

Laois Farm Forestry Group Resource Study - 2010

Project Report Submitted to the Laois Farm Forestry Group
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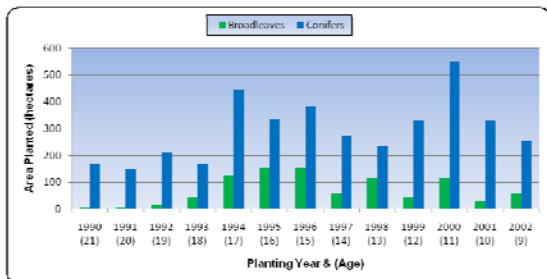


The European Agricultural Fund for Rural Development: Europe investing in rural areas.

Highlights of the Resource Study Findings

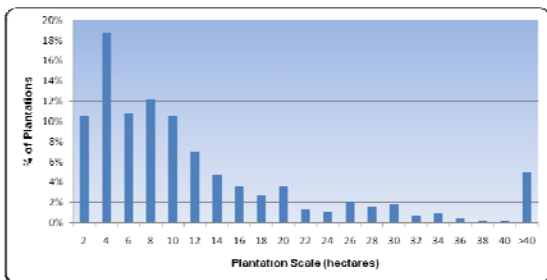
The Planted Resource

- County Laois has an active and well developed forestry sector. Forests now cover approximately 14.5% of the county, which is well above the national average of 10.6%. While timber production within the county is currently dominated by Coillte, private forests now account for 36% of the county's forest cover and this shift in resource ownership will begin to alter the dynamics of timber supply within the county over the next decade.
- There has been approximately 5,250 hectares of private sector afforestation within the county prior to 2003, with the vast majority of this occurring between 1990 and 2002.



Annual Levels of Private Sector Afforestation by Species Category within County Laois

- Coniferous species account for approximately 82% of private sector forests established in County Laois prior to 2003, with Sitka spruce accounting for the majority of this. Broadleaf species account for 18%, with Ash, Sycamore and Oak dominating.
- The average size of a farm forestry plantation in County Laois is 11.8 hectares. Half of all farm forestry plantations in the county are 7.4 hectares or less.



Profile of County Laois Private Forestry Plantation Scale

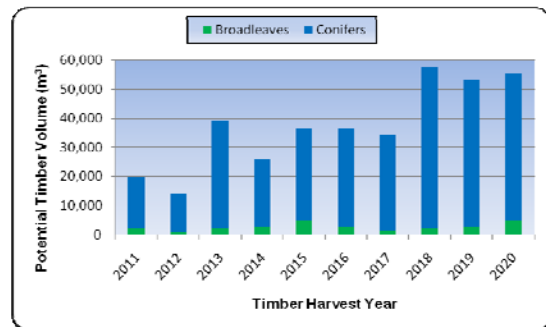
- 80% of plantation owners surveyed can be categorised as either full time, part time or retired farmers.
- 32% of plantations surveyed can be classified as either investments (associated with specific land purchase), or recent inheritances. These plantations make up almost half of the surveyed area.

Resource Performance to Date

- The average productive area of farm forestry plantations in County Laois is 81%. This means that, on average, 81% of the officially recorded area of farm forestry plantations can be classified as capable of producing timber while 19% can be classified as unproductive. This unproductive area has been accounted for in all timber production potential forecasting.
- The average Yield Class of conifer crops growing in farm forestry plantations in County Laois is 21.2 m³/ha/annum. The average Yield Class of broadleaf crops growing in farm forestry plantations in County Laois is 8.8 m³/ha/annum.

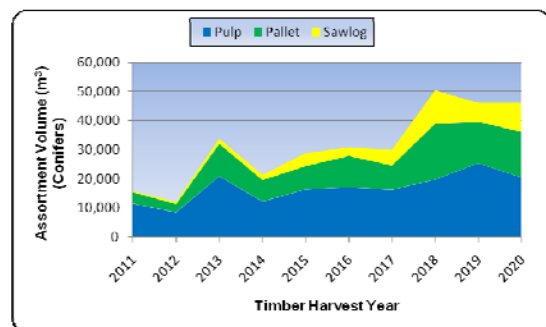
Timber Production Potential

- The total potential harvest from County Laois private farm forestry plantations over the next 10 years is estimated to be in excess of 370,000m³, equating to an average of 37,000m³ per annum. The dominance of coniferous timber is noteworthy, constituting about 93% of forecast volumes.



Potential Timber Production from County Laois Private Farm Forestry Plantations (2011 - 2020)

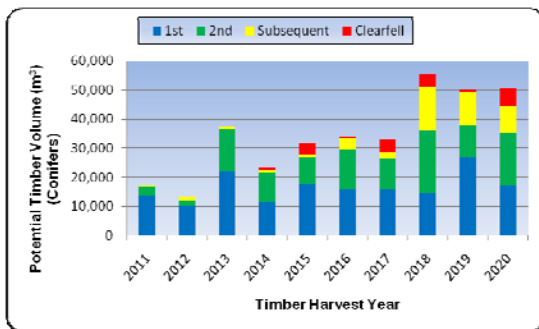
- Pulpwood and palletwood will dominate potential yields from the County Laois private farm forestry resource over the majority of the forecast period, constituting over 90% of potential conifer timber production over the next 5 years.



Potential Conifer Timber Assortment Yields from County Laois Private Farm Forestry Plantations (2011 - 2020)

Potential Scale of Operations

- Combined, first and second conifer thinning operations are forecast to average about 28,000m³ per annum over the next 10 years.



Forecast Volumes associated with 1st, 2nd and Subsequent Thinning and Clearfelling Operations in Conifer Plantations

Potential Number of Participants

- On average, about 29 conifer plantations per year will reach the stage of first thinning over the next 10 years.
- On average, about 14 fast growing broadleaf (Ash & Sycamore) plantations (greater than 0.5 hectares) per year will reach the stage of first thinning over the next 10 years.

Location in Relation to Markets

- There are good local markets within County Laois for all timber products including Sawlog, Palletwood, Stakewood and Energywood and its very central location allows cost effective access to many of the major timber processing facilities in Ireland including the major pulpwood consuming panelboard mills. This proximity to local markets gives a strong advantage to the county's private forest owners when compared to other more isolated counties in Ireland.

Suitability of Plantations for Thinning

- All plantations surveyed were classified as being suitable for thinning, based on silvicultural criteria alone. However, other economic and social factors may preclude thinning operations in practice.

Plantation Access for Timber Production

- At the time of surveying, 81% of conifer plantations assessed had some form of inspection paths cut, and of these, 53% were considered to be of a good standard, suitable for pre-sale timber inspection and measurement operations.
- 72% of the surveyed plantations require some degree of forest road construction, with an average requirement of 360 metres.
- Of the 28 surveyed plantations considered to be at first thinning stage now or within the next two

years, only 3 have forest roads already constructed. 19 plantations require some degree of forest road construction, totalling an estimated 5,570 metres.

- 15 of the surveyed plantations were considered problematic regarding access for future harvesting operations.
- There is currently a lack of adequate roading for timber harvesting operations within the county's farm forestry resource and this will be a significant constraint to market access and will hinder the development of thinning activity in the county. The development of good plantation access is a critical issue for Laois Farm Forestry Group members.
- Some opportunities for cooperative road building and access sharing among members of the Laois Farm Forestry Group were identified during the survey.

Plantation Scale

- The average productive area of conifer farm forestry plantations in County Laois is 8.9 hectares, with half of all such plantations having a productive area of 5.5 hectares or less.
- It is predicted that conifer plantations will produce an average of 530m³ or less from first thinning operations, with half of all conifer plantations producing 330m³ or less.
- The typical productive area of broadleaf farm forestry plantations in County Laois is considerably smaller than that of conifer plantations, averaging 3.2 hectares, with half of all such plantations having a productive area of 1.8 hectares or less.
- It is predicted that broadleaf plantations will produce an average of 65m³ or less from first thinning operations, with half of all such plantations producing 35m³ or less, or just over one lorry load of timber.
- A fundamental constraint to the economic viability of first thinning operations is lack of scale. All surveyed owners are aware of the concept of clustering and cooperative sales and harvesting operations to help to overcome the constraint of small plantation size and the majority are willing to co-operate with each other in this regard.
- The survey identified a number of plantations which would benefit from joining forces with at least one neighbouring private plantation of a similar age.

Profile & Intentions of Plantation Owners

- Surveyed owners have a relatively low financial dependence on future revenues from timber harvesting. While 98% of surveyed owners stated that they plan to thin their plantations, only 30 % considered themselves financially dependent to any significant degree on potential revenues from future timber sales, with 60% viewing any potential revenues as an income “bonus”.
- There is a relatively low level of knowledge and experience relating to timber harvesting and sales operations among surveyed owners. Only 10% of surveyed owners have had any previous experience harvesting and / or selling timber.
- There are relatively low levels of knowledge of, and contact with, the harvesting sector to date among surveyed owners. Only one third of owners surveyed know of a timber harvesting contractor in their area and discussions with owners suggest that there is a definite lack of confidence and trust regarding the *bona fides* of operators within the timber harvesting sector.
- There is a strong willingness to cooperate and share knowledge & experience among surveyed owners. Owners participating in the resource study were generally very open to the concept of developing a cooperative approach to timber sales and thinning operations.

Recreation & Leisure Enterprise Potential

- 10% of surveyed owners have either developed or are considering developing some form of recreational facility within their woodlands in order to generate additional, non-timber revenues. One such enterprise has been developed to date.
- Several plantations were being used for various forms of recreation including gun club game rearing facilities, game sanctuaries, horse riding trails, wildlife sanctuaries and walking trails. However, these had limited or no income generating potential.
- While some plantations showed moderate potential for recreational and leisure enterprises due to their scenic and isolated locations, most owners are realistic about the practicalities of turning such potential into revenues. The majority of owners recognise the difficulty competing with the wide range of highly scenic Coillte forest properties within the county which offer free access to the public across large landscapes. Also, issues relating to public liability and associated insurance costs were cited as limiting factors.

Table of Contents

| | |
|--|----|
| Section 1: | |
| Introduction to the Laois Farm Forestry Resource Study | 5 |
| 1.1 The Laois Farm Forestry Group | 5 |
| 1.2 The Laois Farm Forestry Group Resource Study | 5 |
| 1.2.1 Resource Study Methodology | 6 |
| Section 2: | |
| Quantifying the County Laois Private Forestry Resource | 8 |
| 2.1 The Study Area | 8 |
| 2.2 Review of the Baseline Resource | 8 |
| 2.2.1 Annual Afforestation Activity | 8 |
| 2.2.2 Species Planted | 9 |
| 2.2.3 Size of Areas Planted | 10 |
| 2.3 Development of the Laois Farm Forestry Resource to Date – Resource Survey Results | 11 |
| 2.3.1 Average Productive Area | 12 |
| 2.3.2 Average Yield Class | 12 |
| 2.3.3 Thinning Potential | 12 |
| 2.4 Profile of County Laois Farm Forestry Resource Owners – Ownership Survey Results | 14 |
| Section 3: | |
| Forecasting the Timber Production Potential of the County Laois Private Forestry Resource | 15 |
| 3.1 Overview of Timber Production Forecasting | 15 |
| 3.2 Forecast of Potential Timber Volumes (2011 to 2020) | 15 |
| 3.3 Forecast of Harvesting Operation Requirements (2011 to 2020) | 18 |
| 3.4 Comparison with COFORD Forecast Project Predictions | 19 |
| 3.5 Forecasting the Potential Number of Participants | 19 |
| Section 4: | |
| Suitability of County Laois Farm Forests to Produce Timber | 21 |
| 4.1 Location | 21 |
| 4.2 Silvicultural Suitability of Plantations for Thinning | 21 |
| 4.3 Plantation Access for Timber Production | 22 |
| 4.3.1 Inspection Paths | 22 |
| 4.3.2 Access Roads for Timber Trucks | 22 |
| 4.3.2.1 Uncertainty of the Forest Road Grant Scheme | 23 |
| 4.3.2.2 Possible Opportunities for Cooperative Road Construction? | 23 |
| 4.4 Plantation Scale | 24 |
| 4.4.1 Assessing the Scope to Cluster Timber Sales & Harvesting Operations | 25 |
| 4.5 Timber Quality | 27 |
| 4.5.1 Certified Supply from Private Farm Forests? | 27 |
| 4.5.2 Broadleaf Timber Quality | 27 |
| 4.6 The Profile & Intentions of Plantation Owners | 29 |
| 4.7 Potential for Adding Value to the Basic Forestry Product | 30 |
| Section 5: | |
| Potential for Recreation & Leisure Enterprises within County Laois Farm Forests | 33 |
| Appendix 1: Example of Plantation Survey Data Sheet | 34 |
| Acknowledgements | 35 |
| Laois Farm Forestry Group Contact Details | 35 |

Section 1:

Introduction to the Laois Farm Forestry Resource Study

1.1 The Laois Farm Forestry Group

The Laois Farm Forestry Group was established in 2009 to represent private forestry owners in County Laois who have planted forestry prior to 2002. Promoted by the Teagasc Forest Development Department, IFA Farm Forestry and local forest owners, it provides a representative voice for private forest owners with plantations now approaching or at the stage of timber production. The group is currently providing a useful networking and knowledge sharing function, with particular emphasis on preparing for first thinning operations. Members recognise the many challenges facing the private forestry sector, most notably the relatively small scale of farm forestry plantations and the lack of practical experience among owners. To this end, the Laois Farm Forestry Group aims to facilitate knowledge sharing and the development of economies of scale among members wherever possible in order to optimise returns from farm forestry enterprises within the county.

1.2 The Laois Farm Forestry Group Resource Study

The key to the future success of Ireland's private farm forestry sector will be the development of a fair and transparent timber supply chain which safeguards the interests of the grower by optimising financial returns and the future value and viability of their plantations. It is widely recognised that stand alone thinning operations within small scale farm forestry enterprises are highly inefficient. Efforts must be made to minimise unit costs and maximise timber prices and for many owners, this will not be achieved on a farm by farm basis. Some form of co-operative or coordinated approach to timber sales and harvesting operations must be developed. While this is easier said than done, the Laois Farm Forestry Group has begun the important process of fostering co-operation among a large group of private forestry owners. The first step to developing some form of coordinated approach to timber production within a region is to have a clear understanding of the resource available and the strengths and weaknesses of the resource and its many owners.

The following questions must be answered:

- Have the forests established successfully?
- Have the forests been managed correctly?
- What is their current growth rate?
- How much timber are the forests capable of producing and when will it be produced?
- Are the forests accessible for timber harvesting and haulage operations?
- Are the forests suitable for recreation & leisure activities and is there scope to develop alternative enterprises based on this potential?
- Who owns the forests and what are the intentions of the owners regarding future timber harvesting operations?

As part of its on-going work to foster a co-operative approach to farm forestry timber production operations within the county, the Laois Farm Forestry Group has commissioned a study of the private farm forestry resource within the county. Conducted between August and December 2010, the study has focused on private forestry plantations established prior to 2003, representing the cohort of plantations which will have the potential to produce timber harvests over the next 10 years. Findings of the study will provide the group with up-to-date information about the total private sector forestry resource within the county and is seen as one of the first steps in developing a co-ordinated strategy to produce and market timber from the region's farm forests.

The principal objectives of the study as defined by the Laois Farm Forestry Group were to:

- Produce a quantitative and qualitative **timber production forecast** for private farm forests in County Laois over the period 2010 – 2020. The forecast will be based on collected inventory and management data and the use of the most up to date yield models. This body of work must avoid duplicating and in essence complement recent research carried out by COFORD.
- Assess the **suitability of farm forests in County Laois to supply timber products** in the period 2010 – 2020, in terms of location, access, scope to cluster and forest owners intentions. The study should aim to identify opportunities for adding value to the basic forestry product and should identify innovative uses of the products.
- Ascertain the **suitability of County Laois woodland sites for recreation and leisure activities** and gauge the level of interest among forest owners in diversifying into tourism and leisure enterprises.

1.2.1 Resource Study Methodology

The resource study involved three principal steps:

1. A review of historic County Laois private sector afforestation data provided by the Forest Service;
2. An on-site survey of a sample of private forests established within the county prior to 2003, including interviews with a sample of plantation owners;
3. Modelling of all available data to produce an up-to-date timber production forecast for the county's farm forestry resource.

One of the principal precursors to the development of a regionally specific timber production forecast is the initiation of a resource survey, including a forest inventory and ownership survey. A forest inventory involves identifying a representative sample of farm forests, quantifying their size, and assessing their age, species and productivity. A detailed resource survey was carried out on a sample of 50 private farm forestry plantations across County Laois, established prior to 2003¹. An assessment and inventory of each selected plantation was conducted and the following data were recorded²:

- Species
- Age
- Stocking (trees/hectare)
- Mean DBH (where measurable)
- Top Height
- % Productive Area
- Thinning Potential
- Estimate of 1st Thinning Year
- Access Requirements – Inspection Paths and Roding (Internal & External)
- Evidence of any Recent Management Operations
- Ongoing Management Requirements
- Potential for Recreation & Leisure Activities

Surveyed plantations ranged in age from 9 to 22 years. A total of 859 hectares was surveyed, comprising 713 hectares (83%) conifer species and 146 hectares (17%) broadleaf species (see Figure 1). This correlates closely with the species composition documented in historic County

¹ A formal request for survey participation was made by the Teagasc Forest Development Department to all known private forestry owners in County Laois. The unavoidable process of working with willing survey participants may skew results slightly, particularly in relation to findings from the Ownership Profile survey. For example, it is possible that willing participants may be more progressive or pro-active regarding their forest resource.

² As part of the resource survey, participating owners have received a data sheet relating to their own surveyed plantation (see example in Appendix 1).

Laois afforestation records compiled by the Forest Service (see Section 2.2.2), indicating that the surveyed plantations were largely representative of the species distribution within the county's farm forestry resource.

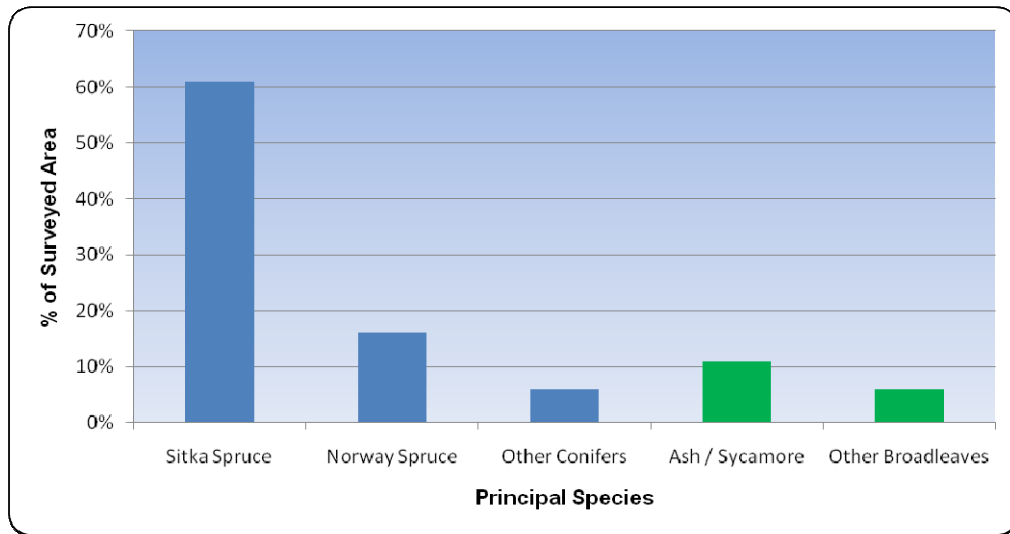


Figure 1 – Species Breakdown of Surveyed Plantations

Where possible, forest surveys were accompanied by a brief interview with each plantation owner in order to ascertain:

- Past Management & Owner's Involvement to Date
- Objectives
- Plans and Expectations
- Knowledge of Markets & Forestry in General
- Access to Help and / or Information
- Interest in Developing any Potential for Recreation & Leisure Activities
- Profile of Owner (Age & Profession)

Data compiled from this intensive survey were used to extrapolate Forest Service private sector afforestation data relating to the 5,250 hectares of officially recorded private afforestation within the county prior to 2003.

This report presents the findings of the resource study. It is divided in five sections as follows:

- Section 1:** Introduction to the Laois Farm Forestry Resource Study
- Section 2:** Quantifying the County Laois Private Forestry Resource
- Section 3:** Forecasting the Timber Production Potential of the County Laois Private Forestry Resource
- Section 4:** Suitability of County Laois Private Forests to Produce Timber
- Section 5:** Potential for Recreation & Leisure Enterprises within County Laois Farm Forests

Section 2: Quantifying the County Laois Private Forestry Resource

2.1 The Study Area

County Laois has an active and well developed forestry sector. Forests now cover approximately 14.5% of the county, which is well above the national average of 10.6%³. While timber production within the county is currently dominated by Coillte, private forests now account for 36% of the county's forest cover and this shift in resource ownership will begin to alter the dynamics of timber supply within the county over the next decade.

This resource study encompasses all private forestry plantations within County Laois that were established prior to 2003.

2.2 Review of the Baseline Resource

In order to begin to assess the current state of the private sector forestry resource in County Laois for timber production forecasting purposes, we must first look at the historic afforestation records compiled by the Forest Service. These basic records document each parcel of land afforested under a Forest Service grant aided scheme, providing us with useful information about the number and size of land parcels planted each year and their species composition. This general information allows us build up a "baseline" profile of the resource at the time of planting.

2.2.1 Annual Afforestation Activity

Forest Service records show that there has been approximately 5,250 hectares of private sector afforestation within the county prior to 2003, with the vast majority of this occurring between 1990 and 2002 (see Figure 2). Annual planting activity peaked at over 660 hectares in 2000.

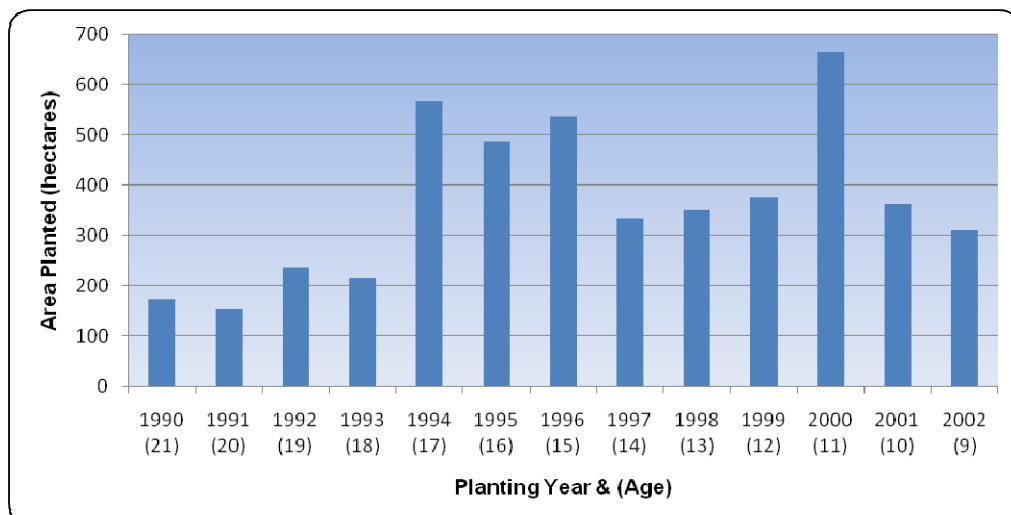


Figure 2 – Annual Levels of Private Sector Afforestation within County Laois (1990 to 2002)

Based on their current age class, these plantations will all have the potential to produce timber volumes over the next decade. It should be noted that levels of broadleaved species planting has increased significantly over this period, peaking at over 150 hectares in 1995 (see Figure 3).

³ Source: Forest Service (2009)

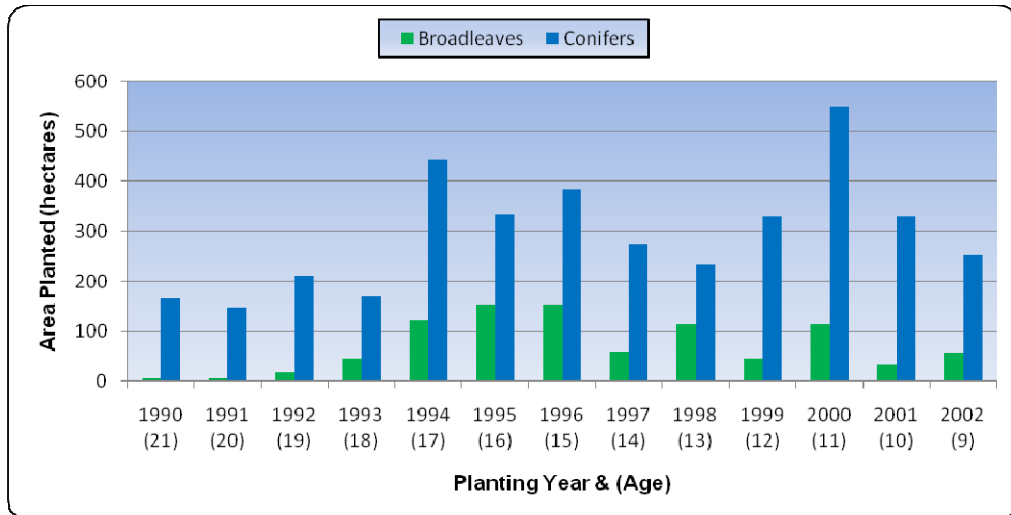


Figure 3– Annual Levels of Private Sector Afforestation by Species Category within County Laois (1990 to 2002)

2.2.2 Species Planted

Coniferous species account for approximately 82% of private sector forests established in County Laois prior to 2003, with Sitka spruce accounting for the majority of this. Broadleaf species account for 18%, with Ash, Sycamore and Oak dominating (see Figure 4 below).

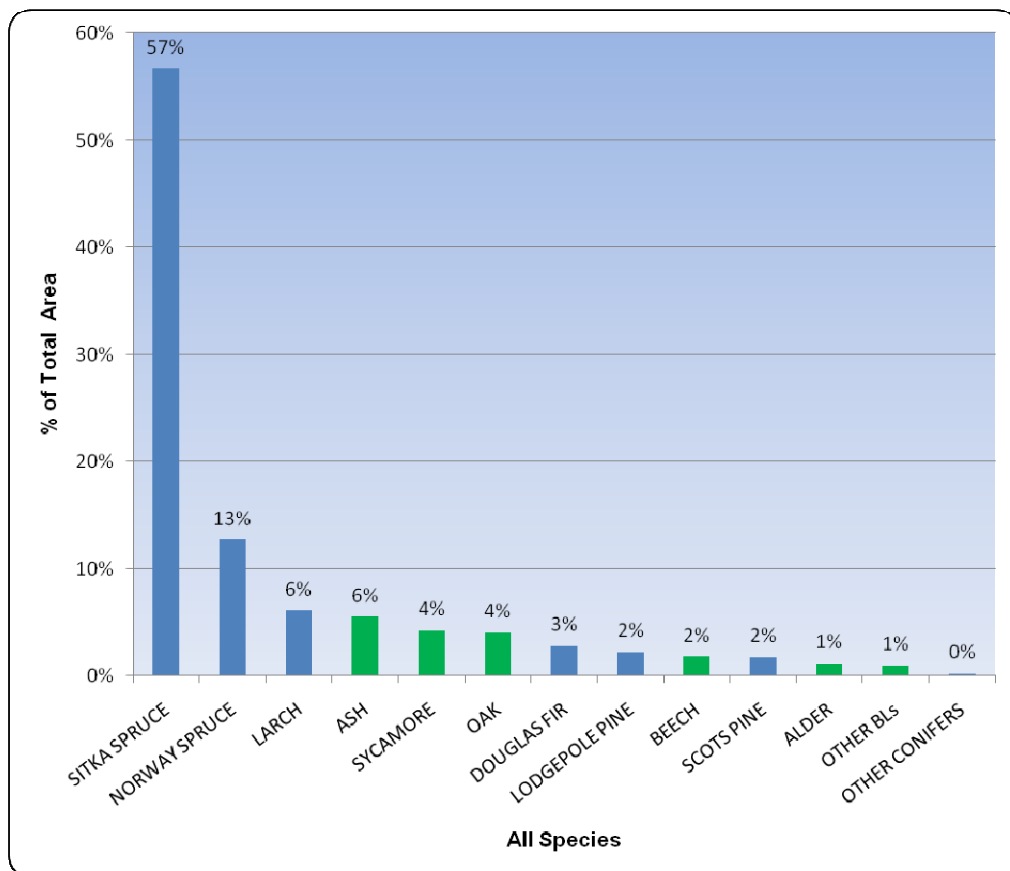


Figure 4 – Species Breakdown of County Laois Private Forestry Plantations (Refers to 2002 Planting & Older)

2.2.3 Size of Areas Planted

Forest Service records show that the 5,250 hectares of private sector afforestation within the county prior to 2003 is comprised of approximately 440 individual plantations⁴. The average size of a farm forestry plantation in County Laois is 11.8 hectares. Half of all farm forestry plantations in the county are 7.4 hectares or less (see Figure 5)⁵.

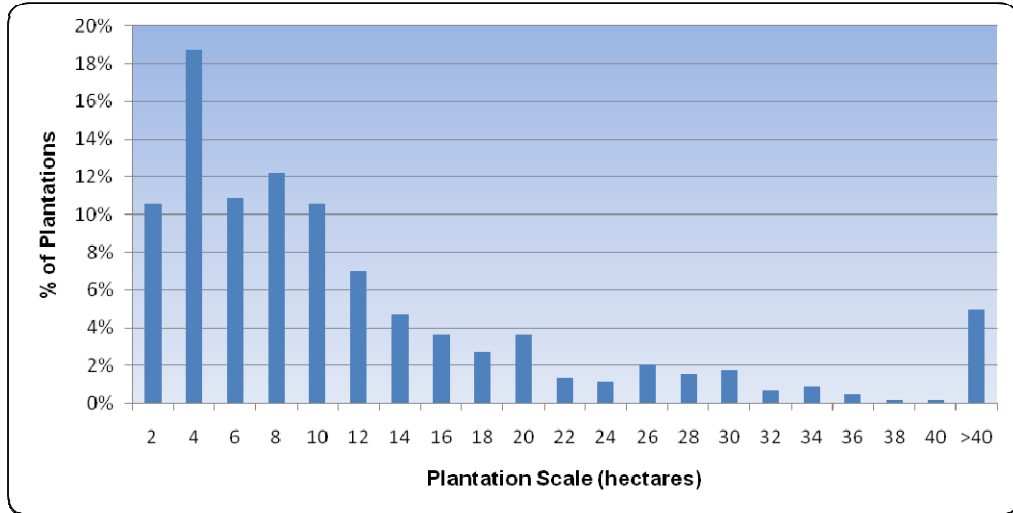


Figure 5 - Profile of County Laois Private Forestry Plantation Scale
(Refers to 2002 Planting & Older)

When reviewing the profile of farm forestry plantations it is important to assess their scale in the context of future timber sales and harvesting operations. Given that the timing and nature of conifer and broadleaf thinning operations is typically different, the conifer and broadleaf components of the Laois private forestry resource should be assessed separately to present a true picture of future operational scale (see Table 1 and Figure 6).

| | Average Plantation Size (ha) | Median Plantation Size (ha) |
|---------------------------|------------------------------|-----------------------------|
| Total Resource | 11.8 | 7.4 |
| Conifer Resource | 11.0 | 6.8 |
| Broadleaf Resource | 4.0 | 2.3 |

Table 1 - Profile of County Laois Private Forestry Plantation Scale
(Refers to 2002 Planting & Older)

⁴ All Forest Service afforestation data for County Laois were presented in an anonymous format and it was not possible to link owners to multiple contract numbers (afforestation plots). Many owners may have more than one contract number associated with planting operations in different years. For example, among the 50 survey participants, 16 (32%) were associated with more than one contract number. Therefore while these data provide a useful insight into plantation scale within the county, it presents the worst case scenario as some owners will benefit from additional scale from having multiple contract numbers of similar age classes.

⁵ These statistics do not account for a reduction in plantation scale due to non-productive areas which cannot be determined from baseline afforestation statistics and must be assessed as part of the resource survey (see Section 2.3.1).

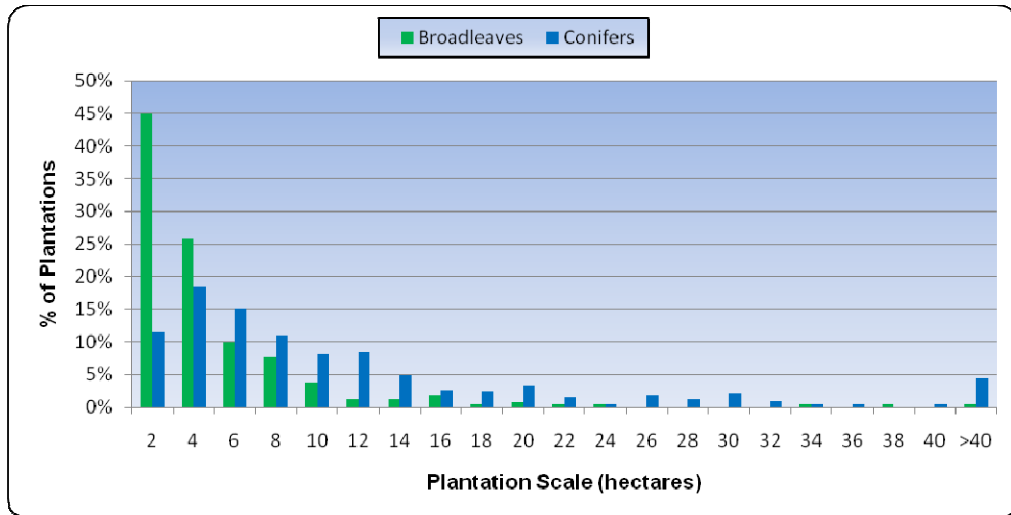


Figure 6 - Profile of County Laois Private Forestry Plantation Scale – Broadleaves & Conifers
(Refers to 2002 Planting & Older)

These baseline resource data show that there is a significant proportion (64%) of conifer plantations less than 10 hectares in size within the Laois private forestry resource. However, the 36% of conifer plantations greater than 10 hectares in size account for over 74% of the total Laois farm forestry conifer resource (see Table 2).

| | % Plantations > 10ha | % Resource in Plantations > 10ha |
|---------------------------|----------------------|----------------------------------|
| Total Resource | 37% | 74% |
| Conifer Resource | 36% | 74% |
| Broadleaf Resource | 8% | 38% |

Table 2 - Analysis of County Laois Private Forestry Plantation Scale
(Refers to 2002 Planting & Older)

The Laois farm forestry broadleaf resource is characterised by a large number of relatively small plots, often comprising part of larger mixed species plantations. Half of all broadleaf plantations within the county are 2.3 hectares or less.

2.3 Development of the Laois Farm Forestry Resource to Date – Resource Survey Results

Historic afforestation records simply tell us what was planted in the past. They do not provide an insight into the on-going performance of establishing forest crops or their future potential to produce viable timber harvests. This must be assessed by conducting a detailed ground survey of a sample of afforested sites, as per the methodology described in Section 1.

Findings from the survey show us that the County Laois private farm forestry resource is best described as a “mixed bag”. It is made up of a diverse array of plantations encompassing a wide range of age classes, species, site sizes, productivity classes, stocking levels, tree quality classes, ownership profiles and locations. This is no different to farm forests across the country.

In order to generate a timber production forecast for this diverse resource, we must first compile some fundamental crop parameters that represent the typical nature of the plantations surveyed within the county which can then be fed into timber yield forecasting models. These parameters have been assessed for each of the 50 private farm forestry plantations surveyed across County Laois and weighted averages have been compiled for timber production forecasting purposes.

2.3.1 Average Productive Area

Not all land officially recorded by the Forest Service as being afforested will be capable of producing a timber crop. Unproductive areas are comprised of roads, ride-lines, ditches, areas that did not establish successfully and unplanted areas under ESB wires. These have been assessed for each plantation surveyed using a combination of maps, aerial photography and on-site survey results. Productive area is defined as a percentage of the total recorded forest area.

Findings from the resource survey show that the average productive area of farm forestry plantations in County Laois is 81%. This means that, on average, 81% of the officially recorded area of farm forestry plantations can be classified as capable of producing timber⁶ while 19% can be classified as unproductive. This unproductive area has been accounted for in all timber production potential forecasting (see Section 3).

2.3.2 Average Yield Class

Yield Class defines the productive potential of a timber crop. It is an estimate of the average annual production of timber from a hectare of fully stocked forest over its lifetime or rotation and is expressed in Cubic Metres per Hectare per Year (m³/ha/annum). An understanding of Yield Class is an important precursor to any timber production forecasting exercise.

A species specific Yield Class has been estimated for each plantation surveyed using Top Height measurements and planting year data⁷. In order to generate a species specific timber production forecast for the farm forestry resource within County Laois, Yield Class data have been analysed and presented for five principal species groups. These are Sitka spruce, Norway spruce, Other Conifers, Ash & Sycamore and Other Broadleaves.

Findings from the resource survey show that the average Yield Class of conifer crops growing in farm forestry plantations in County Laois is 21.2 m³/ha/annum. The average Yield Class of broadleaf crops growing in farm forestry plantations in County Laois is 8.8 m³/ha/annum.

Table 3 below presents average Yield Class results for the five principal species groups analysed.

| Species Group | Average Yield Class (m ³ /ha/annum) |
|-------------------|---|
| Sitka spruce | 22 |
| Norway spruce | 20 |
| Other Conifers | 16 |
| Ash & Sycamore | 10 |
| Other Broadleaves | 6 |

Table 3 - Yield Class for the Five Principal Species Groups

2.3.3 Thinning Potential

Thinning involves the removal of part of the forest crop in order to concentrate future volume growth on fewer and better quality stems. By thinning a forest, the quality of the crop is improved (straighter, healthier trees) and individual trees can reach a larger, more valuable size within a shorter timeframe. Depending on prevailing timber market conditions and plantation specific operational costs, first thinning operations can generate modest revenues while adding significant value to future harvests. However, not all forests are suitable for thinning due to excessive risk of wind damage. Understanding the thinning potential of crops within the County Laois farm forestry resource is an important precursor to forecasting the potential volumes of timber produced. If forests are not thinned, harvest volumes will be significantly delayed and the average size of harvested trees will be smaller.

⁶ In general, unproductive areas were distributed evenly across all species surveyed, allowing us to apply a single productive area reduction factor to each species group when developing species specific timber production forecasts (see Section 3).

⁷ Using Forestry Commission General Yield Class Curves.

Findings from the site surveys show that all plantations assessed were classified as being suitable for thinning, based on silvicultural criteria alone. It should be noted that this is a subjective classification made by the project forester, based on a site specific silvicultural assessment. While all surveyed plantations were classified as being silviculturally suitable for thinning, other economic and social factors may preclude thinning operations in practice. These factors, particularly relating to plantation scale and access are considered in Section 4 of this report.

Based on these surveyed forest crop parameters and Forest Service afforestation statistics, the timber production potential of the County Laois private farm forestry resource can be forecast. This is documented in **Section 3**.

2.4 Profile of County Laois Farm Forestry Resource Owners – Ownership Survey Results

Figures 7 and 8 below present the general profile of private forestry owners surveyed as part of this resource study.

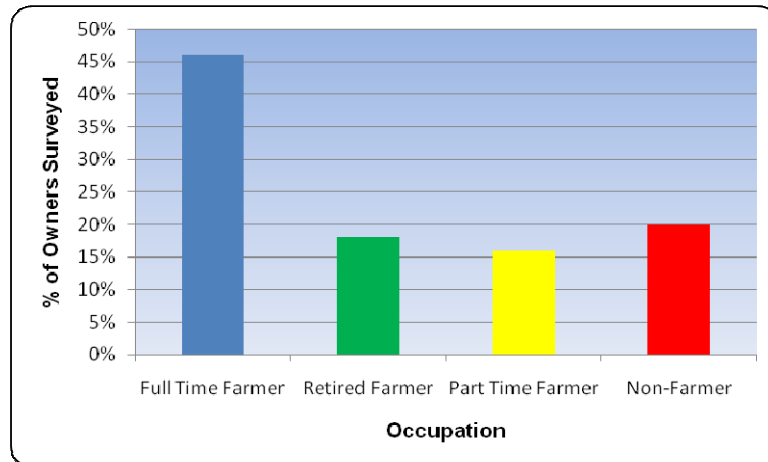


Figure 7 – Occupation Class of County Laois Private Forestry Plantation Owners

80% of plantation owners surveyed can be categorised as either full time, part time or retired farmers.

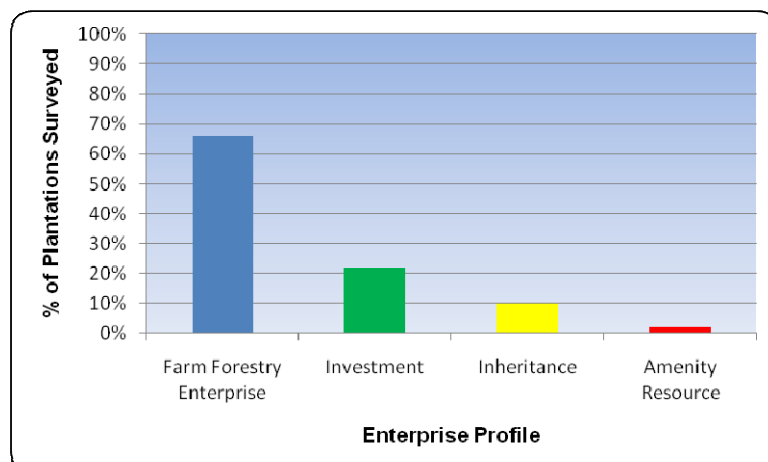


Figure 8 – Enterprise Class of County Laois Private Forestry Plantations

It is noteworthy that 32% of plantations surveyed can be classified as either investments (associated with specific land purchase), or recent inheritances. These plantations make up almost half of the surveyed area.

Issues relating to the motives and intentions of the surveyed owners are discussed in Section 4.6 of this report, in the context of assessing the likely levels of thinning activity in the future.

Section 3: Forecasting the Timber Production Potential of the County Laois Private Forestry Resource

3.1 Overview of Timber Production Forecasting

In a perfect world, a well developed forest resource would have an even age class distribution. This means that each age class across a typical rotation length is growing on equal areas of land. This allows for a very consistent annual supply of timber and facilitates relatively simple timber production potential forecasting, largely determined by the total area and average Yield Class of the resource. For example, a 1,000 hectare forest resource with an even age class distribution and an average Yield Class of 20 has a potential annual timber yield of about 20,000m³.

However, an even age class distribution rarely exists in any forest resource and Ireland's private farm forestry resource has been shaped by considerable variation in annual afforestation activity and is now characterised by a very uneven age class distribution complicated further by differing conifer and broadleaf compositions over time. County Laois is no exception, with about 85% of the county's private farm forestry resource under the age of 20, and virtually all (98%) of its farm forestry broadleaf resource under the age of 20. Therefore, in order to generate a reliable estimate of timber production potential over the next 10 years, we must consider both the **average Yield Class** of the conifer and broadleaf resource and the **productive areas of conifer and broadleaf plantations scheduled for harvesting each year**.

3.2 Forecast of Potential Timber Volumes (2011 to 2020)

A 10 year timber production potential forecast for County Laois private farm forestry plantations has been produced. The forecasting methodology uses results from inventory assessments of 50 survey sites within the county along with plantation specific Forest Service private sector afforestation data relating to 5,250 hectares of officially recorded private afforestation within the county prior to 2003.

The total recorded resource was stratified into 5 species groups (Sitka spruce, Norway spruce, Other Conifers, Ash & Sycamore and Other Broadleaves) and annual age classes. The total area of farm forestry within each species group and age class was computed and discounted by 19% to reflect an average productive area of 81%, as per survey findings (see Section 2.3.1). A Yield Class specific (see Section 2.3.2) Yield Model was applied to each species group, forecasting the timing and volume of thinning and clearfell yields.

The potential timber production from County Laois private farm forestry plantations established prior to 2003 is presented in Figure 9 below. It shows a steady increase in forecast volumes as more and more plantations reach the timber production phase of their rotation. The total potential harvest over the next 10 years is estimated to be in excess of 370,000m³, equating to an average of 37,000m³ per annum. The dominance of coniferous timber is noteworthy, constituting about 93% of forecast volumes.

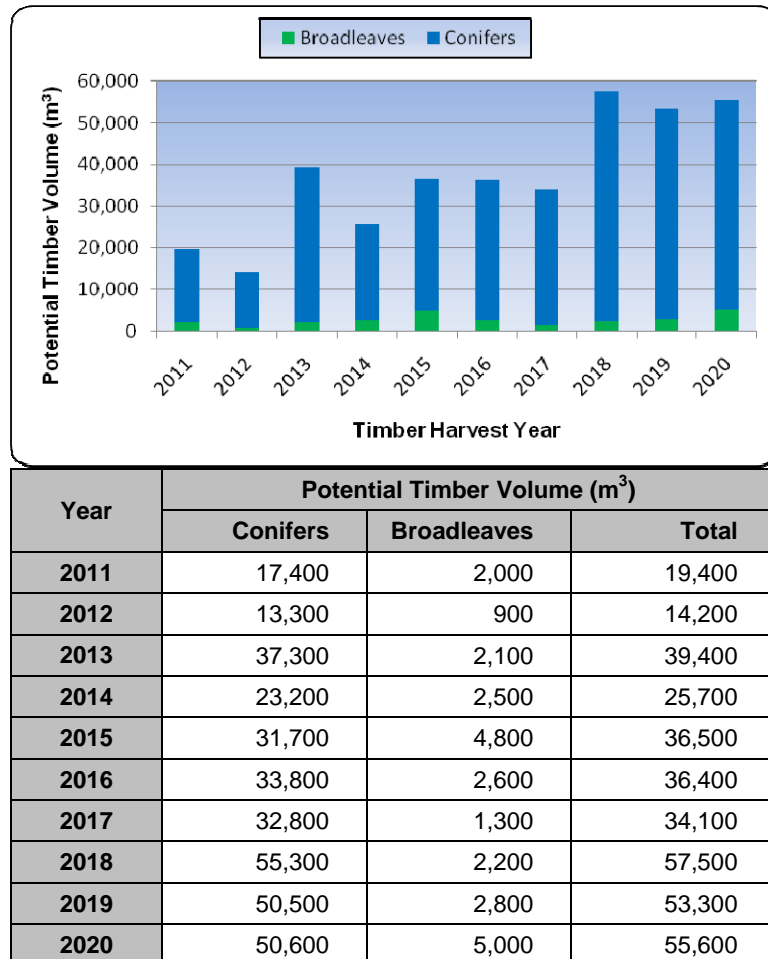
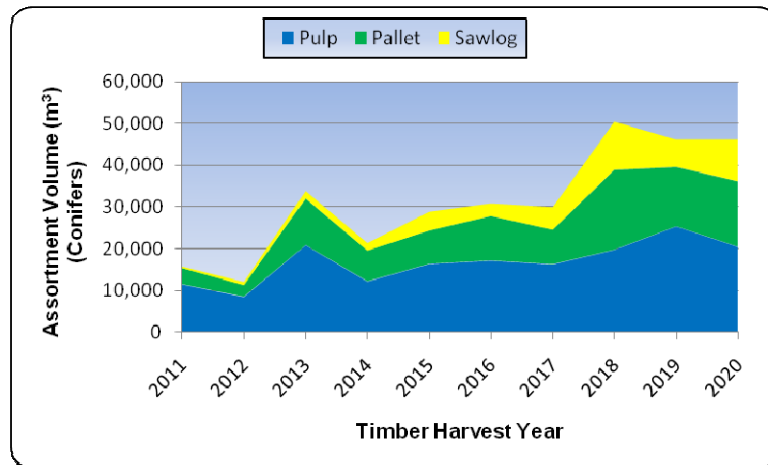


Figure 9 - Potential Timber Production from County Laois Private Farm Forestry Plantations (2011 – 2020)

For forecast conifer yields, an estimated timber product yield breakdown has been calculated⁸. Forecast yields of Pulpwood, Palletwood and Sawlog are presented in Figure 10 below. This breakdown is based on Forestry Commission assortment tables and allows for an average harvest loss of 8% across all harvest types.



| Year | Potential Timber Volume (m ³) - Conifers | | | |
|------|--|--------|--------|--------|
| | Pulp | Pallet | Sawlog | Total |
| 2011 | 11,500 | 3,900 | 400 | 15,800 |
| 2012 | 8,500 | 2,800 | 800 | 12,100 |
| 2013 | 20,900 | 11,200 | 1,800 | 33,900 |
| 2014 | 12,200 | 7,400 | 1,800 | 21,400 |
| 2015 | 16,400 | 8,000 | 4,500 | 28,900 |
| 2016 | 17,200 | 10,700 | 3,000 | 30,900 |
| 2017 | 16,300 | 8,300 | 5,400 | 30,000 |
| 2018 | 19,800 | 19,200 | 11,500 | 50,500 |
| 2019 | 25,400 | 14,300 | 6,500 | 46,200 |
| 2020 | 20,500 | 15,700 | 10,000 | 46,200 |

Figure 10 - Potential Conifer Timber Assortment Yields from County Laois Private Farm Forestry Plantations (2011 – 2020)

Pulpwood and palletwood will dominate potential yields from the County Laois private farm forestry resource over the majority of the forecast period, constituting over 90% of potential conifer timber production over the next 5 years, and about 85% of potential production over the forecast period.

⁸ Using Forestry Commission Stand Overbark Volume Assortment Tables.

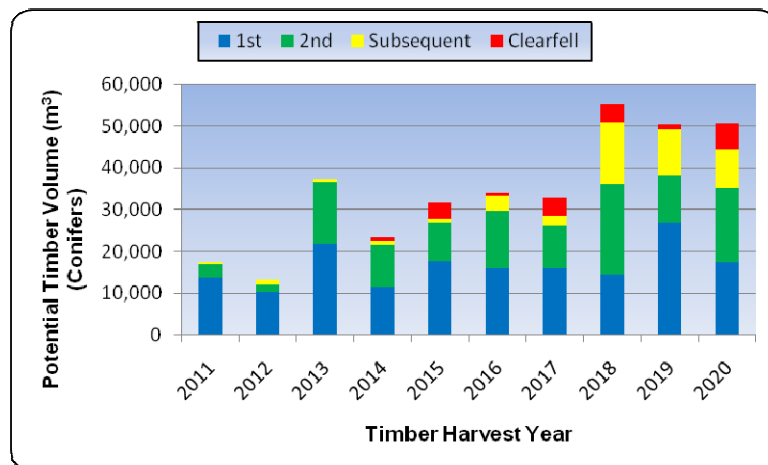
3.3 Forecast of Harvesting Operation Requirements (2011 to 2020)

Table 4 presents a forecast of the total area of private farm forestry within County Laois reaching the stage of first thinning over the next ten years. For example, it is estimated that 224 hectares of the county's conifer resource and 75 hectares of the county's broadleaf resource will reach the stage of first thinning in 2011.

| Year of 1 st Thinning | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|----------------------------------|------|------|------|------|------|------|------|------|------|------|
| Conifer Area (ha) | 224 | 171 | 351 | 186 | 287 | 275 | 274 | 254 | 446 | 305 |
| Broadleaf Area (ha) | 75 | 29 | 56 | 15 | 64 | 23 | 17 | 22 | 39 | 19 |

Table 4 - Areas Reaching the Stage of First Thinning Over the Next Ten Years

Forecast yield data have been analysed to assess the potential volumes from first thinning, second thinning, subsequent thinning and clearfell operations⁹ (see Figure 11 below) within the coniferous resource.



| Year | Potential Timber Volume (m ³) - Conifers | | | | |
|------|--|----------------------|-----------|------------|--------|
| | 1 st Thin | 2 nd Thin | Sub. Thin | Clear Fell | Total |
| 2011 | 13,700 | 3,300 | 400 | - | 17,400 |
| 2012 | 10,400 | 1,600 | 1,300 | - | 13,300 |
| 2013 | 21,800 | 14,700 | 700 | - | 37,200 |
| 2014 | 11,500 | 10,100 | 1,100 | 600 | 23,300 |
| 2015 | 17,600 | 9,200 | 1,000 | 3,900 | 31,700 |
| 2016 | 16,000 | 13,700 | 3,600 | 500 | 33,800 |
| 2017 | 15,900 | 10,400 | 2,200 | 4,300 | 32,800 |
| 2018 | 14,400 | 21,800 | 14,800 | 4,300 | 55,300 |
| 2019 | 26,800 | 11,500 | 11,000 | 1,300 | 50,600 |
| 2020 | 17,500 | 17,600 | 9,300 | 6,200 | 50,600 |

Figure 11 – Forecast Volumes associated with 1st, 2nd and Subsequent Thinning and Clearfelling Operations in Conifer Plantations

Combined, first and second thinning operations are forecast to average about 28,000m³ per annum over the next 10 years. This equates to an annual workload for approximately 2.5 thinning

⁹ For the purpose of this analysis it has been assumed that all sites will be clearfelled before or at an age of maximum mean annual increment. However, alternative silvicultural systems to clearfelling may be adopted by some private owners (e.g. continuous cover systems), possibly reducing the forecast levels of clearfell operations.

machine operators and 2 forwarder operators¹⁰, assuming “normal” operating conditions. One of the major challenges facing the Laois Farm Forestry Group will be to present economically viable work packages to timber harvesting contractors. This may be achieved through initiatives such as geographic clustering and cooperative scheduling of thinning operations (see Section 4).

When forecasting timber yields from private farm forestry resources, the term “potential” production is used to differentiate from actual or realisable production. This forecasting exercise has estimated the total timber production potential of the county’s private farm forestry resource. Whether or not this annual potential is realised depends on the influence of many constraints which cannot be forecast with any degree of certainty. These constraints are discussed in Section 4 of this report, some of which, as mentioned above, may be overcome through cooperative initiatives undertaken by the Laois Farm Forestry Group.

3.4 Comparison with COFORD Forecast Project Predictions

COFORD, the National Council for Forest Research and Development has published a forecast of roundwood production from private sector forests for the period 2009 to 2028¹¹. This has been produced as part of the COFORD Forecast project which will continually improve and update this forecast over the coming years. While detailed data at a county level is limited, it is possible to make some basic comparisons between the COFORD forecast and the resource study forecast.

Figure 12 below compares the COFORD forecast with this resource study forecast for the county’s total timber production potential over the next ten years. While the resource study forecast is predicting about 50% more volume, a very similar upward trend is predicted by both forecasts, beginning and ending at very similar levels.

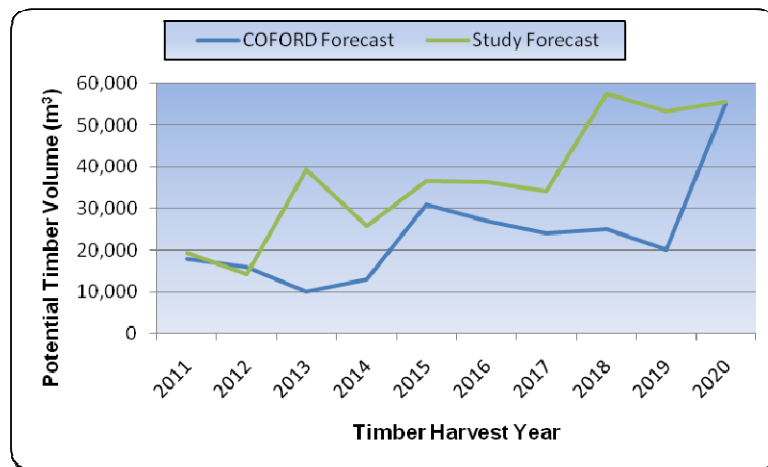


Figure 12 – Forecast Comparisons - COFORD Forecast and Laois Farm Forestry Resource Study Forecast

3.5 Forecasting the Potential Number of Participants

Forest Service afforestation records have been modelled to estimate the potential number of private farm forestry plantations within County Laois reaching the stage of first thinning over the next ten years. While the number of plantations does not exactly match the number of owners, due to the fact that some owners have more than one plantation, this analysis presents a reasonable estimate of the number of farm forestry owners with plantations reaching the stage of first thinning operations over the forecasting period. **On average, about 29 conifer plantations**

¹⁰ Under “normal” thinning operations, an efficient thinning machine operator will typically produce about 10,500m³ per annum in first thinnings and 15,000m³ per annum in second thinnings. A forwarder operator will typically produce about 14,000m³ per annum in first thinnings and 20,000m³ per annum in second thinnings. Source: Personal communication with established timber harvesting contractors.

¹¹ Phillips, H., Redmond, J. Mac Siúrtáin, M. and Nemesova, A. 2009. *Roundwood production from private sector forests 2009 – 2028. A geospatial forecast.* COFORD, Dublin.

per year will reach the stage of first thinning over the next 10 years (see Figure 13). If smaller plantations (less than 4ha) are excluded from this analysis, this average drops to about 23 per year. This is a considerable number, considering that only 1 out of the 50 conifer plantations surveyed had already been thinned.

The most important point to note in this analysis is the steep upward trend in potential first thinning activity over the next 5 years (2011 to 2015). In the absence of reliable regionally specific data on annual timber harvesting activity within the private farm forestry sector, it is not possible to determine the level of activity within County Laois to date. However, given that only one of the 50 conifer plantations surveyed had already been thinned and four were considered to be at a late stage for first thinning, it seems that actual activity is currently significantly lower than potential activity. This is not unusual, and has been the case across the vast majority of Ireland's private farm forestry sector to date.

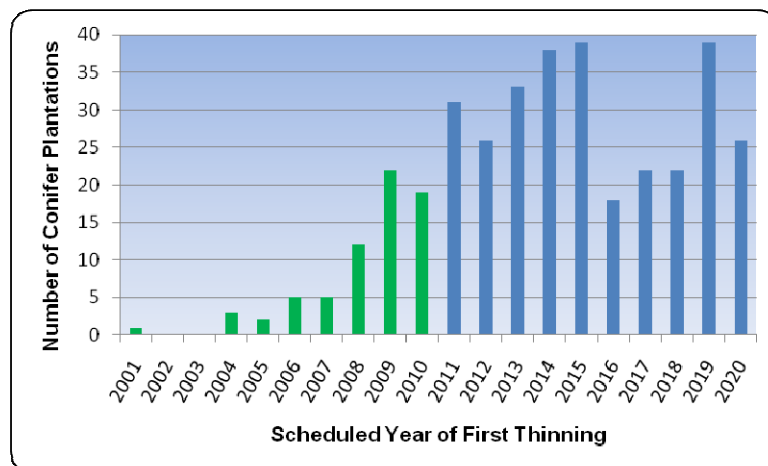


Figure 13 – Estimate of Potential Number of Conifer Plantations Ready for First Thinning¹²

The same analysis was conducted for all fast growing broadleaf (Ash and Sycamore) plantations within the County that are greater than 0.5 hectares (see Figure 14 below). **On average, about 14 Ash and / or Sycamore plantations (greater than 0.5 hectares) per year will reach the stage of first thinning over the next 10 years.** Again, when assessing the broadleaf resource, the upward trend in potential first thinning activity over the next 5 years is also significant.

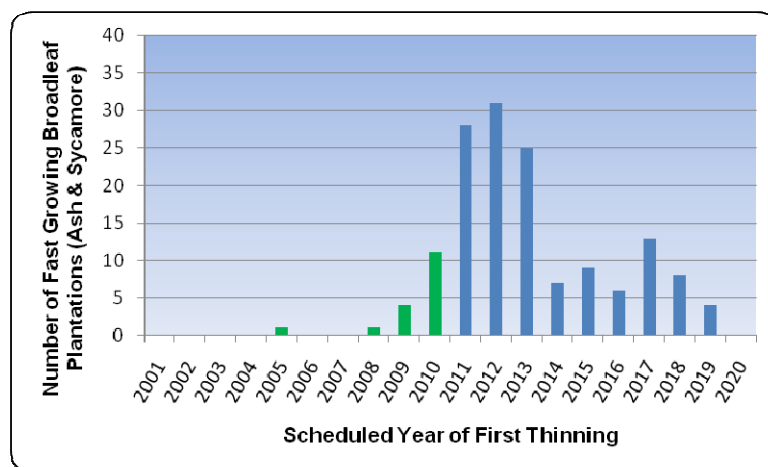


Figure 14 – Estimate of Potential Number of Ash & Sycamore Plantations (> 0.5 ha) Ready for First Thinning¹³

¹² Assuming an average time of first thinning operations to be Year 19.

¹³ Assuming an average time of first thinning operations to be Year 17.

Section 4:

Suitability of Co. Laois Farm Forests to Produce Timber

The suitability of the County Laois private farm forestry resource to produce timber over the next ten years has been assessed in terms of:

- The **location** of the resource in relation to timber harvesting infrastructure and markets;
- The **silvicultural suitability of plantations for thinning**;
- The **existence of suitable plantation access** for timber harvesting operations and timber extraction;
- The **scale** of individual plantations and the **scope to increase operational scale by clustering** plantations for harvesting operations;
- The **potential quality of timber** from the resource;
- The **intentions of plantation owners**.

While it is important to understand what the potential yield from the County Laois private farm forestry resource might be, it is equally important to understand some of the factors most likely to hinder the realisation of these potential yields in order to begin to address them and develop systems to optimise returns from farm forestry plantations. While assessing the suitability of the county's resource to produce timber, some recommendations have been made relating to possible means of overcoming identified constraints.

4.1 Location

County Laois benefits from a well established timber supply chain which has primarily developed around timber grown in Coillte owned plantations. It is the home of several long established timber harvesting, haulage and processing businesses. There are good local markets within the county for all timber products including Sawlog, Palletwood, Stakewood and Energywood and its very central location allows cost effective access to many of the major timber processing facilities in Ireland including the major pulpwood consuming panelboard mills. This proximity to local markets gives a strong advantage to the county's private forest owners when compared to other more isolated counties in Ireland. However, due to the low levels of private sector activity to date there is no established timber supply chain specifically serving the private farm forestry sector. This is one of the major problems identified by plantation owners at or approaching first thinning stage, many of whom showed uncertainty about their intended approach to thinning their plantations and getting their timber to the market.

Recommendation:

The Laois Farm Forestry Group should liaise with local businesses within the County Laois timber supply chain, and present generic data to them about their members' farm forestry resources. Information in this report should help in this regard. This will help to foster cooperation between growers and timber buyers. It may be a good idea to invite representatives from local timber processing enterprises to some of the group meetings to discuss issues relating to local markets and their specific requirements.

4.2 Silvicultural Suitability of Plantations for Thinning

All but one of the 50 plantations surveyed were considered suitable for thinning, on silvicultural grounds. Only two plantations had been thinned to date, one of which had recently undergone a light second thinning. Four plantations were considered to be at a late stage for first thinning, ranging in age from 18 to 22 years. While at a stage of heightened wind throw risk, three of these plantations were still considered suitable for thinning in 2011. The oldest plantation surveyed (22

years) was considered over mature for first thinning operations and a no-thin management regime was recommended.

It is noteworthy that 58% of sites surveyed were considered ready for first thinning within the next three years (2011 to 2013). This accounts for 40% of the productive area of the surveyed plantations. While it is not possible to predict what percentage of private farm forestry plantations will actually be thinned within the county, it is of growing concern that, while currently suitable for thinning, many of these forests may miss the window of opportunity for first thinning operations and become unsuitable for thinning by virtue of their age and associated vulnerability to wind damage.

Recommendation:

The Laois Farm Forestry Group should continue to promote the importance of timely first thinning operations among its members and help to provide ongoing technical direction in this regard. Initiatives to lessen or remove constraints due to scale and / or poor access should also be considered (see Sections 4.3 and 4.4).

4.3 Plantation Access for Timber Production

4.3.1 Inspection Paths

The cutting of inspection paths is the first step in preparing a plantation for thinning operations in coniferous plantations. Without adequate access, developing timber crops cannot be assessed and important stand parameters cannot be measured. All participating owners were encouraged to arrange for inspection paths to be cut through their plantations prior to the survey visits. It was stressed that improved access to forests would facilitate a more complete and comprehensive survey. At the time of surveying, **81% of conifer plantations assessed had some form of inspection paths cut**, and of these, 53% were considered to be of a good standard, suitable for pre-sale timber inspection and measurement operations¹⁴. The survey visits helped to highlight the value of inspection paths and many owners were motivated to arrange for additional paths to be cut.

Recommendation:

The Laois Farm Forestry Group should continue to promote the timely development of inspection paths and help to provide ongoing technical direction for its members in this regard.

4.3.2 Access Roads for Timber Trucks

An assessment of access roading requirements was made for each plantation surveyed¹⁵. The main survey findings relating to roading requirements are highlighted below:

- 8 of the surveyed plantations already have some form of forest road access (6 of these have adequate access for future harvesting operations while 2 require some additional road construction). Some progressive owners have begun forest road development in conjunction with other farm work or are building small sections at a time, when construction materials become available.
- 8 of the surveyed plantations do not require roading or are considered too small to justify any road construction. These are all relatively small plantations (averaging 2.5 hectares), with a high broadleaf component (50%).
- 36 of the surveyed plantations (72%) require some degree of forest road construction, with an average requirement of 360 metres.

¹⁴ Wherever possible, inspection paths should be cut in a structured manner throughout a plantation. If possible, they should be mapped to allow users (foresters, harvesting contractors, timber buyers etc) to find and utilise all paths when assessing a plantation. The start of paths (entrances) and all intersections should be clearly marked.

¹⁵ Roading requirements were estimated based on existing best practice where "normal" roading density provides for a maximum forwarding distance of 400m and an average forwarding distance of 200m.

- 15 of the surveyed plantations were considered problematic regarding access for future harvesting operations.
- Of the 36 plantations with roading requirements, the average road density requirement is about 19 metres per hectare. Individual requirements range from 4 to 95 metres per hectare, with 75% of all requirements being within the Forest Service funded Forest Road Grant Scheme 25 metres per hectare allowance.
- The average road density requirement across the total resource area surveyed is about 15 metres per hectare.
- Of the 28 surveyed plantations considered to be at first thinning stage now or within the next two years, only 3 have forest roads already constructed. 19 plantations require some degree of forest road construction, totalling an estimated 5,570 metres.

There is currently a lack of adequate roading for timber harvesting operations within the county's farm forestry resource and this will be a significant constraint to market access and will hinder the development of thinning activity in the county. The development of good plantation access is a critical issue for Laois Farm Forestry Group members. The value of their potential timber yields will be negatively affected by failing to take prompt action in this regard.

4.3.2.1 Uncertainty of the Forest Road Grant Scheme

The Forest Service funded Forest Road Grant Scheme provides grant aid for the construction of timber harvesting roads to a maximum density of 25 metres per hectare. While some forests surveyed will clearly need additional non-grant aided investment to achieve adequate access, survey findings indicate that a large proportion (75%) of private owners should be able to construct adequate forest roads within the grant scheme budgets. However, the lack of forest road construction activity identified in the survey is partly due to recent curtailments in grant availability and uncertainty with regard to future funding, leaving many forest owners uncertain as to whether to proceed with grant applications.

Currently, forest owners who build a forest road with technical approval but without financial approval will become ineligible for grant aid. In the prevailing fiscal situation where Government funding is limited, forest owners with technical approval from the Forest Service should be allowed to construct their road and apply retrospectively for a grant at their own risk. If the funding does not become available within a certain timeframe there should be no liability to the Forest Service. However, if and when funding does become available, progressive owners who have developed forest roads to Forest Service specifications without grant aid should not be penalised for progressing with their forestry enterprises.

Some cases were identified during the course of the survey where owners of viable plantations are reluctant to proceed with road development and thinning operations because of Forest Road Grant Scheme uncertainty. Some owners indicated that while they would be able to secure credit to temporarily fund road construction costs until timber revenues were realised, they are reluctant to do so knowing that they will jeopardise their opportunity to receive substantial roading grants. A system of retrospective payment would remove this current disincentive to progress towards thinning.

4.3.2.2 Possible Opportunities for Cooperative Road Construction?

Some opportunities for cooperative road building and access sharing among members of the Laois Farm Forestry Group were identified during the survey. One particular case demonstrates the potential benefit of cooperation in this regard. A member with a 10 hectare plantation ready for first thinning faces a considerable road development cost, requiring about 1,050 metres of roading, equating to a density of 95 metres per hectare. By cooperating with an adjoining Group member who has a 27 hectare plantation approaching first thinning stage, a combined roading density of 34 metres per hectare could be achieved. It should be noted that the member surveyed was unaware of the ownership details of the adjoining privately owned plantation.

Cooperation such as this would reduce overall road development costs within the county and possibly lead to opportunities for further cooperation during thinning operations and timber sales. However, in most cases, the benefits of cooperation are not balanced, with members in a “weaker” position regarding their plantation’s scale or access, “piggy backing” other members’ more viable plantations. This is where the good will of the Laois Farm Forestry Group members will be required.

Recommendations:

The Laois Farm Forestry Group should continue to promote the timely development of forest roads and help to provide ongoing technical direction for its members in this regard.

The Group should lobby the relevant government departments to change the rules regarding forest road construction grant funding to allow retrospective payments for road building grants, provided roads are technically approved and developed to Forest Service specifications.

The Group should promote the voluntary sharing of basic plantation details (location, size & age) and associated owner contact details among members in order to capitalise on any potential for cooperative approaches to forest road development such as those identified during the survey.

4.4 Plantation Scale

Findings from the resource survey show that the average productive area of farm forestry plantations in County Laois is 81% of the recorded afforestation area (see Section 2.3.1). A plantation scale reduction factor of 19% has been applied to Forest Service afforestation data to present a more realistic profile of plantation scale in the context of timber sales and harvesting operations planning (see Table 5).

The average productive area of conifer farm forestry plantations in County Laois is 8.9 hectares, with half of all such plantations having a productive area of 5.5 hectares or less. Assuming that normal forest management practice is employed, it is predicted that conifer plantations will produce an average of 530m³ or less from first thinning operations, with half of all conifer plantations producing 330m³ or less. This equates to about 10 typical lorry loads of timber and would be considered comparatively small in scale.

| | Average Productive Area (ha) | Median Productive Area (ha) | Average 1 st Thinning Yield (m ³) ¹⁶ | Median 1 st Thinning Yield (m ³) |
|---------------------------|------------------------------|-----------------------------|--|---|
| Conifer Resource | 8.9 | 5.5 | 530 | 330 |
| Broadleaf Resource | 3.2 | 1.8 | 65 | 35 |

Table 5 - Profile of County Laois Private Forestry Plantation Productive Scale
(Refers to 2002 Planting & Older)

It is noteworthy that the average productive area of conifer plantations surveyed during the resource study was over 10 hectares, with half of all surveyed plantations having a productive area greater than 8.5 hectares, considerably higher than the county average. This is not surprising as owners of larger plantations who have invested significant land resources in their forestry enterprises are more likely to present as willing participants.

The typical productive area of broadleaf farm forestry plantations in County Laois is considerably smaller than that of conifer plantations, averaging 3.2 hectares, with half of all such plantations having a productive area of 1.8 hectares or less. Assuming that normal forest management practice is employed, it is predicted that broadleaf plantations will produce an average of 65m³ or less from first thinning operations, with half of all such plantations producing 35m³ or less, or just over one lorry load of timber.

¹⁶ Assuming a volume per productive hectare first thinning yield of 60 m³ for conifers and 20 m³ for broadleaves.

47% of conifer plantations surveyed also had some broadleaf species which increased their total productive scale. However, given the typically different nature of conifer and broadleaf silviculture, it will be difficult to increase operational scale and associated efficiencies by combining conifer and broadleaf thinning operations, with the possible exception of forest road development.

Owners of many of the plantations surveyed own more than one forest area and some have established plantations over more than one year. This may lead to improved operational scale over time as 2nd or 3rd thinning operations within earlier plantations will be combined with 1st thinning operations in later plantations. Also, the requirement for infrastructural development (roading / access) will be lessened for latter plantations if they are adjoining or nearby.

One of the major constraints to the farm forestry sector's future penetration into existing timber markets is the comparatively small scale of individual plantations and the corresponding small scale of forecast thinning harvests. The potential for grouping timber sales and harvesting operations to achieve more economically viable scale is explored below.

4.4.1 Assessing the Scope to Cluster Timber Sales & Harvesting Operations

A fundamental constraint to the economic viability of first thinning operations is lack of scale. Small plantations produce small volumes of timber from thinning operations and are associated with high overheads relative to the value of timber produced. Harvesting contractors experienced in farm-forestry thinning operations cite a threshold harvest volume of approximately 300m³, below which they cannot justify the overheads of relocating their operation a significant distance. It is estimated that half of all conifer plantations within the County Laois farm forestry resource will produce 330m³ or less from first thinning operations. However, economic thresholds for harvesting operations can be made up of more than one plantation, providing the combined harvest volume is within a catchment that does not require significant downtime between sites.

“Clustering” has become a popular term within the private forestry sector in recent years. One of the key strategies for private forest owners to optimise the value of their early thinning harvests is to facilitate more efficient harvesting operations by collectively planning a package of work in a local area and therefore creating increased scale regarding timber sales and harvesting operations. All surveyed owners are aware of the concept of clustering and cooperative sales and harvesting operations and the majority are willing to co-operate with each other in this regard.

While the potential for specific, local cooperation was considered when surveying the 50 sample plantations, it was not possible to source a geospatial database of private farm forests within the county in order to analyse the geographic locations of non-participating forests in relation to the 50 surveyed forests. This limited the opportunity for properly assessing the scope for “clustering” of forthcoming thinning operations within the county.

However, when assessed in broad terms, the relatively high density of private farm forestry plantations (5% of the county's land use) in County Laois presents definite opportunities to develop clusters or timber producer groups within local regions, providing the benefits of increased scale and improved operational efficiencies, leading to higher financial returns to owners from thinning operations. This is most evident in areas of higher afforestation density such as the lower reaches of the Slieve Bloom mountains around Mountrath and Camross and the upland regions around Luggacurran and Wolfhill to the south of the county.

While most owners were aware of any private plantations of a similar age in their vicinity, most had not fully investigated the potential to combine forces with neighbouring plantations. However, several owners were motivated during the course of the survey to explore the potential for a co-operative approach to first thinning operations with their neighbours. The survey identified a number of plantations which would benefit from joining forces with at least one neighbouring private plantation of a similar age. It also identified plantations which would benefit strongly from cooperation with Coillte.

It must be stressed that any scope to cluster will be significantly reduced if plantation owners are not fully prepared for first thinning operations vis-à-vis inspection paths, road construction and felling licence¹⁷ applications. Survey findings show that insufficient plantation access may significantly limit the scope for clustering timber sales and thinning operations within the county.

As with cooperative roading initiatives discussed in Section 4.3.2.2, the benefits of clustering will not always be balanced, with owners of smaller plantations benefiting more than owners of larger, more viable plantations. Effective clustering will require the support of the owners of larger, more independently viable plantations.

Recommendations:

The Laois Farm Forestry Group should consider the formation of a trial cluster among a group of willing participants. Results of the 50 plantation surveys conducted during this resource study could be used as a starting point for identifying potential cluster zones within the county.

The group should explore the possibility of developing a simple application to pinpoint member's plantations that are at or approaching first thinning stage. Again, the starting point for this could be the results of the 50 site survey.

In order for any clustering initiative to be developed, necessary plantation preparations for thinning operations must be prioritised including the cutting of inspection paths, the construction of forest roads and the securing of felling licences. The Laois Farm Forestry Group should continue to promote the timely development of inspection paths and forest roads and help to provide ongoing technical direction for its members in this regard.

The Group should promote the voluntary sharing of basic plantation details (location, size & age) and associated owner contact details among members in order to capitalise on any potential for cooperative approaches to thinning operations.

¹⁷ All survey participants understood the requirement for a State Felling Licence prior to the thinning or clearfelling of any area of their plantations. 21% of participants had already secured licences, all relating to plantations which had been recently thinned or were considered due for thinning within the next two years. Of the 79% of participants who had not yet secured licences, almost half owned plantations which were considered due for thinning within the next two years.

4.5 Timber Quality

The quality of future timber harvests from conifer plantations within the County Laois farm forestry resource will be largely determined by the nature of first and second thinning operations. Correct thinning operations with selection primarily focusing on improving the quality of the remaining growing stock is crucial if future timber harvest quality within the county is to be optimised. The one conifer plantation (Sitka spruce) observed during the course of the resource survey which had already undergone thinning operations had been thinned to a high standard with obvious benefits accruing to the remaining growing stock. It is important that members of the Laois Farm Forestry Group are aware of the importance of timber quality issues relating to first and second thinning operations if they intend to undertake or manage their own thinning operations. Also, the deployment of reputable and well trained harvesting contractors will help to optimise future timber harvest quality within the conifer resource (see Section 4.6).

4.5.1 Certified¹⁸ Supply from Private Farm Forests?

None of the plantations surveyed are being managed under a forest certification scheme. There is some concern emerging that private forest owners will be unable to sell their timber at optimal prices without obtaining certification, a process which can result in substantial cost and administrative overheads. It is generally felt that there is no immediate need for concern in this regard as Irish sawmills can currently process up to 30% uncertified timber without affecting the validity of their certification status. However, from discussions with local sawmilling enterprises in County Laois, it is apparent that the issue of timber processors reaching their non-certified timber quotas may restrict their plans to expand their log purchasing operations within the private sector in the near future.

Recommendations:

The Laois Farm Forestry Group should begin to explore practical means of achieving a recognised SFM certification status for their timber harvests in as cost effective a manner as possible. Some active Group members have been working closely with the development of the new PEFC¹⁹ certification standard, viewed as a potentially more practical means for private sector forests to attain certification status.

In the current absence of any certification system, members should consider cooperating with local timber processors to manage non-certified supply over time within allowable quotas.

4.5.2 Broadleaf Timber Quality

The quality of future timber harvests from broadleaf plantations within the County Laois farm forestry resource will have been largely determined by past management. While the quality of future yields can be improved by well managed re-spacing and thinning operations, the availability of a suitable proportion of well formed stems from which to select potential final crop trees is very important. To this end, a quality rating was given to each broadleaf plantation assessed during the resource survey. Some excellent broadleaf plantations were observed, where considerable effort has been invested in the establishment phase (shaping & pruning) and on-going tending is resulting in healthy stands with high quality timber yield potential. This was most notable in Ash, Oak and Beech plantations. Figure 15 summarises the overall assessment of broadleaf crop quality within surveyed plantations.

¹⁸ Forest Certification is a market based mechanism which seeks to use the forest products market to demand specific forest management standards from forest owners. It entails a voluntary process whereby forest owners can seek certification from an independent third party auditor that their forest is well managed, according to agreed national and international forest management standards. Forest Certification provides assurance to consumers that the timber in the product that they are buying comes from well managed forests. All Coillte owned forests are certified in this regard. Many of the sawmills and panelboard mills in Ireland now require a predefined percentage of their raw material (logs) to be sourced from certified forests.

¹⁹ Programme for the Endorsement of Forest Certification Schemes.

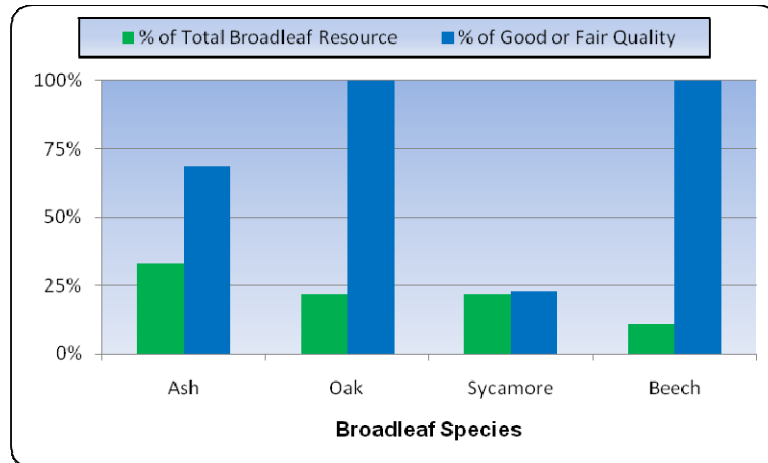


Figure 15 - Quality Rating of Surveyed Broadleaf Plantations

However, relatively large areas of poor quality broadleaves were observed due to low levels of intervention during the establishment and tending phase. This was particularly evident in Sycamore plantations. Only 23% of Sycamore plantations assessed were considered to be of Good or Fair quality. Some of the broadleaved plantations surveyed will struggle to produce high quality timber due to site suitability issues and / or a lack of management during the establishment and tending phase, leaving very few potential final crop trees with good stem form. Multiple leaders, basal sweep and very crooked stems prevailed in several plantations. However, poorer quality broadleaf plantations should not be disregarded as they have the potential to produce relatively large volumes of firewood to serve an increasing demand for hardwood firewood within the county.

Many of the broadleaved plantations surveyed that were considered to be of good or fair quality are now approaching the critical time for first thinning and timely re-spacing and thinning operations will be critical to maximise the quality of future yields. The one broadleaf stand observed during the course of the resource survey which had already undergone thinning operations had been thinned to a high standard, with obvious benefits accruing to the remaining growing stock.

As with the conifer resource, the deployment of reputable and well trained harvesting contractors will help to optimise future timber harvest quality within the county's broadleaf resource (see Section 4.6).

Recommendations:

The Laois Farm Forestry Group should promote the requirement for early management of broadleaf plantations to increase the potential for high quality hardwood timber production within the county. Case studies relating to broadleaf plantations approaching first thinning stage and of differing quality should be selected and visited by the group to clearly demonstrate the benefits of early management operations.

The Laois Farm Forestry Group should continue to promote the importance of timely first thinning operations in broadleaf plantations among its members and help to provide ongoing technical direction in this regard.

4.6 The Profile & Intentions of Plantation Owners

A summary of findings from interviews with a sample of private forestry owners within County Laois is presented below:

- **Low financial dependence on future revenues from timber harvesting:** While 98% of surveyed owners stated that they plan to thin their plantations, only 30 % considered themselves financially dependent to any significant degree on potential revenues from future timber sales, with 60% viewing any potential revenues as an income “bonus”. This prevailing lack of real financial dependence on future revenues from timber sales, particularly in the short to medium term, may present a major constraint to forecast timber production levels from thinning operations. If owners do not need to thin, it is likely that many will not, especially if their plantations are associated with other harvesting constraints such as poor access or small scale.
- **Relatively low levels of knowledge and experience relating to timber harvesting and sales operations:** Only 10% of surveyed owners have had any previous experience harvesting and / or selling timber. However, there is a willingness to learn. 84% of surveyed owners have already attended some form of education and training event relating to thinning operations while 95% expressed an interest in attending such events in the future. Notwithstanding this, the majority of owners feel that they will require assistance from someone in organising their thinning operations and selling their timber.
- **Relatively low levels of knowledge of, and contact with, the harvesting sector to date:** Given that only two of the 50 plantations surveyed have already been thinned, there has been relatively little contact between plantation owners and the timber harvesting sector to date. Only one third of owners surveyed know of a timber harvesting contractor in their area and discussions with owners suggest that there is a definite lack of confidence and trust regarding the *bona fides* of operators within the timber harvesting sector. Owners have been made very aware of the potential damage caused to plantations by improper first thinning operations and some may now be somewhat paranoid in this regard.

The deployment of reputable and well trained harvesting contractors will help to ensure that plantations are properly thinned and owners are paid in full for all timber harvested. Many of the owners surveyed feel that the Laois Farm Forestry Group has a vital role to play in providing feedback from members’ experiences of first thinning operations, particularly in relation to their dealings with harvesting and haulage contractors and timber purchasers.
- **Strong willingness to cooperate and share knowledge & experience:** Owners participating in the resource study were generally very open to the concept of developing a cooperative approach to timber sales and thinning operations. It should be noted that this profile may be somewhat biased as the cohort of owners interviewed were willing participants in the resource study, many of whom are relatively active members of the Laois Farm Forestry Group and are beginning to focus on impending thinning operations and the potential benefits of taking a cooperative approach to timber sales and harvesting.

Recommendations:

The Laois Farm Forestry Group should continue to promote the sharing of knowledge and experience among its members. Field events demonstrating all operations associated with preparing for and undertaking thinning operations should be repeated periodically within the county. This should include opportunities for members to meet with timber harvesting contractors operating within the county.

Laois Farm Forestry Group members should consider developing a system of recommendation for service providers operating within the County’s farm forestry sector. This might involve individual member’s providing feedback (both positive and negative) on their dealings with harvesting & haulage contractors and timber purchasers during their first thinning operations.

4.7 Potential for Adding Value to the Basic Forestry Product

As noted in Section 4.1, the Laois farm forestry resource is served by well established local markets for all timber products including Sawlog, Palletwood, Stakewood and Energywood and the county's central location allows cost effective access to many of the major timber processing facilities in Ireland including the major pulpwood consuming panelboard mills. Unlike timber growers in some more remote counties, timber growers in County Laois can sell their timber into the mainstream log commodity market, albeit through a somewhat underdeveloped supply chain as noted in Section 4.1. However, members of the Laois Farm Forestry Group should consider practical ways of adding further value to their timber harvests in order to optimise returns from their farm forestry enterprises. A number of value adding initiatives are considered below.

4.7.1 Harvested Timber Sales

Many farm forestry owners opt to sell their timber standing to a sawmill or timber harvesting contractor. This means that the timber purchaser carries out the timber harvesting operations and incurs the associated costs. This sales method involves the least amount of time input by the forest owner and requires no capital outlay. The owner is simply paid for what the sawmill harvests. However, it does not always yield the best price for the owner. When harvesting costs are discounted, net standing timber prices can often be lower than harvested timber prices due to the fact that timber buyers factor in additional costs associated with harvesting management overheads and risk. Forest owners have the potential to achieve higher timber prices if they are willing to take on the risk of selling their timber harvested, at roadside. Many sawmills view harvested timber as their preferred means of log supply and, providing forest owners can achieve the correct log specification with regard to quality and dimensions, selling harvested timber provides growers with definite potential for achieving stronger timber prices and adding value to their forecast timber harvests.

Selling harvested timber does not mean that farm forestry owners must harvest and extract their timber themselves. Established timber harvesting contractors will provide a thinning service to farm forestry owners at a price per m³, per hectare or per hour. Forest owners can contract timber harvesting experts to fell, extract and stack timber at roadside to a pre-determined specification, ready for collection by a timber purchaser. However, if owners are to opt for selling harvested timber they must be informed of the various technical aspects involved.

Establishing a good working relationship with a skilled timber harvesting contractor who understands the silvicultural requirements of thinning operations and who has the correct specification of machinery for first and second thinning is key to the success of developing systems of harvested timber sales within the county. Forest owner groups such as the Laois Farm Forestry Group can be instrumental in the fostering of good working relationships with timber harvesting contractors and in the development of efficient, sustainable work packages for contractors.

An additional benefit of harvested timber sales is the retention of control by the forest owner over all silvicultural and harvest site management issues. Focus can be balanced between timber production issues and the silvicultural quality of the thinning operation to ensure the optimal quality and development of the remaining crop.

4.7.1.1 Contract Supply

Security of raw material supply is a major issue affecting timber buyers in the pulpwood, sawlog and energywood processing sectors. Purchasers of logs may be prepared to pay a premium unit price for larger volumes of timber, committed over a pre-determined supply period. Forest owner groups such as the Laois Farm Forestry Group could play an important role in the development of timber supply co-ordination structures that can meet the growing demand for contractual timber supply emerging from the pulpwood and energy wood sectors.

4.7.2 Drying Timber for the Woodfuel Market

If farm forestry owners opt to harvest their timber and sell log products at roadside, they should also consider the potential for adding further value to their lower value pulpwood product by air drying it to meet the moisture content specification of the woodfuel market. Typically, the woodfuel sector requires timber to be air dried to moisture contents significantly lower than that of freshly harvested timber before it can be utilised. The target moisture content and the associated level of timber drying required will depend on the specific wood fuel market being served.

In the absence of pre-dried timber supplies, most wood fuel producers purchase fresh timber from forest owners and stockpile it in drying areas to achieve the desired moisture content following several months of air drying. This is a costly process for wood fuel producers as they must have sufficient space for large timber stacks and must carry the cost of timber stock as it dries. In an ideal world they would purchase air dried logs at their target moisture content, ready for processing and distribution. As energy content is directly related to moisture content, wood fuel producers offer a premium price for dried wood, particularly where moisture contents are such that no further drying is required. Farmers have the potential to utilise their farm land resource to speed up the timber drying process. Research has demonstrated that timber stacked in open areas such as farm land away from the shade and shelter of forest crops will dry quicker. If farm forestry owners intend to dry their timber for the wood fuel sector they should be fully informed of the various technical aspects involved. The matter of timber measurement is of particular relevance here as dry timber is considerably lighter than freshly felled timber, making a tonnage based measurement and payment system unsuitable and necessitating the requirement for a volume based measurement and payment system.

4.7.3 Processing Timber for the Woodfuel Market

Farm forestry owners considering the harvesting and drying of their timber crops should also consider the potential to add further value to their farm forestry produce by producing a finished wood fuel product such as bulk bags of air-dried firewood logs for the domestic market. Many farm forestry owners interviewed during the course of this study were found to be already availing of firewood supply from their forests to supplement their own domestic heating demands (see Section 4.7.3.1 below). However, there is strong potential for forest owners to generate additional farm revenues through the supply of firewood to local firewood markets, thus fostering a new culture of locally sourced renewable fuel use. This is particularly relevant to owners of broadleaf forests which yield higher quality wood fuel that can demand a premium price in the firewood market. Efficient and safe firewood production requires investment in specialist machinery which can be expensive, particularly if it is not fully utilised. Forest owner groups such as the Laois Farm Forestry Group could play a part in the development of machinery resource investment and time sharing initiatives among its members.

4.7.3.1 Substituting Existing On-Farm Requirements for Oil and Electricity

It is possible that farmers could utilise their own farm forestry resource in order to reduce or eliminate their requirement for oil and / or electricity for space and water heating, thus extracting optimal returns from their lower value farm forestry product (pulpwood). On average, between 4 and 6 tonnes of wood chips will displace 1,000 litres of home heating oil and with current uncertainty over future oil prices, individual farm forestry owners may well consider utilising a portion of their timber resource to satisfy their own heating requirements and that of their agricultural enterprise. One of the participants in the resource ownership survey had recently converted his home central heating system from oil to wood fuelled, utilising a high efficiency log gasification boiler. The Sustainable Energy Authority of Ireland (SEAI) currently provides financial assistance to home owners who wish to install new renewable energy heating systems. The development of practical models for the retention of small volumes of harvested material from farm forestry thinning operations should be considered with a view to providing for farm level heat demand (wood chip boilers or log boilers).

Section 5:

Potential for Recreation & Leisure Enterprises within County Laois Farm Forests

The potential for recreation and leisure activities and the development of associated enterprises was assessed for each plantation surveyed, in consultation with the plantation owner wherever possible. Owners were asked about their opinion and possible intentions regarding the future development of recreation and leisure activities within their farm forestry plantations.

While owners of five of the 50 plantations surveyed (10%) have either developed or are considering developing some form of recreational facility within their woodlands in order to generate additional, non-timber revenues, only one owner has developed such an enterprise (a motor cross trail facility). Two owners are exploring the potential for quad biking trails while one is considering the development of a retreat facility, tapping into the solitude and close to nature benefits of a developing broadleaf woodland.

Several plantations were being used for various forms of recreation including gun club game rearing facilities, game sanctuaries, horse riding trails, wildlife sanctuaries and walking trails. However, these had limited or no income generating potential.

While some plantations showed moderate potential for recreational and leisure enterprises due to their scenic and isolated locations, most owners are realistic about the practicalities of turning such potential into revenues. The majority of owners recognise the difficulty competing with the wide range of highly scenic Coillte forest properties within the county which offer free access to the public across large landscapes. Also, issues relating to public liability and associated insurance costs were cited as limiting factors.

Recommendations:

The Laois Farm Forestry Group should promote the development of recreation and leisure activities within their member's forests in order to realise any potential for generating additional, non-timber revenues from their resource.

Members currently engaged in or exploring the possibility of developing recreation and leisure activities within their forests should cooperate to investigate the availability and potential benefits of group insurance schemes.

Appendix 1: Example of Plantation Survey Data Sheet

Laois Farm Forestry Group Plantation Survey 2010

Introduction:

This plantation specific data summary has been compiled as part of the 2010 Laois Farm Forestry Group Resource Study. While the principal objective of the study is to generate a timber production forecast for private farm forests in County Laois over the period 2011 to 2020 based on a survey of 50 sample farm forestry sites, participants in the survey are being supplied with basic survey data relating to their own plantations. Please note that all information contained in this report is based on a brief survey / inventory visit and should not be considered conclusive for timber sales planning, valuation or management purposes. Plantations with good access / inspection paths in place at the time of the survey will be associated with more comprehensive measurement data.

| Plantation Identification | |
|---------------------------------|---------------------------------|
| Survey Number: | X |
| Forest Service Contract Number: | CAXXXX |
| Owner Name: | Forest Owner |
| Plantation Location: | Laois |
| Date of Inspection: | 29 th September 2010 |

| Plantation Details | |
|--------------------------------|---|
| Total Area ¹ : | 10 ha |
| % Productive: | 85% |
| Productive Area ² : | 8.5 ha |
| Planting Year: | 1996 |
| Age ³ : | 15 |
| Main Species: | Sitka spruce |
| Other Species: | Japanese larch Lodgepole pine Alder |

| Measurement Data | | | |
|------------------|-----------------------|-------------------------|--------------------------|
| Species | Avg. DBH ⁴ | Top Height ⁵ | Yield Class ⁶ |
| Sitka spruce | 15 cm | 10.7 m | 24+ |
| | | | |

| Thinning Prescription | |
|---|-------------|
| Is crop capable of receiving a thinning? ⁷ | Yes |
| Estimate of Thinning Year ⁸ | 2011 / 2012 |

| Roading Requirements ⁹ | |
|--|---|
| Metres of Access Roading Required to Plantation Edge | 0 |
| Metres of Internal Roading | 80m (1 Type turning / loading bay) |
| Comment: | Basic lay-by (30m) along public road would suffice but T Type turning / loading bay is desirable. |

| Potential Constraints to Harvesting Operations ¹⁰ |
|--|
| - |

| TO DO LIST – Priority Management Requirements ¹¹ |
|--|
| Apply for forest road construction grant. Some additional inspection paths desirable. |

| Other Notes |
|--|
| Block 1 to South is performing notably better. However, 1 st thinning operations should be planned for both blocks in single operation. |

Page 1 of 2

Glossary of Terms:

1. Total Area

This is the total area of land declared under the afforestation Contract Number. It includes unproductive areas such as ditches, internal tracks, forest roads, scrub areas, ponds, riparian zones, biodiversity areas, etc. Areas of significant crop failure / underperformance are also included in this estimate. Inventory procedures scale this area down to determine a productive forest area for timber yield forecasting purposes (see below).

2. Productive Area

This is an important figure which is an estimate of the actual area covered with productive forestry that will yield timber volumes. Unproductive areas are assessed using maps, aerial photography and on site survey results.

3. Age

This relates to the number of growing seasons and takes into consideration autumn, winter or spring planting dates. Age is used in conjunction with Top Height to determine a species specific Yield Class.

4. Average DBH

This refers to the average diameter at breast height (1.3m) and is a crop measurement parameter used for assessing potential timber harvest volumes at thinning and clearfall stage. It has not been measured at all survey sites.

5. Top Height

This is the average height of a number of "top height trees" identified during surveying. Top height trees are those of largest DBH (see above) within a particular survey area. This height measurement is used in conjunction with crop age to estimate the Yield Class of a forest crop (see below).

6. Yield Class

Age and Top Height are used to estimate the General Yield Class of a forest crop. Yield class is essentially a productivity class which is used to predict the average volume of timber a forest crop is capable of producing annually over its rotation. Higher yield class crops will produce greater volumes of timber over shorter rotations. Lower yield class crops will produce smaller volumes of timber over longer rotations. Yield class is an important factor in determining the timing of first thinning operations and in forecasting potential timber harvest volumes.

7. Is crop capable of receiving a thinning?

This is an overall assessment of the forest crop's suitability for thinning operations. Some crops may not be suitable for thinning because of excessive windblow risk due to factors such as site exposure, soil type and development stage. For example, some crops may have passed the "window of opportunity" for 1st thinning operations and may be too tall and top heavy. Late thinning may carry excessive risk of windblow damage. This can be a subjective and non-definitive assessment and owners should consult with a qualified forester for specific advice on this area.

8. Estimate of Thinning Year

This is an estimate of optimal timing for 1st thinning operations. It should not be considered definitive as most crops have a "window of opportunity" for thinning. Early thinning will help to establish good crop stability however volume and financial returns may be lower. Late thinning increases the risk of windblow damage.

9. Roading Requirements

Approximate roading requirements were assessed during the survey to determine the typical requirement for forest road construction within the Laois Farm Forestry Sector to facilitate future timber harvesting operations. Requirements have been classified as external (across farm land to the forest edge) and internal (within the forest).

10. Potential Constraints to Harvesting Operations

Any constraints to harvesting operations have been noted. These may include poor access, small scale, difficult terrain etc.

11. TO DO LIST – Priority Management Requirements

Any priority management requirements identified during the survey are identified. This may include requirements such as the cutting of inspection paths, planning forest road construction etc. Note that this is not a definitive listing and owners should consult with a qualified forester for on-going management requirements.

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Page 2 of 2

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