Provisional Wood Availability Forecasts – Northland (2014-2050)
Ministry for Primary Industries
Outline

• Brief outline of process
• Forest description
• Scenarios
• Results of modelling
• Comparison to 2008 WAF
• Issues to be addressed
• Discussion
Process (1)

- MPI provided total areas by species, sub-region, age class and ownership size
- Yield tables provided for the following crop types:
  - Radiata – pruned without production thinning
  - Radiata – pruned with production thinning
  - Radiata – unpruned without production thinning
- Assumed radiata stands over 35 years of age will not be harvested (large-scale owners)*
- Assumed radiata stands over 40 years of age will not be harvested (small-scale owners)*
- Assumed Douglas-fir stands over 60 years of age will not be harvested (all owners)*
- The areas of the small owners’ estate (<999 ha) were reduced by 15%, because the area in this ownership category is often reported on a gross area instead of net stocked area basis
- Harvest intentions of the major forest owners compiled by MPI
- Indufor developed an estate model utilising forest description and yield table data.
- Results for first 20 years reconciled to harvest intentions data and yield tables adjusted to match harvest intention total volumes

* Age as at 31 March 2014
Process (2): Large-Scale and Small Scale Owners

- MPI provided a list of large-scale and small scale owners, based on certain characteristics of these owners (e.g. age-class distribution, organisation structure):

  - **Large-Scale Owners**
    - Taumata
    - Summit Forest Management
    - Matariki
    - Greenheart
    - GFP Mahoe II
    - Parengarenga A
    - Holyoake
    - Waytemore Forests
    - Whitford Forest Holding

  - **Small-Scale Owners**
    - Owners with less than 999 ha
    - Investment syndicates
    - Owners with greater than 1 000 ha but did not respond to the survey
Four Radiata Pine Scenarios Modelled

1. The large-scale forest resource is harvested at the stated intentions of the owners, then not allowed to decrease for the remainder of the modelled period (after 2023). The small-scale resource is harvested at age 28 years;

2. The large-scale resource harvested as per Scenario 1. The total wood availability of radiata pine from the region is constrained to be non-declining in perpetuity with a target rotation age of 28 years;

3. Same as Scenario 2 except the total wood availability of radiata pine is allowed to decline between 2035 and 2039;

4. Same as Scenario 3 except that target rotations of 26 (23 for small owners) and 30 are also evaluated
Forest Description – Northland
Age Class Distribution by Species

[Bar chart showing age class distribution by species, with bars representing area (ha) for each year from 2013 to 1973, with peaks in the 1990s for Radiata Pine and 1980s for Douglas-Fir.]
Age Class Distribution by Ownership Size

![Graph showing age class distribution by ownership size with data points for Large-Scale Owners and Small-Scale Owners over a range of planted years.](image-url)
Scenario 1: Large-owners harvest intentions, Small-owners age 28 years
Scenario 1: By Ownership Size Class – Northland

![Graph showing wood availability forecasts by ownership size class for Northland from 2014 to 2050. The graph compares Small-Scale Owners and Large-Scale Owners, with recoverable volume in cubic meters (m³) indicated on the y-axis and years ending December ranging from 2014 to 2050 on the x-axis. The data suggests fluctuations in availability over the forecast period.]
Scenario 1: By Log Type – Northland
Scenario 1: Harvest Age – Northland

Large-Scale Owners

Target 28 yrs, Actual 30.2 yrs

Small-Scale Owners

Target 28 yrs, Actual 28 yrs
Scenario 2: Large-owners harvest intentions, Small-owners target age 28 years, total radiata non-declining yield
Scenario 2: By Ownership Size Class – Northland

[Diagram showing recoverable volume (m³) over years ending December from 2014 to 2060, comparing Small-Scale Owners and Large-Scale Owners.]
Scenario 2: By Log Type – Northland

[Graph showing recoverable volume from 2014 to 2050, with categories for Pulplog, Unpruned, and Pruned.]
Scenario 2: Harvest Age – Northland

Large-Scale Owners

Small-Scale Owners

Target 28 yrs, Actual 29.7 yrs

Target 28 yrs, Actual 28.0 yrs
Scenario 3: Large-owners harvest intentions, All owners target age 28 years, total radiata split non-declining yield after 2034
Scenario 3: By Ownership Size Class – Northland

Recoverable Volume (m³)

Small-Scale Owners
Large-Scale Owners

Year Ending December

Scenario 3: By Log Type – Northland

[Graph showing recoverable volume by year ending December, with categories for pulplog, unpruned, and pruned logs]
Scenario 3: Harvest Age – Northland

Large-Scale Owners

Final Fell Age (Years)

Target 28 yrs, Actual 29.3 yrs

Small-Scale Owners

Final Fell Age (Years)

Target 28 yrs, Actual 28.0 yrs
Scenario 4: Large-owners harvest intentions, All owners target age 26 & 30 years, total radiata split non-declining yield after 2034
Scenario 4: By Ownership Size Class – Northland

Target Rotation Age = 26*

*Based on feedback from stakeholders, the target age for the small owner estate was set at age 23
Scenario 4: By Log Type – Northland

Target Rotation Age = 26*

*Based on feedback from stakeholders, the target age for the small owner estate was set at age 23
Scenario 4: Harvest Age – Northland

Target Rotation Age = 26*

<table>
<thead>
<tr>
<th>Final Fell Age (Years)</th>
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<tbody>
<tr>
<td>45</td>
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<td>40</td>
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<td>35</td>
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<td>25</td>
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<td>20</td>
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<td>10</td>
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<tr>
<td>5</td>
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<td>0</td>
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</table>

Year Ending December

Target 26 yrs, Actual 26.9

Target Rotation Age = 30

<table>
<thead>
<tr>
<th>Final Fell Age (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
</tr>
<tr>
<td>40</td>
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<tr>
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Year Ending December

Target 30 yrs, Actual 29.6 yrs

*Based on feedback from stakeholders, the target age for the small owner estate was set at age 23
Comparison of Radiata Scenarios – Northland

Scenario 1

Scenario 2

Scenario 3

Scenario 3, 4a and 4b (Target Rotation Age = 28, 26, 30)
Scenario 5: Douglas-fir  (No Douglas-fir Scenario in Northland)
Discussion (1):
Comparison to the 2008 Northland Wood Availability Forecast (Scenario 2 – All Owners)

Note – in the 2008 WAF, Auckland was a separate region. In the 2014 WAF, the majority of the area has been transferred to CNI, with the exception of Auckland Council district which is now part of Northland.
Discussion (2):
Comparison to the 2008 Northland Wood Availability Forecast

<table>
<thead>
<tr>
<th>Item</th>
<th>2008 WAF</th>
<th>2014 WAF</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stocked area (ha)</td>
<td>188 951</td>
<td>168 648</td>
<td>- 10.7%</td>
</tr>
<tr>
<td>Average Age (years)</td>
<td>16.2</td>
<td>16.8</td>
<td>+ 4.0%</td>
</tr>
<tr>
<td>Productivity (m³/ha @ age 30 Unpruned)</td>
<td>674</td>
<td>546</td>
<td>- 19.0%</td>
</tr>
<tr>
<td>Productivity (m³/ha @ age 30 Pruned)</td>
<td>566</td>
<td>492</td>
<td>- 13.0%</td>
</tr>
<tr>
<td>CF Target Age (years)</td>
<td>30</td>
<td>28</td>
<td>- 6.7%</td>
</tr>
<tr>
<td>Harvested Volume (million m³)*</td>
<td>149.2</td>
<td>111.4</td>
<td>- 25.3%</td>
</tr>
<tr>
<td>Harvested Area (ha)*</td>
<td>222 756</td>
<td>225 789</td>
<td>+ 1.4%</td>
</tr>
<tr>
<td>Annual Sustainable Harvest (million m³)</td>
<td>4.1</td>
<td>2.8</td>
<td>- 30.5%</td>
</tr>
<tr>
<td>Average TRV (m³/ha) 2014-50</td>
<td>670</td>
<td>493</td>
<td>- 26.3%</td>
</tr>
</tbody>
</table>

*Total over the period 2014 to 2050
Note the boundary between Northland and Central Northland Island has been revised from the 2008 forecasts.
Discussion (3):
Comparison to the 2008 Northland Wood Availability Forecast
(Scenario 2 –Large and Small-Scale Owners)

<table>
<thead>
<tr>
<th>Year Ending December</th>
<th>Large-Scale Owners</th>
<th>Small-Scale Owners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Recoverable Volume (m³)</td>
<td>Recoverable Volume (m³)</td>
</tr>
<tr>
<td></td>
<td>2008 WAF Scenario 3 (Total NDY)</td>
<td>2008 WAF Scenario 3 (Total NDY)</td>
</tr>
<tr>
<td></td>
<td>2014 WAF Scenario 2 (Total NDY)</td>
<td>2014 WAF Scenario 2 (Total NDY)</td>
</tr>
<tr>
<td></td>
<td>2014 WAF Harvest Intentions</td>
<td>2014 WAF Harvest Intentions</td>
</tr>
</tbody>
</table>
Discussion (4):
Comparison to the 2008 Northland Wood Availability Forecast (Scenario 2 – Total Radiata Clearfell Harvested Area)
Discussion (5.1):
Comparison to the 2008 Northland Wood Availability Forecast
(Scenario 2 – Average Radiata Clearfell Total Recoverable Volume)

Unpruned

<table>
<thead>
<tr>
<th>Year Ending December</th>
<th>2014 WAF TRV</th>
<th>2008 WAF TRV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>m$^3$/ha</td>
<td>m$^3$/ha</td>
</tr>
<tr>
<td>Pruned</td>
<td>CF age = 28 yrs</td>
<td>CF age = 30 yrs</td>
</tr>
<tr>
<td>2014 WAF TRV</td>
<td>507</td>
<td>674</td>
</tr>
<tr>
<td>2008 WAF TRV</td>
<td>566</td>
<td>566</td>
</tr>
</tbody>
</table>
Discussion (5.2):
Comparison to the 2008 Northland Wood Availability Forecast
(Pre-90 & Post-89 Yield Tables – Pruned Regime)

Pruned without Production Thinning (Pre-90)

Pruned without Production Thinning (Post-89)
Discussion (5.3):
Comparison to the 2008 Northland Wood Availability Forecast
(Pre-90 & Post-89 Yield Tables – Unpruned Regime)

Unpruned without Production Thinning (Pre-90)

Unpruned without Production Thinning (Post-89)
Discussion (6.1): Comparison to the 2008 Northland Wood Availability Forecast (Area by Age-Class)

By Establishment Year

2014 NEFD Radiata area = 168 648 ha
2007 NEFD Radiata area = 188 951 ha

By Age (at NEFD Date)

2014 NEFD Average Age = 16.8 years
2007 NEFD Average Age = 16.2 years
Discussion (6.2):
Comparison to the 2008 Northland Wood Availability Forecast
(Area by Age-Class and Ownership Scale)

Large-Scale Owners - By Age (at NEFD Date)

2014 NEFD Average Age = 16.4 years
2007 NEFD Average Age = 17.3 years

Small-Scale Owners - By Age (at NEFD Date)

2014 NEFD Average Age = 17.3 years
2007 NEFD Average Age = 13.0 years
Discussion (7)

• Silvicultural Regime Rules
  • Large owners: all pruned areas regenerated to unpruned
  • Small owners: 25% of pruned areas stay as pruned, rest regenerate to unpruned

• Re-establishment Assumptions. All areas are regenerated except:
  • Around 5000 ha hand-back to Ngati Hine (ex Taumata)
  • Varying estimates of hand-back from other estates of between 1000 ha and 3000 ha. Assume 2000 ha for modelling

• The 2014 harvest volume for radiata pine is estimated to be 4.2 million m³ in the Northland region (including forests within Auckland Council). The 2015 harvest volume is assumed to be the same as in 2014.

• Compared to the 2008 WAF, there is now a significant reduction in large-scale forest owners harvest level

• Areas age 1 to 4 were reduced by 5% to allow for expected reductions following remapping prior to any silviculture treatments.

• Area loss on second rotation due to new roads and skids and inaccessible areas assumed to be 3%. 1997 and older areas assumed to be first rotation.