

**KEY SOCIO-ECONOMIC IMPACTS IN TRANSITIONING
TO WOOD SUPPLY ARRANGEMENTS DETAILED IN
TASMANIAN FOREST AGREEMENT (TFA)**

REPORT

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Disclaimer: Bob Smith is currently a Director of Forestry Tasmania and performed this work in a separate capacity. Bob Smith, Tony O'Hara and Martin Farley have previously undertaken socio-economic analysis similar to that undertaken in this Report for the Independent Verification Group under Inter Government Agreement 2011. Bob Smith declared a potential conflict and this was accepted by the commissioning agency with agreement of the Signatories.

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EXECUTIVE SUMMARY

The Tasmanian Forest Agreement 2012 (TFA) between the Signatories specifies (Clause 4) the on-going public native forest wood supply for Tasmanian forest industries as:

- (a) "At least 137,000 cubic metres per year of high quality sawlogs across the State, including volumes required at regional level".
- (b) "Peeler wood supply to meet renegotiated contracts arising out of this Agreement".
- (c) "A yield of speciality timber to meet the need for special species supply. The agreed required yield will be determined by (Signatory/Stakeholder Council). Pending that determination, annual supply will be as per the FT Special Timbers Strategy 2010".
- (d) "Secure supply of low grade sawlogs (Category 2 and Category 8)" - volume unspecified - to Regional sawmillers.

The wood supply volumes specified in the TFA represent significant reductions from traditional native forest log supply levels and current log supply contract commitments to industry by Forestry Tasmania.

The purpose of this Report is to document the key socio-economic impacts for Tasmania and at regional levels, in transitioning the Tasmanian native forest industry to potentially lower log supply volumes, including log supply volumes specified by the TFA. Because time and financial constraints did not permit the data gathering necessary to underpin a comprehensive socio-economic analysis, the Report focuses on direct and indirect impacts on employment and key economic indicators.

The Report also provides commentary on the trends and the significant structural changes (for example, reduction of around 50% in jobs between 2006 and 2011) that occurred within the Tasmanian timber and wood product industry as the TFA has progressed. These changes are somewhat independent of TFA negotiations.

METHODOLOGY

Estimates of the socio-economic impacts (jobs and financial flows) in transitioning Tasmania's native forest industry to lower log supply levels were generated utilising the results from running the Jobs and Investment Changes Model and Input-Output Model previously developed in early 2012 as part of IGA process. The methodology and processes used to construct the Jobs and Investment Changes Model and Input-Output Model are detailed in the consolidated Report of Independent Verification Group, May 2012 (R-IVG 2012).

To assess the key socio-economic impacts under probable future log supply scenarios to the native forest industry, including transitioning under the TFA, a Baseline (reference point) log supply has been developed by the authors. The core driver for this Report's socio-economic analysis is changes to employment levels. The Jobs and Investment Model uses changes in total log volume inputs to vary employment levels. Ideally, the Baseline would be consistent with the estimated operating environment for Tasmanian forest industries applying in the latter part (Oct to Dec) of 2012.

Employment levels being maintained by sawmillers and contractors in recent months are quite inconsistent with total log volume inputs by firms for the same period. There is considerable anecdotal evidence during this period that firms have maintained employment levels, while purchasing lower volumes, pending the outcome of TFA negotiations. For the Jobs and Investment Model to function, it was necessary to estimate a total log volume intake consistent with employment levels in recent months.

The Baseline public native forest log supply is the authors' judgement of a nominal log supply available to and used by the Tasmanian native forest industry that is consistent with average employment levels in recent months. The nominal log supply for the Baseline could be thought of as the log supply that would need to be processed by the industry to result in the average employment levels of recent months and if that log supply was expected to continue at that level for at least two years.

With regard to public forest high quality sawlogs (HQSL), the Baseline was judged to comprise a log availability level similar to Forestry Tasmania's contractual commitments. For other products, the industry is assessed as operating below contracted levels.

A variation on this approach was used for Baseline supply volumes to Ta Ann. Ta Ann's operating structure (for the Baseline and Scenario 1) is based on a peeler log supply of 157,000 m³/year, with both mills to remain operating pending the outcome of the TFA. This volume is significantly less than the contracted volume of 265,000 m³/year. Actual employment (91 persons) at Ta Ann's mills for the processing of 157,000 m³/yr, supplied from public native forests, was used in the Baseline.

For the purposes of this work, the Baseline log supply comprises:

- (a) 163,000 m³/yr of high quality sawlogs, plus 4,050 m³ sliced veneer logs;
- (b) 157,000 m³/yr peeler logs to Ta Ann;
- (c) 10,080 m³/yr of special species timbers (SST, primarily blackwood);
- (d) approximately 1,154,000 m³/yr of other solid wood products including poles and bridge girders and low quality sawlogs for domestic processing, pulpwood and low quality export logs;
- (e) in addition to the above supply from public native forest, private property log supplies of around 100,000 m³/yr of all products are included, as were used in R-IVG 2012.

Two Scenarios were used to generate estimates of key socio-economic impacts under potential future log supplies to Tasmania's native forest industry.

Scenario 1 is built around transitioning the industry to HQSL log supply targeted in the TFA (137,000 m³/yr), with log supply of other products, including peeler supply to Ta Ann, bounded by the HQSL volume. Scenario 1 incorporates Ta Ann continuing to operate both mills at October to December 2012 employment levels. Scenario 1 is considered a proxy for implementing log supply levels intended by the TFA.

Specifically, Scenario 1 log supply comprises:

- (a) 137,000 m³/yr high quality sawlogs (log supply specified in the TFA), plus 3,400 m³ veneer logs;
- (b) 157,000 m³/yr peeler logs to Ta Ann;
- (c) 9,000 m³/yr of special species timbers (SST, primarily blackwood);
- (d) approximately 870,000 m³/yr of other solid wood products, including poles and girders, low quality sawlogs for domestic processing, pulpwood and low quality export logs;
- (e) private property native forest log supplies of approximately 20,000 m³/yr of sawlogs of all grades, 2,000 m³/yr of Special Species and 80,000 m³/yr of all other logs for all products, as per R-IVG 2012.

Scenario 2 is a judgement by the authors of a potential option for log supply to the Tasmanian native forest industry if there is no broadly supported agreement between the parties and high levels of contestability remain on harvesting native forests. Scenario 2 incorporates a future Tasmanian native forest industry using a reduced ongoing supply of sawlogs (HQSL, veneer and lower grade sawlogs), SST and poles, with negligible access to other commercially viable markets for residual wood and peeler logs. In Scenario 2, Ta Ann is assumed to close both mills and profitable residue

markets for public native forest residual logs are not available (these assumptions are consistent with public statements by companies). It should be noted that Scenario 2 is for illustrative purposes. Other scenarios, reflecting specific government policy positions, can be developed. Note that Scenario 2 does not address the substantial challenges in establishing a commercially viable supply chain for all participants and the processing and marketing structures that would be necessary to successfully implement Scenario 2. It is the authors' judgement that meeting these challenges would require significant investment that is beyond the investment appetite of the current Tasmanian forest industry.

Specifically, Scenario 2 log supply comprises:

- (a) 100,000 m³/yr high quality sawlogs, including 2,420 m³ veneer logs;
- (b) 3,000 m³/yr of special species timbers (SST, primarily blackwood);
- (c) approximately 18,000 m³/yr of poles and low quality (Category 2 and Category 8) sawlogs for domestic processing;
- (d) private property native forest log supplies for all products of approximately 20,000 m³/yr of sawlogs of all grades and 2,000 m³/yr of Special Species, as per R-IVG 2012, (no pulpwood logs or peeler logs to Ta Ann).

Log supply levels from public native forest for the Baseline and the two Scenarios are therefore:

Summary Table: Public Forest Log Input Baseline and Scenarios

	HQ (Cat 1/3) sawlogs (m ³ /yr)	Sliced veneer logs (m ³ /yr)	Cat 2 sawlogs (m ³ /yr)	Peeler logs to Ta Ann (m ³ /yr)	Poles (m ³ /yr)	Special Species (m ³ /yr)	Pulplogs and Cat 8 logs (t/yr)
Baseline	163,000	4,050	14,600	157,000	5,270	10,080	1,062,060
Scenario 1	137,000	3,400	11,050	157,000	4,400	9,000	803,630
Scenario 2	97,580	2,420	7,870	0	3,140	3,000	10,000 (Cat 8)

Both Scenarios incorporate log supply from private native forests of approximately 20,000 m³/yr of sawlogs of all grades and 2,000 m³/yr of Special Species, and Scenario 1 includes 80,000 m³/yr of all other logs.

The analysis focuses on the key direct and indirect consequences of the shocks to the Tasmanian economy from changing from the Baseline to Scenario 1 and the Baseline to Scenario 2 respectively. Because Scenarios 1 and 2 are modelled outcomes, it is not valid (nor is there sufficient data) to imply measureable correlations in "transitioning" from Scenario 1 to Scenario 2.

FINDINGS

Transitioning to the wood supply volumes specified by the TFA, in the absence of appropriate mitigation arrangements, will generate socio-economic impacts - job losses and restructuring of industry with consequential adverse community impacts - at State-wide and regional levels for Tasmania.

At State level, using the log supply flows detailed in Scenario 1 (which incorporates Ta Ann continuing to operate both plants at current levels) as a proxy for transitioning to the TFA from Baseline log supply levels), it is estimated that direct jobs will reduce from Baseline jobs by 142 (average, ± an estimated 5%), comprising (on average) 80 processing and 62 contractors. When industrial flow-on impacts are included, a further 147 job losses are estimated to occur. Non-mitigated reduced consumption impacts are estimated to comprise an additional 116 job losses. In

total, transitioning to Scenario 1 (incorporates Ta Ann continuing to operate) could, without effective mitigation actions, generate around 400 job losses.

Again at State level, using the log supply levels detailed in Scenario 2 as a potential log supply to industry if there is no broad agreement between parties and assuming high levels of contestability remain over native forest log allocation, transitioning from Baseline volumes to log supply levels indicated by Scenario 2 will lead to higher job losses. It is estimated that direct jobs will reduce from Baseline jobs by 678 (average, ± an estimated 7%), comprising (on average) 364 processing and 314 contractors. When industrial flow-on impacts are included, a further 697 job losses are estimated to occur. Non-mitigated consumption impacts are estimated to comprise an additional 559 job losses. In total, transitioning from the Baseline to Scenario 2 could, without effective mitigation actions, generate over 1,900 job losses.

In addition to job losses, the reductions in log supplies arising from transitioning from Baseline log supply levels to log supply levels for either Scenario will also significantly reduce financial flows (output, wages & salaries and value added) in the Tasmanian economy. The following tables summarise the estimated job and financial flow impacts for the Tasmanian economy in transitioning from Baseline log supply levels to Scenario 1 (proxy for TFA) and Scenario 2 respectively.

Scenario 1

Forecast reductions (i.e. all figures are **losses**) for key economic indicators in transitioning from Baseline log supply volumes to Scenario 1 are summarised as follows:

	Processing	Contractors	Combined Direct	Industrial Flow-on	Reduced Consumption	Direct + indirect
Jobs	80 (± 5%)	62 (± 10%)	142 (± 5%)	147	116	405
Output (\$m)	\$28.2	\$26.7	\$54.9	\$40.0	\$24.4	\$119.3
Wages/salaries (\$m)	\$4.0	\$5.5	\$9.5	\$8.3	\$5.7	\$23.6
Value-add (\$m)	\$8.1	\$11.6	\$19.7	\$15.6	\$12.8	\$48.1

Scenario 2

Forecast reductions (i.e. all figures are **losses**) for key economic indicators in transitioning from Baseline log supply volumes to Scenario 2 are summarised as follows:

	Processing	Contractors	Combined Direct	Industrial Flow-on	Reduced Consumption	Direct + indirect
Jobs	364 (± 5%)	314 (± 10%)	678 (± 7%)	697	559	1933
Output (\$m)	\$129.8	\$135.3	\$263.1	\$189.8	\$117.2	\$570.1
Wages/salaries (\$m)	\$18.2	\$28.0	\$46.2	\$39.4	\$27.4	\$113.1
Value-add (\$m)	\$37.0	\$58.8	\$95.8	\$73.7	\$61.2	\$230.6

The Report also provides estimates of regional impacts on jobs and key economic indicators, as well as breaking down the impacts of direct and indirect changes to a range of industry sectors.

As indicated, the estimated impacts do not incorporate any mitigation actions. Mitigation actions incorporated in the TFA include sawlog contract buy-back, job exit and assistance packages, and combined support to develop commercial markets/products (with Tasmanian-based manufacturing focus) for the total supply of logs generated by managing a proportion of Tasmania's forests for wood production. It is beyond the scope of this Report to quantify the impact of potential mitigation actions. There is a range of potential opportunities for diversification and growth of the Tasmanian

native forest industry. Commentary is provided on such opportunity for the Tasmanian native forest industry, based on engineered wood products.

Commentary is also provided on the impacts on the Special Species Timber sector, where impacts are arguably more widespread and pervasive than for structural eucalyptus timbers.

SOCIO-ECONOMIC IMPACTS IN TRANSITIONING TO WOOD SUPPLY ARRANGEMENT DETAILED IN TASMANIAN FOREST AGREEMENT 2012 (TFA)

1. PURPOSE

The Tasmanian Forest Agreement 2012 (TFA) details the annual public native forest wood supply arrangements to Tasmanian forest industries for the period to 2025.

The wood supply volumes specified in the TFA represent significant reductions from traditional supply levels and current log supply contract commitments to industry by Forestry Tasmania.

Transitioning to the wood supply volumes specified by the TFA will generate additional socio-economic impacts, in the absence of appropriate mitigation arrangements, at State-wide and regional levels for Tasmania.

The purpose of this Report is to document the key socio-economic impacts for Tasmania and at regional levels, in transitioning the Tasmanian native forest industry to potentially lower log supply volumes, including log supply volumes intended by the TFA. Because time and financial constraints did not permit the data gathering necessary to underpin a comprehensive socio-economic analysis, the Report focuses on direct and indirect impacts on employment and key economic indicators.

2. BACKGROUND

The Current TFA Environment

The Tasmanian Forest Agreement 2012 (TFA) between the Signatories specifies (Clause 4) the ongoing native forest wood supply for Tasmanian forest industries as:

- a) "At least 137,000 cubic metres per year of high quality sawlogs across the State, including volumes required at regional level".
- b) "Peeler wood supply to meet renegotiated contracts arising out of this Agreement".
- c) "A yield of speciality timber to meet the need for special species supply. The agreed required yield will be determined by (Signatory/Stakeholder Council). Pending that determination, annual supply will be as per the FT Special Timbers Strategy 2010".
- d) "Secure supply of low grade sawlogs (Category 2 and Category 8)" – volume unspecified – to Regional sawmillers.

As a reference point for the volumes specified in the TFA, Forestry Tasmania's current long term supply contracted volumes for a range of products are detailed in Appendix 1. For example, in the case of High Quality Sawlogs (HQSL; Category 1 and 3 sawlogs), current contracted commitments are 163,000 m³/year, which will reduce to 137,000 m³/year under the TFA through a "log buy back" process. Up to 5,000 m³/year of sliced veneer logs are also contracted, which is estimated to reduce to 4,050 m³/year. In the case of peeler billets, current contract commitments are 265,000 m³/year. Future peeler billet supply levels will be set to "meet renegotiated contracts arising out of this Agreement" (i.e. the TFA). The current supply level is 157,000 m³/year in total.

The TFA (Clause 17) calls for "the IGA Socio-economic Modelling (to be) run and publicly released to access and report on the regional and state-wide impacts of the agreement".

Utilising the results from running the Jobs and Investment Changes Model and Input-Output Model previously developed in early 2012 as part of IGA process, this Report details key socio-economic impacts (jobs and financial flows) for two scenarios, the first of which comprises transitioning to the

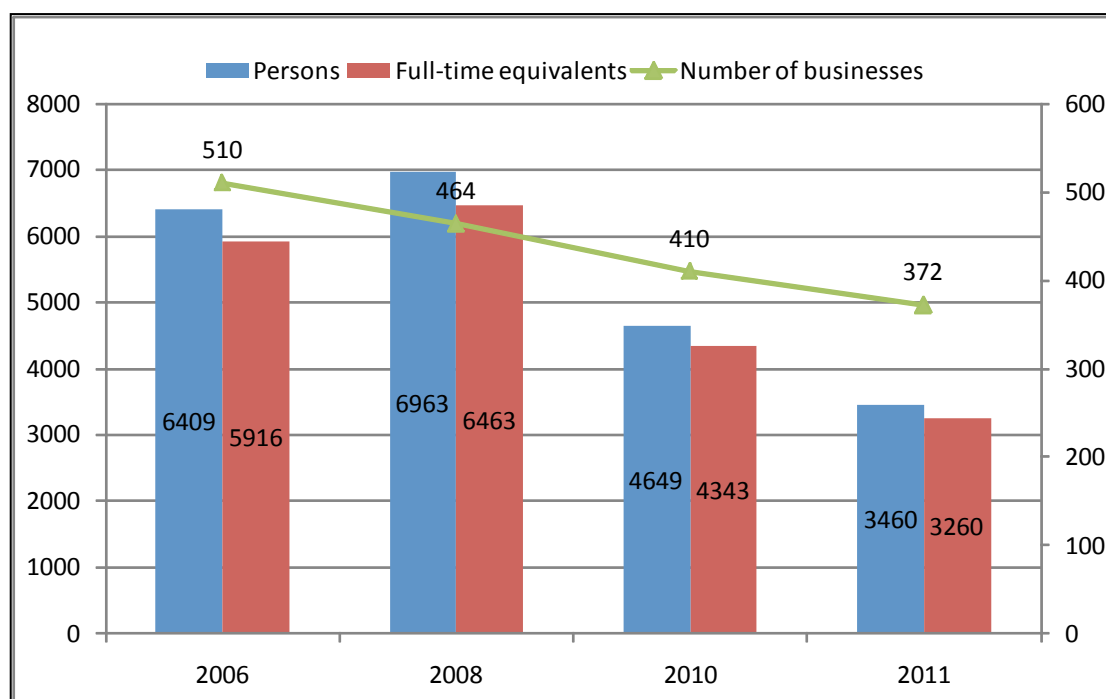
wood supply volumes detailed in the TFA. The methodology and processes used to construct the Jobs and Investment Changes Model and Input-Output Model are detailed in the consolidated Report of Independent Verification Group, May 2012 (R-IVG 2012).

Recent Historical Changes in the Tasmanian Forest Industry

In reviewing the potential impacts of transitioning to wood supply levels intended by the TFA, it is relevant to note the trends and significant downsizing that has occurred within the Tasmanian timber and wood product industry as the TFA has progressed. These changes are somewhat independent of TFA negotiations.

An indication of the impacts of these changes can be gauged from the changes in two statistics between 2006 and 2011 for the Tasmanian forest industry (native forests, hardwood plantations and softwood plantations). As illustrated in Figure 1, during this time employment halved (after peaking in 2008) to around 3,000 jobs in 2011, and the number of businesses reduced from 510 in 2006 to 372 in 2011.

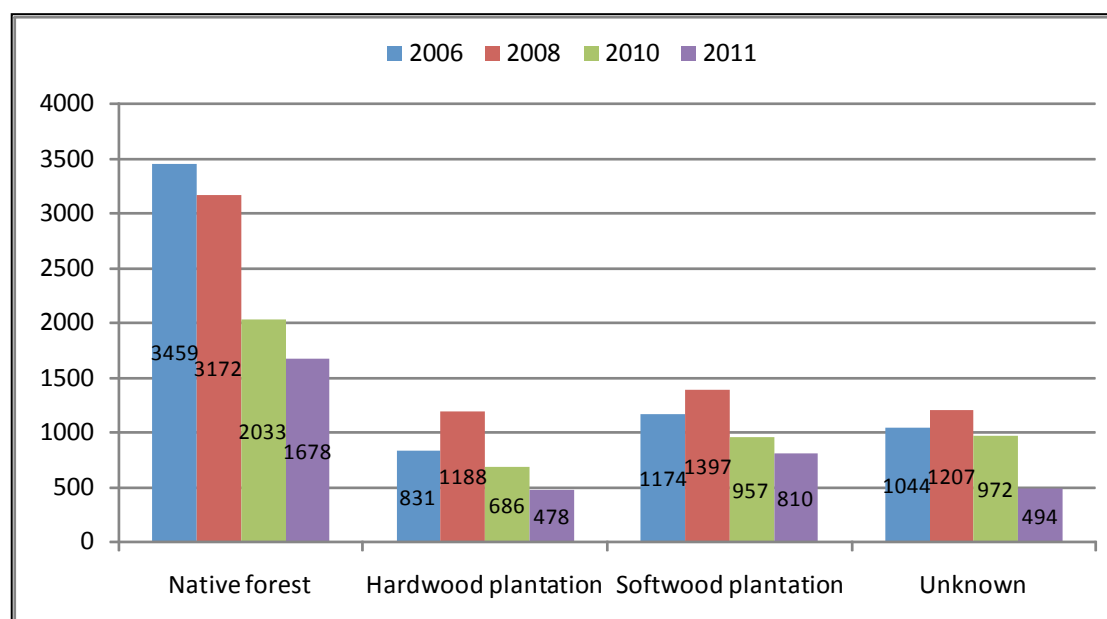
Figure 1: Employment and business numbers in the Tasmanian forest industry 2006–2011 (persons; data are for August 2006, August 2008, September 2010 and May 2011)



Source: Schirmer, J (2012), "Assessment of the employment and economic consequences of change in access to Tasmania's publicly owned native forests: overview of methodology", with data drawn from a CRC for Forestry project.

A more focused picture of employment generated by the native forest industry (the focus of the TFA) is detailed in Figure 2. During the period 2006 to 2011, jobs in native forests are estimated to have reduced by around 1,800 (note that 'unknown' employment in Figure 2 principally includes jobs where the person operates in both the native forest and plantation sectors).

Figure 2: Employment in the Tasmanian native forest and plantation sectors 2006–2011 (persons; data are for August 2006, August 2008, September 2010 and May 2011)



Source: Schirmer, J (2012), "Assessment of the employment and economic consequences of change in access to Tasmania's publicly owned native forests: overview of methodology", with data drawn from a CRC for Forestry project.

An indication of the flow-on impacts of these trends and changes can be gauged from ABS reports on *Wood Product Manufacturing and Pulp, Paper and Converted Paper Product Manufacturing* in Tasmania (these industries are a component of Tasmanian forest industries). Between 2006-07 and 2010-11, direct jobs decreased by 1,234 and output reduced by nearly \$660m. A further 1,145 jobs and \$364m of output were lost when industrial flow on effect are included (see Table 1).

TABLE 1: IMPACT SUMMARY Product Manufacturing and Pulp, Paper and Converted Paper Product Manufacturing in Tasmania 2006/07 to 2010/11

Impact Summary Report						
Impact Summary	Direct Effect	Industrial Flow On Effect	Consumption Flow On Effect	Total	Type 1 Multiplier	Type 2 Multiplier
Output (\$M)	-\$558.9	-\$364.7	-\$190.2	-\$1,113.8	1.65	1.99
Employment (Jobs)	-1,234	-1,145	-818	-3,197	1.93	2.59

A breakdown of this summary information by industry sector is provided in Appendix 2.

While there will be differences as a result of differing time periods and sources, the point of the above documentation is to clarify the social and business context within which the forest industry negotiations were occurring:

- Forest based businesses were closing or downsizing.
- People were becoming unemployed – retiring, gaining new jobs or remaining unemployed or under employed.
- Consumption was declining across all sectors of the Tasmanian economy as a consequence of declining employment and reduced spending in the forestry sector.

The impact of the scenarios considered in this Report are in addition to, and considered independent of, the impacts identified noted above. This Report focuses on potential impacts that post-date the above analysis.

Special Species Timbers

This Report focuses on direct job losses that occur at native forest timber mills and at secondary processors that use this mill output to produce predominantly structural products. The consequences for the Tasmanian economy are estimated using Input-Output modelling and the outcomes do not reflect the consequences of mitigation actions that might be undertaken.

The consequences of reduction in log supply on utilisation of timber products within the Tasmanian community are arguably more widespread and pervasive for Special Species Timbers (SSTs) than for structural eucalypt products. In recognition of its unique status, Appendix 11 provides commentary on the estimated “downstream” impacts of reduction in supply of SSTs, noting that only the harvest and primary milling of SSTs is included in the wood flow and impact analysis that forms the bulk of this Report.

3. METHODOLOGY

Overall Structure

The methodology employed to estimate key socio-economic impacts of transitioning wood supply levels from Tasmanian public native forests to wood supply levels detailed in the TFA is based on the use of scenarios aligned to the TFA. These scenarios incorporate judgements on wood supply volumes and forest industry operating structures. The estimation of key socio-economic impacts, at regional level and State-wide level, are generated by comparing changes in jobs and financial flows for scenarios against a baseline.

For this Report, updated versions of the Jobs and Investment Changes Model and a pilot version of the Input-Output Model (both originally developed in February 2012) were used. The methodology and processes used to construct the Jobs and Investment Changes Model and Input-Output Model are detailed in R-IVG 2012. The updated versions incorporate secondary processing of eucalyptus native forest wood products and speciality timbers supplied from public and private forests at a regional level.

In terms of structure, the Jobs and Investment Model was used to estimate employment levels, gross value of production and gross mill expenditure for mills continuing to operate under the Baseline and each Scenario’s log supply levels. The direct job impacts estimated by the Jobs and Investment Model from changes (from Baseline to Scenario) in native forest wood supply to Tasmanian forest industries were used to estimate the indirect and flow-on impacts to regions and State-wide, using the Input-Output Model.

Baseline Setting

A key issue impacting on predictions for changes in jobs and other socio-economic indicators for different log supply scenarios to industry is establishing a baseline (reference point) against which to assess impacts.

As noted earlier and documented elsewhere, jobs and aggregate value of products from Tasmania’s native forest industries have been decreasing since 2008. These changes can be traced to multiple factors, of which changes to availability of log supplies is only one. Other factors include:

- impact of the GFC;

- the strong Australian dollar reducing the competitiveness of exported products;
- changing markets for native forest products particularly in structural markets;
- market disruption;
- the exit of Gunns, a traditionally large component of Tasmanian native forest industry; and
- implementation of Tasmanian Forest Contractors Exit Program.

For the purpose of this work, a Baseline (reference point) is required against which changes can be assessed. The core driver for this Report's socio-economic analysis is changes to employment levels. The Jobs and Investment Model uses changes in total log volume inputs by firms to vary employment levels. Ideally, the Baseline would be consistent with the estimated operating environment for Tasmanian forest industries applying in the latter part of 2012. However, there is considerable anecdotal evidence during this period that some firms maintained employment levels while purchasing lower than their contracted volumes, pending the outcome of the TFA negotiations. To accurately model this situation, detailed interview data would be necessary for all mills to determine the linkages between current employment levels, expenditures and vulnerability and likely employment levels, expenditures and vulnerability under varying future supply scenarios. Neither time frame nor funding permitted such data gathering. For this reason, this Report focuses on the key socio-economic impacts, reported at regional and State-wide level.

The impact of employment levels by sawmillers and contractors in recent months is that total log volume inputs for the same period do not reflect normal processing efficiency. As the purpose of this work is to estimate socio-economic impacts (with job changes a key focus), it was considered more relevant to utilise estimated actual employment of firms and calculate nominal log inputs for firms using reported processing efficiencies. Further, for the Jobs and Investment Model to function, it was necessary to estimate a nominal total log volume intake consistent with estimated actual employment levels in recent months.

The selected Baseline public native forest log supply is the authors' judgement of a nominal log supply available to and used by the Tasmanian native forest industry that is consistent with average employment levels in recent months. The nominal log supply for the Baseline could be thought of as the log supply that would be processed by the industry at the average employment levels of recent months, if that log supply was expected to continue at that level for at least two years.

With regard to public forest high quality sawlogs (HQSL), the Baseline was judged to comprise a log availability level similar to Forestry Tasmania's contractual commitments. For other products, the industry is assessed as operating below contracted levels.

A variation on this approach was used for Baseline supply volumes to Ta Ann. Ta Ann's operating structure is based on a peeler log supply of 157,000 m³/year, with both mills to remain operating pending outcome of the TFA. This volume is significantly less than the contracted volume of 265,000 m³/year. Actual employment (91 persons) at Ta Ann's mills for the processing of 157,000 m³/yr was used in the Baseline.

The components of the Baseline log supply are set out below.

Baseline:

From Public native forest:

- (i) 163,000 m³/yr of HQSL, plus supply of 4,050 m³/yr of high quality veneer logs.
- (ii) 157,000 m³/yr of peeler logs from Forestry Tasmania to operate both Ta Ann mills.
- (iii) 10,080 m³/yr of special species timbers (SST, primarily blackwood).
- (iv) Approximately 1,154,000 m³/yr of other solid wood products including poles and girders plus low quality sawlogs for domestic processing, pulpwood and low quality export logs.

From Private native forest (as used in R-IVG 2012):

- (i) Approximately 20,000 m³/yr of sawlogs (all grades).
- (ii) Approximately 2,000 m³/yr of SST.
- (iii) Approximately 80,000 m³/yr of other solid wood products, including peeler logs purchased by Ta Ann.

These log volumes are summarised in Table 2 and detailed in Table 3.

It is relevant to note the following with regard to the Baseline volumes:

1. The Baseline volume for residue markets reflects the maintenance of contractor employment levels by implementation of actions such as stockpiling and long distance transport (with financial support by Forestry Tasmania) to ports in northern Tasmania.
2. The estimate of a nominal 163,000 m³/year of HQSL reflects the maintenance of employment levels by firms in late 2012, pending the outcome of the TFA.
3. Special species timbers (SSTs) are explicitly included as a separate log source (for both public and private native forest), with only direct employment associated with mill-based processing of SSTs incorporated within the processing sector.
4. The estimate of wood supply from private native forest is consistent with the estimate used in R-IVG 2012. This estimate derives from a range of predominantly anecdotal sources, as definitive data were and are not available. Private property volumes available in 2012 were estimated to have reduced by 50% from the private property supply level reported in Schirmer (2008).

Scenarios

Two wood supply and industry structure scenarios were constructed to inform the key socio-economic impacts of transitioning the industry to wood supply volumes under the TFA. Details for Scenarios 1 and 2 are set out below, summarised in Table 2 and detailed in Tables 4 and 5.

Scenario 1 is built around transitioning the industry to HQSL log supply targeted in the TFA (137,000 m³/yr) with log supply of other products, including peeler log supply to Ta Ann, bounded by the HQSL volume. Scenario 1 incorporates Ta Ann continuing to operate both mills at October to December 2012 employment levels.

Specifically, the log supply for Scenario 1 comprises:

From Public native forest:

- (i) 137,000 m³/yr of HQSL, plus 3,400 m³/yr of high quality veneer logs.
- (ii) 157,000 m³/yr of peeler logs (current volume being supply by Forestry Tasmania) to operate both Ta Ann mills.
- (iii) 9,000 m³/yr of special species timbers (primarily blackwood).
- (iv) Approximately 870,000 m³/yr of other solid wood products including poles, low quality sawlogs for domestic processing, pulpwood and low quality export logs.

Note that the wood supply of products other than the 137,000 m³/yr of HQSL is based on estimates provided by Forestry Tasmania, with the driver of supply being the HQSL volume specified in the TFA.

From Private native forest (as used in R-IVG 2012):

As for Baseline.

Note that this represents the availability of private property logs. Utilisation may be lower than availability for some model runs because some mills utilising private property are flagged to close and there is no objective way to re-allocate private property logs.

Scenario 2 is a judgement by the authors of a potential log supply to the Tasmanian native forest industry if there is no broadly supported agreement between the parties and high levels of contestability remain on allocation of native forest logs. Scenario 2 incorporates logs only being harvested from outside the 572,000 hectares of forests identified by ENGOs as requiring protection. Scenario 2 incorporates a future Tasmanian native forest industry using a reduced ongoing supply of sawlogs (HQSL, veneer and lower grade sawlogs), SSTs and poles, with negligible access to other commercially viable markets for residual wood and peeler logs. In Scenario 2, Ta Ann is assumed to close both mills (this is consistent with public statements from the company) and profitable export markets for public native forest logs are not available (this is consistent with Triabunna closing, as has been publicly stated, and other export residue markets based on sources that are currently FSC-certified).

It is difficult to define a supply volume of Special Species Timbers (SSTs) for Scenario 2. The estimated supply level used in Scenario 2 is 3,000 m³/year. Anecdotal evidence on the likely supply volume under this Scenario is conflicting, with some commentators suggesting that 3,000 m³/year is too low while other suggest it is too high. The authors consider the chosen supply volume to be a reasonable compromise estimate for the purpose of illustration.

It should be noted that Scenario 2 is for illustrative purposes. Other scenarios, reflecting specific government policy positions, can be constructed to reflect other market opportunities including a greater role for export for residues. Note that Scenario 2 does not address the substantial challenges in establishing a commercially viable supply chain for all participants and the processing and marketing structures that would be necessary to successfully implement Scenario 2. It is the authors' judgement that meeting these challenges would require significant investment that is beyond the investment appetite of the current Tasmanian forest industry. These challenges are addressed in more detail in Section 5 under "Where to from here?"

Specifically, the log supply for Scenario 2 comprises:

From Public native forest:

- (i) 100,000 m³/yr high quality sawlogs, including 2,420 m³/yr veneer logs.
- (ii) 3,000 m³/yr of special species timbers (primarily blackwood).
- (iii) Approximately 18,000 m³/yr of poles and low quality (Category 2 and Category 8) sawlogs for domestic processing.

From Private native forest (see Scenario 1 note re availability versus utilisation):

- (i) Approximately 20,000 m³/yr of sawlogs (all grades).
- (ii) Approximately 2,000 m³/yr of SST.

The log volumes from public native forest for the Baseline and the two Scenarios are summarised in Table 2.

TABLE 2: Public Forest Log Input Volumes By Product for Baseline and Scenarios

	HQ (Cat 1/3) sawlogs (m ³ /yr)	Sliced veneer logs (m ³ /yr)	Cat 2 sawlogs (m ³ /yr)	Peeler logs to Ta Ann (m ³ /yr)	Poles (m ³ /yr)	Special Species (m ³ /yr)	Pulplogs and Cat 8 logs (t/yr)
Baseline	163,000	4,050	14,600	157,000	5,270	10,080	1,062,060
Scenario 1	137,000	3,400	11,050	157,000	4,400	9,000	803,630
Scenario 2	97,580	2,420	7,870	0	3,140	3,000	10,000 (Cat 8)

It is important to note that this Report compares the Baseline with Scenario 1 and the Baseline with Scenario 2. It does not and is not intended to compare Scenario 1 with Scenario 2. The Jobs and Investment Model and the Input-Output Model assess the impacts of changes from a Baseline or reference point following implementation of a Scenario. They do so by modelling the outcomes for each Scenario. It is not valid to then imply measurable correlations between these two modelled outcomes.

4. FINDINGS

Log supply volumes and consequent estimated direct employment (average and range) in processing, contracting and combined are set out by Region and in aggregate for the Baseline, Scenario 1 and Scenario 2 in Tables 3, 4 and 5 respectively.

Estimated direct employment in processing is reported as an average and a range. The Jobs and Investment Change Model does not assume any particular mill will close under a given total log supply, unless that log supply provides insufficient volume to meet the minimum volume necessary for continued operation (Schirmer, 2010). If the minimum volume is supplied, then there is a probability attached to any individual mill closing, depending on the level of supply and the vulnerability of the mill to supply shocks (see R-IVG 2012). A mill may or may not close for any given supply volume, since it is not possible to know for an individual mill how determined or otherwise the mill owner is to continuing its operation. The Model addresses this issue by using probabilities and running the Model multiple times to produce a range of potential mill closures and consequent employment outcomes in processing.

Contractor employment is based on the total volume of logs harvested and hauled, plus the impact on Forestry Tasmania field workers (see R-IVG 2012). A range of variability in contractor employment of $\pm 10\%$ is assumed.

Table 6 sets out the differences between Scenario 1 and the Baseline.

Table 7 sets out the differences between Scenario 2 and the Baseline.

The Input-Output Model uses the average direct job numbers differences (Tables 6 and 7) to estimate indirect impacts on employment and direct and indirect impacts on output, wages & salaries and value-added, as well as how these indirect impacts are distributed throughout various sectors of the economy. The Input-Output Model analysis results for Scenarios 1 and 2 are shown in Tables 8 and 9.

More comprehensive discussion on multipliers and flow-on effects is provided in Section 5.

Transitioning to the wood supply volumes specified by TFA, in the absence of appropriate mitigation arrangements, will generate socio-economic impacts - job losses and restructuring of industry with consequential adverse community impacts - at State-wide and regional levels for Tasmania. The volume and average direct and indirect employment, and consequent average output, wages & salaries and value-added impacts of Scenarios 1 and 2, as compared to the Baseline, can be summarised as set out below (ranges cannot be calculated for differences and so are estimated based on the variability in model results).

1) Scenario 1

The table shows aggregated reductions (i.e. **all figures are losses**) from changing the log supply volumes and employment associated with the Baseline to the log supply volumes and

employment associated with Scenario 1. Indirect job impacts and direct and indirect financial impacts are modelled (with results in Table 8) using the average direct job impacts - it was not feasible to include the ranges in these calculations.

Product Reductions From Baseline

	HQSL & HQ veneer (m ³)	Category 2 sawlogs (m ³)	Peeler logs to Ta Ann (t)	Poles (m ³)	Special Species (m ³)	Pulplogs (t)
Reductions from Baseline per year	26,650	3,550	0	870	1,080	261,960

Jobs and Financial Reductions From Baseline

Reductions from Baseline per year	Processing	Contractors	Combined Direct	Industrial Flow-on	Reduced Consumption	Direct + indirect
Jobs	80 (± 5%)	62 (± 10%)	142 (± 5%)	147	116	405
Output (\$m)	\$28.2	\$26.7	\$54.9	\$40.0	\$24.4	\$119.3
Wages/salaries (\$m)	\$4.0	\$5.5	\$9.5	\$8.3	\$5.7	\$23.6
Value-add (\$m)	\$8.1	\$11.6	\$19.7	\$15.6	\$12.8	\$48.1

Direct and indirect impacts on jobs, output, wages/salaries and value-add are set out in the lower half of the table. Direct impacts are separately reported for Processing (i.e. primary and secondary processing) and Contractors (log harvesting and haulage plus Forestry Tasmania field workers), together with a Combined column. Industrial flow-on impacts are indirect impacts among industry sectors arising from the direct impacts. Reduced consumption indirect impacts are calculated in the absence of any mitigation activities. Direct and indirect impacts are summed in the last column.

In summary, in transitioning to Scenario 1 it is estimated that, in the absence of effective mitigation actions, 142 direct jobs would be lost, increasing to approximately 400 jobs when flow-on (industrial and consumption) effects are included. Output would be reduced by \$119m and \$23m less wages would be earned. The consumption impacts generated by changes in log supply could be reduced by worker exit payments.

In terms of timing, it would be expected that, without effective mitigation actions, direct jobs would be lost within four months, with flow-on impacts being generated within nine months.

2) Scenario 2

The table shows aggregated reductions (i.e. **all figures are losses**) from changing the log supply volumes and employment associated with the Baseline to a potential log supply to industry if there is no broad agreement between parties and high levels of contestability remain over native forest log allocations, as specified for Scenario 2. As with Scenario 1, indirect job impacts and direct and indirect financial impacts are modelled (with results shown in Table 9) using the average direct job impacts - it was not feasible to include the ranges in these calculations.

Product Reductions From Baseline

	HQSL & HQ veneer (m ³)	Category 2 sawlogs (m ³)	Peeler logs to Ta Ann (t)	Poles (m ³)	Special Species (m ³)	Pulplogs (t)
Reductions from Baseline per year	67,050	6,730	157,000	2,130	7,080	1,066,610

Jobs and Financial Reductions From Baseline

Reductions from Baseline per year	Processing	Contractors	Combined Direct	Industrial Flow-on	Reduced Consumption	Direct + indirect
Jobs	364 (± 5%)	314 (± 10%)	678 (± 7%)	697	559	1933
Output (\$m)	\$129.8	\$135.3	\$263.1	\$189.8	\$117.2	\$570.1
Wages/salaries (\$m)	\$18.2	\$28.0	\$46.2	\$39.4	\$27.4	\$113.1
Value-add (\$m)	\$37.0	\$58.8	\$95.8	\$73.7	\$61.2	\$230.6

In summary, in transitioning to Scenario 2 it is estimated that, in the absence of effective mitigation actions, approximately 680 direct jobs would be lost, increasing to approximately 1,900 jobs when flow-on impacts are included. Output would be reduced by \$570m and \$113m less wages would be earned.

**TABLE 3: ESTIMATE OF DIRECT EMPLOYMENT IN PROCESSING AND CONTRACTING ARISING FROM NATIVE FOREST AND PRIVATE PROPERTY LOGS
BASELINE: 167,050 M³ OF HQ LOGS INCL 4,050 M³ SLICED VENEER LOGS, PLUS 157,000 M³ OF PEELER LOGS TO TA ANN (BOTH MILLS)**

	LOG RESOURCES SUPPLIED (M ³ /YEAR) ⁽¹⁾										DIRECT EMPLOYMENT (Number) ⁽⁴⁾		
REGION	PUBLIC NATIVE FOREST					PRIVATE NATIVE FOREST				OVERALL	PROCESSING (Average; range in brackets)	CONTRACTORS (Range in brackets ⁽⁵⁾)	TOTAL (Average; range in brackets)
	HQSL + SLICED VENEER LOGS ⁽²⁾	PEELER LOGS	SPECIAL SPECIES	OTHER ⁽³⁾	TOTAL	SAW LOGS	SPECIAL SPECIES	OTHER ⁽³⁾	TOTAL	TOTAL			
North West	20,240	62,000	7,690	235,940	325,870	5,540	380	0	5,920	331,790	169 (164-176)	25 (23-27)	194 (187-203)
North East	38,270	18,000	720	459,000	515,990	9,740	910	8,740	19,390	535,380	148 (104-173)	153 (138-168)	301 (242-341)
South	108,540	77,000	1,670	458,650	645,860	4,380	800	71,100	76,280	722,140	233 (214-255)	154 (139-169)	387 (353-424)
TOTALS	167,050	157,000	10,080	1,153,590	1,487,720	19,660	2,090	79,840	101,590	1,589,310	550 (484-582)	332 (300-364)	882 (784-946)

NOTES:

- (1) Estimated annual eucalypt and special species timber roundwood from public and private native forests, derived from Forestry Tasmania data for public forest resources and Updated Feb12 Database (update includes adjustment in logs used due to retirement of Gunn's contracts, operation of Ta Ann in the latter part of 2012 and private property log supplies consistent with R-IVG 2012).
- (2) HQSL denotes High Quality sawlogs (Category 1/3).
- (3) OTHER comprises mainly pulpwood logs, plus poles and lower quality logs, plus 63,610 t low quality export logs.
- (4) Direct employment covers estimated number of jobs (full-time equivalent) in primary and secondary processing, harvest and haulage and Forestry Tasmania field workers.
- (5) Contractor employment calculated by jobs per unit volume transported. Contractor range assumed at ±10%.

**TABLE 4: ESTIMATE OF DIRECT EMPLOYMENT IN PROCESSING AND CONTRACTING ARISING FROM NATIVE FOREST AND PRIVATE PROPERTY LOGS
SCENARIO 1: 140,400 M³ OF HQ LOGS INCL. 3,400 M³ OF SLICED VENEER LOGS, PLUS 157,000 M³ OF PEELER LOGS TO TA ANN (BOTH MILLS)**

REGION	LOG RESOURCES SUPPLIED (M ³ /YEAR) ⁽¹⁾										DIRECT EMPLOYMENT (Number) ⁽⁴⁾		
	PUBLIC NATIVE FOREST					PRIVATE NATIVE FOREST				OVERALL	PROCESSING (Average; range in brackets)	CONTRACTORS (Range in brackets ⁽⁵⁾)	TOTAL (Average; range in brackets)
	HQSL + SLICED VENEER LOGS ⁽²⁾	PEELER LOGS	SPECIAL SPECIES	OTHER ⁽³⁾	TOTAL	SAW LOGS	SPECIAL SPECIES	OTHER ⁽³⁾	TOTAL	TOTAL			
North West	17,500	62,000	6,870	177,330	263,700	5,540	380	0	5,920	269,020	163 (162-173)	24 (22-26)	187 (184-199)
North East	31,400	18,000	640	269,590	319,630	9,740	910	8,740	19,390	339,020	101 (80-128)	117 (105-129)	218 (185-257)
South	91,500	77,000	1,490	426,390	596,380	4,380	800	71,100	76,280	672,660	206 (195-209)	129 (116-142)	335 (311-351)
TOTALS	140,400	157,000	9,000	873,310	1,179,710	19,660	2,090	79,840	101,590	1,281,300	470 (439-505)	270 (243-297)	740 (682-802)

NOTES:

- (1) Estimated annual eucalypt and special species timber roundwood from public and private native forests, derived from Forestry Tasmania data for public forest resources and Updated Feb12 Database (update includes adjustment in logs used due to retirement of Gunn's contracts, operation of Ta Ann in the latter part of 2012 and private property log supplies consistent with R-IVG 2012).
- (2) HSQL denotes High Quality sawlogs (Category 1/3).
- (3) OTHER comprises mainly pulpwood logs, plus poles and lower quality logs, plus 43,210 t low quality export logs.
- (4) Direct employment covers estimated number of jobs (full-time equivalent) in primary and secondary processing, harvest and haulage and Forestry Tasmania field workers.
- (5) Contractor employment calculated by jobs per unit volume transported. Contractor range assumed at ±10%.

**TABLE 5: ESTIMATE OF DIRECT EMPLOYMENT IN PROCESSING AND CONTRACTING ARISING FROM NATIVE FOREST AND PRIVATE PROPERTY LOGS
SCENARIO 2: 100,000 M³ OF HQ SAWLOGS incl 2,420 M³ OF SLICED VENEER LOGS, TA ANN MILLS CLOSED, NO WOODCHIP EXPORT**

REGION	LOG RESOURCES SUPPLIED (M ³ /YEAR) ⁽¹⁾										DIRECT EMPLOYMENT (Number) ⁽⁴⁾		
	PUBLIC NATIVE FOREST					PRIVATE NATIVE FOREST				OVERALL	PROCESSING (Average; range in brackets)	CONTRACTORS (Range in brackets ⁽⁵⁾)	TOTAL (Average; range in brackets)
	HQSL + SLICED VENEER LOGS ⁽²⁾	PEELER LOGS	SPECIAL SPECIES	OTHER ⁽³⁾	TOTAL	SAW LOGS	SPECIAL SPECIES	OTHER ⁽³⁾	TOTAL ⁽⁴⁾	TOTAL			
North West	12,820	0	2,290	10,910	26,020	5,540	380	0	5,920	31,940	77 (76-83)	5 (4-6)	82 (80-89)
North East	22,020	0	210	6,400	28,630	9,740	910	0	10,650	39,280	76 (46-93)	8 (5-10)	84 (51-103)
South	65,160	0	500	3,700	69,360	4,360	800	100	5,280	74,640	33 (19-97)	5 (3-19)	38 (22-116)
TOTALS	100,000	0	3,000	21,010	124,010	19,660	2,090	100	21,850	145,860	186 (143-270)	18 (12-35)	204 (155-305)

NOTES:

- (1) Estimated annual eucalypt and special species timber roundwood from public and private native forests, derived from Forestry Tasmania data for public forest resources and Updated Feb12 Database (update includes adjustment in logs used due to retirement of Gunn's contracts, operation of Ta Ann in the latter part of 2012 and private property log supplies consistent with R-IVG 2012).
- (2) HQSL denotes High Quality sawlogs (Category 1/3).
- (3) OTHER comprises Category 2 and Category 8 sawlogs, plus poles. Private property Other decreases significantly with no Ta Ann and no woodchip exports.
- (4) Direct employment definition - see Table 4.
- (5) Contractor employment calculated by jobs per unit volume transported. Contractor ranges are reported as the variability in the model and arise because of the wide variability in mill flagged for closure in NE and South Regions.

TABLE 6: DIFFERENCES TABLE ⁽¹⁾
BASELINE (TABLE 3) - SCENARIO 1 (TABLE 4)

REGION	LOG RESOURCES SUPPLIED (M ³ /YEAR)									DIRECT EMPLOYMENT (Number)			
	PUBLIC NATIVE FOREST					PRIVATE NATIVE FOREST				OVERALL	PROCESSING (Average; range in brackets ⁽²⁾)	CONTRACTORS (Range in brackets ⁽²⁾)	TOTAL (Average; range in brackets ⁽²⁾)
	HQSL + SLICED VENEER LOGS	PEELER LOGS	SPECIAL SPECIES	OTHER	TOTAL	SAW LOGS	SPECIAL SPECIES	OTHER ⁽³⁾	TOTAL	TOTAL			
North West	-2,740	0	-820	-58,610	-62,170	0	0	0	0	-62,170	-6 (±3%)	-1 (±10%)	-7 (±3%)
North East	-6,870	0	-80	-189,410	-196,360	0	0	0	0	-196,360	-47 (±7%)	-36 (±10%)	-83 (±7%)
South	-17,040	0	-180	-32,260	-49,480	0	0	0	0	-49,480	-27 (±5%)	-25 (±10%)	-52 (±5%)
TOTALS	-26,650	0	-1,080	-280,280	-308,010	0	0	0	0	-308,010	-80 (±5%)	-62 (±10%)	-142 (±5%)

NOTES:

- (1) See Notes for Tables 3, 4 and 5 for definition of terms and supplementary information.
- (2) Ranges based on differences cannot be calculated directly. The reported ranges are estimated from confidence limits around the means for data in Tables 4 and 5.

TABLE 7: DIFFERENCES TABLE ⁽¹⁾
BASELINE (TABLE 3) - SCENARIO 2 (TABLE 5)

REGION	LOG RESOURCES SUPPLIED (M ³ /YEAR)										DIRECT EMPLOYMENT (Number)		
	PUBLIC NATIVE FOREST					PRIVATE NATIVE FOREST				OVERALL	PROCESSING (Average; range in brackets ⁽²⁾)	CONTRACTORS (Range in brackets ⁽²⁾)	TOTAL (Average; range in brackets ⁽²⁾)
	HQSL + SLICED VENEER LOGS	PEELER LOGS	SPECIAL SPECIES	OTHER	TOTAL	SAW LOGS	SPECIAL SPECIES	OTHER ⁽³⁾	TOTAL	TOTAL			
North West	-7,420	-62,000	-5,400	-225,030	-299,850	0	0	0	0	-299,850	-92 (±3%)	-20 (±10%)	-112 (±5%)
North East	-16,250	-18,000	-510	-452,600	-487,360	0	0	-8,740	-8,740	-496,100	-72 (±5%)	-145 (±10%)	-217 (±5%)
South	-43,380	-77,000	-1,170	-454,950	-576,500	0	0	-71,000	-71,000	-647,500	-200 (±20%)	-190 (±10%)	-349 (±15%)
TOTALS	-67,050	-157,000	-7,080	-1,132,580	-1,363,710	0	0	-79,740	-79,740	-1,443,450	-364 (±5%)	-314 (±10%)	-678 (±7%)

NOTES:

(1) See Notes for Tables 3, 4 and 5 for definition of terms and supplementary information.

(2) Ranges based on differences cannot be calculated directly. The reported ranges are estimated from confidence limits around the means for data in Tables 4 and 5.

TABLE 8: DIRECT AND INDIRECT OUTCOMES FOR SCENARIO 1

Impact Summary Report						
Impact Summary	Direct Effect	Industrial Flow On Effect	Consumption Flow On Effect	Total	Type 1 Multiplier	Type 2 Multiplier
Output (\$M)	-\$54.88	-\$39.97	-\$24.44	-\$119.28	1.72	2.17
Employment (Jobs)	-142	-147	-116	-405	2.03	2.85
Wages and Salaries (\$M)	-\$9.54	-\$8.33	-\$5.72	-\$23.58	1.87	2.47
Value-Added (\$M)	-\$19.75	-\$15.58	-\$12.76	-\$48.08	1.79	2.43

These outcomes are broken down by industry sector in Appendix 3.

TABLE 9: DIRECT AND INDIRECT OUTCOMES FOR SCENARIO 2

Impact Summary Report						
Impact Summary	Direct Effect	Industrial Flow On Effect	Consumption Flow On Effect	Total	Type 1 Multiplier	Type 2 Multiplier
Output (\$M)	-\$263.08	-\$189.84	-\$117.16	-\$570.08	1.72	2.17
Employment (Jobs)	-677	-697	-559	-1,933	2.03	2.86
Wages and Salaries (\$M)	-\$46.22	-\$39.45	-\$27.40	-\$113.07	1.85	2.44
Value-Added (\$M)	-\$95.75	-\$73.75	-\$61.16	-\$230.65	1.77	2.41

These outcomes are broken down by industry sector in Appendix 4.

5. COMMENTS ON STATE-WIDE OUTCOMES

Transitioning the native forest industry to profitably process the wood supplies specified by the TFA will involve significant reductions in current direct employment opportunities and structure of the industry. These direct job losses are assessed against a Baseline comprising a nominal public forest log supply judged to be consistent with employment levels in the latter part of 2012 in the native forest industry in Tasmania.

Data

It is important to keep in mind that the analysis is based on the authors' judgement of an appropriate Baseline and on the continued validity and currency of data used in modelling as documented in the R-IVG 2012. Given the time frame, no attempt has been made to survey mills to update data.

Log allocation to mills

As was the case for modelling for R-IVG 2012, the Model assigns priority in allocation of available logs from public forests is given to those mills that have a contracted supply from Forestry Tasmania (as aggregated by log class in Appendix 1). Log supply from native forests remaining after this allocation (if any) is allocated for each log class and log supply region to sawmills without a contract

on a pro-rata basis. Hence, no preference is given in allocation between mills with contracts or between mills without contract. In reality, some mills may have a stronger “claim” to logs once contract log commitments have been met. No attempt has been made to incorporate any such priority or to “pick winners” amongst sawmillers - the Model is entirely objective in its approach. Whether a mill remains open under a given log supply scenario is dependent only on whether its minimum supply threshold has been reached and its vulnerability (on a probability basis) to closing for that log supply.

Nonetheless, the Model can be set up to forcibly close specific mills and determine the consequential outcomes on employment and flow-on effects on a Regional basis, if there was a desire to explore such scenarios.

Multipliers and flow-on effects

The flow-on effects of direct job losses have been broken down into industry sub-sectors in Appendix 3 for Scenario 1 and Appendix 4 for Scenario 2. These charts show the extent to which a wide range of industry sectors at State-wide level are affected by loss of jobs and production in the native forestry sector.

The indirect or flow on effects of a particular economic change (such as a major change in processing capacity) are defined as comprising Industrial Effects and Consumption Effects.

The Industrial Effects are defined as the change in output (employment) generated by servicing industry sectors in response to the direct change in output and demand. The Consumption Effects are defined as the change in output (employment) generated by the changes in employment and wages and salaries paid to local employees.

Economic multipliers in the Input-Output Model are defined as either Type I or Type II. Type I multipliers include the Direct Effect + Industrial Effects. For example, a Type I output multiplier of 1.57 indicates that, for every direct one dollar increase in output, there will be an extra \$0.57 of activity generated within the region due to the industrial effects.

Type II multipliers include the Direct Effect + Industrial Effects + Consumption Effects. For example a Type II output multiplier of 2.31 indicates that, for every direct one dollar increase in output, there will be an extra \$1.31 of activity generated within the region due to the industrial effects plus the consumption effects.

This current analysis uses the larger Type II multipliers to capture the effects of the flow-on consumer spending effects.

Input-output analysis requires a number of assumptions about the production of goods and services. However, it is useful to recognise some of the more limiting assumptions:

1. Industry production is a linear process. Changing output creates no economies or diseconomies of scale.
2. Each industry creates only one product. This assumes the total output of multi-product firms is allocated to the primary product produced by that firm or that the production of products can be separated.
3. Each product is produced by a fixed and known process. Different firms producing the same product are assumed to use the same process.
4. There is no substitution of factor inputs, e.g. a firm using a different technology is not recognised.

5. Changes in price will not affect the proportion of inputs used. Changing final demand is the only way to change the level of inputs into production.
6. There are no input constraints - supply is perfectly elastic.
7. There are no unused or underused local resources. Excess capacity in firms and labour are not recognised.

These assumptions obviously may not apply to a specific locale. In spite of these simplifying assumptions, the model makes a significant contribution to describing the economy and predicting impacts.

Input-output modelling is based on the pattern and timing of transactions that occur between industry sectors during production and delivery of services. When the shock to the economy is negative, the consumption effects provided in the model are the maximum effect that would occur. In other words, the flow-on consumption effects for jobs losses over the same time frame are a worst-case scenario: the modelling assumes that with the loss of jobs and wages come proportionate losses of consumption, whereas in reality, mitigation actions reduce the losses in consumption. The negative impacts are likely to be mitigated by the extent to which workers are transitioned into new jobs or welfare payments and, to a lesser degree, transferred into retirement. Hence, input-output models overstate the downstream consumption impacts, although a reduction in downstream consumption will still occur compared with the Baseline. The consumption effects are important to include because they provide a strong indication and understanding of the wider flow-on effects throughout the rest of the economy.

Mitigation actions incorporated in the TFA include sawlog contract buy-back, job exit and assistance packages, and combined support to develop commercial markets/products (with Tasmanian-based manufacturing focus) for the total supply of logs generated by managing a proportion of Tasmania's forests for wood production. Evidence strongly supports the thesis that a key component of long term commercial viability of Tasmania's native forest industry (incorporating secure jobs) is inextricably linked to profitably servicing emerging markets (incorporating innovation for use of the full range of log inputs and wood product characteristics).

Where to from here?

It is beyond the scope of this Report to attempt to quantify the impact of these mitigation actions, or others that might be considered as support measures by government. Nonetheless, the authors offer some comments on the future of the Tasmanian native forest industry.

As mentioned previously, the socio-economic impacts of transitioning to the wood supply levels specified in the TFA are a continuation of the ongoing downsizing of native forest industry over the last 20 years being accelerated over the last 5 years. While there is debate about the adequacy of the wood supply levels and processing structures in the TFA for the on-going industry, there is also recognition that the current structure of and markets targeted by the Tasmanian forestry industry need to be re-evaluated to ensure its long-term commercial viability.

The models developed to provide an assessment of key socio-economic impacts through changes in wood volumes and industry structure can also be utilised to test opportunities for use of wood in new markets and products to generate more secure, manufacturing based, employment in Tasmanian forest industries.

There is a range of potential opportunities for diversification and growth of the Tasmanian native forest industry, as evidenced by rejuvenation of industries such as wine-making, aquaculture and high value cropping and horticulture when a fundamentally new structure for the industry is

implemented. One such opportunity for the Tasmanian native forest industry is based on engineered wood products.

Recognition within the industry of the significant limitations of traditional market/product mix for sawn sections and residuals has led many firms to consider and in some cases implement a transition to engineered wood products derived from lower quality logs sourced from both public and private sources, including logs from plantations originally planted as pulp mill stock which historically have been problematic for the industry.

Engineered wood products include cross-laminated timbers, laminated panels, structural insulated panels and composite structural sections, primarily for residential construction. The mix of panels and laminated products is important because it provides the potential to maximise the recovery of material through a mix of rotary peeled veneers and sawn strips from logs. These products demonstrate potentially higher value-add than the large proportion of sawn sections traditionally produced.

The steadily growing market for engineered wood products is underpinned by a recognition of the advantages that these products bring to both commercial and residential construction: reduced overall cost, increased rate of construction, scope for precision pre-fabrication and flexibility in layout. Engineered wood products also have significant carbon emission advantages over more carbon intensive masonry, concrete and petro-chemical based building materials, and tap into changes in Australian consumer values and purchasing behaviours in relation to sustainability and sustainable living. Both carbon pricing and investor expectations of market behaviour will reinforce the carbon emission advantages of engineered wood products.

These products offer an option to Tasmanian timber processors because some require relatively low capital investment and because they appear to be viable at sub-regional scale. The advantage of this business model is that mills can potentially increase their value-add and, with some products, reduce the time between milling and sale compared with traditional sections. Co-operation amongst mills could facilitate provision of elements to “production hubs” for further value adding, in effect creating a new industry based on proven European and US construction approaches and technology adapted to the Australian context. The increasing acceptance of these products is demonstrated in the use of cross-laminated timber in the Grocon residential project in Melbourne.

The approach suggested here has the following benefits:

- It is built on sustainable forest management practices.
- It transforms lower grade timber unsuitable for other uses into higher value products, improving the ratio of commodity to value add product in the output mix.
- It optimises recovery of what would largely be waste material.
- It achieves economies through collaboration and vertical integration.
- It places the Tasmanian timber product sector in the forefront of sustainable building, building materials and processes.
- It enables regional sawmill operators to directly and indirectly participate in higher levels of value adding.
- It retains and enhances business and employment opportunities in dispersed rural communities.
- It builds the capacity and spirit of participating communities, re-establishing their notions of value and worth.

A key benefit is the transfer of off-shore jobs to on-shore jobs through the replacement of export woodchips with engineered wood products and/or other products including energy that will benefit Australian households, the economy and the environment.

Ideally, these industry changes increase to a scale necessary to satisfy the increasing demand for wood products in national markets. Well-focused development investment is critical to redefining the Tasmanian timber Industry in both reality and in the eyes of the market.

As this transition would significantly alter the sawmill and timber product business model across Tasmania, the employment effect of this transition to engineered timber products has not been specifically analysed. However, using Ta Ann as an employment indicator and up-scaling direct employment by 25% to reflect the greater complexity and labour intensity in making engineered wood products, the combined direct and indirect employment potential is likely to be in the order of 255 jobs above a reference point that does not include engineered wood products. This provides an indication of the importance of achieving this transition.

It is beyond the scope of this Report to estimate the costs of this industry reconfiguration. However, anecdotal evidence suggests that fundamental changes to the industry structure such as the option suggested here are beyond the financial capacity of the industry to achieve or the willingness of the industry (and banks) to invest. Significant government support is expected to be required.

6. REGIONAL IMPACTS

In addition to impacts at State-wide level, modelling was undertaken of impacts at NW, NE and South Regional levels. Note that the boundaries between Regions are based on public forest log supply, rather than necessarily reflecting aggregations of Local Government Areas into economic regions. Note also that the Input-Output Model can only assess each Region independently and in isolation of the impacts in other Regions. For this reason, the indirect impacts for each Region are only indicative and do not sum to the impacts for the combined Regions as shown in Tables 8 and 9.

Log volume and direct employment levels by Region are shown in Tables 3, 4 and 5 for the Baseline, Scenario 1 and Scenario 2 respectively. Differences between the Baseline and Scenarios 1 and 2 by Regions and in aggregate are shown in Table 6 and 7 respectively.

Scenario 1

Direct and indirect impacts at Regional level for the log supply comprising Scenario 1 are shown in Table 10. The flow-on effects of direct job losses under Scenario 1 have been broken down into industry sectors in Appendices 5, 6 and 7 for NW, NE and South Regions respectively.

For Scenario 1, the impacts are much more substantial in NE Region and South Region than in NW Region. The total impacts on output, employment, wages & salaries and value-added are more than 10 times the impact in NE Region than in NW Region.

Scenario 2

Direct and indirect impacts at Regional level for the log supply comprising Scenario 2 are shown in Table 11. The flow-on effects of direct job losses under Scenario 2 have been broken down into industry sectors in Appendices 8, 9 and 10 for NW, NE and South Regions respectively.

For Scenario 2, the impacts are much larger than for Scenario 1 but the differences between Regions are not nearly as dramatic as for Scenario 1. The total impacts on output, employment, wages & salaries and value-added are around twice the impact in NE Region compared to NW Region, and around three times the impact in South Region compared to NW Region.

TABLE 10: DIRECT AND INDIRECT OUTCOMES BY REGION FOR SCENARIO 1

Impact Summary Report						
NW Region Impact Summary	Direct Effect	Industrial Flow On Effect	Consumption Flow On Effect	Total	Type 1 Multiplier	Type 2 Multiplier
Output (\$M)	-\$2.5	-\$1.6	-\$0.7	-\$4.8	1.62	1.88
Employment (Jobs)	-7	-6	-3	-16	1.86	2.29
Wages and Salaries (\$M)	-\$0.4	-\$0.3	-\$0.2	-\$0.9	1.88	2.27
Value-Added (\$M)	-\$0.8	-\$0.6	-\$0.4	-\$1.8	1.80	2.25

NE Region Impact Summary	Direct Effect	Industrial Flow On Effect	Consumption Flow On Effect	Total	Type 1 Multiplier	Type 2 Multiplier
Output (\$M)	-\$32.1	-\$19.2	-\$10.7	-\$62.0	1.60	1.93
Employment (Jobs)	-83	-74	-53	-210	1.89	2.53
Wages and Salaries (\$M)	-\$5.6	-\$4.1	-\$2.5	-\$12.2	1.73	2.19
Value-Added (\$M)	-\$11.5	-\$7.5	-\$5.8	-\$24.8	1.65	2.15

South Region Impact Summary	Direct Effect	Industrial Flow On Effect	Consumption Flow On Effect	Total	Type 1 Multiplier	Type 2 Multiplier
Output (\$M)	-\$20.3	-\$11.2	-\$6.9	-\$38.4	1.56	1.90
Employment (Jobs)	-52	-43	-34	-129	1.82	2.48
Wages and Salaries (\$M)	-\$3.6	-\$2.5	-\$1.7	-\$7.7	1.69	2.16
Value-Added (\$M)	-\$7.4	-\$4.6	-\$3.8	-\$15.8	1.62	2.12

TABLE 11: DIRECT AND INDIRECT OUTCOMES BY REGION FOR SCENARIO 2

Impact Summary Report						
NW Region Impact Summary	Direct Effect	Industrial Flow On Effect	Consumption Flow On Effect	Total	Type 1 Multiplier	Type 2 Multiplier
Output (\$M)	-\$41.4	-\$25.4	-\$10.7	-\$77.5	1.61	1.87
Employment (Jobs)	-113	-94	-55	-262	1.83	2.32
Wages and Salaries (\$M)	-\$6.5	-\$5.5	-\$2.5	-\$14.4	1.84	2.23
Value-Added (\$M)	-\$13.3	-\$10.2	-\$5.9	-\$29.4	1.77	2.21
NE Region Impact Summary	Direct Effect	Industrial Flow On Effect	Consumption Flow On Effect	Total	Type 1 Multiplier	Type 2 Multiplier
Output (\$M)	-\$87.4	-\$50.6	-\$29.8	-\$167.7	1.58	1.92
Employment (Jobs)	-216	-195	-148	-559	1.90	2.59
Wages and Salaries (\$M)	-\$16.5	-\$10.415	-\$7.1	-\$34.0	1.63	2.06
Value-Added (\$M)	-\$34.3	-\$19.1	-\$16.1	-\$69.5	1.56	2.03
South Region Impact Summary	Direct Effect	Industrial Flow On Effect	Consumption Flow On Effect	Total	Type 1 Multiplier	Type 2 Multiplier
Output (\$M)	-\$134.3	-\$76.6	-\$45.8	-\$256.6	1.57	1.91
Employment (Jobs)	-348	-293	-225	-866	1.84	2.49
Wages and Salaries (\$M)	-\$23.3	-\$16.9	-\$11.0	-\$51.2	1.73	2.20
Value-Added (\$M)	-\$48.2	-\$31.4	-\$24.8	-\$104.4	1.65	2.17

APPENDIX 1: Forestry Tasmania’s long term log supply contracted volumes (m³/yr) and number (1) of contracts by region for various product types

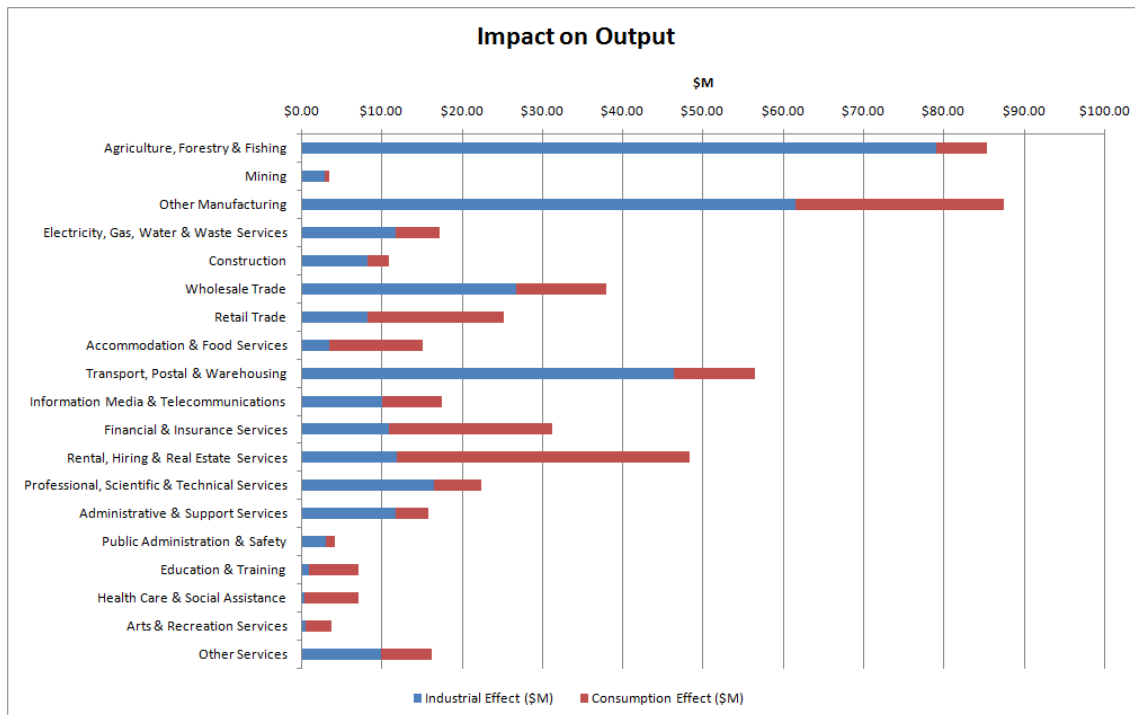
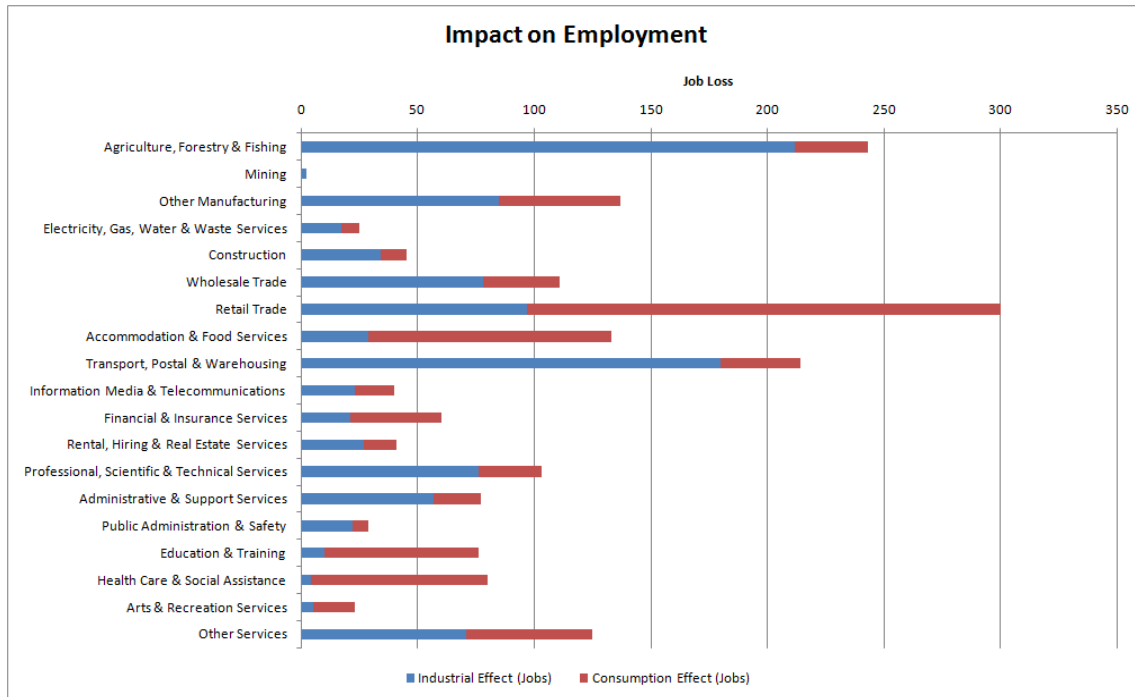
Contracted Volume by Log Category as specified by Forestry Tasmania										
Supply Region	Cat 1+3 ⁽²⁾ sawlogs	Cat 2 ⁽³⁾ sawlogs	Veneer ⁽⁴⁾	Cat 8 ⁽⁵⁾	Peeler/ Billets ⁽⁶⁾	Pulpwood Native Forests ⁽⁷⁾	Poles and Bridge Timbers ⁽⁸⁾	Special Timbers (ST) Cat 4 ⁽⁹⁾	ST Utility & Outspec grade ⁽¹⁰⁾	Plantation Wood ⁽¹¹⁾
	Volume m ³ /yr	Volume m ³ /yr	Volume m ³ /yr	Volume m ³ /yr	Volume m ³ /yr	Tonnes/yr	Pieces/yr	Volume m ³ /yr	Volume m ³ /yr	Volume m ³ /yr
North West	17,500 (1)			24,000 (1)				10,000 (4)	5,500 (3)	0
North East	32,000 (3)	20,000 (2)						670 (3)	2,365 (3)	0
South	102,000 (4)									0
Unspecified region	11,500 (2)		5,000 (1)		265,000 (2)	800,000 (1)	6,000 (1)	410 (5)	285 (5)	0
Totals	163,000	20,000	5,000	24,000	265,000	800,000	6,000	11,080	8,150	0

Notes:

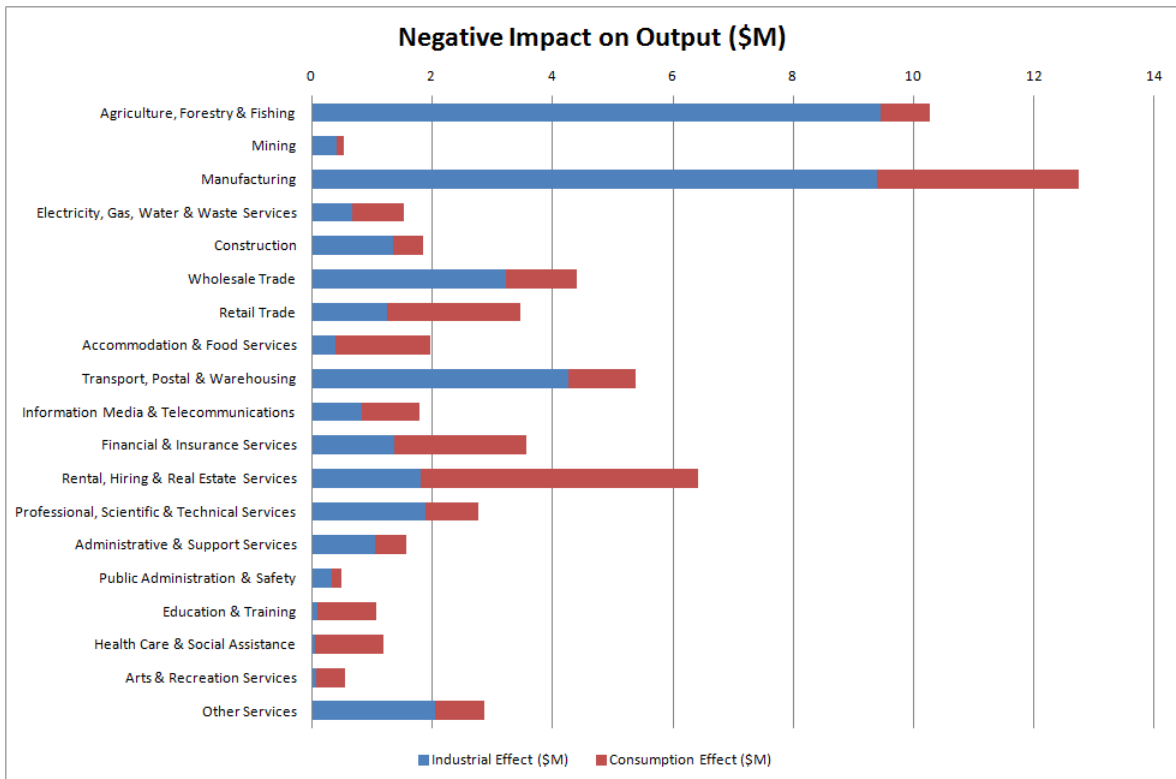
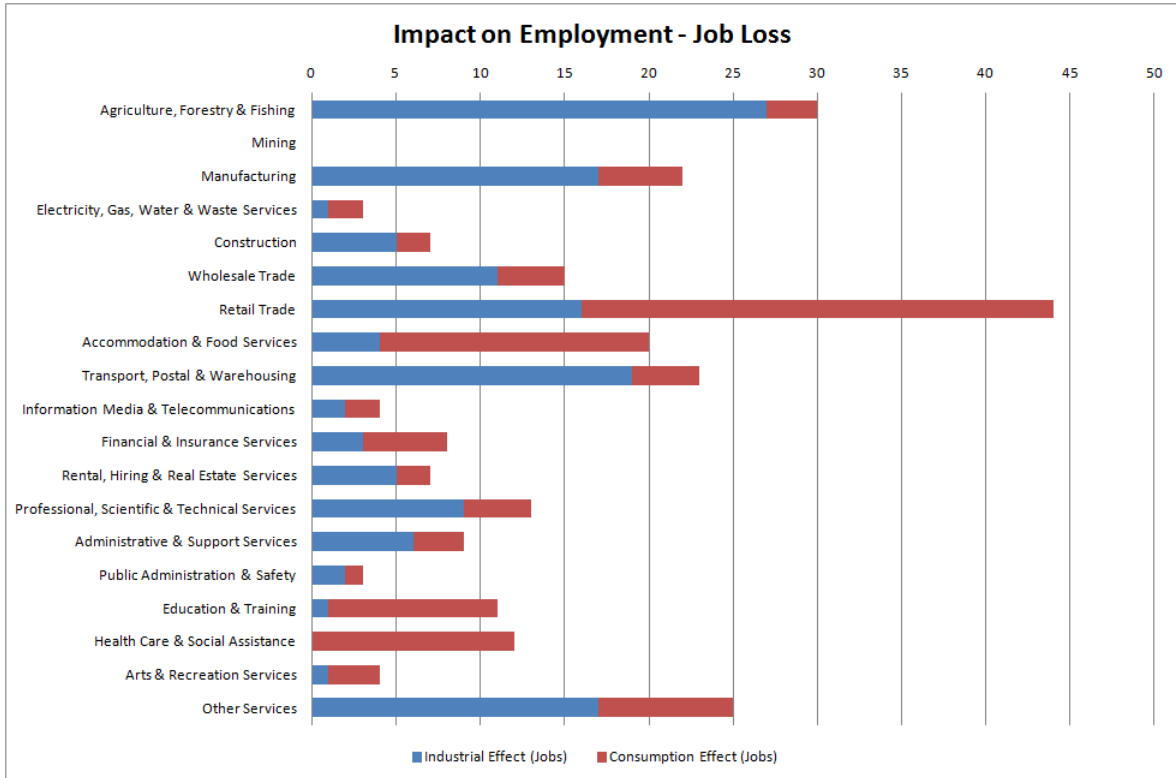
1. (#) denotes number of long term wood supply agreements (5 years or longer) associated with supply from that region.
2. Cat 1/3 sawlogs are high quality sawlogs as specified in Forestry Tasmania’s grading codes. Contractual commitments are to 2027. In addition to 10 long term contracts specifying volumes (total of 163,000 m³/yr), there are 2 long term contracts where log supply is subject to availability.
3. Cat 2 sawlogs are lower quality sawlogs as specified in Forestry Tasmania’s grading codes. Contractual commitments range from 1 to 5+ years (subject to availability) with two contract for supply to 2027.
4. Veneer sawlogs are high quality sawlogs selected for the production of veneer as specified in Tasmania’s grading codes. Contractual agreements are to 2021. The long term contract is for supply up to 5,000 m³/yr.
5. Category 8 sawlogs are pulp logs that can be sawn to recover some sawn timber products. They are specified in Forestry Tasmania’s grading codes. Supply of Category 8 logs are primarily (six contracts) supplied through short term contracts for available logs, with one long term contract.
6. Peeler / Billets are logs used for the production of plywood. They are specified in Forestry Tasmania’s grading codes. Contractual commitments for supply are to 2021-2022 with a 5 year extension.

7. Pulpwood (native forests) is low grade logs that are unsuitable for producing sawn timber. Pulp logs are specified in Forestry Tasmania's grading codes. Contractual commitment (one contract) is for annual supply that is traditionally renewed annually. For the purposes of this work, this contract has been categorised as long term.
8. Poles and Bridge Timbers are specific dimensioned logs, as specified in Forestry Tasmania's grading codes. Poles and Bridge timbers are usually sold by the piece. Contractual agreements are through three short and two long term contracts, of which one of the latter is subject to availability.
9. Special Timber category 4 logs are high quality specialty timber sawlogs, as specified in Forestry Tasmania's grading codes.
10. Special Timber Utility and out spec logs are lower grade special timber sawlogs, as specified in Forestry Tasmania's grading codes.
11. Plantation wood are logs from plantations that are specified in Forestry Tasmania's grading codes.

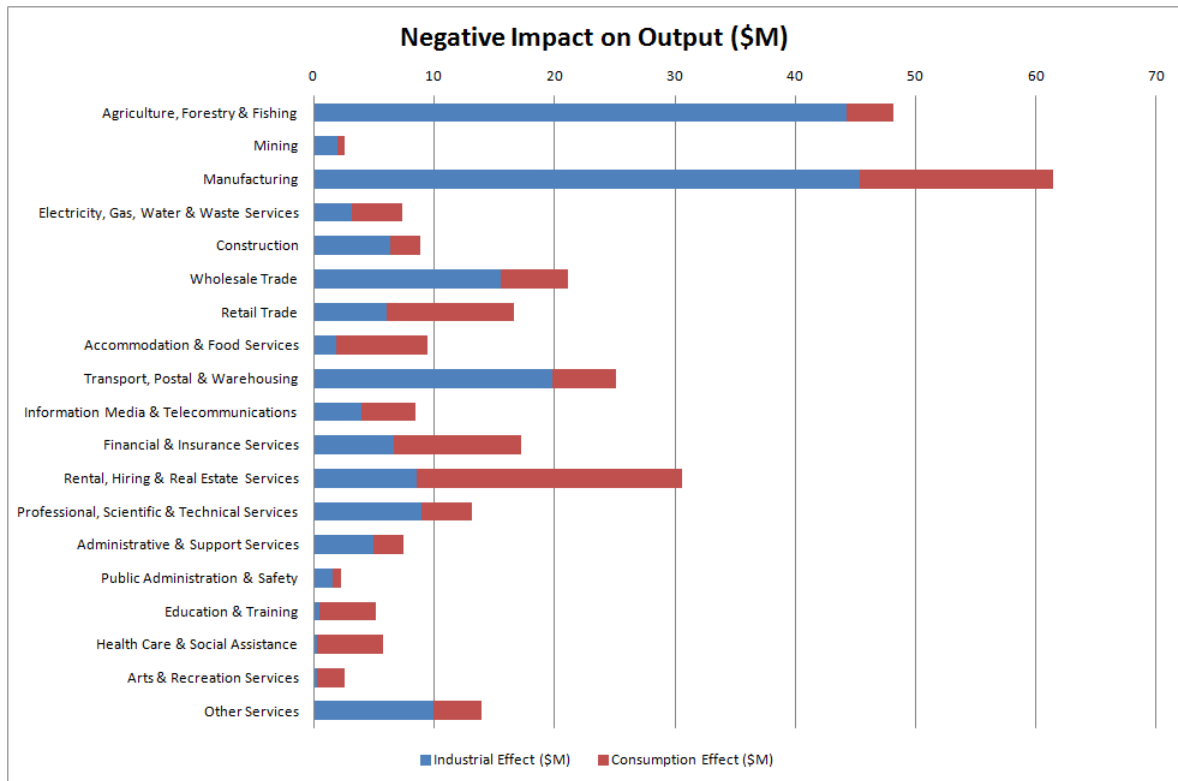
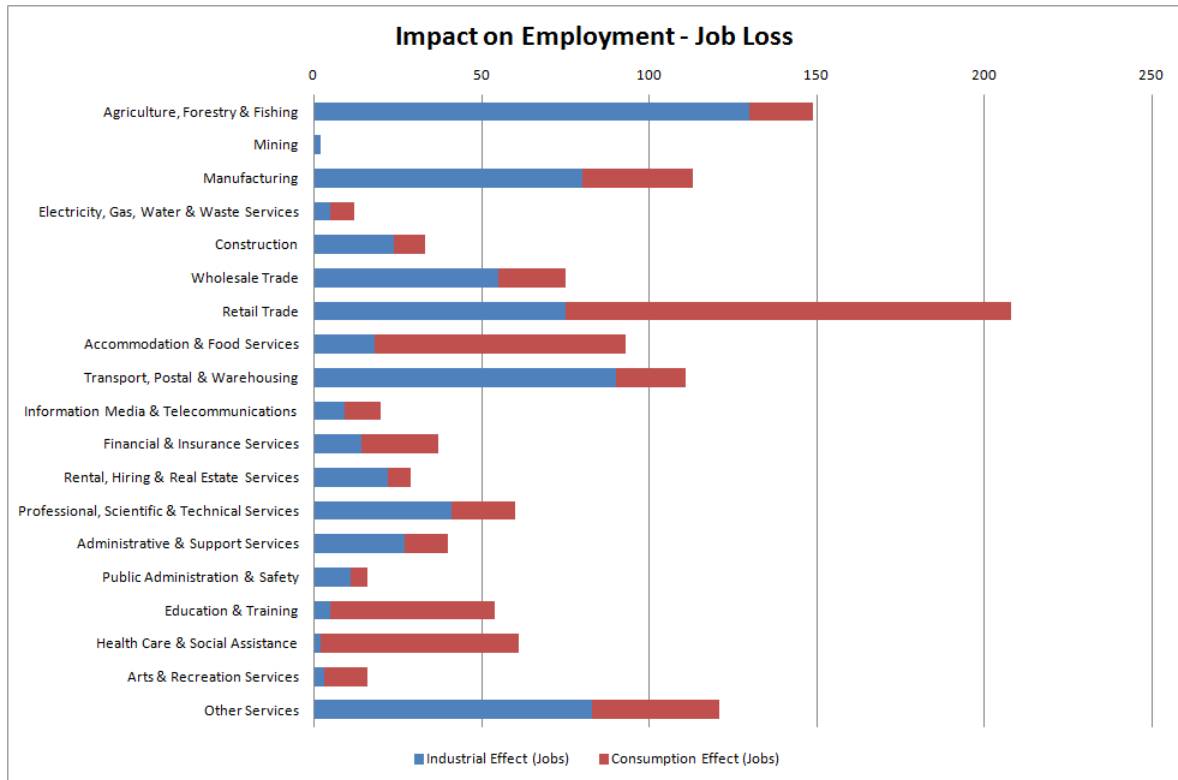
APPENDIX 2: ABS Forest Industry Job Losses 2006/07 to 2010/11 Flow-on Effects



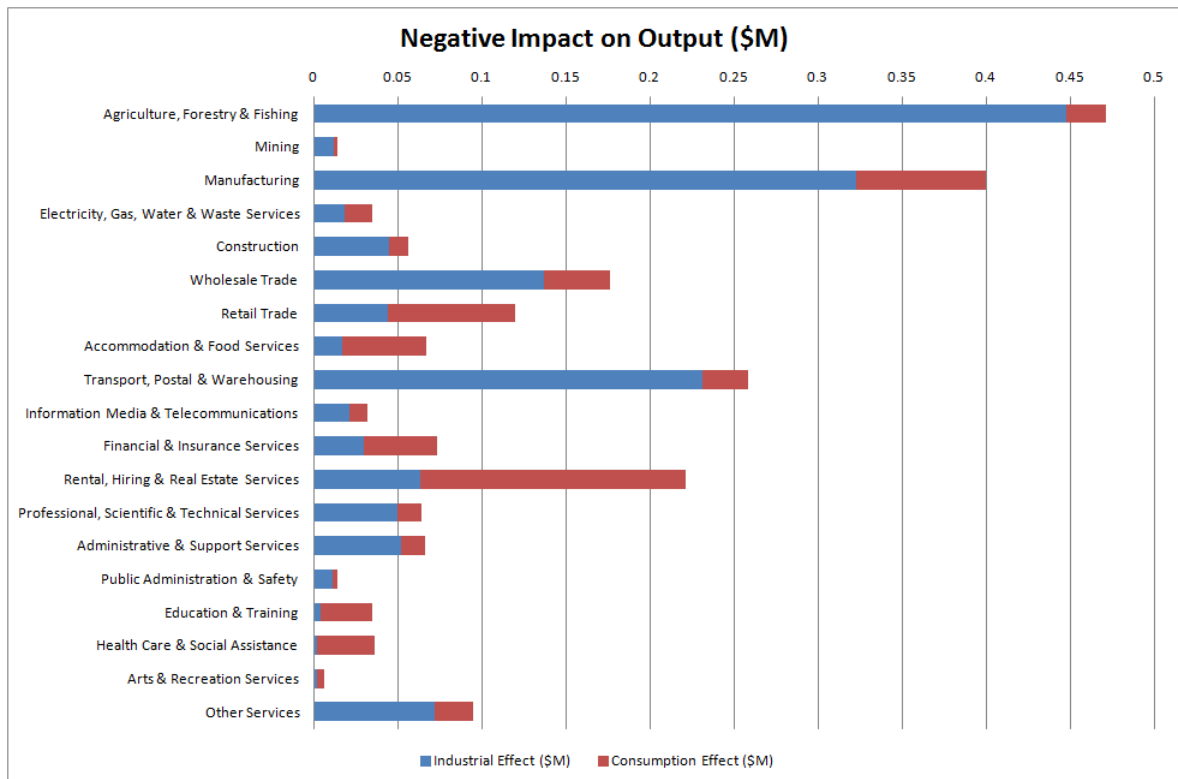
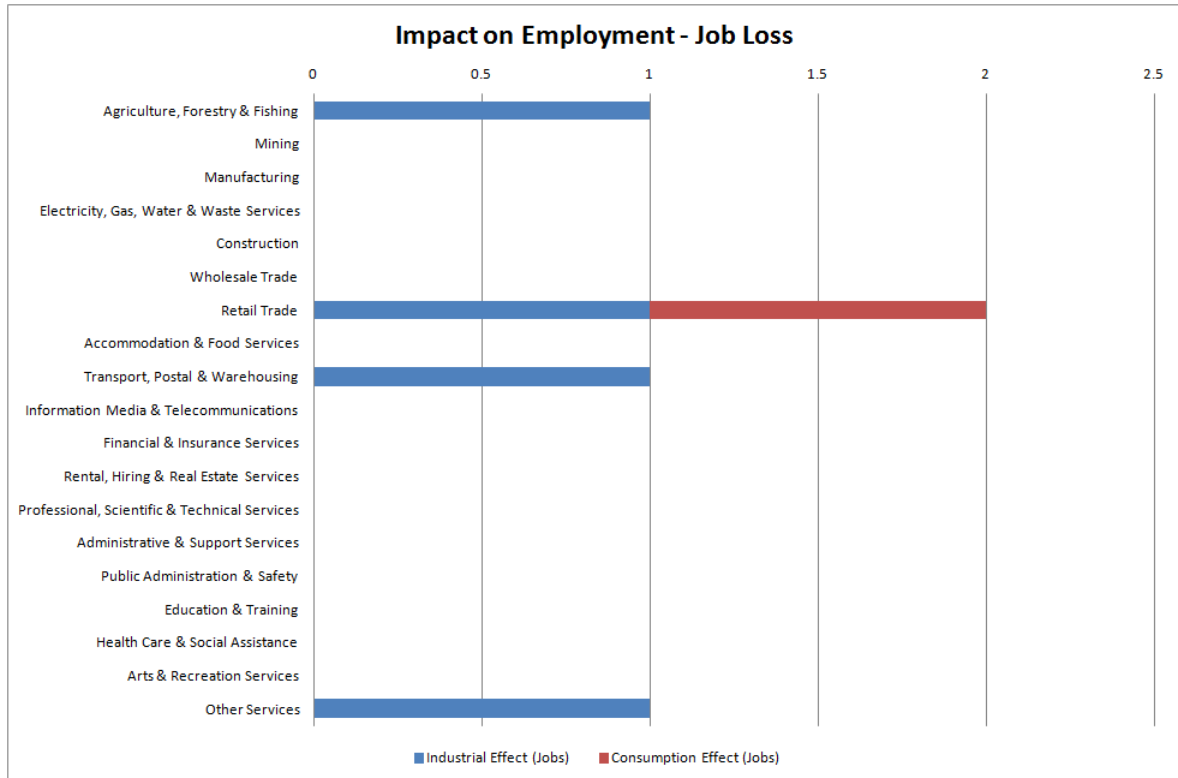
APPENDIX 3: Scenario 1 – Flow-on Effects of Losses Versus Baseline



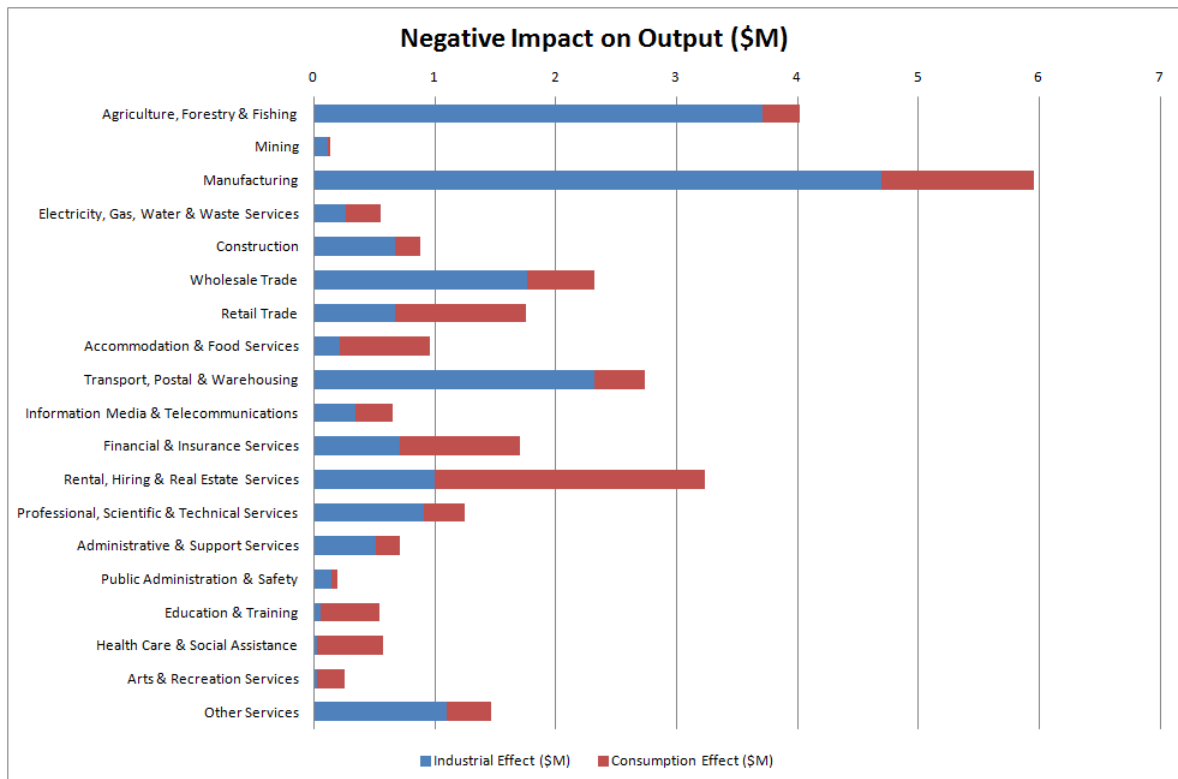
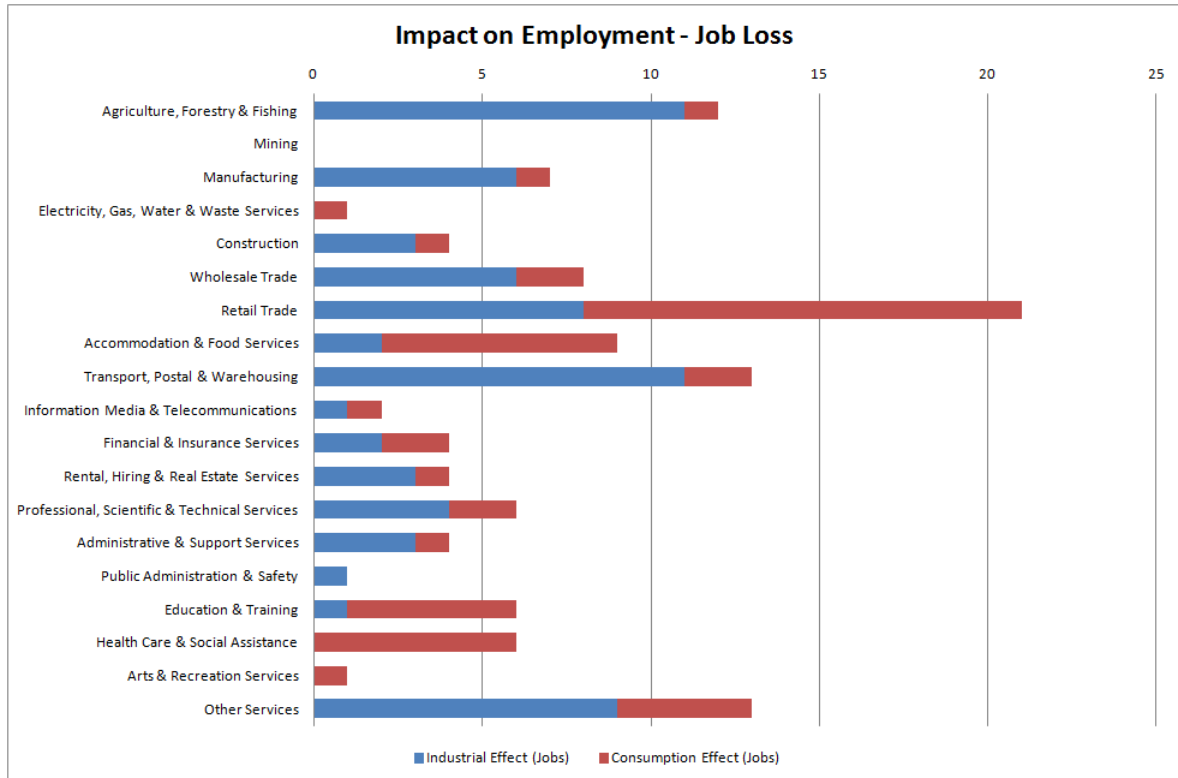
APPENDIX 4: Scenario 2 – Flow-on Effects of Losses Versus Baseline



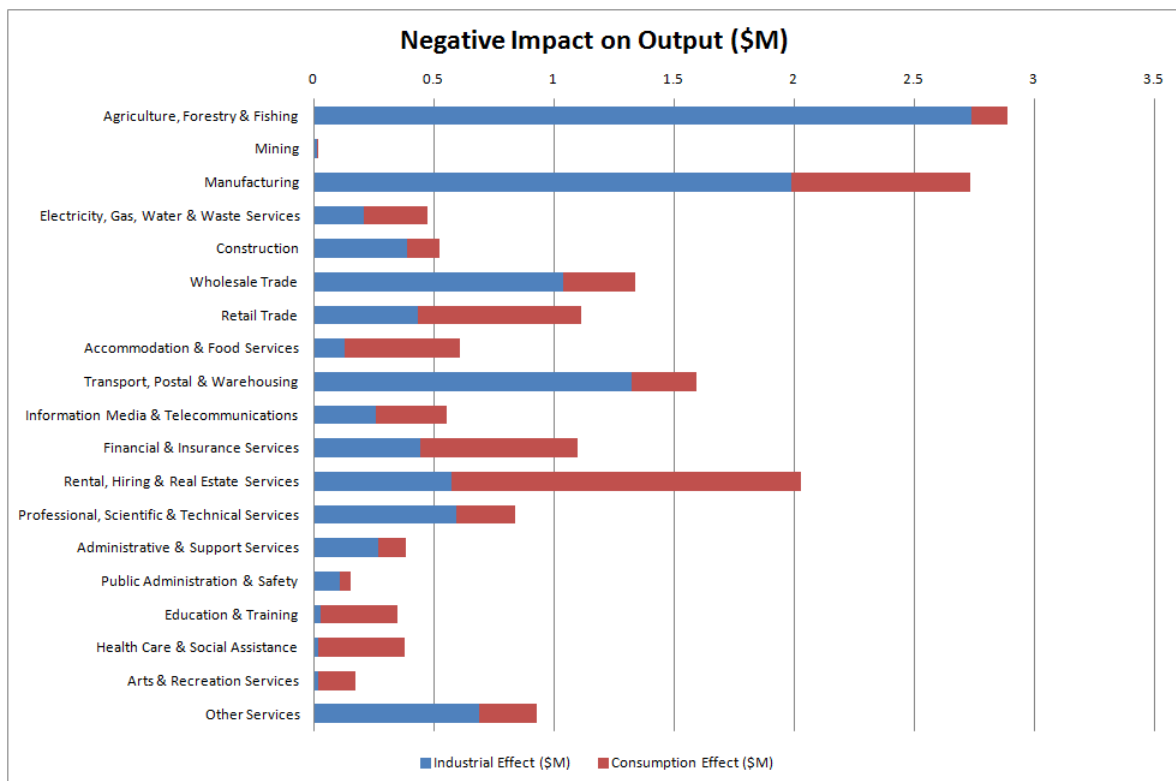
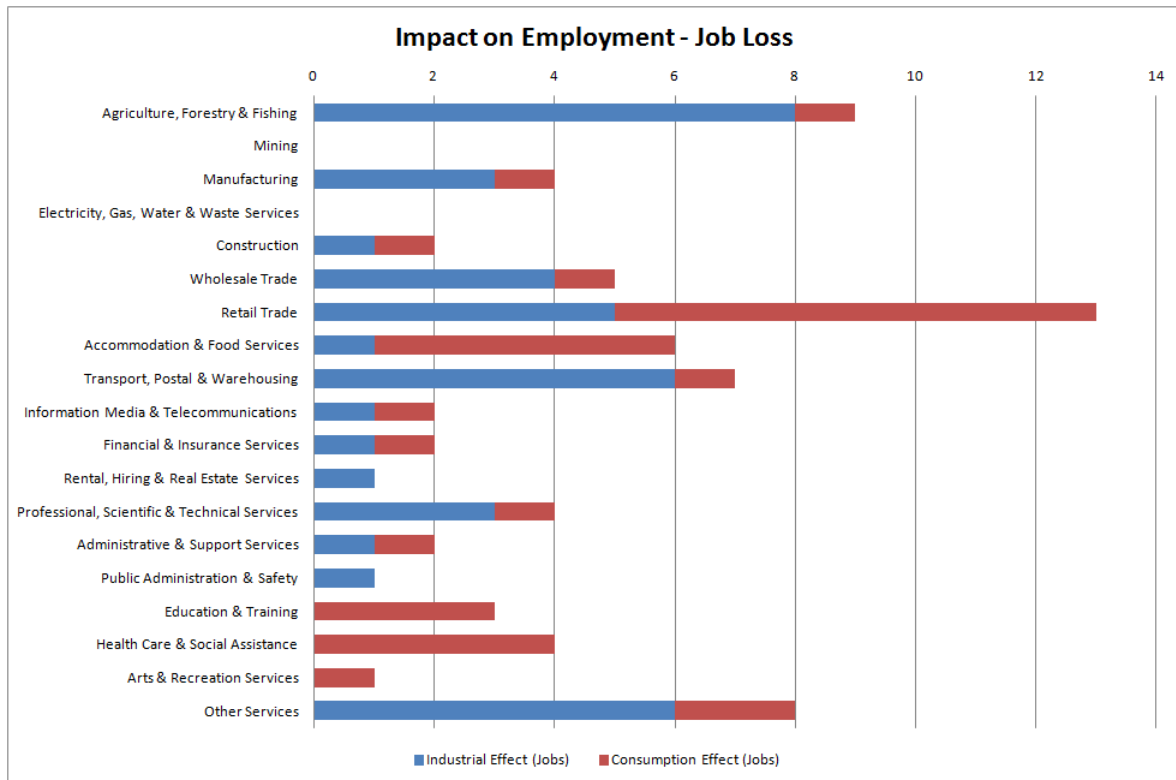
APPENDIX 5: Scenario 1 – Flow-on Effects of Losses Versus Baseline; NW Region



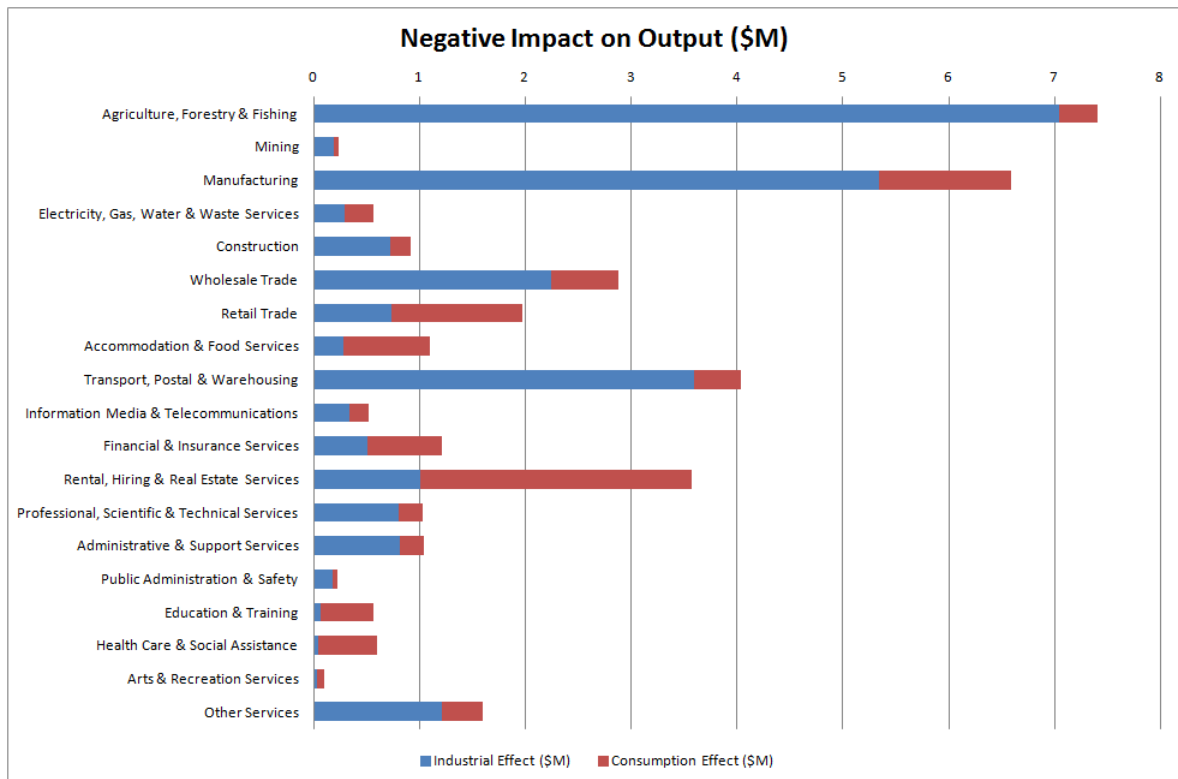
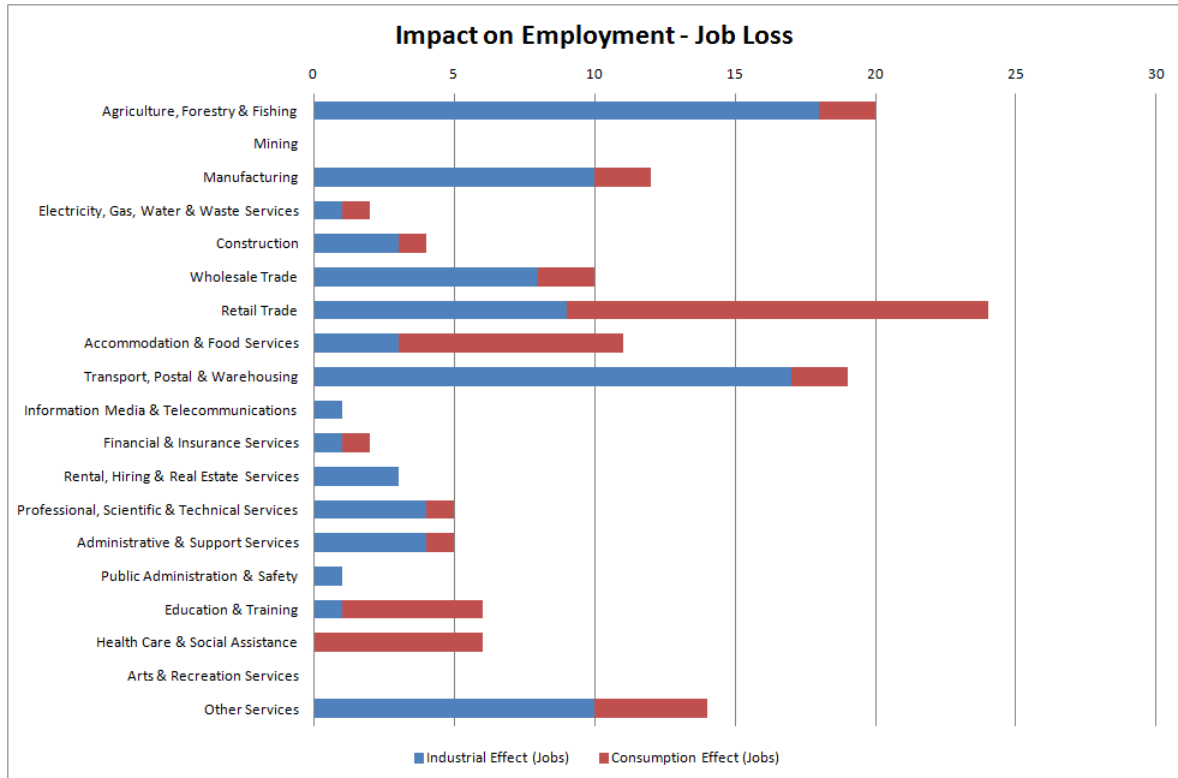
APPENDIX 6: Scenario 1 – Flow-on Effects of Losses Versus Baseline; NE Region



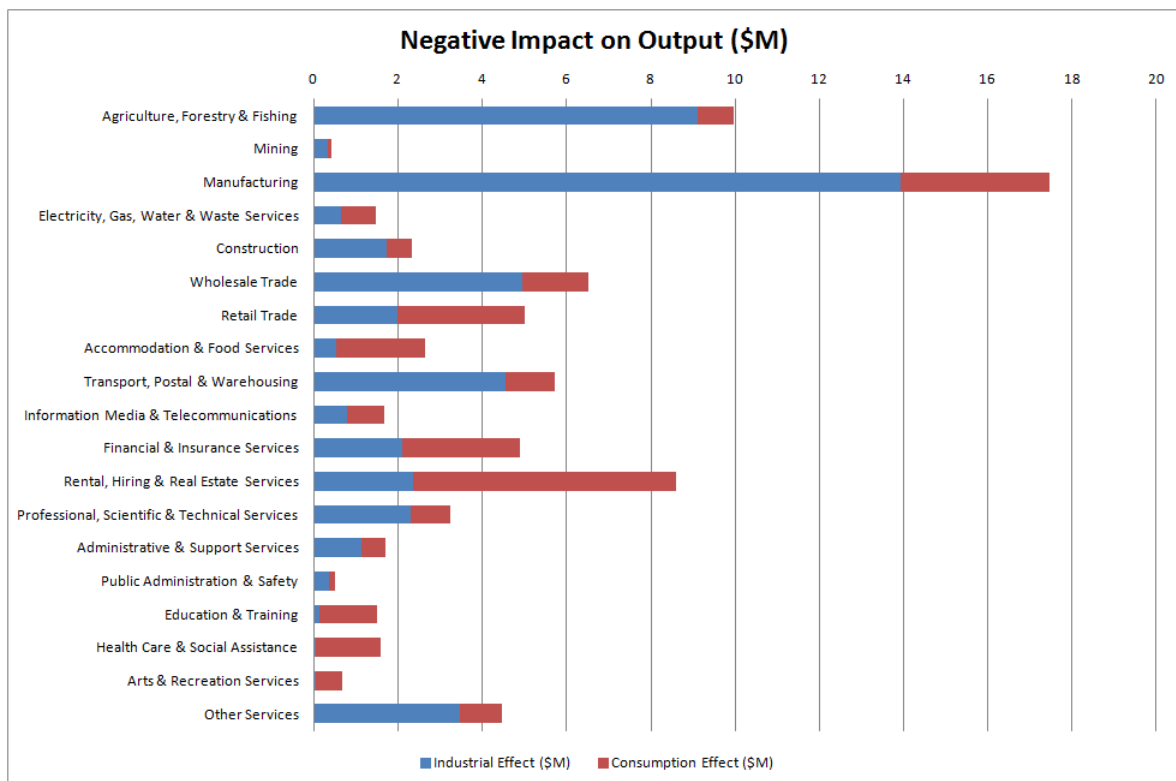
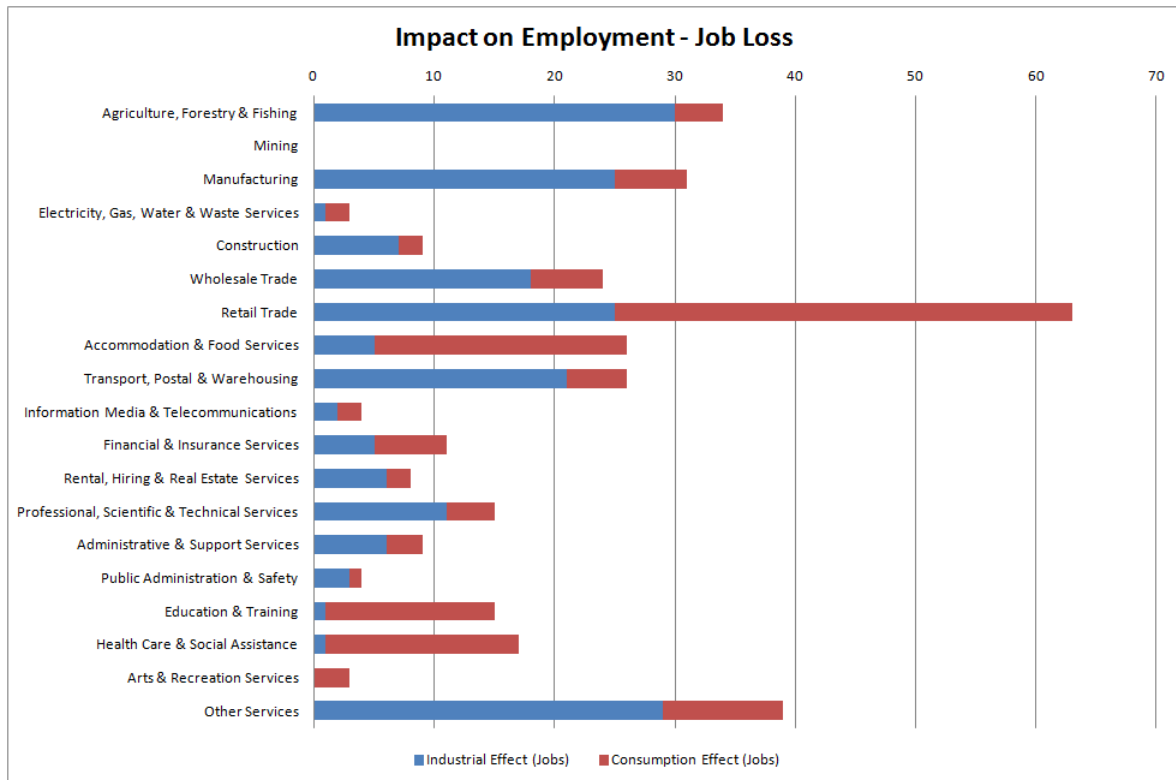
APPENDIX 7: Scenario 1 – Flow-on Effects of Losses Versus Baseline; South Region



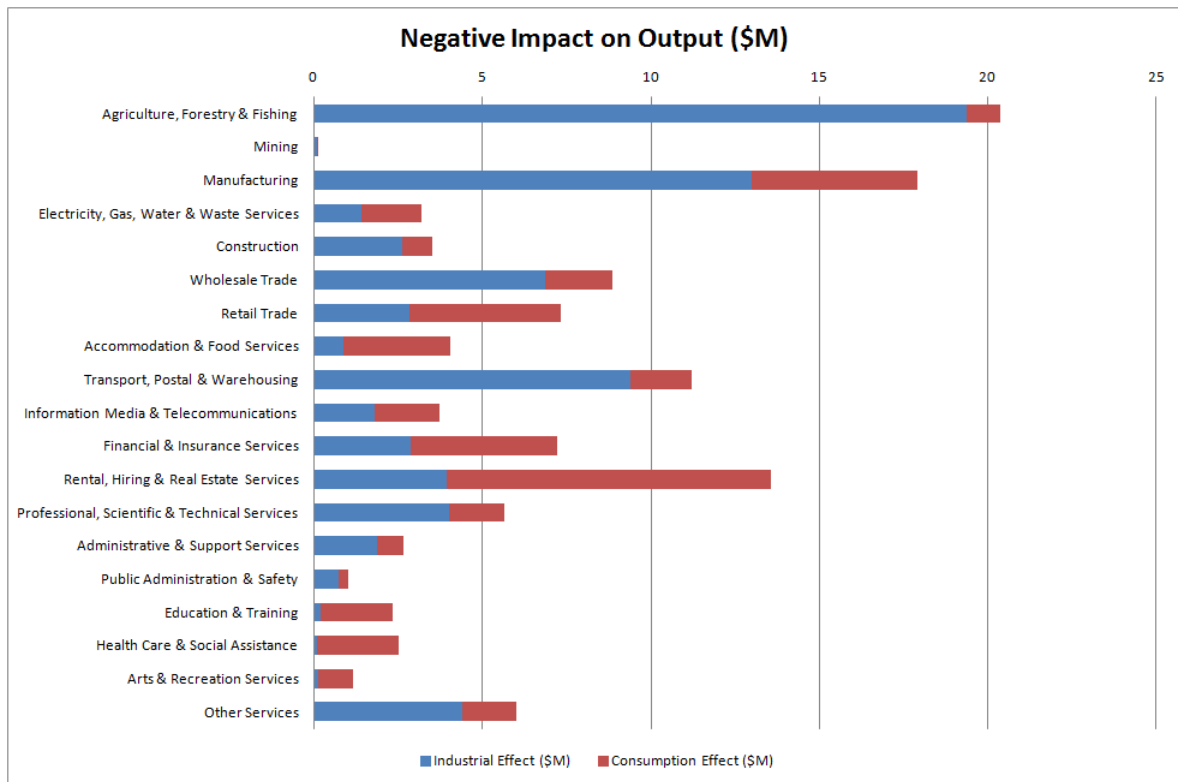
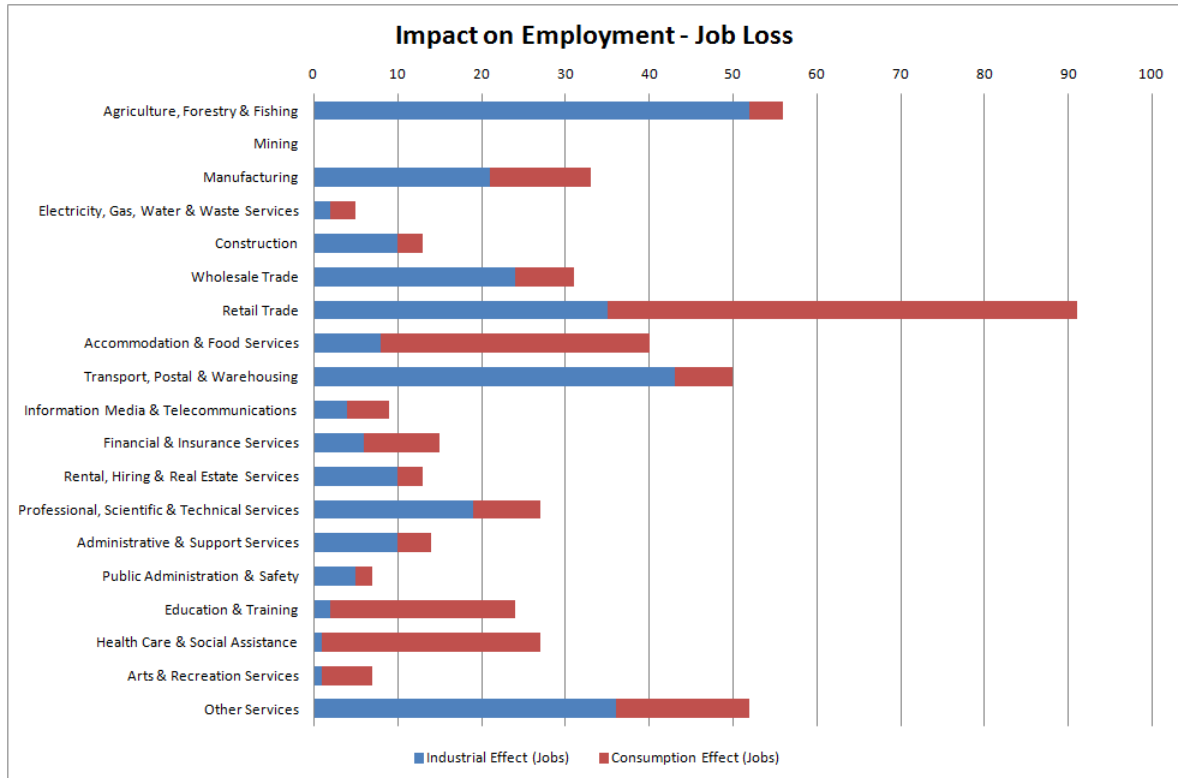
APPENDIX 8: Scenario 2 – Flow-on Effects of Losses Versus Baseline; NW Region



APPENDIX 9: Scenario 2 – Flow-on Effects of Losses Versus Baseline; NE Region



APPENDIX 10: Scenario 2 – Flow-on Effects of Losses Versus Baseline; South Region



APPENDIX 11: Special Species Timber Sector

Introduction

This Report focuses on direct job losses that occur at native forest timber mills and at secondary processors that use this mill output to produce predominantly structural products. The consequences for the Tasmanian economy are estimated using Input-Output modelling and the outcomes do not reflect the consequences of mitigation actions that might be undertaken.

The consequences of reduction in log supply on utilisation of timber products within the Tasmanian community are significantly more dramatic for Special Species Timbers (SSTs) than for structural eucalypt products. In recognition of its unique status, commentary is provided here on the estimated “downstream” impacts of reduction in supply of SSTs (the harvest and milling of SSTs is included in the wood flow and socio-economic impact analysis that forms the bulk of this Report).

Tasmanians and visitors to Tasmania tend to hold special regard for Tasmania’s SSTs and the well designed and crafted pieces made from them. Timbers such as Huon Pine, Sassafras, Myrtle, Blackwood and other endemic species play an important part in Tasmania’s marketing positioning, and the highly sought and valued products produced from these timbers make an important economic contribution, well beyond that associated with processing at mill level.

Special Species Dependency

SSTs are relatively expensive materials. Those involved in producing products and providing services, such as boat maintenance, use the material sparingly and for situations in which it delivers value in terms of its attributes and price. Consequently, different sectors reflect differing levels of dependency on special species. Wooden boat builders, furniture makers and much of the commercial woodcraft and designer/maker sectors are highly dependent, whereas joinery shops are less so. This analysis focuses on the highly dependent sectors.

Trades Sector

This sector comprises primarily furniture makers, boat builders and musical instrument makers. All use high level skills to create high value pieces.

Boat builders are central to the maintenance of traditional timber craft and the restoration of vessels with significant heritage value. Tasmanian wooden boat builders are achieving significant recognition, building and restoring vessels for high profile customers and achieving export sales. While some boats are constructed completely with SSTs (although often including “Blue Gum” for keel and stem), others utilise the high value SSTs for effect. When maintaining vessels, it is often important to repair them with timber that has the same technical specification as the original.

Furniture makers produce high quality pieces for sale through retail outlets and bespoke pieces for private and public clients. Instrument makers are achieving national and international recognition for exquisitely crafted violins, guitars and other traditional stringed instruments. Each time these are used and played to public audiences, they conjure an image of Tasmania.

The 2009 report “A Review of the Tasmanian Woodcraft Sector for The Woodcraft Guild of Tasmania Inc & Forestry Tasmania” identified the following direct employment profile (FTE denotes full time equivalent):

- Boat Building: 56 businesses x Avg. FTE employment 0.8 = 45 FTE employees
- Furniture: 94 businesses x Avg. FTE employment 1.3 = 102 FTE employees
- Musical instruments: 11 businesses x Avg. FTE employment .9 = 10 FTE employees.

Practitioners within the sectors have expressed concerns that the above estimates underestimate the number of businesses and employees.

Production Sector

This sector reflects the people who have developed products suitable for repeat construction using machinery, jigs, templates and, in some cases, production line approaches. The 2009 report identified the following direct employment profile:

- Woodturning: 19 businesses x Avg. FTE employment 1.3 = 43 FTE employees
- Giftware: 33 businesses x Avg. FTE employment 1.8 = 59 FTE employees
- Bowls: 10 Businesses x Avg. FTE employment 1.4 = 14 FTE employees.

These products are focused on specific consumer and visitor markets and are highly dependent upon SSTs as the differentiator in those markets. Significant numbers of visitors leave Tasmania with SSTs in the form of these production items. Without the SST resource, these businesses would arguably not exist.

Designer/Makers

The designer/maker is an important group. The 2009 report identifies 94 designer/maker businesses employing 102 people, including the owners.

These designers add another important dimension to the base material “design”. While it is recognised that all objects are designed, the designer/maker provides a unique perspective on design, functionality and the constructed form, often using materials in a different, highly productive manner. While many pieces are made on a speculative or bespoke basis, others make the transition to production. In effect, the designer/maker is an important research and development underpinning to the crafts sector that utilises SSTs.

The Tasmanian “exhibition quality” pieces that are present in international galleries and museums are important in recognising both the designer and Tasmania within the international context. European visitors tend to value design at least as much as the timber itself in their Tasmanian timber purchases (2009 report).

Retail

The retail sub-sector comprises of galleries/retail outlets, tourist attractions, accommodation facilities and market stalls with an estimated 140 FTE positions, the majority of which are employed in gallery and retail outlets. Salamanca Market typically hosts 21 SST producers weekly and their presence creates significant tourism attraction and spending.

Tasmanian woodcraft is the dominant product in most visitor accommodation outlets, market stalls and retail/gallery outlets. Almost one third of retail respondents indicated that their SST product supply does not meet demand.

The woodcraft sector has a significant export market focus; furniture producers, designer makers, giftware and box makers export 30% or more of their product to national and international outlets. Retailers identify expansion opportunities in both markets.

Projected Impact of the loss of Special Species Timber on the Tasmanian Economy

The contribution of the high quality crafts segment of the Tasmanian Woodcraft Sector, underpinned and largely dependent upon SSTs, is demonstrated by projecting the impact of closing the businesses associated with it as a consequence of loss of supply. The authors are not suggesting that this will happen: it is intended simply to scale potential impacts.

Based on the profile reported above, the loss of supply to a “tipping point” that would see the Special Species Timber sector close down completely would result in:

- A potential loss of 711 jobs comprising 273 direct jobs, a further 181 indirect jobs and 157 through reduced consumption.
- A reduction in output of \$77m.