than those in the private (other) forests, resulting in the lowest (51.6%) lichen occurrence in the private (grant aided) forests and the highest (83.1%) occurrence in the private (other) forest estate

13.1 PLANT DIVERSITY

Definition

Vegetation

Describes the structure, cover and species composition of non-tree plant species.

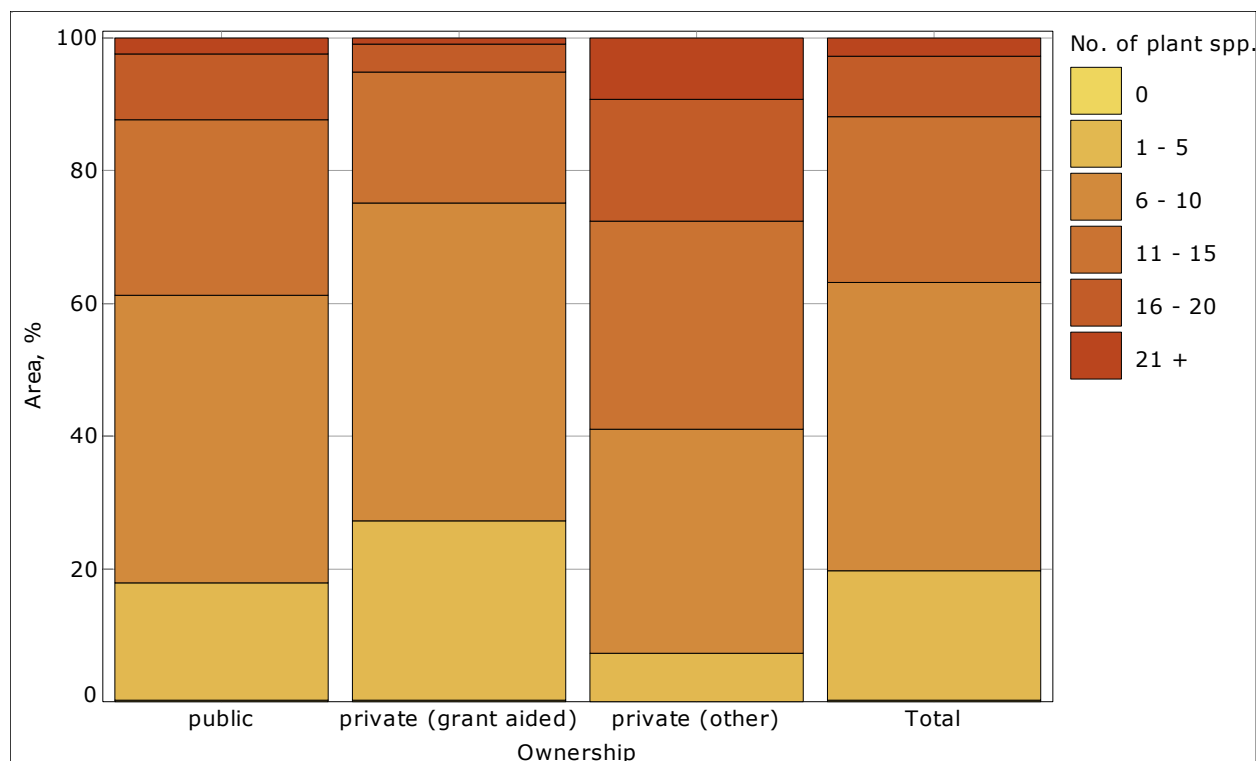
13.1.1 Stocked forest area by total number of non-tree plant species and ownership

Methodology

The stocked forest area is classified by ownership and the number of non-tree plant species present.

No. of plant spp.	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	0.80	(0.00 - 1.91)	0.2	0.40	(0.00 - 1.22)	0.2
1 - 5	60.52	(51.43 - 69.62)	17.7	57.59	(48.66 - 66.52)	27.1
6 - 10	147.81	(134.67 - 160.95)	43.3	101.68	(90.28 - 113.08)	47.9
11 - 15	90.52	(79.77 - 101.27)	26.5	42.04	(34.32 - 49.76)	19.8
16 - 20	34.02	(27.06 - 40.98)	10.0	8.81	(5.17 - 12.45)	4.1
21 +	8.01	(4.53 - 11.50)	2.3	1.99	(0.25 - 3.74)	0.9
Total	341.69	(326.35 - 357.03)	100.0	212.52	(198.06 - 226.99)	100.0

No. of plant spp.	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	1.21	(0.00 - 2.57)	0.2
1 - 5	6.02	(3.01 - 9.03)	7.3	124.14	(111.99 - 136.28)	19.5
6 - 10	28.03	(21.63 - 34.43)	33.8	277.53	(262.13 - 292.92)	43.5
11 - 15	26.03	(19.85 - 32.21)	31.4	158.59	(145.26 - 171.91)	24.9
16 - 20	15.21	(10.44 - 19.98)	18.3	58.04	(49.16 - 66.93)	9.1
21 +	7.63	(4.22 - 11.03)	9.2	17.64	(12.53 - 22.74)	2.8
Total	82.92	(72.42 - 93.42)	100.0	637.13		100.0



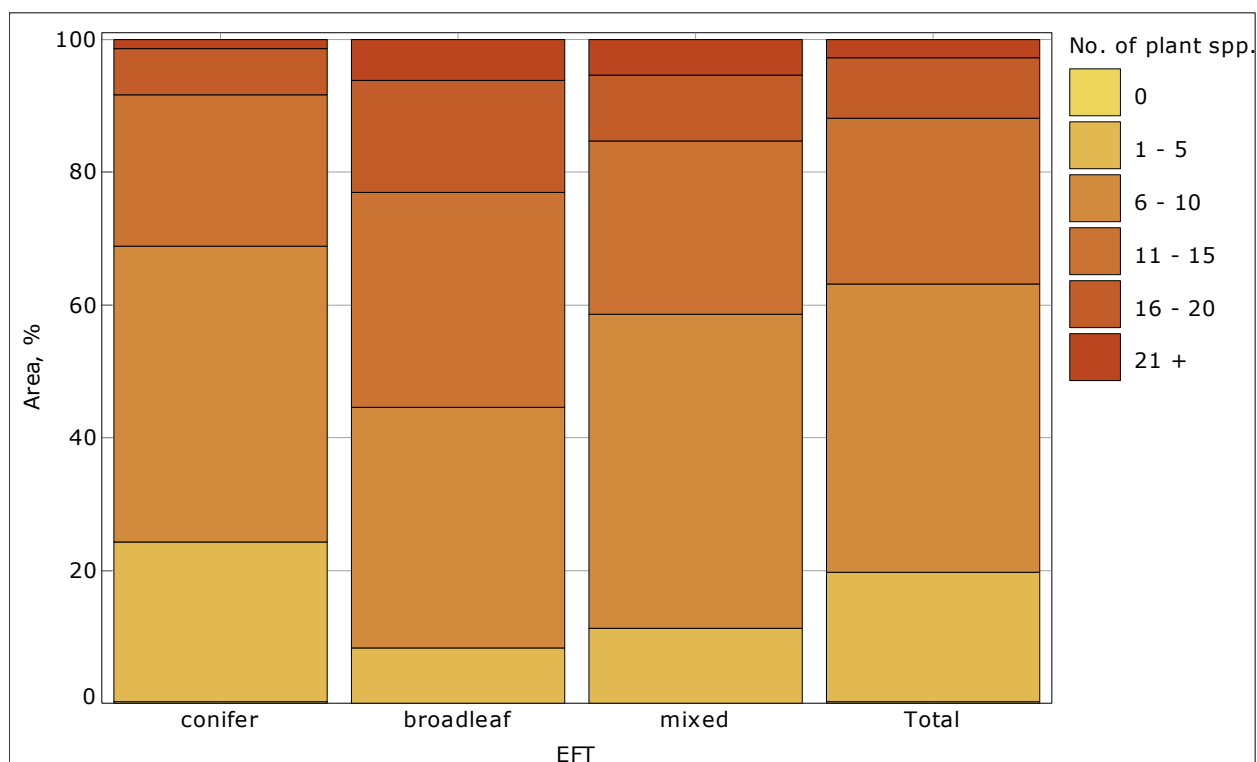
13.1.2 Stocked forest area by total number of non-tree plant species and European Forest Type

Methodology

The stocked forest area is classified by European Forest Type and the number of non-tree plant species present.

No. of plant spp.	EFT / Area					
	conifer			broadleaf		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	1.21	(0.00 – 2.57)	0.3	–	–	–
1 - 5	104.90	(93.44 – 116.36)	24.0	9.23	(5.51 – 12.94)	8.3
6 - 10	195.08	(180.78 – 209.37)	44.6	40.46	(32.89 – 48.02)	36.3
11 - 15	99.35	(88.23 – 110.47)	22.7	36.04	(28.88 – 43.19)	32.4
16 - 20	30.44	(23.84 – 37.04)	7.0	18.80	(13.52 – 24.08)	16.9
21 +	6.01	(2.99 – 9.04)	1.4	6.82	(3.60 – 10.04)	6.1
Total	436.98	(422.79 – 451.18)	100.0	111.34	(99.60 – 123.08)	100.0

No. of plant spp.	EFT / Area					
	mixed			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	1.21	(0.00 – 2.57)	0.2
1 - 5	10.01	(6.19 – 13.84)	11.3	124.14	(111.99 – 136.28)	19.5
6 - 10	41.99	(34.29 – 49.70)	47.3	277.53	(262.13 – 292.92)	43.5
11 - 15	23.20	(17.35 – 29.05)	26.1	158.59	(145.26 – 171.91)	24.9
16 - 20	8.80	(5.14 – 12.46)	9.9	58.04	(49.16 – 66.93)	9.1
21 +	4.80	(2.09 – 7.50)	5.4	17.64	(12.53 – 22.74)	2.8
Total	88.81	(78.09 – 99.52)	100.0	637.13		100.0

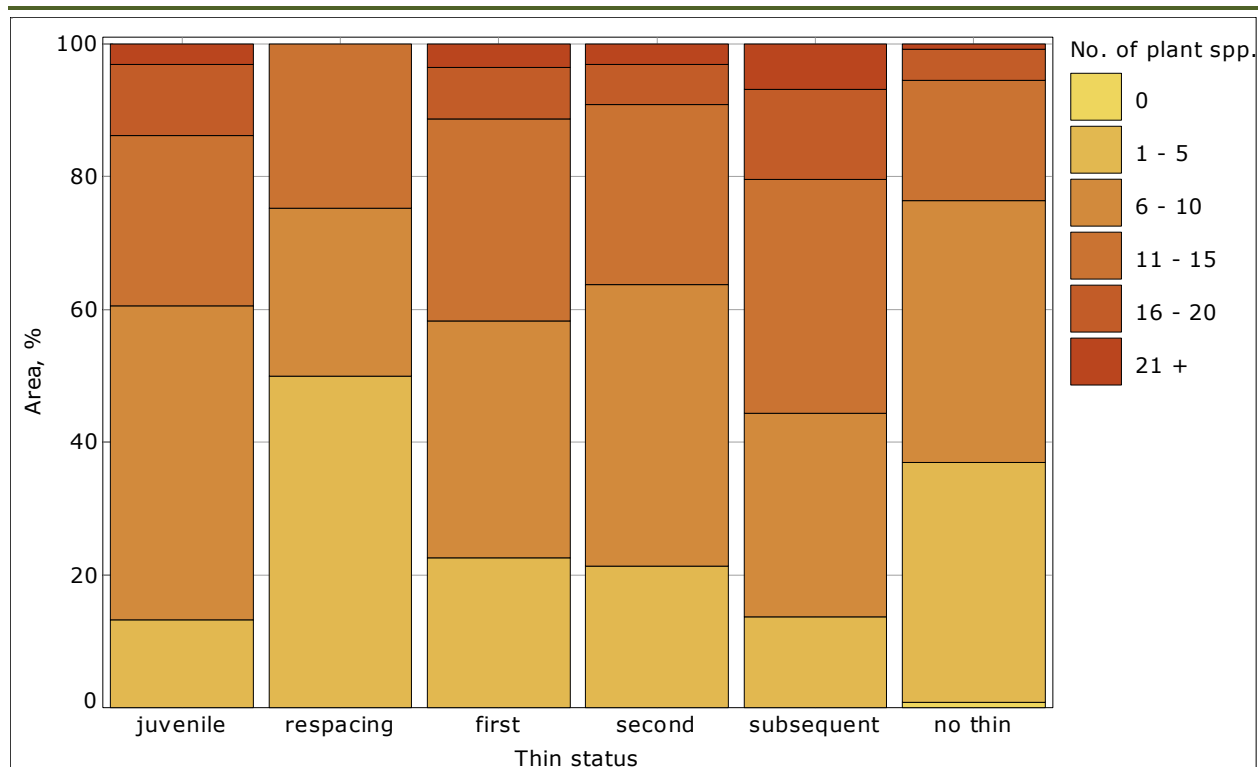


13.1.3 Stocked forest area by total number of non-tree plant species and thin status

Methodology

The stocked forest area is classified by thin status and the number of non-tree plant species present.

No. of plant spp.	Thin status / Area					
	juvenile			respacing		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	–	–	–
1 - 5	52.01	(43.58 – 60.44)	13.2	0.80	(0.00 – 1.91)	50.0
6 - 10	186.19	(172.08 – 200.29)	47.3	0.41	(0.00 – 1.20)	25.3
11 - 15	101.34	(90.10 – 112.58)	25.7	0.40	(0.00 – 1.20)	24.7
16 - 20	42.06	(34.39 – 49.73)	10.7	–	–	–
21 +	12.03	(7.78 – 16.27)	3.1	–	–	–
Total	393.63	(378.43 – 408.83)	100.0	1.60	(0.03 – 3.17)	100.0
No. of plant spp.	Thin status / Area					
	first			second		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	–	–	–
1 - 5	10.42	(6.47 – 14.36)	22.6	2.82	(0.74 – 4.90)	21.3
6 - 10	16.42	(11.46 – 21.38)	35.7	5.60	(2.68 – 8.53)	42.4
11 - 15	14.00	(9.45 – 18.55)	30.4	3.59	(1.25 – 5.94)	27.2
16 - 20	3.60	(1.25 – 5.95)	7.8	0.80	(0.00 – 1.91)	6.1
21 +	1.60	(0.03 – 3.16)	3.5	0.40	(0.00 – 1.20)	3.0
Total	46.04	(37.94 – 54.13)	100.0	13.22	(8.77 – 17.66)	100.0
No. of plant spp.	Thin status / Area					
	subsequent			no thin		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	1.21	(0.00 – 2.57)	0.8
1 - 5	4.82	(2.12 – 7.52)	13.7	53.28	(44.66 – 61.89)	36.1
6 - 10	10.83	(6.80 – 14.86)	30.7	58.07	(49.07 – 67.08)	39.5
11 - 15	12.39	(8.09 – 16.69)	35.2	26.87	(20.56 – 33.17)	18.2
16 - 20	4.79	(2.09 – 7.49)	13.6	6.79	(3.59 – 9.99)	4.6
21 +	2.41	(0.49 – 4.33)	6.8	1.20	(0.00 – 2.56)	0.8
Total	35.24	(28.18 – 42.29)	100.0	147.41	(134.26 – 160.57)	100.0
No. of plant spp.	Thin status / Area					
	Total					
	thousands ha	($\alpha = 0.05$)	%			
0	1.21	(0.00 – 2.57)	0.2			
1 - 5	124.14	(111.99 – 136.28)	19.5			
6 - 10	277.53	(262.13 – 292.92)	43.5			
11 - 15	158.59	(145.26 – 171.91)	24.9			
16 - 20	58.04	(49.16 – 66.93)	9.1			
21 +	17.64	(12.53 – 22.74)	2.8			
Total	637.13		100.0			



13.1.4 Stocked forest area by total number of non-tree plant species and development stage

Methodology

The stocked forest area is classified by development stage and the number of non-tree plant species present.

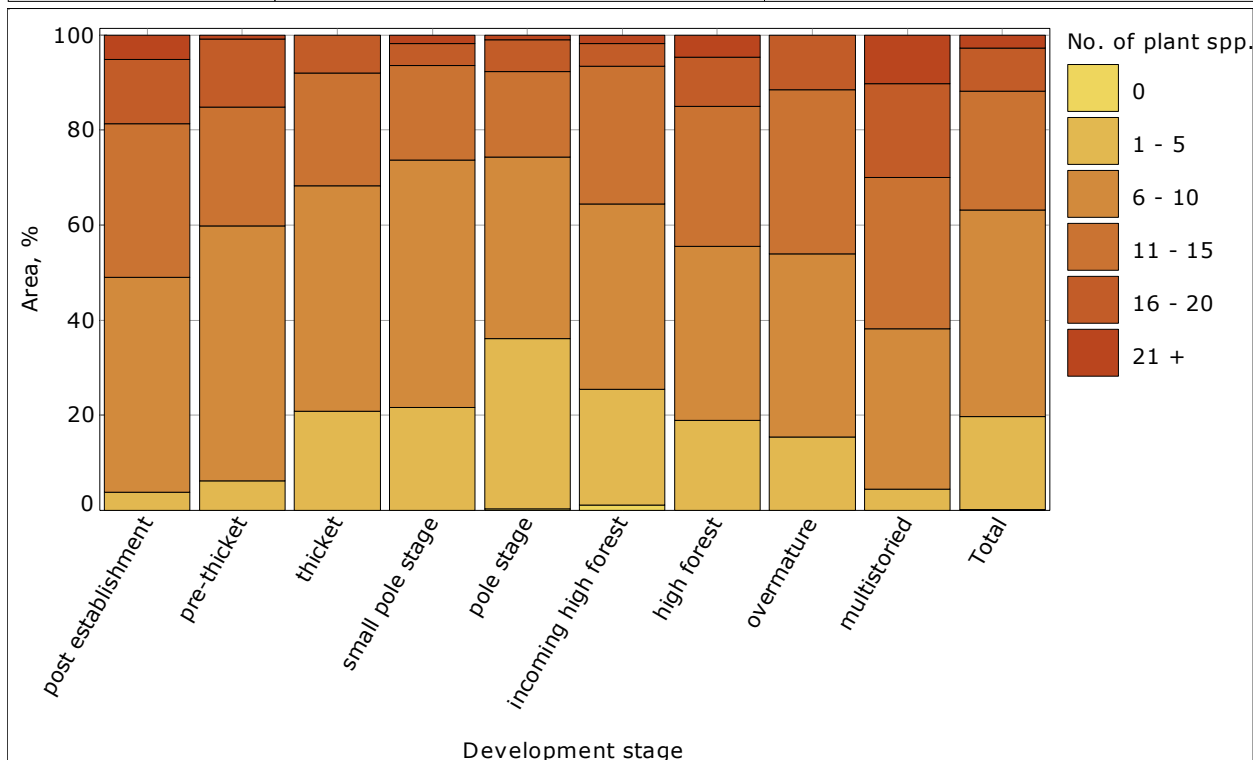
No. of plant spp.	Development stage / Area					
	post establishment			pre-thicket		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	–	–	–
1 - 5	2.41	(0.48 - 4.33)	3.9	2.79	(0.72 - 4.86)	6.2
6 - 10	28.04	(21.62 - 34.45)	45.1	24.02	(18.16 - 29.89)	53.5
11 - 15	19.98	(14.55 - 25.41)	32.2	11.23	(7.11 - 15.36)	25.1
16 - 20	8.42	(4.86 - 11.98)	13.6	6.40	(3.28 - 9.52)	14.3
21 +	3.19	(0.99 - 5.40)	5.2	0.40	(0.00 - 1.19)	0.9
Total	62.04	(52.83 - 71.24)	100.0	44.84	(36.89 - 52.80)	100.0

No. of plant spp.	Development stage / Area					
	thicket			small pole stage		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	–	–	–
1 - 5	16.82	(11.89 - 21.75)	20.8	28.82	(22.33 - 35.31)	21.7
6 - 10	38.44	(30.98 - 45.89)	47.5	69.28	(59.57 - 78.99)	52.1
11 - 15	19.25	(13.95 - 24.55)	23.8	26.45	(20.25 - 32.65)	19.9
16 - 20	6.42	(3.30 - 9.55)	7.9	6.00	(2.99 - 9.02)	4.5
21 +	–	–	–	2.41	(0.48 - 4.33)	1.8
Total	80.93	(70.54 - 91.32)	100.0	132.96	(120.30 - 145.62)	100.0

No. of plant spp.	Development stage / Area					
	pole stage			incoming high forest		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	0.40	(0.00 - 1.22)	0.4	0.80	(0.00 - 1.91)	1.2
1 - 5	40.83	(33.16 - 48.49)	35.8	16.43	(11.47 - 21.39)	24.3
6 - 10	43.63	(35.78 - 51.49)	38.2	26.44	(20.20 - 32.69)	39.0
11 - 15	20.41	(14.94 - 25.88)	17.9	19.64	(14.23 - 25.04)	29.0
16 - 20	7.59	(4.21 - 10.96)	6.6	3.20	(0.98 - 5.41)	4.7
21 +	1.20	(0.00 - 2.56)	1.1	1.20	(0.00 - 2.57)	1.8
Total	114.06	(102.23 - 125.90)	100.0	67.71	(58.07 - 77.36)	100.0

No. of plant spp.	Development stage / Area					
	high forest			overmature		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	-	-	-	-	-	-
1 - 5	11.63	(7.46 - 15.79)	19.0	1.61	(0.02 - 3.20)	15.4
6 - 10	22.43	(16.71 - 28.14)	36.5	4.02	(1.53 - 6.50)	38.6
11 - 15	18.00	(12.85 - 23.15)	29.4	3.61	(1.25 - 5.96)	34.6
16 - 20	6.41	(3.29 - 9.52)	10.5	1.19	(0.00 - 2.54)	11.4
21 +	2.81	(0.73 - 4.89)	4.6	-	-	-
Total	61.27	(52.16 - 70.39)	100.0	10.43	(6.49 - 14.36)	100.0

No. of plant spp.	Development stage / Area					
	multistoried			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	-	-	-	1.21	(0.00 - 2.57)	0.2
1 - 5	2.81	(0.73 - 4.88)	4.5	124.14	(111.99 - 136.28)	19.5
6 - 10	21.23	(15.64 - 26.82)	33.8	277.53	(262.13 - 292.92)	43.5
11 - 15	20.02	(14.59 - 25.45)	31.8	158.59	(145.26 - 171.91)	24.9
16 - 20	12.41	(8.09 - 16.73)	19.7	58.04	(49.16 - 66.93)	9.1
21 +	6.42	(3.30 - 9.55)	10.2	17.64	(12.53 - 22.74)	2.8
Total	62.88	(53.59 - 72.18)	100.0	637.13		100.0



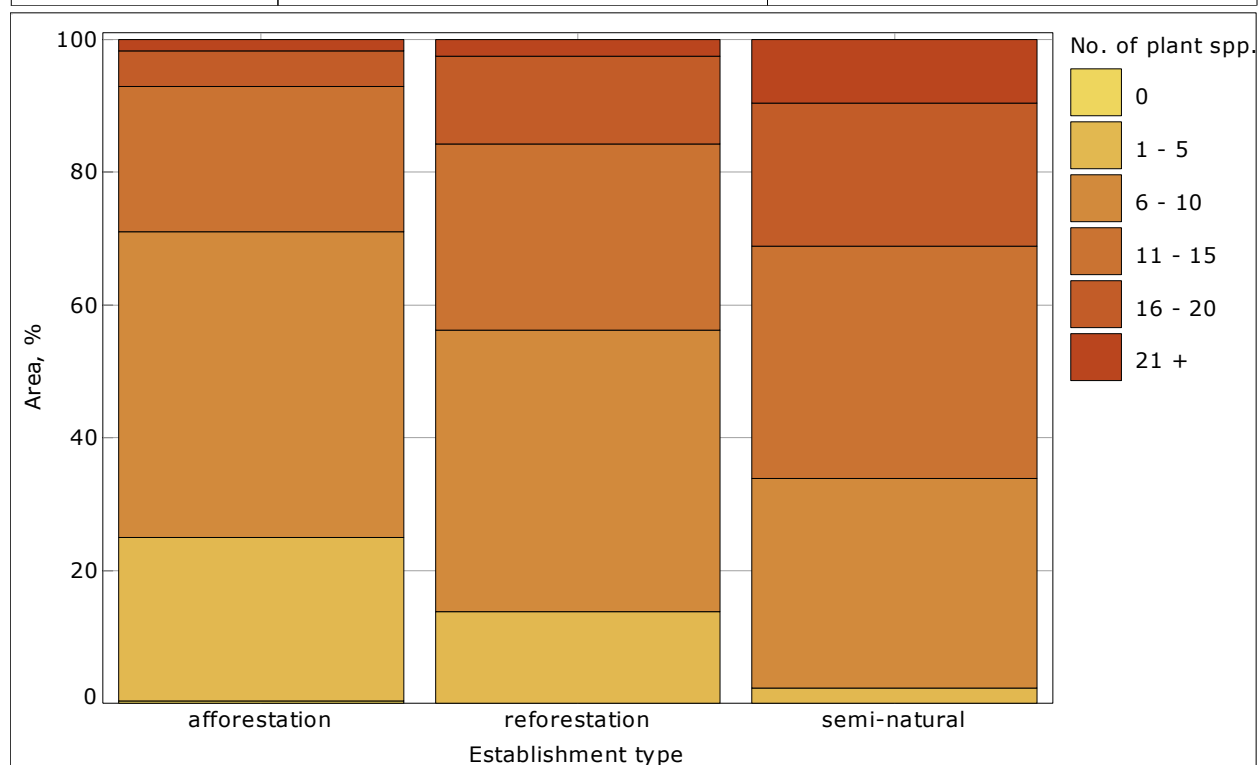
13.1.5 Total stocked forest area by total number of plant species and forest establishment type

Methodology

The total stocked forest area is classified by forest establishment type and the number of non-tree plant species present.

No. of plant spp.	Establishment type / Area					
	afforestation			reforestation		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	1.21	(0.00 - 2.57)	0.3	–	–	–
1 - 5	100.87	(89.57 - 112.17)	24.7	21.67	(16.10 - 27.24)	13.8
6 - 10	188.22	(174.08 - 202.36)	46.0	66.87	(57.48 - 76.25)	42.5
11 - 15	89.74	(79.04 - 100.44)	21.9	44.02	(36.12 - 51.92)	28.0
16 - 20	22.00	(16.31 - 27.70)	5.4	20.83	(15.30 - 26.36)	13.2
21 +	6.82	(3.61 - 10.03)	1.7	4.00	(1.53 - 6.47)	2.5
Total	408.86	(394.18 - 423.53)	100.0	157.38	(144.35 - 170.41)	100.0

No. of plant spp.	Establishment type / Area					
	semi-natural			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	1.21	(0.00 - 2.57)	0.2
1 - 5	1.60	(0.03 - 3.17)	2.3	124.14	(111.99 - 136.28)	19.5
6 - 10	22.44	(16.70 - 28.18)	31.7	277.53	(262.13 - 292.92)	43.5
11 - 15	24.83	(18.82 - 30.83)	35.0	158.59	(145.26 - 171.91)	24.9
16 - 20	15.20	(10.44 - 19.97)	21.4	58.04	(49.16 - 66.93)	9.1
21 +	6.82	(3.60 - 10.04)	9.6	17.64	(12.53 - 22.74)	2.8
Total	70.89	(61.10 - 80.69)	100.0	637.13		100.0



13.1.6 Stocked forest area by total number of non-tree plant species and soil group

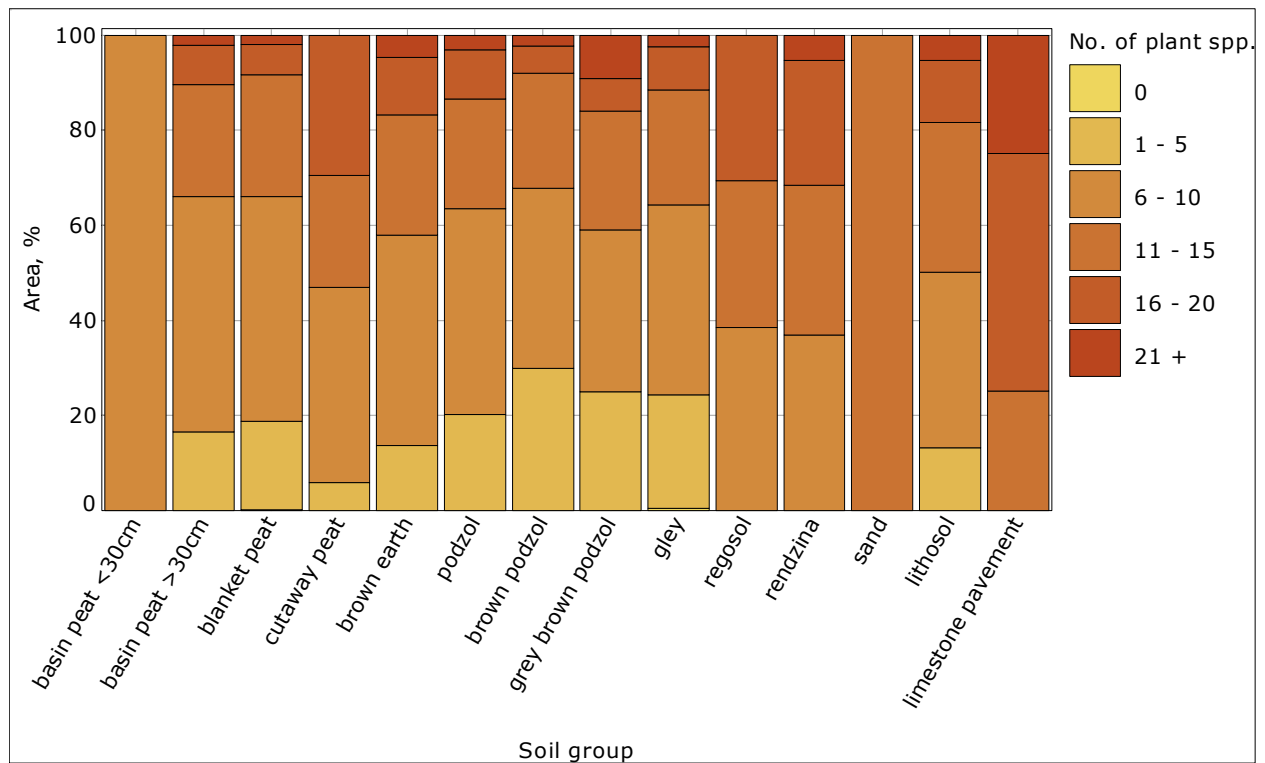
Methodology
The stocked forest area is classified by soil type and the number of non-tree plant species present.

No. of plant spp.	Soil group / Area					
	basin peat <30cm			basin peat >30cm		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	–	–	–
1 - 5	–	–	–	12.81	(8.52 - 17.10)	16.5
6 - 10	1.20	(0.00 - 2.55)	100.0	38.42	(31.21 - 45.64)	49.5
11 - 15	–	–	–	18.40	(13.40 - 23.40)	23.7
16 - 20	–	–	–	6.40	(3.30 - 9.50)	8.2
21 +	–	–	–	1.61	(0.03 - 3.18)	2.1
Total	1.20	(0.00 - 2.55)	100.0	77.64	(68.50 - 86.79)	100.0
No. of plant spp.	Soil group / Area					
	blanket peat			cutaway peat		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	0.40	(0.00 - 1.20)	0.2	–	–	–
1 - 5	34.80	(27.98 - 41.63)	18.6	0.40	(0.00 - 1.18)	5.8
6 - 10	88.54	(78.20 - 98.89)	47.4	2.80	(0.74 - 4.86)	41.1
11 - 15	47.76	(39.83 - 55.68)	25.5	1.61	(0.03 - 3.18)	23.5
16 - 20	12.02	(7.80 - 16.23)	6.4	2.02	(0.26 - 3.77)	29.6
21 +	3.62	(1.27 - 5.97)	1.9	–	–	–
Total	187.14	(174.67 - 199.62)	100.0	6.82	(3.61 - 10.03)	100.0
No. of plant spp.	Soil group / Area					
	brown earth			podzol		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	–	–	–
1 - 5	7.21	(3.90 - 10.52)	13.7	13.24	(8.86 - 17.62)	20.2
6 - 10	23.22	(17.43 - 29.02)	44.3	28.46	(22.23 - 34.69)	43.4
11 - 15	13.22	(8.76 - 17.69)	25.2	15.20	(10.47 - 19.92)	23.1
16 - 20	6.40	(3.28 - 9.52)	12.2	6.80	(3.59 - 10.00)	10.3
21 +	2.41	(0.49 - 4.33)	4.6	2.00	(0.25 - 3.75)	3.0
Total	52.46	(43.99 - 60.93)	100.0	65.70	(56.73 - 74.67)	100.0
No. of plant spp.	Soil group / Area					
	brown podzol			grey brown podzol		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	–	–	–
1 - 5	10.42	(6.51 - 14.34)	29.9	4.41	(1.82 - 6.99)	25.0
6 - 10	13.23	(8.81 - 17.64)	37.9	6.01	(3.01 - 9.02)	34.1
11 - 15	8.44	(4.86 - 12.01)	24.2	4.41	(1.86 - 6.96)	25.0
16 - 20	2.00	(0.25 - 3.75)	5.7	1.20	(0.00 - 2.57)	6.8
21 +	0.80	(0.00 - 1.92)	2.3	1.60	(0.04 - 3.16)	9.1
Total	34.89	(27.91 - 41.87)	100.0	17.63	(12.60 - 22.66)	100.0
No. of plant spp.	Soil group / Area					
	gley			regosol		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	0.80	(0.00 - 1.92)	0.5	–	–	–
1 - 5	38.83	(31.40 - 46.27)	23.8	–	–	–
6 - 10	65.22	(55.89 - 74.55)	39.9	2.01	(0.25 - 3.78)	38.5
11 - 15	39.57	(32.10 - 47.03)	24.2	1.61	(0.04 - 3.18)	30.8
16 - 20	14.82	(10.11 - 19.52)	9.1	1.60	(0.03 - 3.17)	30.7
21 +	4.00	(1.54 - 6.46)	2.5	–	–	–
Total	163.24	(150.33 - 176.16)	100.0	5.23	(2.40 - 8.05)	100.0

No. of plant spp.	Soil group / Area					
	rendzina			sand		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	–	–	–
1 - 5	–	–	–	–	–	–
6 - 10	2.81	(0.74 - 4.87)	36.9	–	–	–
11 - 15	2.40	(0.49 - 4.31)	31.6	0.80	(0.00 - 1.92)	100.0
16 - 20	2.00	(0.25 - 3.74)	26.3	–	–	–
21 +	0.40	(0.00 - 1.18)	5.2	–	–	–
Total	7.60	(4.24 - 10.96)	100.0	0.80	(0.00 - 1.92)	100.0

No. of plant spp.	Soil group / Area					
	lithosol			limestone pavement		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	–	–	–
1 - 5	2.01	(0.22 - 3.80)	13.2	–	–	–
6 - 10	5.60	(2.68 - 8.52)	36.9	–	–	–
11 - 15	4.78	(2.11 - 7.46)	31.5	0.40	(0.00 - 1.22)	25.2
16 - 20	1.99	(0.25 - 3.72)	13.1	0.80	(0.00 - 1.92)	50.0
21 +	0.80	(0.00 - 1.91)	5.3	0.40	(0.00 - 1.18)	24.8
Total	15.17	(10.50 - 19.84)	100.0	1.61	(0.03 - 3.18)	100.0

No. of plant spp.	Soil group / Area		
	Total		
	thousands ha	($\alpha = 0.05$)	%
0	1.21	(0.00 - 2.57)	0.2
1 - 5	124.14	(111.99 - 136.28)	19.5
6 - 10	277.53	(262.13 - 292.92)	43.5
11 - 15	158.59	(145.26 - 171.91)	24.9
16 - 20	58.04	(49.16 - 66.93)	9.1
21 +	17.64	(12.53 - 22.74)	2.8
Total	637.13		100.0



13.2 PLANT TYPE COVERAGE

Definition	
Vegetation cover	
The total vegetation cover (%) is classified as a percentage of the ground covered in a forest stand:	
• No presence • Rare (0-0.2%) • Sporadic (0.2-1%) • Infrequent (1-5%)	• Frequent (6-25%) • Common (26-50%) • Very common (51-75%) • Abundant (76-100%)
Vegetation cover is further classified into the following species categories and quantified using the same scale as above:	
• Grass • Herb • Moss	• Fern • Brush e.g. Briar and Gorse. • Shrub e.g. Elder.

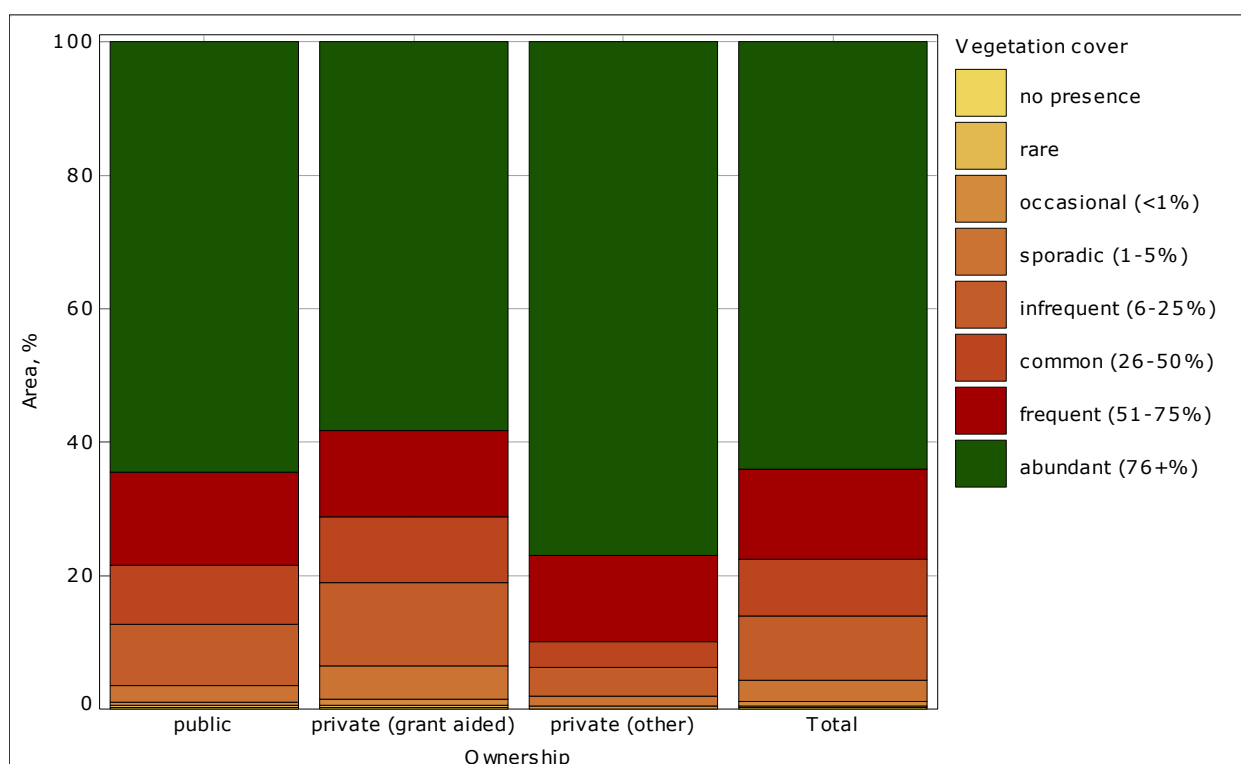
13.2.1 Forest area by ownership and vegetation cover

Methodology

The forest area is classified by ownership and the percentage vegetation cover.

Vegetation cover	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	0.80	(0.00 - 1.91)	0.2	0.40	(0.00 - 1.21)	0.2
rare	1.21	(0.00 - 2.58)	0.3	0.80	(0.00 - 1.90)	0.4
occasional (<1%)	1.61	(0.03 - 3.18)	0.5	2.01	(0.25 - 3.77)	0.9
sporadic (1-5%)	8.84	(5.18 - 12.49)	2.5	10.78	(6.75 - 14.81)	5.0
infrequent (6-25%)	32.49	(25.63 - 39.34)	9.1	26.83	(20.55 - 33.10)	12.5
common (26-50%)	31.64	(24.88 - 38.40)	8.9	21.20	(15.59 - 26.80)	9.9
frequent (51-75%)	49.68	(41.27 - 58.08)	14.0	27.61	(21.23 - 34.00)	12.8
abundant (76+%)	229.06	(214.11 - 244.00)	64.5	125.32	(113.02 - 137.62)	58.3
Total	355.31	(339.78 - 370.85)	100.0	214.95	(200.34 - 229.55)	100.0

Vegetation cover	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	-	-	-	1.21	(0.00 - 2.57)	0.2
rare	-	-	-	2.00	(0.25 - 3.76)	0.3
occasional (<1%)	0.40	(0.00 - 1.21)	0.5	4.02	(1.53 - 6.51)	0.6
sporadic (1-5%)	1.20	(0.00 - 2.63)	1.4	20.82	(15.24 - 26.40)	3.2
infrequent (6-25%)	3.60	(1.26 - 5.94)	4.3	62.91	(53.60 - 72.23)	9.6
common (26-50%)	3.21	(0.99 - 5.42)	3.8	56.04	(47.20 - 64.88)	8.6
frequent (51-75%)	10.84	(6.77 - 14.91)	12.9	88.13	(77.30 - 98.96)	13.5
abundant (76+%)	64.47	(55.03 - 73.90)	77.1	418.84	(403.59 - 434.09)	64.0
Total	83.72	(73.16 - 94.29)	100.0	653.98		100.0



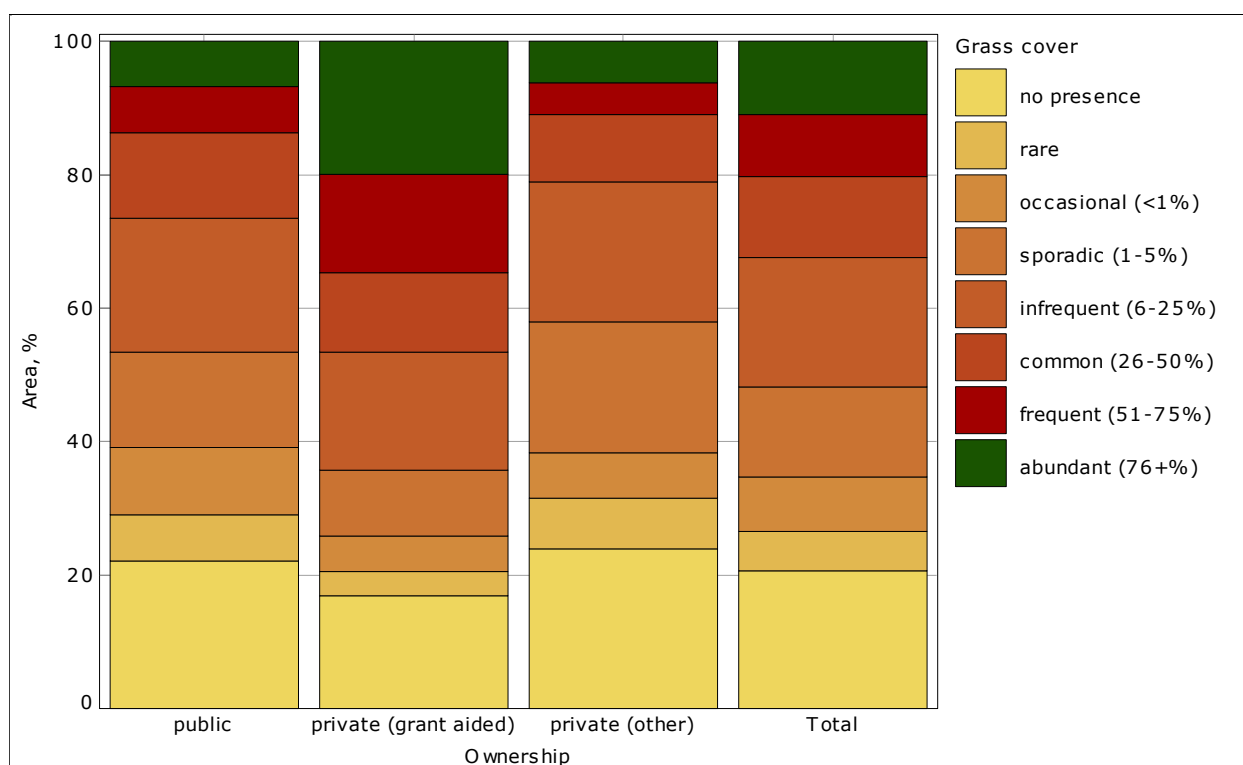
13.2.2 Forest area by ownership and grass cover

Methodology

The forest area is classified by ownership and the percentage grass cover.

Grass cover	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	78.59	(68.33 - 88.84)	22.1	36.41	(29.18 - 43.65)	16.9
rare	24.42	(18.43 - 30.42)	6.9	7.60	(4.21 - 10.99)	3.5
occasional (<1%)	36.03	(28.80 - 43.26)	10.1	11.61	(7.42 - 15.79)	5.4
sporadic (1-5%)	50.87	(42.38 - 59.35)	14.3	21.19	(15.58 - 26.80)	9.9
infrequent (6-25%)	71.28	(61.43 - 81.12)	20.1	38.04	(30.61 - 45.46)	17.7
common (26-50%)	45.23	(37.22 - 53.24)	12.7	25.61	(19.50 - 31.72)	11.9
frequent (51-75%)	24.86	(18.81 - 30.91)	7.0	31.62	(24.82 - 38.42)	14.7
abundant (76+%)	24.03	(18.08 - 29.98)	6.8	42.87	(35.11 - 50.63)	20.0
Total	355.31	(339.78 - 370.85)	100.0	214.95	(200.34 - 229.55)	100.0

Grass cover	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	20.04	(14.63 - 25.45)	24.0	135.04	(122.43 - 147.65)	20.8
rare	6.39	(3.27 - 9.50)	7.6	38.41	(30.97 - 45.85)	5.9
occasional (<1%)	5.62	(2.69 - 8.55)	6.7	53.26	(44.58 - 61.94)	8.1
sporadic (1-5%)	16.42	(11.45 - 21.40)	19.6	88.48	(77.65 - 99.32)	13.5
infrequent (6-25%)	17.64	(12.51 - 22.78)	21.1	126.96	(114.45 - 139.47)	19.4
common (26-50%)	8.41	(4.84 - 11.97)	10.0	79.25	(69.01 - 89.49)	12.1
frequent (51-75%)	4.01	(1.52 - 6.49)	4.8	60.48	(51.31 - 69.66)	9.2
abundant (76+%)	5.19	(2.39 - 8.00)	6.2	72.10	(62.22 - 81.97)	11.0
Total	83.72	(73.16 - 94.29)	100.0	653.98		100.0



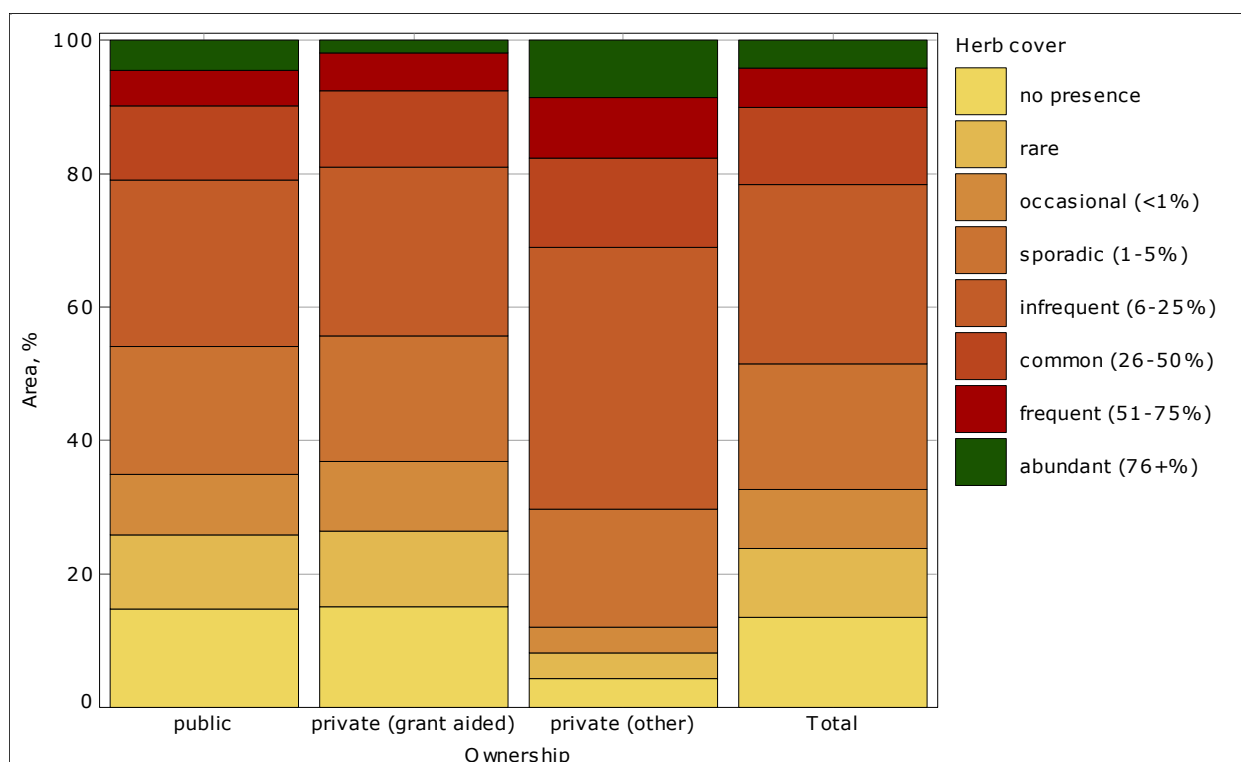
13.2.3 Forest area by ownership and herb cover

Methodology

The forest area is classified by ownership and the percentage herb cover.

Herb cover	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	52.54	(43.99 – 61.10)	14.8	32.40	(25.56 – 39.24)	15.1
rare	39.28	(31.82 – 46.74)	11.1	24.43	(18.43 – 30.42)	11.4
occasional (<1%)	32.45	(25.55 – 39.35)	9.1	22.44	(16.66 – 28.23)	10.4
sporadic (1-5%)	68.08	(58.41 – 77.75)	19.2	40.41	(32.78 – 48.05)	18.8
infrequent (6-25%)	88.51	(77.79 – 99.23)	24.8	54.44	(45.70 – 63.17)	25.2
common (26-50%)	39.65	(32.09 – 47.20)	11.2	24.42	(18.42 – 30.43)	11.4
frequent (51-75%)	18.78	(13.49 – 24.07)	5.3	12.41	(8.09 – 16.73)	5.8
abundant (76+%)	16.02	(11.14 – 20.90)	4.5	3.99	(1.53 – 6.46)	1.9
Total	355.31	(339.78 – 370.85)	100.0	214.95	(200.34 – 229.55)	100.0

Herb cover	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	3.61	(1.25 – 5.96)	4.3	88.55	(77.81 – 99.29)	13.5
rare	3.20	(0.99 – 5.42)	3.8	66.91	(57.43 – 76.39)	10.2
occasional (<1%)	3.21	(0.99 – 5.43)	3.8	58.11	(49.10 – 67.12)	8.9
sporadic (1-5%)	14.84	(10.12 – 19.56)	17.7	123.34	(110.90 – 135.77)	18.9
infrequent (6-25%)	32.85	(25.91 – 39.78)	39.3	175.79	(161.86 – 189.72)	26.9
common (26-50%)	11.20	(7.08 – 15.31)	13.4	75.27	(65.20 – 85.34)	11.5
frequent (51-75%)	7.60	(4.20 – 11.00)	9.1	38.79	(31.31 – 46.26)	5.9
abundant (76+%)	7.22	(3.92 – 10.51)	8.6	27.23	(20.94 – 33.51)	4.2
Total	83.72	(73.16 – 94.29)	100.0	653.98		100.0



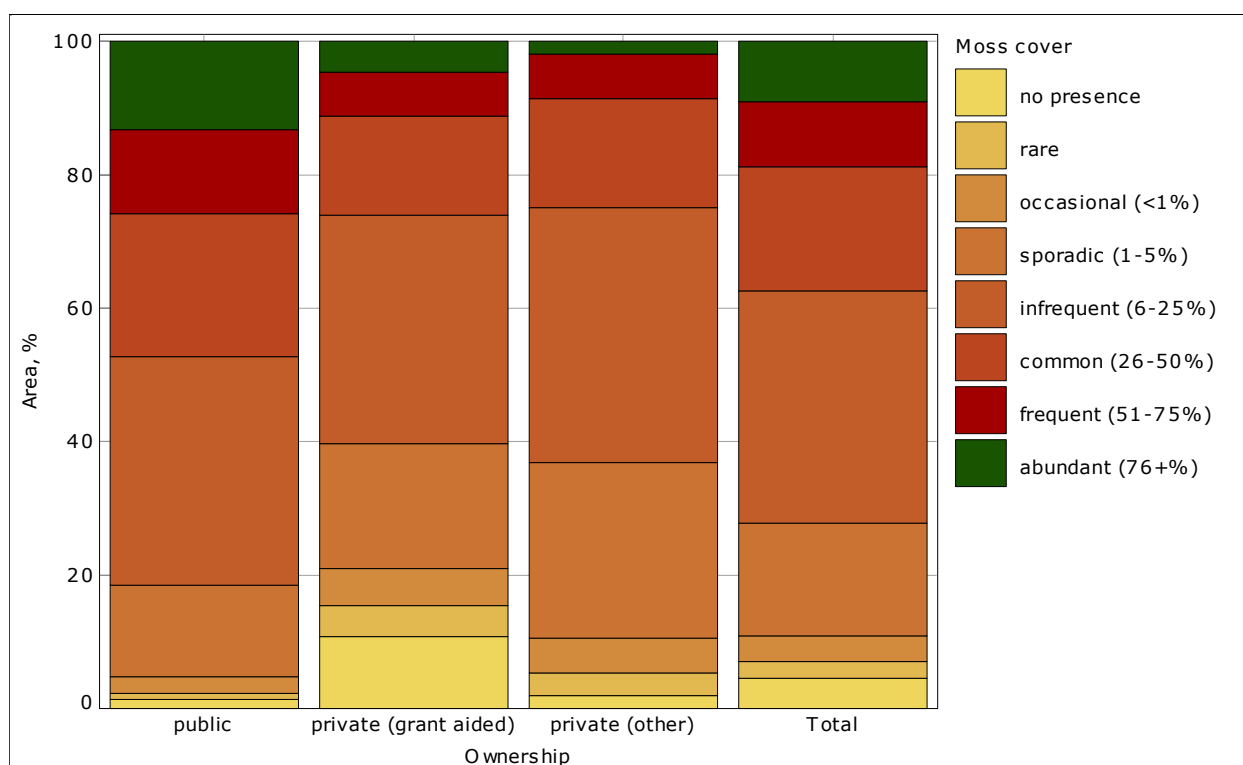
13.2.4 Forest area by ownership and moss cover

Methodology

The forest area is classified by ownership and the percentage moss cover.

Moss cover	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	4.82	(2.12 - 7.52)	1.4	23.21	(17.42 - 29.00)	10.8
rare	3.21	(1.00 - 5.43)	0.9	9.99	(6.13 - 13.86)	4.6
occasional (<1%)	8.81	(5.15 - 12.47)	2.5	12.01	(7.74 - 16.27)	5.6
sporadic (1-5%)	48.90	(40.58 - 57.23)	13.8	40.00	(32.43 - 47.57)	18.6
infrequent (6-25%)	121.77	(109.49 - 134.06)	34.2	73.62	(63.65 - 83.58)	34.3
common (26-50%)	76.09	(65.92 - 86.27)	21.4	32.05	(25.21 - 38.89)	14.9
frequent (51-75%)	44.46	(36.47 - 52.45)	12.5	14.03	(9.42 - 18.64)	6.5
abundant (76+%)	47.24	(39.10 - 55.38)	13.3	10.03	(6.14 - 13.92)	4.7
Total	355.31	(339.78 - 370.85)	100.0	214.95	(200.34 - 229.55)	100.0

Moss cover	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	1.61	(0.00 - 3.24)	1.9	29.65	(23.16 - 36.14)	4.5
rare	2.81	(0.74 - 4.88)	3.4	16.02	(11.13 - 20.90)	2.4
occasional (<1%)	4.40	(1.81 - 6.99)	5.3	25.22	(19.11 - 31.33)	3.9
sporadic (1-5%)	22.06	(16.33 - 27.79)	26.4	110.96	(99.05 - 122.88)	17.0
infrequent (6-25%)	32.00	(25.16 - 38.84)	38.1	227.39	(212.37 - 242.41)	34.8
common (26-50%)	13.62	(9.10 - 18.14)	16.3	121.77	(109.41 - 134.12)	18.6
frequent (51-75%)	5.61	(2.68 - 8.54)	6.7	64.10	(54.65 - 73.54)	9.8
abundant (76+%)	1.61	(0.04 - 3.18)	1.9	58.88	(49.89 - 67.87)	9.0
Total	83.72	(73.16 - 94.29)	100.0	653.98		100.0



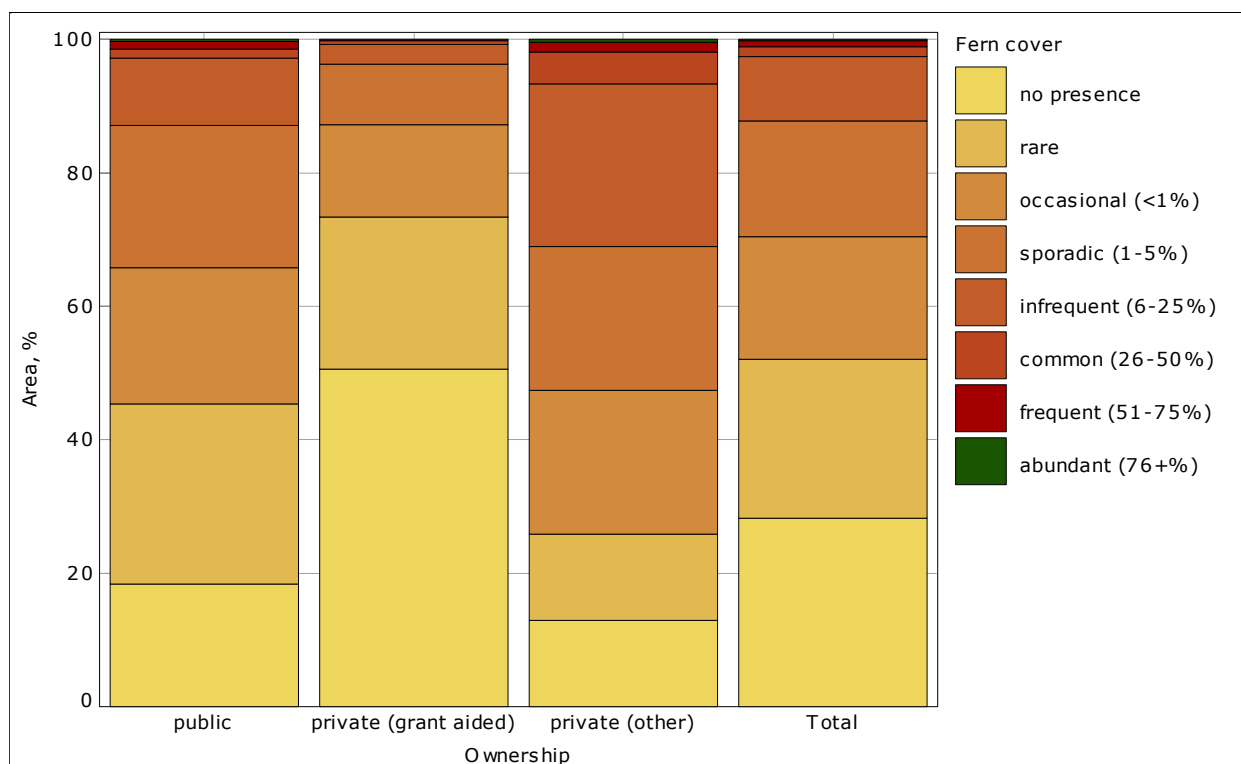
13.2.5 Forest area by ownership and fern cover

Methodology

The forest area is classified by ownership and the percentage fern cover.

Fern cover	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	65.37	(55.97 – 74.77)	18.4	108.80	(97.22 – 120.38)	50.6
rare	95.74	(84.66 – 106.81)	27.1	48.89	(40.56 – 57.22)	22.7
occasional (<1%)	72.55	(62.61 – 82.50)	20.4	29.65	(23.09 – 36.21)	13.8
sporadic (1-5%)	75.64	(65.60 – 85.68)	21.3	19.59	(14.19 – 24.99)	9.1
infrequent (6-25%)	36.01	(28.81 – 43.22)	10.1	6.42	(3.29 – 9.54)	3.0
common (26-50%)	4.80	(2.09 – 7.50)	1.3	1.20	(0.00 – 2.57)	0.6
frequent (51-75%)	4.00	(1.54 – 6.46)	1.1	0.40	(0.00 – 1.18)	0.2
abundant (76+%)	1.20	(0.00 – 2.56)	0.3	–	–	–
Total	355.31	(339.78 – 370.85)	100.0	214.95	(200.34 – 229.55)	100.0

Fern cover	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	10.83	(6.85 – 14.80)	12.9	185.00	(170.97 – 199.03)	28.3
rare	10.83	(6.77 – 14.88)	12.9	155.45	(142.11 – 168.80)	23.8
occasional (<1%)	18.03	(12.83 – 23.23)	21.5	120.23	(107.95 – 132.51)	18.4
sporadic (1-5%)	18.01	(12.81 – 23.21)	21.5	113.24	(101.36 – 125.13)	17.3
infrequent (6-25%)	20.42	(14.92 – 25.92)	24.5	62.85	(53.53 – 72.16)	9.6
common (26-50%)	4.02	(1.53 – 6.50)	4.8	10.02	(6.11 – 13.93)	1.5
frequent (51-75%)	1.19	(0.00 – 2.54)	1.4	5.59	(2.69 – 8.49)	0.9
abundant (76+%)	0.40	(0.00 – 1.22)	0.5	1.60	(0.03 – 3.17)	0.2
Total	83.72	(73.16 – 94.29)	100.0	653.98		100.0



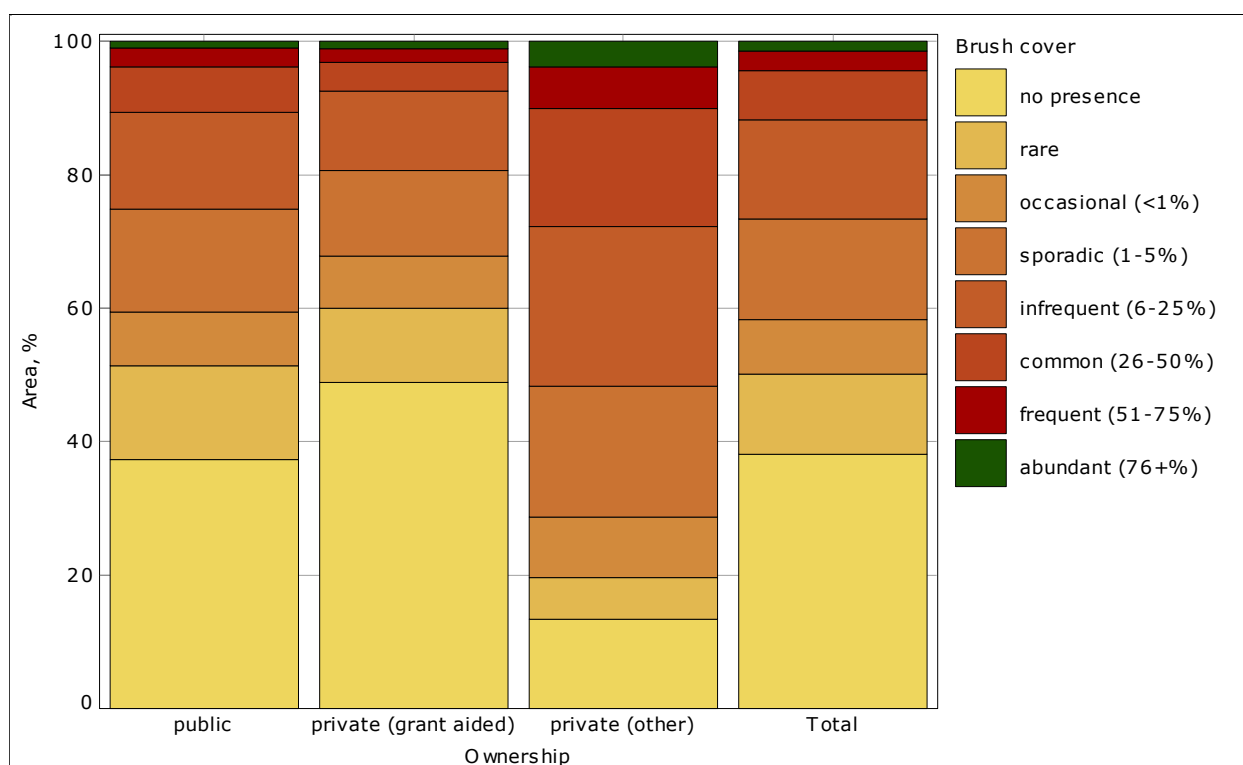
13.2.6 Forest area by ownership and brush cover

Methodology

The forest area is classified by ownership and the percentage brush cover.

Brush cover	Ownership / Area				
	public			private (grant aided)	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
no presence	132.69	(120.16 – 145.21)	37.4	104.95	(93.42 – 116.48) 48.9
rare	49.67	(41.31 – 58.03)	14.0	23.99	(18.06 – 29.93) 11.2
occasional (<1%)	28.81	(22.31 – 35.31)	8.1	16.79	(11.78 – 21.79) 7.8
sporadic (1-5%)	54.83	(46.07 – 63.60)	15.4	27.60	(21.23 – 33.97) 12.8
infrequent (6-25%)	51.67	(43.16 – 60.19)	14.5	25.60	(19.48 – 31.72) 11.9
common (26-50%)	24.00	(18.08 – 29.92)	6.8	9.22	(5.47 – 12.96) 4.3
frequent (51-75%)	10.02	(6.15 – 13.88)	2.8	4.40	(1.81 – 6.98) 2.0
abundant (76+%)	3.62	(1.26 – 5.98)	1.0	2.40	(0.48 – 4.32) 1.1
Total	355.31	(339.78 – 370.85)	100.0	214.95	(200.34 – 229.55) 100.0

Brush cover	Ownership / Area				
	private (other)			Total	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
no presence	11.21	(7.10 – 15.32)	13.4	248.85	(233.74 – 263.96) 38.1
rare	5.21	(2.40 – 8.03)	6.2	78.88	(68.64 – 89.12) 12.1
occasional (<1%)	7.59	(4.20 – 10.98)	9.1	53.18	(44.57 – 61.80) 8.1
sporadic (1-5%)	16.41	(11.46 – 21.36)	19.6	98.84	(87.54 – 110.14) 15.1
infrequent (6-25%)	20.06	(14.59 – 25.53)	24.0	97.33	(86.18 – 108.48) 14.9
common (26-50%)	14.81	(10.09 – 19.54)	17.7	48.03	(39.81 – 56.25) 7.3
frequent (51-75%)	5.21	(2.38 – 8.03)	6.2	19.62	(14.27 – 24.97) 3.0
abundant (76+%)	3.22	(1.00 – 5.44)	3.8	9.24	(5.50 – 12.98) 1.4
Total	83.72	(73.16 – 94.29)	100.0	653.98	100.0



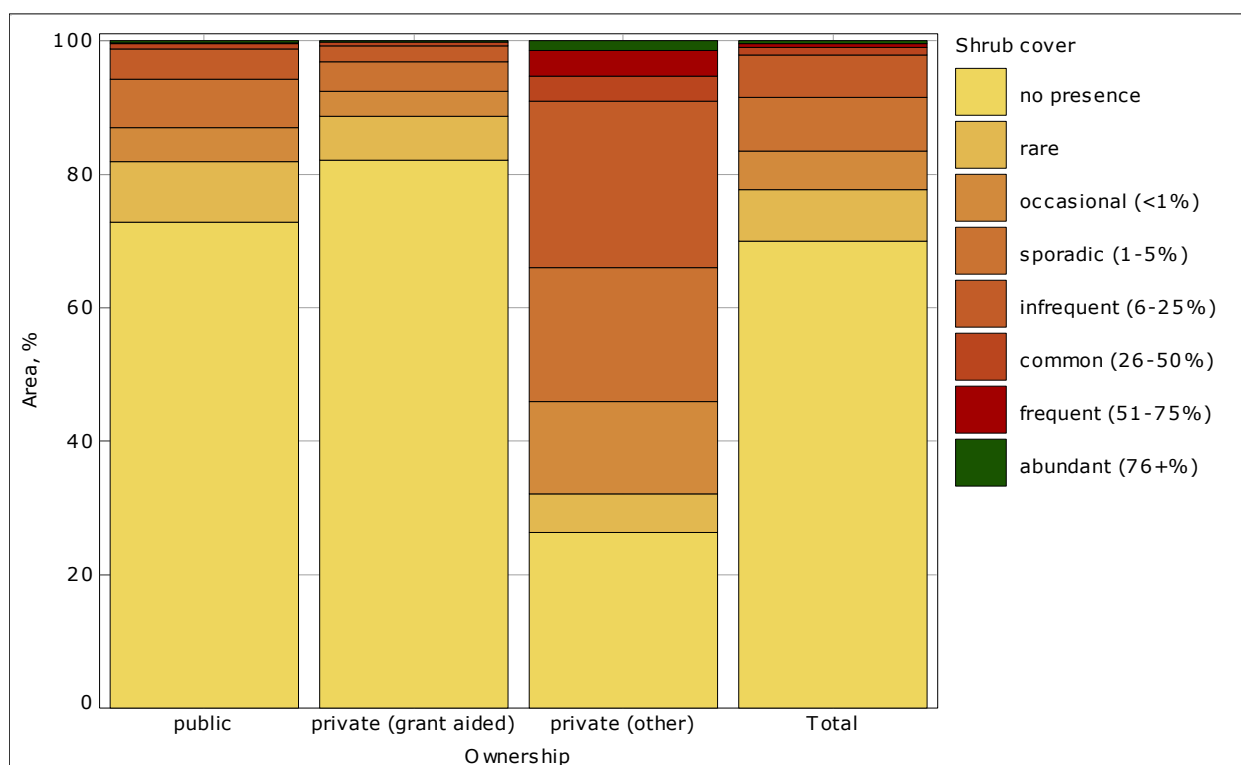
13.2.7 Forest area by ownership and shrub cover

Methodology

The forest area is classified by ownership and the percentage shrub cover.

Shrub cover	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	258.87	(243.65 – 274.09)	72.9	176.53	(162.64 – 190.42)	82.1
rare	31.99	(25.17 – 38.81)	9.0	14.02	(9.45 – 18.58)	6.5
occasional (<1%)	18.02	(12.82 – 23.21)	5.1	8.00	(4.52 – 11.48)	3.7
sporadic (1-5%)	26.01	(19.84 – 32.18)	7.3	9.59	(5.77 – 13.41)	4.5
infrequent (6-25%)	16.03	(11.15 – 20.91)	4.5	5.20	(2.38 – 8.03)	2.4
common (26-50%)	2.79	(0.73 – 4.86)	0.8	1.21	(0.00 – 2.57)	0.6
frequent (51-75%)	0.40	(0.00 – 1.18)	0.1	–	–	–
abundant (76+%)	1.20	(0.00 – 2.55)	0.3	0.40	(0.00 – 1.18)	0.2
Total	355.31	(339.78 – 370.85)	100.0	214.95	(200.34 – 229.55)	100.0

Shrub cover	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no presence	22.03	(16.33 – 27.72)	26.4	457.43	(443.02 – 471.83)	69.9
rare	4.81	(2.09 – 7.54)	5.7	50.82	(42.37 – 59.27)	7.8
occasional (<1%)	11.64	(7.44 – 15.85)	13.9	37.66	(30.27 – 45.06)	5.8
sporadic (1-5%)	16.80	(11.78 – 21.81)	20.1	52.40	(43.79 – 61.00)	8.0
infrequent (6-25%)	20.82	(15.25 – 26.40)	24.9	42.06	(34.29 – 49.83)	6.4
common (26-50%)	3.21	(0.99 – 5.43)	3.8	7.21	(3.89 – 10.52)	1.1
frequent (51-75%)	3.20	(1.00 – 5.41)	3.8	3.61	(1.26 – 5.95)	0.6
abundant (76+%)	1.21	(0.00 – 2.57)	1.4	2.81	(0.73 – 4.88)	0.4
Total	83.72	(73.16 – 94.29)	100.0	653.98		100.0



13.3 LICHENS

Definition

Lichen

An organism consisting of an outer fungal body enclosing photosynthetic algae.

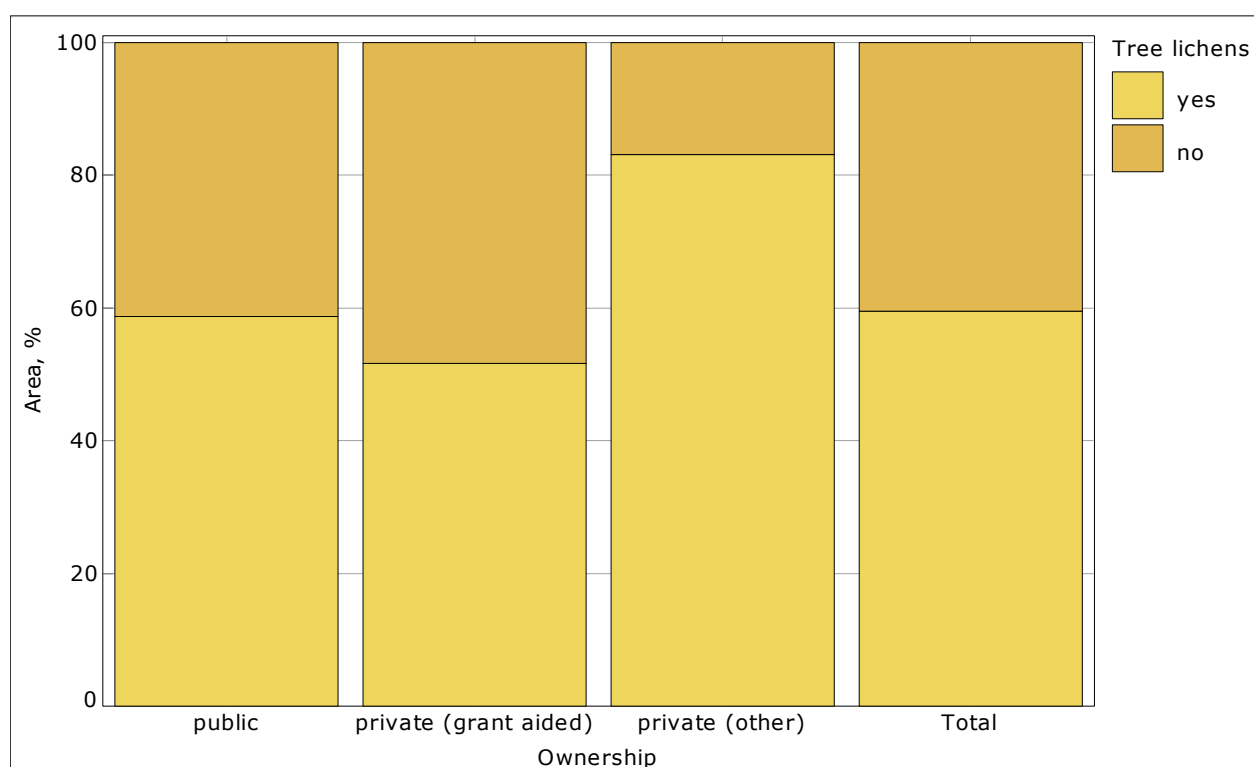
13.3.1 Stocked forest area by ownership and tree lichen occurrence

Methodology

The stocked forest area is classified by ownership and the presence of lichens.

Tree lichens	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
yes	200.74	(186.53 – 214.94)	58.7	109.74	(98.04 – 121.45)	51.6
no	140.95	(128.23 – 153.68)	41.3	102.78	(91.49 – 114.08)	48.4
Total	341.69	(326.35 – 357.03)	100.0	212.52	(198.06 – 226.99)	100.0

Tree lichens	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
yes	68.90	(59.16 – 78.65)	83.1	379.38	(364.42 – 394.35)	59.5
no	14.01	(9.44 – 18.58)	16.9	257.75	(242.78 – 272.72)	40.5
Total	82.92	(72.42 – 93.42)	100.0	637.13		100.0



13.3.2 Stocked conifer forest area with lichens by lichen type and occurrence

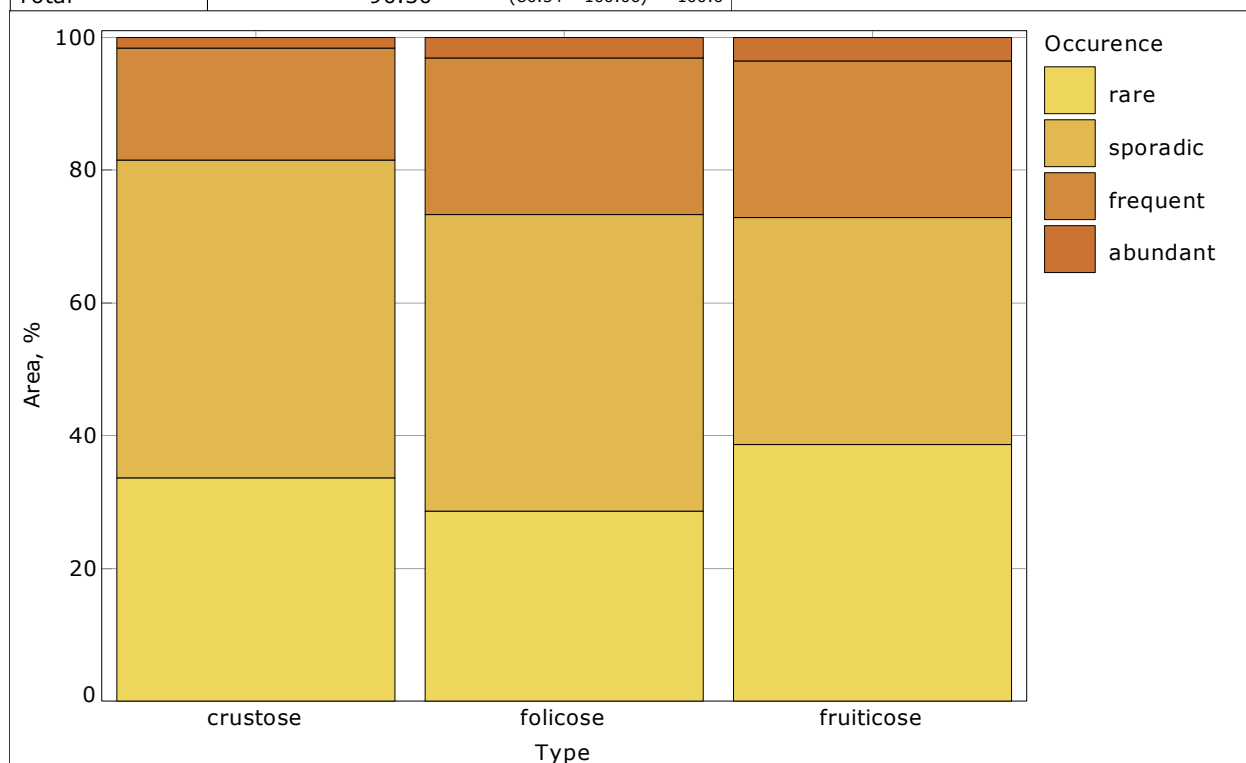
Definition
Lichen type Lichens were classified into three groups: 1. Crustose: Encrusting forms that spread over and into the surface substrate on which they grow. 2. Foliose: Leafy forms that spread horizontally over the substrate. 3. Fruticose: Shrubby or beard-like forms that may be erect or pendulous.

Definition
Lichen occurrence Lichen quantity is classified as one of the following: • Rare (up to-5%) • Frequent (51-75%) • Sporadic (6-25%) • Abundant (76-100%)

Methodology
The stocked forest area on which lichens were found on conifer trees is classified by lichen type and occurrence.

Occurrence	Type / Area					
	crustose			foliose		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
rare	77.34	(67.20 – 87.49)	33.6	45.61	(37.57 – 53.65)	28.6
sporadic	110.18	(98.57 – 121.79)	47.9	71.36	(61.87 – 80.85)	44.7
frequent	38.92	(31.61 – 46.22)	16.9	37.75	(30.63 – 44.86)	23.7
abundant	3.61	(1.26 – 5.95)	1.6	4.83	(2.14 – 7.52)	3.0
Total	230.04	(215.77 – 244.32)	100.0	159.54	(147.13 – 171.96)	100.0

Occurrence	Type / Area		
	fruiticose		
	thousands ha	($\alpha = 0.05$)	%
rare	34.93	(28.05 – 41.81)	38.6
sporadic	30.88	(24.35 – 37.42)	34.2
frequent	21.28	(15.78 – 26.78)	23.6
abundant	3.21	(1.01 – 5.41)	3.6
Total	90.30	(80.54 – 100.06)	100.0



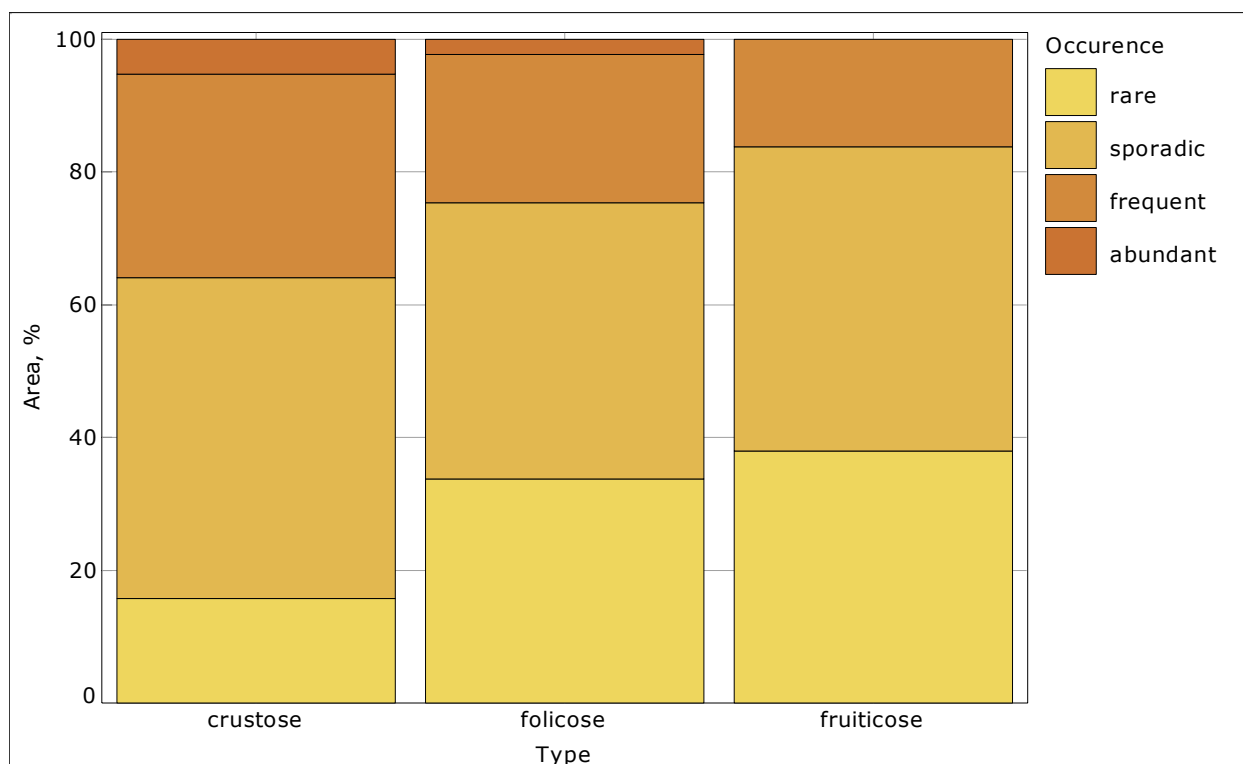
13.3.3 Stocked smooth barked broadleaf forest area with lichens by lichen type and occurrence

Methodology

The stocked forest area, on which lichens were found on smooth barked broadleaf tree species, is classified by lichen type and occurrence.

Occurrence	Type / Area					
	crustose			folicose		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
rare	15.64	(10.79 - 20.49)	15.7	12.04	(7.79 - 16.29)	33.8
sporadic	48.08	(39.77 - 56.40)	48.5	14.83	(10.10 - 19.55)	41.6
frequent	30.43	(23.75 - 37.10)	30.6	7.99	(4.52 - 11.46)	22.4
abundant	5.20	(2.41 - 8.00)	5.2	0.80	(0.00 - 1.92)	2.2
Total	99.36	(87.98 - 110.73)	100.0	35.65	(28.50 - 42.81)	100.0

Occurrence	Type / Area			
	fruiticose			
	thousands ha	($\alpha = 0.05$)	%	
rare	5.63	(2.71 - 8.55)	38.0	
sporadic	6.78	(3.58 - 9.98)	45.8	
frequent	2.40	(0.48 - 4.31)	16.2	
abundant	-	-	-	-
Total	14.81	(10.12 - 19.50)	100.0	



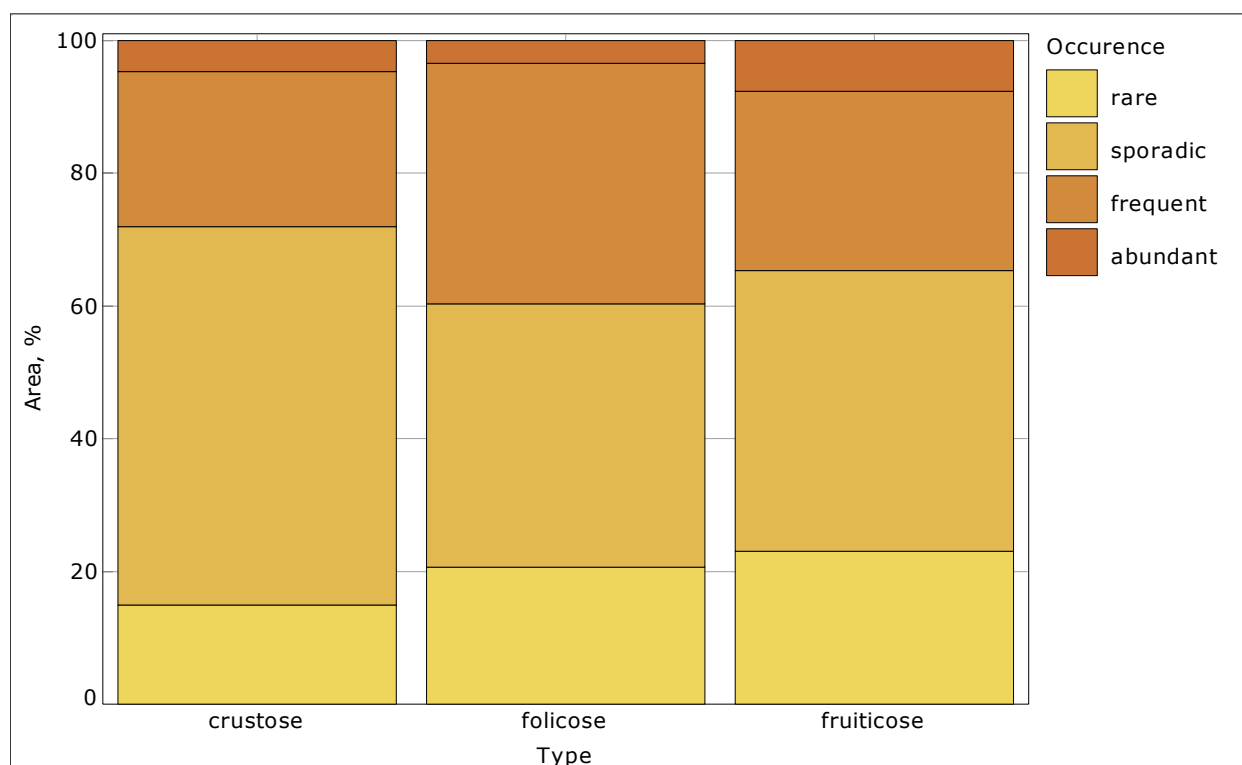
13.3.4 Stocked rough barked broadleaf forest area with lichens by lichen type and occurrence

Methodology

The stocked forest area, on which lichens were found on rough barked broadleaf tree species, is classified by lichen type and occurrence.

Occurrence	Type / Area					
	crustose			folicose		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
rare	6.41	(3.29 – 9.54)	15.0	4.81	(2.11 – 7.50)	20.7
sporadic	24.40	(18.43 – 30.37)	56.9	9.23	(5.49 – 12.98)	39.6
frequent	10.01	(6.11 – 13.91)	23.4	8.41	(4.83 – 11.99)	36.2
abundant	2.01	(0.25 – 3.78)	4.7	0.81	(0.00 – 1.92)	3.5
Total	42.84	(35.02 – 50.65)	100.0	23.25	(17.39 – 29.12)	100.0

Occurrence	Type / Area		
	fruiticose		
	thousands ha	($\alpha = 0.05$)	%
rare	2.39	(0.48 – 4.30)	23.0
sporadic	4.40	(1.82 – 6.99)	42.3
frequent	2.81	(0.73 – 4.88)	27.0
abundant	0.80	(0.00 – 1.92)	7.7
Total	10.40	(6.44 – 14.36)	100.0



Chapter 14

SITE

This chapter describes the environment in which the plot occurs. Descriptive attributes relating to the terrain are also detailed in this chapter.

The majority of the forest estate is found at relatively low elevation, with 90% of the area occurring below 300 m. The proportion of afforestation area established at higher elevations has been steadily declining over the last 30 years.

Soil cultivation has been carried out on 93% of the Public forest estate area, while the area cultivated in the Private (grant aided) estate rises to 98.1%. Deep ploughing (30.7%) and mounding (35%) are the dominant cultivation types in the Public forest estate, while mounding dominates (78%) in the Private (grant aided) estate. Pit planting (19.6%) or no cultivation (62.7%) characterises the soil cultivation in the Private (other) forests.

Over half (56%) of forests occur on mineral soils, with the remaining 44% on peats. One-quarter of all forests are growing on highly productive gley soils while 33% of Private (grant aided) forests occur on these soils, reflecting forestry's move onto more productive soils since the mid to late 1980's. Over the last 40 years, fewer forests are being afforested on peat. The proportion of basin peats being afforested has increased in the last ten years, largely as a result of the afforestation of land that was reclaimed for agriculture. Afforestation of blanket peat is declining, reflecting a shift away from the unenclosed land type.

In terms of soil drainage, Public and Private (grant aided) forests are distinctly different from Private (other) forest, with imperfectly to poorly drained soils predominating in the former and well drained soils in the latter. The national forest estate is located predominantly on terrain without major operational obstacles, particularly the Private (grant aided) forest estate

14.1 ALTITUDE

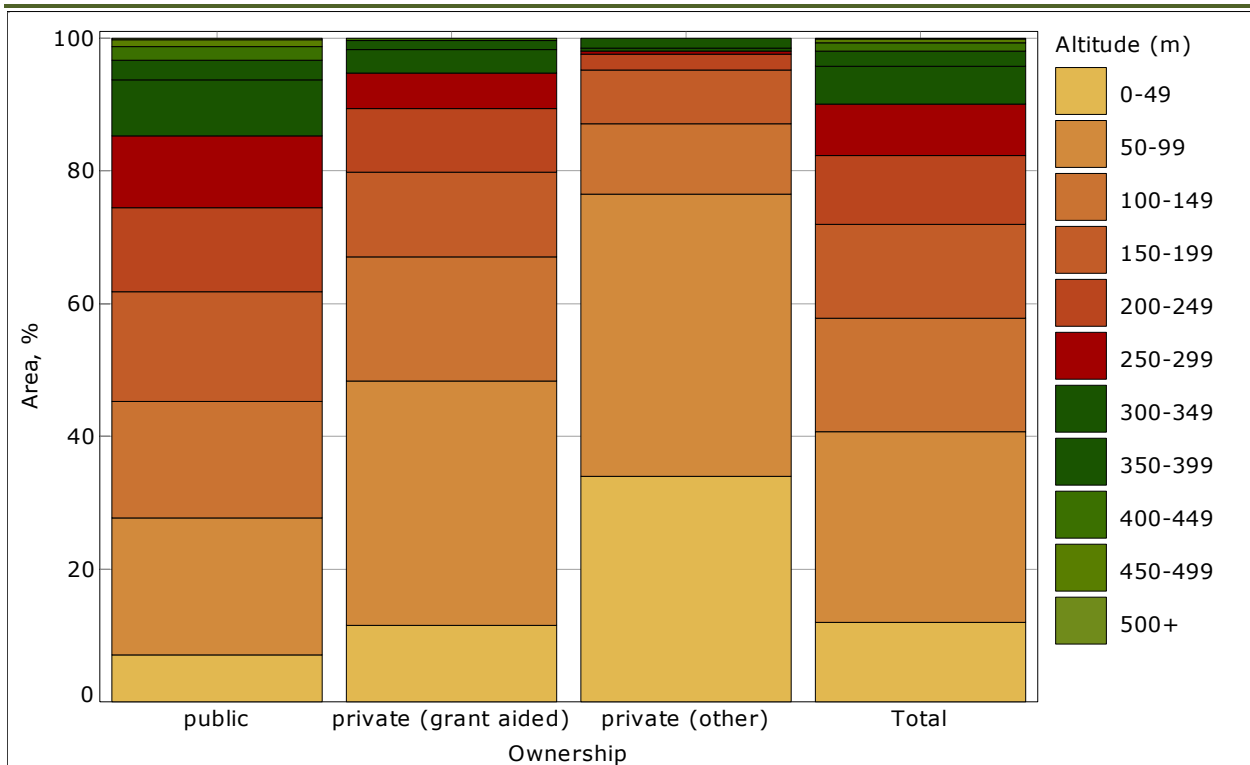
14.1.1 Forest area by ownership and altitude

Definition
Altitude
Height (m) above sea level.

Methodology
The forest area is classified by ownership and altitude (m).

Altitude (m)	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0-49	25.21	(19.16 – 31.25)	7.1	24.77	(18.81 – 30.73)	11.5
50-99	73.25	(63.62 – 82.88)	20.7	79.26	(69.29 – 89.23)	36.9
100-149	62.50	(53.26 – 71.75)	17.6	40.02	(32.48 – 47.56)	18.6
150-199	58.51	(49.59 – 67.44)	16.5	27.64	(21.32 – 33.96)	12.9
200-249	44.95	(37.00 – 52.91)	12.7	20.42	(14.94 – 25.89)	9.5
250-299	38.83	(31.41 – 46.25)	10.9	11.63	(7.49 – 15.77)	5.4
300-349	29.63	(23.09 – 36.17)	8.3	7.60	(4.23 – 10.97)	3.5
350-399	10.79	(6.78 – 14.79)	3.0	2.80	(0.74 – 4.87)	1.3
400-449	7.23	(4.00 – 10.45)	2.0	0.80	(0.00 – 1.91)	0.4
450-499	3.61	(1.28 – 5.95)	1.0	–	–	–
500+	0.81	(0.00 – 1.96)	0.2	–	–	–
Total	355.31	(339.78 – 370.85)	100.0	214.95	(200.34 – 229.55)	100.0

Altitude (m)	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0-49	28.46	(22.04 – 34.87)	34.0	78.43	(68.39 – 88.48)	12.0
50-99	35.64	(28.57 – 42.71)	42.6	188.15	(175.25 – 201.05)	28.7
100-149	8.81	(5.15 – 12.46)	10.5	111.33	(99.48 – 123.19)	17.0
150-199	6.81	(3.63 – 9.99)	8.1	92.97	(82.06 – 103.87)	14.2
200-249	2.00	(0.25 – 3.75)	2.4	67.37	(57.85 – 76.89)	10.3
250-299	0.40	(0.00 – 1.21)	0.5	50.86	(42.51 – 59.21)	7.8
300-349	0.40	(0.00 – 1.20)	0.5	37.63	(30.34 – 44.91)	5.8
350-399	1.20	(0.00 – 2.56)	1.4	14.79	(10.15 – 19.44)	2.3
400-449	–	–	–	8.03	(4.62 – 11.44)	1.2
450-499	–	–	–	3.61	(1.28 – 5.95)	0.6
500+	–	–	–	0.81	(0.00 – 1.96)	0.1
Total	83.72	(73.16 – 94.29)	100.0	653.98		100.0



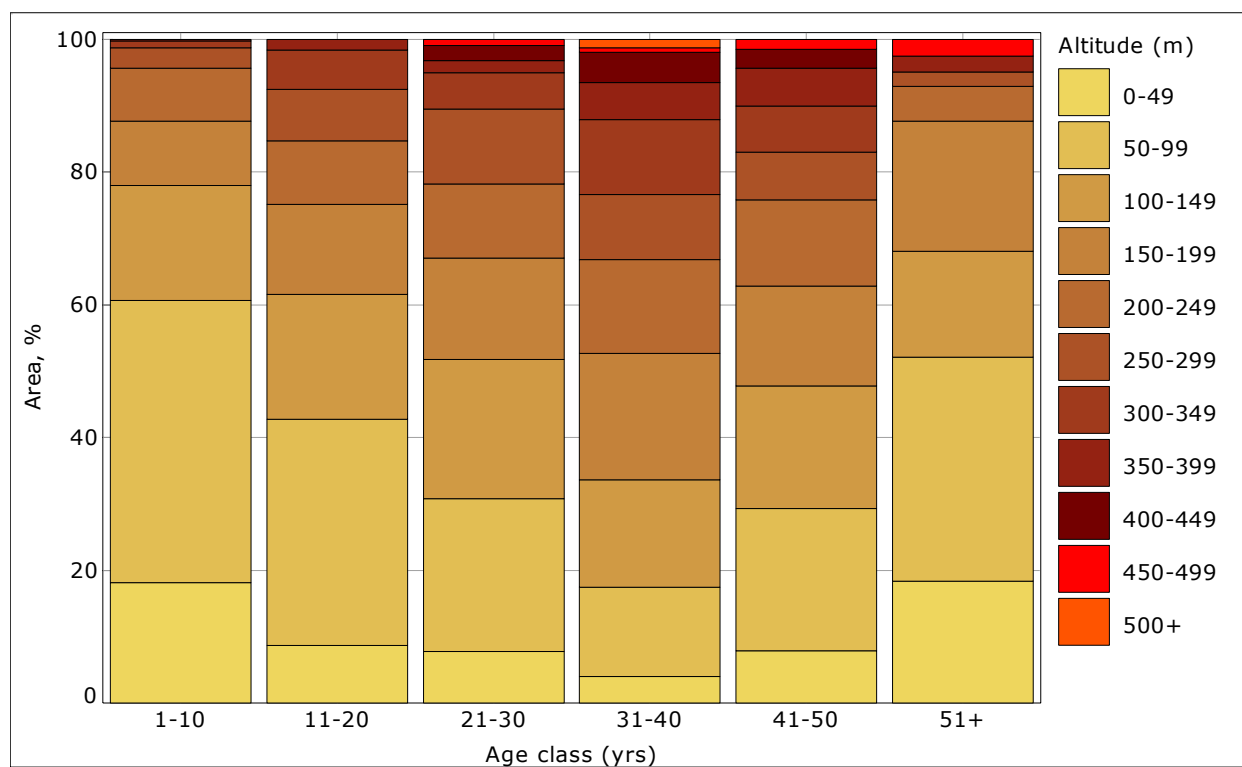
14.1.2 Stocked afforested area by altitude and age class (10 yr)

Methodology						
The stocked afforested area is classified by altitude and age class (10 yr).						
Age class (yrs)	Altitude (m) / Area					
	0-49			50-99		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1-10	11.84	(7.78 - 15.91)	30.2	27.69	(21.62 - 33.76)	23.3
11-20	12.94	(8.70 - 17.18)	33.0	51.37	(43.21 - 59.53)	43.2
21-30	6.74	(3.70 - 9.79)	17.2	20.09	(14.93 - 25.25)	16.9
31-40	2.49	(0.70 - 4.28)	6.4	8.33	(4.97 - 11.69)	7.0
41-50	2.19	(0.45 - 3.93)	5.6	5.97	(3.21 - 8.72)	5.0
51+	2.97	(1.20 - 4.73)	7.6	5.48	(3.03 - 7.92)	4.6
Total	39.17	(31.81 - 46.54)	100.0	118.93	(107.47 - 130.38)	100.0
Age class (yrs)	Altitude (m) / Area					
	100-149			150-199		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1-10	11.30	(7.31 - 15.29)	14.9	6.29	(3.33 - 9.26)	10.6
11-20	28.19	(21.93 - 34.46)	37.3	20.43	(15.12 - 25.74)	34.3
21-30	18.34	(13.24 - 23.45)	24.3	13.39	(9.04 - 17.74)	22.6
31-40	10.06	(6.28 - 13.84)	13.3	11.84	(7.74 - 15.94)	20.0
41-50	5.18	(2.50 - 7.86)	6.8	4.19	(1.82 - 6.56)	7.1
51+	2.57	(0.79 - 4.36)	3.4	3.18	(1.17 - 5.18)	5.4
Total	75.65	(65.62 - 85.67)	100.0	59.33	(50.37 - 68.29)	100.0
Age class (yrs)	Altitude (m) / Area					
	200-249			250-299		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1-10	5.18	(2.41 - 7.96)	12.2	2.05	(0.30 - 3.79)	6.4
11-20	14.30	(9.73 - 18.88)	33.7	11.69	(7.54 - 15.84)	36.5
21-30	9.68	(5.89 - 13.46)	22.8	9.94	(6.12 - 13.76)	31.0
31-40	8.85	(5.21 - 12.50)	20.8	6.05	(3.08 - 9.01)	18.9
41-50	3.62	(1.31 - 5.94)	8.5	1.98	(0.26 - 3.71)	6.2
51+	0.86	(0.00 - 1.97)	2.0	0.33	(0.00 - 1.00)	1.0
Total	42.50	(34.79 - 50.22)	100.0	32.04	(25.28 - 38.80)	100.0

Age class (yrs)	Altitude (m) / Area					
	300-349			350-399		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1-10	0.68	(0.00 - 1.59)	2.9	0.11	(0.00 - 0.28)	1.2
11-20	8.86	(5.25 - 12.47)	38.2	2.41	(0.49 - 4.33)	25.1
21-30	4.69	(2.08 - 7.31)	20.2	1.60	(0.03 - 3.17)	16.7
31-40	7.07	(3.82 - 10.31)	30.4	3.46	(1.22 - 5.71)	36.1
41-50	1.93	(0.23 - 3.63)	8.3	1.60	(0.02 - 3.18)	16.7
51+	-	-	-	0.40	(0.00 - 1.19)	4.2
Total	23.23	(17.40 - 29.07)	100.0	9.59	(5.83 - 13.35)	100.0

Age class (yrs)	Altitude (m) / Area					
	400-449			450-499		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1-10	-	-	-	-	-	-
11-20	-	-	-	-	-	-
21-30	2.00	(0.25 - 3.76)	35.7	0.80	(0.00 - 1.91)	39.9
31-40	2.80	(0.73 - 4.88)	50.0	0.40	(0.00 - 1.20)	19.9
41-50	0.80	(0.00 - 1.92)	14.3	0.40	(0.00 - 1.21)	20.1
51+	-	-	-	0.40	(0.00 - 1.29)	20.1
Total	5.61	(2.71 - 8.52)	100.0	2.01	(0.24 - 3.77)	100.0

Age class (yrs)	Altitude (m) / Area					
	500+			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1-10	-	-	-	65.16	(56.11 - 74.21)	15.9
11-20	-	-	-	150.20	(137.35 - 163.04)	36.8
21-30	-	-	-	87.28	(76.93 - 97.64)	21.3
31-40	0.81	(0.00 - 1.96)	100.0	62.16	(53.18 - 71.15)	15.2
41-50	-	-	-	27.87	(21.73 - 34.01)	6.8
51+	-	-	-	16.19	(11.94 - 20.44)	4.0
Total	0.81	(0.00 - 1.96)	100.0	408.86		100.0



14.2 TERRAIN CLASSIFICATION

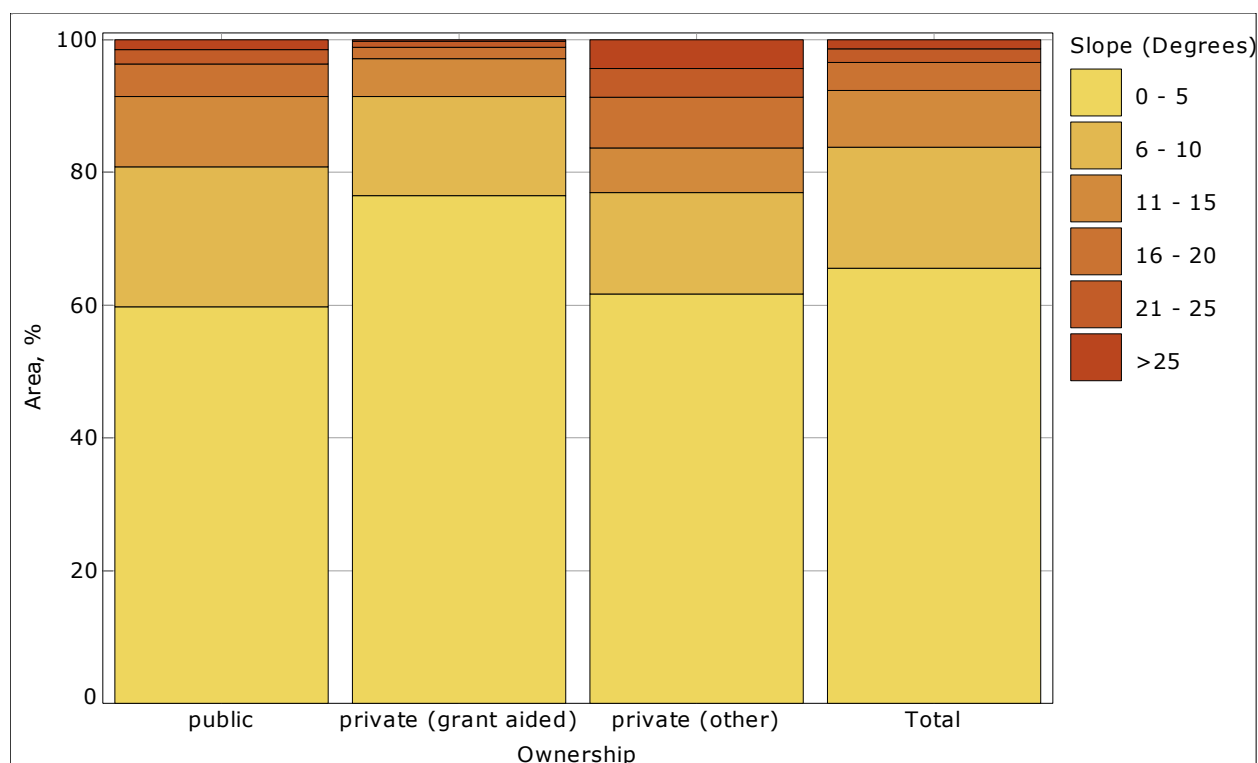
14.2.1 Forest area by ownership and slope

Definition
Slope
The measurement of the steepness of terrain, the ratio of vertical rise to horizontal distance expressed in degrees

Methodology
The forest area is classified by ownership and slope.

Slope (Degrees)	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0 - 5	212.36	(197.77 - 226.95)	59.7	164.48	(151.10 - 177.87)	76.5
6 - 10	74.92	(64.92 - 84.93)	21.1	32.03	(25.20 - 38.85)	14.9
11 - 15	37.63	(30.30 - 44.95)	10.6	12.44	(8.13 - 16.75)	5.8
16 - 20	17.61	(12.52 - 22.69)	5.0	3.60	(1.25 - 5.95)	1.7
21 - 25	7.61	(4.22 - 11.01)	2.1	2.00	(0.25 - 3.75)	0.9
>25	5.18	(2.39 - 7.98)	1.5	0.40	(0.00 - 1.19)	0.2
Total	355.31	(339.78 - 370.85)	100.0	214.95	(200.34 - 229.55)	100.0

Slope (Degrees)	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0 - 5	51.66	(43.19 - 60.13)	61.7	428.50	(414.09 - 442.92)	65.6
6 - 10	12.82	(8.41 - 17.22)	15.3	119.76	(107.64 - 131.88)	18.3
11 - 15	5.62	(2.70 - 8.54)	6.7	55.69	(46.93 - 64.44)	8.5
16 - 20	6.41	(3.28 - 9.54)	7.7	27.61	(21.29 - 33.93)	4.2
21 - 25	3.61	(1.25 - 5.96)	4.3	13.22	(8.76 - 17.68)	2.0
>25	3.61	(1.27 - 5.96)	4.3	9.19	(5.46 - 12.92)	1.4
Total	83.72	(73.16 - 94.29)	100.0	653.98		100.0



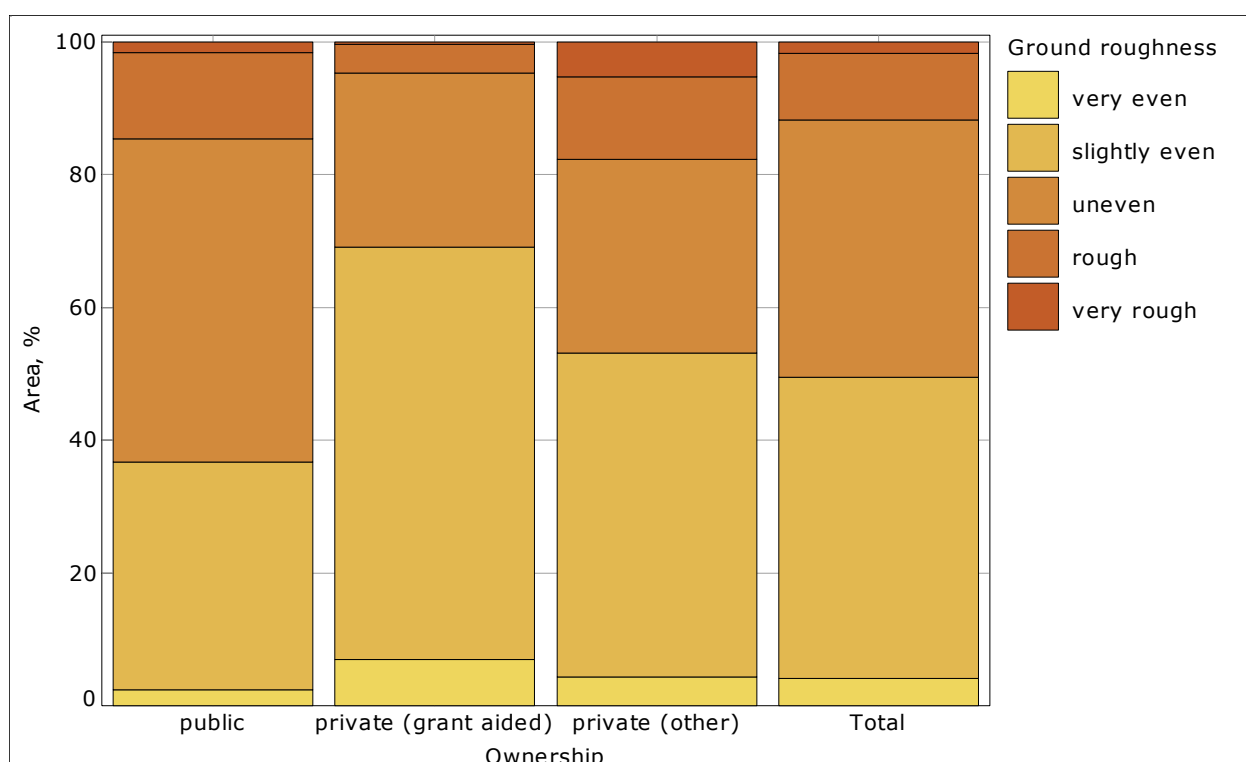
14.2.2 Forest area by ownership and ground roughness

Definition	
Site Roughness	
Site roughness describes the unevenness of the surface of the terrain.	
1.	Very even: Low obstacles infrequent and taller obstacles isolated or absent. E.g. ripping.
2.	Slightly even: Low obstacles moderately frequent and taller obstacles isolated. E.g. shallow mounding.
3.	Uneven: Low obstacles frequent and taller obstacles infrequent. E.g. deep mounding.
4.	Rough: Low obstacles frequent and taller obstacles moderately frequent. E.g. rough ploughing.
5.	Very rough: Sites more severe than the rough classification. E.g. boulders.

Methodology
The forest area is classified by ownership and ground roughness.

Ground roughness	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
very even	8.45	(4.86 – 12.03)	2.4	14.84	(10.19 – 19.50)	6.9
slightly even	121.88	(109.58 – 134.18)	34.3	133.64	(121.00 – 146.29)	62.1
uneven	173.04	(159.36 – 186.73)	48.7	56.45	(47.59 – 65.31)	26.3
rough	46.37	(38.29 – 54.44)	13.0	9.21	(5.51 – 12.91)	4.3
very rough	5.58	(2.68 – 8.48)	1.6	0.80	(0.00 – 1.90)	0.4
Total	355.31	(339.78 – 370.85)	100.0	214.95	(200.34 – 229.55)	100.0

Ground roughness	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
very even	3.62	(1.27 – 5.96)	4.3	26.91	(20.74 – 33.07)	4.1
slightly even	40.88	(33.24 – 48.51)	48.9	296.40	(280.83 – 311.97)	45.4
uneven	24.42	(18.41 – 30.43)	29.2	253.91	(238.73 – 269.09)	38.8
rough	10.42	(6.44 – 14.40)	12.4	65.99	(56.50 – 75.48)	10.1
very rough	4.39	(1.80 – 6.98)	5.2	10.77	(6.76 – 14.77)	1.6
Total	83.72	(73.16 – 94.29)	100.0	653.98		100.0



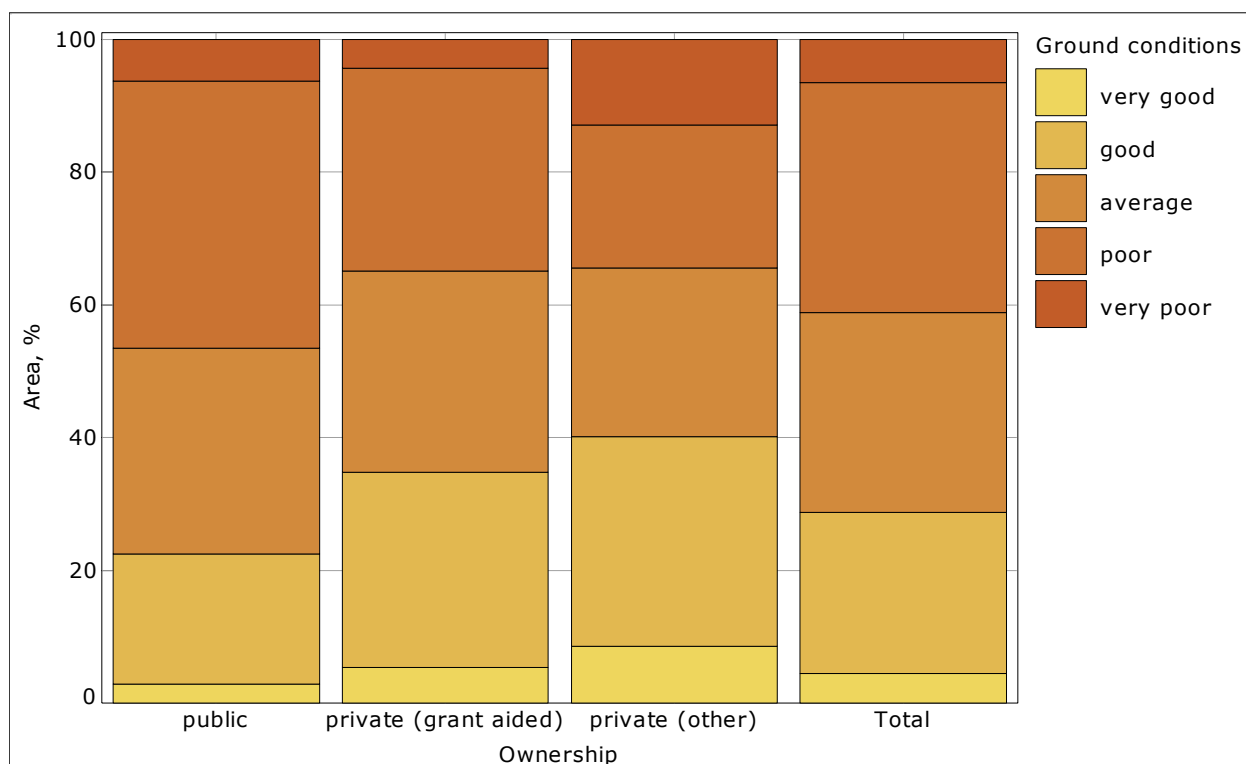
14.2.3 Forest area by ownership and ground conditions

Definition
Ground Conditions Describes the bearing capacity of the soil. Very good: Freely drained gravels and sandy soils. Good: Firm mineral soils. Average: Soft mineral soils, including gleys. Poor: Peaty gleys and podzols. Also wet gleyed soils. Very poor: Soft, wet, deep peats.

Methodology
The forest area is classified by ownership and ground conditions.

Ground conditions	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
very good	10.01	(6.15 - 13.88)	2.8	11.62	(7.51 - 15.73)	5.4
good	69.75	(60.22 - 79.27)	19.6	63.15	(53.92 - 72.38)	29.4
average	110.11	(98.41 - 121.82)	31.0	65.26	(55.83 - 74.69)	30.4
poor	143.02	(130.25 - 155.80)	40.3	65.67	(56.31 - 75.04)	30.5
very poor	22.42	(16.72 - 28.11)	6.3	9.24	(5.50 - 12.98)	4.3
Total	355.31	(339.78 - 370.85)	100.0	214.95	(200.34 - 229.55)	100.0

Ground conditions	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
very good	7.20	(3.91 - 10.50)	8.6	28.84	(22.55 - 35.13)	4.4
good	26.45	(20.20 - 32.70)	31.7	159.35	(146.17 - 172.53)	24.4
average	21.22	(15.59 - 26.85)	25.3	196.59	(182.27 - 210.92)	30.1
poor	18.04	(12.84 - 23.23)	21.5	226.73	(212.25 - 241.21)	34.6
very poor	10.82	(6.79 - 14.84)	12.9	42.47	(34.72 - 50.22)	6.5
Total	83.72	(73.16 - 94.29)	100.0	653.98		100.0



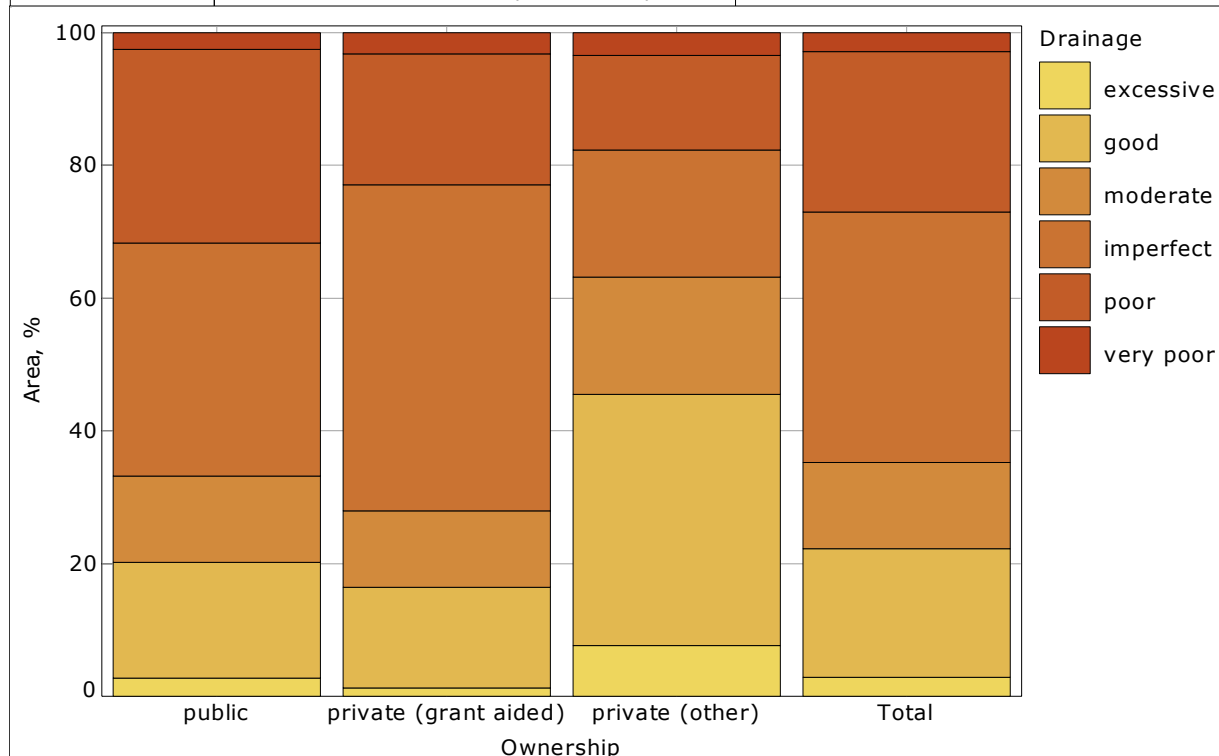
14.2.4 Forest area by ownership and drainage

Definition
Drainage Drainage describes the capacity of the soil to drain water. Excessive: Soil has poor moisture retaining ability, e.g. coastal sand. Good: Site is dry and the soil profile shows no sign of water impedance. Moderate: No significant sign of impedance, e.g. podzol. Imperfect: Drainage is restricted due to soil texture and/or presence of an iron pan. Poor: Soil has poor capacity to drain excess water. Very poor: Site is very wet, i.e. water present at the surface.

Methodology
The forest area is classified by ownership and drainage.

Drainage	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
excessive	9.63	(5.97 – 13.29)	2.7	2.81	(0.74 – 4.87)	1.3
good	62.12	(53.16 – 71.08)	17.5	32.42	(25.58 – 39.25)	15.1
moderate	46.01	(38.00 – 54.03)	13.0	24.81	(18.78 – 30.85)	11.5
imperfect	124.94	(112.60 – 137.28)	35.1	105.64	(94.20 – 117.08)	49.1
poor	103.79	(92.57 – 115.01)	29.2	42.46	(34.75 – 50.17)	19.8
very poor	8.82	(5.15 – 12.48)	2.5	6.81	(3.59 – 10.04)	3.2
Total	355.31	(339.78 – 370.85)	100.0	214.95	(200.34 – 229.55)	100.0

Drainage	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
excessive	6.44	(3.39 – 9.50)	7.7	18.88	(14.08 – 23.68)	2.9
good	31.64	(24.85 – 38.44)	37.8	126.18	(114.23 – 138.13)	19.3
moderate	14.80	(10.10 – 19.49)	17.7	85.63	(75.14 – 96.12)	13.1
imperfect	16.03	(11.14 – 20.92)	19.1	246.61	(231.63 – 261.59)	37.7
poor	12.00	(7.78 – 16.22)	14.3	158.25	(145.25 – 171.25)	24.2
very poor	2.81	(0.73 – 4.88)	3.4	18.44	(13.16 – 23.71)	2.8
Total	83.72	(73.16 – 94.29)	100.0	653.98		100.0



14.3 LITTER AND HUMUS

14.3.1 Stocked forest area by ownership and occurrence of a litter layer

Definition

Litter layer

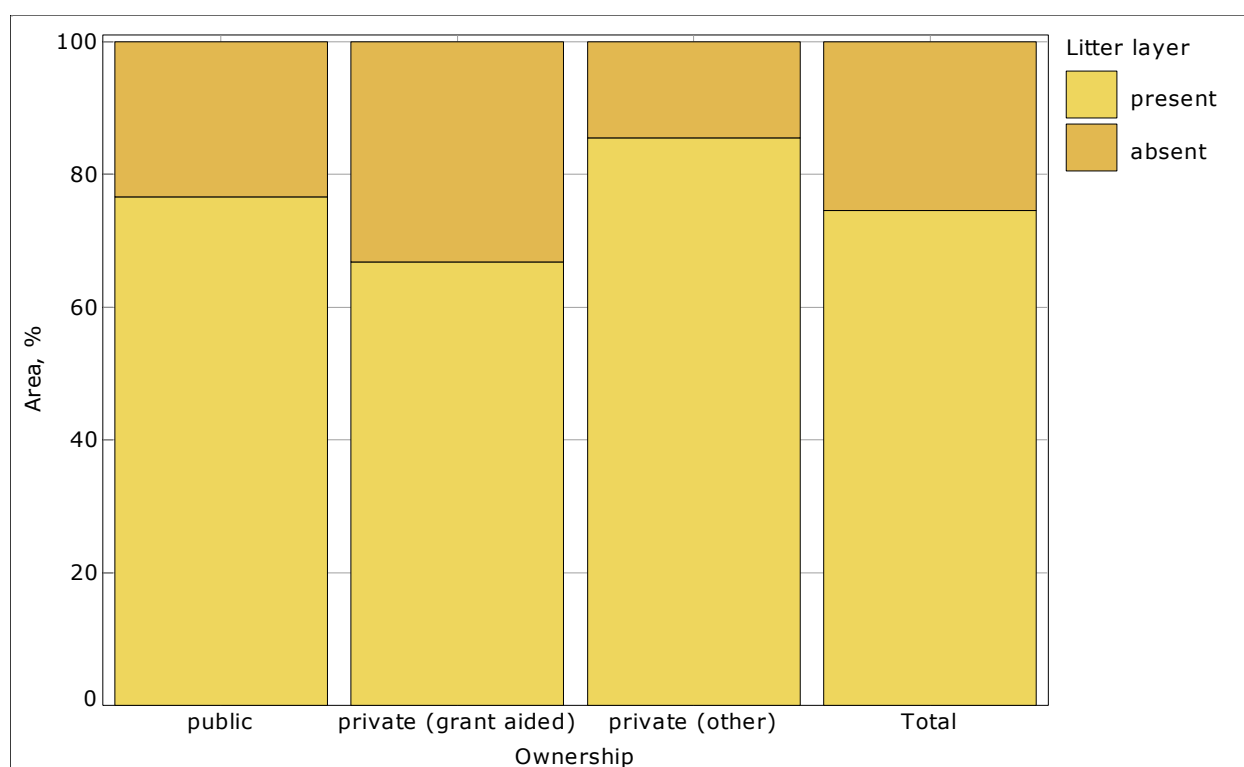
The non-living, slightly decomposed, organic material on the surface of the forest floor.

Methodology

The stocked forest area is classified by ownership and the occurrence of a litter layer.

Litter layer	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
present	261.97	(246.81 – 277.13)	76.7	142.12	(129.22 – 155.02)	66.9
absent	79.72	(69.49 – 89.94)	23.3	70.40	(60.82 – 79.99)	33.1
Total	341.69	(326.35 – 357.03)	100.0	212.52	(198.06 – 226.99)	100.0

Litter layer	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
present	70.92	(61.11 – 80.74)	85.5	475.02	(461.74 – 488.30)	74.6
absent	11.99	(7.76 – 16.23)	14.5	162.11	(148.83 – 175.40)	25.4
Total	82.92	(72.42 – 93.42)	100.0	637.13		100.0



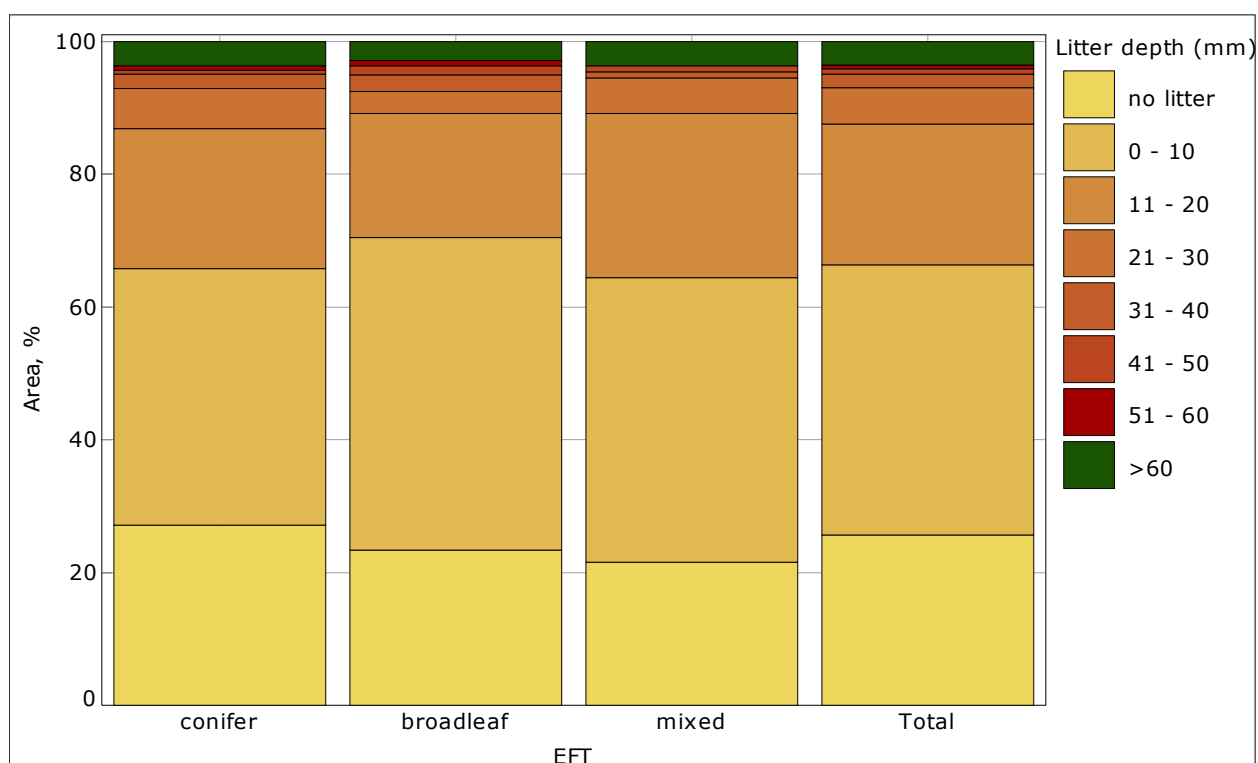
14.3.2 Stocked forest area by litter depth and European Forest Type

Methodology

The stocked forest area is classified by European Forest Type and litter depth.

Litter depth (mm)	EFT / Area				
	conifer			broadleaf	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
no litter	118.55	(106.59 – 130.50)	27.1	25.99	(19.84 – 32.14) 23.3
0 - 10	168.99	(155.68 – 182.29)	38.7	52.47	(43.91 – 61.03) 47.3
11 - 20	92.16	(81.33 – 103.00)	21.1	20.86	(15.34 – 26.37) 18.7
21 - 30	26.47	(20.25 – 32.69)	6.1	3.61	(1.26 – 5.96) 3.2
31 - 40	9.22	(5.48 – 12.95)	2.1	2.81	(0.74 – 4.87) 2.5
41 - 50	2.80	(0.73 – 4.88)	0.6	1.61	(0.02 – 3.19) 1.4
51 - 60	2.81	(0.73 – 4.88)	0.6	0.80	(0.00 – 1.90) 0.7
>60	15.99	(11.14 – 20.84)	3.7	3.20	(0.99 – 5.41) 2.9
Total	436.98	(422.79 – 451.18)	100.0	111.34	(99.60 – 123.08) 100.0

Litter depth (mm)	EFT / Area				
	mixed			Total	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
no litter	19.18	(13.85 – 24.51)	21.6	163.72	(150.38 – 177.05) 25.7
0 - 10	37.99	(30.67 – 45.30)	42.8	259.44	(244.83 – 274.06) 40.7
11 - 20	22.04	(16.33 – 27.75)	24.8	135.06	(122.49 – 147.62) 21.2
21 - 30	4.79	(2.09 – 7.48)	5.4	34.87	(27.77 – 41.97) 5.5
31 - 40	0.80	(0.00 – 1.93)	0.9	12.83	(8.45 – 17.21) 2.0
41 - 50	0.81	(0.00 – 1.94)	0.9	5.22	(2.41 – 8.02) 0.8
51 - 60	–	–	–	3.60	(1.25 – 5.95) 0.6
>60	3.21	(0.99 – 5.42)	3.6	22.40	(16.67 – 28.12) 3.5
Total	88.81	(78.09 – 99.52)	100.0	637.13	100.0



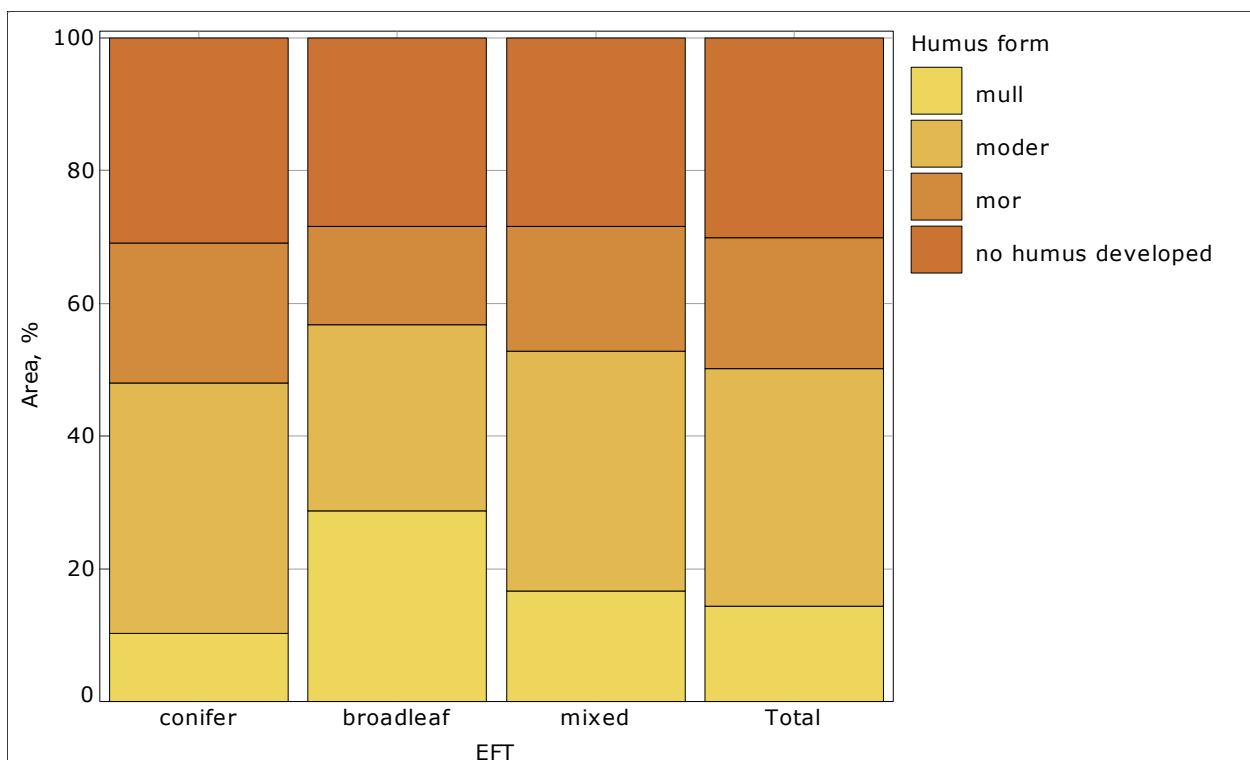
14.3.3 Stocked forest area by humus form and European Forest Type

Definition	
Humus	
Organic layers at the soil surface, where leaf litter and other organic matter are decomposing and being incorporated into the upper mineral soil. Humus forms:	
1.	Mull humus: This is the humus-rich layer of forest soils consisting of mixed organic and mineral matter. The humus is being incorporated into the soil.
2.	Moder humus: The current litter layer overlies partly decomposed material, which is not matted as in mor.
3.	Mor humus: This is raw humus, composed of unincorporated organic material, usually distinct from the mineral soil. It comprises the current litter layer overlying a matted layer of partly decomposed material.
4.	No humus: No humus development. The litter layer may not have formed yet or could be removed due to surface runoff or flooding

Methodology
The stocked forest area is classified by European Forest Type and the humus form present.

Humus form	EFT / Area					
	conifer			broadleaf		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
mull	44.95	(37.03 - 52.87)	10.3	32.02	(25.26 - 38.77)	28.7
moder	164.65	(151.27 - 178.04)	37.6	31.26	(24.51 - 38.01)	28.1
mor	92.49	(81.60 - 103.39)	21.2	16.45	(11.46 - 21.44)	14.8
no humus developed	134.88	(122.36 - 147.41)	30.9	31.62	(24.86 - 38.37)	28.4
Total	436.98	(422.79 - 451.18)	100.0	111.34	(99.60 - 123.08)	100.0

Humus form	EFT / Area					
	mixed			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
mull	14.82	(10.10 - 19.53)	16.7	91.79	(80.92 - 102.65)	14.4
moder	32.03	(25.22 - 38.85)	36.1	227.95	(213.35 - 242.54)	35.8
mor	16.78	(11.78 - 21.79)	18.9	125.73	(113.37 - 138.08)	19.7
no humus developed	25.17	(19.11 - 31.23)	28.3	191.67	(177.81 - 205.53)	30.1
Total	88.81	(78.09 - 99.52)	100.0	637.13		100.0



14.4 SOIL GROUP

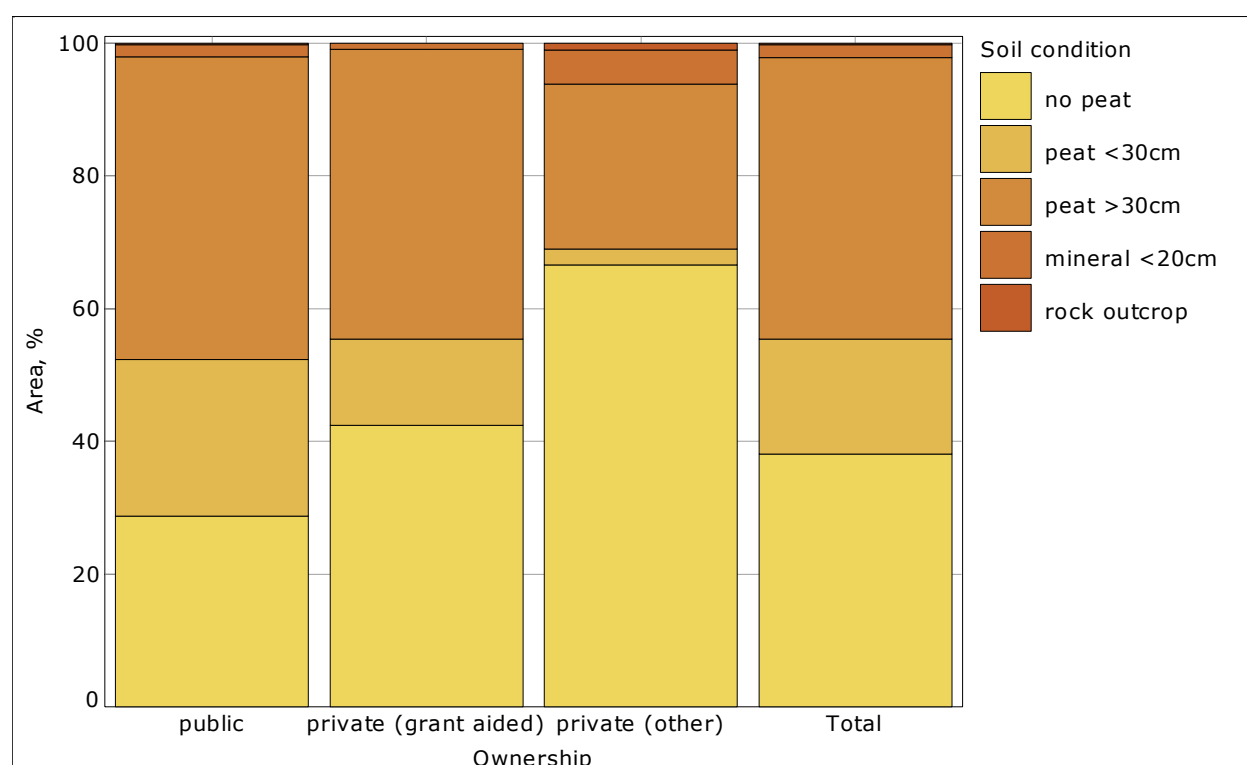
14.4.1 Forest area by ownership and soil condition

Definition
Soil Condition Broad assessment of peat and mineral soil. No peat: Mineral soil with no peat present. Less than 30 cm of peat: Mineral soil overlain with less than 30 cm of peat. More than 30 cm of peat: Mineral soil overlain with more than 30 cm of peat. Mineral soil less 20 cm: Mineral soil less than 20 cm in depth. Outcropping rock: Bedrock exposed, no soil or peat present.

Methodology
The forest area is classified by ownership and soil condition.

Soil condition	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no peat	102.18	(91.07 – 113.30)	28.8	91.18	(80.49 – 101.87)	42.4
peat <30cm	83.67	(73.34 – 94.01)	23.5	28.02	(21.60 – 34.43)	13.0
peat >30cm	162.26	(149.17 – 175.35)	45.7	93.75	(82.99 – 104.51)	43.7
mineral <20cm	6.40	(3.36 – 9.44)	1.8	2.00	(0.25 – 3.74)	0.9
rock outcrop	0.80	(0.00 – 1.91)	0.2	–	–	–
Total	355.31	(339.78 – 370.85)	100.0	214.95	(200.34 – 229.55)	100.0

Soil condition	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no peat	55.73	(46.88 – 64.58)	66.5	249.09	(234.56 – 263.62)	38.1
peat <30cm	1.99	(0.25 – 3.74)	2.4	113.68	(101.96 – 125.40)	17.4
peat >30cm	20.82	(15.38 – 26.25)	24.9	276.82	(262.57 – 291.07)	42.3
mineral <20cm	4.38	(1.81 – 6.96)	5.2	12.78	(8.48 – 17.08)	2.0
rock outcrop	0.81	(0.00 – 1.92)	1.0	1.61	(0.03 – 3.18)	0.2
Total	83.72	(73.16 – 94.29)	100.0	653.98		100.0



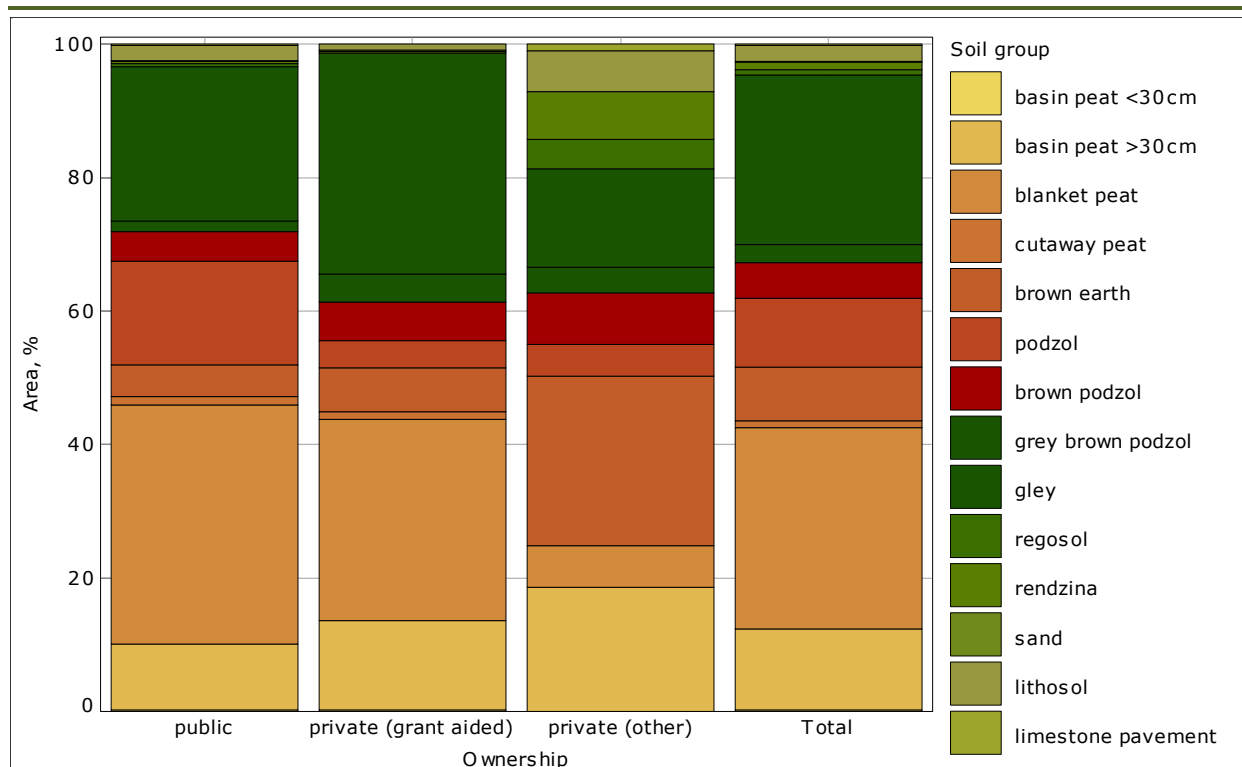
14.4.2 Forest area by ownership and soil group

Definition
Soil group
A standardised system of nomenclature to classify peat and soil into groups.

Methodology
The forest area is classified by ownership and soil group.

Soil group	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat <30cm	0.80	(0.00 - 1.91)	0.2	0.40	(0.00 - 1.18)	0.2
basin peat >30cm	35.22	(28.42 - 42.01)	9.9	28.82	(22.52 - 35.13)	13.4
blanket peat	127.04	(115.30 - 138.78)	35.9	64.93	(55.88 - 73.98)	30.2
cutaway peat	4.42	(1.82 - 7.01)	1.2	2.41	(0.49 - 4.33)	1.1
brown earth	17.23	(12.20 - 22.25)	4.8	14.01	(9.43 - 18.58)	6.5
podzol	54.87	(46.56 - 63.18)	15.4	8.81	(5.15 - 12.47)	4.1
brown podzol	16.04	(11.19 - 20.90)	4.5	12.41	(8.09 - 16.74)	5.8
grey brown podzol	5.63	(2.71 - 8.55)	1.6	9.20	(5.48 - 12.92)	4.3
gley	82.07	(71.91 - 92.23)	23.1	71.17	(61.52 - 80.81)	33.1
regosol	1.60	(0.03 - 3.18)	0.5	-	-	-
rendzina	1.20	(0.00 - 2.55)	0.3	0.40	(0.00 - 1.20)	0.2
sand	0.40	(0.00 - 1.19)	0.1	0.40	(0.00 - 1.20)	0.2
lithosol	8.00	(4.60 - 11.39)	2.3	2.00	(0.25 - 3.74)	0.9
limestone pavement	0.80	(0.00 - 1.91)	0.2	-	-	-
Total	355.31	(339.78 - 370.85)	100.0	214.95	(200.34 - 229.55)	100.0

Soil group	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat <30cm	-	-	-	1.20	(0.00 - 2.55)	0.2
basin peat >30cm	15.61	(10.90 - 20.32)	18.6	79.65	(70.41 - 88.88)	12.2
blanket peat	5.21	(2.40 - 8.01)	6.2	197.18	(184.48 - 209.87)	30.2
cutaway peat	-	-	-	6.82	(3.61 - 10.03)	1.0
brown earth	21.23	(15.63 - 26.82)	25.4	52.46	(43.97 - 60.95)	8.0
podzol	4.02	(1.54 - 6.49)	4.8	67.70	(58.58 - 76.81)	10.4
brown podzol	6.43	(3.31 - 9.56)	7.7	34.89	(27.90 - 41.88)	5.3
grey brown podzol	3.21	(1.01 - 5.40)	3.8	18.03	(12.94 - 23.13)	2.8
gley	12.41	(8.08 - 16.74)	14.8	165.65	(152.63 - 178.67)	25.3
regosol	3.62	(1.27 - 5.98)	4.3	5.23	(2.40 - 8.05)	0.8
rendzina	6.00	(3.01 - 9.00)	7.2	7.60	(4.24 - 10.96)	1.2
sand	-	-	-	0.80	(0.00 - 1.92)	0.1
lithosol	5.18	(2.39 - 7.97)	6.2	15.17	(10.50 - 19.84)	2.3
limestone pavement	0.81	(0.00 - 1.92)	1.0	1.61	(0.03 - 3.18)	0.2
Total	83.72	(73.16 - 94.29)	100.0	653.98		100.0



14.4.3 Forest area by altitude and soil group

Methodology

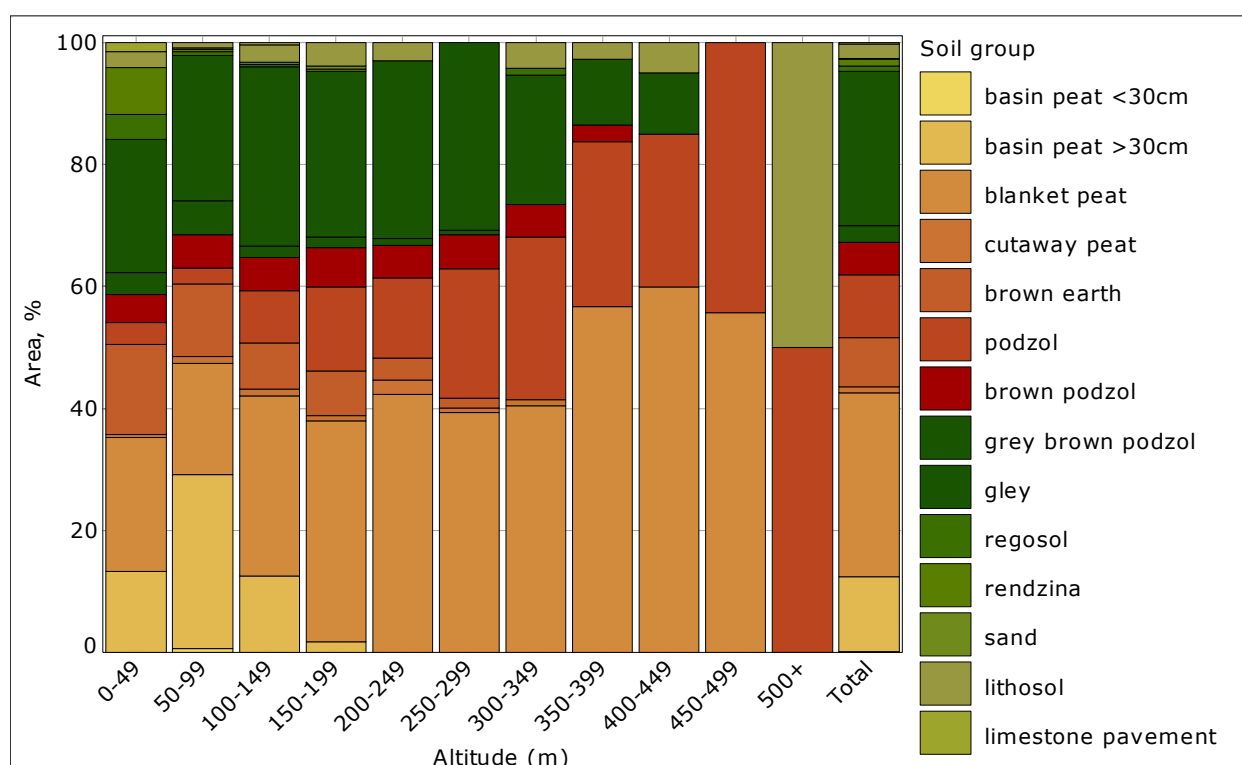
The forest area is classified by altitude and soil group.

Soil group	Altitude (m) / Area					
	0-49			50-99		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat <30cm	–	–	–	1.20	(0.00 – 2.55)	0.6
basin peat >30cm	10.41	(6.46 – 14.36)	13.3	53.63	(46.09 – 61.17)	28.7
blanket peat	17.24	(12.25 – 22.22)	21.9	34.45	(27.71 – 41.20)	18.3
cutaway peat	0.40	(0.00 – 1.20)	0.5	2.01	(0.25 – 3.77)	1.1
brown earth	11.60	(7.46 – 15.74)	14.8	22.42	(16.67 – 28.17)	11.9
podzol	2.80	(0.73 – 4.88)	3.6	4.81	(2.10 – 7.52)	2.6
brown podzol	3.60	(1.25 – 5.95)	4.6	10.43	(6.46 – 14.40)	5.5
grey brown podzol	2.82	(0.74 – 4.90)	3.6	10.41	(6.49 – 14.32)	5.5
gley	17.16	(12.24 – 22.08)	21.9	44.80	(36.94 – 52.65)	23.8
regosol	3.21	(0.99 – 5.44)	4.1	1.21	(0.00 – 2.58)	0.6
rendzina	6.00	(3.01 – 8.99)	7.7	0.80	(0.00 – 1.91)	0.4
sand	–	–	–	0.40	(0.00 – 1.20)	0.2
lithosol	1.99	(0.25 – 3.74)	2.5	1.59	(0.04 – 3.14)	0.8
limestone pavement	1.20	(0.00 – 2.56)	1.5	–	–	–
Total	78.43	(68.39 – 88.48)	100.0	188.15	(175.25 – 201.05)	100.0

Soil group	Altitude (m) / Area					
	100-149			150-199		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat <30cm	-	-	-	-	-	-
basin peat >30cm	14.00	(9.46 - 18.54)	12.6	1.61	(0.01 - 3.21)	1.7
blanket peat	32.88	(26.16 - 39.59)	29.3	33.70	(26.93 - 40.46)	36.3
cutaway peat	1.21	(0.00 - 2.57)	1.1	0.80	(0.00 - 1.91)	0.9
brown earth	8.41	(4.84 - 11.97)	7.6	6.81	(3.65 - 9.97)	7.3
podzol	9.60	(5.79 - 13.41)	8.6	12.83	(8.52 - 17.13)	13.8
brown podzol	6.03	(3.00 - 9.06)	5.4	6.01	(3.00 - 9.02)	6.5
grey brown podzol	2.00	(0.25 - 3.76)	1.8	1.60	(0.03 - 3.17)	1.7
gley	32.82	(25.97 - 39.66)	29.5	25.24	(19.18 - 31.30)	27.1
regosol	0.40	(0.00 - 1.21)	0.4	-	-	-
rendzina	0.40	(0.00 - 1.21)	0.4	0.40	(0.00 - 1.18)	0.4
sand	-	-	-	0.40	(0.00 - 1.19)	0.4
lithosol	3.18	(1.00 - 5.37)	2.9	3.59	(1.25 - 5.92)	3.9
limestone pavement	0.40	(0.00 - 1.21)	0.4	-	-	-
Total	111.33	(99.48 - 123.19)	100.0	92.97	(82.06 - 103.87)	100.0
Soil group	Altitude (m) / Area					
	200-249			250-299		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat <30cm	-	-	-	-	-	-
basin peat >30cm	-	-	-	-	-	-
blanket peat	28.50	(22.22 - 34.78)	42.2	19.99	(14.57 - 25.42)	39.3
cutaway peat	1.60	(0.04 - 3.16)	2.4	0.41	(0.00 - 1.20)	0.8
brown earth	2.42	(0.49 - 4.34)	3.6	0.81	(0.00 - 1.94)	1.6
podzol	8.82	(5.19 - 12.45)	13.1	10.81	(6.82 - 14.80)	21.3
brown podzol	3.60	(1.26 - 5.95)	5.4	2.82	(0.74 - 4.89)	5.5
grey brown podzol	0.80	(0.00 - 1.91)	1.2	0.40	(0.00 - 1.22)	0.8
gley	19.62	(14.26 - 24.98)	29.1	15.62	(10.88 - 20.37)	30.7
regosol	-	-	-	-	-	-
rendzina	-	-	-	-	-	-
sand	-	-	-	-	-	-
lithosol	2.01	(0.28 - 3.74)	3.0	-	-	-
limestone pavement	-	-	-	-	-	-
Total	67.37	(57.85 - 76.89)	100.0	50.86	(42.51 - 59.21)	100.0
Soil group	Altitude (m) / Area					
	300-349			350-399		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat <30cm	-	-	-	-	-	-
basin peat >30cm	-	-	-	-	-	-
blanket peat	15.21	(10.44 - 19.98)	40.3	8.39	(4.84 - 11.94)	56.8
cutaway peat	0.40	(0.00 - 1.18)	1.1	-	-	-
brown earth	-	-	-	-	-	-
podzol	10.01	(6.15 - 13.88)	26.6	4.00	(1.54 - 6.45)	27.0
brown podzol	2.00	(0.25 - 3.76)	5.3	0.40	(0.00 - 1.21)	2.7
grey brown podzol	-	-	-	-	-	-
gley	8.00	(4.52 - 11.48)	21.3	1.60	(0.03 - 3.17)	10.8
regosol	0.40	(0.00 - 1.20)	1.1	-	-	-
rendzina	-	-	-	-	-	-
sand	-	-	-	-	-	-
lithosol	1.60	(0.04 - 3.17)	4.3	0.40	(0.00 - 1.18)	2.7
limestone pavement	-	-	-	-	-	-
Total	37.63	(30.34 - 44.91)	100.0	14.79	(10.15 - 19.44)	100.0

Soil group	Altitude (m) / Area					
	400-449			450-499		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat <30cm	–	–	–	–	–	–
basin peat >30cm	–	–	–	–	–	–
blanket peat	4.81	(2.11 – 7.51)	59.9	2.01	(0.24 – 3.78)	55.6
cutaway peat	–	–	–	–	–	–
brown earth	–	–	–	–	–	–
podzol	2.01	(0.25 – 3.78)	25.1	1.60	(0.03 – 3.17)	44.4
brown podzol	–	–	–	–	–	–
grey brown podzol	–	–	–	–	–	–
gley	0.80	(0.00 – 1.91)	10.0	–	–	–
regosol	–	–	–	–	–	–
rendzina	–	–	–	–	–	–
sand	–	–	–	–	–	–
lithosol	0.40	(0.00 – 1.21)	5.0	–	–	–
limestone pavement	–	–	–	–	–	–
Total	8.03	(4.62 – 11.44)	100.0	3.61	(1.28 – 5.95)	100.0

Soil group	Altitude (m) / Area					
	500+			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat <30cm	–	–	–	1.20	(0.00 – 2.55)	0.2
basin peat >30cm	–	–	–	79.65	(70.41 – 88.88)	12.2
blanket peat	–	–	–	197.18	(184.48 – 209.87)	30.2
cutaway peat	–	–	–	6.82	(3.61 – 10.03)	1.0
brown earth	–	–	–	52.46	(43.97 – 60.95)	8.0
podzol	0.40	(0.00 – 1.29)	50.0	67.70	(58.58 – 76.81)	10.4
brown podzol	–	–	–	34.89	(27.90 – 41.88)	5.3
grey brown podzol	–	–	–	18.03	(12.94 – 23.13)	2.8
gley	–	–	–	165.65	(152.63 – 178.67)	25.3
regosol	–	–	–	5.23	(2.40 – 8.05)	0.8
rendzina	–	–	–	7.60	(4.24 – 10.96)	1.2
sand	–	–	–	0.80	(0.00 – 1.92)	0.1
lithosol	0.40	(0.00 – 1.21)	50.0	15.17	(10.50 – 19.84)	2.3
limestone pavement	–	–	–	1.61	(0.03 – 3.18)	0.2
Total	0.81	(0.00 – 1.96)	100.0	653.98		100.0



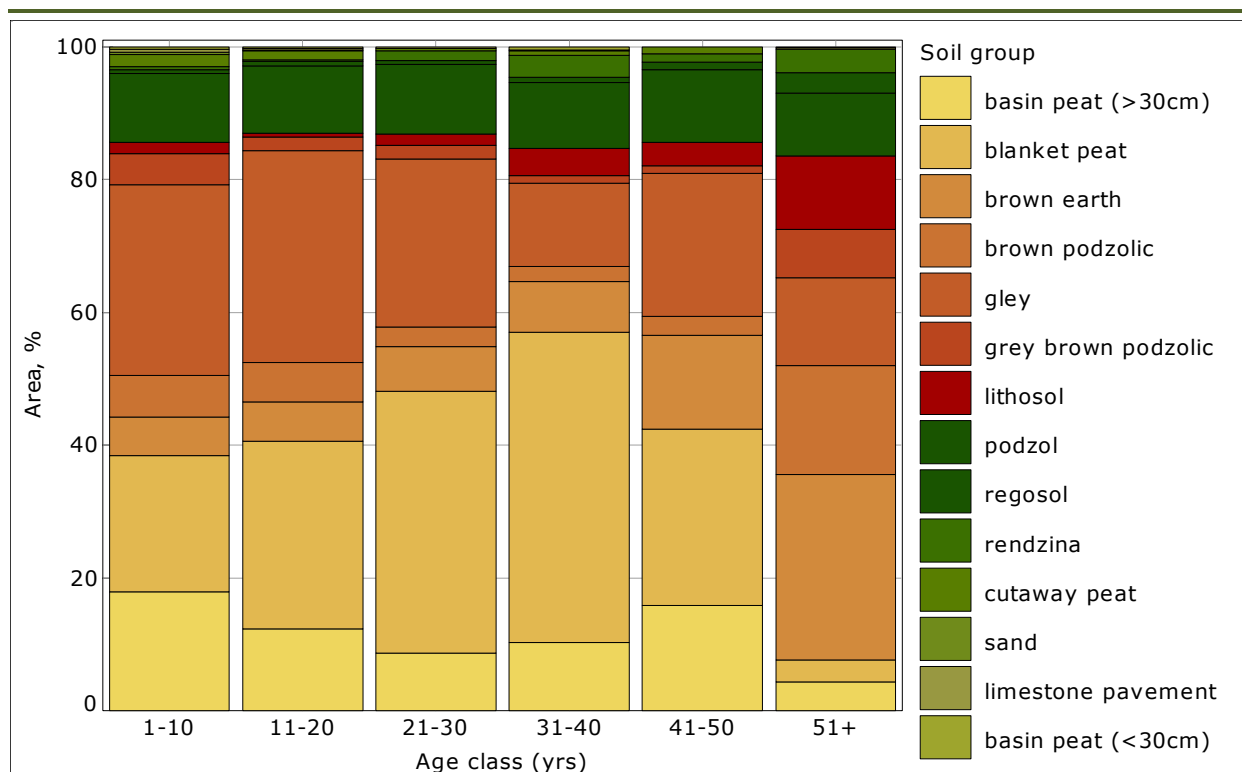
14.4.4 Stocked forest area by soil group and age class (10 yr)**Methodology**

The stocked forest area is classified by soil group and age class 10 yr).

Soil group	Age class (yrs) / Area					
	1-10			11-20		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat (>30cm)	23.70	(18.25 - 29.14)	17.9	27.29	(21.61 - 32.96)	12.3
blanket peat	27.25	(21.13 - 33.37)	20.5	62.86	(54.03 - 71.69)	28.3
brown earth	7.69	(4.75 - 10.62)	5.8	13.12	(9.07 - 17.17)	5.9
brown podzolic	8.31	(4.87 - 11.75)	6.3	13.10	(8.90 - 17.31)	5.9
gley	38.23	(31.28 - 45.18)	28.9	70.88	(61.50 - 80.27)	32.0
grey brown podzolic	6.16	(3.25 - 9.08)	4.6	4.52	(2.09 - 6.95)	2.0
lithosol	2.24	(0.56 - 3.92)	1.7	1.47	(0.29 - 2.65)	0.7
podzol	13.75	(9.42 - 18.08)	10.4	22.50	(16.98 - 28.02)	10.1
regosol	0.85	(0.00 - 1.77)	0.6	1.41	(0.19 - 2.62)	0.6
rendzina	0.55	(0.00 - 1.36)	0.4	0.51	(0.05 - 0.97)	0.2
cutaway peat	2.44	(0.51 - 4.36)	1.8	3.00	(0.91 - 5.09)	1.4
sand	0.40	(0.00 - 1.19)	0.3	0.40	(0.00 - 1.20)	0.2
limestone pavement	0.69	(0.00 - 1.60)	0.5	0.52	(0.00 - 1.29)	0.2
basin peat (<30cm)	0.40	(0.00 - 1.18)	0.3	0.37	(0.00 - 1.10)	0.2
Total	132.64	(120.79 - 144.50)	100.0	221.95	(207.86 - 236.03)	100.0

Soil group	Age class (yrs) / Area					
	21-30			31-40		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat (>30cm)	10.31	(6.97 - 13.66)	8.6	8.28	(5.07 - 11.50)	10.2
blanket peat	47.22	(39.48 - 54.97)	39.7	38.00	(30.79 - 45.21)	46.7
brown earth	7.96	(4.98 - 10.93)	6.7	6.21	(3.71 - 8.71)	7.7
brown podzolic	3.51	(1.42 - 5.60)	2.9	1.83	(0.39 - 3.27)	2.3
gley	30.27	(23.99 - 36.54)	25.3	10.19	(6.62 - 13.77)	12.6
grey brown podzolic	2.47	(0.80 - 4.14)	2.1	0.88	(0.00 - 1.78)	1.1
lithosol	2.05	(0.45 - 3.66)	1.7	3.32	(1.27 - 5.36)	4.1
podzol	12.54	(8.36 - 16.72)	10.5	8.13	(4.77 - 11.49)	10.0
regosol	0.63	(0.00 - 1.42)	0.5	0.61	(0.00 - 1.34)	0.8
rendzina	1.85	(0.42 - 3.27)	1.5	2.70	(0.90 - 4.49)	3.3
cutaway peat	0.40	(0.00 - 1.18)	0.3	0.58	(0.00 - 1.43)	0.7
sand	-	-	-	-	-	-
limestone pavement	0.25	(0.00 - 0.68)	0.2	0.03	(0.00 - 0.08)	0.03
basin peat (<30cm)	-	-	-	0.40	(0.00 - 1.18)	0.5
Total	119.46	(108.12 - 130.80)	100.0	81.15	(71.43 - 90.86)	100.0

Soil group	Age class (yrs) / Area					
	41-50			51+		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat (>30cm)	6.18	(3.35 - 9.01)	15.8	1.88	(0.57 - 3.19)	4.4
blanket peat	10.41	(6.58 - 14.24)	26.7	1.41	(0.00 - 2.85)	3.3
brown earth	5.51	(3.26 - 7.77)	14.1	11.97	(8.53 - 15.41)	27.8
brown podzolic	1.12	(0.00 - 2.29)	2.9	7.02	(4.03 - 10.01)	16.4
gley	8.41	(5.20 - 11.62)	21.5	5.67	(3.37 - 7.97)	13.2
grey brown podzolic	0.47	(0.00 - 1.05)	1.2	3.14	(1.36 - 4.91)	7.3
lithosol	1.35	(0.08 - 2.62)	3.5	4.75	(2.33 - 7.17)	11.1
podzol	4.30	(1.84 - 6.77)	11.0	4.07	(1.84 - 6.29)	9.5
regosol	0.44	(0.03 - 0.86)	1.1	1.29	(0.22 - 2.36)	3.0
rendzina	0.48	(0.00 - 1.23)	1.2	1.53	(0.21 - 2.84)	3.6
cutaway peat	0.41	(0.00 - 1.20)	1.0	-	-	-
sand	-	-	-	-	-	-
limestone pavement	-	-	-	0.11	(0.00 - 0.34)	0.3
basin peat (<30cm)	-	-	-	0.03	(0.00 - 0.10)	0.08
Total	39.08	(32.28 - 45.88)	100.0	42.86	(36.37 - 49.35)	100.0



14.4.5 Stocked afforested area by age class (10 yr) and soil group

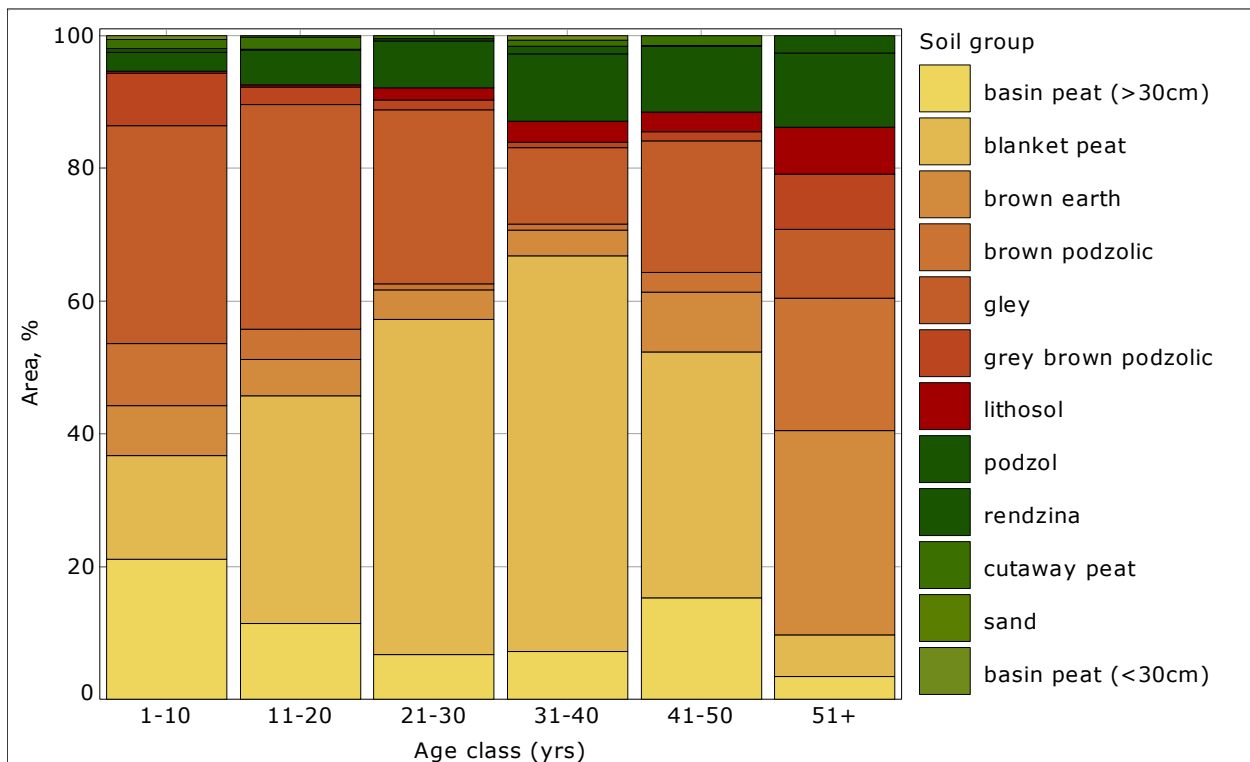
Methodology

The stocked afforested area is classified by the age class (10-yr) and soil group. As only the afforested area is included, the total forest area is reduced from the previous section.

Soil group	Age class (yrs) / Area					
	1-10			11-20		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat (>30cm)	13.77	(9.37 - 18.17)	21.1	17.15	(12.38 - 21.91)	11.4
blanket peat	10.17	(6.46 - 13.89)	15.6	51.61	(43.53 - 59.69)	34.3
brown earth	4.87	(2.31 - 7.42)	7.5	8.13	(4.75 - 11.51)	5.4
brown podzolic	6.09	(3.06 - 9.12)	9.3	6.92	(3.75 - 10.09)	4.6
gley	21.46	(16.02 - 26.89)	33.0	50.85	(42.65 - 59.04)	33.9
grey brown podzolic	5.06	(2.37 - 7.75)	7.8	3.90	(1.57 - 6.23)	2.6
lithosol	0.23	(0.00 - 0.60)	0.3	0.57	(0.00 - 1.44)	0.4
podzol	1.88	(0.28 - 3.48)	2.9	7.89	(4.47 - 11.30)	5.3
rendzina	0.40	(0.00 - 1.20)	0.6	0.18	(0.00 - 0.46)	0.1
cutaway peat	0.83	(0.00 - 1.95)	1.3	2.60	(0.66 - 4.54)	1.7
sand	-	-	-	0.40	(0.00 - 1.20)	0.3
basin peat (<30cm)	0.40	(0.00 - 1.18)	0.6	-	-	-
Total	65.16	(56.11 - 74.21)	100.0	150.20	(137.35 - 163.04)	100.0

Soil group	Age class (yrs) / Area					
	21-30			31-40		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat (>30cm)	5.86	(3.16 - 8.56)	6.7	4.44	(1.92 - 6.96)	7.1
blanket peat	44.07	(36.55 - 51.60)	50.5	37.11	(29.96 - 44.26)	59.8
brown earth	3.92	(1.63 - 6.21)	4.5	2.40	(0.77 - 4.03)	3.9
brown podzolic	0.84	(0.00 - 1.95)	1.0	0.55	(0.00 - 1.42)	0.9
gley	22.89	(17.27 - 28.52)	26.2	7.16	(4.00 - 10.33)	11.5
grey brown podzolic	1.25	(0.00 - 2.61)	1.4	0.49	(0.00 - 1.30)	0.8
lithosol	1.61	(0.06 - 3.17)	1.8	2.01	(0.26 - 3.76)	3.2
podzol	6.18	(3.19 - 9.17)	7.1	6.32	(3.34 - 9.31)	10.2
rendzina	0.25	(0.00 - 0.75)	0.3	0.70	(0.00 - 1.65)	1.1
cutaway peat	0.40	(0.00 - 1.18)	0.5	0.58	(0.00 - 1.43)	0.9
sand	-	-	-	-	-	-
basin peat (<30cm)	-	-	-	0.40	(0.00 - 1.18)	0.6
Total	87.28	(76.93 - 97.64)	100.0	62.16	(53.18 - 71.15)	100.0

Soil group	Age class (yrs) / Area					
	41-50			51+		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
basin peat (>30cm)	4.24	(1.77 - 6.71)	15.2	0.56	(0.00 - 1.36)	3.5
blanket peat	10.33	(6.50 - 14.17)	37.1	1.00	(0.00 - 2.21)	6.2
brown earth	2.53	(0.89 - 4.18)	9.1	4.99	(2.68 - 7.29)	30.8
brown podzolic	0.80	(0.00 - 1.94)	2.9	3.23	(1.13 - 5.33)	20.0
gley	5.56	(2.79 - 8.32)	19.9	1.69	(0.49 - 2.90)	10.4
grey brown podzolic	0.36	(0.00 - 0.92)	1.3	1.35	(0.05 - 2.64)	8.3
lithosol	0.85	(0.00 - 2.07)	3.0	1.13	(0.00 - 2.42)	7.0
podzol	2.75	(0.73 - 4.77)	9.9	1.82	(0.27 - 3.36)	11.2
rendzina	0.04	(0.00 - 0.12)	0.1	0.42	(0.00 - 1.03)	2.6
cutaway peat	0.41	(0.00 - 1.20)	1.5	-	-	-
sand	-	-	-	-	-	-
basin peat (<30cm)	-	-	-	-	-	-
Total	27.87	(21.73 - 34.01)	100.0	16.19	(11.94 - 20.44)	100.0



14.5 SOIL CHARACTERISTICS

14.5.1 Forest area, with peat present, by soil condition and peat texture

Definition
Peat texture Measures the degree of peat decomposition or humification on a ten point scale. Fibric: Degree of decomposition is from 1 to 3, very light in colour, full of non-decomposed plant remains. Hemic: Degree of decomposition is from 4 to 6 and it is dark brown in colour. Identification of plant residues is difficult. Sapric: Degree of decomposition is from 7 to 10. It is black in colour, greasy in texture and identification of plant remains is very difficult. Peat with mineral materials: This covers areas where reclamation has taken place or where most of the peat has been removed or incorporated into the mineral layer.

Methodology
The forest area, with peat present, is classified by soil condition and peat texture.

Peat texture	Soil condition / Area				
	peat <30cm			peat >30cm	
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$) %
fibric	10.41	(6.46 – 14.36)	9.2	40.77	(33.17 – 48.37) 14.7
hemic	43.58	(35.81 – 51.36)	38.3	178.39	(165.51 – 191.27) 64.5
sapric	38.86	(31.44 – 46.27)	34.2	46.07	(38.23 – 53.91) 16.6
peat with mineral materials	20.84	(15.29 – 26.39)	18.3	11.59	(7.42 – 15.76) 4.2
Total	113.68	(101.96 – 125.40)	100.0	276.82	(262.57 – 291.07) 100.0

Peat texture	Soil condition / Area		
	Total		
	thousands ha	($\alpha = 0.05$)	%
fibric	51.18	(42.72 – 59.64)	13.1
hemic	221.97	(207.91 – 236.03)	56.9
sapric	84.93	(74.44 – 95.42)	21.7
peat with mineral materials	32.43	(25.57 – 39.29)	8.3
Total	390.51		100.0



14.5.2 Forest area, with no peat, by soil texture

Definition
Soil Texture
Soil texture refers to the relative proportions of the various size particles in the mineral fraction of the soil.

Methodology
The forest area, with soil present, is classified by soil texture. Forests with peat greater than 30cm are excluded from the analysis.

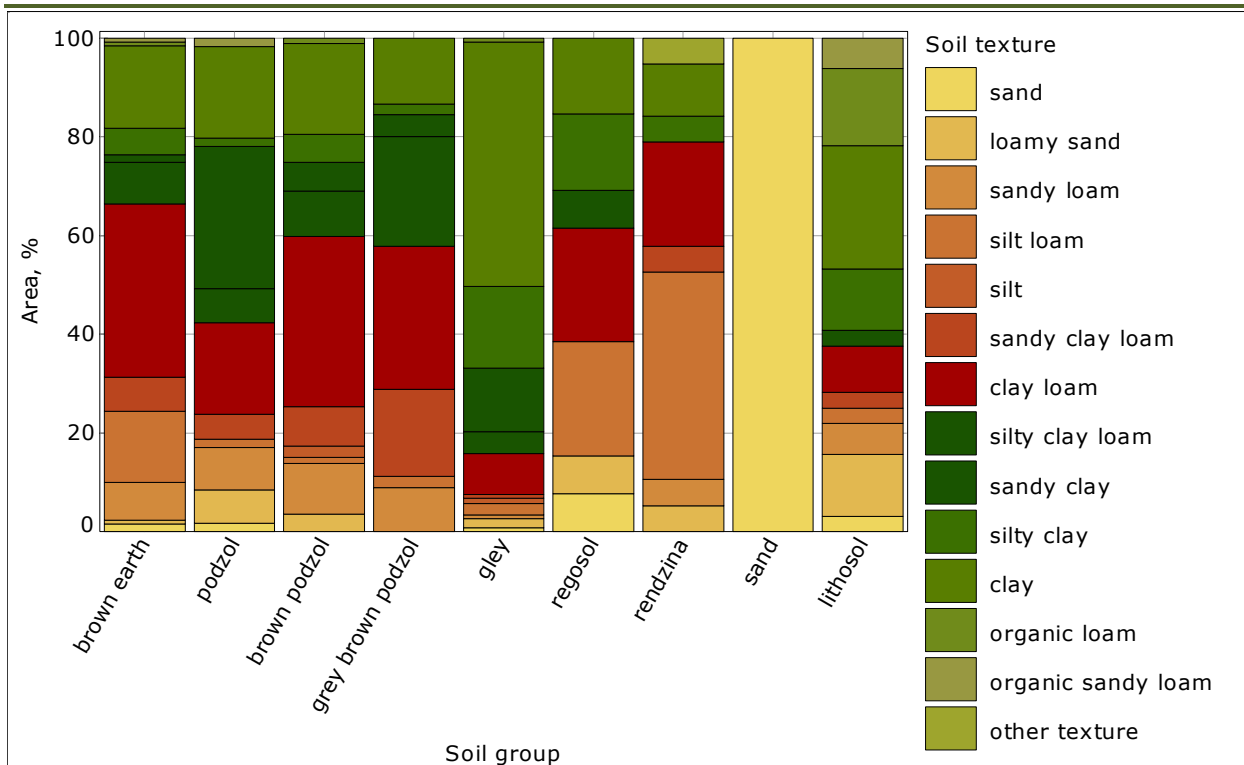
Soil texture	Soil group / Area					
	brown earth			podzol		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
sand	0.80	(0.00 - 1.92)	1.5	0.40	(0.00 - 1.18)	1.7
loamy sand	0.41	(0.00 - 1.20)	0.8	1.61	(0.04 - 3.17)	6.8
sandy loam	4.01	(1.53 - 6.48)	7.6	2.00	(0.26 - 3.75)	8.5
silt loam	7.59	(4.21 - 10.97)	14.5	0.40	(0.00 - 1.21)	1.7
silt	-	-	-	-	-	-
sandy clay loam	3.62	(1.27 - 5.96)	6.9	1.20	(0.00 - 2.56)	5.1
clay loam	18.42	(13.27 - 23.58)	35.1	4.41	(1.82 - 7.00)	18.6
silty clay loam	4.42	(1.83 - 7.02)	8.4	1.60	(0.04 - 3.17)	6.8
sandy clay	0.80	(0.00 - 1.91)	1.5	6.82	(3.61 - 10.03)	28.7
silty clay	2.80	(0.73 - 4.87)	5.3	0.40	(0.00 - 1.18)	1.7
clay	8.80	(5.16 - 12.43)	16.8	4.41	(1.84 - 6.99)	18.7
organic loam	0.41	(0.00 - 1.20)	0.8	-	-	-
organic sandy loam	0.40	(0.00 - 1.18)	0.8	0.40	(0.00 - 1.20)	1.7
other texture	-	-	-	-	-	-
Total	52.46	(43.97 - 60.95)	100.0	23.65	(17.85 - 29.45)	100.0

Soil texture	Soil group / Area					
	brown podzol			grey brown podzol		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
sand	-	-	-	-	-	-
loamy sand	1.20	(0.00 - 2.57)	3.5	-	-	-
sandy loam	3.62	(1.26 - 5.99)	10.4	1.60	(0.02 - 3.19)	8.9
silt loam	0.40	(0.00 - 1.18)	1.1	0.41	(0.00 - 1.20)	2.2
silt	0.80	(0.00 - 1.92)	2.3	-	-	-
sandy clay loam	2.81	(0.74 - 4.88)	8.0	3.20	(0.98 - 5.42)	17.7
clay loam	12.05	(7.87 - 16.23)	34.7	5.22	(2.45 - 8.00)	29.1
silty clay loam	3.21	(0.99 - 5.43)	9.2	4.00	(1.55 - 6.45)	22.2
sandy clay	2.00	(0.25 - 3.76)	5.7	0.80	(0.00 - 1.91)	4.4
silty clay	2.00	(0.25 - 3.75)	5.7	0.40	(0.00 - 1.22)	2.2
clay	6.40	(3.29 - 9.51)	18.3	2.40	(0.48 - 4.32)	13.3
organic loam	0.40	(0.00 - 1.24)	1.1	-	-	-
organic sandy loam	-	-	-	-	-	-
other texture	-	-	-	-	-	-
Total	34.89	(27.90 - 41.88)	100.0	18.03	(12.94 - 23.13)	100.0

Soil texture	Soil group / Area					
	gley			regosol		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
sand	0.80	(0.00 – 1.91)	0.7	0.40	(0.00 – 1.18)	7.6
loamy sand	1.99	(0.26 – 3.71)	1.9	0.40	(0.00 – 1.21)	7.7
sandy loam	0.80	(0.00 – 1.92)	0.8	–	–	–
silt loam	2.40	(0.48 – 4.32)	2.3	1.21	(0.00 – 2.59)	23.1
silt	1.20	(0.00 – 2.56)	1.1	–	–	–
sandy clay loam	0.80	(0.00 – 1.93)	0.8	–	–	–
clay loam	8.80	(5.17 – 12.43)	8.3	1.20	(0.00 – 2.56)	23.0
silty clay loam	4.80	(2.09 – 7.51)	4.5	0.41	(0.00 – 1.20)	7.8
sandy clay	13.60	(9.09 – 18.11)	12.8	–	–	–
silty clay	17.64	(12.57 – 22.70)	16.6	0.81	(0.00 – 1.94)	15.4
clay	52.79	(44.36 – 61.22)	49.4	0.80	(0.00 – 1.93)	15.4
organic loam	0.81	(0.00 – 1.94)	0.8	–	–	–
organic sandy loam	–	–	–	–	–	–
other texture	–	–	–	–	–	–
Total	106.43	(95.32 – 117.53)	100.0	5.23	(2.40 – 8.05)	100.0

Soil texture	Soil group / Area					
	rendzina			sand		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
sand	–	–	–	0.80	(0.00 – 1.92)	100.0
loamy sand	0.40	(0.00 – 1.20)	5.3	–	–	–
sandy loam	0.40	(0.00 – 1.18)	5.2	–	–	–
silt loam	3.20	(0.99 – 5.40)	42.1	–	–	–
silt	–	–	–	–	–	–
sandy clay loam	0.40	(0.00 – 1.18)	5.2	–	–	–
clay loam	1.61	(0.04 – 3.17)	21.1	–	–	–
silty clay loam	–	–	–	–	–	–
sandy clay	–	–	–	–	–	–
silty clay	0.40	(0.00 – 1.21)	5.3	–	–	–
clay	0.80	(0.00 – 1.90)	10.5	–	–	–
organic loam	–	–	–	–	–	–
organic sandy loam	–	–	–	–	–	–
other texture	0.40	(0.00 – 1.20)	5.3	–	–	–
Total	7.60	(4.24 – 10.96)	100.0	0.80	(0.00 – 1.92)	100.0

Soil texture	Soil group / Area					
	lithosol			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
sand	0.40	(0.00 – 1.20)	3.1	3.58	(1.25 – 5.92)	1.4
loamy sand	1.60	(0.00 – 3.21)	12.5	7.61	(4.22 – 10.99)	2.9
sandy loam	0.80	(0.00 – 1.91)	6.3	13.24	(8.76 – 17.71)	5.1
silt loam	0.40	(0.00 – 1.19)	3.1	16.00	(11.11 – 20.89)	6.1
silt	–	–	–	2.00	(0.26 – 3.75)	0.8
sandy clay loam	0.40	(0.00 – 1.53)	3.2	12.42	(8.16 – 16.68)	4.7
clay loam	1.20	(0.00 – 2.56)	9.4	52.92	(44.51 – 61.32)	20.2
silty clay loam	–	–	–	18.44	(13.21 – 23.67)	7.0
sandy clay	0.40	(0.00 – 1.18)	3.1	24.42	(18.45 – 30.39)	9.3
silty clay	1.60	(0.04 – 3.16)	12.5	26.05	(19.91 – 32.18)	9.9
clay	3.19	(1.00 – 5.37)	25.0	79.59	(69.49 – 89.69)	30.4
organic loam	2.00	(0.26 – 3.73)	15.6	3.61	(1.27 – 5.95)	1.4
organic sandy loam	0.80	(0.00 – 1.91)	6.2	1.59	(0.03 – 3.15)	0.6
other texture	–	–	–	0.40	(0.00 – 1.20)	0.2
Total	12.78	(8.48 – 17.08)	100.0	261.87		100.0



14.5.3 Forest area by soil group and soil moisture

Definition
Soil Moisture Moisture contained in the soil above the water table. Dry: The soil is dry with little or no moisture present, e.g. excessively drained coastal sand. Moist: The soil is moist with some moisture present, e.g. most mineral soils or drained peat. Wet: The soil is wet with a lot of moisture present, e.g. gleys or undrained peat.

Methodology
The forest area is classified by soil group and soil moisture.

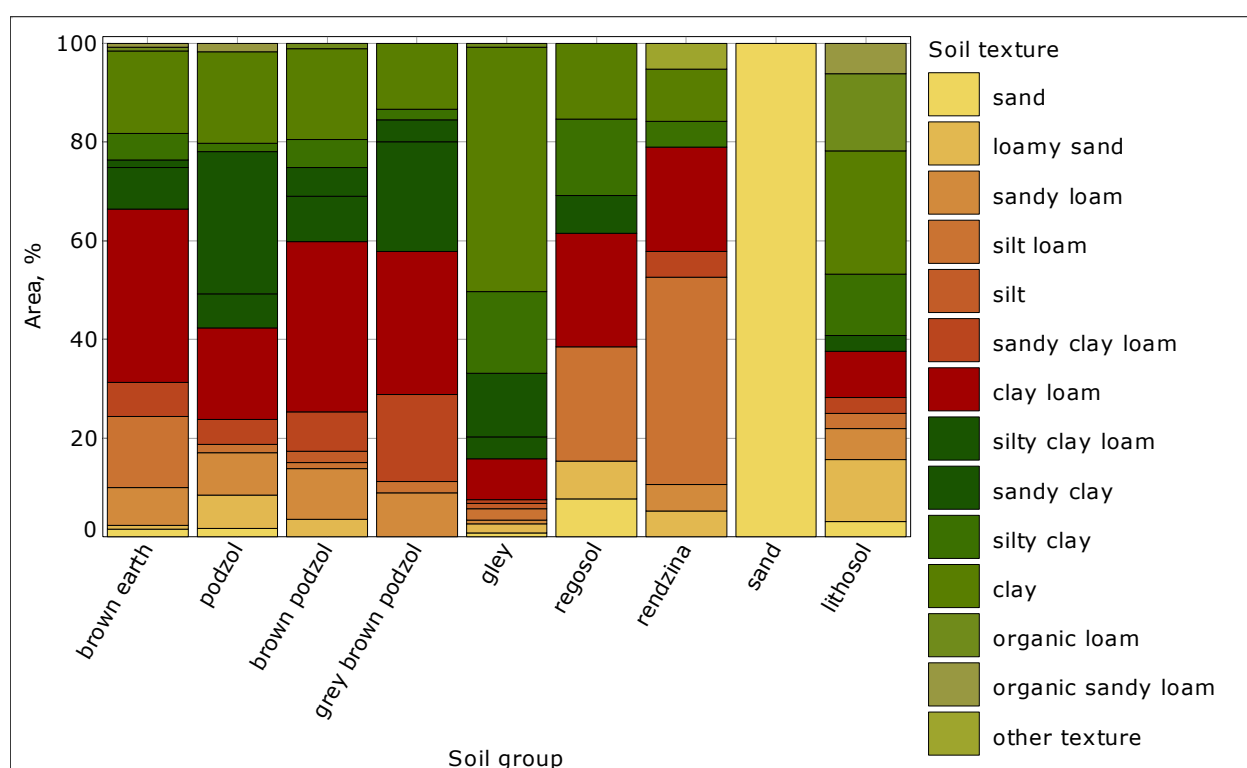
Soil texture	Soil group / Area					
	brown earth			podzol		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
sand	0.80	(0.00 - 1.92)	1.5	0.40	(0.00 - 1.18)	1.7
loamy sand	0.41	(0.00 - 1.20)	0.8	1.61	(0.04 - 3.17)	6.8
sandy loam	4.01	(1.53 - 6.48)	7.6	2.00	(0.26 - 3.75)	8.5
silt loam	7.59	(4.21 - 10.97)	14.5	0.40	(0.00 - 1.21)	1.7
silt	-	-	-	-	-	-
sandy clay loam	3.62	(1.27 - 5.96)	6.9	1.20	(0.00 - 2.56)	5.1
clay loam	18.42	(13.27 - 23.58)	35.1	4.41	(1.82 - 7.00)	18.6
silty clay loam	4.42	(1.83 - 7.02)	8.4	1.60	(0.04 - 3.17)	6.8
sandy clay	0.80	(0.00 - 1.91)	1.5	6.82	(3.61 - 10.03)	28.7
silty clay	2.80	(0.73 - 4.87)	5.3	0.40	(0.00 - 1.18)	1.7
clay	8.80	(5.16 - 12.43)	16.8	4.41	(1.84 - 6.99)	18.7
organic loam	0.41	(0.00 - 1.20)	0.8	-	-	-
organic sandy loam	0.40	(0.00 - 1.18)	0.8	0.40	(0.00 - 1.20)	1.7
other texture	-	-	-	-	-	-
Total	52.46	(43.97 - 60.95)	100.0	23.65	(17.85 - 29.45)	100.0

Soil texture	Soil group / Area					
	brown podzol			grey brown podzol		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
sand	–	–	–	–	–	–
loamy sand	1.20	(0.00 – 2.57)	3.5	–	–	–
sandy loam	3.62	(1.26 – 5.99)	10.4	1.60	(0.02 – 3.19)	8.9
silt loam	0.40	(0.00 – 1.18)	1.1	0.41	(0.00 – 1.20)	2.2
silt	0.80	(0.00 – 1.92)	2.3	–	–	–
sandy clay loam	2.81	(0.74 – 4.88)	8.0	3.20	(0.98 – 5.42)	17.7
clay loam	12.05	(7.87 – 16.23)	34.7	5.22	(2.45 – 8.00)	29.1
silty clay loam	3.21	(0.99 – 5.43)	9.2	4.00	(1.55 – 6.45)	22.2
sandy clay	2.00	(0.25 – 3.76)	5.7	0.80	(0.00 – 1.91)	4.4
silty clay	2.00	(0.25 – 3.75)	5.7	0.40	(0.00 – 1.22)	2.2
clay	6.40	(3.29 – 9.51)	18.3	2.40	(0.48 – 4.32)	13.3
organic loam	0.40	(0.00 – 1.24)	1.1	–	–	–
organic sandy loam	–	–	–	–	–	–
other texture	–	–	–	–	–	–
Total	34.89	(27.90 – 41.88)	100.0	18.03	(12.94 – 23.13)	100.0

Soil texture	Soil group / Area					
	gley			regosol		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
sand	0.80	(0.00 – 1.91)	0.7	0.40	(0.00 – 1.18)	7.6
loamy sand	1.99	(0.26 – 3.71)	1.9	0.40	(0.00 – 1.21)	7.7
sandy loam	0.80	(0.00 – 1.92)	0.8	–	–	–
silt loam	2.40	(0.48 – 4.32)	2.3	1.21	(0.00 – 2.59)	23.1
silt	1.20	(0.00 – 2.56)	1.1	–	–	–
sandy clay loam	0.80	(0.00 – 1.93)	0.8	–	–	–
clay loam	8.80	(5.17 – 12.43)	8.3	1.20	(0.00 – 2.56)	23.0
silty clay loam	4.80	(2.09 – 7.51)	4.5	0.41	(0.00 – 1.20)	7.8
sandy clay	13.60	(9.09 – 18.11)	12.8	–	–	–
silty clay	17.64	(12.57 – 22.70)	16.6	0.81	(0.00 – 1.94)	15.4
clay	52.79	(44.36 – 61.22)	49.4	0.80	(0.00 – 1.93)	15.4
organic loam	0.81	(0.00 – 1.94)	0.8	–	–	–
organic sandy loam	–	–	–	–	–	–
other texture	–	–	–	–	–	–
Total	106.43	(95.32 – 117.53)	100.0	5.23	(2.40 – 8.05)	100.0

Soil texture	Soil group / Area					
	rendzina			sand		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
sand	–	–	–	0.80	(0.00 – 1.92)	100.0
loamy sand	0.40	(0.00 – 1.20)	5.3	–	–	–
sandy loam	0.40	(0.00 – 1.18)	5.2	–	–	–
silt loam	3.20	(0.99 – 5.40)	42.1	–	–	–
silt	–	–	–	–	–	–
sandy clay loam	0.40	(0.00 – 1.18)	5.2	–	–	–
clay loam	1.61	(0.04 – 3.17)	21.1	–	–	–
silty clay loam	–	–	–	–	–	–
sandy clay	–	–	–	–	–	–
silty clay	0.40	(0.00 – 1.21)	5.3	–	–	–
clay	0.80	(0.00 – 1.90)	10.5	–	–	–
organic loam	–	–	–	–	–	–
organic sandy loam	–	–	–	–	–	–
other texture	0.40	(0.00 – 1.20)	5.3	–	–	–
Total	7.60	(4.24 – 10.96)	100.0	0.80	(0.00 – 1.92)	100.0

Soil texture	Soil group / Area					
	lithosol			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
sand	0.40	(0.00 - 1.20)	3.1	3.58	(1.25 - 5.92)	1.4
loamy sand	1.60	(0.00 - 3.21)	12.5	7.61	(4.22 - 10.99)	2.9
sandy loam	0.80	(0.00 - 1.91)	6.3	13.24	(8.76 - 17.71)	5.1
silt loam	0.40	(0.00 - 1.19)	3.1	16.00	(11.11 - 20.89)	6.1
silt	-	-	-	2.00	(0.26 - 3.75)	0.8
sandy clay loam	0.40	(0.00 - 1.53)	3.2	12.42	(8.16 - 16.68)	4.7
clay loam	1.20	(0.00 - 2.56)	9.4	52.92	(44.51 - 61.32)	20.2
silty clay loam	-	-	-	18.44	(13.21 - 23.67)	7.0
sandy clay	0.40	(0.00 - 1.18)	3.1	24.42	(18.45 - 30.39)	9.3
silty clay	1.60	(0.04 - 3.16)	12.5	26.05	(19.91 - 32.18)	9.9
clay	3.19	(1.00 - 5.37)	25.0	79.59	(69.49 - 89.69)	30.4
organic loam	2.00	(0.26 - 3.73)	15.6	3.61	(1.27 - 5.95)	1.4
organic sandy loam	0.80	(0.00 - 1.91)	6.2	1.59	(0.03 - 3.15)	0.6
other texture	-	-	-	0.40	(0.00 - 1.20)	0.2
Total	12.78	(8.48 - 17.08)	100.0	261.87		100.0



14.6 SOIL AND PEAT DEPTH

Definition
Soil/Peat Depth
The depth of soil, peat or the combination of both is recorded to a maximum of 1m.

14.6.1 Forest area, with no peat present, by soil group and soil depth

Methodology
The total stocked forest area, with no peat present, is classified by soil group and soil depth.

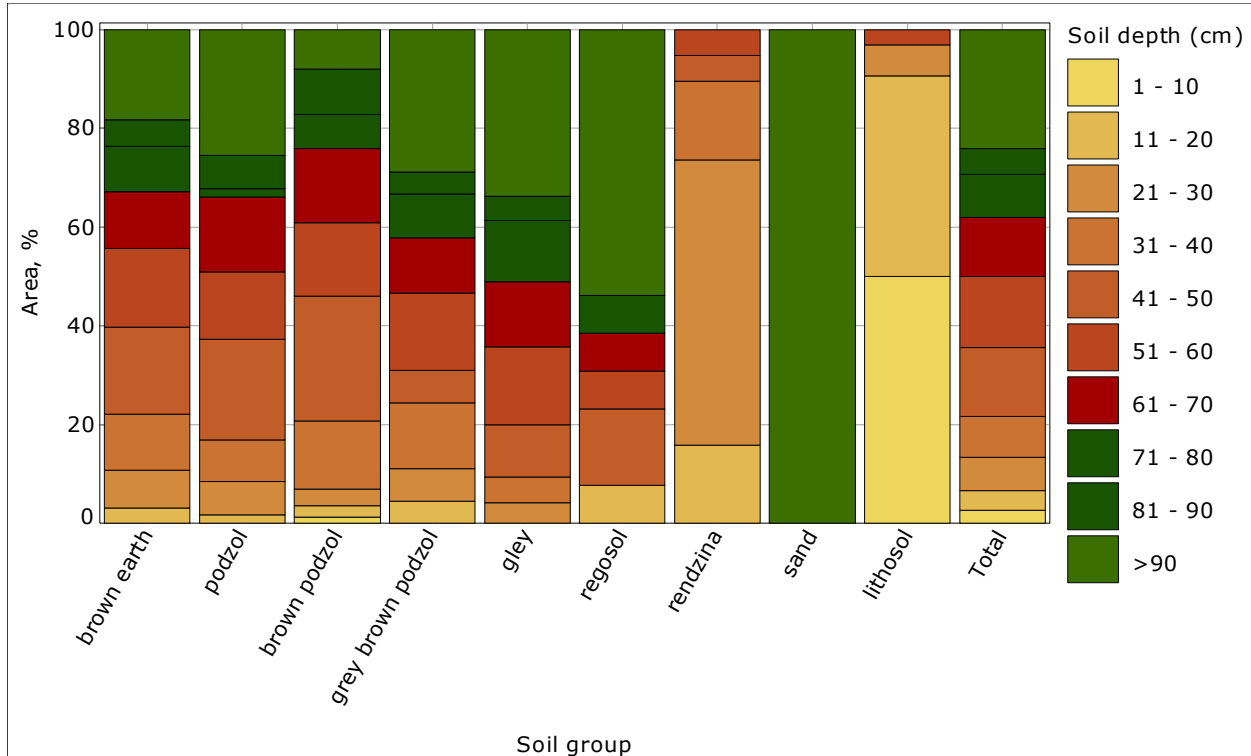
Soil depth (cm)	Soil group / Area					
	brown earth			podzol		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1 - 10	–	–	–	–	–	–
11 - 20	1.60	(0.03 – 3.17)	3.1	0.40	(0.00 – 1.20)	1.7
21 - 30	4.00	(1.54 – 6.46)	7.6	1.60	(0.03 – 3.17)	6.8
31 - 40	6.01	(2.98 – 9.04)	11.5	2.00	(0.25 – 3.76)	8.5
41 - 50	9.21	(5.47 – 12.95)	17.6	4.80	(2.11 – 7.50)	20.3
51 - 60	8.39	(4.84 – 11.95)	16.0	3.22	(1.00 – 5.43)	13.6
61 - 70	6.01	(2.98 – 9.03)	11.5	3.60	(1.26 – 5.95)	15.2
71 - 80	4.81	(2.09 – 7.53)	9.2	0.40	(0.00 – 1.18)	1.7
81 - 90	2.81	(0.74 – 4.87)	5.4	1.61	(0.03 – 3.19)	6.8
>90	9.62	(5.86 – 13.38)	18.1	6.01	(3.03 – 8.99)	25.4
Total	52.46	(43.97 – 60.95)	100.0	23.65	(17.85 – 29.45)	100.0

Soil depth (cm)	Soil group / Area					
	brown podzol			grey brown podzol		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1 - 10	0.40	(0.00 – 1.21)	1.2	–	–	–
11 - 20	0.81	(0.00 – 1.97)	2.3	0.79	(0.00 – 1.91)	4.4
21 - 30	1.20	(0.00 – 2.56)	3.4	1.20	(0.00 – 2.59)	6.7
31 - 40	4.81	(2.10 – 7.52)	13.8	2.40	(0.48 – 4.32)	13.3
41 - 50	8.83	(5.17 – 12.50)	25.3	1.20	(0.00 – 2.56)	6.7
51 - 60	5.21	(2.39 – 8.03)	14.9	2.82	(0.77 – 4.88)	15.6
61 - 70	5.22	(2.40 – 8.05)	15.0	2.00	(0.25 – 3.76)	11.1
71 - 80	2.40	(0.48 – 4.32)	6.9	1.60	(0.04 – 3.17)	8.9
81 - 90	3.21	(0.99 – 5.43)	9.2	0.80	(0.00 – 1.91)	4.4
>90	2.80	(0.73 – 4.87)	8.0	5.21	(2.40 – 8.02)	28.9
Total	34.89	(27.90 – 41.88)	100.0	18.03	(12.94 – 23.13)	100.0

Soil depth (cm)	Soil group / Area					
	gley			regosol		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1 - 10	–	–	–	–	–	–
11 - 20	–	–	–	0.40	(0.00 – 1.21)	7.7
21 - 30	4.36	(1.87 – 6.85)	4.1	–	–	–
31 - 40	5.61	(2.68 – 8.54)	5.3	–	–	–
41 - 50	11.20	(7.10 – 15.30)	10.5	0.80	(0.00 – 1.91)	15.3
51 - 60	16.83	(11.86 – 21.79)	15.8	0.40	(0.00 – 1.21)	7.7
61 - 70	14.02	(9.45 – 18.60)	13.2	0.40	(0.00 – 1.20)	7.7
71 - 80	13.23	(8.80 – 17.65)	12.4	0.40	(0.00 – 1.21)	7.7
81 - 90	5.21	(2.40 – 8.01)	4.9	–	–	–
>90	35.97	(28.94 – 43.00)	33.8	2.82	(0.74 – 4.89)	53.9
Total	106.43	(95.32 – 117.53)	100.0	5.23	(2.40 – 8.05)	100.0

Soil depth (cm)	Soil group / Area					
	rendzina			sand		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1 - 10	–	–	–	–	–	–
11 - 20	1.20	(0.00 – 2.55)	15.7	–	–	–
21 - 30	4.40	(1.83 – 6.98)	58.0	–	–	–
31 - 40	1.20	(0.00 – 2.56)	15.8	–	–	–
41 - 50	0.40	(0.00 – 1.20)	5.3	–	–	–
51 - 60	0.40	(0.00 – 1.18)	5.2	–	–	–
61 - 70	–	–	–	–	–	–
71 - 80	–	–	–	–	–	–
81 - 90	–	–	–	–	–	–
>90	–	–	–	0.80	(0.00 – 1.92)	100.0
Total	7.60	(4.24 – 10.96)	100.0	0.80	(0.00 – 1.92)	100.0

Soil depth (cm)	Soil group / Area					
	lithosol			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
1 - 10	6.38	(3.30 - 9.46)	50.0	6.78	(3.61 - 9.96)	2.6
11 - 20	5.21	(2.40 - 8.02)	40.7	10.41	(6.44 - 14.37)	4.0
21 - 30	0.80	(0.00 - 1.91)	6.2	17.57	(12.52 - 22.62)	6.7
31 - 40	-	-	-	22.03	(16.31 - 27.76)	8.4
41 - 50	-	-	-	36.46	(29.22 - 43.69)	13.9
51 - 60	0.40	(0.00 - 1.19)	3.1	37.66	(30.32 - 45.00)	14.4
61 - 70	-	-	-	31.26	(24.52 - 38.01)	11.9
71 - 80	-	-	-	22.84	(17.04 - 28.65)	8.7
81 - 90	-	-	-	13.63	(9.15 - 18.11)	5.2
>90	-	-	-	63.23	(54.19 - 72.27)	24.2
Total	12.78	(8.48 - 17.08)	100.0	261.87		100.0



14.6.2 Forest area, where peat is present, by soil group and peat depth

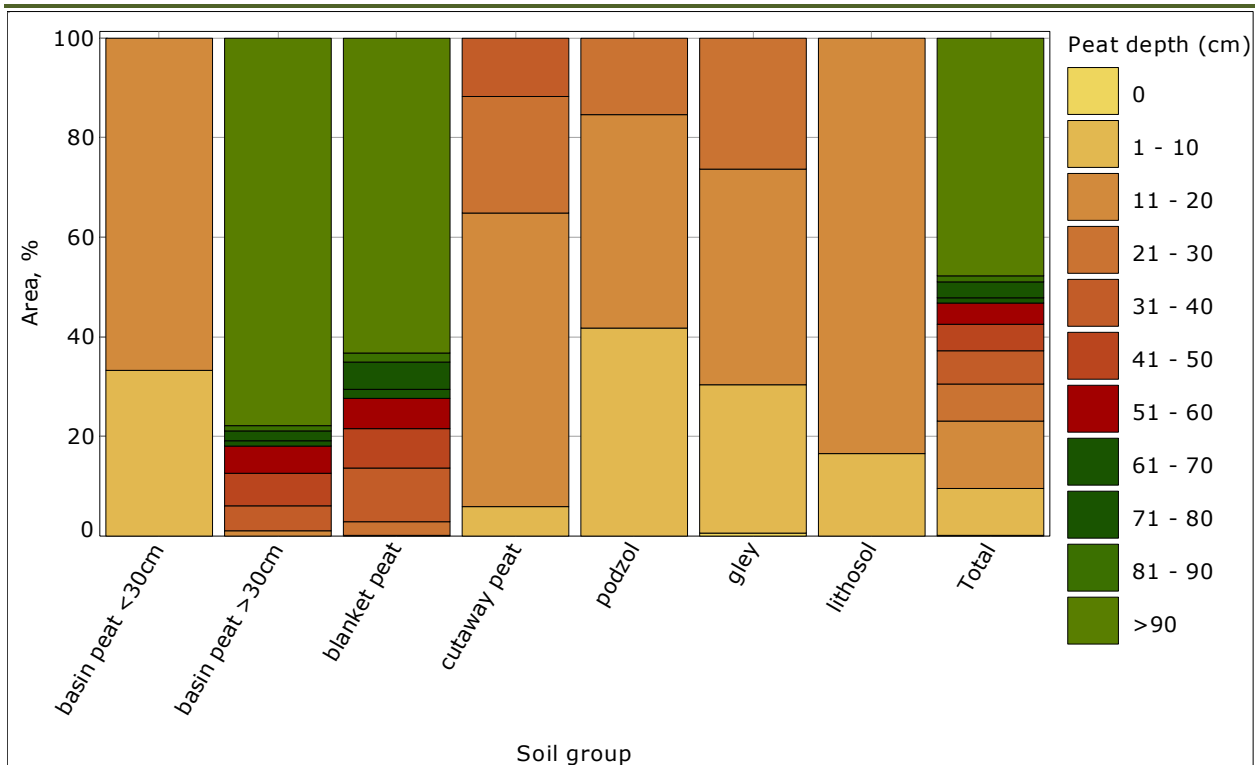
Methodology
The total stocked forest area where peat is present is classified by soil group and peat depth.

Peat depth (cm)	Soil group / Area					
	basin peat <30cm			basin peat >30cm		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	-	-	-	-	-	-
1 - 10	0.40	(0.00 - 1.18)	33.3	-	-	-
11 - 20	0.80	(0.00 - 1.91)	66.7	0.80	(0.00 - 1.93)	1.0
21 - 30	-	-	-	-	-	-
31 - 40	-	-	-	4.00	(1.54 - 6.46)	5.0
41 - 50	-	-	-	5.21	(2.40 - 8.03)	6.5
51 - 60	-	-	-	4.40	(1.82 - 6.99)	5.5
61 - 70	-	-	-	0.80	(0.00 - 1.91)	1.0
71 - 80	-	-	-	1.60	(0.03 - 3.16)	2.0
81 - 90	-	-	-	0.80	(0.00 - 1.91)	1.0
>90	-	-	-	62.03	(53.58 - 70.48)	78.0
Total	1.20	(0.00 - 2.55)	100.0	79.65	(70.41 - 88.88)	100.0

Peat depth (cm)	Soil group / Area					
	blanket peat			cutaway peat		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	–	–	–
1 - 10	–	–	–	0.40	(0.00 – 1.18)	5.9
11 - 20	0.40	(0.00 – 1.29)	0.2	4.02	(1.54 – 6.50)	58.9
21 - 30	5.20	(2.39 – 8.01)	2.6	1.60	(0.03 – 3.17)	23.5
31 - 40	21.23	(15.63 – 26.83)	10.8	0.80	(0.00 – 1.90)	11.7
41 - 50	15.64	(10.81 – 20.48)	7.9	–	–	–
51 - 60	12.04	(7.77 – 16.30)	6.1	–	–	–
61 - 70	3.60	(1.26 – 5.93)	1.8	–	–	–
71 - 80	10.84	(6.82 – 14.86)	5.5	–	–	–
81 - 90	3.61	(1.27 – 5.95)	1.8	–	–	–
>90	124.61	(113.18 – 136.04)	63.3	–	–	–
Total	197.18	(184.48 – 209.87)	100.0	6.82	(3.61 – 10.03)	100.0

Peat depth (cm)	Soil group / Area					
	podzol			gley		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	0.40	(0.00 – 1.20)	0.7
1 - 10	18.42	(13.28 – 23.56)	41.8	17.62	(12.51 – 22.74)	29.8
11 - 20	18.83	(13.61 – 24.05)	42.8	25.61	(19.47 – 31.74)	43.2
21 - 30	6.80	(3.61 – 9.98)	15.4	15.59	(10.76 – 20.42)	26.3
31 - 40	–	–	–	–	–	–
41 - 50	–	–	–	–	–	–
51 - 60	–	–	–	–	–	–
61 - 70	–	–	–	–	–	–
71 - 80	–	–	–	–	–	–
81 - 90	–	–	–	–	–	–
>90	–	–	–	–	–	–
Total	44.05	(36.35 – 51.75)	100.0	59.22	(50.25 – 68.20)	100.0

Peat depth (cm)	Soil group / Area					
	lithosol			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
0	–	–	–	0.40	(0.00 – 1.20)	0.1
1 - 10	0.40	(0.00 – 1.18)	16.6	37.24	(30.04 – 44.45)	9.5
11 - 20	1.99	(0.25 – 3.74)	83.4	52.45	(43.92 – 60.98)	13.4
21 - 30	–	–	–	29.19	(22.65 – 35.74)	7.5
31 - 40	–	–	–	26.02	(19.84 – 32.21)	6.7
41 - 50	–	–	–	20.86	(15.28 – 26.43)	5.3
51 - 60	–	–	–	16.44	(11.48 – 21.39)	4.2
61 - 70	–	–	–	4.40	(1.82 – 6.98)	1.1
71 - 80	–	–	–	12.44	(8.13 – 16.75)	3.2
81 - 90	–	–	–	4.41	(1.82 – 7.00)	1.1
>90	–	–	–	186.64	(173.22 – 200.06)	47.9
Total	2.39	(0.48 – 4.30)	100.0	390.51		100.0



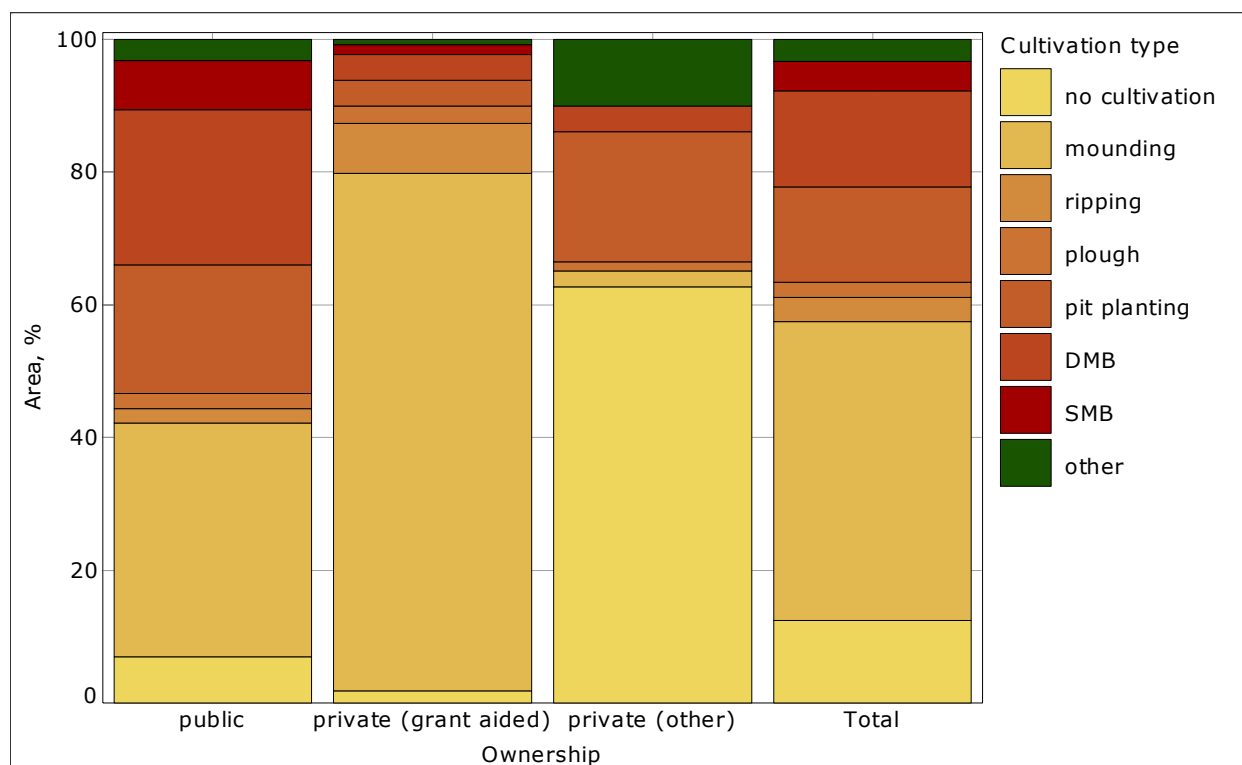
14.6.3 Forest area by ownership and soil cultivation

Definition	
Soil cultivation	Describes the type of mechanical tilling applied to the soil in order to make it more suitable for natural regeneration or the establishment of planted trees.
	The soil cultivation method is recorded as one of the following:
- Mounding - Ripping - Agricultural ploughing - Pit planting	- Double mould board ploughing (DMB) - Single mould ploughing (SMB) - No cultivation - No cultivation

Methodology
The total stocked forest area is classified by ownership and soil cultivation.

Cultivation type	Ownership / Area					
	public			private (grant aided)		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no cultivation	24.80	(18.74 - 30.85)	7.0	4.01	(1.53 - 6.48)	1.9
mounding	125.01	(112.70 - 137.32)	35.2	167.67	(154.23 - 181.12)	78.0
ripping	7.62	(4.25 - 10.98)	2.1	16.03	(11.18 - 20.89)	7.5
plough	8.41	(4.87 - 11.95)	2.4	5.60	(2.68 - 8.52)	2.6
pit planting	68.88	(59.46 - 78.29)	19.4	8.41	(4.84 - 11.98)	3.9
DMB	82.95	(72.81 - 93.09)	23.3	8.41	(4.90 - 11.91)	3.9
SMB	26.44	(20.23 - 32.66)	7.4	3.22	(1.02 - 5.42)	1.5
other	11.21	(7.10 - 15.33)	3.2	1.60	(0.03 - 3.16)	0.7
Total	355.31	(339.78 - 370.85)	100.0	214.95	(200.34 - 229.55)	100.0

Cultivation type	Ownership / Area					
	private (other)			Total		
	thousands ha	($\alpha = 0.05$)	%	thousands ha	($\alpha = 0.05$)	%
no cultivation	52.47	(43.88 – 61.06)	62.7	81.27	(70.87 – 91.67)	12.4
mounding	2.00	(0.25 – 3.76)	2.4	294.68	(279.32 – 310.04)	45.2
ripping	–	–	–	23.65	(17.85 – 29.44)	3.6
plough	1.21	(0.00 – 2.57)	1.4	15.22	(10.48 – 19.96)	2.3
pit planting	16.42	(11.49 – 21.35)	19.6	93.71	(83.17 – 104.25)	14.3
DMB	3.20	(0.99 – 5.42)	3.8	94.56	(83.99 – 105.12)	14.5
SMB	–	–	–	29.66	(23.09 – 36.24)	4.5
other	8.42	(4.84 – 11.99)	10.1	21.23	(15.60 – 26.85)	3.2
Total	83.72	(73.16 – 94.29)	100.0	653.98		100.0





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