Project number: 6735
Funding source: Department of Agriculture, Food & the Marine Coford
Date: Nov, 2018
Project dates: June 2015 - July 2018

Improving timber forecasts

Key external stakeholders:
Forest service, DAFM, CoFord, Policy makers, forest industry

Practical implications for stakeholders:

- An improved capacity to generate more reliable roundwood production forecasts for the private forests in Ireland.
- It is likely that significant increases in timber volume from private forests will be realised owing to excellent levels of productivity and increased awareness about the benefits of management of forests crops to improve returns.

The Forecast Model project was aimed at producing more reliable estimates of roundwood production forecasts from private sector forests in Ireland to assist the All Ireland roundwood production forecast carried out by DAFM.

Main results:

- New methods have been developed which will assist in producing better estimates of the private sector roundwood forecasts from private sector forests in Ireland.
- The majority of private forest owners are motivated by financial returns and will consider thinning to improve the value of their crops.

Opportunity / Benefit:

There is significant potential to capitalise on the results of the research to produce more reliable roundwood production forecasts in time for the next All Ireland National Forecast of timber production in 2020.

Collaborating Institutions:

Teagasc project team: Dr. Niall Farrelly (Project Leader/PI)
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External collaborators: Prof. Maarten Nieuwenhuis, UCD Forestry
Henry Phillips, Forestry consultant

1. Project background:

Timber forecasts have increased in importance in Ireland in recent years and serve to guiding planning and investment decisions on the infrastructure required to mobilise the forest resource. It is estimated that significant increases in timber volume are forecast in the next two decades and that the annual Net Realisiable Volume will increase from 3.95 million m^3 in 2016 to 7.86 million m^3 by 2035 (Phillips et al. 2016). While information on timber supply and production forecasts for state-owned forests are available from Coillte's Inventory and planning system, information about the private sector is less reliable owing to limited Inventory data, which are used as an input into the production model, the lack of knowledge about the management intentions of private forest owners and lack of information on accessibility of private plantations for thinning. However, there have been a number of specific developments which have the potential to improve timber supply forecasting systems for the private sector. The project sought to examine the the potential to use more accurate growth and yield data, improved productivity estimates for private plantations and the availability of dynamic yield models for Irish tree species to improve forecast estimates.

2. Questions addressed by the project:

- Assess the reliability of the productivity estimate of private forests in Ireland
- Assess the impact of varying levels of forest inventory data on roundwood production forecasts for private sector forests.
- Waht are the management intentions of owners, and the harvesting potential of private forest stands?

3. The experimental studies:

The Forecast Model project study focussed on assessing the reliability of the national productivity (yield class) estimate of private forests in Ireland which is based on a site productivity model derived from climate and map based data (Farrelly 2015). This national yield class prediction was compared with traditional measures taken from forest inventory plot data (general yield class) and an alternative local yield class prediction model based on higher resolution map based data (Farrelly et al. 2011). The impact of these different yield class estimates and detailed inventory information have on roundwood production forecasts was examined for a study area covering 52 privately owned stands of Sitka spruce in the north-west of Ireland (Figure 1).

To understand the management intentions of private forestry owners a phone survey was conducted, the knowledge of which would assist with determining the appropriateness of assumptions governing the likely course of forest management of private forests. An assessment of the management and thinning status of a sub-sample of private forests was also carried out to determine if forests deemed suitable for thinning were actually thinned.

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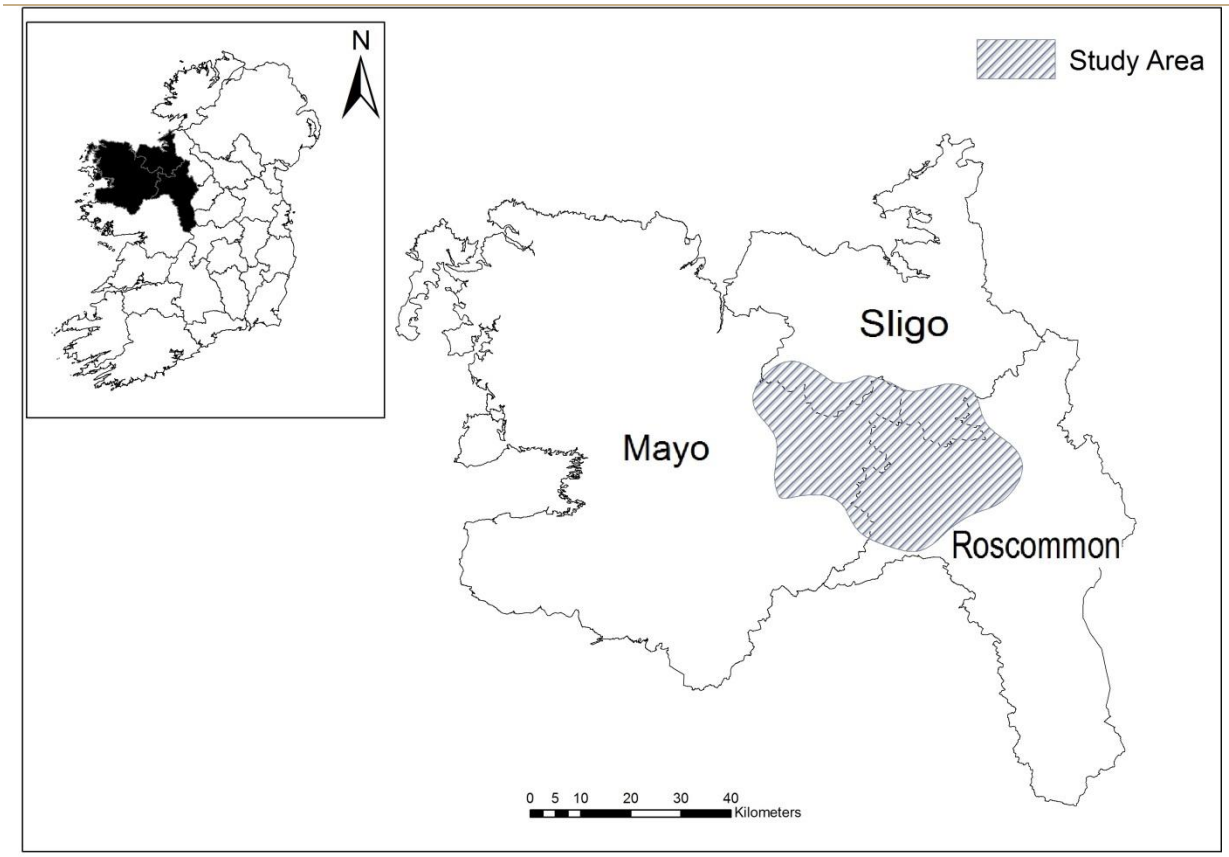

Figure 1: Location of study area in the northwest of Ireland.

4. Main results:

- The national yield class estimate of private forests used in the All Ireland National Forecast of timber production has the potential to under-estimate the yield class of productive private forests. An alternative prediction of yield class from a local prediction model or from direct measurement in the forest show increased reliability and are recommended for use for future forecasts.
- Using plot based measurement data which more adequately represents local production for private sector forests in Ireland indicates a significant increase in roundwood production of up to 35% over the current methods used in the All Ireland National Forecast (Figure 2)
- Forecast output is earlier than expected (5 to 6 years earlier) owing to better than expected levels of productivity and shorter rotation times observed when using the detailed inventory plot data than modelling productivity using the All Ireland Forecast method.
- A national survey of private forest owners indicated that 82% had planted for financial reasons and 80% intend on thinning their forests.
- A survey of unthinned forests in the study area indicated that many forests were highly suitable for thinning, indicating that some owners had not pursued active management of the forest.

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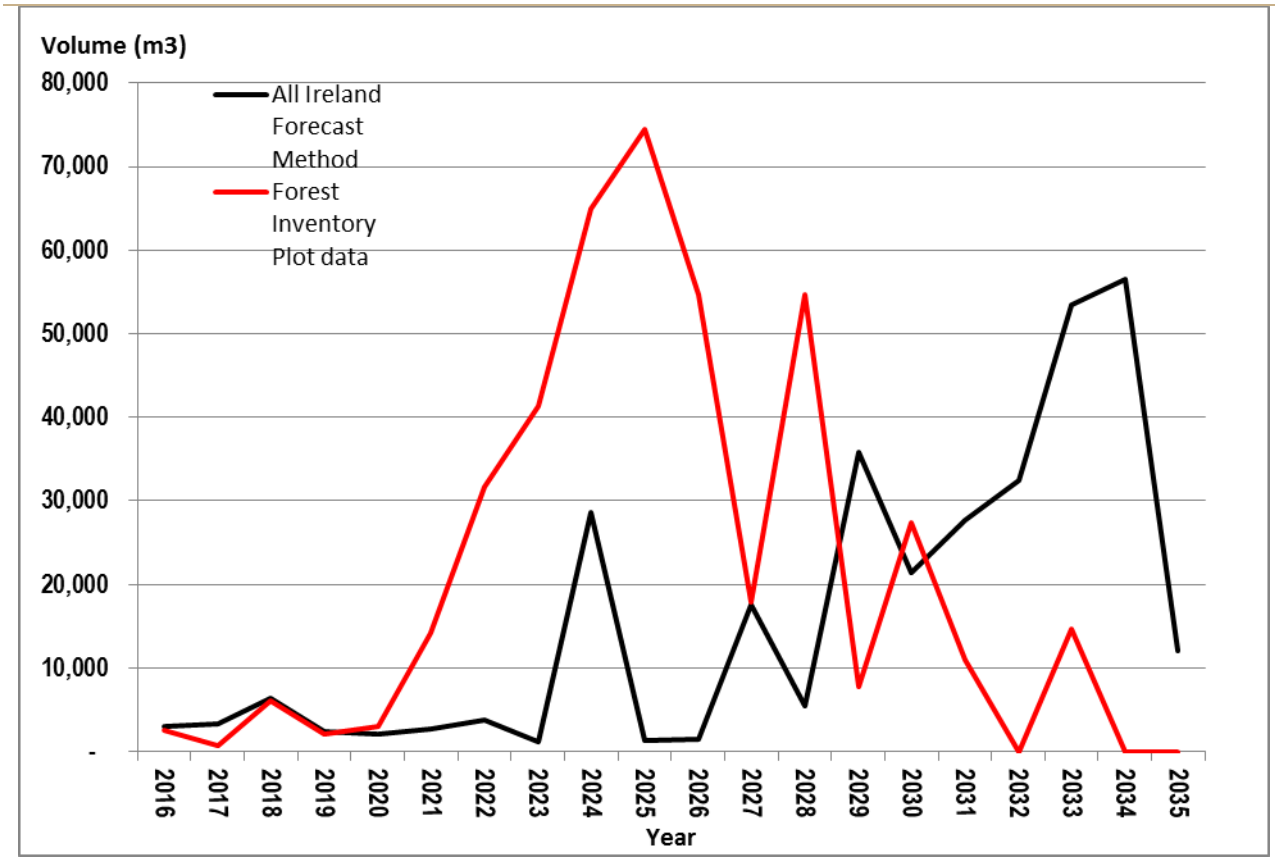

Figure 2: A comparison in roundwood production from private forests in the study area for the All Ireland forecast method and detailed plot inventory method.

5. Opportunity/Benefit:

The primary stakeholder of the research is DAFM Forest Sector Development and CoFoRD, DAFM. The strategic nature of this project means that it will be of particular interest to the processing sector. These results of this study indicate that forecasts can be improved considerably over current methods. These methods could be used to increase the reliability of future forecasts of production.

6. Dissemination:

Forecast Model overview. Presentation to Teagasc research and advisory collegues, Walsh Fellow day, Teagasc, Ashtown, October 2016

A one-day seminar on Forest Management, Forecasting and Timber quality on 24 May, 2017, at UCD.

Presentation at Forest Growth and Yield Modelling workshop organised by COFORD/Forest Sector Development, Ag. House, Dublin, July 2017.

Presentation of the Forecast Model project at European Forestry Institute Summer School in Waterford, June 2017

Poster presentation at Forestry and Energy Show, Stradbally, Co. Laois, May 2017. Forecast Model Project

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Developing methods that can improve private sector roundwood forecasts

Poster presentation at Talking timber, Ballyhaise, Co. Cavan. Sept 2017. The Forecast Model Project

Main publications:

Farrelly, N., O'Connor, C., Niewenhuis, M., and Phillips, H. 2018. Investigating the impact of varying levels of inventory data detail on private sector harvest forecasting. Irish Forestry Vol. 74 (1&2). 2018 (in press).

Farrelly, N. Improving Timber Forecasts – The ForecastModel final Report to CoFoRD, DAFM, Dublin.

7. Compiled by: Dr Niall Farrelly

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