# Southland and South Otago Wood Residue Assessment – Preliminary Findings

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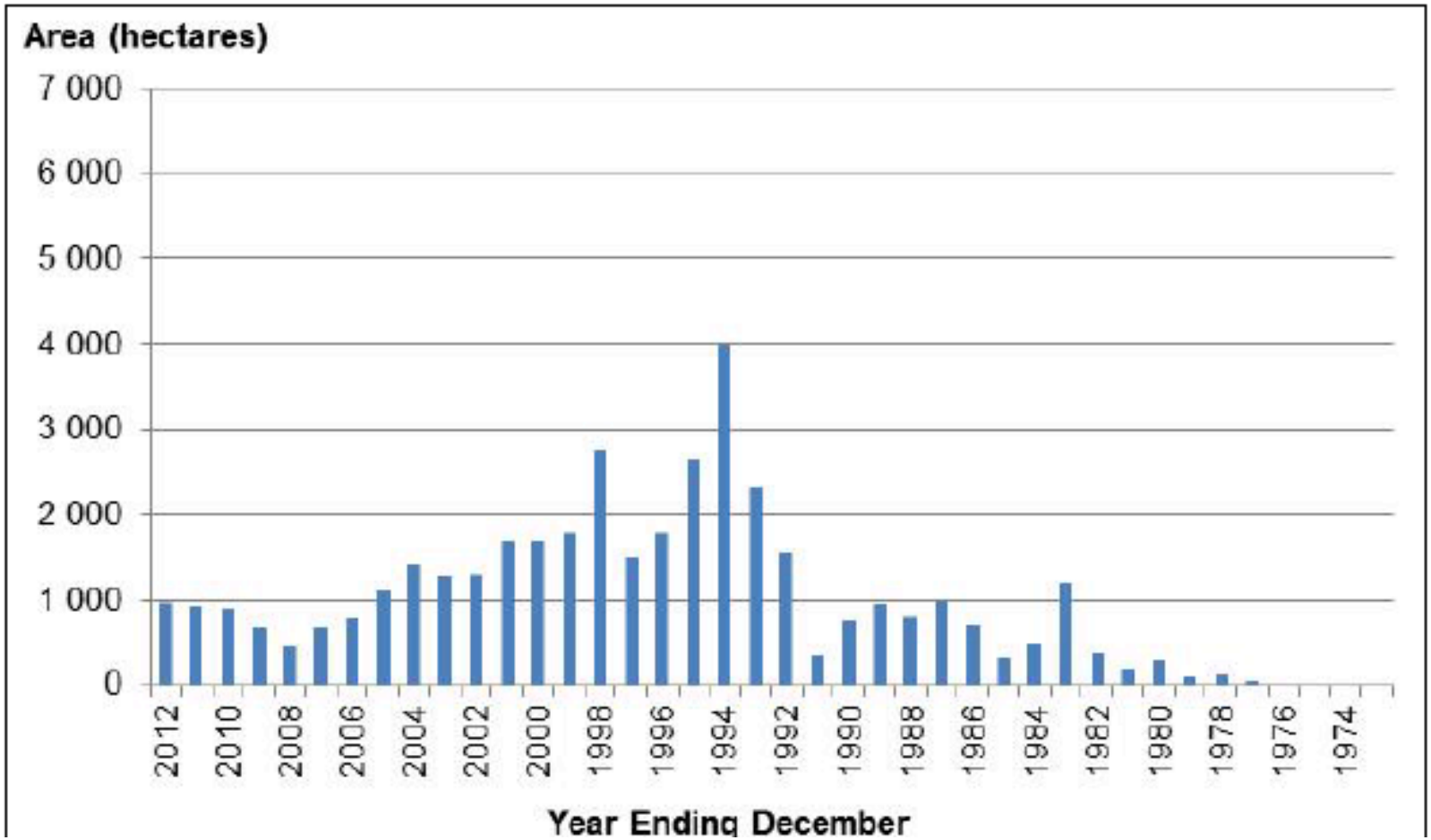
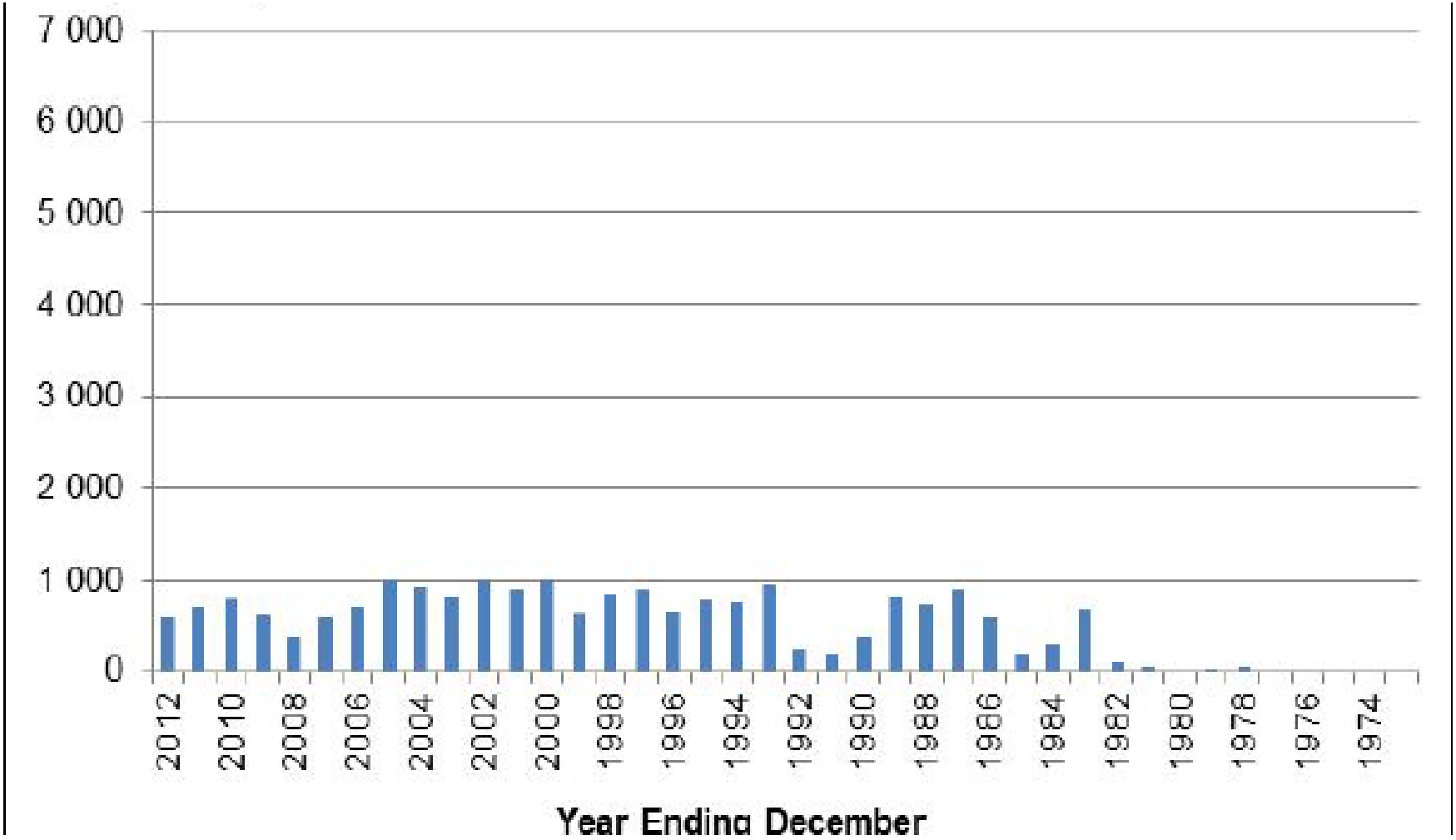
# Overview

- High level overview of forest estate
- Modelled woodflows
- Existing markets
- Opportunity for diversification into wood energy
- Indications of opportunity

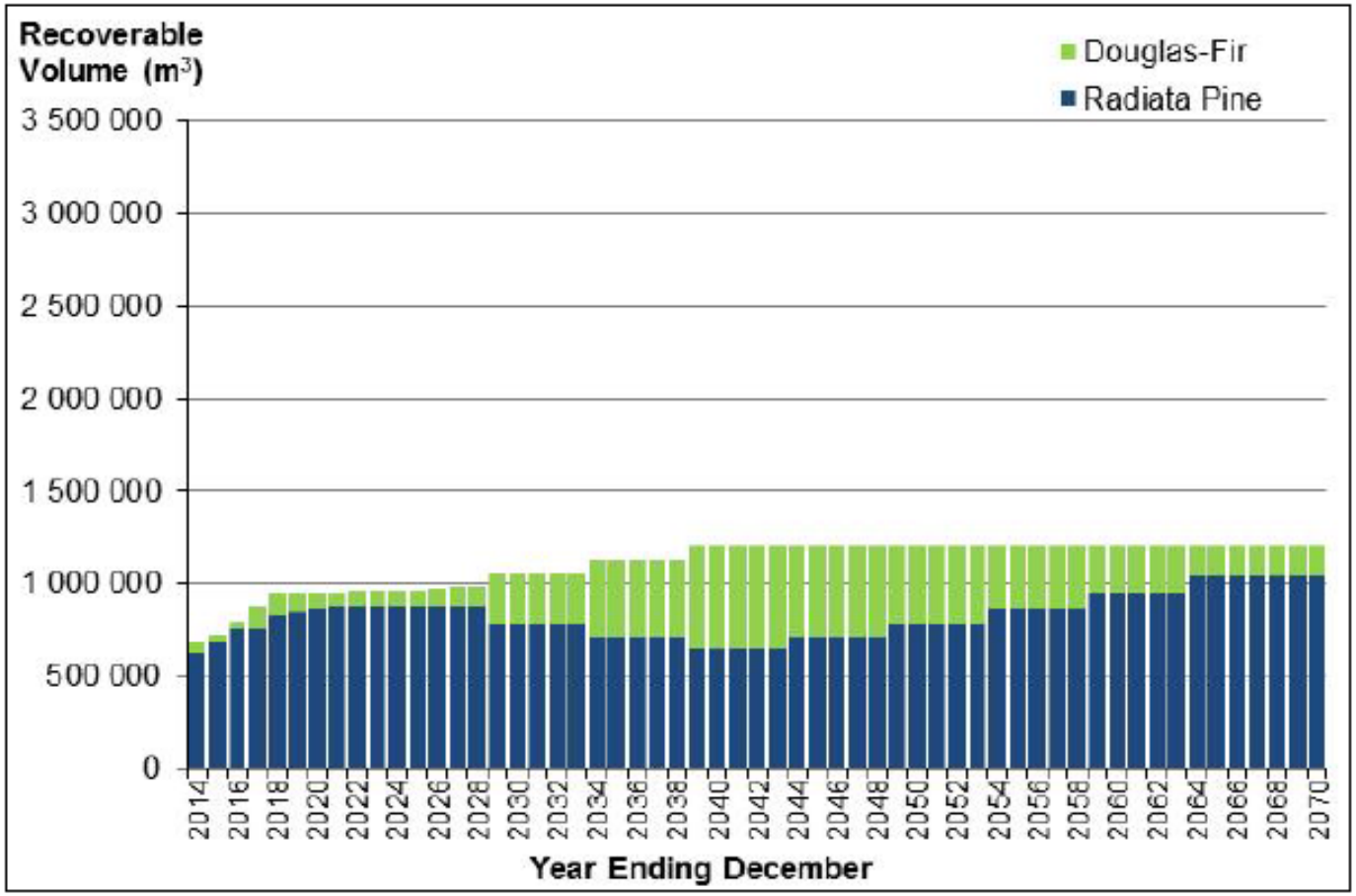
# Southland Forest Age Class (all owners)



# Southland Large Forest Owners Estate



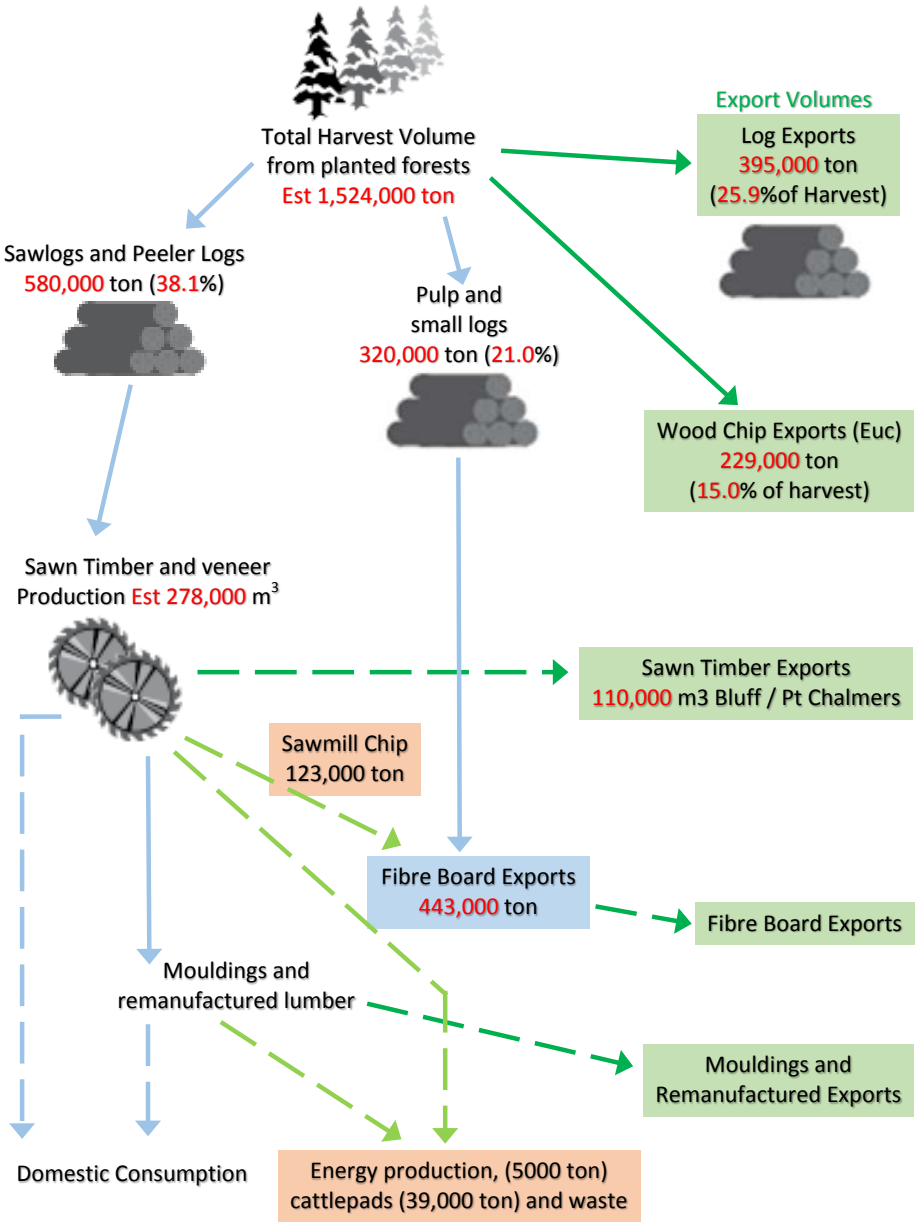
# Expected Southland woodflow



# Existing outlets for low value logs

- Export Chip
- Export Pulp
- MDF Chip
- Billet wood
- Firewood
- Wood energy

# Estimated Log Flow in the Southland Forest Industry year end 2014

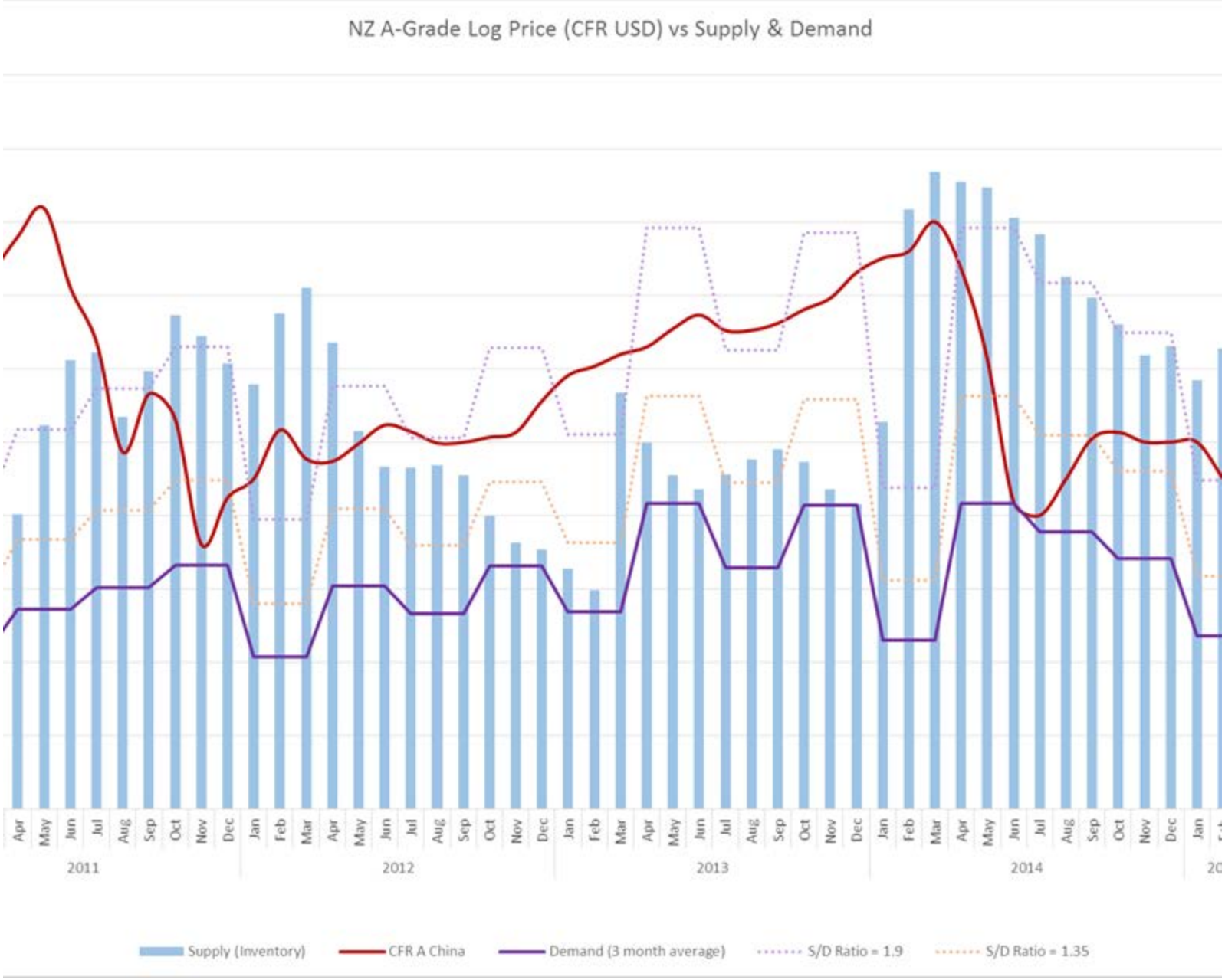


C3 & NFA Bluff
14 may 2014 to 15 May 2015

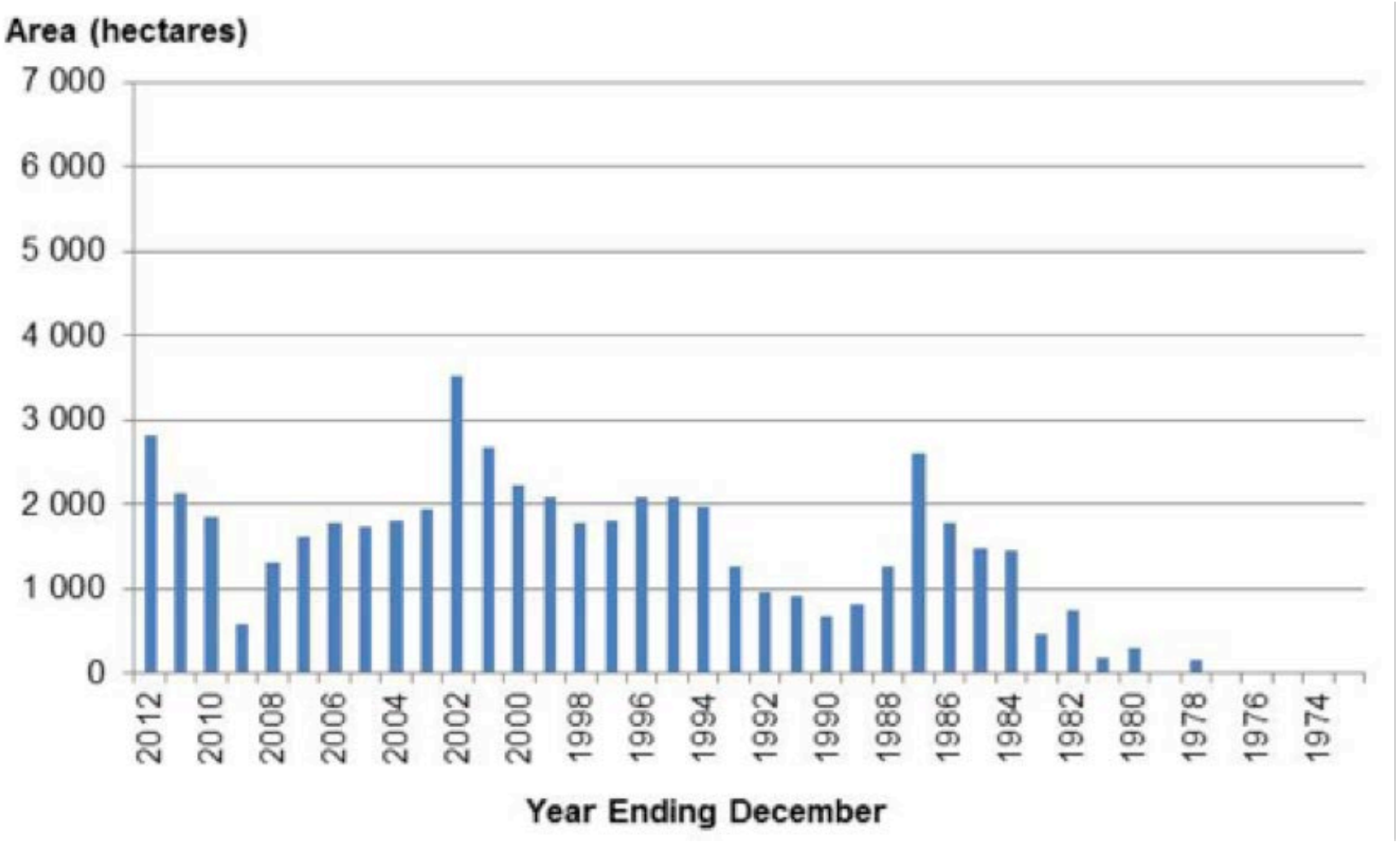
| Species | Grade | Pieces | Volume | Weight | |
|---|---|---|---|---|---|
| CORSC | A | 260 | 137 | 167 | 0.0% |
| CORSC | K | 142 | 31 | 40 | 0.0% |
| CORSC | KI | 85 | 48 | 69 | 0.0% |
| DF | CF- | 2883 | 1285 | 1384 | 0.4% |
| DF | CF+ | 2877 | 1653 | 1533 | 0.4% |
| DF | CIS | 3583 | 422 | 541 | 0.1% |
| DF | CM | 16783 | 2643 | 3071 | 0.8% |
| R | A | 121092 | 74589 | 81513 | 22.0% |
| R | K | 370468 | 117300 | 131768 | 35.5% |
| R | KI | 100275 | 57990 | 68474 | 18.5% |
| R | KIS | 236507 | 42894 | 51258 | 13.8% |
| R | KM | 130497 | 23914 | 28176 | 7.6% |
| R | P | 199 | 133 | 138 | 0.0% |
| R | P30 | 367 | 169 | 169 | 0.0% |
| R | PE | 1594 | 1133 | 1473 | 0.4% |
| R | PP | 1500 | 1144 | 1131 | 0.3% |
| | | | | | |
| | | | **325483** | **370904** | |
| | industrial export tons | | | | |
| | KI & KIS | | | **119731** | **32.3%** |

# Sawmill residue

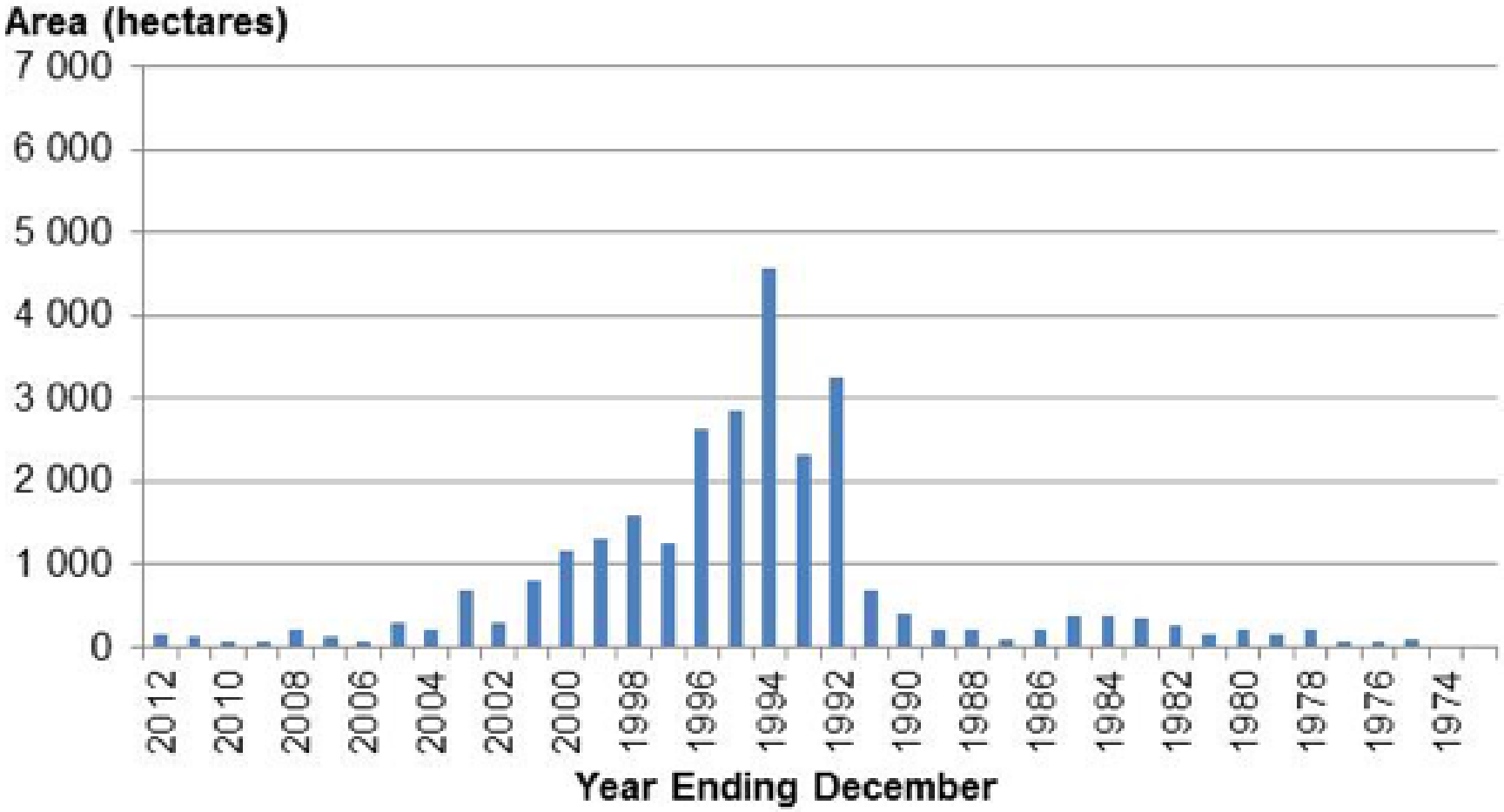
| | | YEAR | YEAR | YEAR | |
|---|---|---|---|---|---|
| SAWMILL | | Log ton | Chips ton | Sawdust | |
| Mill 1 | | 3800 | 800 | 250 | |
| Mill 2 | | 260,000 | 54,000 | 100% boiler | |
| Mill 3 | | 13000 | 4500 | 1000 | |
| Mill 4 | estimate | 11000 | 5000 | | |
| Mill 5 | | 200,000 | 60000 | 100% boiler | |
| Mill 6 | | 40,000 | 14,400 | 3800 | |
| Mill 7 | | 19,200 | 9600 | 4800 | |
| Mill 8 | estimate | 20,000 | 9500 | 4500 | |
| Mill 9 | estimate | 14,000 | 4900 | 1120 | |
| | | | | | |
| | | 581000 | 162700 | | |
| | | | | | |
| MDF chips | | | 123,600 | | |
| | | | | | |
| Stock pads chips | | | 39,100 | | |


NZ A-Grade Log Price (CFR USD) vs Supply & Demand
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
2011
2012
2013
2014
Supply (Inventory)
CFR A China
Demand (3 month average)
S/D Ratio = 1.9
S/D Ratio = 1.35

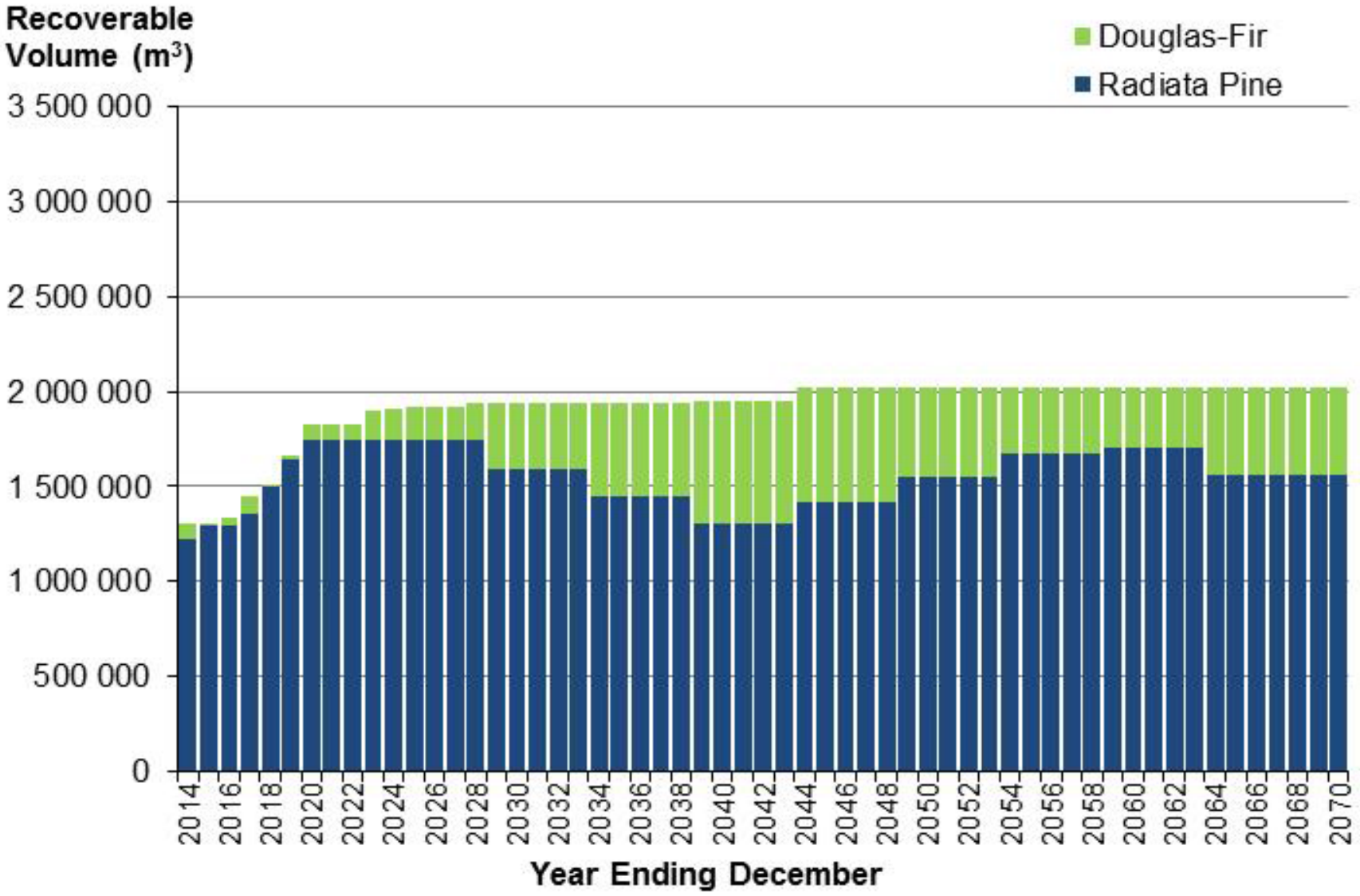
# Otago Forest Estate



# Otago Small Grower Estate



# Expected Otago Woodflow

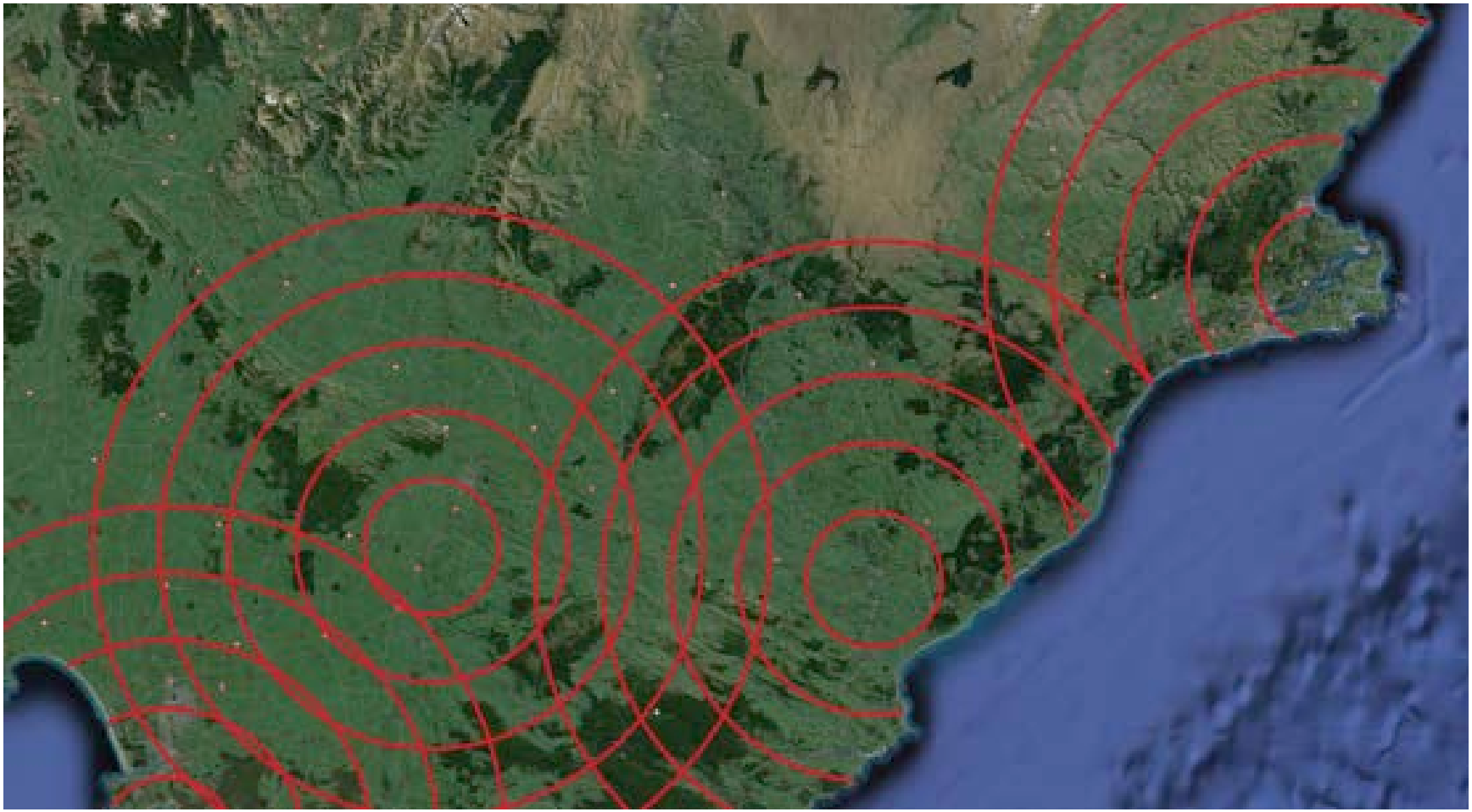


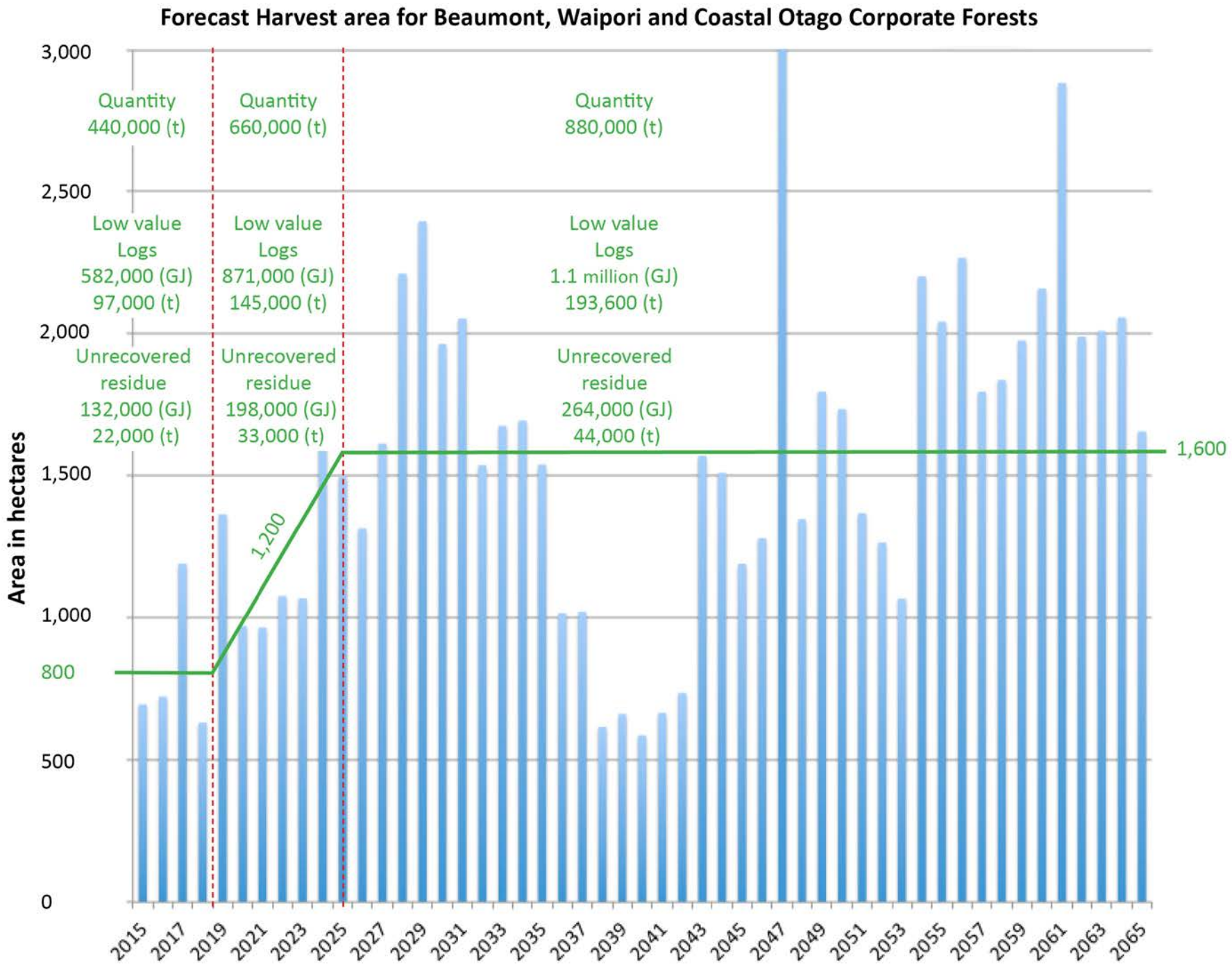
# Opportunity Cost – what is the value?

| Gross Price ($/t) | $60 / t | $48-50 / t | $40 / t | $50 / t | $45 / t | $40 / t |
|---|---|---|---|---|---|---|
| Product | Pulp | Chip | Billet | Energy | Energy | Energy (Billet) |
| Destination | Bluff/Chalmers | Mataura | Mataura | Clydevale | Clydevale | Clydevale |
| **Origin** | **Net Return to Forest Owner** | | | | | |
| Milton | $21.00 | $5.00 | $3.00 | $13.50 | $8.50 | $11.20 |
| Waipori | $22.00 | $- | $-5.00 | $11.00 | $6.00 | $9.00 |
| Beaumont | $9.00 | $5.00 | $ 3.00* | $18.00 | $13.00 | $13.00* |
| Tapanui | $9.00 | $11.00 | $ 9.00* | $13.00 | $8.00 | $6.00* |
| | | | | | | |

* does not commonly supply the billet wood market

# Proximity to market is key




Forecast Harvest area for Beaumont, Waipori and Coastal Otago Corporate Forests
Area in hectares
3,000
2,500
2,000
1,500
1,000
800
500
0
Quantity
440,000 (t)
Quantity
660,000 (t)
Quantity
880,000 (t)
Low value
Logs
582,000 (GJ)
97,000 (t)
Low value
Logs
871,000 (GJ)
145,000 (t)
Low value
Logs
1.1 million (GJ)
193,600 (t)
Unrecovered
residue
132,000 (GJ)
22,000 (t)
Unrecovered
residue
198,000 (GJ)
33,000 (t)
Unrecovered
residue
264,000 (GJ)
44,000 (t)
1,200
1,600
2015
2017
2019
2021
2023
2025
2027
2029
2031
2033
2035
2037
2039
2041
2043
2045
2047
2049
2051
2053
2055
2057
2059
2061
2063
2065

# Unrecovered residue

- Maintaining space on processing site is key
- Handling small residues is expensive
- The value must be greater than the cost!
- Without an attached value, it will continue to be treated as waste

# Supply Chain

- Manage as another log grade
- Cart as is produced
- Process off site – at end destination?
- Least handling is best

Downside:

- Max out on volume, rather than weight.

# Cost of wood energy

- Log price of $45 - $55 / tonne = $7.5 / GJ - $9 / GJ
- Cartage and downstream processing = $5-$6 / GJ
- $12.50 - $15 / GJ.

# Conclusions

- It is not waste – it is energy.  Value it.
- Geographically isolated end users proximate to forests can build strong relationships with forest owners
- End users in areas of higher competition for low value logs will need to secure market share.
- New competition is desired.
- Building strong domestic markets with stable prices trumps export volatility