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Forestry on Farms: Implications for Farm Sustainability and Regional Impact

A Report Prepared for the Fertiliser Association of New Zealand

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EBITDA – Earnings Before Interest, Tax, Depreciation and Amortisation

IOA - Input-Output Analysis

IOT – Input-Output Table

MEC - Modified Employee Counts

Net Present Value₂₀₂₂₋₇₈ - Net Present Value over period 2022 to 2078

NZ\$_{2022Q2m} - NZ \$ in millions based on value in quarter 2, 2022 financial year

2.0 EXECUTIVE SUMMARY

This modelling study was undertaken to understand the opportunity to farm better class farmland more productively while planting forestry on poorer class land farmland, with blanket forestry planting as a comparison.

The four key objectives of this study were:

1. Analysis of the impact at the on-farm level of planting areas into forest, with respect to overall business profitability, and changes in production.

Scenarios included three different types of forestry regimes with different species with analysis of changes in profitability related to long-term farm resilience and sustainable farm level income.

1. A set proportion of the farm planted in forest targeted at the lesser (pastoral) productive areas of 10% (remainder of farm intensifies).
 2. A set proportion of the farm planted in forest targeted at the lesser (pastoral) productive areas of 30%, (remainder of the farm subsequently intensifies).
 3. Planting at 100% in response to carbon market.
2. Assessment of the wider macro-economic impacts of such land use changes with respect to changes in Income, Employment, and Value Add with a breakdown by relevant economic industries e.g. by farm/forestry type, servicing/processing industry.
 3. Analysis based on land use changes within the regions e.g. areas of steeper sheep and beef hill country land transitioning into production forestry and natives, and
 4. Assessment of the impact of blanket planting (i.e. whole farms) into forestry for carbon/timber.

The modelling was carried out on statistically “average” farms for Northland and Hawke’s Bay. The primary reason for targeting these two regions is that they are currently seeing significant carbon forestry plantings.

The farm-level analysis showed:

- (i) As increasing areas of lesser-productive land were planted into forestry, the pastoral operation intensified on the more productive land. This led to:
 - An increase in the EBITDA per (grazed) hectare, but a lower total farm EBITDA.
 - A similar pattern for physical production (meat and wool); an increase in per (grazed) hectare, but a decrease in total production.
 - The same outcome for greenhouse gas emissions; these increased on a per (grazed) hectare basis but decreased in total.
- (ii) The addition of the forestry returns, in the absence of a carbon value showed two marked effects:

- The inclusion of the forestry-only returns (i.e. no carbon) showed:
 - » For pines, the 10% forestry regime return was only slightly lower than the base EBITDA and increasing levels of pines reduced the total EBITDA further. There was an exception to this, where the farm EBITDA combined with the forestry annuity for the 30% pine regime on the Hawke's Bay farm exceeded the total base farm EBITDA.

This result is relatively sensitive to the annuity calculated for the pine regime. This annuity only had to increase by 2% for the Northland farm, and 3% for the Hawke's Bay farm, for the total return for the 10% forestry regime to equal that of the base farm.

- » For the other exotic species regime, all the forestry scenarios resulted in a much lower EBITDA relative to the base farm EBITDA. This is due to the much longer rotation length until timber harvest income is received.
 - » All of the native forest regimes resulted in much lower EBITDA figures relative to the base farm, given there is no timber returns available within the 56-year time span modelled.
- The addition of a carbon value (\$85/T) resulted in the returns from the pines and other exotics forestry regimes being well in excess of the base farm EBITDA. This reinforces the significant impact carbon has on forestry returns.

The most profitable scenario was the 100% pines, with an equivalent EBITDA 524% higher than the Northland sheep and beef base, and 159% higher for the Hawke's Bay base. For the "other Exotics", the 100% forestry scenario was 182% higher than the Northland base, and 12% higher for the Hawke's Bay base.

For the native forest scenarios, the returns with carbon included again resulted in lower financial returns relative to the base farm EBITDA, due to the high cost/slow sequestration rate for carbon. For both case-study farms the 100% native forest scenario resulted in a net negative return.

| Northland | Total EBITDA No Carbon | Net EBITDA after accounting for carbon* | Hawkes Bay | Total EBITDA No Carbon | Net EBITDA after accounting for carbon* |
|------------------------|---------------------------|--|------------------------|---------------------------|--|
| Base | \$76,832 | \$71,424 | Base | \$342,825 | \$334,194 |
| 10% Pines | \$74,328 | \$106,963 | 10% Pines | \$337,045 | \$401,079 |
| 30% Pines | \$64,668 | \$174,822 | 30% Pines | \$350,904 | \$512,185 |
| 100% Pines | \$64,985 | \$446,009 | 100% Pines | \$173,275 | \$898,664 |
| 10% Other Exotic | \$66,780 | \$85,192 | 10% Other Exotic | \$317,342 | \$354,184 |
| 30% Other Exotic | \$38,324 | \$105,391 | 30% Other Exotic | \$241,308 | \$370,109 |
| 100% Other Exotic | -\$35,759 | \$201,777 | 100% Other Exotic | -\$76,442 | \$375,777 |
| 10% Natives | \$45,326 | \$59,421 | 10% Natives | \$276,522 | \$305,114 |
| 30% Native | -\$29,869 | \$24,123 | 30% Native | \$117,346 | \$221,267 |
| 100% Natives | -\$275,295 | -\$81,298 | 100% Natives | -\$524,104 | -\$154,775 |
| Mixed | \$21,082 | \$98,153 | Mixed | \$219,207 | \$376,561 |
| Pines/Periodic Harvest | \$50,431 | \$110,748 | Pines/Periodic Harvest | \$276,813 | \$396,299 |

*Includes carbon levy on farm (for agricultural emissions), + carbon credits for forestry

The regional-level analysis showed:

- (i) A generally positive impact in the initial year, for both value-add and employment, where the benefits of planting the forest offset the loss of the farming production.
- (ii) From then on, the impact was negative, both for the region in question and for the rest of New Zealand, through until the forest was harvested (in year 28 and 56 (2nd rotation harvest)) for the pines, year 35 for the other exotics. In the year of harvest there was a massive increase in both value-add and employment as a result of the harvesting/processing.

This massive positive impact at time of harvesting does result in an overall positive NPV for the pines scenarios, and the 10% other exotics scenario.

This theoretically modelled situation is artificial, as it assumes all forests are planted at the same time and harvested in the future at the same time. This will not occur, as the past has shown from periods of planting booms in the 1970's and early 1990's for example, where large investments in forestry planting were essentially "smoothed out" at time of harvest, by harvesting over several years. But does give rise to the issue of whether there will be sufficient labour available, and, especially, harvesting and processing capacity at time of harvest. The long timeframes involved in forestry provide potential for larger scale (e.g. regional) planning of the forest establishment, and future development of harvesting and processing capacity. This approach has been successfully used in the past at a regional level but has been less prevalent in recent decades.

- (iii) For the native forest scenarios, the overall impact was negative, given there is no harvesting within the 56-year timeframe.

| Scenario | Direct and Indirect Value-Added Impacts | Direct, Indirect and Induced Value-Added Impacts |
|--|---|---|
| | Net Present Value ₂₀₂₂₋₇₈ NZ\$ _{2022Q2m} | Net Present Value ₂₀₂₂₋₇₈ NZ\$ _{2022Q2m} |
| Northland Region | | |
| Baseline vs Sheep and Beef Farming with 10% <i>Pinus radiata</i> Forest ¹ | 430 | 990 |
| Baseline vs Sheep and Beef Farming with 30% <i>Pinus radiata</i> Forest ¹ | 930 | 2,310 |
| Baseline vs 100% <i>Pinus radiata</i> Forest ¹ | 1,910 | 3,980 |
| Baseline vs Sheep and Beef Farming with 10% SPS Forest ² | 70 | 330 |
| Baseline vs Sheep and Beef Farming with 30% SPS Forest ² | -190 | 300 |
| Baseline vs 100% SPS Forest ² | -1,980 | -1,800 |
| Baseline vs Sheep and Beef Farming with 10% Native Forest ³ | -610 | 200 |
| Baseline vs Sheep and Beef Farming with 30% Native Forest ³ | -2,320 | -2,970 |
| Baseline vs 100% Native Forest ³ | -9,180 | -12,750 |
| Hawkes Bay Region | | |
| Baseline vs Sheep and Beef Farming with 10% <i>Pinus radiata</i> Forest ¹ | 1,080 | 2,350 |
| Baseline vs Sheep and Beef Farming with 30% <i>Pinus radiata</i> Forest ¹ | 2,270 | 5,700 |
| Baseline vs 100% <i>Pinus radiata</i> Forest ¹ | 3,600 | 11,760 |
| Baseline vs Sheep and Beef Farming with 10% SPS Forest ² | 200 | 720 |
| Baseline vs Sheep and Beef Farming with 30% SPS Forest ² | -390 | 780 |
| Baseline vs 100% SPS Forest ² | -5,720 | -4,810 |
| Baseline vs Sheep and Beef Farming with 10% Native Forest ³ | -930 | -1,060 |
| Baseline vs Sheep and Beef Farming with 30% Native Forest ³ | -3,800 | -4,580 |
| Baseline vs 100% Native Forest ³ | -17,410 | -22,770 |

NB: 1. Includes 2 rotations. 2. Includes 1 rotation. 3. No harvests. SPS – Special Purpose Species.

In a separate analysis, the assumption was that the forests were planted at periodic intervals, resulting in a semi-regular harvest post the first rotation for the first block planted. This scenario was modelled for the 30% forestry regime for both Northland and Hawke's Bay.

The analysis for Northland showed:

- For non-harvest years the value-added impacts for New Zealand average a net loss of around \$80m, while for harvest years a net gain of \$730m per year (\$540 of which is in Northland) is felt. Overall, the value-added contribution in NPV terms to the New Zealand economy is estimated to be a net loss of \$393m.
- For employment, there was a loss of between 426 and 567 jobs per year in the non-harvest years, with a gain of 6,400 additional jobs in the harvest years (years 28 and 56 in pine, and 35 in SPS) spread across in 'wood product manufacturing' (principally wood processing), 'utilities, construction and transport' (road construction and maintenance, and log transport) and 'agriculture, forestry, and fishing support services (forestry services)'.

For Hawke's Bay the analysis showed:

- The net annual value-added contribution to the Hawke's Bay region economy are negative ranging between -\$102.1m and -\$148.6m, however from Year 28 on a 3-year basis harvests generate positive value-added contributions of ~\$1,164m each year. Overall, the NPV over the period 2022-78 to the New Zealand region economy is negative \$236m.
- The employment contribution to the economy is relatively small, but negative in non-harvest years, with lost jobs ranging between approximately 250 and 450 people each year. In harvest years approximately 10,000 additional jobs (for a single year) in the Hawke's Bay are required in the 'wood product manufacturing' sector, and an additional 2,000 jobs are required in the 'utilities, construction and transport' sector – mainly for road building/maintenance and log transport services.

From an employment perspective therefore, there is a necessity for planting and harvesting to be phased and sequenced to maintain a sufficiently skilled labour force for harvest.

The addition of a value for carbon provides no net gain in value-add. The impact of a value for carbon is essentially an internal wealth transfer, with no overall net benefit at a national level. There could well be a benefit via additional sequestration/additional carbon credits being available over time, in that this would then enable other economic activity to occur, resulting in a gain to value-add. This aspect is outside the scope of this analysis.

The analysis undertaken in this study provides an important first step in examining farm and regional economic impacts of integrating forestry into sheep and beef farming operations. By the nature of the forestry modelling assumptions, principally around forest establishment occurring at a single or set points in time, it gives a somewhat artificial result, in that in reality, the industry would "smooth out" the harvest, which has direct implications for the regional impact. Nevertheless, it shows a potential significant lift in returns at a farm and regional level from integrating forestry into the farm, assuming a carbon value is involved.

Based on the early results from this study, future work is likely to be required to examine the:

- Impact of strategically staging forest establishment to develop stable workforce and future processing infrastructure – to optimise practical implementation as well as returns.
- Impacts of carbon sequestration at a regional economic level
- Value of other environmental services from integrated forests – such as reduced erosion, reduced downstream sediment effects increased biodiversity etc

An overall summary of the analysis is:

At current policy settings blanket planting of pines is the most profitable activity at farm-scale compared to "pocket planting of pines" and thus purchasers can pay more for the land. This may well not be in the national interest. Additionally, blanket planting of pines for carbon-only is much more profitable than clear wood harvesting, meaning the more remote farms are more likely to be blanket planted. Plus, carbon provides opportunities for pastoral farmers to improve overall farm profitability which would be beneficial for them to investigate.

3.0 BACKGROUND

Planting forest to sequester carbon, either for carbon farming or directly offsetting farm emissions, is likely to increase as a result of climate change policy, and the need to reduce greenhouse gas emissions. There are strong financial drivers for this, with carbon farming at current prices giving returns of three to five times greater than traditional sheep, beef and deer farming.

The recent Climate Change Commission report estimated 300,000 ha being planted in indigenous forest, and 380,000 ha of exotic plantings, by 2035. It could be expected that much of the exotic plantings will be in the North Island, given the better growth rates achieved.

The impact of this could be significant. At an on-farm level the integration of forestry on parts of the farm alongside pastoral farming could well strengthen the farm business, as well as providing carbon credits to offset GHG emissions from the farm (or generating income to pay for the emissions levy). At a wider regional or national level there would be a mix of impacts via a reduction in pastoral production/processing/exports, offset by the change to forestry and increased income generated by carbon credits, and (eventually) timber sales.

The most logical areas for forestry integration would be on LUC Class 5-7 land, of which there is 6.62 million hectares farmed (i.e. in pasture) in New Zealand. The proposed Climate Change Commission 680,000 hectares therefore makes up 10% of this.

4.0 OBJECTIVES

The key objectives of this study are:

- (i) Analysis of the impact at the on-farm level of planting areas into forest, with respect to overall business profitability, and changes in production. The forestry regimes would be:
 - » Radiata pine
 - » Native
 - » Mixed forest ($\frac{1}{3}$ pine, $\frac{1}{3}$ native, $\frac{1}{3}$ other exotic species)

The analysis considered how changes in profitability relate to long-term farm resilience and sustainable farm level income.

The on-farm analysis assumed a set proportion of the farm planted in forest targeted at the lesser (pastoral) productive areas, meaning that the remainder of the farm subsequently intensifies. The proportion of the farms planted in forestry were:

- » 10%
- » 30%
- » 100%

The analysis also included:

- (ii) Assessment of the wider macro-economic impacts of such land use changes with respect to changes in Income, Employment, and Value Add. This includes a breakdown

by relevant economic industries e.g. by farm/forestry type, servicing/processing industry.

- (iii) The analysis also accounts for land use changes within the regions e.g. areas of steeper sheep and beef hill country land transitioning into production forestry and natives.
- (iv) Analysis of the impact of blanket planting (i.e. whole farms) into forestry for carbon/timber.

5.0 METHODOLOGY

- (i) Regions studied were Northland, Hawke’s Bay, and the Rest of New Zealand
- (ii) Farmax models were developed representing a hill country farms in these regions, based on the Beef + Lamb NZ statistics, and differentiated by steep/rolling/flat land so as to analyse the impact of planting forest on the steeper land resulting in intensification on the easier land.
- (iii) Forestry cashflows were developed for the relevant species, over a 56-year period (i.e. two radiata rotations). The purpose of was to allow for analysis of:
 - » The transition over the first rotation
 - » A “steady-state” situation (i.e. the second rotation)
 - » The impact of carbon flows (which for harvested radiata pine would only occur in the first rotation)
- (iv) Income from carbon was incorporated into the forestry cashflows, and similarly a carbon cost would be imposed on the farm models; GHG emissions from each are calculated within Farmax. These were differentiated out, and discussion outlines the issues as to whether to offset or sell carbon in the integrated farm models.
- (v) A Multi-Regional Input-Output Model (MRIO) was developed incorporating approximately 100 industries covering the two regions and the rest of New Zealand – this captured the interregional trade exchanges between these economies and ensures that the economic impacts are assessed at both the regional level, and for New Zealand as a whole.

This analysis would cover both the transition and the “steady-state” scenarios.

- (vi) Discussion is also provided on:
 - » The need for local processing, especially if non-radiata species are grown.
 - » The wider implications and opportunities for delivery of carbon, biodiversity and ecosystem services from different approaches.
- (vii) The report provides analysis covering:
 - » Status quo
 - » On-farm integrated forestry planting
 - » Blanket forestry planting

6.0 FARM SYSTEM MODELLING

6.1 Farm Model Setup

Two representative farms were developed, one for each of the Northland and Hawke's Bay (Regional Council) regions. These were based on the Beef + Lamb NZ Economic Service data, from their economic survey, and are a weighted average of the Hard Hill Country (Class 3) and Hill Country (Class 4) farms for those regions.

6.1.1 Northland

The parameters of the Northland farm are:

Table 1: Northland Land Use Areas

| | Total ha | Land use | ha |
|---------|----------|-----------|-----|
| Steep | 134 | Effective | 343 |
| Rolling | 207 | Forestry | 18 |
| Flat | 92 | Other | 72 |
| Total | 433 | | 433 |

The breakdown of the effective area, by slope, is:

Table 2: Breakdown of Northland Effective Area by Slope

| Effective area | ha | KgDM/ha/year |
|------------------------|-----|--------------|
| Steep | 45 | 4,127 |
| Rolling | 206 | 6,358 |
| Flat | 92 | 8,626 |
| Total/Weighted average | 343 | 6,674 |

The breakdown of the slope categories are:

Table 3: Slope Categories

| | |
|---------|----------------------|
| Flat | 0 to 8 ^o |
| Rolling | 8 to 20 ^o |
| Steep | > 20 ^o |

The dry matter (DM) growth per hectare is based on discussion with AgFirst consultants in Northland as to average dry matter production on hill country, and the disaggregation of this by slope.

Stock numbers on the farm were again based on the Beef + Lamb NZ statistics.

Table 4: Northland Farm Stock Numbers

| | | | |
|---------------|------|---------------|-----|
| Breeding ewes | 275 | Breeding Cows | 69 |
| Ewe hoggets | 69 | R 1 Heifers | 17 |
| Mixed hoggets | 50 | Bulls | 2 |
| Rams | 6 | R 1 Steers | 280 |
| Lambing % | 133% | R 2 steers | 250 |
| | | Calving % | 82% |

6.1.2 Hawke's Bay

The parameters of the Hawke's Bay farm are:

Table 5: Hawke's Bay Land Use Areas

| | Total ha | Land Use | ha |
|---------|----------|-----------|-----|
| Steep | 459 | Effective | 653 |
| Rolling | 339 | Forestry | 53 |
| Flat | 66 | Other | 158 |
| Total | 864 | | 864 |

The breakdown of the effective area, by slope, is:

Table 6: Breakdown of Hawke's Bay Effective Area by Slope

| Effective area | ha | KgDM/ha/year |
|------------------------|-----|--------------|
| Steep | 248 | 4,320 |
| Rolling | 339 | 7,290 |
| Flat | 66 | 9,450 |
| Total/Weighted average | 653 | 6,380 |

Again, the DM growth per hectare is based on discussion with AgFirst consultants in the Hawke's Bay as to average dry matter production on hill country, and the disaggregation of this by slope.

Stock numbers were:

Table 7: Hawke's Bay Farm Stock Numbers

| | | | |
|---------------|------|---------------|-----|
| Breeding ewes | 2320 | Breeding Cows | 179 |
| Ewe hoggets | 580 | R 1 Heifers | 45 |
| Rams | 46 | Bulls | 5 |
| Lambing % | 134% | R 1 Steers | 150 |
| | | R 2 steers | 120 |
| | | Calving % | 82% |

These farms were then set up in Farmax¹ using the data as described above. For the purposes of the analysis, 3-year average meat schedules were used in order to give a more "averaged" calculation of the farm's Earnings before Interest, Tax, Depreciation and Amortisation (EBITDA). This was done to give a more representative indication of farm profitability, given payouts and schedules rise and fall, and to better fit with the annuities from forestry (also calculated on 3-year average log prices).

These payouts/schedules were:

Table 8: 3-year average prices (\$/kg; 2018/19 – 2020/21)

| Lamb | Bull Beef | Prime Beef |
|--------|-----------|------------|
| \$7.52 | \$5.31 | \$5.48 |

¹ www.farmax.co.nz

Once the Farmax file was developed, this then allowed for modelling of the various forestry scenarios. In these situations, the area to be planted was taken out of the “steep” block within the model, and then stock numbers reduced down proportionally until a feasible solution was found. Stock performance levels were left unchanged.

For the 30% forestry scenario on the Northland farm, this resulted in all of the “steep” block being planted in forestry, plus 58 hectares taken out of the “rolling” block.

Analysis was also carried out using the Farmax file, to differentiate the returns from the “steep” land relative to the rest of the farm.

6.2 Farm System Modelling Results

The results of the scenario modelling are:

Table 9: Northland Scenario Modelling Results (Pastoral Component Only)

| | EBITDA Total | % Change from Base | EBITDA/ha | % Change from Base | SU Eff/ha | Stock Numbers Adjustment |
|---------------------|--------------|-----------------------|-----------|-----------------------|-----------|----------------------------|
| Base | \$76,564 | | \$223 | | 9.9 | |
| 10% Forestry | \$72,376 | -5% | \$234 | 5% | 10.4 | Sheep & Cattle reduced 5% |
| 30% Forestry | \$52,940 | -31% | \$221 | -1% | 11.1 | Sheep & Cattle reduced 22% |
| Steep | \$3,101 | | \$69 | | | |
| Rest of Farm | \$73,463 | | \$247 | | | |

Table 10: Hawke’s Bay Scenario Modelling Results (Pastoral Component Only)

| | EBITDA Total | % Change from Base | EBITDA/ha | % Change from Base | SU Eff/ha | Stock Numbers Adjustment |
|---------------------|--------------|-----------------------|-----------|-----------------------|-----------|----------------------------|
| Base | \$342,666 | | \$525 | | 9.0 | |
| 10% Forestry | \$328,633 | -4% | \$559 | 7% | 9.5 | Sheep & Cattle reduced 5% |
| 30% Forestry | \$274,730 | -20% | \$601 | 15% | 10.3 | Sheep & Cattle reduced 20% |
| Steep | \$91,761 | | \$370 | | | |
| Rest of Farm | \$250,905 | | \$620 | | | |

These Tables show:

- The total (pastoral) EBITDA from the farms reduces as land is taken out for forestry.
- The EBITDA per hectare increases, as the remaining pastoral operation intensifies on the better land. This is also reflected in the stocking rate per effective hectare.
- The 30% forestry scenario has a greater proportional effect on the Northland farm, as it requires an area of more productive land (i.e. rolling) being taken out of farming.

In a similar vein, production levels (of meat and wool) from the farms also decreases, but proportionally less relative to the land being taken up in forestry, as it is the less productive land being converted.

Table 11: Physical Production Northland Farm

| | Farm | | | | |
|---------------------|------------|------------|------------------|------------|------------------|
| | Base | 10% Forest | % Change cf Base | 30% Forest | % Change cf Base |
| kg sheep meat sold* | 6,493 | 6,141 | -5.4% | 5,039 | -22.4% |
| kg wool sold | 2,176 | 2,064 | -5.1% | 1,693 | -22.2% |
| kg beef sold* | 82,934 | 78,660 | -5.2% | 64,522 | -22.2% |
| | | | | | |
| | Region | | | | |
| | Base | 10% Forest | 30% Forest | | |
| kg sheep meat sold | 3,376,360 | 3,193,320 | 2,620,280 | | |
| kg wool sold | 1,131,520 | 1,073,280 | 880,360 | | |
| kg beef sold | 43,125,680 | 40,903,200 | 33,551,440 | | |

* kg carcass weight

Table 12: Physical Production Hawke's Bay Farm

| | Farm | | | | |
|--------------------|------------|------------|------------------|------------|------------------|
| | Base | 10% Forest | % Change cf Base | 30% Forest | % Change cf Base |
| kg sheep meat sold | 56,643 | 53,832 | -5.0% | 45,301 | -20.0% |
| kg wool sold | 18,616 | 17,736 | -4.7% | 15,073 | -19.0% |
| kg beef sold | 76,594 | 72,727 | -5.0% | 61,359 | -19.9% |
| | | | | | |
| | Region | | | | |
| | Base | 10% Forest | 30% Forest | | |
| kg sheep meat sold | 26,055,780 | 24,762,720 | 20,838,460 | | |
| kg wool sold | 8,563,360 | 8,158,560 | 6,933,580 | | |
| kg beef sold | 35,233,240 | 33,454,420 | 28,225,140 | | |

* kg carcass weight

6.3 Greenhouse Gas Emissions

The greenhouse gas emissions from the pastoral area of the farms were also taken from Farmax:

Table 13: Northland GHG Emissions (Pastoral Component Only) (Tonnes CO₂e)

| | CH ₄ /ha | N ₂ O /ha | CO ₂ from nitrogen fertiliser/ha | Total CO ₂ e/ha | % Change from Base | Total CO ₂ e/farm | % Change from Base |
|--------------|---------------------|----------------------|---|----------------------------|--------------------|------------------------------|--------------------|
| Base | 2.95 | 0.72 | 0.04 | 3.71 | | 1,271 | |
| 10% Forestry | 3.11 | 0.76 | 0.04 | 3.91 | 5.4% | 1,208 | -4.9% |
| 30% Forestry | 3.29 | 0.83 | 0.06 | 4.17 | 12.4% | 1,002 | -21.2% |

Table 14: Hawke's Bay GHG Emissions (Pastoral Component Only) (Tonnes CO₂e)

| | CH ₄ /ha | N ₂ O /ha | CO ₂ from nitrogen fertiliser/ha | Total CO ₂ e/ha | % Change from Base | Total CO ₂ e/farm | % Change from Base |
|---------------------|---------------------|----------------------|---|-------------------------------|-----------------------|---------------------------------|-----------------------|
| Base | 2.49 | 0.6 | 0.02 | 3.11 | | 2,030 | |
| 10% Forestry | 2.62 | 0.63 | 0.02 | 3.28 | 5.5% | 1,928 | -5.0% |
| 30% Forestry | 2.84 | 0.7 | 0.03 | 3.57 | 14.8% | 1,631 | -19.6% |

These show that:

- GHG Emissions per hectare increase as the intensity of the farming on the remaining pastoral land increases.
- Total GHG emissions from the farms decrease as more land is taken out for forestry.

7.0 FORESTRY MODELLING

The impact of planting new forests on land with existing pastoral production is assessed for a range of scenarios for the average farm in either Northland or Hawke’s Bay. The model farms are described above and include classification of the farm into steep (>20 degrees), rolling (8-20 degrees) and flat (less than 8 degrees). New forests were assumed to be located on the steepest land, which also has the lowest agricultural production. As the area of pastoral land established in forest increases under the 10%, 30% and 100% scenarios, forest progressively moves onto better land. More so for the Northland farm than the Hawke’s Bay farm. The table below shows the portion and area of each land type under the different scenarios in each region.

Table 15: Land type, portion and area planted in forestry for Northland and Hawke’s Bay model farms.

| Region | Land type | Scenario | | |
|--------------------|------------------------------|--------------|---------------|---------------|
| | | 10% of farm | 30% farm | 100% farm |
| Northland | Steep (ha >20°) | 34 ha | 45 ha | 45 ha |
| | Rolling (ha 8 to 20°) | | 58 ha | 206 ha |
| | Flat (ha 0 to 8°) | | | 92 ha |
| | Total New Forest area | 34 ha | 103 ha | 343 ha |
| Hawke’s Bay | Steep (ha >20°) | 65 ha | 196 ha | 248 ha |
| | Rolling (ha 8 to 20°) | | | 339 ha |
| | Flat (ha 0 to 8°) | | | 66 ha |
| | Total new Forest area | 65 ha | 196 ha | 653 ha |

The quantity of foregone pastoral production (available DM/ha/year) was estimated based on the average DM consumption derived by the Farmax model for each farm in relation to the area retired to new forest.

7.1 Forest types

Three types of forest have been included in the analysis of integrated land use in this study. Radiata pine is low risk, low cost to establish, relatively simple to manage, has established markets with known returns and achieves a high sequestration rate. Special purpose timber species (SPS) such as Cypress, an exotic softwood, adds diversification into high value timbers which don’t require preservative and suit longer term projects such as continuous cover forestry. However, in comparison to Radiata pine the management and markets are less well-known, they are more expensive to establish and achieve only a moderate carbon sequestration rate. A framing regime was chosen for Radiata as this was the simplest and most cost-effective option. A clearwood regime was chosen for Cypress in order to maximise the returns from higher value timber. Native forests create improved biodiversity and protection of water quality with potential for very long-term sustained timber yield but are the most expensive to establish, are the least able to cope with pest weeds and have a low carbon sequestration rate. The mix of forest types on a farm will depend on landowner preference and site suitability.

The scenario of establishing a mixture of forest types was also examined for the 30% landuse change based on 10% Radiata pine, 10% special purpose species and 10% native. This reflects a balanced approach at the farm level where steep gullies are retired to native and on

moderate steep to rolling land is changed to a range of production forest species, some of which are more suited to long term carbon sequestration and selective logging.

7.1.1 *Harvest options*

The standard approach to forest establishment for this report was that all of the forest was established in year one. Radiata pine forest was clear-felled at age 28 and the special purpose timber species at age 35. This meant the cashflow modelling out to age 56 included two harvests of Radiata pine.

A simple examination was also carried out for periodic establishment of forest so that a farm business could enter a future scenario where there was regular cycle of forest establishment and harvest. The option of 30% landuse change from pasture to Radiata pine was modified to reflect establishment of 10% of the proposed forest area every three years. This resulted in a series of 10 smaller stands of approximately 10 hectares in the case of Northland, or 20 hectares in the case of Hawke's Bay. This was useful in showing the average cashflow that could be generated once harvest commenced and is essentially a partial budget. To complete the farm budget during the establishment period (30 years) analysis would require sequential reduction in pastoral income during that period.

7.2 Carbon sequestration, the Emissions Trading Scheme (ETS) and Greenhouse Gas Emissions

Sequestration of carbon in forests occurs through photosynthesis by trees taking CO₂ from the atmosphere and moisture and nutrients through their roots to build cellulose and other biological materials, particularly in their woody stems. Sequestration or storage occurs while a forest is growing on a site that previously did not have forest, such as a pasture site. Eventually a forest will grow to its maximum biomass and be cycling carbon – so will cease to sequester more carbon from the atmosphere. Forest offsets provide an interim measure while we move away from burning fossil fuels.

Recognition of carbon sequestration has added a new income stream from forests. The New Zealand Emissions Trading Scheme (ETS) facilitates the registration of land with new forests and provides the mechanism to account for gains and losses of carbon stored in a forest via “Look-up tables”². Table 16 describes the forest types along with the average sequestration rate. For this analysis carbon income was included with timber income. Under the ETS the “averaging” scheme was chosen. In this case average age for Radiata pine is 16 years and for Cypress (exotic softwood) it is 22 years. Sequestration for native has been averaged over 50 years which is the current extent of the Look-up tables.

Income from the sale of carbon credits was allocated to forest income, at a price of \$85/NZU. The quantum of NZUs available for sale was determined by the proposed new forest area and forest type.

² <https://mpi.govt.nz/dmsdocument/44575/direct>

Table 16: Forest type and average carbon sequestration rate.

| Forest Type | Description | Average sequestration tonnes CO ₂ e/ha/year to average age (age, total tonnes/ha) |
|---------------------------------------|---|--|
| Radiata Pine | Structural or framing regime, thinned at age 9, clearfell at age 28 | Hawke's Bay 24.9 (16, 398) Auckland 24.8 (16, 396) |
| Special purpose timber species | Cypress example, pruned and thinned, clearfell at age 35 | All regions 12.9 (22, 283) |
| Native Forest | plant mix of native species, control pest weeds and animals, not harvested for 50 years | All regions 6.5 (50, 323) |

7.3 Agriculture and the ETS

Agriculture will face a levy on on-farm GHG biological emissions on January 1, 2025. Establishing new forest on pastoral areas can reduce the cost of GHG emissions to the farm business in two ways. Firstly, through the annual sale of carbon credits arising from the growth of new (post-1989) forests and secondly by potentially displacing livestock from the farming operation. This study also reports on these aspects from the modelling.

7.4 Locating proposed new forest and transport distance

In order to calculate forest yield and transport costs a location had to be selected for each farm. The location for each farm and transport distance is described below.

Northland

The Northland farm location was assumed to be somewhere south-east of Kaikohe. The transport distance for Radiata pine was 110 km, equivalent to the distance from Kaikohe to Marsden Point. The transport distance for special purpose species was reduced slightly to 100 km to allow for the fact that at least some of these logs may be sawn locally in small mills.

Assumptions for other attributes used in modelling yield were:

| | |
|--------------------------------------|------|
| Altitude (m ASL) | 180m |
| Site index (m) | 33.0 |
| 300 index (m ³ /ha/annum) | 29.7 |

Hawke's Bay

The Hawke's Bay farm was located inland of Wairoa. The transport distance was 110 km, equivalent to the distance from Wairoa to Bay View (PanPac Mill). The transport distance for special purpose species was reduced slightly to 100 km to allow for the fact that at least some of these logs may be sawn locally in small mills.

Assumptions for other attributes used in modelling yield were:

| | |
|--------------------------------------|------|
| Altitude (m ASL) | 400m |
| Site index (m) | 30.0 |
| 300 index (m ³ /ha/annum) | 34.0 |

7.4.1 Key cost and return assumptions

Key costs for new forests include costs of forest establishment, silviculture and follow up weed control. These establishment and growing costs are summarised in Table 17. More detail on cost assumptions can be found in Appendix 1.

Table 17: Effect of forest type on establishment and growing costs.

| Forest Type | Establishment costs. \$/ha | Growing costs. \$/ha |
|---|----------------------------|----------------------|
| | Year 1 (stems/ha) | (Yrs 1 to 11) |
| Radiata Pine | \$1,650 (1000 sph) | \$850 |
| Special Purpose Timber Species (Cypress*) | \$3,110 (800 sph) | \$4,700 |
| Native Forest | \$10,000 (1600 + sph) | \$3,000 |

*Cypress is an example special purpose exotic softwood forest species redwood is another

Harvest revenues are expected for Radiata pine and Cypress, whereas no harvest income is expected from native. Yield, log quality, costs associated with harvest and marketing and log values were collated for Radiata pine and Cypress. Radiata pine timber yield and log grade mix were calculated for each location using Forecaster Calculator (Ver 1.0.4.81). These were reduced by 20% to allow for uncertainties in actual production from these sites. For Cypress, yield and log grade mix were estimated from Groundtruth Ltd experience and industry reports.

Harvest cost was based on the proportion of the site in different terrain classes. On steep land (>20°) a mixture of hauler and tracked machine would be required to harvest the crop with the most expensive harvest cost. On rolling country (8° to 20°) a mixture of tracked and rubber tyred machines could be used at relatively lower cost as compared with steep land. On flat land (0 to 8°) harvest can be carried out with rubber tyred machines with faster work rates providing the lowest harvest cost.

Roading cost was estimated from the distance of formed road requiring upgrade, new road required on easy, moderate or difficult terrain. Details on the proportion of harvest cost and the roading distances and difficulty assumed for the proposed new forest in Northland and Hawke’s Bay are shown in Appendix 1.

Three year rolling average log prices for Radiata pine were used from the Ministry of Primary Industries March 2022 report. Export log prices were reduced by 15% to allow for JAS³ conversion and wharfage. Composite prices were derived in relation to log product mix percentages. For Cypress, the lower values of the range were used from values quoted in farm forestry market report from Laurie Forestry.

The gross harvest return per hectare was calculated from yield, mix of log grades and mill gate or export prices. A broad estimate of 50% to domestic processing, 50% to export port was used for cost calculations. From this, harvest, roading, transport and marketing costs were deducted based on log volume harvested per ha (m³). This provided a net harvest return per hectare. This figure, also known as “stumpage”, is the net return to the landowner from harvest. This has been calculated for pine and special purpose species (Cypress), and again shown in Appendix 1.

³ Japanese Agricultural Standard (JAS) – global industry standard measurement for a cubic metre to measure log volume.

7.5 Economic analysis

Two key performance Indicators were derived for each forest type at each farm. These were the Net Present Value (NPV) and Equivalent Annual Annuity. The NPV is the value of the cash flow if a 5% annual discount rate is applied to all future costs and revenue. This is effectively the amount that could be paid for land at the start of the project while still obtaining a 5% return on investment and is also referred to as the Land Expectation Value (LEV). The Equivalent Annual Annuity is the annual payment that would need to be made over the rotation length to give an equivalent NPV. This is one way of considering a per hectare return from forestry that is spread over a long time period as compared with EBITDA from livestock operations where returns are calculated over a relatively short term. Note that an average cashflow which is the cash flow average per year over the rotation period would be higher on an annual basis but does not take account of the time value of money as no discount rate is applied to future income.

Tables 18 and 19 summarise the production and economic results for landuse change for the proposed new forest of three types of forest for Northland and Hawke's Bay farms respectively. Sales of carbon add significant return to all forest types.

The Tables show data from the example of 10% conversion of pasture to forest. Harvest returns per hectare increase with increasing proportion of landuse change due to reduced cost for harvest and roading cost per m³ timber in relation to easier terrain. Higher yield would also be expected on flatter land, but no yield adjustment was made. Radiata pine provides the highest NPV and annuity. The addition of carbon income supports special purpose species such as Cypress which becomes economic (i.e. positive NPV) at carbon values of \$85/NZU. Natives require higher carbon values to achieve a positive return in investment.

Note that returns are based on conservative yield and pessimistic roading, harvest and transport cost estimates, and may be less than recent published data on stumpages attained for Radiata pine. They are also likely to be conservative as our economy moves away from fossil fuel to renewable resources like timber for building, plastics and energy in the future. This more conservative approach has been taken due to the generalised high-level approach of this initial analysis. Further fine tuning could be undertaken in the future at a case study farm level.

Mixed Forest

The option of establishing a mixture of forest types was assessed for a 30% change in landuse from pasture to forest. The results are mid-range of the individual forest types shown above. However, this strategy of establishing a practical mix of forest species in relation to land types requires a carbon income to be viable, given Cypress is not viable without carbon and native is not viable in any case.

Table 18: Equivalent annual annuity and NPV for three forest types and two carbon values for Northland

| | No Carbon income (\$/NZU) | | With Carbon income (\$85/NZU) | |
|-------------------|---|------------------------------|---|------------------------------|
| | Equivalent annual annuity (\$/ha/year) | Net Present Value (\$/ha) | Equivalent annual annuity (\$/ha/year) | Net Present Value (\$/ha) |
| Radiata Pine 10% | \$50 | \$942 | \$1,161 | \$21,714 |
| Radiata Pine 30% | \$115 | \$2,154 | \$1,226 | \$22,926 |
| Radiata Pine 100% | \$189 | \$3,543 | \$1,300 | \$24,314 |
| Cypress 10% | -\$172 | -\$3,209 | \$521 | \$9,740 |
| Cypress 30% | -\$141 | -\$2,628 | \$552 | \$10,321 |
| Cypress 100% | -\$104 | -\$1,949 | \$588 | \$11,000 |
| Native 10% | -\$803 | -\$15,008 | -\$237 | -\$4,432 |
| Native 30% | -\$803 | -\$15,008 | -\$237 | -\$4,432 |
| Mixed 30% | -\$308 | -\$5,758 | \$482 | \$9,007 |

Table 19: Equivalent annual annuity and NPV for three forest types and two carbon values for Hawkes Bay

| | No Carbon income (\$/NZU) | | With Carbon income (\$85/NZU) | |
|-------------------|---|------------------------------|---|------------------------------|
| | Equivalent annual annuity (\$/ha/year) | Net Present Value (\$/ha) | Equivalent annual annuity (\$/ha/year) | Net Present Value (\$/ha) |
| Radiata Pine 10% | \$129 | \$2,403 | \$1,239 | \$23,174 |
| Radiata Pine 30% | \$136 | \$2,550 | \$1,247 | \$23,322 |
| Radiata Pine 100% | \$265 | \$4,962 | \$1,376 | \$25,733 |
| Cypress 10% | -\$175 | -\$3,265 | \$518 | \$9,684 |
| Cypress 30% | -\$170 | -\$3,182 | \$522 | \$9,768 |
| Cypress 100% | -\$117 | -\$2,189 | \$575 | \$10,760 |
| Native 10% | -\$803 | -\$15,008 | -\$237 | -\$4,432 |
| Native 30% | -\$803 | -\$15,008 | -\$237 | -\$4,432 |
| Mixed 30% | -\$283 | -\$5,290 | \$507 | \$9,475 |

Periodic ongoing harvest (mixed age forest)

Carbon income early in the rotation for Radiata pine and Cypress add significant value for pine and make Cypress and other special purpose species a viable crop supporting a change in landuse from pasture to forest. Once a new forest reaches long-term average carbon stock under the averaging category in the ETS, no more carbon income is available. Our analysis included a situation where rather than establishing a new Radiata pine forest all in year one, the establishment was staggered over 30 years on 30% of the currently grazed area. In this case harvest occurs on average every three years. After 44 years carbon no longer contributes to income. From then on income is from timber rather than an annuity with a long lead time, achieving a steady harvest return every three years. This is more directly comparable to a traditional, annual pastoral return (EBITDA). Table 20 compares pastoral returns with Radiata pine forest returns by land type. The table shows that once in a steady state of triannual planting and harvest, income from timber is higher than income from meat and wool. Income from meat and wool will be further reduced when agriculture faces a price on emissions in 2025, further reducing pastoral income (-\$13 to \$16/ha in 2025) and increasing the attractiveness of forestry on the more challenging parts of the farm.

Table 20: Comparison of pastoral and forest EBITDA for 30 % radiata pine and forest harvest every 3 years

| Region | Land type (ha) | Pastoral EBITDA (\$/ha) | Radiata pine (\$/ha) | Radiata pine (\$/ha) |
|------------|----------------|-------------------------|----------------------|---|
| | | | Annuity 56 years | Average annual cash flow post carbon (yr 44-57) |
| Northland | Steep | \$69 | \$604 | \$360 |
| | Rolling | \$180 | | \$360 |
| Hawkes Bay | Steep | \$307 | \$656 | \$505 |

7.6 Discussion

The operation of a carbon market under the ETS has had a fundamental impact on the economics of forestry. Under traditional discounted cash flow economic analysis, forestry suffers from a long period until income is generated at timber harvest. The sale of sequestered carbon during the growth of the forest provides early income, greatly increasing rates of return. The presentation of these returns as an estimated annuity allows broad comparison with returns from sheep and beef farming operations. This shows an increased return from forestry compared to sheep and beef on many sites.

Lower returns obtained in Northland compared to Hawke’s Bay were largely due to greater timber yield estimated in Hawke’s Bay. As this analysis involved an average farm in each region, there were assumptions made about the average forest location for modelling of yield and transport distance. Future analysis could further examine the sensitivity of results to these various assumptions.

Farmers who have carried out such land use change experience a positive impact on farm profitability due to an increase in per head livestock performance and a decrease in running costs for weed control, infrastructure maintenance and labour associated with managing reduced land area. As such an integrated land use approach offers the opportunity for greater economic and environmental resilience. Where forests are established on appropriate areas

of the farm and farm systems analysis shows a positive impact of economics, additional benefits will also accrue.

7.6.1 Investing in land use change

It is important to understand that forestry is not necessarily a one-off process of planting a forest and harvesting it at some time in the future. It is a shift in land use from ongoing annual pasture production and livestock growth – to ongoing forest production (requiring management at key times) and timber growth. Establishing larger areas offers the opportunity to stage this planting into forest stands that can be harvested periodically, so an ongoing forest timber income is obtained. There is also scope to plant with less attention to periodic establishment, and then stagger harvesting to move to a mixed age class stand with ongoing periodic harvesting later.

The simple analysis of periodic planting and harvest (three yearly on average) for the 30% new forest option showed how a staged approach to planting could generate higher future cash flow than pasture on comparable land. This could be considered a future steady state for diversified farm income. This way, there is an investment phase during establishment of forest, but once there is a move to ongoing harvesting of a mixed age forest, this becomes an ongoing cashflow, more akin to a farming operation. At this stage there is a forest asset that is generating ongoing regular harvest income. Getting to this stage or state of a forest asset that is generating income requires initial investment, but once there, it is supported by its own cash flow. This is comparable to a farming operation requiring initial investment in fencing and other infrastructure as well as capital stock before it moves to a self-sustaining cashflow.

Carbon income is only received once, as the forest is established on pasture and moves to its averaging point (e.g. for the first 16 years for Radiata pine). However, this works very well for the farm owner in funding the establishment of a forest asset that then provides ongoing farm income through the sale of timber.

When undertaken in a planned and integrated way at a farm-scale, establishment of forest on the farm can improve farm returns and resilience, while still maintaining significant livestock farming operations. Further discussion of some of the key points are provided below.

7.6.2 Forestry in an integrated farming operation

Forestry can have a key role in the farm business in providing an injection of revenue from harvest at key points. There is significant flexibility over harvest timing for forests, for example, Radiata pine stands are often harvested anywhere between 25 and 35 years in age. This means harvest timing can be targeted to markets and to the landowner's financial situation, such as harvesting in a drought year when returns from pasture are poor.

7.6.3 Greater farm resilience and climate adaptation

Integration of well-planned forest areas within a farm can enhance farm management, removing areas that are steep and difficult for stock management and access, and providing improved stock welfare through shelter and shade. These latter aspects are likely to become more important with increasing frequency of climate events predicted with climate change.

Where steep and vulnerable faces and gullies are in pasture, major storm events can have greater impacts on farm infrastructure, such as tracks and fences, compared to the same areas in different types of forest. If these recovery costs can be reduced at a farm level this will have a positive impact on the resilience of whole communities.

7.6.4 Opportunities for mixture of forest types related to farm and objectives

The three forest types considered, Radiata pine, special purpose timber species and native have quite different financial and environmental implications. It is likely that a mixture of these forest types will be used at a farm-scale, depending on the particular farm and the particular landowner objectives.

At a farm scale there is opportunity to get the best combination of financial, farm resilience and environmental outcomes from good farm level planning of integrated forestry. An example of this might be establishing woodlots of special purpose species on more easily accessed areas of the farm where they can be used to also provide farm shelter and shade but have moderate terrain and reasonable access where there is potential for a flexible approach to harvesting, possibly including management as a continuous cover forest. Radiata pine might be established in a larger area of steep face that is away from vulnerable waterways, and permanent native forest could be established in major riparian and gully retirement areas that connect through the property, protecting waterways and access routes and providing biodiversity corridors.

7.6.5 Flexibility to adjust long term forest management and continuous cover forest

One advantage of native forest is that it provides for long term carbon sequestration and, in time, greater biodiversity benefits as compared with exotic production forest. Native forest is not subject to intermittent disturbance from a harvest and plant cycle. However, exotic forest species can also be managed for long term carbon sequestration, especially species that are longer lived and shade tolerant such as Cypress and Redwoods.

A registration in the ETS can be changed from averaging to permanent at any stage up to the point of harvest. Providing a forest is registered in the ETS the decision to harvest can be based on the relative price of carbon and timber and the market prospects for both. These aspects cannot be predicted at planting time and will be clearest once the forest reaches harvest maturation, which is a window of at least 10 years for pine and longer for special purpose species.

For example, in 15 years' time (2037) activity and economics around climate change mitigation will be clearer than at present. It may be that both timber as a raw material for a biomass-based economy and carbon sequestration have both increased in value as reliance on fossil fuels is phased out. The permanent forest category allows for harvest of a portion (up to 20%) of trees from that forest. So, within a permanent forest, continuous cover forestry or selective logging, sometimes also known as coup harvesting, provides an option to provide both products in the long-term. This is better suited to special purpose species such as Cypress and Redwoods as they produce higher value timber which does not require chemical treatment for use in buildings where it can be used for external and internal cladding and cabinetry.

Recovery cost will be higher per cubic metre than for clearfell Radiata pine, so a higher price point is necessary to make a continuous cover approach viable. The requirement for selective logging probably also limits this opportunity to rolling rather than steep land, although low impact cable harvest systems such as those used in Europe could open up this option.

7.6.6 Increasing farm value and providing mechanisms for succession in farm businesses

As mentioned above, establishing well planned forest areas within a farm can provide additional income on under-performing areas. It provides a long-term asset and can also increase the landscape appeal of the farm. These components increase the long-term value of the farm asset for the landowner.

Because ownership of forests can be legally separated from the land under a Forestry Right, this provides opportunity for the forest asset to be owned and managed separately. This is sometimes used to allow succession of asset value and management within a family-owned farm. For example, the parents retaining ownership and income from forests while the next generation work into managing and owning the farm.

7.6.7 Adding additional values to farm production

In addition to providing carbon sequestration for income or greenhouse gas emissions offset, forestry can provide a range of co-benefits to the farm operation including:

- » Soil and water protection
- » Income diversification
- » Climate resilience
- » Increase biodiversity
- » Shade and shelter
- » Increased subdivision
- » Provision of building material

Integration of forestry into a farming business has long been an opportunity for farmers. Some of the hurdles to involvement in forestry have been capital investment, new skills required and potential loss of pasture and livestock production. The combination of opportunities around earning of carbon income in the relatively short term, and increased pressure on landowners to reduce erosion to water ways and improve biodiversity may enhance the attraction of forestry to some landowners.

8.0 FARM LEVEL MODELLING RESULTS

The modelling results at the farm level, incorporating forestry with/without the impact of the farm emissions levy and carbon income are illustrated below.

Table 21: Northland Modelling Results without emissions levy and carbon income

| | Area in Pasture (ha) | Area in Forest (ha) | CO ₂ e Sequestered (T/ha) | CH ₄ (TCO ₂ e/ha) | N ₂ O (TCO ₂ e/ha) | T CO ₂ from N Fertiliser/ha | Total TCO ₂ e/ha | Net Total CO ₂ e (T) | Farm EBITDA/ha | Forestry Annuity/ha | Net (\$) |
|-------------------------------|----------------------|---------------------|--------------------------------------|---|--|--|-----------------------------|---------------------------------|----------------|---------------------|------------|
| Base | 343 | 0 | | 2.95 | 0.72 | 0.04 | 3.71 | 1,272.5 | \$224 | | \$76,832 |
| 10% Pines | 309 | 34 | 24.8 | 3.11 | 0.76 | 0.04 | 3.91 | 365.0 | \$235 | \$50 | \$74,328 |
| 30% Pines | 240 | 103 | 24.8 | 3.29 | 0.83 | 0.06 | 4.18 | -1,551.2 | \$220 | \$115 | \$64,668 |
| 100% Pines | 0 | 343 | 24.8 | 0 | 0 | 0 | 0 | -8,506.4 | \$0 | \$189 | \$64,985 |
| 10% Other Exotic | 309 | 34 | 12.9 | 3.11 | 0.76 | 0.04 | 3.91 | 769.6 | \$235 | -\$172 | \$66,780 |
| 30% Other Exotic | 240 | 103 | 12.9 | 3.29 | 0.83 | 0.06 | 4.18 | -325.5 | \$220 | -\$141 | \$38,324 |
| 100% Other Exotic | 0 | 343 | 12.9 | 0 | 0 | 0 | 0 | -4,424.7 | \$0 | -\$104 | -\$35,759 |
| 10% Natives | 309 | 34 | 6.5 | 3.11 | 0.76 | 0.04 | 3.91 | 987.2 | \$235 | -\$803 | \$45,326 |
| 30% Native | 240 | 103 | 6.5 | 3.29 | 0.83 | 0.06 | 4.18 | 333.7 | \$220 | -\$803 | -\$29,869 |
| 100% Natives | 0 | 343 | 6.5 | 0 | 0 | 0 | 0 | -2,229.5 | 0 | -\$803 | -\$275,295 |
| Mixed Forest | 240 | 103 | 14.62 | 3.29 | 0.83 | 0.06 | 4.18 | -502.7 | \$220 | -\$308 | \$21,082 |
| Pines/Periodic Harvest | 240 | 103 | 24.8 | 3.29 | 0.83 | 0.06 | 4.18 | -1,551.2 | \$220 | -\$23 | \$50,431 |

Table 22: Northland Modelling Results with farm emissions levy and carbon income

| | Area in Pasture (ha) | Area in Forest (ha) | CO ₂ e Sequestered (T/ha) | CH ₄ (TCO ₂ e/ha) | N ₂ O (TCO ₂ e/ha) | T CO ₂ from N Fertiliser/ha | Total TCO ₂ e/ha | Net Total CO ₂ e (T) | Farm EBITDA/ha | Farm emissions Levy (\$) | Forestry Annuity with Carbon (\$/ha) | Net (\$) after accounting for carbon |
|-------------------------------|----------------------|---------------------|--------------------------------------|---|--|--|-----------------------------|---------------------------------|----------------|--------------------------|--------------------------------------|--------------------------------------|
| Base | 343 | 0 | | 2.95 | 0.72 | 0.04 | 3.71 | 1,272.5 | \$224 | \$5,408 | | \$71,424 |
| 10% Pines | 309 | 34 | 24.8 | 3.11 | 0.76 | 0.04 | 3.91 | 365.0 | \$235 | \$5,135 | \$1,161 | \$106,963 |
| 30% Pines | 240 | 103 | 24.8 | 3.29 | 0.83 | 0.06 | 4.18 | -1,551.2 | \$220 | \$4,264 | \$1,226 | \$174,822 |
| 100% Pines | 0 | 343 | 24.8 | 0 | 0 | 0 | | -8,506.4 | \$0 | \$0 | \$1,300 | \$446,009 |
| 10% Other Exotic | 309 | 34 | 12.9 | 3.11 | 0.76 | 0.04 | 3.91 | 769.6 | \$235 | \$5,135 | \$521 | \$85,192 |
| 30% Other Exotic | 240 | 103 | 12.9 | 3.29 | 0.83 | 0.06 | 4.18 | -325.5 | \$220 | \$4,264 | \$552 | \$105,391 |
| 100% Other Exotic | 0 | 343 | 12.9 | 0 | 0 | 0 | 0 | -4,424.7 | \$0 | \$0 | \$588 | \$201,777 |
| 10% Natives | 309 | 34 | 6.5 | 3.11 | 0.76 | 0.04 | 3.91 | 987.2 | \$235 | \$5,135 | -\$237 | \$59,421 |
| 30% Native | 240 | 103 | 6.5 | 3.29 | 0.83 | 0.06 | 4.18 | 333.7 | \$220 | \$4,264 | -\$237 | \$24,123 |
| 100% Natives | 0 | 343 | 6.5 | 0 | 0 | 0 | 0 | -2229.5 | 0 | \$0 | -\$237 | -\$81,298 |
| Mixed | 240 | 103 | 14.62 | 3.29 | 0.83 | 0.06 | 4.18 | -502.66 | \$220 | \$4,264 | \$482 | \$98,153 |
| Pines/Periodic Harvest | 240 | 103 | 24.8 | 3.29 | 0.83 | 0.06 | 4.18 | -1551.2 | \$220 | \$4,264 | \$604 | \$110,748 |

Table 23: Hawke's Bay Modelling Results without emissions levy and carbon income

| | Area in Pasture (ha) | Area in Forest (ha) | CO ₂ e Sequestered (ha) | CH ₄ (TCO ₂ e/ha) | N ₂ O (TCO ₂ e/ha) | T CO ₂ from N Fertiliser/ha | Total TCO ₂ e/ha | Net Total CO ₂ e (T) | Farm EBITDA/ha | Forestry Annuity/ha | Net (\$) |
|-------------------------------|----------------------|---------------------|------------------------------------|---|--|--|-----------------------------|---------------------------------|----------------|---------------------|------------|
| Base | 653 | 0 | | 2.49 | 0.6 | 0.02 | 3.11 | 2,030.8 | \$525 | | \$342,825 |
| 10% Pines | 588 | 65 | 24.9 | 2.62 | 0.63 | 0.02 | 3.27 | 304.3 | \$559 | \$129 | \$337,045 |
| 30% Pines | 457 | 196 | 24.9 | 2.84 | 0.7 | 0.03 | 3.57 | -12,287.6 | \$601 | \$136 | \$350,904 |
| 100% Pines | 0 | 653 | 24.9 | 0 | 0 | 0 | 0 | -16,259.7 | \$0 | \$265 | \$173,275 |
| 10% Other Exotic | 588 | 65 | 12.9 | 2.62 | 0.63 | 0.02 | 3.27 | 1,084.3 | \$559 | -\$175 | \$317,342 |
| 30% Other Exotic | 457 | 196 | 12.9 | 2.84 | 0.7 | 0.03 | 3.57 | -896.9 | \$601 | -\$170 | \$241,308 |
| 100% Other Exotic | 0 | 653 | 12.9 | 0 | 0 | 0 | 0 | -8,423.7 | \$0 | -\$117 | -\$76,442 |
| 10% Natives | 588 | 65 | 6.5 | 2.62 | 0.63 | 0.02 | 3.27 | 1,500.3 | \$559 | -\$803 | \$276,522 |
| 30% Native | 457 | 196 | 6.5 | 2.84 | 0.7 | 0.03 | 3.57 | 357.5 | \$601 | -\$803 | \$117,346 |
| 100% Natives | 0 | 653 | 6.5 | 0 | 0 | 0 | 0 | -4,244.5 | \$0 | -\$803 | -\$524,104 |
| Mixed Forest | 457 | 196 | 14.66 | 2.84 | 0.7 | 0.03 | 3.57 | -1,241.9 | \$601 | -\$283 | \$219,207 |
| Pines/Periodic Harvest | 457 | 196 | 24.9 | 2.84 | 0.7 | 0.03 | 3.57 | -3,248.9 | \$601 | \$11 | \$276,813 |

Table 24: Hawke's Bay Modelling Results with farm emissions levy and carbon income

| | Area in Pasture (ha) | Area in Forest (ha) | CO ₂ e Sequestered (ha) | CH ₄ (TCO ₂ e/ha) | N ₂ O (TCO ₂ e/ha) | T CO ₂ from N Fertiliser/ha | Total TCO ₂ e/ha | Net Total CO ₂ e (T) | Farm EBITDA/ha | Carbon Levy (\$) | Forestry Annuity with Carbon (\$/ha) | Net (\$) after accounting for carbon |
|-------------------------------|----------------------|---------------------|------------------------------------|---|--|--|-----------------------------|---------------------------------|----------------|------------------|--------------------------------------|--------------------------------------|
| Base | 653 | 0 | | 2.49 | 0.6 | 0.02 | 3.11 | 2,030.8 | \$525 | \$8,631 | | \$334,194 |
| 10% Pines | 588 | 65 | 24.9 | 2.62 | 0.63 | 0.02 | 3.27 | 304.3 | \$559 | \$8,172 | \$1,239 | \$401,079 |
| 30% Pines | 457 | 196 | 24.9 | 2.84 | 0.7 | 0.03 | 3.57 | -12,287.6 | \$601 | \$6,934 | \$1,247 | \$512,185 |
| 100% Pines | 0 | 653 | 24.9 | 0 | 0 | 0 | 0 | -16,259.7 | \$0 | \$0 | \$1,376 | \$898,664 |
| 10% Other Exotic | 588 | 65 | 12.9 | 2.62 | 0.63 | 0.02 | 3.27 | 1,084.3 | \$559 | \$8,172 | \$518 | \$354,184 |
| 30% Other Exotic | 457 | 196 | 12.9 | 2.84 | 0.7 | 0.03 | 3.57 | -896.9 | \$601 | \$6,934 | \$522 | \$370,109 |
| 100% Other Exotic | 0 | 653 | 12.9 | 0 | 0 | 0 | 0 | -8,423.7 | \$0 | \$0 | \$575 | \$375,777 |
| 10% Natives | 588 | 65 | 6.5 | 2.62 | 0.63 | 0.02 | 3.27 | 1,500.3 | \$559 | \$8,172 | -\$237 | \$305,114 |
| 30% Native | 457 | 196 | 6.5 | 2.84 | 0.7 | 0.03 | 3.57 | 357.5 | \$601 | \$6,934 | -\$237 | \$221,267 |
| 100% Natives | 0 | 653 | 6.5 | 0 | 0 | 0 | 0 | -4,244.5 | \$0 | \$0 | -\$237 | -\$154,775 |
| Mixed | 457 | 196 | 14.66 | 2.84 | 0.7 | 0.03 | 3.57 | -1,241.9 | \$601 | \$6,934 | \$555 | \$376,561 |
| Pines/Periodic Harvest | 457 | 196 | 24.9 | 2.84 | 0.7 | 0.03 | 3.57 | -3,248.9 | \$601 | \$6,934 | \$656 | \$396,299 |

Another illustration of the value of the carbon sequestration from forestry, as an offset to farm-level emissions is shown below. This is for the 10% forestry scenarios and assumes a carbon price of \$85/tonne CO₂e.

Table 25: Value of Sequestered Carbon as an Offset

| Northland | Area in Pasture (ha) | Area in Forest (ha) | Total T CO ₂ e/Pastoral area | 2025 Carbon Levy (\$) | Forestry Credit | Net Levy | EBITDA/ha Post Levy |
|------------------|----------------------|---------------------|---|-----------------------|-----------------|----------|---------------------|
| Base | 343 | 0 | 1272.5 | \$5,408 | | -\$5,408 | \$208 |
| 10% Pines | 309 | 34 | 1208.2 | \$5,135 | \$71,672 | \$66,537 | \$406 |
| 10% Other Exotic | 309 | 34 | 1208.2 | \$5,135 | \$37,281 | \$32,146 | \$305 |
| 10% Natives | 309 | 34 | 1208.2 | \$5,135 | \$18,785 | \$13,650 | \$252 |

| Hawkes Bay | Area in Pasture (ha) | Area in Forest (ha) | Total T CO ₂ e/Pastoral area | 2025 Carbon Levy (\$) | Forestry Credit | Net Levy | EBITDA/ha Post Levy |
|------------------|----------------------|---------------------|---|-----------------------|-----------------|-----------|---------------------|
| Base | 653 | 0 | 2030.8 | \$8,631 | | -\$8,631 | \$512 |
| 10% Pines | 588 | 65 | 1922.8 | \$8,172 | \$137,020 | \$128,848 | \$701 |
| 10% Other Exotic | 588 | 65 | 1922.8 | \$8,172 | \$71,273 | \$63,101 | \$600 |
| 10% Natives | 588 | 65 | 1922.8 | \$8,172 | \$35,913 | \$27,741 | \$546 |

8.1 Discussion

Tables 21/23 show that the addition of forestry to the farms, in the absence of a value on carbon, has generally reduced the overall EBITDA from the farms, albeit marginally for the 10% pines scenario, and more significantly for the natives’ scenarios, due to the very limited timber value within the 56 years period. The exception to this is the 30% pine forest for the Hawke’s Bay farm.

This changes markedly with the addition of a value for the sequestered carbon (Tables 22/24), where both the pines and the “other exotics” show significant gains over the pastoral-only operation. The natives’ scenarios show a net result less than the pastoral base, due mainly to the combination of high establishment costs and long but slow sequestration rate. In noting this, the 10% native’s scenario for the Hawke’s Bay model is only marginally behind that of the pastoral-only operation.

The value of carbon is also illustrated in Table 25. In this example the proposed 2025 emissions levy has been applied to the farm, which is then more than offset by selling the carbon credits from the forestry operation. In this example, all the credits have been sold. In reality, the farmer may well just sell sufficient credits to offset the levy and carry the excess credits forward. By doing this, the value of the carbon credits can be extended well beyond the ETS averaging period.

This analysis details methods used to assess the wider macro-economic impacts of land use changes from sheep and beef farms to mixed farm-forestry activities, and the associated discounted cash flows for representative farms. This economic impact assessment relies on sheep and beef farm-level information provided by AgFirst and forestry information provided by Groundtruth Ltd.

Two case study areas are considered: Northland and Hawke's Bay. The case study areas are considered independently, and separate results are produced for each case study. Note, however, that due to the multi-regional model used in the analysis, an analysis is also included of the flow-on economic consequences in the rest of New Zealand from changes in each of the case study areas.

Consistent with the farm-level and forestry financial analysis (i.e. discounted cash flows) for each case study area, three scenarios of land use change are considered: 10% forest conversion, 30% forest conversion, and 100% forest conversion. Additionally, for each proportion of forestry land use considered, three different forestry types are also considered: *Pinus radiata*, Special Production Species (SPS), and natives. Combining all these different variations means that altogether, 18 separate scenarios (i.e. 2 regions x 3 conversion rates x 3 forest types) have been analysed.

9.1 Methodology

9.1.1 Overall Approach

The regional and national economic impact assessment is undertaken using an Input-Output Analysis (IOA). Underpinning IOA is a set of financial transactions, recorded in an Input-Output Table (IOT) that state the sales of goods and services between industries within an economy, the value of primary inputs used by each industry (includes payments for wages and salaries, industry profits and taxes), and the sales of goods and services by industries to final demand categories (includes households, exports and investments). The IOTs used in this study are multi-regional – for the analysis of the Northland scenarios the IOT covers two regions being Northland and Rest of New Zealand and for the Hawke's Bay scenarios, the IOT contains the Hawke's Bay region and Rest of New Zealand.

IOA has both strengths and weaknesses. On the one hand, a key strength of IOA include the use of linear algebra to assess economic interdependencies (i.e. flow-on supply chain and consumer spending) effects that result from initial changes in an economic system. It can also be applied with paucity of data (i.e. with aggregated representative farms that lack commodity and factor elasticities).

On the other hand, IOA does not capture important dynamic economic effects that exist within economies. This includes pricing dynamics for commodities (e.g. milk, meat, wool) and factors (i.e. labour and capital), and substitution or transformation effects (unless manually incorporated within the model). Computable General Equilibrium (CGE) modelling is an alternative method to IOA that can be similarly utilised for examining the system-wide implications of policies or shocks applied to an economy. There are some disadvantages and practical limitations, particularly time, cost, and data constraints, with this method that meant it could not be used in this study. One frequently cited advantage of CGE models over IOA is the ability to consider substitution effects (i.e. between factors and commodities).

There are several categories of substitution that can be considered in economic modelling. Perhaps the most important is input substitution, or in other words the way in which firms or industries can change how they go about producing goods and services in response to changes in input prices, resource availability or other changes in situations. As the primary sector will be the most impacted under the farm-forestry conversion, it is within this sector that changes in the modes of production will be most important. In the case of the modelling undertaken in this study, we have relied directly on the farm and forestry system modelling to capture these changes.

For this study IOA is a practical solution to the assessment of regional and national economic impacts because:

- It balances constraints on information, computation time and costs with needs for comprehensiveness and accuracy in modelling;
- For sectors most significantly impacted by the conversion scenarios, the modelling directly incorporates the most important behavioural changes and adaptations as undertaken by farmers via the farm budget work undertaken; and
- IOA covers the important flow-on impacts to the rest of the economy that occur because of changes to the primary sector. Consistent indicators can also be applied to measure changes in the primary sector alongside changes in other sectors. In this way, we obtain an overall picture of the impacts or 'change pressure' experienced by the whole economy.

Importantly, the results presented in this study are indicative rather than predictive.

9.1.2 Impacts Considered

In terms of economy-wide impacts, our economic impact assessment (EIA) reports on value-added and employment impacts. Value-added is measured in NZ\$ millions (based on 2022Q2), while employment impacts are measured in job-year equivalents using Modified Employee Counts (MECs). The EIA captures the following economic consequences:

1. Direct Impacts as experienced through on farm changes in revenue/expenditure (and farm surplus) and employment needs;
2. Indirect backward (upstream) and forward (downstream) linkage impacts associated with supply and use chains. This includes flow-on impacts to meat and wood processors, but also to all other industries within the economy; and
3. Induced impacts associated with changes in farmer (via economic farm surplus) and worker (wage and salary) spending.

The IOA was undertaken in five key steps (see Figure 1). Prior to describing the specifics of the methodology, it is helpful to provide readers, particularly those not familiar with IOA, with a brief introduction. The remaining sections of the methodology describe the different stages passed through in undertaking the EIA.

9.1.3 Input-Output Analysis

At the core of any Input-Output Analysis (IOA) is a set of data that measures the flows of money or goods among various industrial groups within an economy for a given period. These flows

are recorded in an IOT (Input-Output Table), a matrix of columns and rows that summarise (in each column) the purchases made by each industry (its inputs or production recipe), and (in each row) the sales of each industry (its outputs or products produced) to all other industries.

By using the information contained within this matrix, practitioners of IOA may calculate mathematical relationships that describe the interdependencies that exist between the economic industries that comprise the economy under investigation. These relationships describe the interactions between industries – specifically, the way in which each industry’s production requirements depend on the supply of goods and services from other industries. With this information, it is possible to calculate, given a proposed alteration to a selected industry (e.g. through the integration of forestry into farming systems), all the necessary changes in production that are likely to occur throughout supporting industries within the wider economy. For example, if one of the changes anticipated was a reduction in the amount of fertiliser purchased, the model would calculate losses in output by the fertiliser manufacturing industry as well as all industries supplying fertiliser manufacturing such as electricity production.

As with all modelling approaches, IOA relies on certain assumptions for its operation. Among the most important is the assumption that the input structures of industries (i.e. the mix of commodities or industry outputs used in producing output for a specific industry) are fixed. However, models necessarily simplify the real world in which these ‘technical coefficients’ will change in the long-run over time because of new technologies, relative price shifts causing factor and commodity substitutions, and the introduction of new industries.

9.1.4 Calculation Steps

The IOA was undertaken in five key steps (Figure 1). Note this is not a so-called multiplier analysis; many of the steps involved are carefully designed to mitigate key implications of using multipliers. Nevertheless, as outlined above, dynamic equilibrium effects (e.g. price changes and factor and commodity substitutions) associated with the changes have not been calculated. Each step of these is described below.

Figure 1: Methodological Sequence followed for the Economic Impact Assessment

| Control panel | Summarise Farm and Farm-Forestry Revenues & Expenditures | Transform to form compatible with National Accounting | Identify direct system changes | Economic impact assessment | Reporting |
|--|---|--|---|---|---|
| <ul style="list-style-type: none"> * Select region (Northland or Hawkes Bay) * Select proportion converted forestry * Select forest type * Run scenarios iteratively through time using macros | <ul style="list-style-type: none"> * Calculate total direct revenue & expenditure items for all farms across time (baseline and conversion scenario) | <ul style="list-style-type: none"> * Match farm revenue & expenditure items to commodity and primary input classifications * Create commodity-based farm type supply and use vectors * Deflate as appropriate | <ul style="list-style-type: none"> * Calculate farm purchases vectors * Calculate changes to output of processors * Calculate processor purchases vectors * Calculate household purchases vectors | <ul style="list-style-type: none"> * Calculate direct & indirect output effects by 106 industries * Calculate direct, indirect & induced output effects by 106 industries | <ul style="list-style-type: none"> * Calculate difference between baseline and conversion scenarios * Convert from output effects to other indicators (value added/employment) * Inflate results as appropriate * Aggregate reporting - 16 industries * NPV of impacts |

9.1.4.1 Control Panel

In this step the scenario is defined which the model then considers. As stated above, the scenarios are defined according to three criteria: case study region, proportion of sheep and beef farms converted to forestry, and forestry type. These criteria have been provided directly

from the sheep and beef farming and forestry models developed respectively by AgFirst Ltd and Groundtruth Ltd. The model is automated so that through selection of the scenario the model is populated with the relevant multi-regional IO table, farm and forestry data, and the number and hectares of farms considered in the case study region.

Regardless of the scenario selected, the results are all derived by comparing with a baseline sheep and beef farming scenario. Under the baseline scenario the sheep and beef farms do not include any forestry. Not all sheep and beef farming land within the Northland and Hawke's Bay region is used for conversion, some land remains in the sheep, beef cattle and grain farming sector. Adjustments have been made to the Northland and Hawke's Bay IOTs to ensure this is accounted for appropriately.

9.1.4.2 Summarise Farm and Farm-Forestry Revenue and Expenditures

AgFirst Ltd and Groundtruth Ltd have provided detailed sets of farm and forestry financial accounts applicable to the scenarios. The AgFirst data stipulates the annual revenue and expenses (\$/farm) line items for a representative sheep and beef farm for each of the case study areas, and for the situations of 0%, 10% and 30% forestry cover. It is assumed that these annual revenues and expenses hold constant over the entire timeframe considered. The Groundtruth Ltd data provides a set of forestry cashflows (\$/farm) over 56 years, for farms with different intensities of forestry operation, i.e. 10% of farm conversion to forest, 30% of farm conversion to forest, and 100% of farm conversion to forest, for three different types of forestry, i.e. *Pinus radiata*, Special Production Species (SPS) and natives. The cashflows vary each year reflecting forestry rotations and the time-varying nature of carbon revenues.

By accounting for the total number of sheep and beef farms considered in the relevant study region and joining together the AgFirst and Groundtruth financial data (i.e. discounted cashflows) so that all farms (and hectares) are considered, a set of annual revenue and expenditure accounts for the sum of all sheep and beef farms (with forestry) is created over a 56-year time horizon.

9.1.4.3 Transform to a Form Compatible with National Accounting

In this step, the revenue and expenditure line items for the sum of the combined sheep and beef farming with forestry farms are transformed into a form compatible with the System of National Accounts.

- Each revenue line-item category is allocated to one or multiple commodity categories from within the 205 commodities in the New Zealand Supply-Use Table (SUT). This translates the revenues into a vector of commodities supplied. Adjustments are also made to translate the values into purchaser's prices.
- Each expenditure line-item category is allocated to one or multiple commodity or primary input categories from the New Zealand SUT. This translates the expenditures into a Use Vector. Note that revenue generated from carbon is treated as a negative tax expenditure and is allocated to the primary input category 'taxes on production'⁴. Also, the primary

⁴ The treatment of financial transactions associated with emission trading schemes in the system of national accounts is an evolving topic. Up until very recently, it has been recommended to record all emissions trading schemes as taxes on production, reflecting in part that the permits were not considered to relate to the use of a natural asset (2008 SNA, para 17.363). Thus far, this is the approach generally taken in New Zealand, with emissions trading permits recognised as a tax revenue to the extent to which payment is received by government (SNZ, 2019). However, recently a national accounting task force has a new approach being taken where emissions

input category 'operating surplus' is a balance item and is equal to the difference between total supply and total use.

Given that multi-regional IO table utilised in this analysis is for Year Ending March 2016, it was also necessary to deflate all values in the supply and use vectors from 2022Q2 (i.e. New Zealand dollars (\$) as at end of June 2022) to 2016Q1 (as at the end of March 2016) dollars before undertaking the economic impact assessment – this ensures inflationary changes are appropriately accounted for. Commodity and industry price deflation was based on StatsNZ's Producer's Price Index (PPI) at Level 4 NZSIOC (StatsNZ's Infoshare Table Reference PPI028AA).

The calculations are undertaken separately for each year (i.e., from year 0 (2022) through to year 56 (2078), and for the baseline farms and the forestry conversion scenarios.

9.1.4.4 Identify Direct System Changes for which Flow-On Indirect and Induced Impacts will be Assessed

To estimate the backward and forward linkage (supply chain) effects, we first must recognise that sheep and beef farms sell some goods and services among themselves. We therefore create 'net' supply and use vectors for the sheep/beef/forestry farms by removing consideration of sales that are simply between farms themselves.

Three major categories were identified as to likely change associated with farm-to-forestry conversions that will cause flow-on effects:

(1) Changes to farming systems – backward linkage supply chain impacts.

There are operational expenditure changes associated with the changes to farm systems as provided by AgFirst and Groundtruth. Note these are converted from 2022Q2 prices into 2016Q1 prices to ensure compatibility with the New Zealand IOT which is for the year ending March 2016⁵. These changes will create flow-on upstream impacts through economic supply chain linkages.

The net use vector defines the demands for goods and services by sheep/beef/forestry operations. However, before this can be utilised in the IO table to calculate the backward linkage effects, it is necessary to translate this from purchases of commodities by sheep/beef/forestry farms to purchases from other industries by sheep/beef/forestry farms (because the IO table has an industry-by-industry structure rather than a commodity-by-industry structure). The average proportion of each commodity supplied by each industry is used to estimate from which industries the commodities are purchased and to translate to the necessary structure.

(2) Changes to farming systems – forward linkage supply chain impacts.

Changes in the overall output and sales of the farms will mean changes in supply to downstream processors, ultimately leading to changes in output and revenues/profits by

permits are seen as a right to use a natural asset (United Nations AEGNA, 2021). It is still to be seen how this will be implemented in detail, including in the case of foresters who by sequestering carbon effectively increase the size of the natural asset available.

⁵ At the time of writing the latest available New Zealand Input-Output Table is for the year ending March 2020 (as produced by StatsNZ on 21 December 2021). Unfortunately, multi-regional input-output tables (which is a considerable and laborious task) have not yet been produced from this table. The tables used in this analysis are for the year ending March 2016.

these industries. We concentrated on changes in meat and meat product manufacturing and in wood and wood product manufacturing as the key supply-induced impacts. Using information from the National SUTs, it was assumed that around 90% of sheep and cattle commodities are sold to meat and meat product manufacturing, and that for every \$1 loss of supply, around \$1.9 of output from meat and meat product manufacturing will be lost. It is also assumed that around 18% of wood and non-wood forest products are sold to wood product manufacturing, and that for every \$1 loss of wood supply to processing, there is around \$7.9 lost in wood product outputs. It is important to note that while these percentages are derived directly from StatsNZ's New Zealand SUTs and IOTs they may not hold into the future – this would depend on available labour and capital. The technology used for processing might also change through time.

With changes to processing industries, there will also be changes in demand for goods and services by industries that support processors (further backward-linkages effects resulting from the initial forward-linkage effects). The calculated changes in output of wood product manufacturing and meat product manufacturing were used to estimate the change in demands for goods and services by these industries, assuming a linear relationship between industry outputs and industry inputs. This approach is commonly used in IOA, nevertheless it is worth noting that economies of scale may result in non-linear relationships between industry outputs and industry inputs.

(3) *Changes in farming incomes.*

Under the different scenarios there will be different incomes generated from sheep and beef farming with forest in terms of farm profits and payments of wages and salaries. When this income is then spent on goods and services, this produces downstream backward linkage effects through the economic system.

For the baseline and forestry conversion scenarios under consideration, a vector of household purchases were created for which we wish to assess backward linkages effects. This is created by taking StatsNZ's IOT wages and salaries income and approximately 20% of the operating surplus (estimated from income data provided by StatsNZ) generated by the sheep/beef/forestry farms and splitting this income into a vector of purchases from other industries. This is undertaken on a pro-rata basis using the final demand purchases by households in the input-output table.

The vectors generated under (1), (2) and (3) are collated for input in the IO model. However, before this is undertaken, it is important to also make an adjustment to ensure that there is no double counting from (1) and (2). Farms are part of the supply chain for processors, but since farms and their subsequent suppliers are already included in (1), they need to be eliminated from (2).

9.1.4.5 *Economic Impact Assessment*

The economic impact assessment commences with calculating of the direct and indirect, and then direct, indirect, and induced output effects by all economic industries.

The vector of direct and indirect output effects by industry, X , is calculated according to the equation:

$$X = (I - A)^{-1} Y \quad (1)$$

Where \mathbf{A} is the matrix of technical coefficients (refer to Miller and Blair (2009) for further explanation), \mathbf{I} is the identity matrix and the vector \mathbf{Y} is a set of exogenous output changes by industry, the impacts of which are sought to be measured. The inverse matrix $(\mathbf{I} - \mathbf{A})^{-1}$ is termed the ‘Leontief Inverse Matrix’.

There is some debate within IO literature and applications of the degree to which an input-output model should be ‘closed’ with respect to the household sector when calculating the impacts according to Equation (1) above (refer to Miller and Blair (2009) for further details) to capture the relationships between income and consumer spending. This study also calculates the direct, indirect, and induced effects by industry resulting from changes in farmer household expenditure according to the equation:

$$\mathbf{X}^* = (\mathbf{I} - \mathbf{A}^*)^{-1} \mathbf{Y}. \quad (2)$$

This time \mathbf{A}^* is the matrix of technical coefficients that is enlarged to include the household sector.⁶

9.1.4.6 Reporting

Once the direct and indirect, and induced, output of 106 economic industries is determined for the baseline and forestry conversion scenario, the *net* difference between the two scenarios is calculated. Subsequently, the estimates of net output change are translated into value added, and employment impacts by 106 industries. This occurs by multiplying the output change for each industry by (1) the industry’s ratio of value added per unit of output, and (2) the industry’s ratio of employment per unit of output. The ratio for an industry is assumed to be constant with the ratios obtained from the New Zealand IOT, except in the case of the farming industries (dairying, beef breeding, drystock) where superior data was available directly from the farm/forestry data of AgFirst and Groundtruth.

Note as one of the final steps, the value-added impacts must be converted from 2016Q1 dollars back to 2022Q2 dollars. For reporting purposes, the results are also aggregated from 106 industries (as defined by the Australia and New Zealand Standard Industrial Classification (ANZSIC) System) to 17 aggregated industry definitions (a mapping is provided in Appendix 2).

9.2 Results

The IOA has been undertaken for both the Northland and Hawke’s Bay regions for each of the nine scenarios. Results have also been generated for two reporting metrics, i.e., value added and employment, over two forestry rotations (i.e. 56 years) and for the 17 reporting industries. Results are also provided for (a) direct and indirect effects (using the ‘open’ Leontief matrix), and (b) direct, indirect, and induced effects (using the ‘closed’ Leontief matrix).

⁶ Under this approach, households are treated in a similar manner to industries in the IO matrix, with a column and row of the matrix recording inputs and outputs of the household ‘sector’. Transactions presented along the household row of the matrix record the income generated for households by each industry within the economy in the form of payments for labour, while transactions recorded in the household column of the matrix record the structure of household purchases (i.e. consumption). If it is assumed that the structure of household expenditure among different product types remains constant irrespective of the level of income, it is possible to calculate a vector of technical coefficients for households which can be included in the \mathbf{A} matrix described above. When the vector of exogenous output changes (\mathbf{Y}) is multiplied by the Leontief Inverse Matrix, the model will calculate the value of outputs from each industry that will be purchased by households. Household incomes are, in turn, also determined by the level of output of each industry.

Given the large number of reporting tables necessary to cover the multiple scenarios and reporting metrics, just a few headline results are focused on in this section. As an illustrative example of the broader results, we also examine in detail within this section the results produced for the *Pinus radiata* scenarios for Northland (10% and 30% conversion). Appendix 3 and 4 contains direct and indirect results for all scenarios.

Headline Results

Table 26 provides a summary of the Net Present Values for value-added impacts. The table reports both (a) direct and indirect, and (b) direct, indirect, and induced impacts to the region and rest of New Zealand economies. Indirect impacts included those both upstream (i.e. backward linkage) and downstream (i.e. forward linkage) associated with the sheep and beef farming with forestry sector. Induced impacts may also arise from changes in consumer spending associated with the direct and indirect impacts. All impacts are measured *net* of the base Northland/Hawke's Bay region sheep and beef farming sector and are reported in NZ\$_{2022Q2}m. It is important to note that it is assumed that a skilled labour force and sufficient capital are readily available to process the logs produced under the *Pinus radiata* and SPS scenarios. This may not however be the case, and thus, the indirect impacts may be less. Input-output analysis, which has been used in this study, does not capture dynamic equilibrium effects associated with labour and capital markets. This would require the use of a Computable General Equilibrium model – the application of which is beyond the scope, timing, and budget of this work.

9.2.1 Northland Region Value Added Impacts

For Northland region net positive economic direct and indirect value-added impacts as measured in NPV₂₀₂₂₋₇₈ terms, range from \$70m under the sheep and beef farming with 10% SPS forest scenario through to \$1,910m under the 100% *Pinus radiata* scenario.⁷ Net positive value-added impacts are also felt under the sheep and beef farming with 10% *Pinus radiata* forest (NPV₂₀₂₂₋₇₈ \$430m), sheep and beef farming with 30% *Pinus radiata* forest (NPV₂₀₂₂₋₇₈ \$930m), and 100% *Pinus radiata* forest (NPV₂₀₂₂₋₇₈ \$1,910m). The remaining scenarios which cover sheep and beef farming with 30% SPS forest scenario, and all native forest scenarios, produce net negative value-added contributions. Under the direct, indirect, and induced net impact assessment a similar pattern holds, except the sheep and beef farming with 30% SPS forest, and sheep and beef farming with 10% native forest, scenarios now also show positive outcomes.

9.2.2 Hawkes Bay Region Value Added Impacts

For Hawke's Bay region net positive economic direct and indirect value-added impacts as measured in NPV₂₀₂₂₋₇₈ terms, range from \$200m under the sheep and beef farming with 10% SPS forest scenario through to \$3,600m under the 100% *Pinus radiata* scenario. Net positive value-added impacts are also felt under the sheep and beef farming with 10% *Pinus radiata* forest (NPV₂₀₂₂₋₇₈ \$1,080m), sheep and beef farming with 30% *Pinus radiata* forest (NPV₂₀₂₂₋₇₈ \$2,270m), and 100% *Pinus radiata* forest (NPV₂₀₂₂₋₇₈ \$3,600m). The remaining scenarios which cover sheep and beef farming with 30% SPS forest, and 100% SPS forest scenarios, and all native forest scenarios, produce net negative value-added contributions. Under the direct,

⁷ Note that Net Present Values (NPVs) are only calculated for the years 0 (2022) through to 56 (2078). For *Pinus radiata* plantations two rotations are assumed to occur throughout this period (i.e. at year 28 and 56), for SPS plantations only one rotation at 35 years, and for native no harvesting occurs.

indirect, and induced net impact assessment a similar pattern holds, except the sheep and beef farming with 30% SPS forest and sheep scenarios now also show positive outcomes.

Table 26: Direct and Indirect and Direct, Indirect, and Induced Net Value Added Impacts

| Scenario | | Direct and Indirect Value-Added Impacts | Direct, Indirect and Induced Value-Added Impacts |
|--|--|---|---|
| | | Net Present Value ₂₀₂₂₋₇₈ NZ\$ _{2022Q2m} | Net Present Value ₂₀₂₂₋₇₈ NZ\$ _{2022Q2m} |
| Northland Region | | | |
| 1 | Baseline vs Sheep and Beef Farming with 10% <i>Pinus radiata</i> Forest ¹ | 430 | 990 |
| 2 | Baseline vs Sheep and Beef Farming with 30% <i>Pinus radiata</i> Forest ¹ | 930 | 2,310 |
| 3 | Baseline vs 100% <i>Pinus radiata</i> Forest ¹ | 1,910 | 3,980 |
| 4 | Baseline vs Sheep and Beef Farming with 10% SPS Forest ² | 70 | 330 |
| 5 | Baseline vs Sheep and Beef Farming with 30% SPS Forest ² | -190 | 300 |
| 6 | Baseline vs 100% SPS Forest ² | -1,980 | -1,800 |
| 7 | Baseline vs Sheep and Beef Farming with 10% Native Forest ³ | -610 | 200 |
| 8 | Baseline vs Sheep and Beef Farming with 30% Native Forest ³ | -2,320 | -2,970 |
| 9 | Baseline vs 100% Native Forest ³ | -9,180 | -12,750 |
| Hawkes Bay Region | | | |
| 1 | Baseline vs Sheep and Beef Farming with 10% <i>Pinus radiata</i> Forest ¹ | 1,080 | 2,350 |
| 2 | Baseline vs Sheep and Beef Farming with 30% <i>Pinus radiata</i> Forest ¹ | 2,270 | 5,700 |
| 3 | Baseline vs 100% <i>Pinus radiata</i> Forest ¹ | 3,600 | 11,760 |
| 4 | Baseline vs Sheep and Beef Farming with 10% SPS Forest ² | 200 | 720 |
| 5 | Baseline vs Sheep and Beef Farming with 30% SPS Forest ² | -390 | 780 |
| 6 | Baseline vs 100% SPS Forest ² | -5,720 | -4,810 |
| 7 | Baseline vs Sheep and Beef Farming with 10% Native Forest ³ | -930 | -1,060 |
| 8 | Baseline vs Sheep and Beef Farming with 30% Native Forest ³ | -3,800 | -4,580 |
| 9 | Baseline vs 100% Native Forest ³ | -17,410 | -22,770 |
| NB: 1. Includes 2 rotations. 2. Includes 1 rotation. 3. No harvests. | | | |

Northland 10% Conversion to Pinus radiata

Tables 27 and 28 provide detailed results for the Northland case study, respectively for value added and employment, of 10% forestry conversion to *Pinus radiata*. In terms of value added, the sheep and beef cattle farming with forestry industry itself changes in value added range from a loss of \$71m in the first year, to gain of \$556m in the years during which forestry is harvested, i.e. 2050 and 2078. For other industries, both in Northland and the rest of New Zealand, there are generally losses in value added for non-harvest years, and gains during harvest years. Note that even though sectors such as recreation and personal services are not directly connected to farming or forestry activities, they are still impacted by changes in the economy, particularly changes in the quantity of incomes being generated which then impacts on consumer spending.

In terms of employment, the most significant year-on-year losses occur for the meat and meat product manufacturing industry. However, during the years of harvesting, there are extremely significant pulses of employment demand, totally some 23,000 extra jobs across the nation. Around 2,000 of these job increases during harvest years is attributed to agriculture, forestry, and fishing support services. This sector collects much of the services required for forestry operation including harvesting. For the harvest years this industry will need to increase to around 1.8 times its current size in Northland. Another 8,800 of the additional jobs during harvest years are in the wood product manufacturing industry. As stated above, some 18% of the value of logs harvested is assumed to go onto processing, which means for the years of harvest, the Northland industry must effectively operate at around seven times its current size. Obviously, the proportion of logs sent for processing within New Zealand could vary in the future. If there is not an appropriate increased local demand for wood products, or an expansion in New Zealand's capture of the export market for manufactured wood products to match the increase in wood supply, then a greater proportion of harvested logs may be exported from New Zealand without processing (thus reducing the indirect processing impacts). Depending on the types of wood products produced (or the processing technology used), the ratio of employees required per \$ of output could also vary from the current situation, which would alter the employee estimates for this industry.⁸

Northland 30% Conversion to Pinus radiata

In Table 29 the direct and indirect value-added results for Northland with 30% converted to *Pinus radiata* are reported, while Table 30 reports the direct and indirect employment results for the same scenario. It can be noted that while the land converted is three times as large under this scenario compared to the previous scenario, the loss in value added for sheep and beef farming for most years (i.e. not harvesting or planting years) is around 5.2 times as large. For non-harvest or planting years the value-added impacts average around a loss of \$80 million but when harvests occur a staggering \$8.4 billion gain in value added is recorded, with three quarters of this being in Northland.

Not surprisingly, under this scenario, job increases during harvest years are even more significant than the previous scenario, particularly in wood product manufacturing and for forestry support services recorded under the agriculture, forestry, and fishing support services

⁸ It is worth noting that we have used the current ratio of employees per \$ output for Northland's wood product manufacturing industry to estimate the required employees. Northland's ratio is around 50% higher than the ratio for the rest of New Zealand. This is unlikely to hold into the future without an increase in labour supply and capital investment. Some upskilling of labour would also be required to continue to achieve this ratio.

sector. Collectively other services industries account for more than 40% of the increased job requirements during the harvest years (mainly associated log and load process (forestry and logging), civil engineering (road building), and transport services (of logs on farm, to processing facilities where appropriate, and to ports), reflecting interconnections between services and the rest of the economic system.

Hawke's Bay 10% Conversion to Pinus radiata

Table 31 provides the value-added impacts for Hawke's Bay and the Rest of New Zealand with 10% of farmland in the Hawke's Bay case study converted to 10% *Pinus radiata*. Table 32 provides the employment impacts for the same scenario.

Over all industries in Hawke's Bay and the rest of New Zealand, the annual value-added impacts range from a loss of \$90m during the initial year, through to a very substantial gain of \$5.4b in 2050 and 2078. For the sheep and beef industry (with forestry) in Hawke's Bay, the timing and distribution of impacts is similar to the Northland results. For non-harvest or planting years there is a loss in value added of nearly \$9m annually, during the initial year when planting occurs the loss is some \$118m and during the harvest years (2050 and 2078) there is a significant value-added gain of \$1.2b. Relative to losses in other years, the gain in value added during harvest years is higher in Hawke's Bay compared to Northland. Another observation is that the flow on effects to wood processing are slightly higher in relative terms for Hawke's Bay. For example, in Hawke's Bay the value-added gains in wood processing in 2050 are roughly equivalent to the size of the value-added gain for sheep/beef/forestry farming, whereas in Northland for the same year the wood processing impacts are 80% of that experienced by sheep/beef/forestry farming. This reflects, in part, that the value added to output ratio for wood processing is currently higher in Hawke's Bay than Northland, and we assume these are constant for the study.

The employment impacts generated for the Hawke's Bay case study are extremely high under the harvest years, at some additional 50,000 jobs across the nation, while for other years the impacts are generally minimal. Nearly 70% of the additional jobs are within the wood product manufacturing industry alone. Note that the value of output produced by the wood processing industry during these years is calculated to be more than double that of Northland under the equivalent scenario, reflecting that the value of wood harvested and thus sent for processing is around double for Hawke's Bay compared to Northland. Added to this, Hawke's Bay currently has a higher ratio of employees required per dollar of output in wood processing and this contributes to the high numbers of employees calculated for this industry. It should however be noted, and as already explained above, this ratio could change substantially in the future depending on the type of products manufactured and technologies employed.

Hawke's Bay 30% Conversion to Pinus radiata

The value-added impacts for Hawke's Bay and the rest of New Zealand under the 30% conversion to *Pinus radiata* are described in Table 33, and the associated employment impacts are in Table 34. The land converted to forestry is three times as large under this scenario compared to the previous scenario, and accordingly the value-added gains for the industry during harvest years are around three times that of the previous scenario (\$3.7b compared to \$1.2b). Interestingly, during other years when there are losses in value added for the industry, the losses are on average four times larger in this scenario compared to the previous scenario.

Overall, annual value-added impacts for New Zealand range from a loss of \$330m (during the initial year) to a gain of \$16.2b in the harvest years.

Employment impacts are extremely high under this scenario during the harvest years, particularly in wood processing with a whopping 100,000 extra needed and another 19,000 needed in utilities, construction and transport. During other years the employment impacts are still relatively small. These results underscore the necessity for planting and harvesting to be phased and sequenced. We also see that decisions around timing and location of new wood processing investment, the degree to which the industry can capture processing locally rather than offshore, and the types of technologies employed and the relative labour requirements, will have huge implications for regional economies under these forestry conversion scenarios.

Additional Tables showing the impacts across all forestry scenarios are shown in Appendix 3 and 4.

Table 27: Direct and Indirect Net Value Added Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 10% Forest (NZ\$_{2022Q2}mil)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|--------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 2.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 2.1 |
| Sheep and beef cattle farming with forestry | -71.4 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | 556.0 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | 556.0 |
| Dairy cattle farming | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Other farming | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.2 |
| Other primary | 4.6 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 117.8 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 117.8 |
| Agriculture, forestry and fishing support services | 6.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 176.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 176.5 |
| Meat and meat product manufacturing | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.7 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.7 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.4 |
| Other food manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 |
| Wood product manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 470.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 470.7 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 |
| Other manufacturing | 0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 63.0 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 63.0 |
| Utilities, construction, transport | 0.1 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | 335.6 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | 335.6 |
| Wholesale and retail trade, hospitality | 2.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 36.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 36.4 |
| Information, finance, insurance, property and business services | -0.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 188.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 188.1 |
| Government, education and health | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 35.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 35.9 |
| Recreational and personal services | -0.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 21.5 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 21.5 |
| SUB-TOTAL | -58.4 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | 2,006.9 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | 2,006.9 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Sheep, beef cattle and grain farming | -0.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 3.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 3.1 |
| Dairy cattle farming | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 3.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 3.2 |
| Other farming | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.3 |
| Other primary | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 21.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 21.0 |
| Agriculture, forestry and fishing support services | 0.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 15.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 15.5 |
| Meat and meat product manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.8 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.8 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 |
| Other food manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.1 |
| Wood product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 6.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 6.3 |
| Other manufacturing | 0.0 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 96.9 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 96.9 |
| Utilities, construction, transport | 0.5 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 190.9 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 190.9 |
| Wholesale and retail trade, hospitality | -0.1 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 103.8 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 103.8 |
| Information, finance, insurance, property and business services | 0.0 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 219.1 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 219.1 |
| Government, education and health | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 15.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 15.1 |
| Recreational and personal services | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 18.8 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 18.8 |
| SUB-TOTAL | 0.5 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | 706.9 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | 706.9 |
| TOTAL | -57.9 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | 2,713.8 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | 2,713.8 |

Table 28: Direct and Indirect Employment Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 10% Forest (Modified Employee Counts - MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 10 | -2 | -2 | -2 | -2 | -2 | 33 | -2 | -2 | -2 | -2 | -2 | -2 | 33 |
| Sheep and beef cattle farming | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Other farming | -1 | -3 | -3 | -3 | -3 | -3 | 3 | -3 | -3 | -3 | -3 | -3 | -3 | 3 |
| Other primary | 27 | 1 | 1 | 1 | 1 | 1 | 684 | 1 | 1 | 1 | 1 | 1 | 1 | 684 |
| Agriculture, forestry and fishing support services | 81 | -1 | -1 | -1 | -1 | -1 | 2,081 | -1 | -1 | -1 | -1 | -1 | -1 | 2,081 |
| Meat and meat product manufacturing | -53 | -53 | -53 | -53 | -53 | -53 | -48 | -53 | -53 | -53 | -53 | -53 | -53 | -48 |
| Dairy product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| Other food manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 19 |
| Wood product manufacturing | -1 | -2 | -2 | -2 | -2 | -2 | 8,775 | -2 | -2 | -2 | -2 | -2 | -2 | 8,775 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Other manufacturing | 1 | -2 | -2 | -2 | -2 | -2 | 233 | -2 | -2 | -2 | -2 | -2 | -2 | 233 |
| Utilities, construction, transport | 1 | -10 | -10 | -10 | -10 | -10 | 2,919 | -10 | -10 | -10 | -10 | -10 | -10 | 2,919 |
| Wholesale and retail trade, hospitality | 37 | -10 | -10 | -10 | -10 | -10 | 569 | -10 | -10 | -10 | -10 | -10 | -10 | 569 |
| Information, finance, insurance, property and business services | -1 | -12 | -12 | -12 | -12 | -12 | 1,107 | -12 | -12 | -12 | -12 | -12 | -12 | 1,107 |
| Government, education and health | 0 | -2 | -2 | -2 | -2 | -2 | 693 | -2 | -2 | -2 | -2 | -2 | -2 | 693 |
| Recreational and personal services | -3 | -6 | -6 | -6 | -6 | -6 | 472 | -6 | -6 | -6 | -6 | -6 | -6 | 472 |
| SUB-TOTAL | 100 | -101 | -101 | -101 | -101 | -101 | 17,568 | -101 | -101 | -101 | -101 | -101 | -101 | 17,568 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| Sheep and beef cattle farming with forestry | -1 | -1 | -1 | -1 | -1 | -1 | 16 | -1 | -1 | -1 | -1 | -1 | -1 | 16 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| Other farming | -2 | -2 | -2 | -2 | -2 | -2 | 4 | -2 | -2 | -2 | -2 | -2 | -2 | 4 |
| Other primary | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 39 |
| Agriculture, forestry and fishing support services | 7 | -2 | -2 | -2 | -2 | -2 | 237 | -2 | -2 | -2 | -2 | -2 | -2 | 237 |
| Meat and meat product manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | 10 | -1 | -1 | -1 | -1 | -1 | -1 | 10 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Other food manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 44 |
| Wood product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 48 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |
| Other manufacturing | -1 | -4 | -4 | -4 | -4 | -4 | 670 | -4 | -4 | -4 | -4 | -4 | -4 | 670 |
| Utilities, construction, transport | 4 | -7 | -7 | -7 | -7 | -7 | 1,169 | -7 | -7 | -7 | -7 | -7 | -7 | 1,169 |
| Wholesale and retail trade, hospitality | -1 | -6 | -6 | -6 | -6 | -6 | 873 | -6 | -6 | -6 | -6 | -6 | -6 | 873 |
| Information, finance, insurance, property and business services | 0 | -10 | -10 | -10 | -10 | -10 | 1,392 | -10 | -10 | -10 | -10 | -10 | -10 | 1,392 |
| Government, education and health | 0 | -1 | -1 | -1 | -1 | -1 | 186 | -1 | -1 | -1 | -1 | -1 | -1 | 186 |
| Recreational and personal services | 0 | -2 | -2 | -2 | -2 | -2 | 266 | -2 | -2 | -2 | -2 | -2 | -2 | 266 |
| SUB-TOTAL | 5 | -38 | -38 | -38 | -38 | -38 | 5,025 | -38 | -38 | -38 | -38 | -38 | -38 | 5,025 |
| TOTAL | 104 | -140 | -140 | -140 | -140 | -140 | 22,594 | -140 | -140 | -140 | -140 | -140 | -140 | 22,594 |

Table 29: Direct and Indirect Net Value Added Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 30% *Pinus radiata* Forest (NZ\$2022Q2m)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 1.9 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 6.1 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 6.1 |
| Sheep and beef cattle farming with forestry | -230.0 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | 2,064.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | 2,064.6 |
| Dairy cattle farming | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 |
| Other farming | -0.3 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 0.3 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 0.3 |
| Other primary | 13.9 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 321.1 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 321.1 |
| Agriculture, forestry and fishing support services | 20.7 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 481.6 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 481.6 |
| Meat and meat product manufacturing | -7.5 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.1 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.1 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.3 |
| Other food manufacturing | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.3 |
| Wood product manufacturing | -0.3 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 1,425.8 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 1,425.8 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 |
| Other manufacturing | 1.4 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | 184.3 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | 184.3 |
| Utilities, construction, transport | -1.0 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | 998.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | 998.9 |
| Wholesale and retail trade, hospitality | 6.8 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | 108.5 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | 108.5 |
| Information, finance, insurance, property and business services | -1.5 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | 559.0 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | 559.0 |
| Government, education and health | -0.1 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 107.9 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 107.9 |
| Recreational and personal services | -0.5 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | 64.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | 64.0 |
| SUB-TOTAL | -196.4 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | 6,330.0 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | 6,330.0 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1.6 |
| Sheep, beef cattle and grain farming | -0.9 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 8.7 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 8.7 |
| Dairy cattle farming | -0.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 9.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 9.3 |
| Other farming | -0.5 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 0.8 |
| Other primary | 0.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 62.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 62.2 |
| Agriculture, forestry and fishing support services | 1.2 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 43.0 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 43.0 |
| Meat and meat product manufacturing | -0.4 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 2.4 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 2.4 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.8 |
| Other food manufacturing | -0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 15.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 15.2 |
| Wood product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 13.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 13.5 |
| Pulp, paper, and converted paper product manufacturing | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 19.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 19.1 |
| Other manufacturing | -0.5 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | 288.9 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | 288.9 |
| Utilities, construction, transport | 0.6 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | 566.5 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | 566.5 |
| Wholesale and retail trade, hospitality | -1.0 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | 309.9 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | 309.9 |
| Information, finance, insurance, property and business services | -1.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | 652.6 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | 652.6 |
| Government, education and health | 0.0 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 45.4 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 45.4 |
| Recreational and personal services | -0.1 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 55.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 55.8 |
| SUB-TOTAL | -3.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | 2,100.7 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | 2,100.7 |
| TOTAL | -199.7 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | 8,430.7 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | 8,430.7 |

Table 30: Direct and Indirect Employment Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 30% *Pinus radiata* Forest (Modified Employee Counts - MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 30 | -7 | -7 | -7 | -7 | -7 | 94 | -7 | -7 | -7 | -7 | -7 | -7 | 94 |
| Sheep and beef cattle farming | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| Other farming | -7 | -11 | -11 | -11 | -11 | -11 | 6 | -11 | -11 | -11 | -11 | -11 | -11 | 6 |
| Other primary | 81 | 2 | 2 | 2 | 2 | 2 | 1,864 | 2 | 2 | 2 | 2 | 2 | 2 | 1,864 |
| Agriculture, forestry and fishing support services | 244 | -5 | -5 | -5 | -5 | -5 | 5,679 | -5 | -5 | -5 | -5 | -5 | -5 | 5,679 |
| Meat and meat product manufacturing | -213 | -214 | -214 | -214 | -214 | -214 | -200 | -214 | -214 | -214 | -214 | -214 | -214 | -200 |
| Dairy product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 64 |
| Other food manufacturing | 3 | -1 | -1 | -1 | -1 | -1 | 58 | -1 | -1 | -1 | -1 | -1 | -1 | 58 |
| Wood product manufacturing | -5 | -7 | -7 | -7 | -7 | -7 | 26,578 | -7 | -7 | -7 | -7 | -7 | -7 | 26,578 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| Other manufacturing | 2 | -8 | -8 | -8 | -8 | -8 | 692 | -8 | -8 | -8 | -8 | -8 | -8 | 692 |
| Utilities, construction, transport | -6 | -39 | -39 | -39 | -39 | -39 | 8,696 | -39 | -39 | -39 | -39 | -39 | -39 | 8,696 |
| Wholesale and retail trade, hospitality | 107 | -35 | -35 | -35 | -35 | -35 | 1,697 | -35 | -35 | -35 | -35 | -35 | -35 | 1,697 |
| Information, finance, insurance, property and business services | -11 | -44 | -44 | -44 | -44 | -44 | 3,293 | -44 | -44 | -44 | -44 | -44 | -44 | 3,293 |
| Government, education and health | -1 | -7 | -7 | -7 | -7 | -7 | 2,087 | -7 | -7 | -7 | -7 | -7 | -7 | 2,087 |
| Recreational and personal services | -11 | -21 | -21 | -21 | -21 | -21 | 1,410 | -21 | -21 | -21 | -21 | -21 | -21 | 1,410 |
| SUB-TOTAL | 209 | -399 | -399 | -399 | -399 | -399 | 52,038 | -399 | -399 | -399 | -399 | -399 | -399 | 52,038 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -1 | -1 | -1 | -1 | -1 | -1 | 28 | -1 | -1 | -1 | -1 | -1 | -1 | 28 |
| Sheep and beef cattle farming with forestry | -5 | -6 | -6 | -6 | -6 | -6 | 46 | -6 | -6 | -6 | -6 | -6 | -6 | 46 |
| Dairy cattle farming | -1 | -1 | -1 | -1 | -1 | -1 | 36 | -1 | -1 | -1 | -1 | -1 | -1 | 36 |
| Other farming | -6 | -7 | -7 | -7 | -7 | -7 | 10 | -7 | -7 | -7 | -7 | -7 | -7 | 10 |
| Other primary | 1 | -1 | -1 | -1 | -1 | -1 | 115 | -1 | -1 | -1 | -1 | -1 | -1 | 115 |
| Agriculture, forestry and fishing support services | 18 | -8 | -8 | -8 | -8 | -8 | 654 | -8 | -8 | -8 | -8 | -8 | -8 | 654 |
| Meat and meat product manufacturing | -5 | -6 | -6 | -6 | -6 | -6 | 30 | -6 | -6 | -6 | -6 | -6 | -6 | 30 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| Other food manufacturing | -1 | -2 | -2 | -2 | -2 | -2 | 131 | -2 | -2 | -2 | -2 | -2 | -2 | 131 |
| Wood product manufacturing | 0 | -1 | -1 | -1 | -1 | -1 | 145 | -1 | -1 | -1 | -1 | -1 | -1 | 145 |
| Pulp, paper, and converted paper product manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | 130 | -1 | -1 | -1 | -1 | -1 | -1 | 130 |
| Other manufacturing | -5 | -15 | -15 | -15 | -15 | -15 | 2,002 | -15 | -15 | -15 | -15 | -15 | -15 | 2,002 |
| Utilities, construction, transport | 4 | -28 | -28 | -28 | -28 | -28 | 3,463 | -28 | -28 | -28 | -28 | -28 | -28 | 3,463 |
| Wholesale and retail trade, hospitality | -8 | -24 | -24 | -24 | -24 | -24 | 2,604 | -24 | -24 | -24 | -24 | -24 | -24 | 2,604 |
| Information, finance, insurance, property and business services | -8 | -40 | -40 | -40 | -40 | -40 | 4,149 | -40 | -40 | -40 | -40 | -40 | -40 | 4,149 |
| Government, education and health | -1 | -3 | -3 | -3 | -3 | -3 | 559 | -3 | -3 | -3 | -3 | -3 | -3 | 559 |
| Recreational and personal services | -2 | -8 | -8 | -8 | -8 | -8 | 790 | -8 | -8 | -8 | -8 | -8 | -8 | 790 |
| SUB-TOTAL | -21 | -152 | -152 | -152 | -152 | -152 | 14,907 | -152 | -152 | -152 | -152 | -152 | -152 | 14,907 |
| TOTAL | 189 | -551 | -551 | -551 | -551 | -551 | 66,945 | -551 | -551 | -551 | -551 | -551 | -551 | 66,945 |

Table 31: Direct and Indirect Net Value Added Impacts for Hawke's Bay Region: Baseline vs Sheep and Beef Farming with 10% *Pinus radiata* Forest (NZ\$2022Q2m)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|--------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Hawke's Bay Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 1.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 4.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 4.4 |
| Sheep and beef cattle farming with forestry | -118.8 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | 1,210.9 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | 1,210.9 |
| Dairy cattle farming | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Other farming | -0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 0.7 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 0.7 |
| Other primary | 6.7 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 233.8 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 233.8 |
| Agriculture, forestry and fishing support services | 13.6 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 426.3 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 426.3 |
| Meat and meat product manufacturing | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -2.7 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -2.7 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 |
| Other food manufacturing | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 8.8 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 8.8 |
| Wood product manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1,173.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1,173.0 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 29.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 29.1 |
| Other manufacturing | 0.0 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 74.0 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 74.0 |
| Utilities, construction, transport | 1.1 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 596.8 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 596.8 |
| Wholesale and retail trade, hospitality | 4.5 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 135.0 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 135.0 |
| Information, finance, insurance, property and business services | 2.0 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | 326.7 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | 326.7 |
| Government, education and health | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 39.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 39.9 |
| Recreational and personal services | 0.1 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 39.6 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 39.6 |
| SUB-TOTAL | -93.5 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | 4,298.3 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | 4,298.3 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 |
| Sheep, beef cattle and grain farming | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | 2.9 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | 2.9 |
| Dairy cattle farming | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 6.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 6.6 |
| Other farming | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.5 |
| Other primary | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 53.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 53.0 |
| Agriculture, forestry and fishing support services | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 11.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 11.6 |
| Meat and meat product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 |
| Other food manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.8 |
| Wood product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 94.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 94.6 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.6 |
| Other manufacturing | 1.2 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 180.6 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 180.6 |
| Utilities, construction, transport | 0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | 247.0 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | 247.0 |
| Wholesale and retail trade, hospitality | 0.2 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 103.2 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 103.2 |
| Information, finance, insurance, property and business services | 1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | 299.6 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | 299.6 |
| Government, education and health | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 19.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 19.1 |
| Recreational and personal services | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 28.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 28.4 |
| SUB-TOTAL | 3.2 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | 1,061.1 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | 1,061.1 |
| TOTAL | -90.3 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | 5,359.4 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | 5,359.4 |

Table 32: Direct and Indirect Employment Impacts for Hawke’s Bay Region: Baseline vs Sheep and Beef Farming with 10% *Pinus radiata* Forest (Modified Employee Counts - MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Hawke's Bay Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 8 | -1 | -1 | -1 | -1 | -1 | 29 | -1 | -1 | -1 | -1 | -1 | -1 | 29 |
| Sheep and beef cattle farming | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Other farming | -1 | -2 | -2 | -2 | -2 | -2 | 7 | -2 | -2 | -2 | -2 | -2 | -2 | 7 |
| Other primary | 75 | 2 | 2 | 2 | 2 | 2 | 2,621 | 2 | 2 | 2 | 2 | 2 | 2 | 2,621 |
| Agriculture, forestry and fishing support services | 46 | -1 | -1 | -1 | -1 | -1 | 1,437 | -1 | -1 | -1 | -1 | -1 | -1 | 1,437 |
| Meat and meat product manufacturing | -15 | -15 | -15 | -15 | -15 | -15 | -10 | -15 | -15 | -15 | -15 | -15 | -15 | -10 |
| Dairy product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 37 |
| Other food manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| Wood product manufacturing | -3 | -4 | -4 | -4 | -4 | -4 | 33,062 | -4 | -4 | -4 | -4 | -4 | -4 | 33,062 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Other manufacturing | -1 | -7 | -7 | -7 | -7 | -7 | 677 | -7 | -7 | -7 | -7 | -7 | -7 | 677 |
| Utilities, construction, transport | 11 | -13 | -13 | -13 | -13 | -13 | 6,383 | -13 | -13 | -13 | -13 | -13 | -13 | 6,383 |
| Wholesale and retail trade, hospitality | 62 | -12 | -12 | -12 | -12 | -12 | 1,380 | -12 | -12 | -12 | -12 | -12 | -12 | 1,380 |
| Information, finance, insurance, property and business services | 9 | -14 | -14 | -14 | -14 | -14 | 1,555 | -14 | -14 | -14 | -14 | -14 | -14 | 1,555 |
| Government, education and health | 2 | -2 | -2 | -2 | -2 | -2 | 709 | -2 | -2 | -2 | -2 | -2 | -2 | 709 |
| Recreational and personal services | 1 | -7 | -7 | -7 | -7 | -7 | 660 | -7 | -7 | -7 | -7 | -7 | -7 | 660 |
| SUB-TOTAL | 194 | -78 | -78 | -78 | -78 | -78 | 48,575 | -78 | -78 | -78 | -78 | -78 | -78 | 48,575 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| Sheep and beef cattle farming with forestry | -4 | -5 | -5 | -5 | -5 | -5 | 17 | -5 | -5 | -5 | -5 | -5 | -5 | 17 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| Other farming | -1 | -1 | -1 | -1 | -1 | -1 | 7 | -1 | -1 | -1 | -1 | -1 | -1 | 7 |
| Other primary | 0 | 0 | 0 | 0 | 0 | 0 | 134 | 0 | 0 | 0 | 0 | 0 | 0 | 134 |
| Agriculture, forestry and fishing support services | 0 | -1 | -1 | -1 | -1 | -1 | 194 | -1 | -1 | -1 | -1 | -1 | -1 | 194 |
| Meat and meat product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Other food manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 34 |
| Wood product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 1,004 | 0 | 0 | 0 | 0 | 0 | 0 | 1,004 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 45 |
| Other manufacturing | 1 | -3 | -3 | -3 | -3 | -3 | 743 | -3 | -3 | -3 | -3 | -3 | -3 | 743 |
| Utilities, construction, transport | 8 | -6 | -6 | -6 | -6 | -6 | 1,662 | -6 | -6 | -6 | -6 | -6 | -6 | 1,662 |
| Wholesale and retail trade, hospitality | 2 | -4 | -4 | -4 | -4 | -4 | 905 | -4 | -4 | -4 | -4 | -4 | -4 | 905 |
| Information, finance, insurance, property and business services | 9 | -9 | -9 | -9 | -9 | -9 | 1,890 | -9 | -9 | -9 | -9 | -9 | -9 | 1,890 |
| Government, education and health | 1 | -1 | -1 | -1 | -1 | -1 | 243 | -1 | -1 | -1 | -1 | -1 | -1 | 243 |
| Recreational and personal services | 2 | -2 | -2 | -2 | -2 | -2 | 395 | -2 | -2 | -2 | -2 | -2 | -2 | 395 |
| SUB-TOTAL | 18 | -35 | -35 | -35 | -35 | -35 | 7,327 | -35 | -35 | -35 | -35 | -35 | -35 | 7,327 |
| TOTAL | 212 | -113 | -113 | -113 | -113 | -113 | 55,902 | -113 | -113 | -113 | -113 | -113 | -113 | 55,902 |

Table 33: Direct and Indirect Net Value Added Impacts for Hawke's Bay Region: Baseline vs Sheep and Beef Farming with 30% *Pinus radiata* Forest (NZ\$2022Q2m)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Hawke's Bay Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 3.4 | -0.4 | -0.5 | -0.4 | -0.6 | -0.6 | 19.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 19.6 |
| Sheep and beef cattle farming with forestry | -400.4 | -67.9 | -68.0 | -67.8 | -68.1 | -68.1 | 3,702.2 | -68.1 | -68.1 | -68.1 | -68.1 | -68.1 | -68.1 | 3,702.2 |
| Dairy cattle farming | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.6 |
| Other farming | -0.5 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | 2.9 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | 2.9 |
| Other primary | 20.2 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 706.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 706.0 |
| Agriculture, forestry and fishing support services | 40.5 | -1.0 | -1.0 | -1.0 | -1.1 | -1.1 | 1,292.3 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 1,292.3 |
| Meat and meat product manufacturing | -16.0 | -15.8 | -15.8 | -15.8 | -16.0 | -16.0 | -7.6 | -16.0 | -16.0 | -16.0 | -16.0 | -16.0 | -16.0 | -7.6 |
| Dairy product manufacturing | -0.1 | 0.0 | 0.0 | 0.1 | -0.1 | -0.1 | 7.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 7.6 |
| Other food manufacturing | -0.5 | 0.1 | -0.1 | 0.3 | -0.6 | -0.6 | 48.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 48.8 |
| Wood product manufacturing | -0.5 | -0.6 | -0.6 | -0.5 | -0.6 | -0.6 | 3,538.2 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 3,538.2 |
| Pulp, paper, and converted paper product manufacturing | -0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 89.6 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 89.6 |
| Other manufacturing | -1.0 | -2.0 | -2.2 | -1.8 | -2.7 | -2.7 | 239.4 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | 239.4 |
| Utilities, construction, transport | -1.1 | -4.9 | -5.6 | -4.2 | -7.6 | -7.6 | 1,839.5 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | 1,839.5 |
| Wholesale and retail trade, hospitality | 7.9 | -1.4 | -2.6 | 0.0 | -6.2 | -6.2 | 511.8 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | 511.8 |
| Information, finance, insurance, property and business services | -8.5 | -4.0 | -7.0 | -0.6 | -16.1 | -16.1 | 1,236.8 | -16.1 | -16.1 | -16.1 | -16.1 | -16.1 | -16.1 | 1,236.8 |
| Government, education and health | -1.7 | 0.5 | 0.0 | 1.1 | -1.4 | -1.4 | 162.0 | -1.4 | -1.4 | -1.4 | -1.4 | -1.4 | -1.4 | 162.0 |
| Recreational and personal services | -0.3 | 0.0 | -0.3 | 0.3 | -1.1 | -1.1 | 141.5 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 141.5 |
| SUB-TOTAL | -358.6 | -97.9 | -104.2 | -91.0 | -122.9 | -122.9 | 13,532.0 | -122.9 | -122.9 | -122.9 | -122.9 | -122.9 | -122.9 | 13,532.0 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.2 | -0.3 | -0.3 | -0.3 | -0.5 | -0.5 | 66.6 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 66.6 |
| Sheep, beef cattle and grain farming | -2.7 | -3.6 | -3.7 | -3.6 | -3.9 | -3.9 | 112.7 | -3.9 | -3.9 | -3.9 | -3.9 | -3.9 | -3.9 | 112.7 |
| Dairy cattle farming | -0.1 | -0.6 | -0.8 | -0.5 | -1.1 | -1.1 | 124.2 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 124.2 |
| Other farming | -0.4 | -0.5 | -0.5 | -0.5 | -0.6 | -0.6 | 20.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 20.6 |
| Other primary | 0.6 | -0.6 | -0.6 | -0.5 | -0.8 | -0.8 | 245.9 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | 245.9 |
| Agriculture, forestry and fishing support services | 0.1 | -0.5 | -0.5 | -0.4 | -0.6 | -0.6 | 78.7 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 78.7 |
| Meat and meat product manufacturing | 0.2 | -0.3 | -0.4 | -0.3 | -0.5 | -0.5 | 72.3 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 72.3 |
| Dairy product manufacturing | 0.3 | -0.3 | -0.4 | -0.3 | -0.5 | -0.5 | 94.4 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 94.4 |
| Other food manufacturing | 1.3 | -1.3 | -1.4 | -1.0 | -2.0 | -2.0 | 346.8 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | 346.8 |
| Wood product manufacturing | 0.1 | -0.2 | -0.2 | -0.2 | -0.3 | -0.3 | 315.8 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 315.8 |
| Pulp, paper, and converted paper product manufacturing | 0.1 | -0.1 | -0.1 | -0.1 | -0.2 | -0.2 | 35.9 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 35.9 |
| Other manufacturing | 5.0 | -4.0 | -4.4 | -3.5 | -5.8 | -5.8 | 1,182.7 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | 1,182.7 |
| Utilities, construction, transport | 7.2 | -8.5 | -9.5 | -7.5 | -12.3 | -12.3 | 2,247.3 | -12.3 | -12.3 | -12.3 | -12.3 | -12.3 | -12.3 | 2,247.3 |
| Wholesale and retail trade, hospitality | 10.9 | -11.1 | -12.7 | -9.5 | -17.2 | -17.2 | 3,062.9 | -17.2 | -17.2 | -17.2 | -17.2 | -17.2 | -17.2 | 3,062.9 |
| Information, finance, insurance, property and business services | 28.6 | -28.7 | -32.9 | -24.1 | -45.3 | -45.3 | 7,851.5 | -45.3 | -45.3 | -45.3 | -45.3 | -45.3 | -45.3 | 7,851.5 |
| Government, education and health | 3.4 | -3.1 | -3.6 | -2.6 | -4.9 | -4.9 | 888.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | 888.9 |
| Recreational and personal services | 2.8 | -2.8 | -3.2 | -2.4 | -4.3 | -4.3 | 753.9 | -4.3 | -4.3 | -4.3 | -4.3 | -4.3 | -4.3 | 753.9 |
| SUB-TOTAL | 57.6 | -66.7 | -75.3 | -57.2 | -100.7 | -100.7 | 17,501.3 | -100.7 | -100.7 | -100.7 | -100.7 | -100.7 | -100.7 | 17,501.3 |
| TOTAL | -301.0 | -164.5 | -179.5 | -148.2 | -223.5 | -223.5 | 31,033.3 | -223.5 | -223.5 | -223.5 | -223.5 | -223.5 | -223.5 | 31,033.3 |

Table 34: Direct and Indirect Employment Impacts for Hawke’s Bay Region: Baseline vs Sheep and Beef Farming with 30% *Pinus radiata* Forest (Modified Employee Counts - MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|------------|-------------|-------------|-------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Hawke's Bay Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 22 | -3 | -3 | -3 | -4 | -4 | 127 | -4 | -4 | -4 | -4 | -4 | -4 | 127 |
| Sheep and beef cattle farming | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 |
| Dairy cattle farming | 0 | -1 | -1 | -1 | -1 | -1 | 46 | -1 | -1 | -1 | -1 | -1 | -1 | 46 |
| Other farming | -5 | -8 | -8 | -7 | -8 | -8 | 28 | -8 | -8 | -8 | -8 | -8 | -8 | 28 |
| Other primary | 227 | 5 | 5 | 5 | 4 | 4 | 7,915 | 4 | 4 | 4 | 4 | 4 | 4 | 7,915 |
| Agriculture, forestry and fishing support services | 136 | -3 | -3 | -3 | -4 | -4 | 4,356 | -4 | -4 | -4 | -4 | -4 | -4 | 4,356 |
| Meat and meat product manufacturing | -58 | -58 | -58 | -58 | -58 | -58 | -28 | -58 | -58 | -58 | -58 | -58 | -58 | -28 |
| Dairy product manufacturing | -1 | 1 | 0 | 2 | -1 | -1 | 157 | -1 | -1 | -1 | -1 | -1 | -1 | 157 |
| Other food manufacturing | 0 | 1 | 0 | 2 | -2 | -2 | 124 | -2 | -2 | -2 | -2 | -2 | -2 | 124 |
| Wood product manufacturing | -13 | -16 | -16 | -15 | -17 | -17 | 99,725 | -17 | -17 | -17 | -17 | -17 | -17 | 99,725 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| Other manufacturing | -14 | -18 | -20 | -16 | -26 | -26 | 2,193 | -26 | -26 | -26 | -26 | -26 | -26 | 2,193 |
| Utilities, construction, transport | 3 | -43 | -47 | -38 | -61 | -61 | 19,485 | -61 | -61 | -61 | -61 | -61 | -61 | 19,485 |
| Wholesale and retail trade, hospitality | 86 | 3 | -20 | 27 | -86 | -86 | 6,102 | -86 | -86 | -86 | -86 | -86 | -86 | 6,102 |
| Information, finance, insurance, property and business services | -3 | -38 | -44 | -32 | -59 | -59 | 5,142 | -59 | -59 | -59 | -59 | -59 | -59 | 5,142 |
| Government, education and health | -32 | 10 | 1 | 19 | -24 | -24 | 2,909 | -24 | -24 | -24 | -24 | -24 | -24 | 2,909 |
| Recreational and personal services | -16 | -15 | -19 | -11 | -30 | -30 | 2,346 | -30 | -30 | -30 | -30 | -30 | -30 | 2,346 |
| SUB-TOTAL | 321 | -192 | -241 | -138 | -387 | -387 | 150,628 | -387 | -387 | -387 | -387 | -387 | -387 | 150,628 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 4 | -6 | -7 | -5 | -9 | -9 | 1,257 | -9 | -9 | -9 | -9 | -9 | -9 | 1,257 |
| Sheep and beef cattle farming with forestry | -16 | -21 | -21 | -21 | -23 | -23 | 652 | -23 | -23 | -23 | -23 | -23 | -23 | 652 |
| Dairy cattle farming | 0 | -2 | -3 | -2 | -4 | -4 | 461 | -4 | -4 | -4 | -4 | -4 | -4 | 461 |
| Other farming | -4 | -7 | -7 | -6 | -7 | -7 | 255 | -7 | -7 | -7 | -7 | -7 | -7 | 255 |
| Other primary | 1 | -1 | -1 | -1 | -1 | -1 | 571 | -1 | -1 | -1 | -1 | -1 | -1 | 571 |
| Agriculture, forestry and fishing support services | 2 | -8 | -8 | -7 | -10 | -10 | 1,316 | -10 | -10 | -10 | -10 | -10 | -10 | 1,316 |
| Meat and meat product manufacturing | 3 | -4 | -5 | -4 | -6 | -6 | 971 | -6 | -6 | -6 | -6 | -6 | -6 | 971 |
| Diary product manufacturing | 1 | -1 | -1 | -1 | -1 | -1 | 217 | -1 | -1 | -1 | -1 | -1 | -1 | 217 |
| Other food manufacturing | 11 | -10 | -12 | -9 | -16 | -16 | 2,841 | -16 | -16 | -16 | -16 | -16 | -16 | 2,841 |
| Wood product manufacturing | 1 | -2 | -3 | -2 | -3 | -3 | 3,350 | -3 | -3 | -3 | -3 | -3 | -3 | 3,350 |
| Pulp, paper, and converted paper product manufacturing | 0 | -1 | -1 | -1 | -1 | -1 | 286 | -1 | -1 | -1 | -1 | -1 | -1 | 286 |
| Other manufacturing | 15 | -22 | -25 | -19 | -33 | -33 | 6,100 | -33 | -33 | -33 | -33 | -33 | -33 | 6,100 |
| Utilities, construction, transport | 48 | -52 | -57 | -46 | -73 | -73 | 13,523 | -73 | -73 | -73 | -73 | -73 | -73 | 13,523 |
| Wholesale and retail trade, hospitality | 174 | -167 | -190 | -141 | -260 | -260 | 46,315 | -260 | -260 | -260 | -260 | -260 | -260 | 46,315 |
| Information, finance, insurance, property and business services | 90 | -103 | -117 | -87 | -159 | -159 | 26,818 | -159 | -159 | -159 | -159 | -159 | -159 | 26,818 |
| Government, education and health | 57 | -51 | -59 | -43 | -82 | -82 | 14,756 | -82 | -82 | -82 | -82 | -82 | -82 | 14,756 |
| Recreational and personal services | 33 | -33 | -38 | -28 | -51 | -51 | 8,934 | -51 | -51 | -51 | -51 | -51 | -51 | 8,934 |
| SUB-TOTAL | 419 | -492 | -555 | -423 | -740 | -740 | 128,624 | -740 | -740 | -740 | -740 | -740 | -740 | 128,624 |
| TOTAL | 740 | -684 | -796 | -561 | -1,126 | -1,126 | 279,252 | -1,126 | -1,126 | -1,126 | -1,126 | -1,126 | -1,126 | 279,252 |

9.3 Other Considerations and Caveats

9.3.1 Sequencing of Forestry Planting and Harvesting

In the financial cashflows for the scenarios completed by Groundtruth, it was assumed that all land is converted and planted into forests commencing the same time. Furthermore, that once the trees have reached maturity the land is all harvested during the same year. These cashflows have formed the basis to the economic impact assessment described in this report.

In the real world, it is unlikely that all farms will be ready to undertake conversion at the same date. When harvests are undertaken may vary considerably through time and will depend on several factors including farm performance, prediction of future log prices and so on. Of greater significance, the very lumpy nature of employment requirements that would be needed if forests were harvested concurrently would be extremely problematic in terms of skilled labour supply – with extremely large numbers of people needed, but only for a short period. Delays and sequencing of planting and harvesting are therefore likely to be needed to smooth labour and other resource requirements for on-farm forestry.

Tables 35 and 37 present the direct and indirect value-added results respectively for Northland and Hawke's Bay with the 30% conversion to *Pinus radiata* scenario but with a periodic planting regime instigated. Unlike the 30% conversion to *Pinus radiata* scenario where planting is assumed to occur all in Year 0 and full harvest at the end of a 28-year rotation, this scenario assumes that planting occurs through time (every 3 years from Year 0). Arguably, this will be closer to reality, in the sense that farm-to-forestry conversion may take time to instigate and embed into farm system operations. From a wider economic perspective, the periodic planting scenario will reduce the net economic impacts between 2022-78 as future workstreams are more heavily discounted.

Table 35: Direct and Indirect Net Value Added Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 30% *Pinus radiata* Forest - Periodic Planting (NZ\$2022Q2m)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -0.2 | -0.4 | -0.4 | -0.2 | -0.4 | -0.4 | 0.3 | -0.4 | -0.4 | 0.3 | -0.4 | -0.4 | 0.3 | 0.3 |
| Sheep and beef cattle farming with forestry | -49.0 | -25.9 | -27.6 | -63.3 | -30.1 | -31.7 | 116.1 | -42.7 | -32.6 | 105.9 | -32.6 | -32.6 | 105.9 | 116.1 |
| Dairy cattle farming | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other farming | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.4 | -0.5 | -0.5 | -0.4 | -0.5 | -0.5 | -0.4 | -0.4 |
| Other primary | 1.6 | -0.1 | 0.0 | 2.8 | 0.1 | 0.2 | 36.4 | 1.3 | 0.3 | 37.5 | 0.3 | 0.3 | 37.5 | 36.4 |
| Agriculture, forestry and fishing support services | 1.6 | -0.9 | -0.8 | 3.5 | -0.6 | -0.5 | 53.6 | 1.1 | -0.4 | 55.1 | -0.4 | -0.4 | 55.1 | 53.6 |
| Meat and meat product manufacturing | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.5 | -7.6 | -7.6 | -7.5 | -7.6 | -7.6 | -7.5 | -7.5 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 |
| Other food manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.2 | 0.2 |
| Wood product manufacturing | -0.3 | -0.4 | -0.4 | -0.3 | -0.4 | -0.4 | 142.3 | -0.4 | -0.4 | 142.3 | -0.4 | -0.4 | 142.3 | 142.3 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 |
| Other manufacturing | -1.4 | -1.8 | -1.8 | -1.2 | -1.8 | -1.8 | 17.8 | -1.6 | -1.8 | 17.9 | -1.8 | -1.8 | 17.9 | 17.8 |
| Utilities, construction, transport | -4.5 | -5.0 | -5.0 | -4.2 | -4.9 | -4.9 | 100.8 | -4.7 | -4.9 | 101.0 | -4.9 | -4.9 | 101.0 | 100.8 |
| Wholesale and retail trade, hospitality | -1.3 | -2.3 | -2.3 | -1.2 | -2.3 | -2.3 | 9.1 | -2.2 | -2.3 | 9.2 | -2.3 | -2.3 | 9.2 | 9.1 |
| Information, finance, insurance, property and business services | -8.3 | -8.9 | -8.6 | -7.3 | -8.1 | -7.8 | 50.5 | -7.5 | -7.7 | 50.8 | -7.7 | -7.7 | 50.8 | 50.5 |
| Government, education and health | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 10.5 | -0.4 | -0.4 | 10.5 | -0.4 | -0.4 | 10.5 | 10.5 |
| Recreational and personal services | -1.0 | -1.0 | -1.0 | -0.9 | -1.0 | -1.0 | 5.6 | -1.0 | -1.0 | 5.7 | -1.0 | -1.0 | 5.7 | 5.6 |
| SUB-TOTAL | -71.3 | -55.3 | -56.4 | -81.0 | -58.1 | -59.2 | 536.5 | -66.7 | -59.8 | 529.6 | -59.8 | -59.8 | 529.6 | 536.5 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.1 | -0.1 | -0.1 | 0.1 | -0.1 | -0.1 | 0.1 | 0.1 |
| Sheep, beef cattle and grain farming | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -0.1 | -1.1 | -1.1 | -0.1 | -1.1 | -1.1 | -0.1 | -0.1 |
| Dairy cattle farming | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 0.7 | -0.3 | -0.3 | 0.7 | -0.3 | -0.3 | 0.7 | 0.7 |
| Other farming | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.4 |
| Other primary | -0.3 | -0.4 | -0.4 | -0.3 | -0.3 | -0.3 | 6.1 | -0.3 | -0.3 | 6.2 | -0.3 | -0.3 | 6.2 | 6.1 |
| Agriculture, forestry and fishing support services | -0.4 | -0.6 | -0.6 | -0.2 | -0.6 | -0.5 | 4.3 | -0.4 | -0.5 | 4.4 | -0.5 | -0.5 | 4.4 | 4.3 |
| Meat and meat product manufacturing | -0.4 | -0.5 | -0.5 | -0.4 | -0.5 | -0.5 | -0.2 | -0.4 | -0.5 | -0.2 | -0.5 | -0.5 | -0.2 | -0.2 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.6 | 0.6 |
| Other food manufacturing | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 1.4 | -0.2 | -0.2 | 1.4 | -0.2 | -0.2 | 1.4 | 1.4 |
| Wood product manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1.3 | -0.1 | -0.1 | 1.3 | -0.1 | -0.1 | 1.3 | 1.3 |
| Pulp, paper, and converted paper product manufacturing | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 1.7 | -0.2 | -0.2 | 1.7 | -0.2 | -0.2 | 1.7 | 1.7 |
| Other manufacturing | -2.0 | -2.2 | -2.2 | -1.9 | -2.2 | -2.2 | 27.9 | -2.1 | -2.2 | 27.9 | -2.2 | -2.2 | 27.9 | 27.9 |
| Utilities, construction, transport | -3.9 | -4.5 | -4.4 | -3.5 | -4.4 | -4.4 | 54.2 | -4.1 | -4.4 | 54.5 | -4.4 | -4.4 | 54.5 | 54.2 |
| Wholesale and retail trade, hospitality | -2.6 | -2.8 | -2.8 | -2.5 | -2.8 | -2.7 | 29.3 | -2.7 | -2.7 | 29.3 | -2.7 | -2.7 | 29.3 | 29.3 |
| Information, finance, insurance, property and business services | -5.9 | -6.5 | -6.4 | -5.5 | -6.3 | -6.3 | 61.2 | -6.0 | -6.3 | 61.4 | -6.3 | -6.3 | 61.4 | 61.2 |
| Government, education and health | -0.2 | -0.3 | -0.3 | -0.2 | -0.3 | -0.3 | 4.4 | -0.3 | -0.3 | 4.4 | -0.3 | -0.3 | 4.4 | 4.4 |
| Recreational and personal services | -0.5 | -0.6 | -0.6 | -0.5 | -0.6 | -0.6 | 5.2 | -0.5 | -0.6 | 5.2 | -0.6 | -0.6 | 5.2 | 5.2 |
| SUB-TOTAL | -18.7 | -20.7 | -20.6 | -17.5 | -20.4 | -20.3 | 197.6 | -19.3 | -20.3 | 198.5 | -20.3 | -20.3 | 198.5 | 197.6 |
| TOTAL | -90.0 | -76.0 | -77.0 | -98.5 | -78.5 | -79.5 | 734.1 | -86.0 | -80.0 | 728.1 | -80.0 | -80.0 | 728.1 | 734.1 |
| Net Present Value 2022-78 | -393.6 | | | | | | | | | | | | | |

Table 36: Direct and Indirect Employment Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 30% *Pinus radiata* Forest (Modified Employee Counts - MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|--------------|-------------|-------------|--------------|--------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -3 | -7 | -7 | -3 | -7 | -7 | 4 | -7 | -7 | 4 | -7 | -7 | 4 | 4 |
| Sheep and beef cattle farming | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other farming | -10 | -11 | -11 | -10 | -11 | -11 | -9 | -11 | -11 | -9 | -11 | -11 | -9 | -9 |
| Other primary | 10 | 0 | 0 | 17 | 1 | 2 | 211 | 8 | 2 | 217 | 2 | 2 | 217 | 211 |
| Agriculture, forestry and fishing support services | 19 | -11 | -9 | 41 | -7 | -6 | 632 | 13 | -5 | 650 | -5 | -5 | 650 | 632 |
| Meat and meat product manufacturing | -214 | -214 | -214 | -214 | -214 | -214 | -212 | -214 | -214 | -212 | -214 | -214 | -212 | -212 |
| Dairy product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 6 |
| Other food manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | 5 | -1 | -1 | 5 | -1 | -1 | 5 | 5 |
| Wood product manufacturing | -6 | -7 | -7 | -6 | -7 | -7 | 2,653 | -7 | -7 | 2,653 | -7 | -7 | 2,653 | 2,653 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| Other manufacturing | -7 | -8 | -8 | -7 | -8 | -8 | 64 | -8 | -8 | 65 | -8 | -8 | 65 | 64 |
| Utilities, construction, transport | -35 | -39 | -39 | -33 | -39 | -39 | 879 | -37 | -39 | 881 | -39 | -39 | 881 | 879 |
| Wholesale and retail trade, hospitality | -20 | -35 | -35 | -19 | -35 | -35 | 143 | -35 | -35 | 144 | -35 | -35 | 144 | 143 |
| Information, finance, insurance, property and business services | -42 | -46 | -45 | -40 | -45 | -44 | 299 | -43 | -44 | 300 | -44 | -44 | 300 | 299 |
| Government, education and health | -7 | -8 | -8 | -7 | -7 | -7 | 204 | -7 | -7 | 204 | -7 | -7 | 204 | 204 |
| Recreational and personal services | -20 | -21 | -21 | -19 | -21 | -21 | 125 | -20 | -21 | 126 | -21 | -21 | 126 | 125 |
| SUB-TOTAL | -339 | -410 | -408 | -303 | -404 | -401 | 5,004 | -371 | -399 | 5,033 | -399 | -399 | 5,033 | 5,004 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | 2 | 2 |
| Sheep and beef cattle farming with forestry | -6 | -6 | -6 | -6 | -6 | -6 | -1 | -6 | -6 | 0 | -6 | -6 | 0 | -1 |
| Dairy cattle farming | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | -1 | 3 | -1 | -1 | 3 | 3 |
| Other farming | -7 | -7 | -7 | -7 | -7 | -7 | -5 | -7 | -7 | -5 | -7 | -7 | -5 | -5 |
| Other primary | 0 | -1 | -1 | 0 | -1 | -1 | 12 | 0 | -1 | 12 | -1 | -1 | 12 | 12 |
| Agriculture, forestry and fishing support services | -6 | -9 | -9 | -4 | -8 | -8 | 65 | -6 | -8 | 66 | -8 | -8 | 66 | 65 |
| Meat and meat product manufacturing | -6 | -6 | -6 | -6 | -6 | -6 | -2 | -6 | -6 | -2 | -6 | -6 | -2 | -2 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| Other food manufacturing | -2 | -2 | -2 | -2 | -2 | -2 | 12 | -2 | -2 | 12 | -2 | -2 | 12 | 12 |
| Wood product manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | 14 | -1 | -1 | 14 | -1 | -1 | 14 | 14 |
| Pulp, paper, and converted paper product manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | 12 | -1 | -1 | 12 | -1 | -1 | 12 | 12 |
| Other manufacturing | -14 | -15 | -15 | -13 | -15 | -15 | 193 | -14 | -15 | 194 | -15 | -15 | 194 | 193 |
| Utilities, construction, transport | -25 | -28 | -28 | -22 | -28 | -28 | 331 | -26 | -28 | 333 | -28 | -28 | 333 | 331 |
| Wholesale and retail trade, hospitality | -23 | -24 | -24 | -21 | -24 | -24 | 245 | -23 | -24 | 246 | -24 | -24 | 246 | 245 |
| Information, finance, insurance, property and business services | -37 | -41 | -41 | -35 | -40 | -40 | 389 | -38 | -40 | 391 | -40 | -40 | 391 | 389 |
| Government, education and health | -3 | -3 | -3 | -3 | -3 | -3 | 54 | -3 | -3 | 54 | -3 | -3 | 54 | 54 |
| Recreational and personal services | -7 | -8 | -8 | -7 | -8 | -8 | 74 | -8 | -8 | 74 | -8 | -8 | 74 | 74 |
| SUB-TOTAL | -139 | -155 | -154 | -130 | -153 | -152 | 1,398 | -144 | -152 | 1,405 | -152 | -152 | 1,405 | 1,398 |
| TOTAL | -478 | -565 | -562 | -433 | -556 | -553 | 6,401 | -515 | -551 | 6,438 | -551 | -551 | 6,438 | 6,401 |

Table 37: Direct and Indirect Net Value Added Impacts for Hawke's Bay Region: Baseline vs Sheep and Beef Farming with 30% *Pinus radiata* Forest - Periodic Planting (NZ\$2022Q2m)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|----------------|---------------|---------------|----------------|----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Hawke's Bay Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -0.1 | -0.5 | -0.5 | -0.1 | -0.5 | -0.5 | 0.9 | -0.5 | -0.5 | 0.9 | -0.5 | -0.5 | 0.9 | 0.9 |
| Sheep and beef cattle farming with forestry | -95.1 | -56.3 | -59.1 | -119.3 | -63.3 | -66.1 | 259.9 | -84.6 | -67.5 | 242.8 | -67.5 | -67.5 | 242.8 | 259.9 |
| Dairy cattle farming | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other farming | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.5 | -0.8 | -0.8 | -0.5 | -0.8 | -0.8 | -0.5 | -0.5 |
| Other primary | 2.3 | -0.1 | 0.0 | 4.1 | 0.2 | 0.3 | 71.5 | 1.9 | 0.4 | 73.0 | 0.4 | 0.4 | 73.0 | 71.5 |
| Agriculture, forestry and fishing support services | 3.0 | -2.0 | -1.8 | 6.6 | -1.4 | -1.2 | 128.6 | 1.9 | -1.1 | 131.6 | -1.1 | -1.1 | 131.6 | 128.6 |
| Meat and meat product manufacturing | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -15.5 | -15.9 | -15.9 | -15.5 | -15.9 | -15.9 | -15.5 | -15.5 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.5 | 0.5 |
| Other food manufacturing | -0.1 | -0.2 | -0.2 | -0.1 | -0.2 | -0.2 | 2.5 | -0.2 | -0.2 | 2.5 | -0.2 | -0.2 | 2.5 | 2.5 |
| Wood product manufacturing | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 353.2 | -0.6 | -0.6 | 353.2 | -0.6 | -0.6 | 353.2 | 353.2 |
| Pulp, paper, and converted paper product manufacturing | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 8.6 | -0.2 | -0.2 | 8.6 | -0.2 | -0.2 | 8.6 | 8.6 |
| Other manufacturing | -2.1 | -2.4 | -2.4 | -2.1 | -2.4 | -2.4 | 20.6 | -2.3 | -2.4 | 20.7 | -2.4 | -2.4 | 20.7 | 20.6 |
| Utilities, construction, transport | -5.5 | -6.5 | -6.4 | -4.9 | -6.3 | -6.3 | 181.8 | -5.8 | -6.3 | 182.3 | -6.3 | -6.3 | 182.3 | 181.8 |
| Wholesale and retail trade, hospitality | -2.0 | -3.9 | -3.9 | -1.8 | -3.8 | -3.8 | 37.8 | -3.7 | -3.8 | 37.9 | -3.8 | -3.8 | 37.9 | 37.8 |
| Information, finance, insurance, property and business services | -10.3 | -11.9 | -11.5 | -8.6 | -10.8 | -10.4 | 90.6 | -9.5 | -10.2 | 91.3 | -10.2 | -10.2 | 91.3 | 90.6 |
| Government, education and health | -0.4 | -0.5 | -0.5 | -0.3 | -0.4 | -0.4 | 11.7 | -0.4 | -0.4 | 11.7 | -0.4 | -0.4 | 11.7 | 11.7 |
| Recreational and personal services | -1.2 | -1.3 | -1.3 | -1.1 | -1.3 | -1.3 | 10.9 | -1.2 | -1.3 | 11.0 | -1.3 | -1.3 | 11.0 | 10.9 |
| SUB-TOTAL | -128.9 | -103.0 | -105.0 | -144.8 | -107.8 | -109.7 | 1,163.3 | -121.8 | -110.7 | 1,152.2 | -110.7 | -110.7 | 1,152.2 | 1,163.3 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.2 | -0.1 | -0.1 | 0.2 | -0.1 | -0.1 | 0.2 | 0.2 |
| Sheep, beef cattle and grain farming | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | -2.2 | -3.3 | -3.3 | -2.2 | -3.3 | -3.3 | -2.2 | -2.2 |
| Dairy cattle farming | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 1.6 | -0.4 | -0.4 | 1.6 | -0.4 | -0.4 | 1.6 | 1.6 |
| Other farming | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.3 | -0.5 | -0.5 | -0.3 | -0.5 | -0.5 | -0.3 | -0.3 |
| Other primary | -0.3 | -0.3 | -0.3 | -0.2 | -0.3 | -0.3 | 15.9 | -0.3 | -0.3 | 15.9 | -0.3 | -0.3 | 15.9 | 15.9 |
| Agriculture, forestry and fishing support services | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 3.2 | -0.3 | -0.3 | 3.2 | -0.3 | -0.3 | 3.2 | 3.2 |
| Meat and meat product manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.1 | -0.1 | -0.1 | 0.1 | -0.1 | -0.1 | 0.1 | 0.1 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.9 | 0.9 |
| Other food manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1.1 | -0.1 | -0.1 | 1.1 | -0.1 | -0.1 | 1.1 | 1.1 |
| Wood product manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 28.4 | -0.1 | -0.1 | 28.4 | -0.1 | -0.1 | 28.4 | 28.4 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | -0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 | 1.7 | 1.7 |
| Other manufacturing | -1.6 | -2.2 | -2.1 | -1.2 | -2.1 | -2.1 | 53.5 | -1.7 | -2.0 | 53.8 | -2.0 | -2.0 | 53.8 | 53.5 |
| Utilities, construction, transport | -3.1 | -3.8 | -3.8 | -2.7 | -3.7 | -3.7 | 71.8 | -3.3 | -3.7 | 72.1 | -3.7 | -3.7 | 72.1 | 71.8 |
| Wholesale and retail trade, hospitality | -1.5 | -1.7 | -1.7 | -1.4 | -1.7 | -1.7 | 29.9 | -1.6 | -1.7 | 30.0 | -1.7 | -1.7 | 30.0 | 29.9 |
| Information, finance, insurance, property and business services | -5.0 | -6.0 | -5.9 | -4.3 | -5.8 | -5.7 | 86.1 | -5.2 | -5.6 | 86.6 | -5.6 | -5.6 | 86.6 | 86.1 |
| Government, education and health | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 5.6 | -0.2 | -0.2 | 5.6 | -0.2 | -0.2 | 5.6 | 5.6 |
| Recreational and personal services | -0.4 | -0.5 | -0.5 | -0.4 | -0.5 | -0.5 | 8.2 | -0.5 | -0.5 | 8.2 | -0.5 | -0.5 | 8.2 | 8.2 |
| SUB-TOTAL | -16.9 | -19.8 | -19.6 | -15.1 | -19.3 | -19.1 | 305.6 | -17.7 | -19.1 | 307.0 | -19.1 | -19.1 | 307.0 | 305.6 |
| TOTAL | -145.8 | -122.9 | -124.6 | -159.9 | -127.2 | -128.9 | 1,468.9 | -139.5 | -129.7 | 1,459.2 | -129.7 | -129.7 | 1,459.2 | 1,468.9 |
| Net Present Value 2022-78 | -236.7 | | | | | | | | | | | | | |

Table 38: Direct and Indirect Employment Impacts for Hawke’s Bay Region: Baseline vs Sheep and Beef Farming with 30% *Pinus radiata* Forest (Modified Employee Counts - MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|-------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|---------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0 | -3 | -3 | 0 | -3 | -3 | 6 | -3 | -3 | 6 | -3 | -3 | 6 | 6 |
| Sheep and beef cattle farming | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 |
| Dairy cattle farming | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | 1 | 1 |
| Other farming | -7 | -8 | -8 | -7 | -8 | -8 | -5 | -8 | -8 | -5 | -8 | -8 | -5 | -5 |
| Other primary | 26 | -1 | 0 | 46 | 2 | 4 | 802 | 21 | 4 | 819 | 4 | 4 | 819 | 802 |
| Agriculture, forestry and fishing support services | 10 | -7 | -6 | 22 | -5 | -4 | 433 | 6 | -4 | 444 | -4 | -4 | 444 | 433 |
| Meat and meat product manufacturing | -58 | -58 | -58 | -58 | -58 | -58 | -57 | -58 | -58 | -57 | -58 | -58 | -57 | -57 |
| Dairy product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 11 | 0 | 0 | 11 | 11 |
| Other food manufacturing | 0 | -1 | -1 | 0 | -1 | -1 | 6 | -1 | -1 | 6 | -1 | -1 | 6 | 6 |
| Wood product manufacturing | -16 | -16 | -16 | -16 | -16 | -16 | 9,956 | -16 | -16 | 9,956 | -16 | -16 | 9,956 | 9,956 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| Other manufacturing | -20 | -22 | -22 | -19 | -22 | -22 | 189 | -21 | -22 | 189 | -22 | -22 | 189 | 189 |
| Utilities, construction, transport | -45 | -54 | -53 | -39 | -52 | -52 | 1,949 | -47 | -52 | 1,954 | -52 | -52 | 1,954 | 1,949 |
| Wholesale and retail trade, hospitality | -18 | -43 | -43 | -16 | -42 | -42 | 384 | -40 | -42 | 386 | -42 | -42 | 386 | 384 |
| Information, finance, insurance, property and business services | -44 | -52 | -51 | -39 | -50 | -49 | 432 | -46 | -49 | 435 | -49 | -49 | 435 | 432 |
| Government, education and health | -6 | -7 | -7 | -5 | -7 | -7 | 209 | -6 | -7 | 209 | -7 | -7 | 209 | 209 |
| Recreational and personal services | -20 | -23 | -23 | -19 | -23 | -23 | 180 | -21 | -23 | 182 | -23 | -23 | 182 | 180 |
| SUB-TOTAL | -210 | -306 | -302 | -161 | -296 | -292 | 14,488 | -251 | -290 | 14,527 | -290 | -290 | 14,527 | 14,488 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -2 | -2 | -2 | -2 | -2 | -2 | 3 | -2 | -2 | 3 | -2 | -2 | 3 | 3 |
| Sheep and beef cattle farming with forestry | -19 | -19 | -19 | -19 | -19 | -19 | -13 | -19 | -19 | -13 | -19 | -19 | -13 | -13 |
| Dairy cattle farming | -1 | -2 | -2 | -1 | -2 | -2 | 6 | -2 | -2 | 6 | -2 | -2 | 6 | 6 |
| Other farming | -6 | -6 | -6 | -6 | -6 | -6 | -3 | -6 | -6 | -3 | -6 | -6 | -3 | -3 |
| Other primary | 0 | -1 | -1 | 0 | 0 | 0 | 40 | 0 | 0 | 40 | 0 | 0 | 40 | 40 |
| Agriculture, forestry and fishing support services | -5 | -6 | -6 | -5 | -6 | -6 | 54 | -5 | -6 | 54 | -6 | -6 | 54 | 54 |
| Meat and meat product manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | 2 | 2 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 2 | 2 |
| Other food manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | 10 | -1 | -1 | 10 | -1 | -1 | 10 | 10 |
| Wood product manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | 302 | -1 | -1 | 302 | -1 | -1 | 302 | 302 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 13 | 0 | 0 | 13 | 13 |
| Other manufacturing | -9 | -11 | -10 | -8 | -10 | -10 | 218 | -10 | -10 | 219 | -10 | -10 | 219 | 218 |
| Utilities, construction, transport | -20 | -25 | -25 | -17 | -24 | -24 | 483 | -21 | -24 | 486 | -24 | -24 | 486 | 483 |
| Wholesale and retail trade, hospitality | -14 | -16 | -16 | -12 | -15 | -15 | 262 | -14 | -15 | 263 | -15 | -15 | 263 | 262 |
| Information, finance, insurance, property and business services | -32 | -38 | -38 | -28 | -37 | -36 | 543 | -33 | -36 | 546 | -36 | -36 | 546 | 543 |
| Government, education and health | -3 | -3 | -3 | -2 | -3 | -3 | 71 | -3 | -3 | 71 | -3 | -3 | 71 | 71 |
| Recreational and personal services | -6 | -7 | -7 | -5 | -7 | -7 | 114 | -6 | -7 | 114 | -7 | -7 | 114 | 114 |
| SUB-TOTAL | -120 | -139 | -138 | -108 | -136 | -134 | 2,106 | -125 | -134 | 2,114 | -134 | -134 | 2,114 | 2,106 |
| TOTAL | -330 | -445 | -439 | -269 | -432 | -426 | 16,593 | -376 | -424 | 16,641 | -424 | -424 | 16,641 | 16,593 |

9.3.1.1 Northland 30% Conversion to *Pinus radiata* with periodic planting

In Table 35 the direct and indirect value-added results for Northland with 30% converted to *Pinus radiata* with periodic planting scenario are reported, while Table 36 reports the direct and indirect employment results for the same scenario. For non-harvest years the value-added impacts for New Zealand average around a net loss of \$80m, while for harvest years a net gain of \$730m per year (\$540 of which is in Northland) is felt.

Overall, the value-added contribution in NPV terms to the New Zealand economy is estimated to be net loss of \$393m.

Not surprisingly, under the scenarios, job losses across the New Zealand economy range between 426 and 567 per year in non-harvest years, while in harvest years around 6,400 additional jobs are required in 'wood product manufacturing' (principally wood processing), 'utilities, construction and transport' (road construction and maintenance, and log transport) and 'agriculture, forestry, and fishing support services (forestry services)'.

9.3.1.2 Hawke's Bay 30% Conversion to *Pinus radiata* with periodic planting

The value-added impacts for Hawke's Bay and the rest of New Zealand under the 30% conversion to *Pinus radiata* with periodic planting scenario are described in Table 37, and the associated employment impacts are in Table 38. For the first 28 years (i.e. until the first harvest) the net annual value-added contribution to the Hawke's Bay region economy are negative ranging between -\$102.1m and -\$148.6m, however from Year 28 on a 3-year basis harvests generate positive value-added contributions of ~\$1,164m each year.

Overall, the NPV over the period 2022-78 to the New Zealand economy is -\$236m.

The employment impacts for the Hawke's Bay and the rest of New Zealand under the 30% conversion to *Pinus radiata* with periodic planting scenario are less extreme (compared with the same scenario without a periodic planting regime) during harvest years where approximately 10,000 additional jobs (for a single year) in the Hawke's Bay are required in the 'wood product manufacturing' sector, and an additional 2,000 jobs are required in the 'utilities, construction and transport' sector – mainly for road building/maintenance and log transport services.

The employment contribution to the economy is relatively small, but negative in non-harvest years, with lost jobs ranging between approximately 250 and 450 people each year. Thus, there is a necessity for planting and harvesting to be phased and sequenced to maintain a sufficiently skilled labour force for harvest.

9.3.2 Carbon and National Accounting

A special point to note in the results reported above is that revenues received from carbon forestry are not included in the value-added metric. Although revenues received by landowners for carbon sequestration will add to operating surplus (one of the key categories included in the calculation of value-added), the revenues are also recorded in the other taxes on production category (another category included in the calculation of value-added) as a negative item. Essentially the two items balance each other out - leading to no impact on value

added. This approach reflects that the value-added measure intends to capture all income generated from an economic activity, not just that which accrues to the business owner or landowner. Thus, it includes categories covering wages and salaries and income received by government through taxes. In the case of revenues for carbon sequestration, while landowners receive income, it must also come from somewhere else, i.e. government transfers. As explained in a footnote above the mode of recording financial transactions for carbon trading schemes is likely to change in the future reflecting a new view that emissions trading schemes represent rights to use a natural resource (the atmosphere). It is not yet clear, however, what this will all mean – including whether it will result in any actual changes in value added calculations or only asset accounting.

9.3.3 Economic Impacts of Increasing Supply of National Units

Regardless of the above, a salient consideration is that in the process of sequestering carbon and thus gaining a right to be issued New Zealand Units in the ETS, forestry production is essentially enabling economic activities in general with greater ability to emit carbon (assuming a capped system). An important flow-on economic consequence of carbon sequestration activities is that they thus allow for increased production elsewhere within the economy. The economic implications are complex and dissipated, being translated through complex supply-demand and pricing relationships. This would require a CGE model that captures carbon emitting activities subject to the ETS across the entire economy and the supply-demand-price dynamics of the ETS to capture some of these implications which is beyond the scope of this project.

10.0 SUMMARY

The key objectives of this study were to analyse the impact at the on-farm level of planting areas into forest, with respect to overall business profitability, and changes in production, as well as assessing the wider macro-economic impacts of such land use changes with respect to changes in Income, Employment, and Value Add.

The farm-level analysis showed:

- (i) As increasing areas of lesser-productive land were planted into forestry, the pastoral operation intensified on the more productive land. This led to:
 - An increase in the EBITDA per hectare, but a lower total farm EBITDA (excluding forestry and carbon).
 - A similar pattern for physical production of meat and wool; an increase in per hectare, but a decrease in total production.
 - And ditto for greenhouse gas emissions; these increased on a per (grazed) hectare basis but decreased in total.
- (ii) The addition of the forestry returns showed two marked effects:
 - The inclusion of the forestry-only returns (i.e. no carbon) showed:
 - » For pines, the 10% forestry regime return was only slightly lower than the base EBITDA and increasing levels of pines reduced the total EBITDA further. There was an exception to this, where the farm EBITDA combined with the forestry annuity for the 30% pine regime on the Hawke's Bay farm exceeded the total base farm EBITDA.
 - » This result is relatively sensitive to the annuity calculated for the pine regime. This annuity only had to increase by 2% for the Northland farm, and 3% for the Hawke's Bay farm, for the total return for the 10% forestry regime to equal that of the base farm.
 - » For the other exotic species regime, all the forestry scenarios resulted in a much lower EBITDA relative to the base farm EBITDA. This is due to the much longer rotation length required for production forestry.
 - » All of the native forest regimes resulted in much lower EBITDA figures relative to the base farm, given there is no timber returns available within the 56-year time span modelled.
 - The addition of a carbon value (\$85/T) resulted in the returns from the pines and other exotic forestry regimes, being well in excess of the base farm EBITDA (shown in the table below). This reinforces the significant impact carbon has on forestry returns.

The most profitable scenario was the 100% pines, with an equivalent EBITDA 524% higher than the Northland sheep and beef base, and 159% higher for the Hawke’s Bay base. For the “other Exotics”, the 100% forestry scenario was 182% higher than the Northland base, and 12% higher for the Hawke’s Bay base.

For the native forest scenarios, the returns with carbon included again resulted in lower financial returns relative to the base farm EBITDA, due to the high cost/slow sequestration rate for carbon. For both case-study farms the 100% native forest scenario resulted in a net negative return.

| Northland | Total EBITDA No Carbon | Net EBITDA after accounting for carbon* | Hawkes Bay | Total EBITDA No Carbon | Net EBITDA after accounting for carbon* |
|------------------------|------------------------|---|------------------------|------------------------|---|
| Base | \$76,832 | \$71,424 | Base | \$342,825 | \$334,194 |
| 10% Pines | \$74,328 | \$106,963 | 10% Pines | \$337,045 | \$401,079 |
| 30% Pines | \$64,668 | \$174,822 | 30% Pines | \$350,904 | \$512,185 |
| 100% Pines | \$64,985 | \$446,009 | 100% Pines | \$173,275 | \$898,664 |
| 10% Other Exotic | \$66,780 | \$85,192 | 10% Other Exotic | \$317,342 | \$354,184 |
| 30% Other Exotic | \$38,324 | \$105,391 | 30% Other Exotic | \$241,308 | \$370,109 |
| 100% Other Exotic | -\$35,759 | \$201,777 | 100% Other Exotic | -\$76,442 | \$375,777 |
| 10% Natives | \$45,326 | \$59,421 | 10% Natives | \$276,522 | \$305,114 |
| 30% Native | -\$29,869 | \$24,123 | 30% Native | \$117,346 | \$221,267 |
| 100% Natives | -\$275,295 | -\$81,298 | 100% Natives | -\$524,104 | -\$154,775 |
| Mixed | \$21,082 | \$98,153 | Mixed | \$219,207 | \$376,561 |
| Pines/Periodic Harvest | \$50,431 | \$110,748 | Pines/Periodic Harvest | \$276,813 | \$396,299 |

*Includes emissions levy on farm, + carbon credits for forestry

The regional-level analysis (summarised in the table below) showed:

- (i) A generally positive impact in the initial year, for both value-add and employment, where the benefits of planting the forest offset the loss of the farming production.
- (ii) From then on, the impact was negative, both for the region in question and for the rest of New Zealand, through until the forest was harvested (in year 28 and 56 for the pines, year 35 for the other exotics). In the year of harvest there was a massive increase in both value-add and employment as a result of the harvesting/processing.

This massive positive impact at time of harvesting does result in an overall positive NPV for the pines scenarios, and the 10% other exotics scenario.

This is a somewhat artificial situation, in that the assumption was that the forests are all planted and then harvested at the same time. But does give rise to the issue of whether there will be sufficient labour available, and, especially, harvesting and processing capacity at time of harvest.

- (iii) For the native forest scenarios, the overall impact was negative, given no harvesting within the 56-year timeframe.

| | Direct and Indirect Value-Added Impacts | Direct, Indirect and Induced Value-Added Impacts |
|--|--|--|
| Scenario | Net Present Value ₂₀₂₂₋₇₈ NZ\$ _{2022Q2} m | Net Present Value ₂₀₂₂₋₇₈ NZ\$ _{2022Q2} m |
| Northland Region | | |
| Baseline vs Sheep and Beef Farming with 10% <i>Pinus radiata</i> Forest ¹ | 430 | 990 |
| Baseline vs Sheep and Beef Farming with 30% <i>Pinus radiata</i> Forest ¹ | 930 | 2,310 |
| Baseline vs 100% <i>Pinus radiata</i> Forest ¹ | 1,910 | 3,980 |
| Baseline vs Sheep and Beef Farming with 10% SPS Forest ² | 70 | 330 |
| Baseline vs Sheep and Beef Farming with 30% SPS Forest ² | -190 | 300 |
| Baseline vs 100% SPS Forest ² | -1,980 | -1,800 |
| Baseline vs Sheep and Beef Farming with 10% Native Forest ³ | -610 | 200 |
| Baseline vs Sheep and Beef Farming with 30% Native Forest ³ | -2,320 | -2,970 |
| Baseline vs 100% Native Forest ³ | -9,180 | -12,750 |
| Hawkes Bay Region | | |
| Baseline vs Sheep and Beef Farming with 10% <i>Pinus radiata</i> Forest ¹ | 1,080 | 2,350 |
| Baseline vs Sheep and Beef Farming with 30% <i>Pinus radiata</i> Forest ¹ | 2,270 | 5,700 |
| Baseline vs 100% <i>Pinus radiata</i> Forest ¹ | 3,600 | 11,760 |
| Baseline vs Sheep and Beef Farming with 10% SPS Forest ² | 200 | 720 |
| Baseline vs Sheep and Beef Farming with 30% SPS Forest ² | -390 | 780 |
| Baseline vs 100% SPS Forest ² | -5,720 | -4,810 |
| Baseline vs Sheep and Beef Farming with 10% Native Forest ³ | -930 | -1,060 |
| Baseline vs Sheep and Beef Farming with 30% Native Forest ³ | -3,800 | -4,580 |
| Baseline vs 100% Native Forest ³ | -17,410 | -22,770 |
| NB: 1. Includes 2 rotations. 2. Includes 1 rotation. 3. No harvests. | | |

In a separate analysis, the assumption was that the forests were planted at periodic intervals, resulting in a semi-regular harvest post the first rotation for the first block planted. This scenario was modelled for the 30% forestry regime for both Northland and Hawke's Bay.

The analysis for Northland showed:

- For non-harvest years the value-added impacts for New Zealand average around a net loss of \$80m, while for harvest years a net gain of \$730m per year (\$540 of which is in Northland) is felt. Overall, the value-added contribution in NPV terms to the New Zealand economy is estimated to be net loss of \$393m.
- For employment, there was a loss of between 426 and 567 jobs per year in the non-harvest years, with a gain of 6,400 additional jobs in the harvest years spread across in 'wood product manufacturing' (principally wood processing), 'utilities, construction and

transport' (road construction and maintenance, and log transport) and 'agriculture, forestry, and fishing support services (forestry services).

For Hawke's Bay the analysis showed:

- The net annual value-added contribution to the Hawke's Bay region economy are negative ranging between -\$102.1m and -\$148.6m, however from Year 28 on a 3-year basis harvests generate positive value-added contributions of ~\$1,164m each year. Overall, the NPV over the period 2022-78 to the New Zealand region economy is negative \$236m.
- The employment contribution to the economy is relatively small, but negative in non-harvest years, with lost jobs ranging between approximately 250 and 450 people each year. In harvest years approximately 10,000 additional jobs (for a single year) in the Hawke's Bay are required in the 'wood product manufacturing' sector, and an additional 2,000 jobs are required in the 'utilities, construction and transport' sector – mainly for road building/maintenance and log transport services.

From an employment perspective therefore, there is a necessity for planting and harvesting to be phased and sequenced to maintain a sufficiently skilled labour force for harvest.

The addition of a value for carbon provides no net gain in value-add. The impact of a value for carbon is essentially an internal wealth transfer, with no overall net benefit at a national level. There could well be a benefit via additional sequestration/additional carbon credits being available over time, in that this would then enable other economic activity to occur, resulting in a gain to value-add. But this aspect is outside the scope of this analysis.

11.0 REFERENCES

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12.0 APPENDIX 1: FORESTRY

Forestry cost assumptions for economic analysis

Assumptions used in generating a cash flow for the different options are described below.

- » Establishment Cost: this is the cost of seedlings/plants, their planting and any pre-plant or post-plant spot releasing.
- » Silviculture Yr 5-11: For exotic forests pruning and operations after planting costs have been included, follow up weed and animal pest control. A 15% supervision fee has been added to establishment and silvicultural (growing) costs.
- » Weed and animal pest control and enrichment planting: Yr 1-3: For native forest follow up weed and animal pest control.
- » Management fee: An annual management fee of \$80/ha is also costed to cover aspects such as insurance, health, weed and pest inspections, weed and pest control, track maintenance and fire protection (dams).
- » A management/marketing fee of \$3.50 /m³ and a contingency (e.g. RMA) fee of \$1.00/m³ was included as part of the harvest cost.

Along with transport cost, roading and harvest costs have a large impact on the profitability and are especially site specific. The Table below describes the breakdown of roading and harvest cost in relation to slope of the forest site.

Effect of slope on harvest and roading cost

| Roading | Slope Category | Description | Cost |
|---------|----------------|--|---------------------|
| | Easy | Upgrade of formed farm tracks | \$25,000/km |
| | Medium | New Road on flat to rolling | \$50,000/km |
| | Difficult | New Road on Hill | \$100,000/km |
| Harvest | | | |
| | Flat | Suitable for rubber tyre wheeled machine flat to rolling (up to 15° slope) | \$30/m ³ |
| | Rolling | Requires tracked machine (over 15° slope) | \$40/m ³ |
| | Steep | Requires a Hauler. ,may be some tracked areas | \$50/m ³ |

The impact of these on harvesting and roading costs are:

Northland

Harvesting cost

| Land type | Harvest Base rate | Scenario | | |
|----------------------------|---------------------|--------------|----------------|----------------|
| | | 10% of farm | 30% farm | 100% farm |
| Steep | \$50/m ³ | 34 ha | 45 ha | 45 ha |
| Rolling | \$40/m ³ | | 58 ha | 206 ha |
| Flat | \$30/m ³ | | | 92 ha |
| Total area | | 34 ha | 103 ha | 343 ha |
| Combined \$/m ³ | | \$50 | \$44.37 | \$38.63 |

Roading Cost

| Rooding Difficulty | Cost/km | 10% | | 30% | | 100% | |
|--------------------|-----------|--------|----------|--------|-----------|--------|-----------|
| | | Length | Cost | Length | Cost | Length | Cost |
| Low | \$25,000 | 0.5 | \$12,500 | 1.0 | \$25,000 | 2.0 | \$50,000 |
| Medium | \$50,000 | 0.5 | \$25,000 | 2.0 | \$100,000 | 4.0 | \$200,000 |
| High | \$100,000 | 0.5 | \$50,000 | 1.0 | \$100,000 | 2.0 | \$200,000 |
| Total | | 1.5 | \$87,500 | 4.0 | \$225,000 | 8.0 | \$450,000 |

Hawke's Bay

Harvesting cost

| Land type | Harvest Base rate | Scenario | | |
|----------------|-------------------|-------------|----------|-----------|
| | | 10% of farm | 30% farm | 100% farm |
| Steep | \$50/m3 | 65 ha | 196 ha | 248 ha |
| Rolling | \$40/m3 | | | 339 ha |
| Flat | \$30/m3 | | | 66 ha |
| Total area | | 65 ha | 196 ha | 653 ha |
| Combined \$/m3 | | \$50 | \$50 | \$40.91 |

Roading Cost

| Rooding Difficulty | Cost/km | 10% | | 30% | | 100% | |
|--------------------|-----------|--------|-----------|--------|-----------|--------|-----------|
| | | Length | Cost | Length | Cost | Length | Cost |
| Low | \$25,000 | 0.5 | \$12,500 | 1.0 | \$25,000 | 3.0 | \$75,000 |
| Medium | \$50,000 | 1.5 | \$75,000 | 3.0 | \$150,000 | 6.0 | \$300,000 |
| High | \$100,000 | 1.0 | \$100,000 | 3.0 | \$300,000 | 6.0 | \$600,000 |
| Total | | 3.0 | \$187,500 | 7.0 | \$475,000 | 15.0 | \$975,000 |

Forestry Harvest returns (stumpage)

Northland (10% of farm example)

Log grades, yield, log price and stumpage for Radiata pine

| Log Grades | Yield (m ³ /ha) | Log price | Harvest & Transport | Net Stumpage (\$/ha) |
|------------------|----------------------------|-----------|---------------------|----------------------|
| Unpruned A/S1/S2 | 159 | \$132.35 | \$86.27 | \$7,344 |
| Unpruned K/L/S3 | 346 | \$119.18 | \$86.27 | \$11,371 |
| Pulp | 98 | \$80.63 | \$86.27 | -\$555 |
| Total/ha | 608 | | | \$18,160 |

Log grades, yield, log price and stumpage for Cypress

| Log Grades | Yield (m ³ /ha) | Log price | Harvest & Transport | Net Stumpage (\$/ha) | |
|-----------------|----------------------------|------------|---------------------|----------------------|-----------------|
| Pruned | SED 40cm | 50 | \$350.00 | \$84.65 | \$13,268 |
| Pruned | SED 30cm | 100 | \$170.00 | \$84.65 | \$8,535 |
| Small Branch | SED 30cm | 75 | \$160.00 | \$84.65 | \$5,651 |
| Small Branch | SED 20cm | 100 | \$135.00 | \$84.65 | \$5,035 |
| Large Branch | | 100 | \$115.00 | \$84.65 | \$3,035 |
| Firewood | | 75 | \$75.00 | \$84.65 | -\$724 |
| Total/ha | | 500 | | | \$34,801 |

Hawkes Bay (10% of farm example)

Log grades, yield, log price and stumpage for Radiata pine

| Log Grades | Yield (m ³ /ha) | Log price | Harvest & Transport | Net Stumpage (\$/ha) |
|------------------|----------------------------|-----------|---------------------|----------------------|
| Unpruned A/S1/S2 | 258 | \$132.35 | \$85.97 | \$11,890 |
| Unpruned K/L/S3 | 344 | \$119.18 | \$85.97 | \$11,406 |
| Pulp | 124 | \$80.63 | \$85.97 | -\$665 |
| Total/ha | 726 | | | \$22,721 |

Log grades, yield, log price and stumpage for Cypress

| Log Grades | | Yield (m ³ /ha) | Log price | Harvest & Transport | Net Stumpage (\$/ha) |
|-----------------|----------|----------------------------|-----------|---------------------|----------------------|
| Pruned | SED 40cm | 50 | \$350.00 | \$85.27 | \$13,237 |
| Pruned | SED 30cm | 100 | \$170.00 | \$85.27 | \$8,473 |
| Small Branch | SED 30cm | 75 | \$160.00 | \$85.27 | \$5,605 |
| Small Branch | SED 20cm | 100 | \$135.00 | \$85.27 | \$4,673 |
| Large Branch | | 100 | \$115.00 | \$85.27 | \$2,973 |
| Firewood | | 75 | \$75.00 | \$85.27 | -\$770 |
| Total/ha | | 500 | | | \$34,490 |

Forestry Cashflows

These covered 56 years, and the Tables are too big to fit within this report. A summary of the scenarios modelled are:

Carbon Price = \$85/NZU

Discount Rate = 5%

With Carbon

| Region | Farm % | Area (ha) | Species | NPV | NPV/ha (LEV) | Annuity |
|-------------|--------|-----------|---------------------------------|--------------|--------------|---------|
| Northland | 10 | 34 | <i>Pinus radiata</i> | \$738,267 | \$21,714 | \$1,161 |
| Northland | 30 | 103 | <i>Pinus radiata</i> | \$2,361,365 | \$22,926 | \$1,226 |
| Northland | 100 | 343 | <i>Pinus radiata</i> | \$8,339,718 | \$24,314 | \$1,300 |
| Northland | 30 | 103 | <i>Pinus radiata</i> - periodic | \$1,162,490 | \$11,286 | \$604 |
| Northland | 10 | 34 | Special purpose species | \$331,177 | \$9,740 | \$521 |
| Northland | 30 | 103 | Special purpose species | \$1,063,099 | \$10,321 | \$552 |
| Northland | 100 | 343 | Special purpose species | \$3,772,943 | \$11,000 | \$588 |
| Northland | 10 | 34 | Native | -\$150,686 | -\$4,432 | -\$237 |
| Northland | 30 | 103 | Native | -\$456,491 | -\$4,432 | -\$237 |
| Northland | 100 | 343 | Native | -\$1,520,158 | -\$4,432 | -\$237 |
| Northland | 30 | 103 | Mixed | \$918,757 | \$9,007 | \$482 |
| | | | | | | |
| Hawke's Bay | 10 | 65 | <i>Pinus radiata</i> | \$1,506,324 | \$23,174 | \$1,239 |
| Hawke's Bay | 30 | 196 | <i>Pinus radiata</i> | \$4,571,085 | \$23,322 | \$1,247 |
| Hawke's Bay | 100 | 653 | <i>Pinus radiata</i> | \$16,803,705 | \$25,733 | \$1,376 |
| Hawke's Bay | 30 | 196 | <i>Pinus radiata</i> - periodic | \$2,404,245 | \$12,267 | \$656 |
| Hawke's Bay | 10 | 65 | Special purpose species | \$629,466 | \$9,684 | \$518 |
| Hawke's Bay | 30 | 196 | Special purpose species | \$1,914,468 | \$9,768 | \$522 |
| Hawke's Bay | 100 | 653 | Special purpose species | \$7,026,490 | \$10,760 | \$575 |
| Hawke's Bay | 10 | 65 | Native | -\$288,077 | -\$4,432 | -\$237 |
| Hawke's Bay | 30 | 196 | Native | -\$868,662 | -\$4,432 | -\$237 |
| Hawke's Bay | 100 | 653 | Native | -\$2,894,062 | -\$4,432 | -\$237 |
| Hawke's Bay | 30 | 196 | Mixed | \$1,847,714 | \$9,475 | \$507 |

Without Carbon

| Region | Farm % | Area (ha) | Species | NPV | NPV/ha (LEV) | Annuity |
|-------------|--------|-----------|---------------------------------|--------------|--------------|---------|
| Northland | 10 | 34 | <i>Pinus radiata</i> | \$32,039 | \$942 | \$50 |
| Northland | 30 | 103 | <i>Pinus radiata</i> | \$221,911 | \$2,154 | \$115 |
| Northland | 100 | 343 | <i>Pinus radiata</i> | \$1,215,131 | \$3,543 | \$189 |
| Northland | 30 | 103 | <i>Pinus radiata</i> - periodic | -\$45,209 | -\$439 | -\$23 |
| Northland | 10 | 34 | Special purpose species | -\$109,097 | -\$3,209 | -\$172 |
| Northland | 30 | 103 | Special purpose species | -\$270,671 | -\$2,628 | -\$141 |
| Northland | 100 | 343 | Special purpose species | -\$668,642 | -\$1,949 | -\$104 |
| Northland | 10 | 34 | Native | -\$510,259 | -\$15,008 | -\$803 |
| Northland | 30 | 103 | Native | -\$1,545,785 | -\$15,008 | -\$803 |
| Northland | 100 | 343 | Native | -\$5,147,613 | -\$15,008 | -\$803 |
| Northland | 30 | 103 | Mixed | -\$587,317 | -\$5,758 | -\$308 |
| | | | | | | |
| Hawke's Bay | 10 | 65 | <i>Pinus radiata</i> | \$156,184 | \$2,403 | \$129 |
| Hawke's Bay | 30 | 196 | <i>Pinus radiata</i> | \$499,893 | \$2,550 | \$136 |
| Hawke's Bay | 100 | 653 | <i>Pinus radiata</i> | \$3,239,987 | \$4,962 | \$265 |
| Hawke's Bay | 30 | 196 | <i>Pinus radiata</i> - periodic | \$41,912 | \$214 | \$11 |
| Hawke's Bay | 10 | 65 | Special purpose species | -\$212,234 | -\$3,265 | -\$175 |
| Hawke's Bay | 30 | 196 | Special purpose species | -\$623,581 | -\$3,182 | -\$170 |
| Hawke's Bay | 100 | 653 | Special purpose species | -\$1,429,356 | -\$2,189 | -\$117 |
| Hawke's Bay | 10 | 65 | Native | -\$975,495 | -\$15,008 | -\$803 |
| Hawke's Bay | 30 | 196 | Native | -\$2,941,493 | -\$15,008 | -\$803 |
| Hawke's Bay | 100 | 653 | Native | -\$9,799,975 | -\$15,008 | -\$803 |
| Hawke's Bay | 30 | 196 | Mixed | -\$1,031,545 | -\$5,290 | -\$283 |

13.0 APPENDIX 2: STATISTICS NZ'S IOT INDUSTRY DEFINITIONS

This appendix provides a mapping of the StatsNZ's IOT industry definitions to the 17 aggregated industries used in the Results section above and Appendix 14 below. It also provides a list of the ANZSIC system codes for the 106 StatsNZ industries.

Table A.1 Mapping StatNZ's 106 Input-Output Industries (with ANZSIC codes) to Aggregated 17 Input-Output Industries used for Reporting

| 106IO_Coden | 106IO_Name | ANZSIC Codes | 17IO_Coden | 17IO_Name |
|-------------|---|--------------|------------|---|
| | 1 Horticulture and fruit growing | AA111 | 1 | Horticulture and fruit growing |
| | 2 Sheep, beef cattle and grain farming | AA121 | 2 | Sheep and beef cattle farming with forestry |
| 2a | Sheep and beef cattle farming with forestry | | 2 | Sheep and beef cattle farming with forestry |
| | 3 Dairy cattle farming | AA131 | 3 | Dairy cattle farming |
| | 4 Poultry, deer and other livestock farming | AA141 | 4 | Other farming |
| | 5 Forestry and logging | AA211 | 5 | Other primary |
| | 6 Fishing and aquaculture | AA311, AA312 | 5 | Other primary |
| | 7 Agriculture, forestry and fishing support services | AA321, AA322 | 6 | Agriculture, forestry and fishing support services |
| | 8 Coal mining | BB111 | 5 | Other primary |
| | 9 Oil and gas extraction | BB112 | 5 | Other primary |
| 10 | Metal ore and non-metallic mineral mining and quarrying | BB113 | 5 | Other primary |
| 11 | Exploration and other mining support services | BB114 | 15 | Information, finance, insurance, property and business services |
| 12 | Meat and meat product manufacturing | CC111 | 7 | Meat and meat product manufacturing |
| 13 | Seafood processing | CC121 | 9 | Other food manufacturing |
| 14 | Dairy product manufacturing | CC131 | 8 | Dairy product manufacturing |
| 15 | Fruit, oil, cereal and other food product manufacturing | CC141 | 9 | Other food manufacturing |
| 16 | Beverage and tobacco product manufacturing | CC151 | 9 | Other food manufacturing |
| 17 | Textile and leather manufacturing | CC211 | 12 | Other manufacturing |
| 18 | Clothing, knitted products and footwear manufacturing | CC212 | 12 | Other manufacturing |
| 19 | Wood product manufacturing | CC311 | 10 | Wood product manufacturing |
| 20 | Pulp, paper and converted paper product manufacturing | CC321 | 11 | Pulp, paper, and converted paper product manufacturing |
| 21 | Printing | CC411 | 12 | Other manufacturing |
| 22 | Petroleum and coal product manufacturing | CC511 | 12 | Other manufacturing |
| 23 | Basic chemical and basic polymer manufacturing | CC521 | 12 | Other manufacturing |
| 24 | Fertiliser and pesticide manufacturing | CC522 | 12 | Other manufacturing |
| 25 | Pharmaceutical, cleaning and other chemical manufacturing | CC523 | 12 | Other manufacturing |
| 26 | Polymer product and rubber product manufacturing | CC531 | 12 | Other manufacturing |
| 27 | Non-metallic mineral product manufacturing | CC611 | 12 | Other manufacturing |
| 28 | Primary metal and metal product manufacturing | CC711 | 12 | Other manufacturing |
| 29 | Fabricated metal product manufacturing | CC721 | 12 | Other manufacturing |
| 30 | Transport equipment manufacturing | CC811 | 12 | Other manufacturing |
| 31 | Electronic and electrical equipment manufacturing | CC821 | 12 | Other manufacturing |
| 32 | Machinery manufacturing | CC822 | 12 | Other manufacturing |
| 33 | Furniture manufacturing | CC911 | 12 | Other manufacturing |
| 34 | Other manufacturing | CC912 | 12 | Other manufacturing |

| 106IO_Coden | 106IO_Name | ANZSIC Codes | 17IO_Coden | 17IO_Name |
|-------------|---|---------------------|------------|---|
| 35 | Electricity generation and on-selling | DD111 | 13 | Utilities, construction, transport |
| 36 | Electricity transmission and distribution | DD112 | 13 | Utilities, construction, transport |
| 37 | Gas supply | DD113 | 13 | Utilities, construction, transport |
| 38 | Water supply | DD121 | 13 | Utilities, construction, transport |
| 39 | Sewerage and drainage services | DD122 | 13 | Utilities, construction, transport |
| 40 | Waste collection, treatment and disposal services | DD123 | 13 | Utilities, construction, transport |
| 41 | Residential building construction | EE111, EE112 | 13 | Utilities, construction, transport |
| 42 | Non-residential building construction | EE113 | 13 | Utilities, construction, transport |
| 43 | Heavy and civil engineering construction | EE121 | 13 | Utilities, construction, transport |
| 44 | Construction services | EE131 | 13 | Utilities, construction, transport |
| 45 | Basic material wholesaling | FF111 | 14 | Wholesale and retail trade, hospitality |
| 46 | Machinery and equipment wholesaling | FF112 | 14 | Wholesale and retail trade, hospitality |
| 47 | Motor vehicle and motor vehicle parts wholesaling | FF113 | 14 | Wholesale and retail trade, hospitality |
| 48 | Grocery, liquor and tobacco product wholesaling | FF114 | 14 | Wholesale and retail trade, hospitality |
| 49 | Other goods and commission based wholesaling | FF115, FF116 | 14 | Wholesale and retail trade, hospitality |
| 50 | Motor vehicle and parts retailing | GH111 | 14 | Wholesale and retail trade, hospitality |
| 51 | Fuel retailing | GH112 | 14 | Wholesale and retail trade, hospitality |
| 52 | Supermarket and grocery stores | GH121 | 14 | Wholesale and retail trade, hospitality |
| 53 | Specialised food retailing | GH122 | 14 | Wholesale and retail trade, hospitality |
| 54 | Furniture, electrical and hardware retailing | GH131 | 14 | Wholesale and retail trade, hospitality |
| 55 | Recreational, clothing, footwear and personal accessory retailing | GH132 | 14 | Wholesale and retail trade, hospitality |
| 56 | Department stores | GH133 | 14 | Wholesale and retail trade, hospitality |
| 57 | Other store based retailing; non-store and commission based retailing | GH134, GH135 | 14 | Wholesale and retail trade, hospitality |
| 58 | Accommodation | GH211 | 14 | Wholesale and retail trade, hospitality |
| 59 | Food and beverage services | GH212 | 14 | Wholesale and retail trade, hospitality |
| 60 | Road transport | II111 | 13 | Utilities, construction, transport |
| 61 | Rail transport | II121 | 13 | Utilities, construction, transport |
| 62 | Other transport | II122, II124, II125 | 13 | Utilities, construction, transport |
| 63 | Air and space transport | II123 | 13 | Utilities, construction, transport |
| 64 | Postal and courier pick up and delivery services | II131 | 13 | Utilities, construction, transport |
| 65 | Transport support services | II132 | 13 | Utilities, construction, transport |
| 66 | Warehousing and storage services | II133 | 13 | Utilities, construction, transport |
| 67 | Publishing (except internet and music publishing) | JJ111 | 15 | Information, finance, insurance, property and business services |
| 68 | Motion picture and sound recording activities | JJ112 | 15 | Information, finance, insurance, property and business services |
| 69 | Broadcasting and internet publishing | JJ113 | 15 | Information, finance, insurance, property and business services |

Table A.1 Mapping StatNZ's 106 Input-Output Industries (with ANZSIC codes) to Aggregated 17 Input-Output Industries used for Reporting (Continued)

| 106IO_Coden | 106IO_Name | ANZSIC Codes | 17IO_Coden | 17IO_Name |
|-------------|--|--------------|------------|---|
| 70 | Telecommunications services including internet service providers | JJ121, JJ122 | 15 | Information, finance, insurance, property and business services |
| 71 | Library and other information services | JJ123 | 15 | Information, finance, insurance, property and business services |
| 72 | Banking and financing; financial asset investing | KK111, KK112 | 15 | Information, finance, insurance, property and business services |
| 73 | Life insurance | KK121 | 15 | Information, finance, insurance, property and business services |
| 74 | Health and general insurance | KK122 | 15 | Information, finance, insurance, property and business services |
| 75 | Superannuation funds | KK123 | 15 | Information, finance, insurance, property and business services |
| 76 | Auxiliary finance and insurance services | KK131 | 15 | Information, finance, insurance, property and business services |
| 77 | Rental and hiring services (except real estate); non-financial asset leasing | LL111, LL112 | 15 | Information, finance, insurance, property and business services |
| 78 | Residential property operation | LL121 | 15 | Information, finance, insurance, property and business services |
| 79 | Non-residential property operation | LL122 | 15 | Information, finance, insurance, property and business services |
| 80 | Real estate services | LL123 | 15 | Information, finance, insurance, property and business services |
| 81 | Owner-occupied property operation | LL211 | 15 | Information, finance, insurance, property and business services |
| 82 | Scientific, architectural and engineering services | MN111 | 15 | Information, finance, insurance, property and business services |
| 83 | Legal and accounting services | MN112 | 15 | Information, finance, insurance, property and business services |
| 84 | Advertising, market research and management services | MN113 | 15 | Information, finance, insurance, property and business services |
| 85 | Veterinary and other professional services | MN114 | 15 | Information, finance, insurance, property and business services |
| 86 | Computer system design and related services | MN115 | 15 | Information, finance, insurance, property and business services |
| 87 | Travel agency and tour arrangement services | MN211 | 15 | Information, finance, insurance, property and business services |
| 88 | Employment and other administrative services | MN212 | 15 | Information, finance, insurance, property and business services |
| 89 | Building cleaning, pest control and other support services | MN213 | 15 | Information, finance, insurance, property and business services |
| 90 | Local government administration | OO111 | 16 | Government, education and health |
| 91 | Central government administration and justice | OO211 | 16 | Government, education and health |
| 92 | Defence | OO212 | 16 | Government, education and health |
| 93 | Public order, safety and regulatory services | OO213 | 16 | Government, education and health |
| 94 | Preschool education | PP111 | 16 | Government, education and health |
| 95 | School education | PP112 | 16 | Government, education and health |
| 96 | Tertiary education | PP113 | 16 | Government, education and health |
| 97 | Adult, community and other education | PP114 | 16 | Government, education and health |
| 98 | Hospitals | QQ111 | 16 | Government, education and health |
| 99 | Medical and other health care services | QQ112 | 16 | Government, education and health |
| 100 | Residential care services and social assistance | QQ113 | 16 | Government, education and health |
| 101 | Heritage and artistic activities | RS111 | 17 | Recreational and personal services |
| 102 | Sport and recreation activities | RS112 | 17 | Recreational and personal services |
| 103 | Gambling activities | RS113 | 17 | Recreational and personal services |
| 104 | Repair and maintenance | RS211 | 17 | Recreational and personal services |
| 105 | Personal services; domestic household staff | RS212, RS215 | 17 | Recreational and personal services |
| 106 | Religious services; civil, professional and other interest groups | RS213, RS214 | 17 | Recreational and personal services |

These tables flow on from those in the body of the report (Section 9.2), and show the results across Direct and Indirect impacts

Table 1: Direct and Indirect Net Value Added Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 10% Forest (NZ\$₂₀₂₂m)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|--------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 2.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 2.1 |
| Sheep and beef cattle farming with forestry | -71.4 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | 556.0 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | 556.0 |
| Dairy cattle farming | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Other farming | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.2 |
| Other primary | 4.6 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 117.8 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 117.8 |
| Agriculture, forestry and fishing support services | 6.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 176.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 176.5 |
| Meat and meat product manufacturing | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.7 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.7 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.4 |
| Other food manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 |
| Wood product manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 470.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 470.7 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 |
| Other manufacturing | 0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 63.0 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 63.0 |
| Utilities, construction, transport | 0.1 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | 335.6 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | 335.6 |
| Wholesale and retail trade, hospitality | 2.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 36.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 36.4 |
| Information, finance, insurance, property and business services | -0.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 188.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 188.1 |
| Government, education and health | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 35.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 35.9 |
| Recreational and personal services | -0.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 21.5 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 21.5 |
| SUB-TOTAL | -58.4 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | 2,006.9 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | 2,006.9 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Sheep, beef cattle and grain farming | -0.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 3.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 3.1 |
| Dairy cattle farming | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 3.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 3.2 |
| Other farming | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.3 |
| Other primary | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 21.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 21.0 |
| Agriculture, forestry and fishing support services | 0.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 15.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 15.5 |
| Meat and meat product manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.8 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.8 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 |
| Other food manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.1 |
| Wood product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 6.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 6.3 |
| Other manufacturing | 0.0 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 96.9 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 96.9 |
| Utilities, construction, transport | 0.5 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 190.9 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 190.9 |
| Wholesale and retail trade, hospitality | -0.1 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 103.8 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 103.8 |
| Information, finance, insurance, property and business services | 0.0 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 219.1 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 219.1 |
| Government, education and health | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 15.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 15.1 |
| Recreational and personal services | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 18.8 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 18.8 |
| SUB-TOTAL | 0.5 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | 706.9 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | 706.9 |
| TOTAL | -57.9 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | 2,713.8 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | 2,713.8 |

Table 2: Direct and Indirect Employment Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 10% Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 10 | -2 | -2 | -2 | -2 | -2 | 33 | -2 | -2 | -2 | -2 | -2 | -2 | 33 |
| Sheep and beef cattle farming | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Other farming | -1 | -3 | -3 | -3 | -3 | -3 | 3 | -3 | -3 | -3 | -3 | -3 | -3 | 3 |
| Other primary | 27 | 1 | 1 | 1 | 1 | 1 | 684 | 1 | 1 | 1 | 1 | 1 | 1 | 684 |
| Agriculture, forestry and fishing support services | 81 | -1 | -1 | -1 | -1 | -1 | 2,081 | -1 | -1 | -1 | -1 | -1 | -1 | 2,081 |
| Meat and meat product manufacturing | -53 | -53 | -53 | -53 | -53 | -53 | -48 | -53 | -53 | -53 | -53 | -53 | -53 | -48 |
| Dairy product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| Other food manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 19 |
| Wood product manufacturing | -1 | -2 | -2 | -2 | -2 | -2 | 8,775 | -2 | -2 | -2 | -2 | -2 | -2 | 8,775 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Other manufacturing | 1 | -2 | -2 | -2 | -2 | -2 | 233 | -2 | -2 | -2 | -2 | -2 | -2 | 233 |
| Utilities, construction, transport | 1 | -10 | -10 | -10 | -10 | -10 | 2,919 | -10 | -10 | -10 | -10 | -10 | -10 | 2,919 |
| Wholesale and retail trade, hospitality | 37 | -10 | -10 | -10 | -10 | -10 | 569 | -10 | -10 | -10 | -10 | -10 | -10 | 569 |
| Information, finance, insurance, property and business services | -1 | -12 | -12 | -12 | -12 | -12 | 1,107 | -12 | -12 | -12 | -12 | -12 | -12 | 1,107 |
| Government, education and health | 0 | -2 | -2 | -2 | -2 | -2 | 693 | -2 | -2 | -2 | -2 | -2 | -2 | 693 |
| Recreational and personal services | -3 | -6 | -6 | -6 | -6 | -6 | 472 | -6 | -6 | -6 | -6 | -6 | -6 | 472 |
| SUB-TOTAL | 100 | -101 | -101 | -101 | -101 | -101 | 17,568 | -101 | -101 | -101 | -101 | -101 | -101 | 17,568 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| Sheep and beef cattle farming with forestry | -1 | -1 | -1 | -1 | -1 | -1 | 16 | -1 | -1 | -1 | -1 | -1 | -1 | 16 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| Other farming | -2 | -2 | -2 | -2 | -2 | -2 | 4 | -2 | -2 | -2 | -2 | -2 | -2 | 4 |
| Other primary | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 39 |
| Agriculture, forestry and fishing support services | 7 | -2 | -2 | -2 | -2 | -2 | 237 | -2 | -2 | -2 | -2 | -2 | -2 | 237 |
| Meat and meat product manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | 10 | -1 | -1 | -1 | -1 | -1 | -1 | 10 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Other food manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 44 |
| Wood product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 48 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |
| Other manufacturing | -1 | -4 | -4 | -4 | -4 | -4 | 670 | -4 | -4 | -4 | -4 | -4 | -4 | 670 |
| Utilities, construction, transport | 4 | -7 | -7 | -7 | -7 | -7 | 1,169 | -7 | -7 | -7 | -7 | -7 | -7 | 1,169 |
| Wholesale and retail trade, hospitality | -1 | -6 | -6 | -6 | -6 | -6 | 873 | -6 | -6 | -6 | -6 | -6 | -6 | 873 |
| Information, finance, insurance, property and business services | 0 | -10 | -10 | -10 | -10 | -10 | 1,392 | -10 | -10 | -10 | -10 | -10 | -10 | 1,392 |
| Government, education and health | 0 | -1 | -1 | -1 | -1 | -1 | 186 | -1 | -1 | -1 | -1 | -1 | -1 | 186 |
| Recreational and personal services | 0 | -2 | -2 | -2 | -2 | -2 | 266 | -2 | -2 | -2 | -2 | -2 | -2 | 266 |
| SUB-TOTAL | 5 | -38 | -38 | -38 | -38 | -38 | 5,025 | -38 | -38 | -38 | -38 | -38 | -38 | 5,025 |
| TOTAL | 104 | -140 | -140 | -140 | -140 | -140 | 22,594 | -140 | -140 | -140 | -140 | -140 | -140 | 22,594 |

Table 3: Direct and Indirect Net Value Added Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 30% *Pinus radiata* Forest (NZ\$_{202202m})

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 1.9 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 6.1 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 6.1 |
| Sheep and beef cattle farming with forestry | -230.0 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | 2,064.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | 2,064.6 |
| Dairy cattle farming | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 |
| Other farming | -0.3 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 0.3 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 0.3 |
| Other primary | 13.9 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 321.1 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 321.1 |
| Agriculture, forestry and fishing support services | 20.7 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 481.6 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 481.6 |
| Meat and meat product manufacturing | -7.5 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.1 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.1 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.3 |
| Other food manufacturing | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.3 |
| Wood product manufacturing | -0.3 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 1,425.8 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 1,425.8 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 |
| Other manufacturing | 1.4 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | 184.3 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | 184.3 |
| Utilities, construction, transport | -1.0 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | 998.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | 998.9 |
| Wholesale and retail trade, hospitality | 6.8 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | 108.5 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | 108.5 |
| Information, finance, insurance, property and business services | -1.5 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | 559.0 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | 559.0 |
| Government, education and health | -0.1 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 107.9 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 107.9 |
| Recreational and personal services | -0.5 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | 64.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | 64.0 |
| SUB-TOTAL | -196.4 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | 6,330.0 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | 6,330.0 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1.6 |
| Sheep, beef cattle and grain farming | -0.9 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 8.7 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 8.7 |
| Dairy cattle farming | -0.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 9.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 9.3 |
| Other farming | -0.5 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 0.8 |
| Other primary | 0.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 62.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 62.2 |
| Agriculture, forestry and fishing support services | 1.2 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 43.0 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 43.0 |
| Meat and meat product manufacturing | -0.4 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 2.4 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 2.4 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.8 |
| Other food manufacturing | -0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 15.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 15.2 |
| Wood product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 13.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 13.5 |
| Pulp, paper, and converted paper product manufacturing | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 19.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 19.1 |
| Other manufacturing | -0.5 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | 288.9 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | 288.9 |
| Utilities, construction, transport | 0.6 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | 566.5 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | 566.5 |
| Wholesale and retail trade, hospitality | -1.0 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | 309.9 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | 309.9 |
| Information, finance, insurance, property and business services | -1.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | 652.6 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | 652.6 |
| Government, education and health | 0.0 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 45.4 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 45.4 |
| Recreational and personal services | -0.1 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 55.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 55.8 |
| SUB-TOTAL | -3.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | 2,100.7 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | 2,100.7 |
| TOTAL | -199.7 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | 8,430.7 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | 8,430.7 |

Table 4: Direct and Indirect Employment Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 30% *Pinus radiata* Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 30 | -7 | -7 | -7 | -7 | -7 | 94 | -7 | -7 | -7 | -7 | -7 | -7 | 94 |
| Sheep and beef cattle farming | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| Other farming | -7 | -11 | -11 | -11 | -11 | -11 | 6 | -11 | -11 | -11 | -11 | -11 | -11 | 6 |
| Other primary | 81 | 2 | 2 | 2 | 2 | 2 | 1,864 | 2 | 2 | 2 | 2 | 2 | 2 | 1,864 |
| Agriculture, forestry and fishing support services | 244 | -5 | -5 | -5 | -5 | -5 | 5,679 | -5 | -5 | -5 | -5 | -5 | -5 | 5,679 |
| Meat and meat product manufacturing | -213 | -214 | -214 | -214 | -214 | -214 | -200 | -214 | -214 | -214 | -214 | -214 | -214 | -200 |
| Dairy product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 64 |
| Other food manufacturing | 3 | -1 | -1 | -1 | -1 | -1 | 58 | -1 | -1 | -1 | -1 | -1 | -1 | 58 |
| Wood product manufacturing | -5 | -7 | -7 | -7 | -7 | -7 | 26,578 | -7 | -7 | -7 | -7 | -7 | -7 | 26,578 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| Other manufacturing | 2 | -8 | -8 | -8 | -8 | -8 | 692 | -8 | -8 | -8 | -8 | -8 | -8 | 692 |
| Utilities, construction, transport | -6 | -39 | -39 | -39 | -39 | -39 | 8,696 | -39 | -39 | -39 | -39 | -39 | -39 | 8,696 |
| Wholesale and retail trade, hospitality | 107 | -35 | -35 | -35 | -35 | -35 | 1,697 | -35 | -35 | -35 | -35 | -35 | -35 | 1,697 |
| Information, finance, insurance, property and business services | -11 | -44 | -44 | -44 | -44 | -44 | 3,293 | -44 | -44 | -44 | -44 | -44 | -44 | 3,293 |
| Government, education and health | -1 | -7 | -7 | -7 | -7 | -7 | 2,087 | -7 | -7 | -7 | -7 | -7 | -7 | 2,087 |
| Recreational and personal services | -11 | -21 | -21 | -21 | -21 | -21 | 1,410 | -21 | -21 | -21 | -21 | -21 | -21 | 1,410 |
| SUB-TOTAL | 209 | -399 | -399 | -399 | -399 | -399 | 52,038 | -399 | -399 | -399 | -399 | -399 | -399 | 52,038 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -1 | -1 | -1 | -1 | -1 | -1 | 28 | -1 | -1 | -1 | -1 | -1 | -1 | 28 |
| Sheep and beef cattle farming with forestry | -5 | -6 | -6 | -6 | -6 | -6 | 46 | -6 | -6 | -6 | -6 | -6 | -6 | 46 |
| Dairy cattle farming | -1 | -1 | -1 | -1 | -1 | -1 | 36 | -1 | -1 | -1 | -1 | -1 | -1 | 36 |
| Other farming | -6 | -7 | -7 | -7 | -7 | -7 | 10 | -7 | -7 | -7 | -7 | -7 | -7 | 10 |
| Other primary | 1 | -1 | -1 | -1 | -1 | -1 | 115 | -1 | -1 | -1 | -1 | -1 | -1 | 115 |
| Agriculture, forestry and fishing support services | 18 | -8 | -8 | -8 | -8 | -8 | 654 | -8 | -8 | -8 | -8 | -8 | -8 | 654 |
| Meat and meat product manufacturing | -5 | -6 | -6 | -6 | -6 | -6 | 30 | -6 | -6 | -6 | -6 | -6 | -6 | 30 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| Other food manufacturing | -1 | -2 | -2 | -2 | -2 | -2 | 131 | -2 | -2 | -2 | -2 | -2 | -2 | 131 |
| Wood product manufacturing | 0 | -1 | -1 | -1 | -1 | -1 | 145 | -1 | -1 | -1 | -1 | -1 | -1 | 145 |
| Pulp, paper, and converted paper product manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | 130 | -1 | -1 | -1 | -1 | -1 | -1 | 130 |
| Other manufacturing | -5 | -15 | -15 | -15 | -15 | -15 | 2,002 | -15 | -15 | -15 | -15 | -15 | -15 | 2,002 |
| Utilities, construction, transport | 4 | -28 | -28 | -28 | -28 | -28 | 3,463 | -28 | -28 | -28 | -28 | -28 | -28 | 3,463 |
| Wholesale and retail trade, hospitality | -8 | -24 | -24 | -24 | -24 | -24 | 2,604 | -24 | -24 | -24 | -24 | -24 | -24 | 2,604 |
| Information, finance, insurance, property and business services | -8 | -40 | -40 | -40 | -40 | -40 | 4,149 | -40 | -40 | -40 | -40 | -40 | -40 | 4,149 |
| Government, education and health | -1 | -3 | -3 | -3 | -3 | -3 | 559 | -3 | -3 | -3 | -3 | -3 | -3 | 559 |
| Recreational and personal services | -2 | -8 | -8 | -8 | -8 | -8 | 790 | -8 | -8 | -8 | -8 | -8 | -8 | 790 |
| SUB-TOTAL | -21 | -152 | -152 | -152 | -152 | -152 | 14,907 | -152 | -152 | -152 | -152 | -152 | -152 | 14,907 |
| TOTAL | 189 | -551 | -551 | -551 | -551 | -551 | 66,945 | -551 | -551 | -551 | -551 | -551 | -551 | 66,945 |

Table 5: Direct and Indirect Net Value Added Impacts for Northland Region: Baseline vs 100% *Pinus radiata* Forest (NZ\$_{2022Q2M})

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 5.6 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | 18.7 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | 18.7 |
| Sheep and beef cattle farming with forestry | -783.2 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | 8,362.4 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | 8,362.4 |
| Dairy cattle farming | -0.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 2.7 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 2.7 |
| Other farming | -1.8 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | 0.2 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | 0.2 |
| Other primary | 46.1 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 945.8 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 945.8 |
| Agriculture, forestry and fishing support services | 64.8 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | 1,419.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | 1,419.6 |
| Meat and meat product manufacturing | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -32.1 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -32.1 |
| Dairy product manufacturing | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 34.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 34.0 |
| Other food manufacturing | 0.3 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 7.6 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 7.6 |
| Wood product manufacturing | -1.4 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 4,747.1 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 4,747.1 |
| Pulp, paper, and converted paper product manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 4.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 4.5 |
| Other manufacturing | 2.4 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | 587.8 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | 587.8 |
| Utilities, construction, transport | -9.4 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | 3,230.9 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | 3,230.9 |
| Wholesale and retail trade, hospitality | 19.4 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | 352.9 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | 352.9 |
| Information, finance, insurance, property and business services | -13.3 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | 1,816.4 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | 1,816.4 |
| Government, education and health | -0.6 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | 356.7 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | 356.7 |
| Recreational and personal services | -2.6 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | 208.9 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | 208.9 |
| SUB-TOTAL | -707.6 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | 22,064.1 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | 22,064.1 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 5.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 5.1 |
| Sheep, beef cattle and grain farming | -4.4 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | 26.4 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | 26.4 |
| Dairy cattle farming | -1.0 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | 30.2 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | 30.2 |
| Other farming | -2.4 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 1.9 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 1.9 |
| Other primary | 0.2 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 201.4 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 201.4 |
| Agriculture, forestry and fishing support services | 3.1 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 128.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 128.6 |
| Meat and meat product manufacturing | -1.9 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | 7.4 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | 7.4 |
| Dairy product manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 19.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 19.1 |
| Other food manufacturing | -0.5 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | 49.6 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | 49.6 |
| Wood product manufacturing | -0.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 44.5 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 44.5 |
| Pulp, paper, and converted paper product manufacturing | -0.8 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | 63.2 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | 63.2 |
| Other manufacturing | -4.3 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | 941.0 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | 941.0 |
| Utilities, construction, transport | -3.4 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | 1,841.3 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | 1,841.3 |
| Wholesale and retail trade, hospitality | -6.6 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | 1,012.8 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | 1,012.8 |
| Information, finance, insurance, property and business services | -11.9 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | 2,128.5 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | 2,128.5 |
| Government, education and health | -0.5 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | 149.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | 149.2 |
| Recreational and personal services | -1.1 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 181.5 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 181.5 |
| SUB-TOTAL | -35.9 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | 6,831.7 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | 6,831.7 |
| TOTAL | -743.5 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | 28,895.9 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | 28,895.9 |

Table 6: Direct and Indirect Employment Impacts for Northland Region: Baseline vs 100% *Pinus radiata* Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|-------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Northland Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 87 | -36 | -36 | -36 | -36 | -36 | 290 | -36 | -36 | -36 | -36 | -36 | -36 | 290 |
| Sheep and beef cattle farming | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 |
| Dairy cattle farming | -1 | -2 | -2 | -2 | -2 | -2 | 18 | -2 | -2 | -2 | -2 | -2 | -2 | 18 |
| Other farming | -36 | -49 | -49 | -49 | -49 | -49 | 5 | -49 | -49 | -49 | -49 | -49 | -49 | 5 |
| Other primary | 270 | 5 | 5 | 5 | 5 | 5 | 5,490 | 5 | 5 | 5 | 5 | 5 | 5 | 5,490 |
| Agriculture, forestry and fishing support services | 764 | -67 | -67 | -67 | -67 | -67 | 16,742 | -67 | -67 | -67 | -67 | -67 | -67 | 16,742 |
| Meat and meat product manufacturing | -953 | -954 | -954 | -954 | -954 | -954 | -909 | -954 | -954 | -954 | -954 | -954 | -954 | -909 |
| Dairy product manufacturing | 0 | -1 | -1 | -1 | -1 | -1 | 214 | -1 | -1 | -1 | -1 | -1 | -1 | 214 |
| Other food manufacturing | 7 | -5 | -5 | -5 | -5 | -5 | 190 | -5 | -5 | -5 | -5 | -5 | -5 | 190 |
| Wood product manufacturing | -26 | -31 | -31 | -31 | -31 | -31 | 88,487 | -31 | -31 | -31 | -31 | -31 | -31 | 88,487 |
| Pulp, paper, and converted paper product manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | 52 | -1 | -1 | -1 | -1 | -1 | -1 | 52 |
| Other manufacturing | -2 | -36 | -36 | -36 | -36 | -36 | 2,236 | -36 | -36 | -36 | -36 | -36 | -36 | 2,236 |
| Utilities, construction, transport | -66 | -175 | -175 | -175 | -175 | -175 | 28,163 | -175 | -175 | -175 | -175 | -175 | -175 | 28,163 |
| Wholesale and retail trade, hospitality | 304 | -171 | -171 | -171 | -171 | -171 | 5,514 | -171 | -171 | -171 | -171 | -171 | -171 | 5,514 |
| Information, finance, insurance, property and business services | -96 | -205 | -205 | -205 | -205 | -205 | 10,697 | -205 | -205 | -205 | -205 | -205 | -205 | 10,697 |
| Government, education and health | -13 | -33 | -33 | -33 | -33 | -33 | 6,906 | -33 | -33 | -33 | -33 | -33 | -33 | 6,906 |
| Recreational and personal services | -55 | -86 | -86 | -86 | -86 | -86 | 4,610 | -86 | -86 | -86 | -86 | -86 | -86 | 4,610 |
| SUB-TOTAL | 173 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | 168,693 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | 168,693 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -4 | -6 | -6 | -6 | -6 | -6 | 89 | -6 | -6 | -6 | -6 | -6 | -6 | 89 |
| Sheep and beef cattle farming with forestry | -23 | -27 | -27 | -27 | -27 | -27 | 141 | -27 | -27 | -27 | -27 | -27 | -27 | 141 |
| Dairy cattle farming | -4 | -5 | -5 | -5 | -5 | -5 | 117 | -5 | -5 | -5 | -5 | -5 | -5 | 117 |
| Other farming | -29 | -31 | -31 | -31 | -31 | -31 | 23 | -31 | -31 | -31 | -31 | -31 | -31 | 23 |
| Other primary | 2 | -2 | -2 | -2 | -2 | -2 | 369 | -2 | -2 | -2 | -2 | -2 | -2 | 369 |
| Agriculture, forestry and fishing support services | 47 | -40 | -40 | -40 | -40 | -40 | 1,957 | -40 | -40 | -40 | -40 | -40 | -40 | 1,957 |
| Meat and meat product manufacturing | -24 | -25 | -25 | -25 | -25 | -25 | 92 | -25 | -25 | -25 | -25 | -25 | -25 | 92 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 45 |
| Other food manufacturing | -6 | -9 | -9 | -9 | -9 | -9 | 430 | -9 | -9 | -9 | -9 | -9 | -9 | 430 |
| Wood product manufacturing | -2 | -4 | -4 | -4 | -4 | -4 | 479 | -4 | -4 | -4 | -4 | -4 | -4 | 479 |
| Pulp, paper, and converted paper product manufacturing | -5 | -6 | -6 | -6 | -6 | -6 | 431 | -6 | -6 | -6 | -6 | -6 | -6 | 431 |
| Other manufacturing | -35 | -67 | -67 | -67 | -67 | -67 | 6,529 | -67 | -67 | -67 | -67 | -67 | -67 | 6,529 |
| Utilities, construction, transport | -20 | -126 | -126 | -126 | -126 | -126 | 11,236 | -126 | -126 | -126 | -126 | -126 | -126 | 11,236 |
| Wholesale and retail trade, hospitality | -56 | -110 | -110 | -110 | -110 | -110 | 8,501 | -110 | -110 | -110 | -110 | -110 | -110 | 8,501 |
| Information, finance, insurance, property and business services | -75 | -181 | -181 | -181 | -181 | -181 | 13,533 | -181 | -181 | -181 | -181 | -181 | -181 | 13,533 |
| Government, education and health | -6 | -15 | -15 | -15 | -15 | -15 | 1,836 | -15 | -15 | -15 | -15 | -15 | -15 | 1,836 |
| Recreational and personal services | -16 | -37 | -37 | -37 | -37 | -37 | 2,571 | -37 | -37 | -37 | -37 | -37 | -37 | 2,571 |
| SUB-TOTAL | -256 | -692 | -692 | -692 | -692 | -692 | 48,380 | -692 | -692 | -692 | -692 | -692 | -692 | 48,380 |
| TOTAL | -83 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | 217,074 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | 217,074 |

Table 7: Direct and Indirect Net Value Added Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 10% SPS Forest (NZ\$_{2022Q2m})

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 2.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 4.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Sheep and beef cattle farming with forestry | -120.0 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | 1,079.7 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 |
| Dairy cattle farming | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other farming | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other primary | 5.3 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 97.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Agriculture, forestry and fishing support services | 8.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 146.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Meat and meat product manufacturing | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.7 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wood product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 517.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other manufacturing | 1.2 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 62.0 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Utilities, construction, transport | 0.7 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | 310.3 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 |
| Wholesale and retail trade, hospitality | 8.5 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 45.2 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Information, finance, insurance, property and business services | 2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 193.0 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 |
| Government, education and health | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 38.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Recreational and personal services | 0.0 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 22.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| SUB-TOTAL | -92.9 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | 2,520.5 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sheep, beef cattle and grain farming | -0.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 3.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Dairy cattle farming | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 3.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other farming | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other primary | 0.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 21.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Agriculture, forestry and fishing support services | 0.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 13.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Meat and meat product manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wood product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 6.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other manufacturing | 0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 102.2 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Utilities, construction, transport | 1.4 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 194.4 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 |
| Wholesale and retail trade, hospitality | 0.3 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 109.4 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 |
| Information, finance, insurance, property and business services | 1.4 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 227.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 |
| Government, education and health | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 16.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Recreational and personal services | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 19.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| SUB-TOTAL | 4.2 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | 732.2 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 |
| TOTAL | -88.8 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | 3,252.7 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 |

Table 8: Direct and Indirect Employment Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 10% SPS Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 36 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 69 | -2 | -2 | -2 | -2 | -2 |
| Sheep and beef cattle farming | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Other farming | 1 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | 7 | -3 | -3 | -3 | -3 | -3 |
| Other primary | 31 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 562 | 1 | 1 | 1 | 1 | 1 |
| Agriculture, forestry and fishing support services | 100 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1,729 | -1 | -1 | -1 | -1 | -1 |
| Meat and meat product manufacturing | -53 | -53 | -53 | -53 | -53 | -53 | -53 | -53 | -48 | -53 | -53 | -53 | -53 | -53 |
| Dairy product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 |
| Wood product manufacturing | 0 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 9,639 | -2 | -2 | -2 | -2 | -2 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 5 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 242 | -2 | -2 | -2 | -2 | -2 |
| Utilities, construction, transport | 6 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | 2,628 | -10 | -10 | -10 | -10 | -10 |
| Wholesale and retail trade, hospitality | 134 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | 704 | -10 | -10 | -10 | -10 | -10 |
| Information, finance, insurance, property and business services | 11 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | 1,153 | -12 | -12 | -12 | -12 | -12 |
| Government, education and health | 2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 750 | -2 | -2 | -2 | -2 | -2 |
| Recreational and personal services | 0 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | 493 | -6 | -6 | -6 | -6 | -6 |
| SUB-TOTAL | 276 | -101 | -101 | -101 | -101 | -101 | -101 | -101 | 17,984 | -101 | -101 | -101 | -101 | -101 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 |
| Sheep and beef cattle farming with forestry | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 17 | -1 | -1 | -1 | -1 | -1 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 |
| Other farming | -1 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 4 | -2 | -2 | -2 | -2 | -2 |
| Other primary | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | 0 |
| Agriculture, forestry and fishing support services | 10 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 207 | -2 | -2 | -2 | -2 | -2 |
| Meat and meat product manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 11 | -1 | -1 | -1 | -1 | -1 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 0 | 0 | 0 | 0 | 0 |
| Wood product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 0 | 0 | 0 | 0 | 0 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 2 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | 712 | -4 | -4 | -4 | -4 | -4 |
| Utilities, construction, transport | 9 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | 1,175 | -7 | -7 | -7 | -7 | -7 |
| Wholesale and retail trade, hospitality | 3 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | 917 | -6 | -6 | -6 | -6 | -6 |
| Information, finance, insurance, property and business services | 9 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | 1,452 | -10 | -10 | -10 | -10 | -10 |
| Government, education and health | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 198 | -1 | -1 | -1 | -1 | -1 |
| Recreational and personal services | 1 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 275 | -2 | -2 | -2 | -2 | -2 |
| SUB-TOTAL | 32 | -38 | -38 | -38 | -38 | -38 | -38 | -38 | 5,183 | -38 | -38 | -38 | -38 | -38 |
| TOTAL | 308 | -140 | -140 | -140 | -140 | -140 | -140 | -140 | 23,166 | -140 | -140 | -140 | -140 | -140 |

Table 9: Direct and Indirect Net Value Added Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 30% SPS Forest (NZ\$_{2022Q2M})

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Northland Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 7.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 11.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Sheep and beef cattle farming with forestry | -377.4 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | 3,590.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 |
| Dairy cattle farming | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other farming | 0.0 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 0.6 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Other primary | 15.9 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 269.9 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| Agriculture, forestry and fishing support services | 25.5 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 407.8 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Meat and meat product manufacturing | -7.5 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.0 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 |
| Dairy product manufacturing | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wood product manufacturing | -0.2 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 1,566.2 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other manufacturing | 3.3 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | 182.6 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 |
| Utilities, construction, transport | 0.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | 924.5 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 |
| Wholesale and retail trade, hospitality | 25.5 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | 127.1 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 |
| Information, finance, insurance, property and business services | 5.1 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | 573.7 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 |
| Government, education and health | 0.3 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 116.5 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Recreational and personal services | -0.1 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | 66.6 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| SUB-TOTAL | -301.1 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | 7,846.7 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Sheep, beef cattle and grain farming | -0.7 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 8.8 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 |
| Dairy cattle farming | -0.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 9.9 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Other farming | -0.5 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Other primary | 0.4 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 65.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Agriculture, forestry and fishing support services | 1.8 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 38.3 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Meat and meat product manufacturing | -0.4 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 2.6 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 0.0 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 16.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Wood product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 14.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Pulp, paper, and converted paper product manufacturing | -0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 20.9 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Other manufacturing | 0.8 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | 305.5 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 |
| Utilities, construction, transport | 3.3 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | 579.6 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 |
| Wholesale and retail trade, hospitality | 0.3 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | 327.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 |
| Information, finance, insurance, property and business services | 2.8 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | 679.7 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 |
| Government, education and health | 0.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 48.4 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Recreational and personal services | 0.2 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 57.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| SUB-TOTAL | 8.0 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | 2,184.0 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 |
| TOTAL | -293.1 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | 10,031 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 |

Table 10: Direct and Indirect Employment Impacts for Northland Region : Baseline vs Sheep and Beef Farming with 30% SPS Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 108 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | 170 | -7 | -7 | -7 | -7 | -7 |
| Sheep and beef cattle farming | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Other farming | 1 | -11 | -11 | -11 | -11 | -11 | -11 | -11 | 13 | -11 | -11 | -11 | -11 | -11 |
| Other primary | 93 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1,564 | 2 | 2 | 2 | 2 | 2 |
| Agriculture, forestry and fishing support services | 300 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | 4,810 | -5 | -5 | -5 | -5 | -5 |
| Meat and meat product manufacturing | -213 | -214 | -214 | -214 | -214 | -214 | -214 | -214 | -199 | -214 | -214 | -214 | -214 | -214 |
| Dairy product manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 71 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 10 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 69 | -1 | -1 | -1 | -1 | -1 |
| Wood product manufacturing | -3 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | 29,194 | -7 | -7 | -7 | -7 | -7 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 14 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | 716 | -8 | -8 | -8 | -8 | -8 |
| Utilities, construction, transport | 10 | -39 | -39 | -39 | -39 | -39 | -39 | -39 | 7,833 | -39 | -39 | -39 | -39 | -39 |
| Wholesale and retail trade, hospitality | 399 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | 1,978 | -35 | -35 | -35 | -35 | -35 |
| Information, finance, insurance, property and business services | 25 | -44 | -44 | -44 | -44 | -44 | -44 | -44 | 3,433 | -44 | -44 | -44 | -44 | -44 |
| Government, education and health | 5 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | 2,261 | -7 | -7 | -7 | -7 | -7 |
| Recreational and personal services | -3 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | 1,476 | -21 | -21 | -21 | -21 | -21 |
| SUB-TOTAL | 745 | -399 | -399 | -399 | -399 | -399 | -399 | -399 | 53,410 | -399 | -399 | -399 | -399 | -399 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 29 | -1 | -1 | -1 | -1 | -1 |
| Sheep and beef cattle farming with forestry | -4 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | 47 | -6 | -6 | -6 | -6 | -6 |
| Dairy cattle farming | 0 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 39 | -1 | -1 | -1 | -1 | -1 |
| Other farming | -6 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | 10 | -7 | -7 | -7 | -7 | -7 |
| Other primary | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 118 | -1 | -1 | -1 | -1 | -1 |
| Agriculture, forestry and fishing support services | 27 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | 582 | -8 | -8 | -8 | -8 | -8 |
| Meat and meat product manufacturing | -4 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | 32 | -6 | -6 | -6 | -6 | -6 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 0 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 140 | -2 | -2 | -2 | -2 | -2 |
| Wood product manufacturing | 0 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 158 | -1 | -1 | -1 | -1 | -1 |
| Pulp, paper, and converted paper product manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 142 | -1 | -1 | -1 | -1 | -1 |
| Other manufacturing | 3 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | 2,131 | -15 | -15 | -15 | -15 | -15 |
| Utilities, construction, transport | 20 | -28 | -28 | -28 | -28 | -28 | -28 | -28 | 3,500 | -28 | -28 | -28 | -28 | -28 |
| Wholesale and retail trade, hospitality | 4 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | 2,742 | -24 | -24 | -24 | -24 | -24 |
| Information, finance, insurance, property and business services | 19 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | 4,336 | -40 | -40 | -40 | -40 | -40 |
| Government, education and health | 2 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | 596 | -3 | -3 | -3 | -3 | -3 |
| Recreational and personal services | 2 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | 820 | -8 | -8 | -8 | -8 | -8 |
| SUB-TOTAL | 62 | -152 | -152 | -152 | -152 | -152 | -152 | -152 | 15,437 | -152 | -152 | -152 | -152 | -152 |
| TOTAL | 807 | -551 | -551 | -551 | -551 | -551 | -551 | -551 | 68,847 | -551 | -551 | -551 | -551 | -551 |

Table 11: Direct and Indirect Net Value Added Impacts for Northland Region: Baseline vs 100% SPS Forest (NZ\$_{2022Q2m})

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 22.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | 35.2 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 |
| Sheep and beef cattle farming with forestry | -1,273.8 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | 13,238.4 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 |
| Dairy cattle farming | 0.0 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 2.9 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Other farming | -0.6 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | 1.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 |
| Other primary | 52.9 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 796.0 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |
| Agriculture, forestry and fishing support services | 80.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | 1,204.8 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 |
| Meat and meat product manufacturing | -33.6 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -32.0 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 |
| Dairy product manufacturing | 0.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 37.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other food manufacturing | 1.3 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 9.0 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Wood product manufacturing | -1.0 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 5,214.5 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 5.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other manufacturing | 8.8 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | 585.6 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 |
| Utilities, construction, transport | -2.9 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | 2,987.7 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 |
| Wholesale and retail trade, hospitality | 81.4 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | 415.4 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 |
| Information, finance, insurance, property and business services | 8.7 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | 1,870.4 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 |
| Government, education and health | 0.5 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | 385.7 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 |
| Recreational and personal services | -1.2 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | 217.9 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 |
| SUB-TOTAL | -1,056.1 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | 26,975.3 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -0.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 5.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Sheep, beef cattle and grain farming | -3.8 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | 27.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 |
| Dairy cattle farming | -0.6 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | 32.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 |
| Other farming | -2.4 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 1.9 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 |
| Other primary | 0.9 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 212.1 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 |
| Agriculture, forestry and fishing support services | 5.2 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 115.3 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 |
| Meat and meat product manufacturing | -1.7 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | 8.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 |
| Dairy product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 20.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other food manufacturing | -0.1 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | 53.0 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 |
| Wood product manufacturing | -0.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 48.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Pulp, paper, and converted paper product manufacturing | -0.6 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | 69.0 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 |
| Other manufacturing | -0.1 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | 998.2 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 |
| Utilities, construction, transport | 5.6 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | 1,890.8 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 |
| Wholesale and retail trade, hospitality | -2.2 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | 1,073.7 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 |
| Information, finance, insurance, property and business services | 1.7 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | 2,223.6 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 |
| Government, education and health | 0.1 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | 159.6 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 |
| Recreational and personal services | -0.2 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 188.7 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 |
| SUB-TOTAL | 1.7 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | 7,127.8 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 |
| TOTAL | -1,054.4 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | 34,103.1 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 |

Table 12: Direct and Indirect Employment Impacts for Northland Region : Baseline vs 100% SPS Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 346 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | 545 | -36 | -36 | -36 | -36 | -36 |
| Sheep and beef cattle farming | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 |
| Dairy cattle farming | 0 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 20 | -2 | -2 | -2 | -2 | -2 |
| Other farming | -11 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | 28 | -49 | -49 | -49 | -49 | -49 |
| Other primary | 310 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4,612 | 5 | 5 | 5 | 5 | 5 |
| Agriculture, forestry and fishing support services | 951 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | 14,208 | -67 | -67 | -67 | -67 | -67 |
| Meat and meat product manufacturing | -951 | -954 | -954 | -954 | -954 | -954 | -954 | -954 | -906 | -954 | -954 | -954 | -954 | -954 |
| Dairy product manufacturing | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 234 | -1 | -1 | -1 | -1 | -1 |
| Other food manufacturing | 31 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | 227 | -5 | -5 | -5 | -5 | -5 |
| Wood product manufacturing | -19 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | 97,200 | -31 | -31 | -31 | -31 | -31 |
| Pulp, paper, and converted paper product manufacturing | 0 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 57 | -1 | -1 | -1 | -1 | -1 |
| Other manufacturing | 38 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | 2,325 | -36 | -36 | -36 | -36 | -36 |
| Utilities, construction, transport | -13 | -175 | -175 | -175 | -175 | -175 | -175 | -175 | 25,330 | -175 | -175 | -175 | -175 | -175 |
| Wholesale and retail trade, hospitality | 1,275 | -171 | -171 | -171 | -171 | -171 | -171 | -171 | 6,457 | -171 | -171 | -171 | -171 | -171 |
| Information, finance, insurance, property and business services | 26 | -205 | -205 | -205 | -205 | -205 | -205 | -205 | 11,189 | -205 | -205 | -205 | -205 | -205 |
| Government, education and health | 8 | -33 | -33 | -33 | -33 | -33 | -33 | -33 | 7,491 | -33 | -33 | -33 | -33 | -33 |
| Recreational and personal services | -28 | -86 | -86 | -86 | -86 | -86 | -86 | -86 | 4,840 | -86 | -86 | -86 | -86 | -86 |
| SUB-TOTAL | 1,955 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | 173,847 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -3 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | 93 | -6 | -6 | -6 | -6 | -6 |
| Sheep and beef cattle farming with forestry | -20 | -27 | -27 | -27 | -27 | -27 | -27 | -27 | 145 | -27 | -27 | -27 | -27 | -27 |
| Dairy cattle farming | -2 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | 125 | -5 | -5 | -5 | -5 | -5 |
| Other farming | -28 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | 23 | -31 | -31 | -31 | -31 | -31 |
| Other primary | 4 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 382 | -2 | -2 | -2 | -2 | -2 |
| Agriculture, forestry and fishing support services | 78 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | 1,755 | -40 | -40 | -40 | -40 | -40 |
| Meat and meat product manufacturing | -21 | -25 | -25 | -25 | -25 | -25 | -25 | -25 | 100 | -25 | -25 | -25 | -25 | -25 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | -3 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | 460 | -9 | -9 | -9 | -9 | -9 |
| Wood product manufacturing | -1 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | 520 | -4 | -4 | -4 | -4 | -4 |
| Pulp, paper, and converted paper product manufacturing | -4 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | 471 | -6 | -6 | -6 | -6 | -6 |
| Other manufacturing | -8 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | 6,969 | -67 | -67 | -67 | -67 | -67 |
| Utilities, construction, transport | 34 | -126 | -126 | -126 | -126 | -126 | -126 | -126 | 11,398 | -126 | -126 | -126 | -126 | -126 |
| Wholesale and retail trade, hospitality | -17 | -110 | -110 | -110 | -110 | -110 | -110 | -110 | 8,978 | -110 | -110 | -110 | -110 | -110 |
| Information, finance, insurance, property and business services | 14 | -181 | -181 | -181 | -181 | -181 | -181 | -181 | 14,187 | -181 | -181 | -181 | -181 | -181 |
| Government, education and health | 1 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | 1,962 | -15 | -15 | -15 | -15 | -15 |
| Recreational and personal services | -3 | -37 | -37 | -37 | -37 | -37 | -37 | -37 | 2,678 | -37 | -37 | -37 | -37 | -37 |
| SUB-TOTAL | 20 | -692 | -692 | -692 | -692 | -692 | -692 | -692 | 50,294 | -692 | -692 | -692 | -692 | -692 |
| TOTAL | 1,975 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | 224,142 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 |

Table 13: Direct and Indirect Net Value Added Impacts for Northland Region : Baseline vs Sheep and Beef Farming with 10% Native Forest (NZ\$_{2022Q2m})

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 6.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Sheep and beef cattle farming with forestry | -360.0 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 | -6.2 |
| Dairy cattle farming | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other farming | 0.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other primary | 17.8 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Agriculture, forestry and fishing support services | 28.8 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Meat and meat product manufacturing | -1.8 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 | -1.9 |
| Dairy product manufacturing | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wood product manufacturing | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other manufacturing | 4.7 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Utilities, construction, transport | 5.0 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 |
| Wholesale and retail trade, hospitality | 25.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Information, finance, insurance, property and business services | 10.6 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 |
| Government, education and health | 0.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Recreational and personal services | 0.6 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| SUB-TOTAL | -260.1 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 | -13.3 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sheep, beef cattle and grain farming | 0.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Dairy cattle farming | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other farming | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other primary | 0.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Agriculture, forestry and fishing support services | 2.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Meat and meat product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wood product manufacturing | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pulp, paper, and converted paper product manufacturing | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other manufacturing | 2.5 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Utilities, construction, transport | 7.0 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 |
| Wholesale and retail trade, hospitality | 2.4 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 |
| Information, finance, insurance, property and business services | 7.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 |
| Government, education and health | 0.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Recreational and personal services | 0.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| SUB-TOTAL | 24.0 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 |
| TOTAL | -236.1 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 | -18.4 |

Table 14: Direct and Indirect Employment Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 10% Native Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 107 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Sheep and beef cattle farming | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other farming | 8 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Other primary | 104 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Agriculture, forestry and fishing support services | 339 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Meat and meat product manufacturing | -52 | -53 | -53 | -53 | -53 | -53 | -53 | -53 | -53 | -53 | -53 | -53 | -53 | -53 |
| Dairy product manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wood product manufacturing | 2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 19 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Utilities, construction, transport | 42 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 |
| Wholesale and retail trade, hospitality | 400 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 |
| Information, finance, insurance, property and business services | 57 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | -12 |
| Government, education and health | 11 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Recreational and personal services | 12 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 |
| SUB-TOTAL | 1,060 | -101 | -101 | -101 | -101 | -101 | -101 | -101 | -101 | -101 | -101 | -101 | -101 | -101 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sheep and beef cattle farming with forestry | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other farming | -1 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Other primary | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Agriculture, forestry and fishing support services | 36 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Meat and meat product manufacturing | 0 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wood product manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 14 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 |
| Utilities, construction, transport | 44 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 |
| Wholesale and retail trade, hospitality | 22 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 |
| Information, finance, insurance, property and business services | 49 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 |
| Government, education and health | 4 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Recreational and personal services | 8 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| SUB-TOTAL | 184 | -38 | -38 | -38 | -38 | -38 | -38 | -38 | -38 | -38 | -38 | -38 | -38 | -38 |
| TOTAL | 1,244 | -140 | -140 | -140 | -140 | -140 | -140 | -140 | -140 | -140 | -140 | -140 | -140 | -140 |

Table 15: Direct and Indirect Net Value Added Impacts for Northland Region : Baseline vs Sheep and Beef Farming with 30% Native Forest (NZ\$_{2022Q2m})

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 20.8 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Sheep and beef cattle farming with forestry | -1,104.2 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 | -32.6 |
| Dairy cattle farming | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other farming | 1.1 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Other primary | 54.1 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| Agriculture, forestry and fishing support services | 87.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Meat and meat product manufacturing | -7.5 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 | -7.6 |
| Dairy product manufacturing | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wood product manufacturing | 0.2 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Pulp, paper, and converted paper product manufacturing | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other manufacturing | 14.1 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 |
| Utilities, construction, transport | 13.8 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 |
| Wholesale and retail trade, hospitality | 77.1 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 |
| Information, finance, insurance, property and business services | 30.9 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 | -7.7 |
| Government, education and health | 1.7 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Recreational and personal services | 1.8 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| SUB-TOTAL | -807.2 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 | -59.8 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Sheep, beef cattle and grain farming | 0.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 |
| Dairy cattle farming | 0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Other farming | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Other primary | 2.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Agriculture, forestry and fishing support services | 7.2 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Meat and meat product manufacturing | -0.2 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Dairy product manufacturing | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 0.5 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Wood product manufacturing | 0.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Pulp, paper, and converted paper product manufacturing | 0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Other manufacturing | 7.0 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 | -2.2 |
| Utilities, construction, transport | 20.2 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 | -4.4 |
| Wholesale and retail trade, hospitality | 6.9 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 | -2.7 |
| Information, finance, insurance, property and business services | 21.6 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 |
| Government, education and health | 1.0 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Recreational and personal services | 1.7 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| SUB-TOTAL | 68.4 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 | -20.3 |
| TOTAL | -738.8 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 | -80.0 |

Table 16: Direct and Indirect Employment Impacts for Northland Region: Baseline vs Sheep and Beef Farming with 30% Native Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 322 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 |
| Sheep and beef cattle farming | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Dairy cattle farming | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other farming | 22 | -11 | -11 | -11 | -11 | -11 | -11 | -11 | -11 | -11 | -11 | -11 | -11 | -11 |
| Other primary | 316 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Agriculture, forestry and fishing support services | 1,026 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 |
| Meat and meat product manufacturing | -211 | -214 | -214 | -214 | -214 | -214 | -214 | -214 | -214 | -214 | -214 | -214 | -214 | -214 |
| Dairy product manufacturing | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 30 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Wood product manufacturing | 3 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 |
| Pulp, paper, and converted paper product manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 58 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 |
| Utilities, construction, transport | 118 | -39 | -39 | -39 | -39 | -39 | -39 | -39 | -39 | -39 | -39 | -39 | -39 | -39 |
| Wholesale and retail trade, hospitality | 1,208 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | -35 |
| Information, finance, insurance, property and business services | 165 | -44 | -44 | -44 | -44 | -44 | -44 | -44 | -44 | -44 | -44 | -44 | -44 | -44 |
| Government, education and health | 30 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 |
| Recreational and personal services | 33 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 |
| SUB-TOTAL | 3,123 | -399 | -399 | -399 | -399 | -399 | -399 | -399 | -399 | -399 | -399 | -399 | -399 | -399 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Sheep and beef cattle farming with forestry | 0 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 |
| Dairy cattle farming | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Other farming | -5 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 |
| Other primary | 5 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Agriculture, forestry and fishing support services | 109 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 |
| Meat and meat product manufacturing | -2 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 4 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Wood product manufacturing | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Pulp, paper, and converted paper product manufacturing | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Other manufacturing | 40 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 |
| Utilities, construction, transport | 127 | -28 | -28 | -28 | -28 | -28 | -28 | -28 | -28 | -28 | -28 | -28 | -28 | -28 |
| Wholesale and retail trade, hospitality | 63 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 |
| Information, finance, insurance, property and business services | 141 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 |
| Government, education and health | 12 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Recreational and personal services | 24 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 |
| SUB-TOTAL | 523 | -152 | -152 | -152 | -152 | -152 | -152 | -152 | -152 | -152 | -152 | -152 | -152 | -152 |
| TOTAL | 3,646 | -551 | -551 | -551 | -551 | -551 | -551 | -551 | -551 | -551 | -551 | -551 | -551 | -551 |

Table 17: Direct and Indirect Net Value Added Impacts for Northland Region: Baseline vs 100% Native Forest (NZ\$_{2022Q2M})

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Northland Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 68.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 | -2.3 |
| Sheep and beef cattle farming with forestry | -3,694.0 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 | -125.8 |
| Dairy cattle farming | 0.4 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Other farming | 2.9 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 |
| Other primary | 179.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |
| Agriculture, forestry and fishing support services | 285.3 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 |
| Meat and meat product manufacturing | -33.4 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 | -33.7 |
| Dairy product manufacturing | 1.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other food manufacturing | 4.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Wood product manufacturing | 0.1 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 |
| Pulp, paper, and converted paper product manufacturing | 0.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other manufacturing | 44.7 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 | -8.1 |
| Utilities, construction, transport | 40.0 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 |
| Wholesale and retail trade, hospitality | 253.3 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 | -10.9 |
| Information, finance, insurance, property and business services | 94.6 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 | -33.8 |
| Government, education and health | 5.2 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 |
| Recreational and personal services | 5.0 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2 |
| SUB-TOTAL | -2,742.3 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 | -252.6 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Sheep, beef cattle and grain farming | -1.0 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 | -5.1 |
| Dairy cattle farming | 0.7 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 |
| Other farming | -1.9 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 |
| Other primary | 6.5 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 |
| Agriculture, forestry and fishing support services | 22.9 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 |
| Meat and meat product manufacturing | -1.1 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 |
| Dairy product manufacturing | 0.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other food manufacturing | 1.4 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 |
| Wood product manufacturing | 0.5 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Pulp, paper, and converted paper product manufacturing | 0.1 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 |
| Other manufacturing | 20.6 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 | -9.9 |
| Utilities, construction, transport | 61.5 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 |
| Wholesale and retail trade, hospitality | 19.3 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 | -12.5 |
| Information, finance, insurance, property and business services | 64.3 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 | -28.4 |
| Government, education and health | 2.9 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 |
| Recreational and personal services | 5.0 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 |
| SUB-TOTAL | 202.3 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 | -92.4 |
| TOTAL | -2,540.0 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 | -345.0 |

Table 18: Direct and Indirect Employment Impacts for Northland Region : Baseline vs 100% Native Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Northland Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 1,057 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 |
| Sheep and beef cattle farming | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 |
| Dairy cattle farming | 3 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Other farming | 59 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | -49 |
| Other primary | 1,050 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Agriculture, forestry and fishing support services | 3,365 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | -67 |
| Meat and meat product manufacturing | -945 | -954 | -954 | -954 | -954 | -954 | -954 | -954 | -954 | -954 | -954 | -954 | -954 | -954 |
| Dairy product manufacturing | 8 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Other food manufacturing | 99 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 |
| Wood product manufacturing | 2 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | -31 |
| Pulp, paper, and converted paper product manufacturing | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Other manufacturing | 183 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 |
| Utilities, construction, transport | 345 | -175 | -175 | -175 | -175 | -175 | -175 | -175 | -175 | -175 | -175 | -175 | -175 | -175 |
| Wholesale and retail trade, hospitality | 3,968 | -171 | -171 | -171 | -171 | -171 | -171 | -171 | -171 | -171 | -171 | -171 | -171 | -171 |
| Information, finance, insurance, property and business services | 491 | -205 | -205 | -205 | -205 | -205 | -205 | -205 | -205 | -205 | -205 | -205 | -205 | -205 |
| Government, education and health | 92 | -33 | -33 | -33 | -33 | -33 | -33 | -33 | -33 | -33 | -33 | -33 | -33 | -33 |
| Recreational and personal services | 93 | -86 | -86 | -86 | -86 | -86 | -86 | -86 | -86 | -86 | -86 | -86 | -86 | -86 |
| SUB-TOTAL | 9,863 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 | -1,856 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 3 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 |
| Sheep and beef cattle farming with forestry | -5 | -27 | -27 | -27 | -27 | -27 | -27 | -27 | -27 | -27 | -27 | -27 | -27 | -27 |
| Dairy cattle farming | 3 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 |
| Other farming | -23 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | -31 | -31 |
| Other primary | 17 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Agriculture, forestry and fishing support services | 349 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 |
| Meat and meat product manufacturing | -14 | -25 | -25 | -25 | -25 | -25 | -25 | -25 | -25 | -25 | -25 | -25 | -25 | -25 |
| Diary product manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 |
| Wood product manufacturing | 6 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 |
| Pulp, paper, and converted paper product manufacturing | 1 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 |
| Other manufacturing | 115 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | -67 | -67 |
| Utilities, construction, transport | 387 | -126 | -126 | -126 | -126 | -126 | -126 | -126 | -126 | -126 | -126 | -126 | -126 | -126 |
| Wholesale and retail trade, hospitality | 177 | -110 | -110 | -110 | -110 | -110 | -110 | -110 | -110 | -110 | -110 | -110 | -110 | -110 |
| Information, finance, insurance, property and business services | 419 | -181 | -181 | -181 | -181 | -181 | -181 | -181 | -181 | -181 | -181 | -181 | -181 | -181 |
| Government, education and health | 36 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 |
| Recreational and personal services | 69 | -37 | -37 | -37 | -37 | -37 | -37 | -37 | -37 | -37 | -37 | -37 | -37 | -37 |
| SUB-TOTAL | 1,549 | -692 | -692 | -692 | -692 | -692 | -692 | -692 | -692 | -692 | -692 | -692 | -692 | -692 |
| TOTAL | 11,412 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 | -2,547 |

These tables flow on from those in the body of the report (Section 8.2), and show the results across Direct and Indirect impacts

Table 19: Direct and Indirect Net Value Added Impacts for Hawkes Bay Region: Baseline vs Sheep and Beef Farming with 10% *Pinus radiata* Forest (NZ\$₂₀₂₂m)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|--------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Hawke's Bay Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 1.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 4.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 4.4 |
| Sheep and beef cattle farming with forestry | -118.8 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | 1,210.9 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | 1,210.9 |
| Dairy cattle farming | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Other farming | -0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 0.7 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 0.7 |
| Other primary | 6.7 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 233.8 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 233.8 |
| Agriculture, forestry and fishing support services | 13.6 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 426.3 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 426.3 |
| Meat and meat product manufacturing | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -2.7 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -2.7 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 |
| Other food manufacturing | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 8.8 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 8.8 |
| Wood product manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1,173.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1,173.0 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 29.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 29.1 |
| Other manufacturing | 0.0 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 74.0 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 74.0 |
| Utilities, construction, transport | 1.1 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 596.8 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 596.8 |
| Wholesale and retail trade, hospitality | 4.5 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 135.0 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 135.0 |
| Information, finance, insurance, property and business services | 2.0 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | 326.7 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | 326.7 |
| Government, education and health | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 39.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 39.9 |
| Recreational and personal services | 0.1 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 39.6 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 39.6 |
| SUB-TOTAL | -93.5 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | 4,298.3 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | 4,298.3 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 |
| Sheep, beef cattle and grain farming | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | 2.9 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | 2.9 |
| Dairy cattle farming | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 6.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 6.6 |
| Other farming | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.5 |
| Other primary | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 53.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 53.0 |
| Agriculture, forestry and fishing support services | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 11.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 11.6 |
| Meat and meat product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 |
| Other food manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.8 |
| Wood product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 94.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 94.6 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.6 |
| Other manufacturing | 1.2 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 180.6 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 180.6 |
| Utilities, construction, transport | 0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | 247.0 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | 247.0 |
| Wholesale and retail trade, hospitality | 0.2 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 103.2 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 103.2 |
| Information, finance, insurance, property and business services | 1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | 299.6 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | 299.6 |
| Government, education and health | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 19.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 19.1 |
| Recreational and personal services | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 28.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 28.4 |
| SUB-TOTAL | 3.2 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | 1,061.1 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | 1,061.1 |
| TOTAL | -90.3 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | 5,359.4 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | 5,359.4 |

Table 20: Direct and Indirect Net Value Added Impacts for Hawkes Bay Region: Baseline vs Sheep and Beef Farming with 10% *Pinus radiata* Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|------------|------------|------------|------------|------------|------------|---------------|------------|------------|------------|------------|------------|------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 8 | -1 | -1 | -1 | -1 | -1 | 29 | -1 | -1 | -1 | -1 | -1 | -1 | 29 |
| Sheep and beef cattle farming with forestry | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Other farming | -1 | -2 | -2 | -2 | -2 | -2 | 7 | -2 | -2 | -2 | -2 | -2 | -2 | 7 |
| Other primary | 75 | 2 | 2 | 2 | 2 | 2 | 2,621 | 2 | 2 | 2 | 2 | 2 | 2 | 2,621 |
| Agriculture, forestry and fishing support services | 46 | -1 | -1 | -1 | -1 | -1 | 1,437 | -1 | -1 | -1 | -1 | -1 | -1 | 1,437 |
| Meat and meat product manufacturing | -15 | -15 | -15 | -15 | -15 | -15 | -10 | -15 | -15 | -15 | -15 | -15 | -15 | -10 |
| Dairy product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 37 |
| Other food manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| Wood product manufacturing | -3 | -4 | -4 | -4 | -4 | -4 | 33,062 | -4 | -4 | -4 | -4 | -4 | -4 | 33,062 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Other manufacturing | -1 | -7 | -7 | -7 | -7 | -7 | 677 | -7 | -7 | -7 | -7 | -7 | -7 | 677 |
| Utilities, construction, transport | 11 | -13 | -13 | -13 | -13 | -13 | 6,383 | -13 | -13 | -13 | -13 | -13 | -13 | 6,383 |
| Wholesale and retail trade, hospitality | 62 | -12 | -12 | -12 | -12 | -12 | 1,380 | -12 | -12 | -12 | -12 | -12 | -12 | 1,380 |
| Information, finance, insurance, property and business services | 9 | -14 | -14 | -14 | -14 | -14 | 1,555 | -14 | -14 | -14 | -14 | -14 | -14 | 1,555 |
| Government, education and health | 2 | -2 | -2 | -2 | -2 | -2 | 709 | -2 | -2 | -2 | -2 | -2 | -2 | 709 |
| Recreational and personal services | 1 | -7 | -7 | -7 | -7 | -7 | 660 | -7 | -7 | -7 | -7 | -7 | -7 | 660 |
| SUB-TOTAL | 194 | -78 | -78 | -78 | -78 | -78 | 48,575 | -78 | -78 | -78 | -78 | -78 | -78 | 48,575 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | | | | | | | | | | | | | | |
| Sheep, beef cattle and grain farming | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| Dairy cattle farming | -4 | -5 | -5 | -5 | -5 | -5 | 17 | -5 | -5 | -5 | -5 | -5 | -5 | 17 |
| Other farming | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| Other primary | -1 | -1 | -1 | -1 | -1 | -1 | 7 | -1 | -1 | -1 | -1 | -1 | -1 | 7 |
| Agriculture, forestry and fishing support services | 0 | 0 | 0 | 0 | 0 | 0 | 134 | 0 | 0 | 0 | 0 | 0 | 0 | 134 |
| Meat and meat product manufacturing | 0 | -1 | -1 | -1 | -1 | -1 | 194 | -1 | -1 | -1 | -1 | -1 | -1 | 194 |
| Dairy product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| Other food manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Wood product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 34 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 1,004 | 0 | 0 | 0 | 0 | 0 | 0 | 1,004 |
| Other manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 45 |
| Utilities, construction, transport | 1 | -3 | -3 | -3 | -3 | -3 | 743 | -3 | -3 | -3 | -3 | -3 | -3 | 743 |
| Wholesale and retail trade, hospitality | 8 | -6 | -6 | -6 | -6 | -6 | 1,662 | -6 | -6 | -6 | -6 | -6 | -6 | 1,662 |
| Information, finance, insurance, property and business services | 2 | -4 | -4 | -4 | -4 | -4 | 905 | -4 | -4 | -4 | -4 | -4 | -4 | 905 |
| Government, education and health | 9 | -9 | -9 | -9 | -9 | -9 | 1,890 | -9 | -9 | -9 | -9 | -9 | -9 | 1,890 |
| Recreational and personal services | 1 | -1 | -1 | -1 | -1 | -1 | 243 | -1 | -1 | -1 | -1 | -1 | -1 | 243 |
| SUB-TOTAL | 2 | -2 | -2 | -2 | -2 | -2 | 395 | -2 | -2 | -2 | -2 | -2 | -2 | 395 |
| TOTAL | 18 | -35 | -35 | -35 | -35 | -35 | 7,327 | -35 | -35 | -35 | -35 | -35 | -35 | 7,327 |

Table 21: Direct and Indirect Net Value Added Impacts for Hawkes Bay Region: Baseline vs Sheep and Beef Farming with 30% *Pinus radiata* Forest (NZ\$_{2022Q2m})

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 3.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 13.1 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 13.1 |
| Sheep and beef cattle farming with forestry | -399.6 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | 3,691.2 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | 3,691.2 |
| Dairy cattle farming | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| Other farming | -0.4 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | 1.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | 1.8 |
| Other primary | 20.2 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 704.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 704.5 |
| Agriculture, forestry and fishing support services | 40.6 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 1,285.2 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 1,285.2 |
| Meat and meat product manufacturing | -15.8 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -12.1 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -12.1 |
| Dairy product manufacturing | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.4 |
| Other food manufacturing | 0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 26.3 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 26.3 |
| Wood product manufacturing | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 3,536.9 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 3,536.9 |
| Pulp, paper, and converted paper product manufacturing | -0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 87.6 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 87.6 |
| Other manufacturing | -0.3 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | 222.1 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | 222.1 |
| Utilities, construction, transport | 1.8 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | 1,780.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | 1,780.3 |
| Wholesale and retail trade, hospitality | 13.2 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | 405.6 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | 405.6 |
| Information, finance, insurance, property and business services | 4.8 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | 981.5 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | 981.5 |
| Government, education and health | 0.3 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 120.1 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 120.1 |
| Recreational and personal services | 0.2 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | 118.9 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | 118.9 |
| SUB-TOTAL | -331.7 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | 12,969.1 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | 12,969.1 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 2.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 2.4 |
| Sheep, beef cattle and grain farming | -3.1 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | 7.9 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | 7.9 |
| Dairy cattle farming | -0.2 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 19.9 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 19.9 |
| Other farming | -0.4 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 1.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 1.5 |
| Other primary | 0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 159.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 159.1 |
| Agriculture, forestry and fishing support services | 0.0 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 35.0 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 35.0 |
| Meat and meat product manufacturing | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1.9 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.9 |
| Other food manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 11.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 11.3 |
| Wood product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 285.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 285.2 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.0 |
| Other manufacturing | 3.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | 542.2 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | 542.2 |
| Utilities, construction, transport | 2.0 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | 743.0 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | 743.0 |
| Wholesale and retail trade, hospitality | 0.2 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | 310.3 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | 310.3 |
| Information, finance, insurance, property and business services | 3.3 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | 900.4 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | 900.4 |
| Government, education and health | 0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 57.6 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 57.6 |
| Recreational and personal services | 0.3 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 85.3 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 85.3 |
| SUB-TOTAL | 5.5 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | 3,188.9 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | 3,188.9 |
| TOTAL | -326.3 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | 16,158.0 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | 16,158.0 |

Table 22: Direct and Indirect Employment Impacts for Hawkes Bay Region: Baseline vs Sheep and Beef Farming with 30% *Pinus radiata* Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|------------|-------------|-------------|-------------|-------------|-------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 23 | -3 | -3 | -3 | -3 | -3 | 85 | -3 | -3 | -3 | -3 | -3 | -3 | 85 |
| Sheep and beef cattle farming | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 |
| Dairy cattle farming | 0 | -1 | -1 | -1 | -1 | -1 | 21 | -1 | -1 | -1 | -1 | -1 | -1 | 21 |
| Other farming | -4 | -8 | -8 | -8 | -8 | -8 | 18 | -8 | -8 | -8 | -8 | -8 | -8 | 18 |
| Other primary | 227 | 4 | 4 | 4 | 4 | 4 | 7,899 | 4 | 4 | 4 | 4 | 4 | 4 | 7,899 |
| Agriculture, forestry and fishing support services | 137 | -4 | -4 | -4 | -4 | -4 | 4,332 | -4 | -4 | -4 | -4 | -4 | -4 | 4,332 |
| Meat and meat product manufacturing | -58 | -58 | -58 | -58 | -58 | -58 | -44 | -58 | -58 | -58 | -58 | -58 | -58 | -44 |
| Dairy product manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 112 | 0 | 0 | 0 | 0 | 0 | 0 | 112 |
| Other food manufacturing | 3 | -1 | -1 | -1 | -1 | -1 | 66 | -1 | -1 | -1 | -1 | -1 | -1 | 66 |
| Wood product manufacturing | -12 | -16 | -16 | -16 | -16 | -16 | 99,688 | -16 | -16 | -16 | -16 | -16 | -16 | 99,688 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| Other manufacturing | -6 | -22 | -22 | -22 | -22 | -22 | 2,030 | -22 | -22 | -22 | -22 | -22 | -22 | 2,030 |
| Utilities, construction, transport | 22 | -52 | -52 | -52 | -52 | -52 | 19,065 | -52 | -52 | -52 | -52 | -52 | -52 | 19,065 |
| Wholesale and retail trade, hospitality | 182 | -42 | -42 | -42 | -42 | -42 | 4,147 | -42 | -42 | -42 | -42 | -42 | -42 | 4,147 |
| Information, finance, insurance, property and business services | 20 | -49 | -49 | -49 | -49 | -49 | 4,666 | -49 | -49 | -49 | -49 | -49 | -49 | 4,666 |
| Government, education and health | 5 | -7 | -7 | -7 | -7 | -7 | 2,135 | -7 | -7 | -7 | -7 | -7 | -7 | 2,135 |
| Recreational and personal services | 1 | -23 | -23 | -23 | -23 | -23 | 1,982 | -23 | -23 | -23 | -23 | -23 | -23 | 1,982 |
| SUB-TOTAL | 532 | -290 | -290 | -290 | -290 | -290 | 146,201 | -290 | -290 | -290 | -290 | -290 | -290 | 146,201 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -1 | -2 | -2 | -2 | -2 | -2 | 45 | -2 | -2 | -2 | -2 | -2 | -2 | 45 |
| Sheep and beef cattle farming with forestry | -18 | -19 | -19 | -19 | -19 | -19 | 46 | -19 | -19 | -19 | -19 | -19 | -19 | 46 |
| Dairy cattle farming | -1 | -2 | -2 | -2 | -2 | -2 | 74 | -2 | -2 | -2 | -2 | -2 | -2 | 74 |
| Other farming | -5 | -6 | -6 | -6 | -6 | -6 | 19 | -6 | -6 | -6 | -6 | -6 | -6 | 19 |
| Other primary | 1 | 0 | 0 | 0 | 0 | 0 | 404 | 0 | 0 | 0 | 0 | 0 | 0 | 404 |
| Agriculture, forestry and fishing support services | 0 | -6 | -6 | -6 | -6 | -6 | 585 | -6 | -6 | -6 | -6 | -6 | -6 | 585 |
| Meat and meat product manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | 25 | -1 | -1 | -1 | -1 | -1 | -1 | 25 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| Other food manufacturing | 0 | -1 | -1 | -1 | -1 | -1 | 103 | -1 | -1 | -1 | -1 | -1 | -1 | 103 |
| Wood product manufacturing | 0 | -1 | -1 | -1 | -1 | -1 | 3,025 | -1 | -1 | -1 | -1 | -1 | -1 | 3,025 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 135 | 0 | 0 | 0 | 0 | 0 | 0 | 135 |
| Other manufacturing | 2 | -10 | -10 | -10 | -10 | -10 | 2,230 | -10 | -10 | -10 | -10 | -10 | -10 | 2,230 |
| Utilities, construction, transport | 19 | -24 | -24 | -24 | -24 | -24 | 4,999 | -24 | -24 | -24 | -24 | -24 | -24 | 4,999 |
| Wholesale and retail trade, hospitality | 3 | -15 | -15 | -15 | -15 | -15 | 2,720 | -15 | -15 | -15 | -15 | -15 | -15 | 2,720 |
| Information, finance, insurance, property and business services | 20 | -36 | -36 | -36 | -36 | -36 | 5,680 | -36 | -36 | -36 | -36 | -36 | -36 | 5,680 |
| Government, education and health | 2 | -3 | -3 | -3 | -3 | -3 | 730 | -3 | -3 | -3 | -3 | -3 | -3 | 730 |
| Recreational and personal services | 4 | -7 | -7 | -7 | -7 | -7 | 1,186 | -7 | -7 | -7 | -7 | -7 | -7 | 1,186 |
| SUB-TOTAL | 24 | -134 | -134 | -134 | -134 | -134 | 22,027 | -134 | -134 | -134 | -134 | -134 | -134 | 22,027 |
| TOTAL | 556 | -424 | -424 | -424 | -424 | -424 | 168,228 | -424 | -424 | -424 | -424 | -424 | -424 | 168,228 |

Table 23: Direct and Indirect Net Value Added Impacts for Hawkes Bay Region: Baseline vs 100% *Pinus radiata* Forest (NZ\$_{2022Q2m})

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|-----------------|---------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 10.5 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | 39.3 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | 39.3 |
| Sheep and beef cattle farming with forestry | -1,476.0 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | 16,550.8 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | 16,550.8 |
| Dairy cattle farming | -0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 2.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 2.1 |
| Other farming | -3.0 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | 3.6 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | 3.6 |
| Other primary | 67.3 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 2,008.4 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 2,008.4 |
| Agriculture, forestry and fishing support services | 127.4 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | 3,601.3 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | 3,601.3 |
| Meat and meat product manufacturing | -79.5 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -67.6 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -67.6 |
| Dairy product manufacturing | 0.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 18.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 18.0 |
| Other food manufacturing | 0.2 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 85.4 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 85.4 |
| Wood product manufacturing | -2.4 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | 11,781.0 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | 11,781.0 |
| Pulp, paper, and converted paper product manufacturing | -0.6 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | 290.6 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | 290.6 |
| Other manufacturing | -3.5 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | 717.3 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | 717.3 |
| Utilities, construction, transport | -4.4 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | 5,686.9 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | 5,686.9 |
| Wholesale and retail trade, hospitality | 37.8 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | 1,305.8 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | 1,305.8 |
| Information, finance, insurance, property and business services | 3.1 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | 3,085.9 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | 3,085.9 |
| Government, education and health | 0.5 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 389.9 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 389.9 |
| Recreational and personal services | -0.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | 373.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | 373.8 |
| SUB-TOTAL | -1,323.2 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | 45,872.6 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | 45,872.6 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -0.3 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 7.2 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 7.2 |
| Sheep, beef cattle and grain farming | -15.9 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | 18.3 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | 18.3 |
| Dairy cattle farming | -1.4 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 64.5 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 64.5 |
| Other farming | -2.2 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | 3.6 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | 3.6 |
| Other primary | 0.5 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 517.5 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 517.5 |
| Agriculture, forestry and fishing support services | -0.6 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | 110.7 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | 110.7 |
| Meat and meat product manufacturing | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 5.9 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 5.9 |
| Dairy product manufacturing | 0.0 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 29.3 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 29.3 |
| Other food manufacturing | -0.1 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 35.9 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 35.9 |
| Wood product manufacturing | -0.3 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 948.5 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 948.5 |
| Pulp, paper, and converted paper product manufacturing | -0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 56.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 56.2 |
| Other manufacturing | 6.3 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | 1,718.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | 1,718.6 |
| Utilities, construction, transport | 0.5 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | 2,382.0 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | 2,382.0 |
| Wholesale and retail trade, hospitality | -2.1 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | 1,003.1 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | 1,003.1 |
| Information, finance, insurance, property and business services | 1.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | 2,875.5 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | 2,875.5 |
| Government, education and health | 0.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | 186.3 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | 186.3 |
| Recreational and personal services | 0.0 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 271.8 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 271.8 |
| SUB-TOTAL | -14.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | 10,235.0 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | 10,235.0 |
| TOTAL | -1,337.9 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | 56,107.6 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | 56,107.6 |

Table 24: Direct and Indirect Employment Impacts for Hawkes Bay Region: Baseline vs 100% *Pinus radiata* Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|--------------|---------------|---------------|---------------|---------------|---------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 10.5 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | 39.3 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | 39.3 |
| Sheep and beef cattle farming | -1,476.0 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | 16,550.8 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | 16,550.8 |
| Dairy cattle farming | -0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 2.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 2.1 |
| Other farming | -3.0 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | 3.6 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | 3.6 |
| Other primary | 67.3 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 2,008.4 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 2,008.4 |
| Agriculture, forestry and fishing support services | 127.4 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | 3,601.3 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | 3,601.3 |
| Meat and meat product manufacturing | -79.5 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -67.6 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -67.6 |
| Dairy product manufacturing | 0.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 18.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 18.0 |
| Other food manufacturing | 0.2 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 85.4 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 85.4 |
| Wood product manufacturing | -2.4 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | 11,781.0 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | 11,781.0 |
| Pulp, paper, and converted paper product manufacturing | -0.6 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | 290.6 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | 290.6 |
| Other manufacturing | -3.5 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | 717.3 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | 717.3 |
| Utilities, construction, transport | -4.4 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | 5,686.9 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | 5,686.9 |
| Wholesale and retail trade, hospitality | 37.8 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | 1,305.8 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | 1,305.8 |
| Information, finance, insurance, property and business services | 3.1 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | 3,085.9 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | 3,085.9 |
| Government, education and health | 0.5 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 389.9 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 389.9 |
| Recreational and personal services | -0.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | 373.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | 373.8 |
| SUB-TOTAL | ##### | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | ##### | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | ##### |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | | | | | | | | | | | | | | |
| Sheep and beef cattle farming with forestry | -0.3 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 7.2 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 7.2 |
| Dairy cattle farming | -15.9 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | 18.3 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | 18.3 |
| Other farming | -1.4 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 64.5 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 64.5 |
| Other primary | -2.2 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | 3.6 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | 3.6 |
| Agriculture, forestry and fishing support services | 0.5 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 517.5 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 517.5 |
| Meat and meat product manufacturing | -0.6 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | 110.7 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | 110.7 |
| Diary product manufacturing | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 5.9 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 5.9 |
| Other food manufacturing | 0.0 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 29.3 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 29.3 |
| Wood product manufacturing | -0.1 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 35.9 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 35.9 |
| Pulp, paper, and converted paper product manufacturing | -0.3 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 948.5 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 948.5 |
| Other manufacturing | -0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 56.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 56.2 |
| Utilities, construction, transport | 6.3 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | 1,718.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | 1,718.6 |
| Wholesale and retail trade, hospitality | 0.5 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | 2,382.0 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | 2,382.0 |
| Information, finance, insurance, property and business services | -2.1 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | 1,003.1 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | 1,003.1 |
| Government, education and health | 1.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | 2,875.5 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | 2,875.5 |
| Recreational and personal services | 0.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | 186.3 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | 186.3 |
| SUB-TOTAL | 0.0 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 271.8 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 271.8 |
| TOTAL | -14.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | ##### | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | ##### |

Table 25: Direct and Indirect Net Value Added Impacts for Hawkes Bay Region : Baseline vs Sheep and Beef Farming with 10% SPS Forest (NZ\$₂₀₂₂2022m)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 4.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 6.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Sheep and beef cattle farming | -201.1 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | 1,811.6 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 |
| Dairy cattle farming | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other farming | 0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 0.7 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Other primary | 7.7 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 170.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Agriculture, forestry and fishing support services | 16.9 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 303.7 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Meat and meat product manufacturing | -3.9 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -2.9 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 |
| Dairy product manufacturing | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 0.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 7.8 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Wood product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1,062.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Pulp, paper, and converted paper product manufacturing | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 26.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other manufacturing | 0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 64.4 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 |
| Utilities, construction, transport | 2.4 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 449.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 |
| Wholesale and retail trade, hospitality | 15.3 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 123.6 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 |
| Information, finance, insurance, property and business services | 6.5 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | 265.7 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 |
| Government, education and health | 0.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 34.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Recreational and personal services | 0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 32.1 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| SUB-TOTAL | -150.1 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | 4,357.8 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | | | | | | | | | | | | | | |
| Sheep and beef cattle farming with forestry | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dairy cattle farming | -0.7 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | 2.2 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 |
| Other farming | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 6.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other primary | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Agriculture, forestry and fishing support services | 0.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 46.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Meat and meat product manufacturing | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 9.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Diary product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wood product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 85.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Utilities, construction, transport | 2.0 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 146.8 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Wholesale and retail trade, hospitality | 1.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | 207.3 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 |
| Information, finance, insurance, property and business services | 0.6 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 89.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Government, education and health | 3.7 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | 250.1 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 |
| Recreational and personal services | 0.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 16.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| SUB-TOTAL | 0.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 23.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| TOTAL | 8.3 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | 896.1 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 |

Table 26: Direct and Indirect Employment Impacts for Hawkes Bay Region: Baseline vs Sheep and Beef Farming with 10% SPS Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 26 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 42 | -1 | -1 | -1 | -1 | -1 |
| Sheep and beef cattle farming | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Dairy cattle farming | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 |
| Other farming | 1 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 7 | -2 | -2 | -2 | -2 | -2 |
| Other primary | 87 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1,906 | 2 | 2 | 2 | 2 | 2 |
| Agriculture, forestry and fishing support services | 57 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1,024 | -1 | -1 | -1 | -1 | -1 |
| Meat and meat product manufacturing | -14 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -11 | -15 | -15 | -15 | -15 | -15 |
| Dairy product manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 |
| Wood product manufacturing | -1 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | 29,944 | -4 | -4 | -4 | -4 | -4 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 4 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | 584 | -7 | -7 | -7 | -7 | -7 |
| Utilities, construction, transport | 23 | -13 | -13 | -13 | -13 | -13 | -13 | -13 | 4,635 | -13 | -13 | -13 | -13 | -13 |
| Wholesale and retail trade, hospitality | 206 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | 1,282 | -12 | -12 | -12 | -12 | -12 |
| Information, finance, insurance, property and business services | 30 | -14 | -14 | -14 | -14 | -14 | -14 | -14 | 1,279 | -14 | -14 | -14 | -14 | -14 |
| Government, education and health | 6 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 619 | -2 | -2 | -2 | -2 | -2 |
| Recreational and personal services | 6 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | 538 | -7 | -7 | -7 | -7 | -7 |
| SUB-TOTAL | 433 | -78 | -78 | -78 | -78 | -78 | -78 | -78 | 41,910 | -78 | -78 | -78 | -78 | -78 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 |
| Sheep and beef cattle farming with forestry | -4 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | 13 | -5 | -5 | -5 | -5 | -5 |
| Dairy cattle farming | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 |
| Other farming | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 5 | -1 | -1 | -1 | -1 | -1 |
| Other primary | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 0 | 0 | 0 | 0 | 0 |
| Agriculture, forestry and fishing support services | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 165 | -1 | -1 | -1 | -1 | -1 |
| Meat and meat product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 0 |
| Wood product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 908 | 0 | 0 | 0 | 0 | 0 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 5 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | 644 | -3 | -3 | -3 | -3 | -3 |
| Utilities, construction, transport | 15 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | 1,379 | -6 | -6 | -6 | -6 | -6 |
| Wholesale and retail trade, hospitality | 6 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | 775 | -4 | -4 | -4 | -4 | -4 |
| Information, finance, insurance, property and business services | 24 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | 1,586 | -9 | -9 | -9 | -9 | -9 |
| Government, education and health | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 209 | -1 | -1 | -1 | -1 | -1 |
| Recreational and personal services | 4 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 328 | -2 | -2 | -2 | -2 | -2 |
| SUB-TOTAL | 52 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | 6,249 | -35 | -35 | -35 | -35 | -35 |
| TOTAL | 485 | -113 | -113 | -113 | -113 | -113 | -113 | -113 | 48,159 | -113 | -113 | -113 | -113 | -113 |

Table 27: Direct and Indirect Net Value Added Impacts for Hawkes Bay Region: Baseline vs Sheep and Beef Farming with 30% SPS Forest (NZ\$_{2022Q2m})

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Hawke's Bay Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 12.0 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 19.4 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Sheep and beef cattle farming with forestry | -647.6 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | 5,502.4 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 |
| Dairy cattle farming | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other farming | 0.2 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | 1.9 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 |
| Other primary | 23.2 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 512.2 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| Agriculture, forestry and fishing support services | 50.6 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 915.3 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 |
| Meat and meat product manufacturing | -15.7 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -12.6 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 |
| Dairy product manufacturing | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 0.9 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 23.4 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Wood product manufacturing | -0.2 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | 3,203.2 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Pulp, paper, and converted paper product manufacturing | 0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 79.0 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Other manufacturing | 2.0 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | 193.0 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 |
| Utilities, construction, transport | 6.0 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | 1,336.1 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 |
| Wholesale and retail trade, hospitality | 45.5 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | 371.3 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 |
| Information, finance, insurance, property and business services | 18.4 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | 797.5 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 |
| Government, education and health | 1.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 104.1 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Recreational and personal services | 1.1 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | 96.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 |
| SUB-TOTAL | -502.2 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | 13,148.2 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 2.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Sheep, beef cattle and grain farming | -2.9 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | 5.9 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 |
| Dairy cattle farming | 0.1 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 17.9 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Other farming | -0.4 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 1.1 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Other primary | 0.6 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 140.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Agriculture, forestry and fishing support services | 0.2 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | 29.7 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Meat and meat product manufacturing | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 1.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Dairy product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 9.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Wood product manufacturing | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 257.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other manufacturing | 5.5 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | 440.3 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 |
| Utilities, construction, transport | 5.0 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | 623.2 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 |
| Wholesale and retail trade, hospitality | 1.4 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | 267.3 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 |
| Information, finance, insurance, property and business services | 10.0 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | 751.1 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 |
| Government, education and health | 0.5 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 49.6 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Recreational and personal services | 0.7 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 70.8 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| SUB-TOTAL | 20.9 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | 2,691.4 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 |
| TOTAL | -481.3 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | 15,839.6 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 |

Table 28: Direct and Indirect Employment Impacts for Hawkes Bay Region: Baseline vs Sheep and Beef Farming with 30% SPS Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------|-------------|-------------|-------------|-------------|-------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 78 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | 126 | -3 | -3 | -3 | -3 | -3 |
| Sheep and beef cattle farming | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 |
| Dairy cattle farming | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 20 | -1 | -1 | -1 | -1 | -1 |
| Other farming | 2 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | 18 | -8 | -8 | -8 | -8 | -8 |
| Other primary | 261 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5,742 | 4 | 4 | 4 | 4 | 4 |
| Agriculture, forestry and fishing support services | 170 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | 3,085 | -4 | -4 | -4 | -4 | -4 |
| Meat and meat product manufacturing | -57 | -58 | -58 | -58 | -58 | -58 | -58 | -58 | -46 | -58 | -58 | -58 | -58 | -58 |
| Dairy product manufacturing | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 104 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 10 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 63 | -1 | -1 | -1 | -1 | -1 |
| Wood product manufacturing | -5 | -16 | -16 | -16 | -16 | -16 | -16 | -16 | 90,284 | -16 | -16 | -16 | -16 | -16 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 11 | -22 | -22 | -22 | -22 | -22 | -22 | -22 | 1,750 | -22 | -22 | -22 | -22 | -22 |
| Utilities, construction, transport | 57 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | 13,795 | -52 | -52 | -52 | -52 | -52 |
| Wholesale and retail trade, hospitality | 616 | -42 | -42 | -42 | -42 | -42 | -42 | -42 | 3,849 | -42 | -42 | -42 | -42 | -42 |
| Information, finance, insurance, property and business services | 84 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | 3,834 | -49 | -49 | -49 | -49 | -49 |
| Government, education and health | 16 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | 1,865 | -7 | -7 | -7 | -7 | -7 |
| Recreational and personal services | 15 | -23 | -23 | -23 | -23 | -23 | -23 | -23 | 1,616 | -23 | -23 | -23 | -23 | -23 |
| SUB-TOTAL | 1,254 | -290 | -290 | -290 | -290 | -290 | -290 | -290 | 126,102 | -290 | -290 | -290 | -290 | -290 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 37 | -2 | -2 | -2 | -2 | -2 |
| Sheep and beef cattle farming with forestry | -17 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | 34 | -19 | -19 | -19 | -19 | -19 |
| Dairy cattle farming | 0 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 66 | -2 | -2 | -2 | -2 | -2 |
| Other farming | -5 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | 14 | -6 | -6 | -6 | -6 | -6 |
| Other primary | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 358 | 0 | 0 | 0 | 0 | 0 |
| Agriculture, forestry and fishing support services | 3 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | 497 | -6 | -6 | -6 | -6 | -6 |
| Meat and meat product manufacturing | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 22 | -1 | -1 | -1 | -1 | -1 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 87 | -1 | -1 | -1 | -1 | -1 |
| Wood product manufacturing | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2,736 | -1 | -1 | -1 | -1 | -1 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 12 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | 1,931 | -10 | -10 | -10 | -10 | -10 |
| Utilities, construction, transport | 39 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | 4,144 | -24 | -24 | -24 | -24 | -24 |
| Wholesale and retail trade, hospitality | 14 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | 2,329 | -15 | -15 | -15 | -15 | -15 |
| Information, finance, insurance, property and business services | 64 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | 4,763 | -36 | -36 | -36 | -36 | -36 |
| Government, education and health | 5 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | 630 | -3 | -3 | -3 | -3 | -3 |
| Recreational and personal services | 9 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | 987 | -7 | -7 | -7 | -7 | -7 |
| SUB-TOTAL | 128 | -134 | -134 | -134 | -134 | -134 | -134 | -134 | 18,774 | -134 | -134 | -134 | -134 | -134 |
| TOTAL | 1,381 | -424 | -424 | -424 | -424 | -424 | -424 | -424 | 144,876 | -424 | -424 | -424 | -424 | -424 |

Table 29: Direct and Indirect Net Value Added Impacts for Hawkes Bay Region: Baseline vs 100% SPS Forest (NZ\$₂₀₂₂2021m)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 38.7 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | 61.2 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 |
| Sheep and beef cattle farming with forestry | -2,301.8 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | 21,385.2 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 |
| Dairy cattle farming | 0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 2.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Other farming | -0.9 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | 4.1 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 |
| Other primary | 77.3 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1,472.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Agriculture, forestry and fishing support services | 160.7 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | 2,578.1 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 |
| Meat and meat product manufacturing | -79.1 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -69.3 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 |
| Dairy product manufacturing | 0.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 16.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other food manufacturing | 2.5 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | 76.2 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 |
| Wood product manufacturing | -1.6 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | 10,669.6 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | 262.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Other manufacturing | 4.2 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | 624.6 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 |
| Utilities, construction, transport | 9.3 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | 4,242.0 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 |
| Wholesale and retail trade, hospitality | 145.8 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | 1,202.0 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 |
| Information, finance, insurance, property and business services | 48.5 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | 2,521.2 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 |
| Government, education and health | 2.7 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 339.5 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 |
| Recreational and personal services | 2.2 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | 304.7 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 |
| SUB-TOTAL | -1,890.7 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | 45,691.7 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -0.2 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 6.0 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Sheep, beef cattle and grain farming | -15.4 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | 12.3 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 |
| Dairy cattle farming | -0.3 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | 58.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 |
| Other farming | -2.1 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | 2.5 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 |
| Other primary | 1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | 457.3 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 |
| Agriculture, forestry and fishing support services | -0.1 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | 94.9 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 |
| Meat and meat product manufacturing | -0.3 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | 5.1 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Dairy product manufacturing | 0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 26.3 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Other food manufacturing | 0.2 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | 30.4 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Wood product manufacturing | 0.1 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | 858.0 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 |
| Pulp, paper, and converted paper product manufacturing | 0.0 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | 50.3 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Other manufacturing | 14.4 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | 1,401.0 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 |
| Utilities, construction, transport | 10.4 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | 2,007.4 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 |
| Wholesale and retail trade, hospitality | 2.0 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | 867.2 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 |
| Information, finance, insurance, property and business services | 23.9 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | 2,410.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 |
| Government, education and health | 1.1 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | 161.1 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 |
| Recreational and personal services | 1.4 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | 226.8 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 |
| SUB-TOTAL | 36.9 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | 8,674.8 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 |
| TOTAL | -1,853.7 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | 54,366.4 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 |

Table 30: Direct and Indirect Employment Impacts for Hawkes Bay Region: Baseline vs 100% SPS Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 252 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | 398 | -19 | -19 | -19 | -19 | -19 |
| Sheep and beef cattle farming | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 |
| Dairy cattle farming | 2 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | 62 | -7 | -7 | -7 | -7 | -7 |
| Other farming | -8 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | 39 | -40 | -40 | -40 | -40 | -40 |
| Other primary | 867 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 16,502 | 11 | 11 | 11 | 11 | 11 |
| Agriculture, forestry and fishing support services | 542 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | 8,690 | -40 | -40 | -40 | -40 | -40 |
| Meat and meat product manufacturing | -289 | -291 | -291 | -291 | -291 | -291 | -291 | -291 | -253 | -291 | -291 | -291 | -291 | -291 |
| Dairy product manufacturing | 14 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 343 | -1 | -1 | -1 | -1 | -1 |
| Other food manufacturing | 33 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | 202 | -3 | -3 | -3 | -3 | -3 |
| Wood product manufacturing | -45 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | 300,726 | -82 | -82 | -82 | -82 | -82 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 21 | -87 | -87 | -87 | -87 | -87 | -87 | -87 | 5,651 | -87 | -87 | -87 | -87 | -87 |
| Utilities, construction, transport | 104 | -259 | -259 | -259 | -259 | -259 | -259 | -259 | 43,997 | -259 | -259 | -259 | -259 | -259 |
| Wholesale and retail trade, hospitality | 1,984 | -212 | -212 | -212 | -212 | -212 | -212 | -212 | 12,408 | -212 | -212 | -212 | -212 | -212 |
| Information, finance, insurance, property and business services | 206 | -238 | -238 | -238 | -238 | -238 | -238 | -238 | 12,119 | -238 | -238 | -238 | -238 | -238 |
| Government, education and health | 42 | -34 | -34 | -34 | -34 | -34 | -34 | -34 | 6,102 | -34 | -34 | -34 | -34 | -34 |
| Recreational and personal services | 26 | -100 | -100 | -100 | -100 | -100 | -100 | -100 | 5,128 | -100 | -100 | -100 | -100 | -100 |
| SUB-TOTAL | 3,711 | -1,444 | -1,444 | -1,444 | -1,444 | -1,444 | -1,444 | -1,444 | 412,104 | -1,444 | -1,444 | -1,444 | -1,444 | -1,444 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | -4 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | 113 | -9 | -9 | -9 | -9 | -9 |
| Sheep and beef cattle farming with forestry | -89 | -97 | -97 | -97 | -97 | -97 | -97 | -97 | 71 | -97 | -97 | -97 | -97 | -97 |
| Dairy cattle farming | -1 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | 216 | -8 | -8 | -8 | -8 | -8 |
| Other farming | -26 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | 30 | -29 | -29 | -29 | -29 | -29 |
| Other primary | 3 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 1,176 | -2 | -2 | -2 | -2 | -2 |
| Agriculture, forestry and fishing support services | -1 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | 1,587 | -29 | -29 | -29 | -29 | -29 |
| Meat and meat product manufacturing | -4 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | 68 | -6 | -6 | -6 | -6 | -6 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 1 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | 277 | -5 | -5 | -5 | -5 | -5 |
| Wood product manufacturing | 1 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | 9,102 | -7 | -7 | -7 | -7 | -7 |
| Pulp, paper, and converted paper product manufacturing | 0 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | 400 | -2 | -2 | -2 | -2 | -2 |
| Other manufacturing | 22 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | 6,262 | -52 | -52 | -52 | -52 | -52 |
| Utilities, construction, transport | 89 | -122 | -122 | -122 | -122 | -122 | -122 | -122 | 13,292 | -122 | -122 | -122 | -122 | -122 |
| Wholesale and retail trade, hospitality | 21 | -77 | -77 | -77 | -77 | -77 | -77 | -77 | 7,538 | -77 | -77 | -77 | -77 | -77 |
| Information, finance, insurance, property and business services | 153 | -182 | -182 | -182 | -182 | -182 | -182 | -182 | 15,294 | -182 | -182 | -182 | -182 | -182 |
| Government, education and health | 13 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | 2,049 | -15 | -15 | -15 | -15 | -15 |
| Recreational and personal services | 18 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | 3,163 | -36 | -36 | -36 | -36 | -36 |
| SUB-TOTAL | 198 | -678 | -678 | -678 | -678 | -678 | -678 | -678 | 60,697 | -678 | -678 | -678 | -678 | -678 |
| TOTAL | 3,908 | -2,122 | -2,122 | -2,122 | -2,122 | -2,122 | -2,122 | -2,122 | 472,801 | -2,122 | -2,122 | -2,122 | -2,122 | -2,122 |

Table 31: Direct and Indirect Net Value Added Impacts for Hawkes Bay Region : Baseline vs Sheep and Beef Farming with 10% Native Forest (NZ\$_{2022Q2M})

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Hawke's Bay Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 18.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Sheep and beef cattle farming with forestry | -606.5 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 |
| Dairy cattle farming | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other farming | 1.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Other primary | 11.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Agriculture, forestry and fishing support services | 30.8 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Meat and meat product manufacturing | -3.7 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 |
| Dairy product manufacturing | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 1.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Wood product manufacturing | 0.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Pulp, paper, and converted paper product manufacturing | 0.4 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other manufacturing | 4.4 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 |
| Utilities, construction, transport | 8.9 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 |
| Wholesale and retail trade, hospitality | 70.7 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 |
| Information, finance, insurance, property and business services | 29.1 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 |
| Government, education and health | 1.5 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Recreational and personal services | 1.9 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| SUB-TOTAL | -429.3 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 | -20.2 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sheep, beef cattle and grain farming | -0.4 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 |
| Dairy cattle farming | 0.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other farming | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other primary | 0.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Agriculture, forestry and fishing support services | 0.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Meat and meat product manufacturing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dairy product manufacturing | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wood product manufacturing | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pulp, paper, and converted paper product manufacturing | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other manufacturing | 5.8 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Utilities, construction, transport | 6.6 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 | -0.9 |
| Wholesale and retail trade, hospitality | 2.5 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Information, finance, insurance, property and business services | 14.8 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 | -1.5 |
| Government, education and health | 0.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Recreational and personal services | 0.9 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| SUB-TOTAL | 33.2 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 | -4.9 |
| TOTAL | -396.1 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 | -25.1 |

Table 32: Direct and Indirect Employment Impacts for Hawkes Bay Region : Baseline vs Sheep and Beef Farming with 10% Native Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Hawke's Bay Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 121 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Sheep and beef cattle farming | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Dairy cattle farming | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other farming | 12 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Other primary | 126 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Agriculture, forestry and fishing support services | 104 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Meat and meat product manufacturing | -14 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 |
| Dairy product manufacturing | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wood product manufacturing | 11 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 31 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 |
| Utilities, construction, transport | 77 | -13 | -13 | -13 | -13 | -13 | -13 | -13 | -13 | -13 | -13 | -13 | -13 | -13 |
| Wholesale and retail trade, hospitality | 950 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | -12 |
| Information, finance, insurance, property and business services | 138 | -14 | -14 | -14 | -14 | -14 | -14 | -14 | -14 | -14 | -14 | -14 | -14 | -14 |
| Government, education and health | 24 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Recreational and personal services | 29 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 |
| SUB-TOTAL | 1,631 | -78 | -78 | -78 | -78 | -78 | -78 | -78 | -78 | -78 | -78 | -78 | -78 | -78 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sheep and beef cattle farming with forestry | -2 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 |
| Dairy cattle farming | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other farming | 0 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Other primary | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Agriculture, forestry and fishing support services | 5 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Meat and meat product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diary product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wood product manufacturing | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pulp, paper, and converted paper product manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 20 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Utilities, construction, transport | 47 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 |
| Wholesale and retail trade, hospitality | 24 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 |
| Information, finance, insurance, property and business services | 97 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 |
| Government, education and health | 8 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Recreational and personal services | 13 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| SUB-TOTAL | 220 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | -35 | -35 |
| TOTAL | 1,851 | -113 | -113 | -113 | -113 | -113 | -113 | -113 | -113 | -113 | -113 | -113 | -113 | -113 |

Table 33: Direct and Indirect Net Value Added Impacts for Hawkes Bay Region : Baseline vs Sheep and Beef Farming with 30% Native Forest (NZ\$_{2022Q2m})

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| Hawke's Bay Region | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 56.0 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Sheep and beef cattle farming with forestry | -1,870.2 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 | -67.5 |
| Dairy cattle farming | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other farming | 3.5 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 |
| Other primary | 33.8 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| Agriculture, forestry and fishing support services | 92.6 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 |
| Meat and meat product manufacturing | -15.1 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 | -15.9 |
| Dairy product manufacturing | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 4.4 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Wood product manufacturing | 1.0 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Pulp, paper, and converted paper product manufacturing | 1.0 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Other manufacturing | 13.2 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 |
| Utilities, construction, transport | 25.7 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 | -6.3 |
| Wholesale and retail trade, hospitality | 213.1 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 | -3.8 |
| Information, finance, insurance, property and business services | 86.6 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 | -10.2 |
| Government, education and health | 4.3 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Recreational and personal services | 5.5 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 | -1.3 |
| SUB-TOTAL | -1,343.1 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 | -110.7 |
| Rest of New Zealand | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Sheep, beef cattle and grain farming | -2.1 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 | -3.3 |
| Dairy cattle farming | 1.9 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Other farming | -0.2 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Other primary | 2.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Agriculture, forestry and fishing support services | 0.9 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 |
| Meat and meat product manufacturing | 0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Dairy product manufacturing | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other food manufacturing | 0.6 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Wood product manufacturing | 0.7 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Pulp, paper, and converted paper product manufacturing | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other manufacturing | 17.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 |
| Utilities, construction, transport | 19.2 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 | -3.7 |
| Wholesale and retail trade, hospitality | 7.4 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 | -1.7 |
| Information, finance, insurance, property and business services | 43.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 | -5.6 |
| Government, education and health | 1.9 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Recreational and personal services | 2.6 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| SUB-TOTAL | 96.2 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 | -19.1 |
| TOTAL | -1,246.9 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 | -129.7 |

Table 34: Direct and Indirect Employment Impacts for Hawkes Bay Region: Baseline vs Sheep and Beef Farming with 30% Native Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 364 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Sheep and beef cattle farming | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 |
| Dairy cattle farming | 12 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Other farming | 34 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 |
| Other primary | 380 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Agriculture, forestry and fishing support services | 312 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 | -4 |
| Meat and meat product manufacturing | -55 | -58 | -58 | -58 | -58 | -58 | -58 | -58 | -58 | -58 | -58 | -58 | -58 | -58 |
| Dairy product manufacturing | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 47 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Wood product manufacturing | 29 | -16 | -16 | -16 | -16 | -16 | -16 | -16 | -16 | -16 | -16 | -16 | -16 | -16 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 91 | -22 | -22 | -22 | -22 | -22 | -22 | -22 | -22 | -22 | -22 | -22 | -22 | -22 |
| Utilities, construction, transport | 222 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | -52 |
| Wholesale and retail trade, hospitality | 2,863 | -42 | -42 | -42 | -42 | -42 | -42 | -42 | -42 | -42 | -42 | -42 | -42 | -42 |
| Information, finance, insurance, property and business services | 409 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | -49 | -49 |
| Government, education and health | 70 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 |
| Recreational and personal services | 86 | -23 | -23 | -23 | -23 | -23 | -23 | -23 | -23 | -23 | -23 | -23 | -23 | -23 |
| SUB-TOTAL | 4,874 | -290 | -290 | -290 | -290 | -290 | -290 | -290 | -290 | -290 | -290 | -290 | -290 | -290 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 3 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Sheep and beef cattle farming with forestry | -12 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | -19 |
| Dairy cattle farming | 7 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Other farming | -3 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 |
| Other primary | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Agriculture, forestry and fishing support services | 14 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 |
| Meat and meat product manufacturing | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Diary product manufacturing | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 4 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Wood product manufacturing | 8 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Pulp, paper, and converted paper product manufacturing | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 58 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 |
| Utilities, construction, transport | 136 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 |
| Wholesale and retail trade, hospitality | 69 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 |
| Information, finance, insurance, property and business services | 285 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 |
| Government, education and health | 23 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Recreational and personal services | 37 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 |
| SUB-TOTAL | 636 | -134 | -134 | -134 | -134 | -134 | -134 | -134 | -134 | -134 | -134 | -134 | -134 | -134 |
| TOTAL | 5,511 | -424 | -424 | -424 | -424 | -424 | -424 | -424 | -424 | -424 | -424 | -424 | -424 | -424 |

Table 35: Direct and Indirect Net Value Added Impacts for Hawkes Bay Region : Baseline vs 100% Native Forest (NZ\$₂₀₂₂202m)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 185.6 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 | -3.0 |
| Sheep and beef cattle farming with forestry | -6,374.6 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 | -369.5 |
| Dairy cattle farming | 1.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Other farming | 10.2 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 | -4.1 |
| Other primary | 112.6 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Agriculture, forestry and fishing support services | 300.6 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 | -11.7 |
| Meat and meat product manufacturing | -77.2 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 | -79.8 |
| Dairy product manufacturing | 3.3 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Other food manufacturing | 14.4 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 | -1.1 |
| Wood product manufacturing | 2.4 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 | -2.9 |
| Pulp, paper, and converted paper product manufacturing | 3.2 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Other manufacturing | 41.6 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 | -10.4 |
| Utilities, construction, transport | 75.0 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 | -31.5 |
| Wholesale and retail trade, hospitality | 704.4 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 | -18.9 |
| Information, finance, insurance, property and business services | 276.0 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 | -46.8 |
| Government, education and health | 13.7 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 |
| Recreational and personal services | 16.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 | -5.8 |
| SUB-TOTAL | -4,691.0 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 | -588.0 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 0.4 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Sheep, beef cattle and grain farming | -12.5 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 | -16.7 |
| Dairy cattle farming | 5.5 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 | -2.1 |
| Other farming | -1.5 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 | -2.4 |
| Other primary | 6.5 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 |
| Agriculture, forestry and fishing support services | 2.3 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 | -1.8 |
| Meat and meat product manufacturing | 0.1 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Dairy product manufacturing | 0.8 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Other food manufacturing | 1.7 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Wood product manufacturing | 2.1 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 | -0.7 |
| Pulp, paper, and converted paper product manufacturing | 0.6 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 |
| Other manufacturing | 52.9 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 | -10.6 |
| Utilities, construction, transport | 57.7 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 | -18.6 |
| Wholesale and retail trade, hospitality | 22.0 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 | -8.5 |
| Information, finance, insurance, property and business services | 136.0 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 | -28.3 |
| Government, education and health | 6.0 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 |
| Recreational and personal services | 7.9 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 | -2.6 |
| SUB-TOTAL | 288.5 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 | -96.7 |
| TOTAL | -4,402.5 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 | -684.7 |

Table 36: Direct and Indirect Employment Impacts for Hawkes Bay Region: Baseline vs 100% Native Forest (MECs)

| Forecast Year | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2050 | 2052 | 2057 | 2062 | 2067 | 2072 | 2077 | 2078 |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Year | 0 | 5 | 10 | 15 | 20 | 25 | 28 | 30 | 35 | 40 | 45 | 50 | 55 | 56 |
| <i>Hawke's Bay Region</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 1,206 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | -19 |
| Sheep and beef cattle farming | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 |
| Dairy cattle farming | 35 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 |
| Other farming | 99 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 |
| Other primary | 1,263 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 |
| Agriculture, forestry and fishing support services | 1,013 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 | -40 |
| Meat and meat product manufacturing | -282 | -291 | -291 | -291 | -291 | -291 | -291 | -291 | -291 | -291 | -291 | -291 | -291 | -291 |
| Dairy product manufacturing | 67 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Other food manufacturing | 155 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Wood product manufacturing | 67 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 |
| Pulp, paper, and converted paper product manufacturing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other manufacturing | 291 | -87 | -87 | -87 | -87 | -87 | -87 | -87 | -87 | -87 | -87 | -87 | -87 | -87 |
| Utilities, construction, transport | 654 | -259 | -259 | -259 | -259 | -259 | -259 | -259 | -259 | -259 | -259 | -259 | -259 | -259 |
| Wholesale and retail trade, hospitality | 9,476 | -212 | -212 | -212 | -212 | -212 | -212 | -212 | -212 | -212 | -212 | -212 | -212 | -212 |
| Information, finance, insurance, property and business services | 1,289 | -238 | -238 | -238 | -238 | -238 | -238 | -238 | -238 | -238 | -238 | -238 | -238 | -238 |
| Government, education and health | 223 | -34 | -34 | -34 | -34 | -34 | -34 | -34 | -34 | -34 | -34 | -34 | -34 | -34 |
| Recreational and personal services | 263 | -100 | -100 | -100 | -100 | -100 | -100 | -100 | -100 | -100 | -100 | -100 | -100 | -100 |
| SUB-TOTAL | 15,780 | -1,444 | -1,444 | -1,444 | -1,444 | -1,444 | -1,444 | -1,444 | -1,444 | -1,444 | -1,444 | -1,444 | -1,444 | -1,444 |
| <i>Rest of New Zealand</i> | | | | | | | | | | | | | | |
| Horticulture and fruit growing | 7 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 |
| Sheep and beef cattle farming with forestry | -72 | -97 | -97 | -97 | -97 | -97 | -97 | -97 | -97 | -97 | -97 | -97 | -97 | -97 |
| Dairy cattle farming | 21 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 |
| Other farming | -19 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | -29 |
| Other primary | 11 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Agriculture, forestry and fishing support services | 38 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | -29 | -29 |
| Meat and meat product manufacturing | 1 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 |
| Diary product manufacturing | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other food manufacturing | 13 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 | -5 |
| Wood product manufacturing | 23 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 |
| Pulp, paper, and converted paper product manufacturing | 5 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 |
| Other manufacturing | 178 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | -52 | -52 |
| Utilities, construction, transport | 411 | -122 | -122 | -122 | -122 | -122 | -122 | -122 | -122 | -122 | -122 | -122 | -122 | -122 |
| Wholesale and retail trade, hospitality | 208 | -77 | -77 | -77 | -77 | -77 | -77 | -77 | -77 | -77 | -77 | -77 | -77 | -77 |
| Information, finance, insurance, property and business services | 889 | -182 | -182 | -182 | -182 | -182 | -182 | -182 | -182 | -182 | -182 | -182 | -182 | -182 |
| Government, education and health | 73 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 |
| Recreational and personal services | 110 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 | -36 |
| SUB-TOTAL | 1,896 | -678 | -678 | -678 | -678 | -678 | -678 | -678 | -678 | -678 | -678 | -678 | -678 | -678 |
| TOTAL | 17,676 | -2,122 | -2,122 | -2,122 | -2,122 | -2,122 | -2,122 | -2,122 | -2,122 | -2,122 | -2,122 | -2,122 | -2,122 | -2,122 |

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