KELLOGG
RURAL LEADERSHIP
PROGRAMME

WOODFLOWS OF THE EASTERN SOUTHERN NORTH ISLAND 2019-2028

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Contents

1. Executive Summary

The catch phrase “Wall of Wood” is approaching reality with the substantial increase of afforestation in the mid-1990s coming to maturity and ready for harvest in the coming years. The Eastern Southern North Island (ESNI) was no exception in this new afforestation with the reported area of plantation forestry more than tripling from 20,500ha in 1993 to 66,500ha by 2003.

This report sets out to determine what the status is of the current forestry and woodproducts infrastructure of the ESNI. Then to ascertain whether this capacity is sufficient to meet the growing needs of the future radiata pine resource.

A survey was compiled to obtain the harvesting capacity of the forestry companies within the ESNI region. They were asked to provide their current daily harvesting capacity and forecast their harvest volumes over the next 10-year period.

The domestic mills and log cartage companies were also questioned regarding their capacities.

The yield volume was calculated using the 2018 National Exotic Forest Description (NEFD) for the area of radiata pine plantations and overlaid with the MPI yield tables from 2015 for the ESNI. The minimum target age for harvest was set at 28. A total yield volume was calculated for all radiata pine plantations that reach the age of 28 within the period of 2019-2028. The area of plantations that made up the yield volume was evenly spread over the 10 year period to make a non-declining yield based on the fixed average annual area of harvest.

The forestry companies harvesting capacity sits at 1.97 million m^3 and is forecast to increase to 2.25 million m^3 in the next 3 years. The analysis concluded that these forecasted volumes are the more accurate figures to use in forecasting the woodflow for the region. Though these volumes are less than the calculated yield the forestry companies can be confident that there is enough volume to meet their planned harvesting capacity. The forecast volumes can now be used by the log cartage companies and export traders to help forecast their capacity requirements.

The analysis concluded that there are insufficient markets for domestic pulp that give a positive return. The industry has to make the decision whether to remove this pulp from harvesting sites at a cost or find an alternative market for this product.

Further analysis is required to determine the absolute limit of the annual capacity at the Napier and Wellington ports. Both ports have noted record annual throughput of logs but how much further can they go?

The analysis has shown that there are potential errors in the total area documented in the NEFD. This is predominately around the modelling and recording of the small scale forest areas. Remote sensing has had proof of concept confirmed in identifying small scale forests. As technology improves this should be a vital tool to use for the NEFD data collection.

2. Introduction

The Eastern Southern North Island (ESNI) is made up of four Territorial Authorities. Tararua, Masterton, Carterton and South Wairarapa Districts.

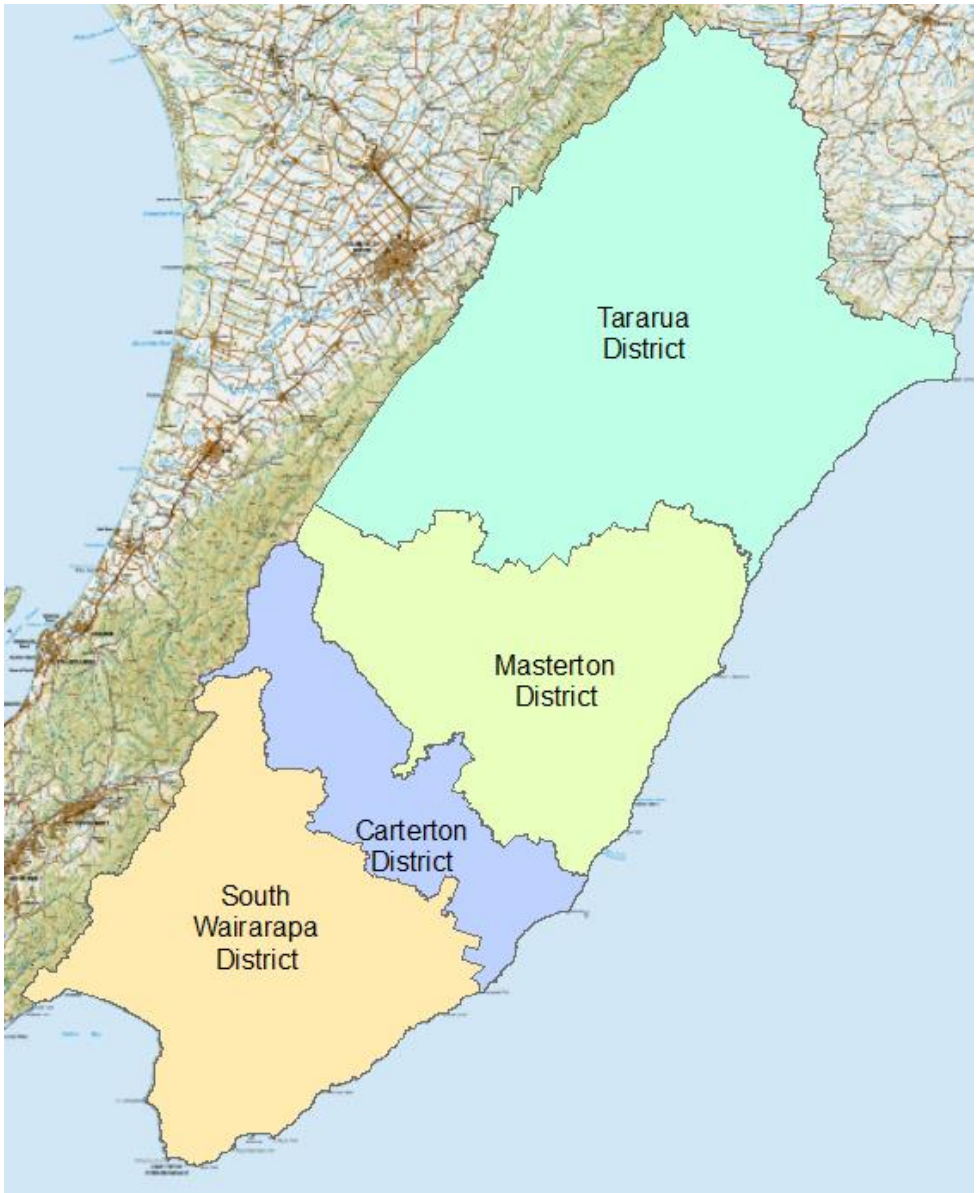

Figure 1: Eastern Southern North Island Territorial Authorities

The forest and wood manufacturing industries within the ESNI have a greater influence on GDP than the national average (Infometrics, 2018). In the Masterton District the forestry and wood product industries provide 1.7% of the districts GDP compared to a national average of 1.2% (Infometrics, 2018). In the Carterton District it is a greater value with 12.7% of the districts GDP (Infometrics, 2018).This is largely due to the location of the two largest sawmills in the region being within the Carterton territorial boundaries.

The “Wall of Wood” has been a catch phrase for several years to describe the future maturing of the large influx of radiata pine planting in the mid 1990’s after the export price spikes of 1993. The ESNI was no different to the rest of the country where a large increase in afforestation occurred over the region. The vast majority of these new forests were from small scale growers whether they be farm woodlots or small investment syndicates (Braaksma, 2019).

The increase in afforestation during this period is a major trigger for this report as the predicted Wall of Wood comes on stream in the next 5-10 years.

The aim of this report is to provide a high level forecast of the radiata pine volumes that will be available for harvest in the next ten year period from 2019-2028 and compare this to the current infrastructure within the forestry industry in the ESNI.

With the predicted increase in available plantations for harvest will the infrastructure be able to utilise this volume as it comes on stream or will there be a deficit leading to plantations being delayed below their optimum harvesting time?

The infrastructure to be reviewed includes harvesting capacity, domestic sawmill capacity, log cartage capacity, and rail.

The findings will give a forecast of volume and truck movements that will be required to travel on the district council roads. A high level forecast of volume for the sales and marketing companies especially in the export market.

3. History of Plantation Forestry in the ESNI

The first recordings of exotic plantation forests was in the New Zealand Year Books from 1900. In 1900 the ESNI had an area recorded of 1505 acres (607 hectares) (Statistics New Zealand, 1900).

By the 1930s the native timber resources in the region had diminished and it was recognised that this had to be replaced with suitable exotic species. The replanting was not just for timber production but for erosion protection and the desire to preserve the general environment (Winter, 2017). Also at this time afforestation was being promoted for different reasons. The Wairarapa Progress League was promoting the potential of afforestation by local bodies to increase their revenue and hence reduce rates. The Masterton County Council began planting trees and in 1940 were bequeathed land for the purposes of public afforestation. These forests are what are known as the Trimble Forests (Winter, 2017).

Large scale plantation forestry started in the region with the establishment of the Ngaumu Estate by the New Zealand Forest Service after World War 2 (Millen, 1980) (Allsop, 1973) (Atkinson, 2003).The stated long term objective being the supply of timber to both the Wairarapa region and the Wellington market (Millen, 1980). The 15,000 hectare estate is now managed by Juken NZ Ltd who have the cutting rights for the 11,500ha net of radiata pine plantation forest.

After the war erosion was becoming an issue in some of the fragile catchments of the region (Atkinson, 2003). Through the 1950s and 60s the Wairarapa Catchment Board were using the planting of conservation woodlots on farmland to help mitigate the erosion problem (Braaksma, 2003). This continues today through subsides provided by MPI and the regional councils.

In the 1970's a new form of plantation afforestation was introduced by Forest Enterprises. Forest Enterprises were the first company in New Zealand to introduce forestry as a public issue investment (Forest Enterprises Ltd, 2019). Large areas of land were planted and now the company is one of the biggest forest managers in the region.

Radiata pine continued to be planted in the region by investors and farmers through the 1980s and substantially increasing through the 1990s after the export price spikes (Braaksma, 2019).

There are 509 individual forest ownership identities recorded within the ESNI region. (Farm Forestry Association, 2019)

Today new afforestation is in the spotlight with the purchasing of farmland by forestry investment interests throughout the region.

4. Methodology

4.1 Literature and Data Review

The main data source that was used for this report is from the Ministry of Primary Industries National Exotic Forest Description (NEFD). The NEFD has the purpose of maintaining a high quality database of the New Zealand production plantation forests. It has been published annually since 1985 (Ministry for Primary Industries, 2018).

The data is collected by surveys completed by forest owners. The survey has a two yearly cycle where all known forest owners with more than 40 hectares are surveyed. In the year's in-between, a sample survey is completed by larger forest owners with more than 1,000 hectares (Ministry for Primary Industries, 2018).

The total area of forests that are less than 40 hectares are estimated using the combination of 3 data collections. The 2004 AgriQuality Small Forest Growers Survey, an imputation based on new plantings from 1992-2006 and forests that fell below the 40 hectare threshold that had been previously surveyed (Ministry for Primary Industries, 2018).

The reliability of the data reduces with the size of the area owned. Large scale forest owners have professional systems to produce reliable datasets. For the smaller owners with less than 1,000 hectares the data provided is likely to be more variable in nature. This is mainly due to not having the mapping expertise to accurately measure forest areas including unstocked gaps (Ministry for Primary Industries, 2018).

To produce yields for the areas of radiata pine plantations the report used the 2015 yield tables produced by MPI in 2015. Section 5 will go into more detail about the yield tables.

The School of Forestry at the University of Canterbury have undertaken a GIS[1] mapping exercise to identify the areas of small scale forests within the ESNI region. For this report the large scale forest owners were added to the GIS shapefile[2] to calculate a total area of plantation forestry cover in the region. A comparison of the NEFD and the area mapped are discussed further in section 5.

In 2016 MPI published a Wood Availability Forecast for New Zealand for the period 2014-2050. The forecast undertook five scenarios to model the wood available forecast. Two of the scenarios are discussed here.

Scenario 1 was for all small scale owners targeting age 28 for harvesting clearfell combined with the large scale owners stated intentions of harvest volumes until 2023 then at the target age of 28 years.

[1] GIS –Graphic Information System – Computer mapping tool for capturing and displaying data of the earth's surface.

[2] A GIS shapefile is the geographic features represented by points, lines or polygons

Scenario 2 had the large-scale owners stated harvest volume intentions to 2023 then a non-declining yield with a target clearfell age of 28 out to 2050. This produced an annual clearfell volume of 1.3 million m^3. This scenario would be seen as undercutting the resource as the average age of harvest goes up to over 35 years plus (Indufor , 2016).

Section 5 will explore more of scenario 1 with a comparison with this reports yield analysis.

New technologies are starting to be used in calculating areas and yield volumes for forest plantations. Dr Vega Xu completed her PhD on using integrated remote sensing[3] for describing small scale forests. Dr Xu used the Wairarapa region to test her research. Her results calculated the forest area to be 3.4% less than the NEFD areas and the yield volumes calculated slightly below the WAF yield tables. This showed a proof of concept for calculating area and yield for forestry plantations (Xu, 2017). As technology rapidly improves for remote sensing this will be an important tool for recording small scale forest areas more accurately.

4.2 Infrastructure Review

The infrastructure information was obtained from the forestry and wood product players within the region. These included the domestic sawmills, harvesting and marketing companies, forest management companies, forest owners, harvesting contractors and log cartage contractors.

The harvesting volumes were collected using a small survey to describe each company's current harvesting types and volume capacity and their harvest volume intentions for the next 10 year period. See Appendix 1.

Sawmill and log cartage capacity was collected through interviews by phone or in person.

[3] Remote sensing generally refers to the use of satellite or aircraft based sensor technologies to detect and classify objects on Earth.

5. Findings and Discussion

This section explores the different data sets collected for this report. It will compare national data from the Ministry of Primary Industries National Exotic Forest Description and the accompanying yields with the harvest volumes forecasted by the regions forestry companies and woodproduct industries.

5.1 Area of Radiata Pine Recorded in the NEFD

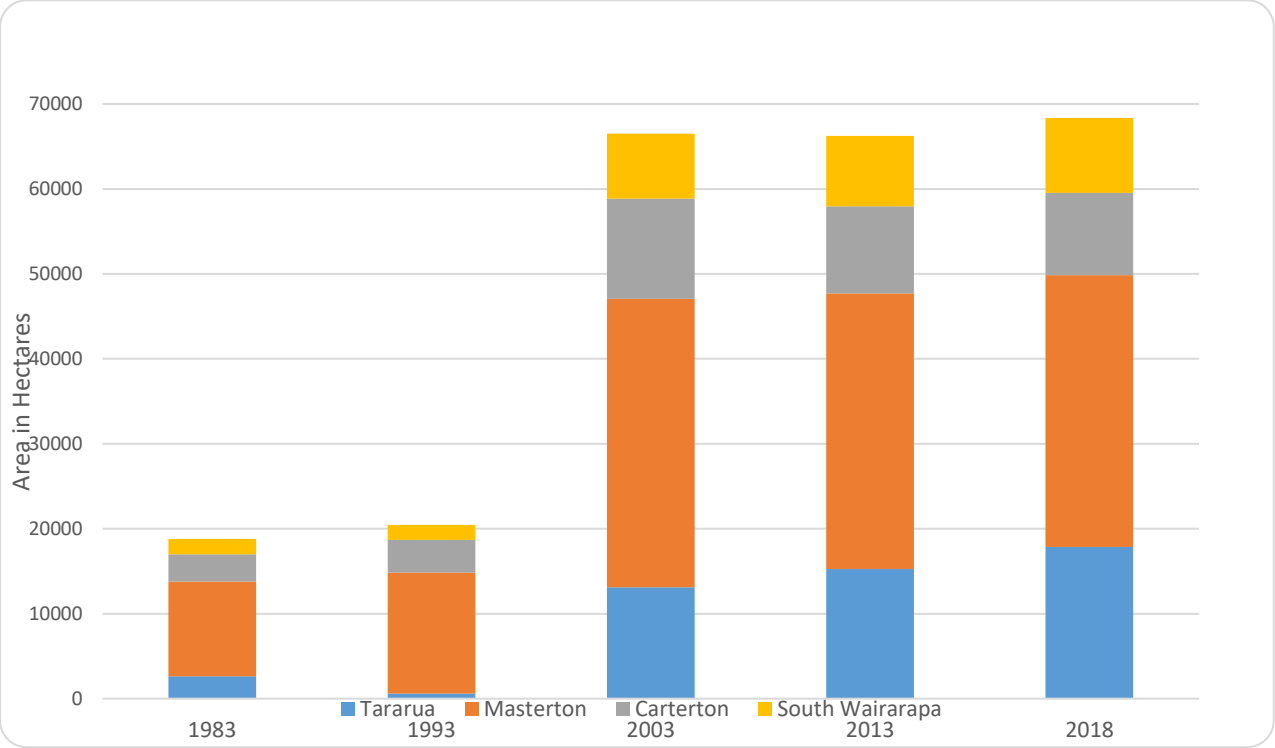

Figure 2: Area of Radiata Pine recorded in NEFD (Ministry for Primary Industries, 2018) (MPI, 1985-2013) See appendix 2

The NEFD data shows the large increase in area planted in the mid-1990s after the export price spike of 1993. In the early 1990s there was just over 20,000 hectares of radiata pine plantations. Ten years later this had increased more than threefold to 66,000 hectares. This remained steady over the next twenty years with only a small increase up to 68,000 hectares.

5.2 Area of Radiata Pine by Territorial Authority

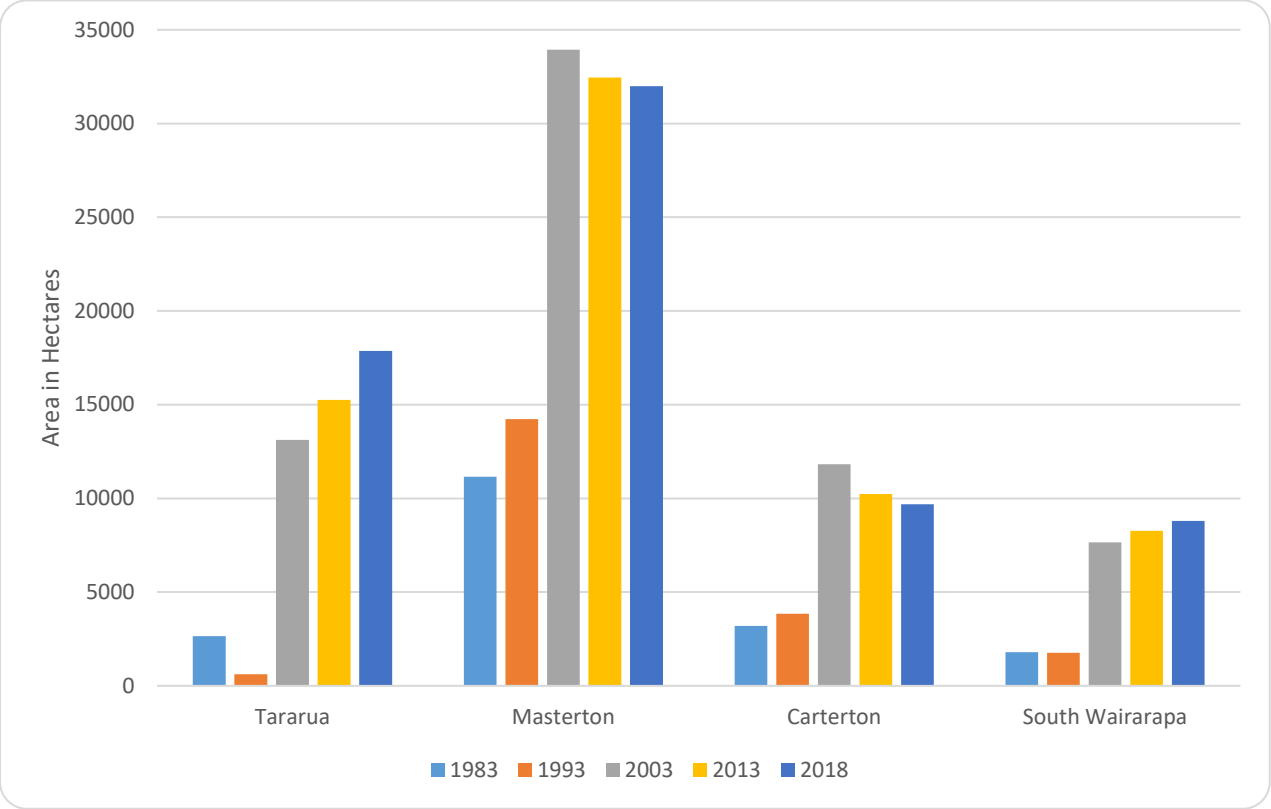

Figure 3: Area of Radiata Pine by Territorial Authority

Figure 3 illustrates the NEFD areas recorded by territorial authority. There appears to be a discrepancy in the recording of the Tararua data in 1993 with a significant drop in area from the 1983 data. The 1983 data comes from the pre amalgamation of several county councils into the Tararua District. The 2019 planting season has seen an upsurge in afforestation especially in the Tararua District. This will produce a significant increase in radiata pine plantation areas in the next published NEFD.

5.3 Area by Age Class

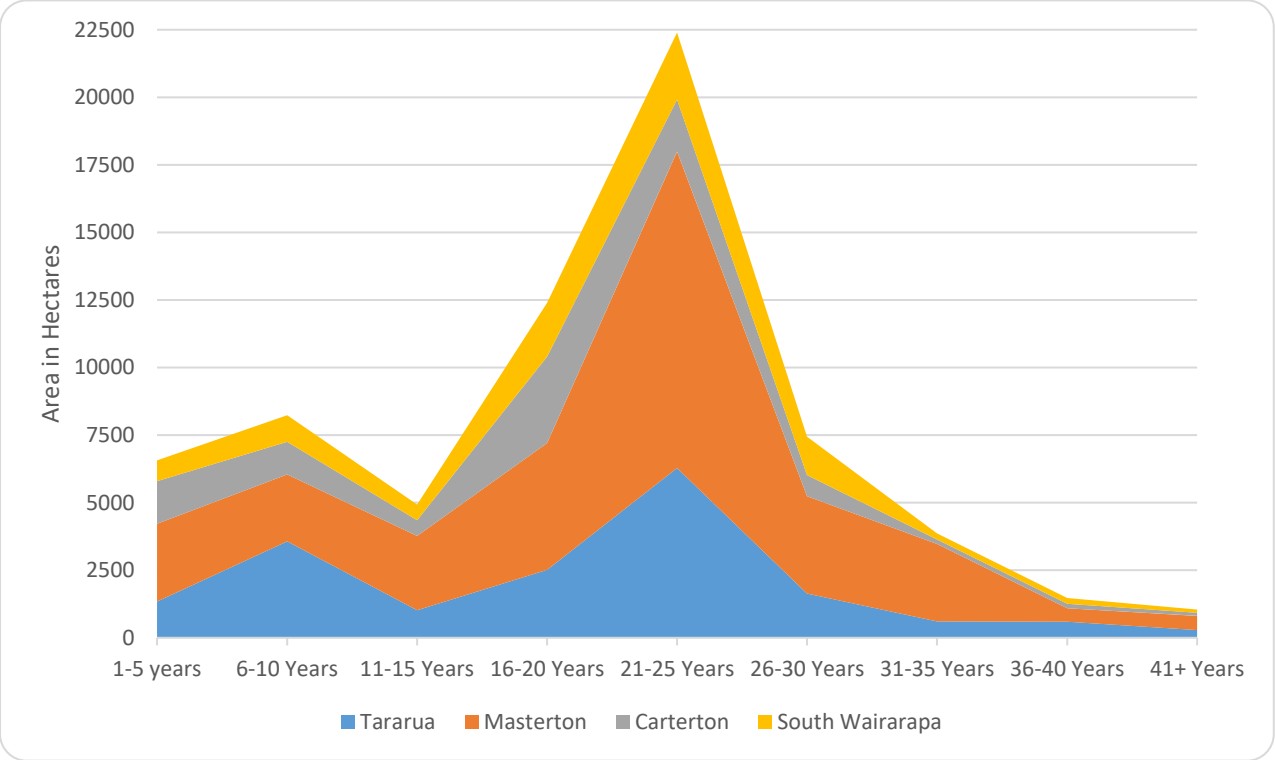

Figure 4: Area by Age Class

The 1990s afforestation is illustrated in figure 4 with the spike in age class for the 21-25 year age class. It is this age class that will provide the bulk of the regions woodflow over the next 10 years.

5.4 Age Class Area by Regime

Figure 5 illustrates the split in clearwood and framing regimes. The majority of the area available for harvest in the next ten years is part of a clearwood regime. The volumes available will be shown in subsequent yield calculations within this section.

The younger age classes show that there is less pruning happening. This is not reflected by the data used for this analysis due to confidence clauses in the NEFD. If figures are made from less than 3 owners or one owner's data makes up more than 80% of the number, it will not be published in the tables (Ministry for Primary Industries, 2018). In this case the total amount of area being pruned is unable to be reported. The author has allocated this area as framing regimes in this case. As this is in the early age classes it will not affect the woodflow period for this report.

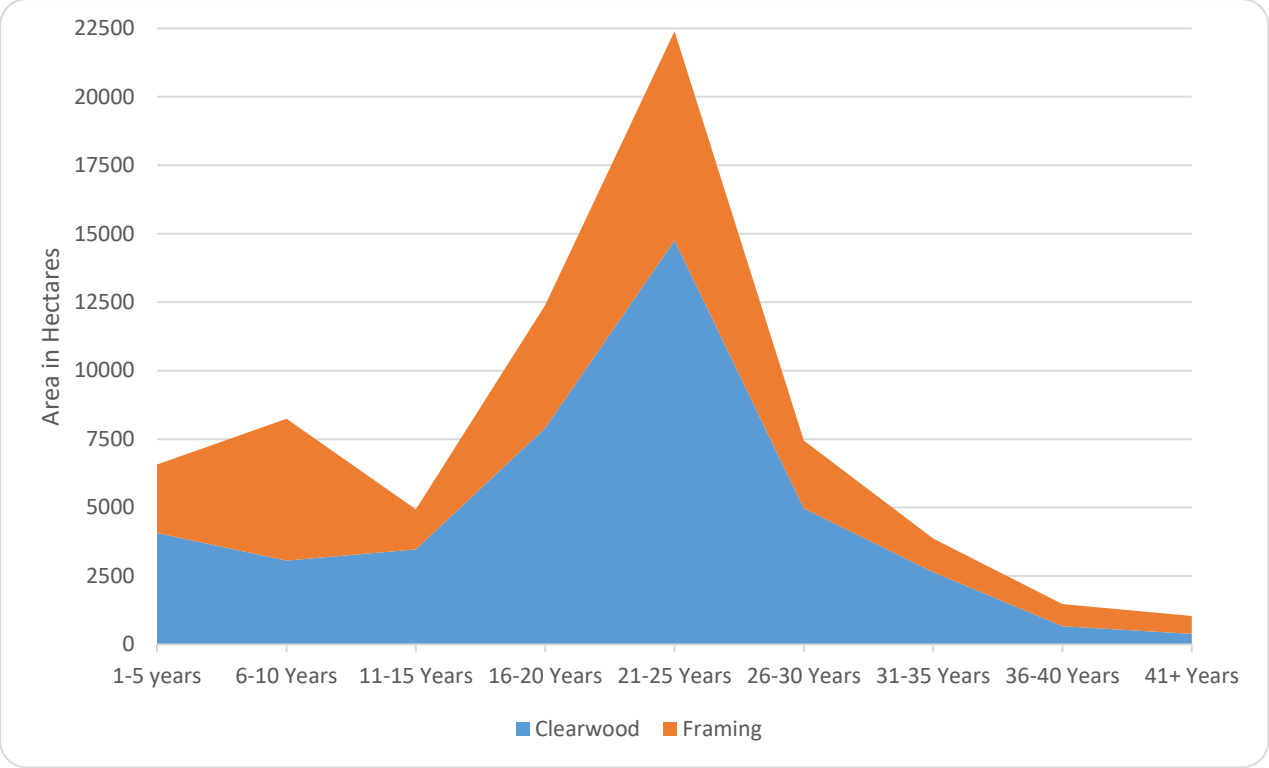

Figure 5:Age class area by regime

5.5 Area Available for Harvesting

The NEFD data is grouped into age classes of 5 year periods. For this analysis the total area for each 5 year interval has been averaged to give an annual area for each annual age class. This is illustrated in Figure 6. Age 28 has been chosen as the minimum age for harvest availability. This is line with yield forecast completed by MPI (Indufor , 2016). Age 18 is therefore used as the starting age for area available for harvest over the next 10 years.

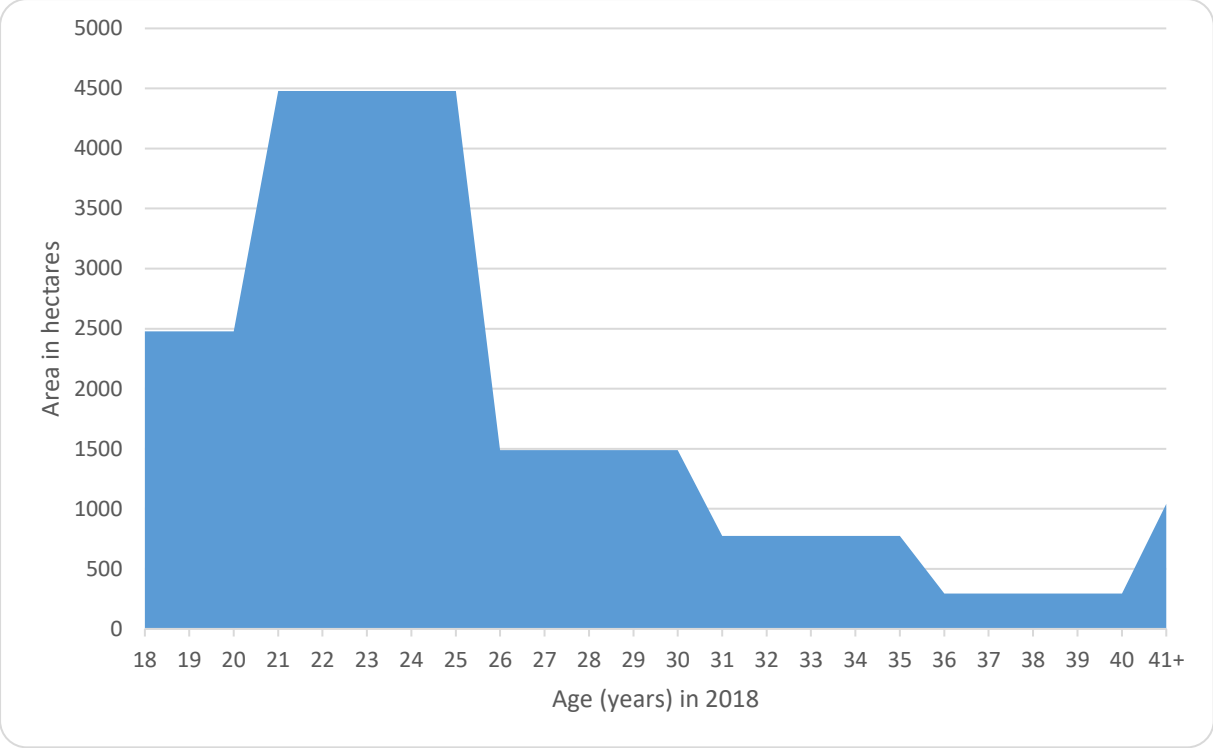

Figure 6: Age of Radiata pine plantations

5.6 Current Standing Yield

The age class area from section 5.5 was overlaid with yield from MPI's 2015 Yield tables for the ESNI. The two yield tables used were for pruned and unpruned stands with no production thinning. Though some of the available area is pre 1990 planting, the post 1989 yield tables were used over the total available resource. The post 1989 tables were used to keep consistency over the forecasted period to calculate the total volume (TRV)[4].

Using the minimum age of 28 years figure 7 shows the TRV of the standing resource available for harvest at the start of the period 2019. The graph shows in 2019 the volume from the ages 28 up to 41+. For the following years the volume shown is for the available resource at age 28.

This however is not a practical scenario to harvest all of the radiata pine resource at the minimum age of 28 in period 2019. A non-declining yield is required which is described in 5.7.

[4] TRV is the Total Recoverable Volume in cubic metres.

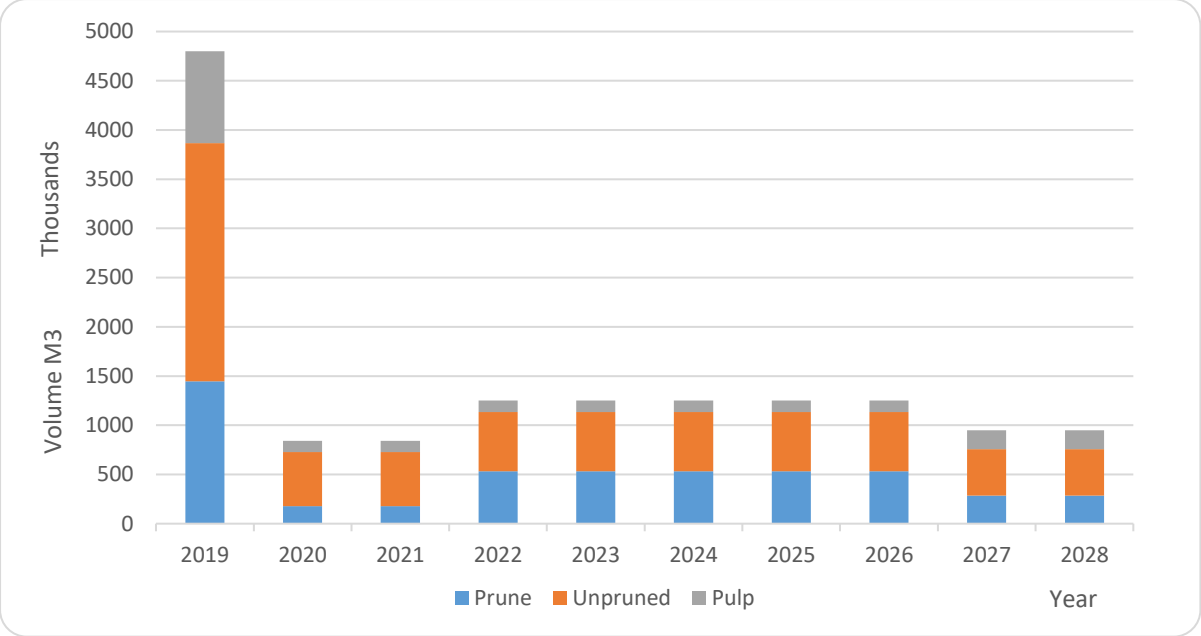

Figure 7: Current Standing Yield calculated from MPI 2015 Yield Tables

5.7 Non Declining Yield

The non-declining yield[5] shown in figure 8 was calculated from the area used to calculate the yield shown in 5.6. All radiata pine area that was older than 35 years in the 2018 NEFD was removed for the calculation. This was done as it was hypothesised that the area was non economical to harvest, otherwise it would have already been completed. This is a high level assumption and will add a conservative approach that not all the area of radiata pine in the region is harvestable. This area totals 2,500 hectares. A similar approach was taken in the WAF where over mature plantations were removed from the analysis (Indufor , 2016).

The yield for the 18-35 years age class was calculated on an annual cut of 4,135 hectares (see appendix 5). The minimum age of 28 years was again used for the yield calculations with the older resource forced to be harvested first. Figure 8 shows the yield for each year over the 10 year period.

The average age is calculated for each year. In 2019 with the older resource harvested first the average age is 33.8 years. 2020 sees the age drop to 31 years before settling at around age 29 in 2021 before dipping to 28.4 years in 2028. The average age over the whole 10 year period is 29.6 years.

[5] The non-declining yield for this report is the volume based on non-declining area.

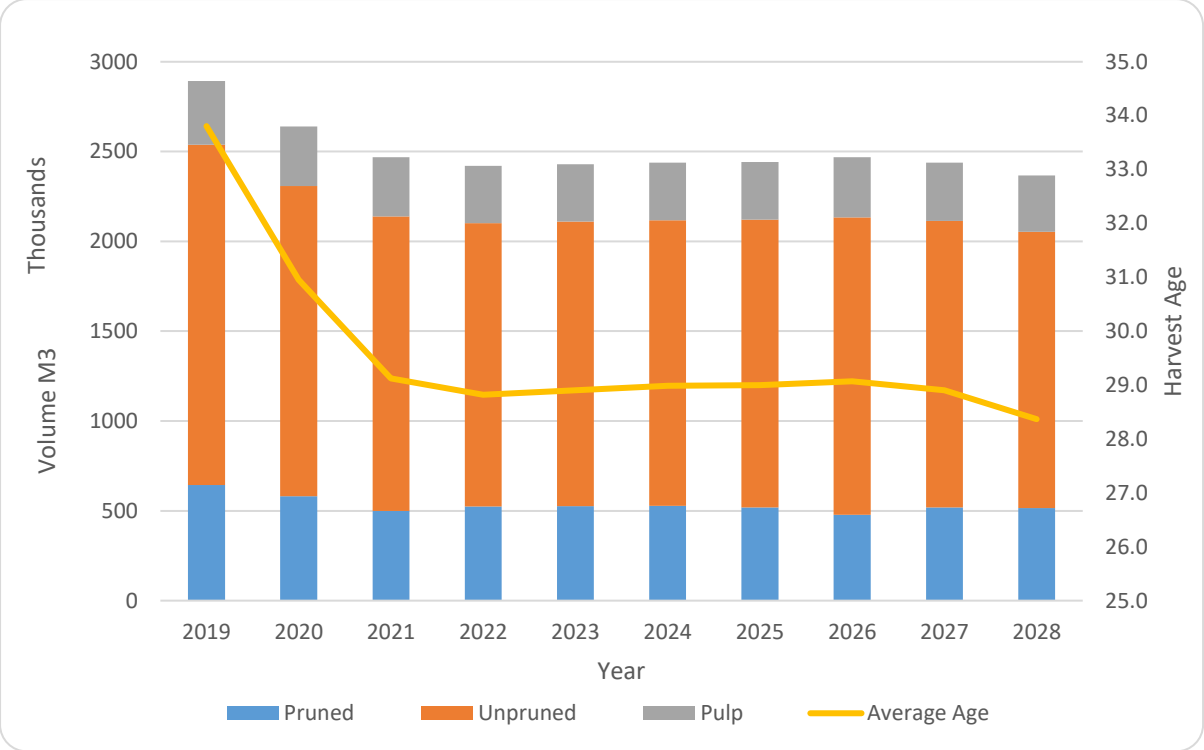

Figure 8: Non Declining Yield 2019-2028

5.8 Calculated Volumes vs WAF 2014-2050

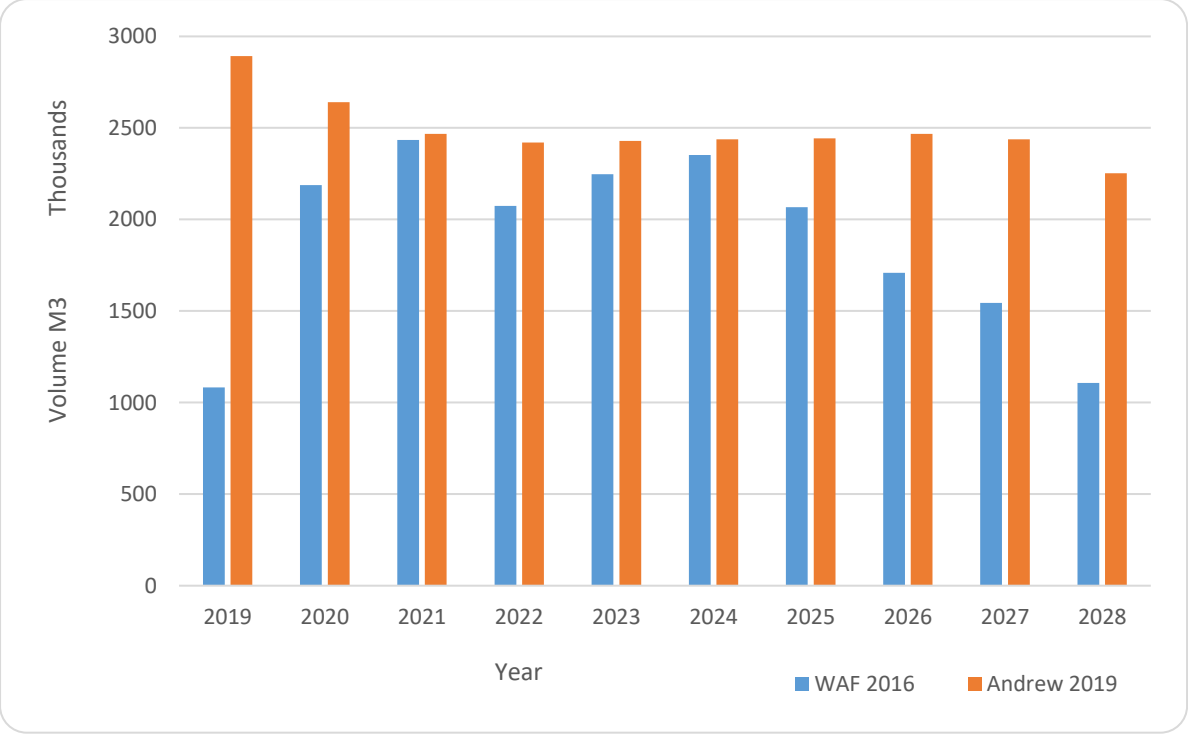

Figure 9 Calculated Volumes vs WAF 2014-2050

The comparison between the volumes calculated in 5.7 and the WAF data show how the annual yield volumes can change considerably if the predicted available volume is not harvested. The WAF had predicted 2.3 million m^3 available for harvest in 2016. The infrastructure at the time was not able to accommodate this total volume therefore the volume would have rolled into the following years. The WAF data also made the assumption that the area of small scale owners be reduced by 15% as a result of inaccuracies in the mapping due to the notion that only gross area is reported and therefore over reporting the net area of plantations (Indufor , 2016). The NEFD does acknowledge that the reported area for the small-scale forest owners is less accurate but does not remove this area from the data collection (Ministry for Primary Industries, 2018).

5.9 Harvesting Capacity

	Number of Harvesting Crews	Capacity in Tonnes[6]
Hauler Operations	19	4100
Ground Base Operations	26	4105
Total	**45**	**8205**

Table 1: Total Daily Harvesting Capacity for the ESNI

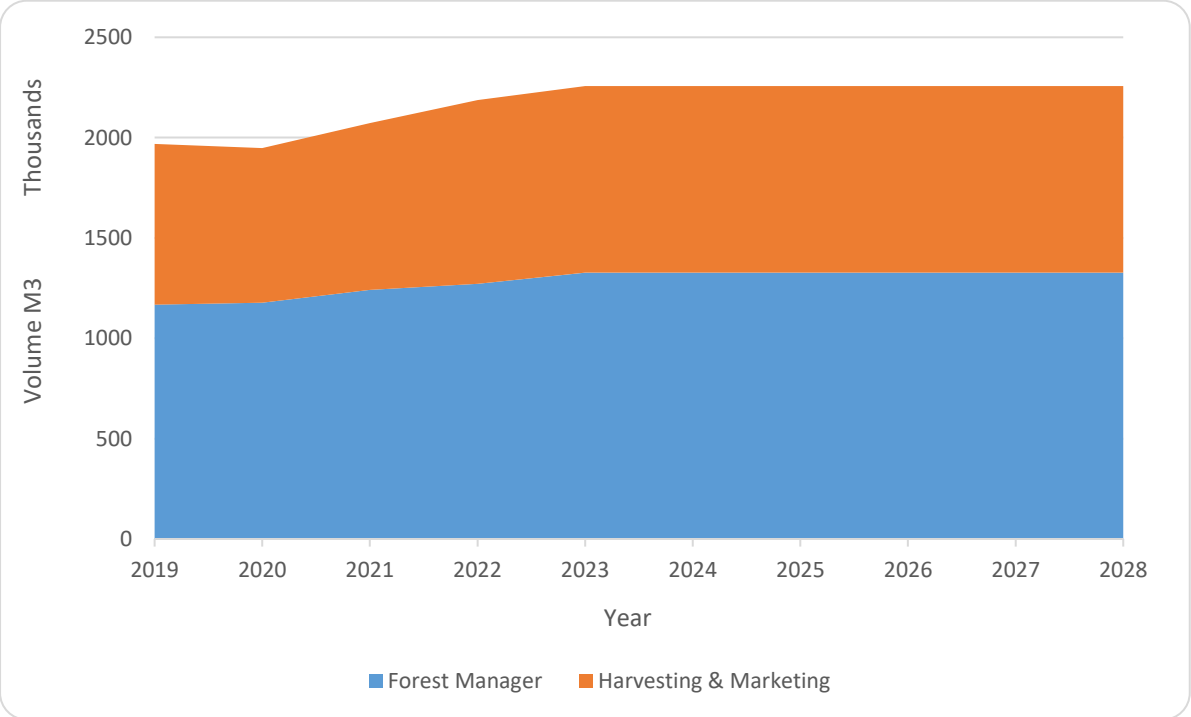

Figure 10: Planned Harvesting Capacity

[6] Though yield is calculated in cubic metres harvesting outputs are recorded in tonnes. For comparison purposes 1 tonne equals 1 cubic metre.

Figure 10 above illustrates the regions forest industry companies planned harvesting volumes for the 10 year period. The graph has been split into the two different categories of companies, Forest Managers/Owners and Harvesting and Marketing companies. The area in blue illustrates the strategic planned volume to be harvested by forest managers and larger scale owners. It shows a small increase in annual volume during the period. The area in orange illustrates the forecast from harvesting and marketing companies. All the H&M companies are predicting a required increase of capacity as the mid-1990s planting comes on stream. It should also be noted that this volume is contestable as it is volume that comes from the small-scale forest owners that the H&M companies will be competing for whereas the larger scale owners and managers where volume will be coming from set forests.

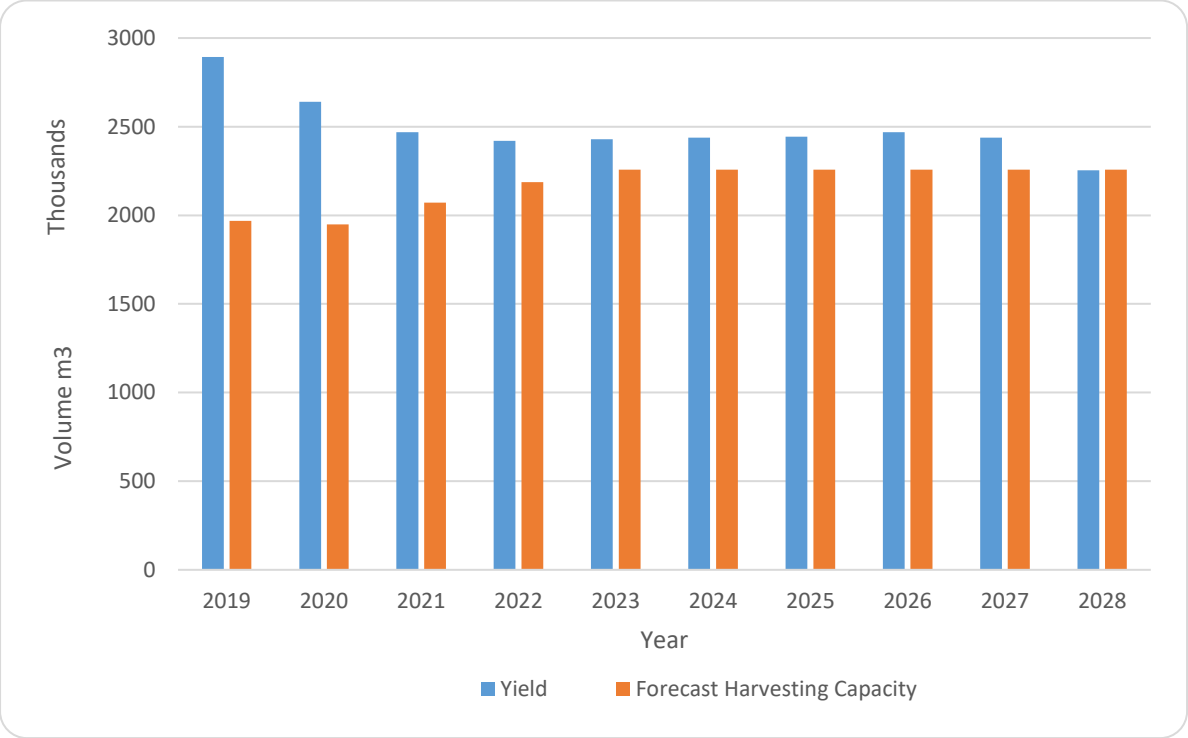

Figure 11 Calculated Yields vs Forecast Harvesting Capacity

Figure 11 compares the calculated yields against the reported forecast volumes from the forestry companies. The limits and variables around the target age of 28 set for the yield analysis calculates the yield volume greater than the harvesting infrastructure available. The area of plantations not harvested will role in to future years to be harvested. This will increase the overall volume from the increased yield as the average age of the plantations increase.

5.10 Trucking Capacity

Interviews with log haulage companies gave a capacity of approximately 110 trucks a day on the regions roads. Each truck will complete 2-3 loads a day totalling approximately 270 truck movements[7].

Using the harvesting volume forecast from the forest companies, the minimum amount of truck movements per day will be approximately 310 to transport the harvested volume in the next 2-3 years.

If the full volume yield was to be utilised this will require 350 truck movements a day.

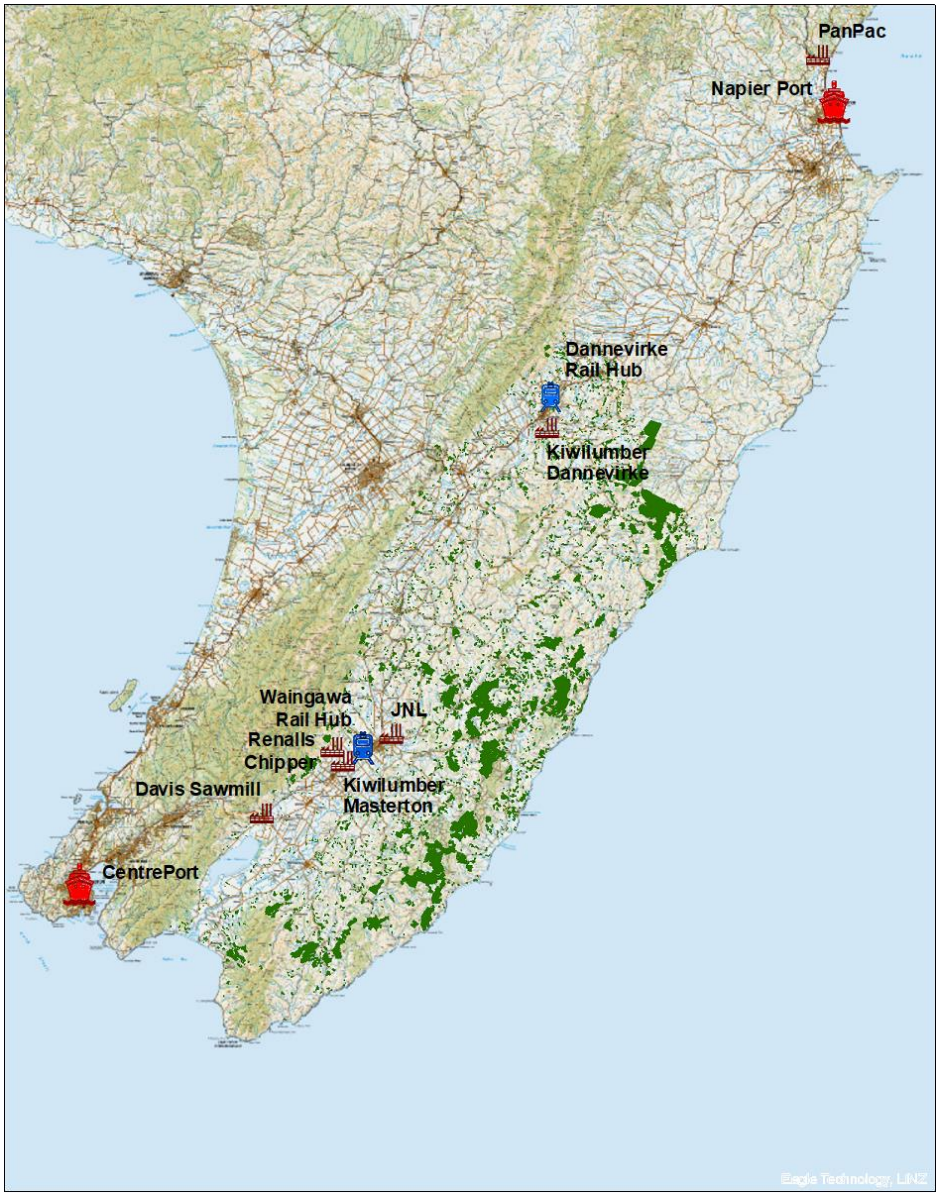

Figure 12: Woodflow Distribution Map

Figure 12 shows the geographical spread of the market destinations from the ESNI forest resource.

[7] One truck movement is a 30 tonne load.

There are over 100 truck movements a day into the Waingawa industrial hub south of Masterton to the rail hub and domestic mills. On top of this other trucks need to be weighed here before heading south to Centreport in Wellington. With the forecasted increase in harvest volume this is only going to increase the traffic in an already congested area.

5.11 Market Capacity

5.11.1 Domestic Market

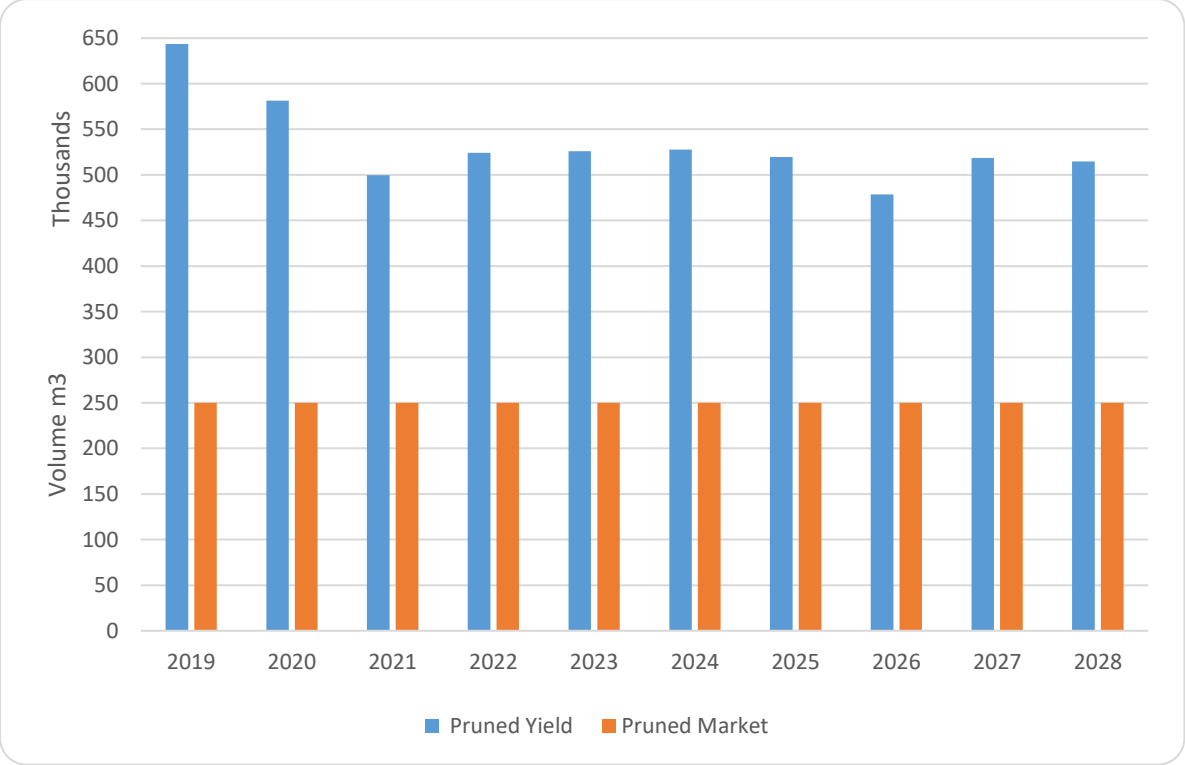

Figure 13 Domestic Pruned log market

The domestic pruned market opportunities for the region has a consistent demand of 250,000 m^3 of logs. This leaves up to at least another 250,000 m^3 per annum of pruned log volume available for the export market.

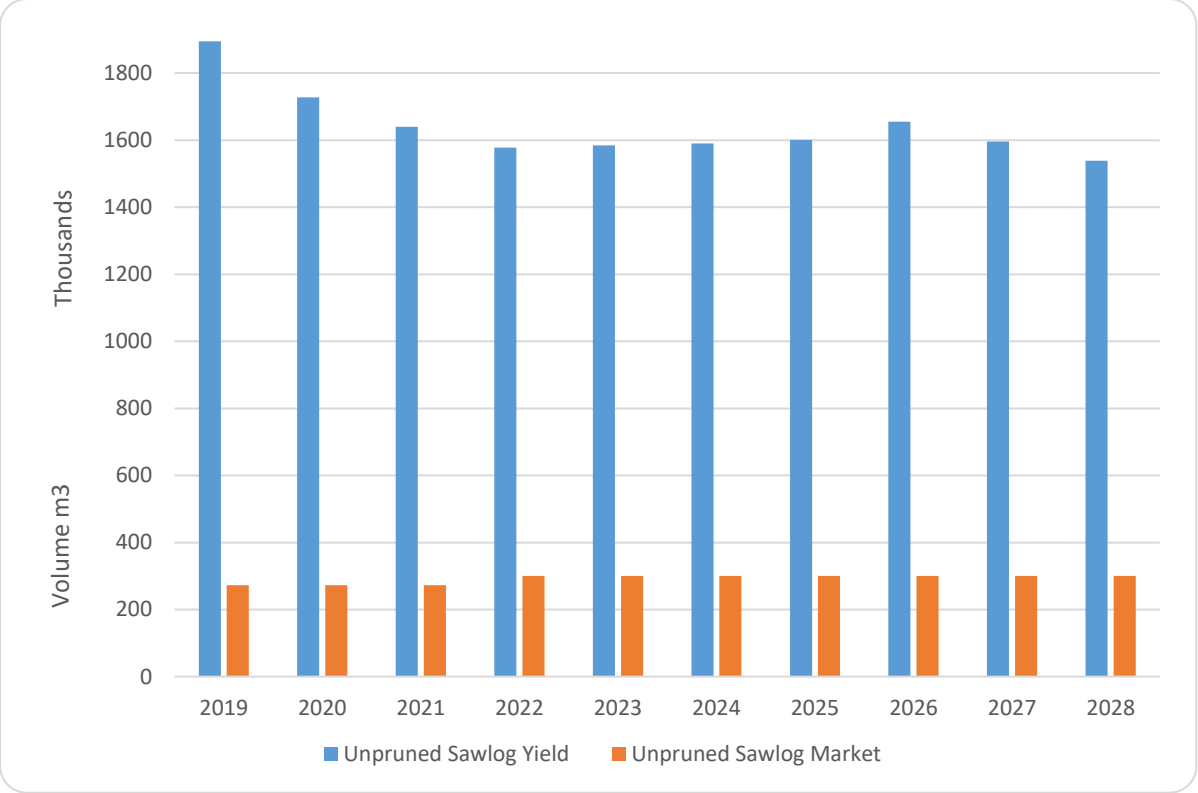

Figure 14; Domestic Unpruned Sawlog Market

The domestic market for unpruned sawlog is a secondary player to the volume that needs to be utilised by the export market. There is a small increase in forecasted demand in 2022 with volume increasing from 270,000 to 300,000 m^3.

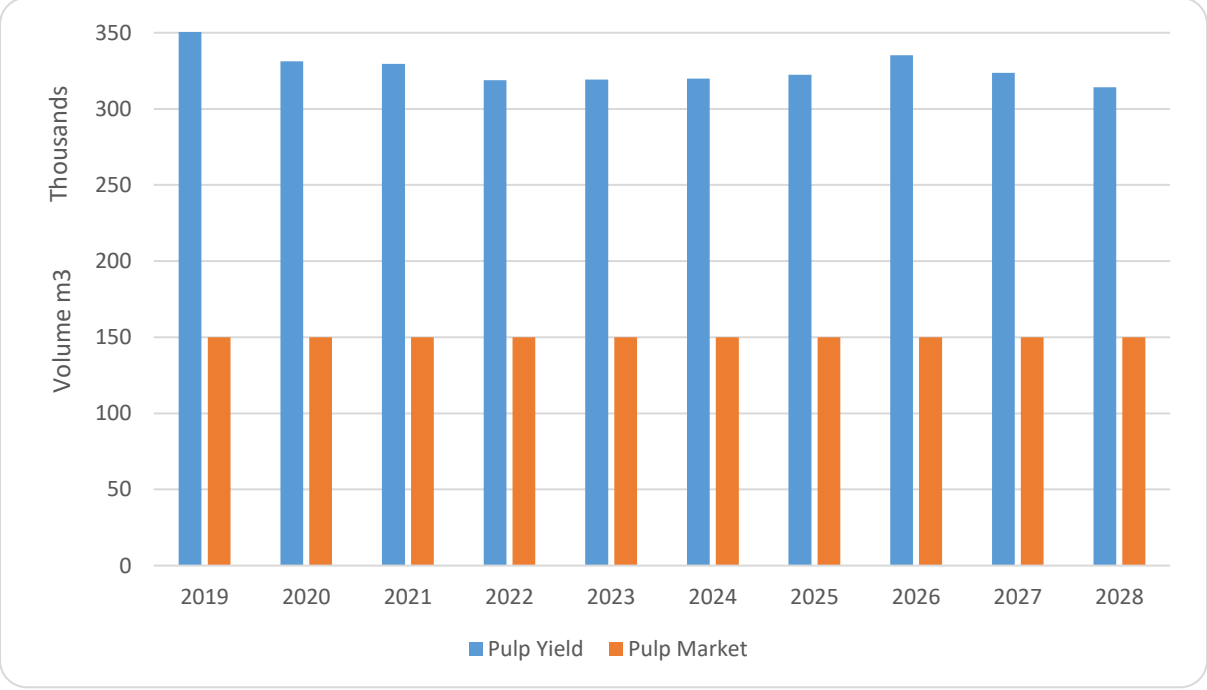

Figure 15; Domestic Pulp Log Market

Though figure 15 above illustrates a demand/capacity of 150,000 m^3 this market is currently being underutilised with only 45,000 m^3 of supply currently being available for the domestic pulp wood processors.

The pulp yield includes log specifications that can be utilised for industrial type grades which is sold into the export market. In the yield all material that is between 10 and 20 cm SED[8] will fall into an export pulp grade called KIS. Larger material with a knot size between 14 and 25 cm will fall into an industrial export grade called KI. See Appendix 4 for log yield specifications.

Though the yield tables do not specify what falls outside the KIS and KI specifications it is this volume that will be left for the domestic pulp market. The issue with this grade of log is that it is a cost negative commodity. This is where the price paid for the pulp logs is less than the cost of the harvesting extraction and transport. In many cases this volume will be left on site due to the cost negative impact to the bottom line of the forest plantations profit margin (Visser, Spinelli, & Brown, 2018) especially for the small scale forest owner. For larger scale forest owners/managers with a better infrastructure there is the opportunity to see as much of the merchantable timber removed from site. This will be an environmental management cost to the company.

5.11.2 Export Market

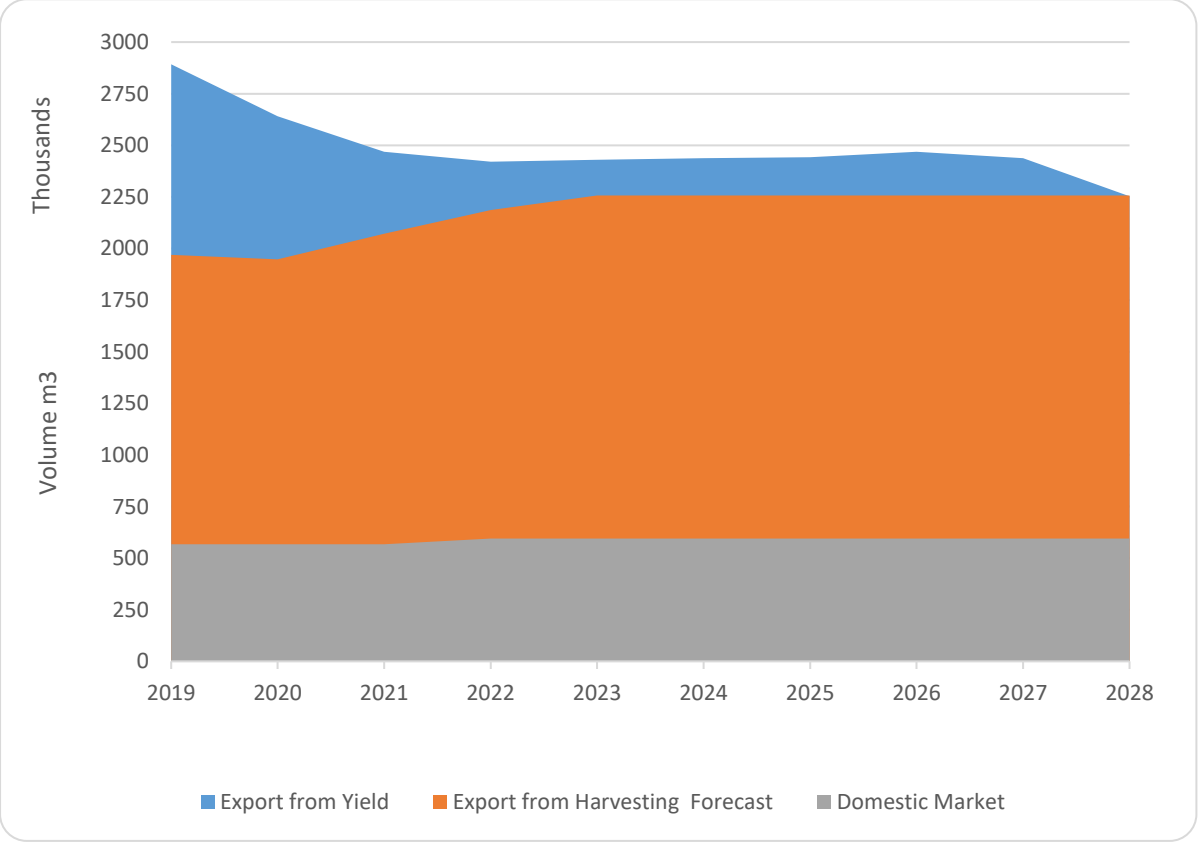

Figure 16; Potential Export Volumes

[8] SED – Small end diameter

Figure 16 illustrates the available volume for the export market after the domestic market in grey has been met. Note that the domestic pulp volume used for this graph is 45,000 m^3.

The area in orange is the volume from the harvesting capacity forecasts from the forestry companies. This volume starts at 1.4 million m^3 before stepping up to 1.66 million m^3.

The area in blue is the extra yield volume on top of the harvesting volume forecast.

The orange area is a more accurate forecast of export volumes so will be used for the remainder of this section.

The recent annual volumes exported from Napier and Wellington are 2.2 million m^3 (Napier Port, 2018) and 1.7 million m^3 (Centreport, 2019) respectively. The forecast volume of 1.4 million m^3 from the ESNI is 35% of the most recent throughput of the two ports. It is outside the scope of this report to conclude if this volume is able to be all utilised without doing the same analysis for the Hawkes Bay and Western Southern North Island. This however will provide the export and port companies a high level forecast to incorporate into their own forecasts.

To transport this export volume will require 230 truck movements per day. The rail hub at Waingawa has recently increased its capacity to 370,000 m^3 of logs that can be railed down to Centerport in Wellington annually (Kiwirail, 2019). This equates to 50 less trucks a day that do not have to travel over the Remutaka Hill.

The proposed rail hub in Dannevirke will be capable of railing 200,000 m^3 annually to Napier Port (Logger, 2019) or 30 less trucks a day to Napier Port.

This still leaves 150 trucks a day to travel to the two ports.

5.12 NEFD Area Discrepancies

Through the research process of this report an opportunity was found to compare the areas recorded in the NEFD and the mapping exercise that the School of Forestry at the University of Canterbury undertook. The mapping exercise was to map the small scale owner forests in the region. A range of imagery from 2010-2017 was used for the mapping exercise. For this report areas of forest from large scale forest owners were added to the data to give a total area of plantation forests within the region.

The total area of plantation forests from the shapefiles was 75,289 hectares. This compares to the area of radiata pine in the NEFD of 68,354 hectares. When all species in the NEFD are added the total area is 70,735 hectares. Still short of the area from the GIS data.

It was observed that the mapping exercise did not cover all plantations in the region. This will be due to younger stands not being visible at the time of the photography used. This therefore would increase the total area.

The difference in area between the GIS and the NEFD reemphasises the variability in the reliability of data used to calculate the areas of smaller scale forest owned plantations.

6. Conclusions

The analysis of the ESNI radiata pine plantation areas and yield exceeds the current harvesting infrastructure. The current reported harvesting capacity is for 1.97 million m^3 compared to the calculated starting yield volume of 2.9 million m^3 using the targeted minimum age of 28 years. The volume not utilised in this first year will roll into the following years to be harvested, increasing the average age of the resources and hence increase the available volume through yield growth. The forestry companies in the region are foreseeing the requirement to increase harvest capacity and are planning an overall increase in their forecast of harvesting volumes. The increased forecast reaches 2.25 million m^3 by 2023 close to the predicted yield of 2.4 million m^3. However this yield will increase with the accumulated harvesting shortfalls from the previous years.

The analysis has shown that comparing the year on year yield volumes against previous yield forecasts is not very accurate if the earlier yield has not been harvested. The comparison is not relevant if the previous available yield has not all been harvested and rolls into future years.

From this analysis the more accurate forecast of woodflow for the ESNI is to use the forecasts provided by the forest companies rather than the calculated yield. The calculated yield will provide certainty to the forest companies and markets that the volume is available for their forecasts going forward.

There are questions on whether the total yield available will have a market to be utilised. The domestic market volume for pruned and unpruned sawlogs is approximately only 20-25% of the available yield. This relies on the export market to be the majority market for the ESNI resource with volumes of 1.4 million m^3. The question that needs to be asked is what volume the Napier and Wellington ports can handle on an annual basis. This needs to be done in conjunction with the Hawkes Bay and Western Southern North Island regions.

The rail hubs will play a large role in transporting the log volume to the ports but the majority of the volume will still heavily rely on the trucking cartage network.

The volume of pulp in the forecast is unknown without knowing the breakdown of the industrial export grade volumes that come out of the high level yield. The domestic pulp that is available is being underutilised as it is a cost negative product. The pulp will either be left on the harvesting sites or be removed as an environmental management cost to the forest owners.

The current reported trucking fleet is capable of approximately 270 truck movements a day. Based on the harvest forecasts 310 truck movements will be required to transport this volume.

The one variable that has not been taken into account for this analysis is market conditions. The well-publicised recent downturn in the export market shows how the forest industry infrastructure can be forced to shrink in the short term to ride out the poorer market conditions. The larger forest owners are able to sustain the market conditions but the small-scale forest owners are very sensitive to log prices (Manley, Morgenroth, & Visser, 2015).

7. Recommendations

Make the harvest forecast a reality

The forecasts of harvesting volume capacity that the forestry companies have provided for this report show that the ESNI region is well resourced to meet the ongoing requirements for harvest demand. It is recommended that the companies plan to make their forecast a reality as the volume will be available. The one caveat on that is the potential for fluctuating market conditions. Though the yield volume is available the forest owners may not want to have their plantations harvested and therefore wait to get a better return in the future. This is prevalent in the small scale forestry owners who only have one chance to harvest and gain a good return for their investment into the plantation. The main players in the small scale space is the harvesting and marketing companies. They need to balance the harvesting contractors with ongoing work during the lower cycles of the log market and wind up quickly when the markets are in good shape.

Calculate the Maximum Port Capacity

Napier and Wellington have both had record years of log volumes through the ports to the export market. The question that needs to be answered is, what is the maximum throughput the ports could sustain? At recent levels of supply to the export market, bottlenecks at shifting significant volumes at the ports have led to delays within the supply chain. Are the ports in a position that they can break records again? If the forecasted volume to be harvested is realised then the ports will have to break records year on year to sustain the supply of logs. In conjunction with the exporting traders a feasibility study is recommended to calculate what that maximum annual log volume is. An accurate figure here for the export market will determine what the maximum quantity of the harvesting capacity can be.

Find a Pulp Market Solution

More work is required to find a cash neutral or positive solution for the domestic pulp yield that is being left on the harvesting sites. Or that the removal of pulp at cost is seen as good environmental management and becomes best practice for the industry. This is harder for the small scale forest owner's bottom line but a cost that has to be taken into account in the future.

Utilise new Technology for the NEFD

This analysis has shown that in the NEFD there are inaccuracies in the total area of plantations in the ESNI region. With the surveys targeting the larger scale forest owners the errors are in the small scale forests where the majority of this area is modelled. Dr Vega Xu has shown proof of concept in identifying the plantation areas using remote sensing. The technology in this space is moving at a fast pace. As the technology improves the accuracy calculated by remote sensing will improve dramatically and lead to this being the main source of information for the NEFD areas and yields.

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10. Appendices

Appendix 1 Harvesting Capacity Questionnaire

Future Eastern Southern North Island Woodflow and the Required Infrastructure

Harvesting Capacity and Future Volumes Questionnaire

Thank you for participating in this questionnaire on your companies harvesting capacity and future volumes. The report is being completed as part of the Kellogg Rural Leadership Programme.

All submitted answers will be kept confidential and will not be published in the report against your company name.

Please answer in the boxes below for your Eastern Southern North Island Operations

1. Total number of Groundbase crews in your harvesting operations? ☐
2. Total daily capacity in tonnes of ground base crews? ☐
3. Total number of Hauler crews in your harvesting operations? ☐
4. Total daily capacity in tonnes of hauler crews? ☐
5. Planned annual harvesting volume (tonnes) for next 5 years?

2020	
2021	
2022	
2023	
2024	

6. Planned annual harvesting volume Years 2025 – 2029

Average annual tonnes	

Appendix 2 – ESNI NEFD Areas (ha)

Year	District	1-5 years	6-10 Years	11-15 Years	16-20 Years	21-25 Years	26-30 Years	31-35 Years	36-40 Years	41+ Years
2018	Tararua	1345	3569	1025	2518	6282	1638	610	590	285
2018	Masterton	2879	2479	2742	4692	11710	3599	2867	497	529
2018	Carterton	1573	1201	578	3190	1927	778	161	174	110
2018	South Wairarapa	770	989	589	1992	2477	1432	229	210	118
2013	Tararua	1730	1019	2074	6990	1721	774	660	209	78
2013	Masterton	2201	2953	4734	12187	3898	4368	1458	401	257
2013	Carterton	1089	577	3567	2142	1078	1041	513	148	86
2013	South Wairarapa	431	597	2072	2649	1578	546	226	96	78
2003	Tararua	2696	5864	1584	759	1018	651	343	43	157
2003	Masterton	3527	15681	4348	4447	3340	2039	313	221	14
2003	Carterton	5297	2159	986	1154	873	1238	84	26	5
2003	South Wairarapa	1921	3462	1370	371	113	196	151	64	0
1993	Tararua	0	40	396	149	4	9	13	0	2
1993	Masterton	1713	4195	3436	2138	1545	955	216	31	1
1993	Carterton	356	1213	852	1255	107	31	7	19	0
1993	South Wairarapa	914	325	27	175	191	124	8	0	0
1983	Tararua	1017	758	338	128	64	48	41	161	88
1983	Masterton	3088	2406	2271	1627	835	713	124	68	29
1983	Carterton	995	1445	456	148	68	70	0	6	4
1983	South Wairarapa	238	392	583	418	127	28	4	7	3

Appendix 3 – Yield Tables ESNI

(Ministry for Primary Industries, 2015)

Southern N Island (East)						
Radiata pine						
Pruned						
no production thin						
planted post-1989						
Age		TRV	Thinnings	Pruned logs	Unpruned logs	Pulplogs
(years)		m3/ha	m3/ha	m3/ha	m3/ha	m3/ha
28		535	0	180	298	57
29		564	0	190	315	59
30		593	0	200	333	60
31		619	0	209	348	62
32		646	0	218	363	65
33		668	0	225	376	67
34		689	0	232	388	69
35		712	0	240	401	71
36		741	0	250	417	74
37		764	0	257	430	77
38		789	0	266	443	80
39		812	0	274	456	82
40		833	0	281	468	84
Southern N Island (East)						
Radiata pine						
Unpruned						
no production thin						
planted post-1989						
Age		TRV	Thinnings	Pruned logs	Unpruned logs	Pulplogs
(years)		m3/ha	m3/ha	m3/ha	m3/ha	m3/ha
28		622	0	0	508	114
29		643	0	0	528	115
30		663	0	0	548	115
31		681	0	0	564	117
32		699	0	0	580	119
33		714	0	0	596	118
34		729	0	0	609	120
35		743	0	0	622	121
36		756	0	0	634	122
37		767	0	0	645	122
38		777	0	0	654	123
39		787	0	0	663	124
40		796	0	0	672	124

Appendix 4 – Log Specifications

(Ministry for Primary Industries, 2015)

Log type specifications	Small end diameter	Maximum branch	Sweep class*
	(cm)	size (cm)	
Pruned	35	0	1
Unpruned	20	14	1
Pulp	10	N/A	2

		Log length (m)			
*Sweep class		< 3.7	3.7 – 4.8	4.9 – 7.6	7.6 +
	1	d/8	d/4	d/3	d/2
	2	d	2d	3d	4d

Appendix 5 – Area and Yield Calculations

					Prune Stand			Framing	
Pruned Regime Area	Framing Regime Area	Total Area	Harvest Year	Age	Pruned Sawlog Volume	Unpruned sawlog Volume	Pulp Log Volume	Unpruned sawlog Volume	Pulp Log Volume
1734	949	2478	2028	**28**	312156	516792	98849	482194	108209
1066	385	1451	2028	**29**	202578	335853	62906	203386	44298
514	513	1027	2027	**28**	92520	153172	29298	260604	58482
1580	898	2478	2027	**29**	300238	497763	93232	474250	103293
629	0	629	2027	**30**	125800	209457	37740	110	23
2322	1528	3850	2026	**29**	441180	731430	136998	806784	175720
186	99	285	2026	**30**	37200	61938	11160	54362	11408
2735	1400	4135	2025	**29**	519650	861525	161365	739200	161000
30	29	59	2024	**28**	5400	8940	1710	14732	3306
2749	1327	4076	2024	**29**	522310	865935	162191	700762	152628
202	201	403	2023	**28**	36360	60196	11514	102108	22914
2577	1155	3732	2023	**29**	489630	811755	152043	609946	132848
374	373	747	2022	**28**	67320	111452	21318	189484	42522
2405	983	3388	2022	**29**	456950	757575	141895	519130	113068
546	545	1091	2021	**28**	98280	162708	31122	276860	62130
994	495	1489	2021	**29**	188936	313236	58670	261360	56925
994	495	1489	2021	**30**	198880	331135	59664	271260	56925
65		65	2021	**31**	13585	22620	4030	0	0
929	495	1424	2020	**30**	185880	309490	55764	271260	56925
994	495	1489	2020	**31**	207830	346051	61653	279180	57915
860	361	1221	2020	**32**	187567	312325	55926	209380	42959
134	134	268	2019	**31**	28006	46632	8308	75576	15678
528	245	773	2019	**32**	115191	191809	34346	142100	29155
528	245	773	2019	**33**	118890	198678	35403	146020	28910
528	245	773	2019	**34**	122589	205019	36460	149205	29400
528	245	773	2019	**35**	126816	211888	37516	152390	29645
528	245	773	2019	**36**	132100	220343	39102	155330	29890

Appendix 6 – Forest Company Harvest Forecast

Company	Type	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
A	Forest Manager	222000	250000	255000	285000	300000	300000	300000	300000	300000	300000
B	Harvesting & Marketing	297600	280000	300000	350000	350000	350000	350000	350000	350000	350000
C	Forest Manager	386400	350000	350000	350000	350000	350000	350000	350000	350000	350000
D	Harvesting & Marketing	216000	200000	220000	240000	240000	240000	240000	240000	240000	240000
E	Forest Manager	57600	120000	180000	180000	180000	180000	180000	180000	180000	180000
F	Harvesting & Marketing	156000	156000	175000	190000	205000	205000	205000	205000	205000	205000
G	Harvesting & Marketing	108000	110000	110000	110000	110000	110000	110000	110000	110000	110000
H	Forest Manager	228000	217000	217000	217000	217000	217000	217000	217000	217000	217000
I	Forest Manager	160800	180000	180000	220000	220000	220000	220000	220000	220000	220000
J	Harvesting & Marketing	24000	25000	25000	25000	25000	25000	25000	25000	25000	25000
K	Forest Manager	112800	60000	60000	20000	60000	60000	60000	60000	60000	60000
		1969200	1948000	2072000	2187000	2257000	2257000	2257000	2257000	2257000	2257000