Specialty Wood Products Research Partnership

MARLBOROUGH RESEARCH CENTRE
Te Rito Hiranga o Wairau

NZ Dryland Forests Initiative

Developing a multi-regional sustainable durable hardwood industry

Paul Millen
NZDFI Project Manager

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supported by forestgrowers commodity levy

FOREST GROWERS RESEARCH

NZDFI's vision and goals

The vision

New Zealand will be home to a multi-regional sustainable durable hardwood industry worth over $1billion annually by 2050.

The goal:

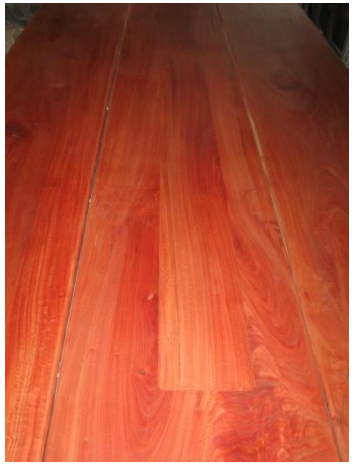
- Twelve durable eucalypt wood supply catchments planted by 2050 to start producing a sustainable log supply for a future network of strategically located regional sawmills and wood processing businesses.

- *New Zealand's forest industry is recognised internationally for improving durable eucalypts by breeding and producing high-value hardwood timbers and products.*

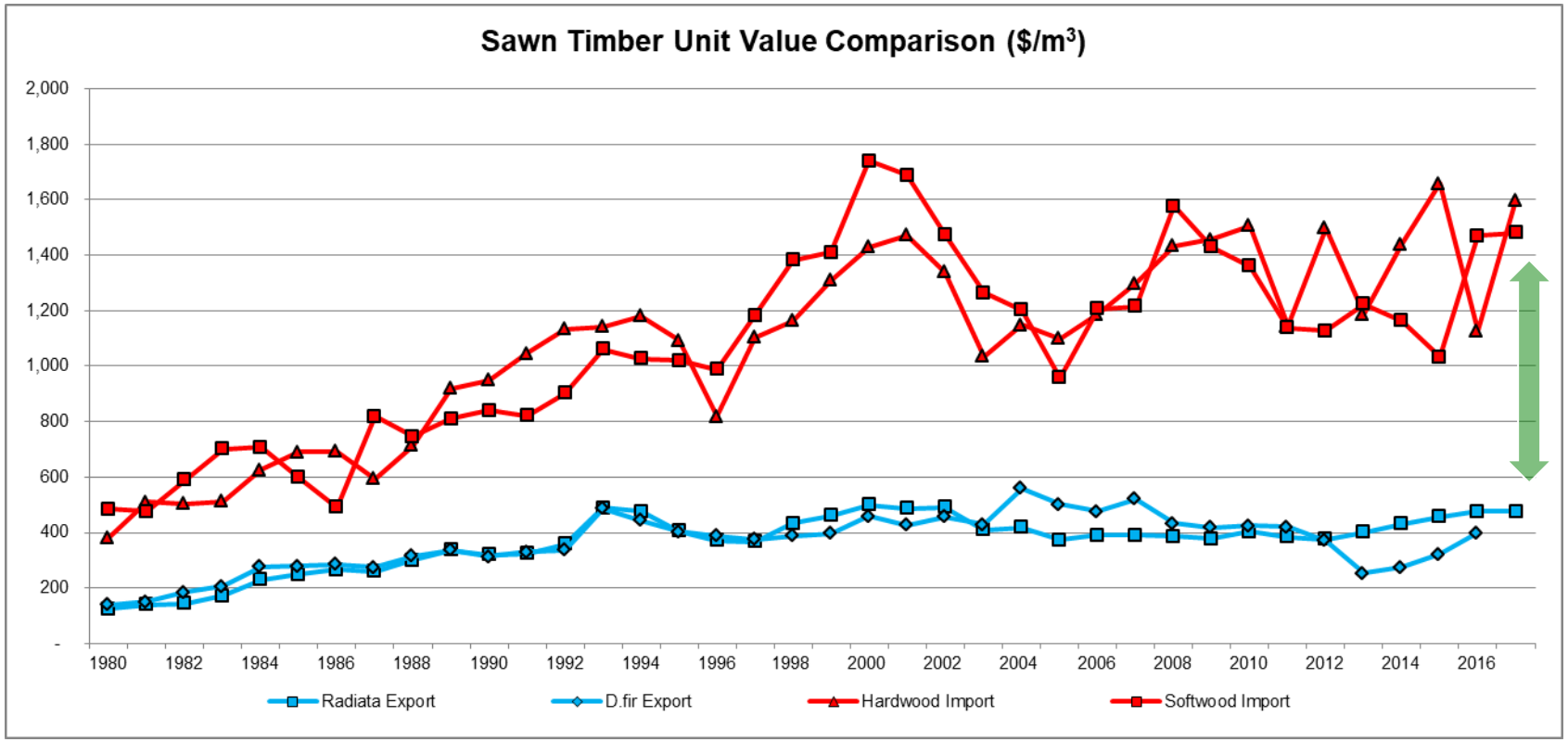
A market-focused project: opportunities for durable hardwood

Product	Market opportunity	Current market value
Sawn timber	Domestic substitution of CCA treated sawn timber for outdoor use – estimated annual domestic consumption of sawn timber exceeds 400,000m^3 per annum (ERMA 2003 and MPI 2019)	**$280-320 million per annum** based on retail value of $700-800 per m^3.
Posts and poles	Domestic substitution of CCA treated agricultural/horticultural posts - demand estimated at 300,000m^3 annually (van Bruchem 2020).	**$210-240 million per annum** based on retail value of $700-800 per m^3.
Hardwood imports	Substitution of high value hardwood imports – in 2017 over 29,000m^3 lumber, 3,000m^3 sleepers and 5,000 m^3 posts/poles (MPI 2017).	**$53.3 million** in 2017. 5 year average value of over $1400 per m^3.
Export markets	Significant lumber and log export potential to replace Australian and tropical hardwoods with certified timber.	Annual export value of 100,000m^3 of hardwood could be **$140 million**.
Engineered wood	Utilisation as a component of high value and high strength hardwood laminated veneer lumber (LVL) and cross-laminated timber (CLT)	International value of high strength veneer is $400 - 500 per m^3 (JNL)

Market opportunities – domestic



International market opportunity: NZ grown hardwoods substituting imports and competing in international markets



NZ forest industry market opportunity

5-year average unit value difference of imported hardwood ($1402/m^3) over export radiata ($448/m^3) is **$954/m^3.**

Source: MPI (2020)

Market opportunities – exports to substitute ‘native forest’ timbers

- China is the world’s largest consumer of tropical timber

  China alone expected to import 170 million m^3 pa hardwoods over next 30 years, 38 million m^3 in 2012.

- China and India account for 80% of tropical log imports: rosewood is one of more favoured timbers - CITES curbing supply.

- Hardwoods plentiful in Australia, but legislative environment preventing logging of old growth trees

- Plantation hardwoods (eucalypts) abundant but primarily grown for pulp, not high value timber uses

- **Durable** softwood supply from North America under increasing supply constraints

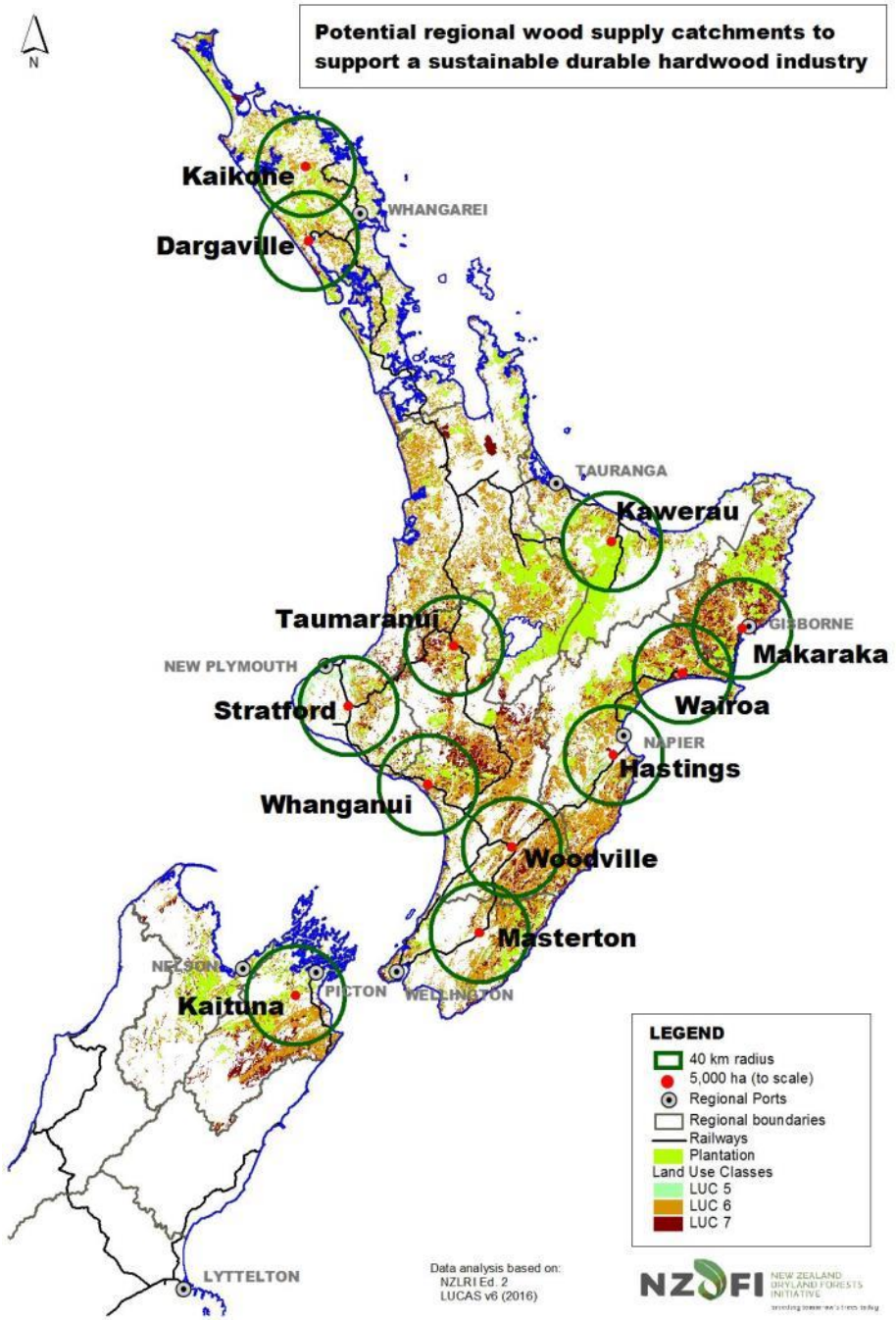
The goal:

12 wood supply catchments planted by 2050 in NZDFI target regions.

Wood-supply catchments centred on suitably zoned 5 ha industrial site for future small-to-medium sized hardwood processing business.

Indicative catchment boundary – forests planted within 40km radius of the planned processing site.

Good road/rail/port connections for log supply and to transport hardwood products.



Small-scale processing: techno-economic analysis

Small mill & processing hardwoods (eucalypts) – 5 hectare site	
Logs in: m^3 per annum	52,000
Lumber out: m^3 p.a	30,000
Low value products out m^3 p.a	6,000
Residuals out: m^3 p.a	13,000
Remanufacturing – in: m^3 p.a	24,000
High value products out: m^3 p.a	21,600
Log price delivered in $/$m^3$	$195
High value product price $/$m^3$	$1,950

N.B. All data based '*Assessment of afforestation and future wood processing opportunity with non-radiata species: Wairoa District*' (Peter Hall, Scion, April 2020). Report produced for Hawke's Bay Regional Council/HBRIC.

Small-scale processing: Australian example (2009) – Boral's Narooma sawmill, south east NSW

Mixed native log supply of durable eucalypts - ironbarks, stringybarks and spotted gum

A range of products were sawn including

beams

cross arms

survey pegs

Decking/flooring

What area of forest is needed to produce a sustainable log supply for a small-scale processing operation?

Assume eucalypts:

- take 30 years to reach harvestable size
- produce an average of 500m^3 per hectare total recoverable volume

Area of new planting required for the next 30 years would be between 110 – 160 hectares per annum.

Mill demand m^3 per annum	Area (ha) of planting per annum	Years of planting	Total area required (hectares)
50,000 (small)	110	30	3,250
80,000 (medium)	160	30	4,800

N.B. All data based '*Assessment of afforestation and future wood processing opportunity with non-radiata species: Wairoa District*' (Peter Hall, Scion, April 2020). Report produced for Hawke's Bay Regional Council/HBRIC

Proposal for a sustainable regional hardwood industry for northern Hawke's Bay

40 km wood supply catchment based on a future Wairoa based processing site

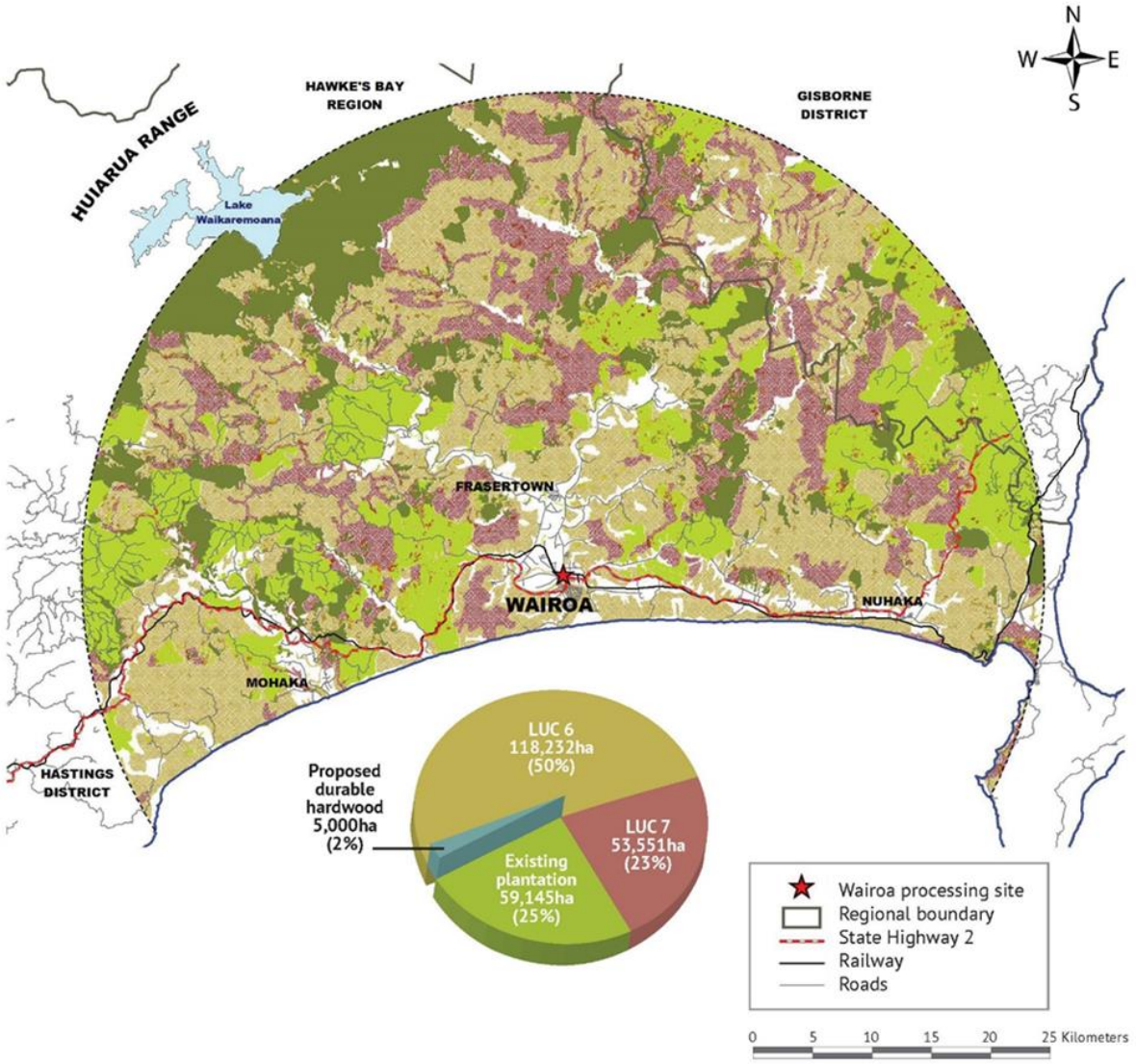
Land areas in Wairoa wood-supply catchment:

LUC 6	119,898 ha
LUC 7	55,217 ha
Plantation	60,911 ha
Total area:	**235,926 ha**

Land area required for planting eucalypts: **5,000 ha**

Target annual planting over 30 years **170 ha**

Proposed eucalypt forest as % of total land area: **2.1%**



A sustainable regional hardwood industry for northern Hawke's Bay

40km wood supply catchment for a proposed Wairoa processing site

Direct employment created (FTEs):

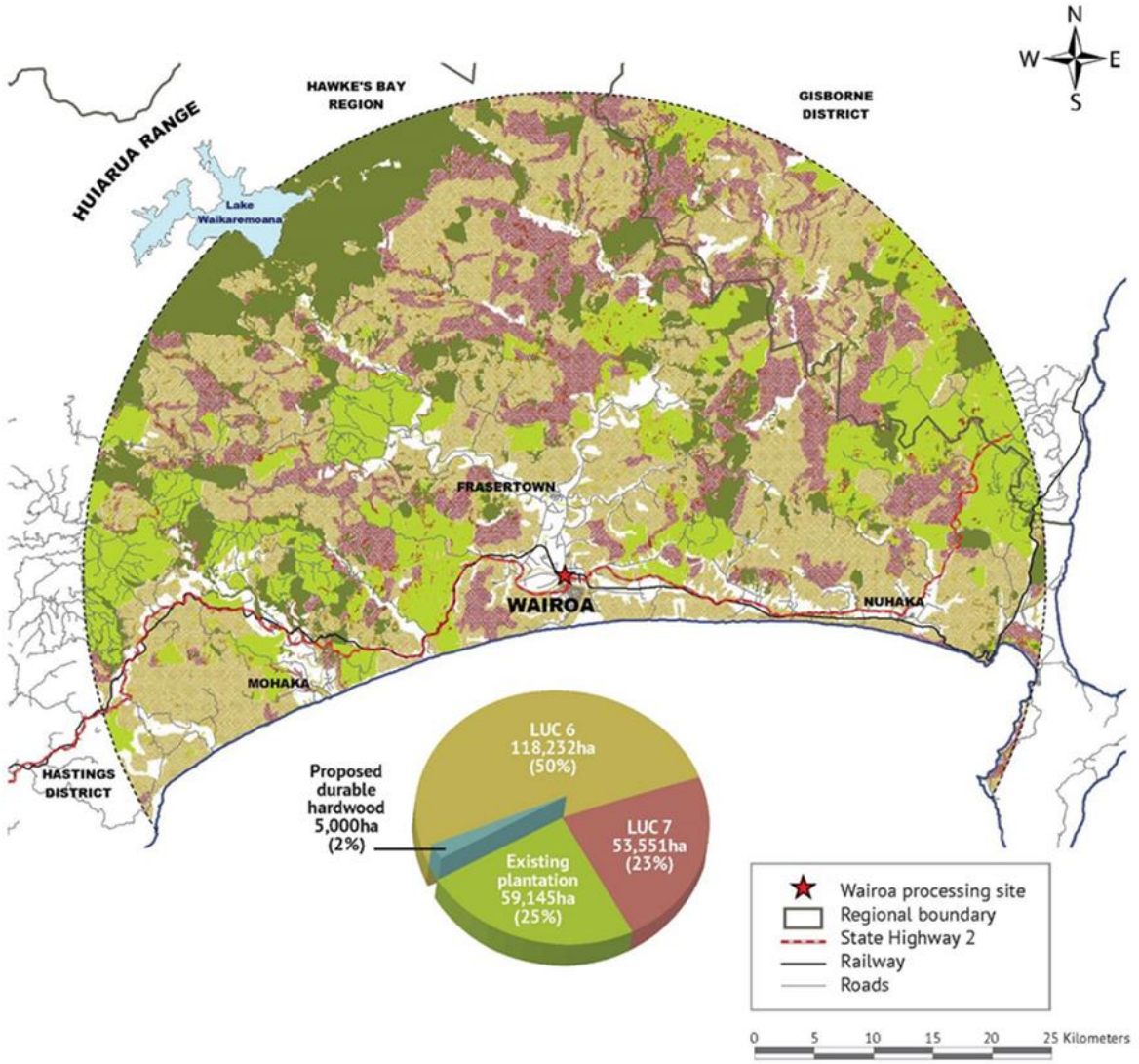
Forest establishment:	3-10
Forest harvesting:	9-10
Sawmilling:	50-55
Remanufacturing	130-135

Additional employment in log transport and other service & downstream sectors.

Annual estimate of contribution to regional GDP from 2051:

$82.5 million

(based on 2020 costs and revenues)



The national opportunity:

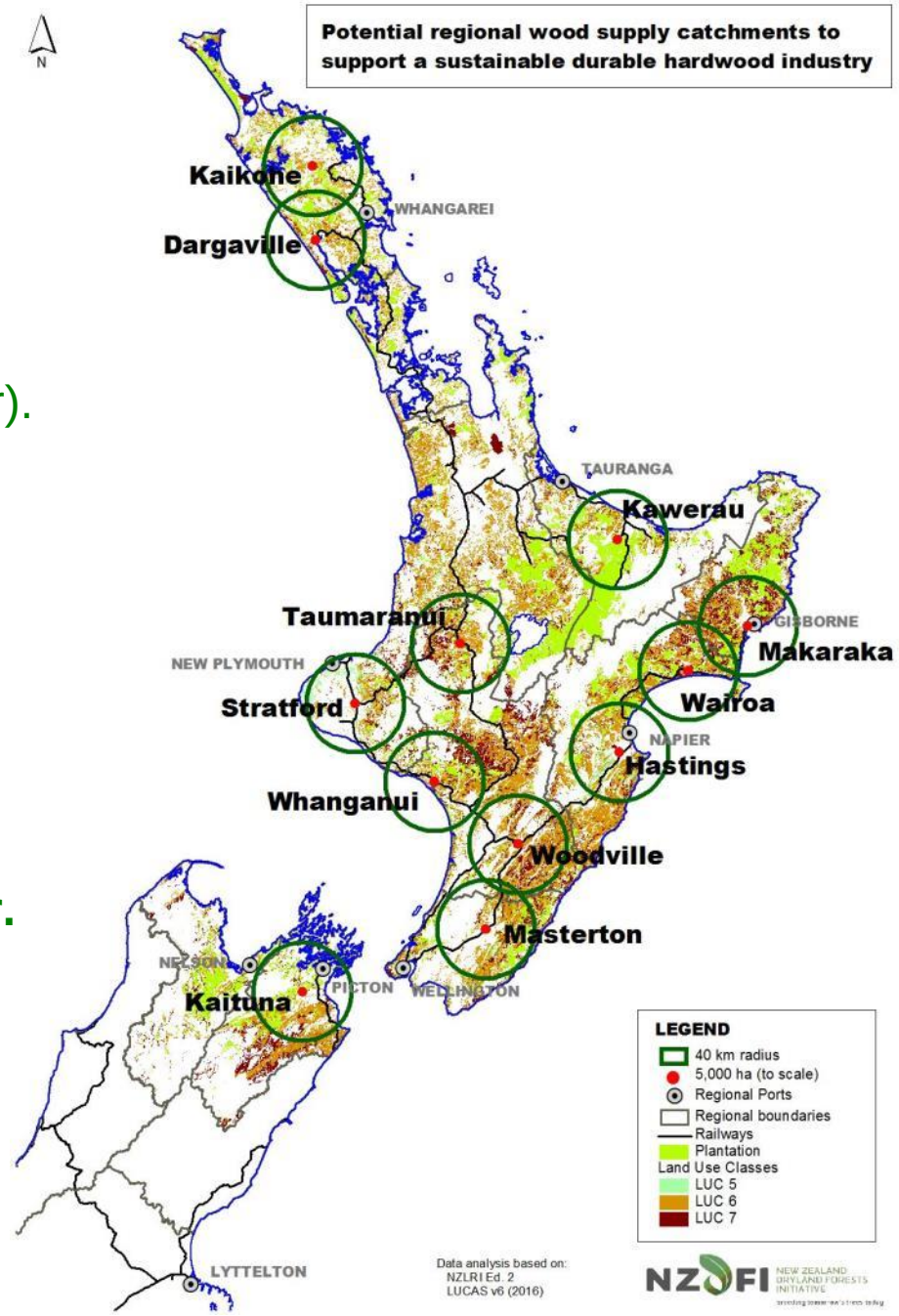
Total hardwood forest to plant: 60,000ha (5,000ha per catchment @ 170ha per year).

Future annual log supply required for 12 hardwood processing businesses: 624,000m^3 (52,000m^3 per business*)

Future annual production: 360,000m^3 of hardwood lumber.

Future contribution to GDP: **$1.022 billion/yr.**

Future direct employment: **2400 FTEs**.



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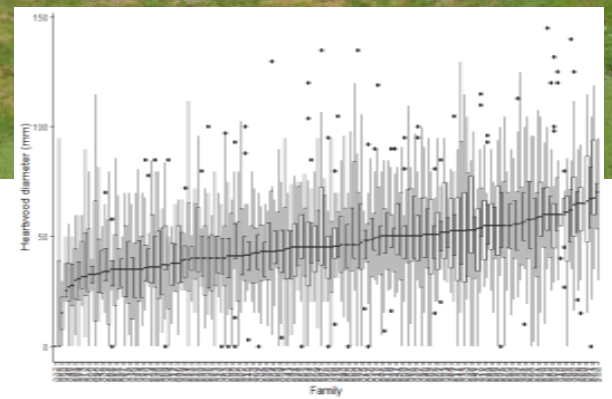
NZDFI has been establishing trials and undertaking research in target regions

Avery property, Grassmere, south Marlborough

2011



2020

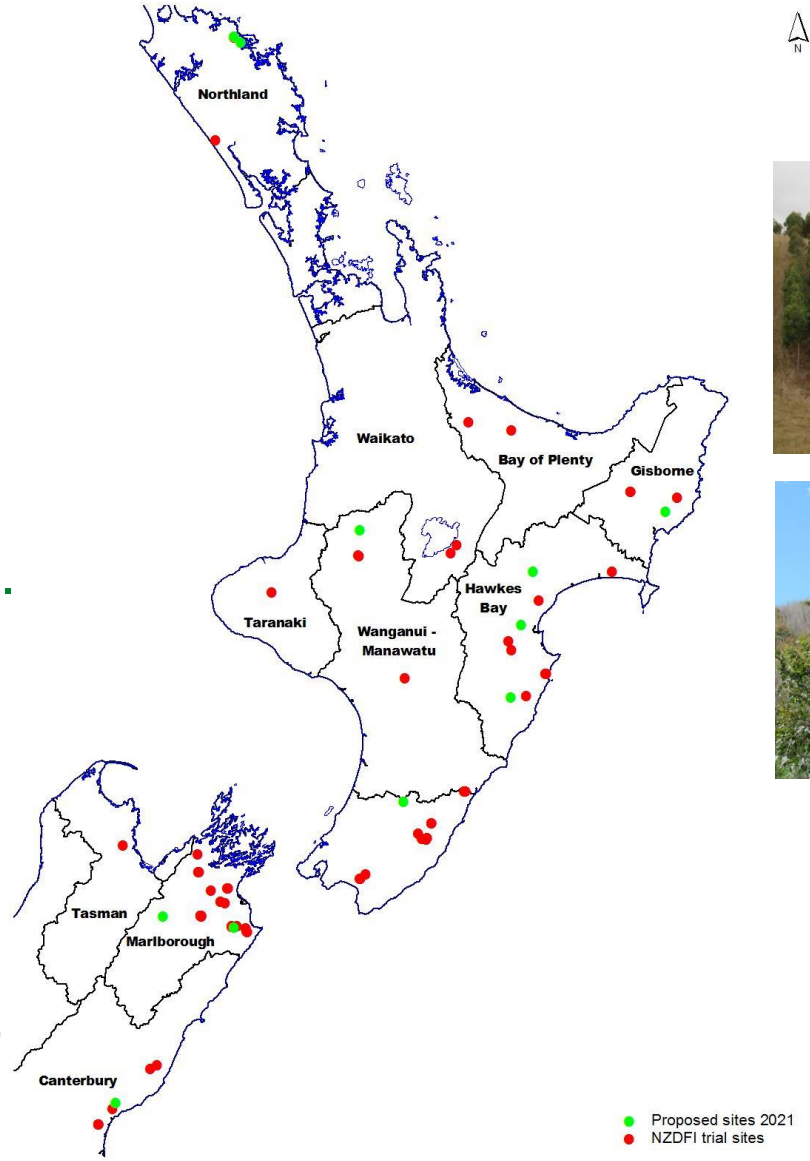
The NZDFI breeding and demonstration trial site network

NZDFI now has over 30 breeding and demonstration trial sites.

The trial network is the foundation of NZDFI's breeding research with over 500 pedigreed families being tested of five different species.

These sites and additional demonstration trials contain approx. 600 permanent sample plots (PSPs)

8-10 new sites planned for 2021.

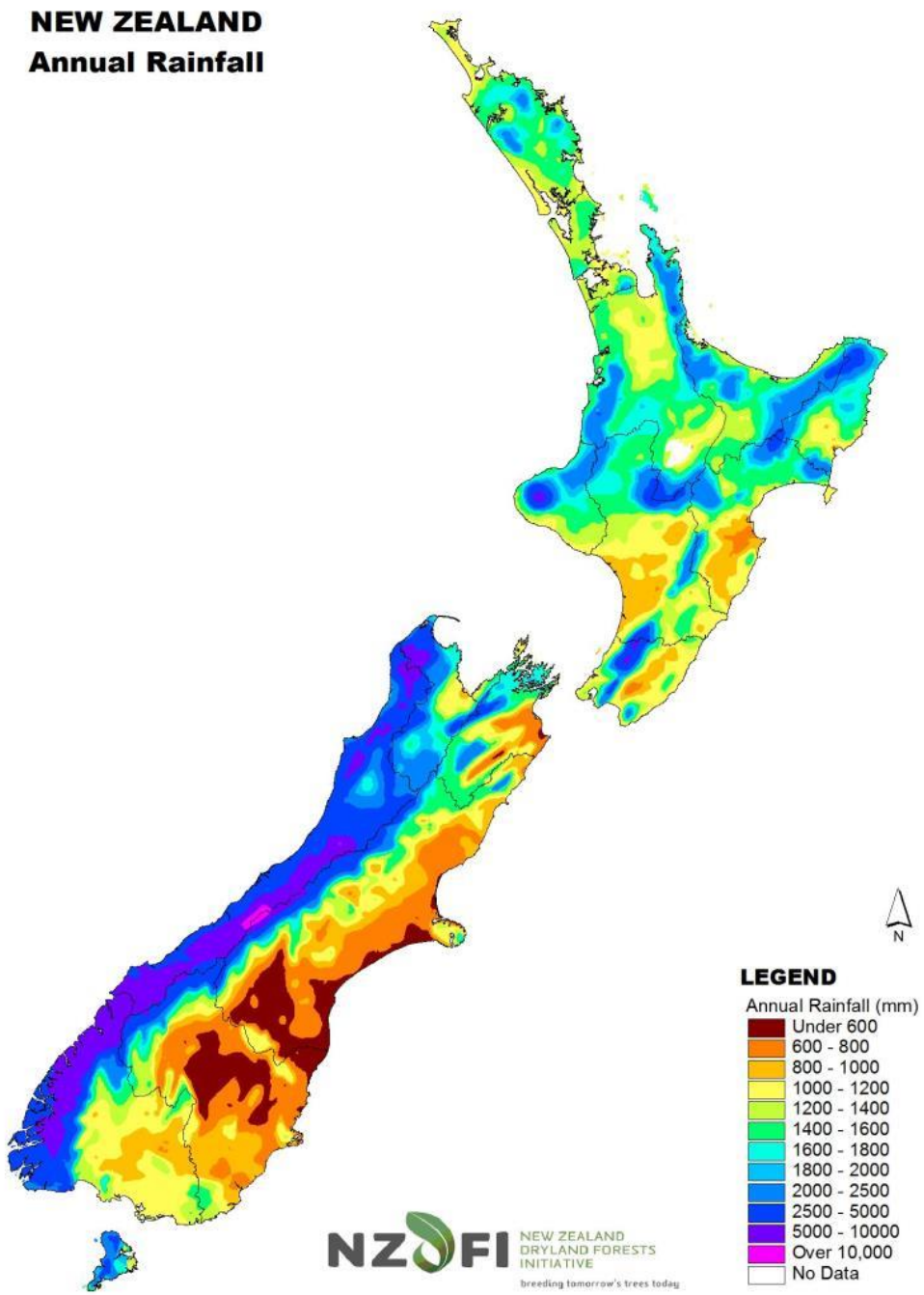


Hawkes Bay sites – Saathof, McNeill Landcorp Edenham, Alexander

At a national scale two key climate factors define adaptability of eucalypts.....

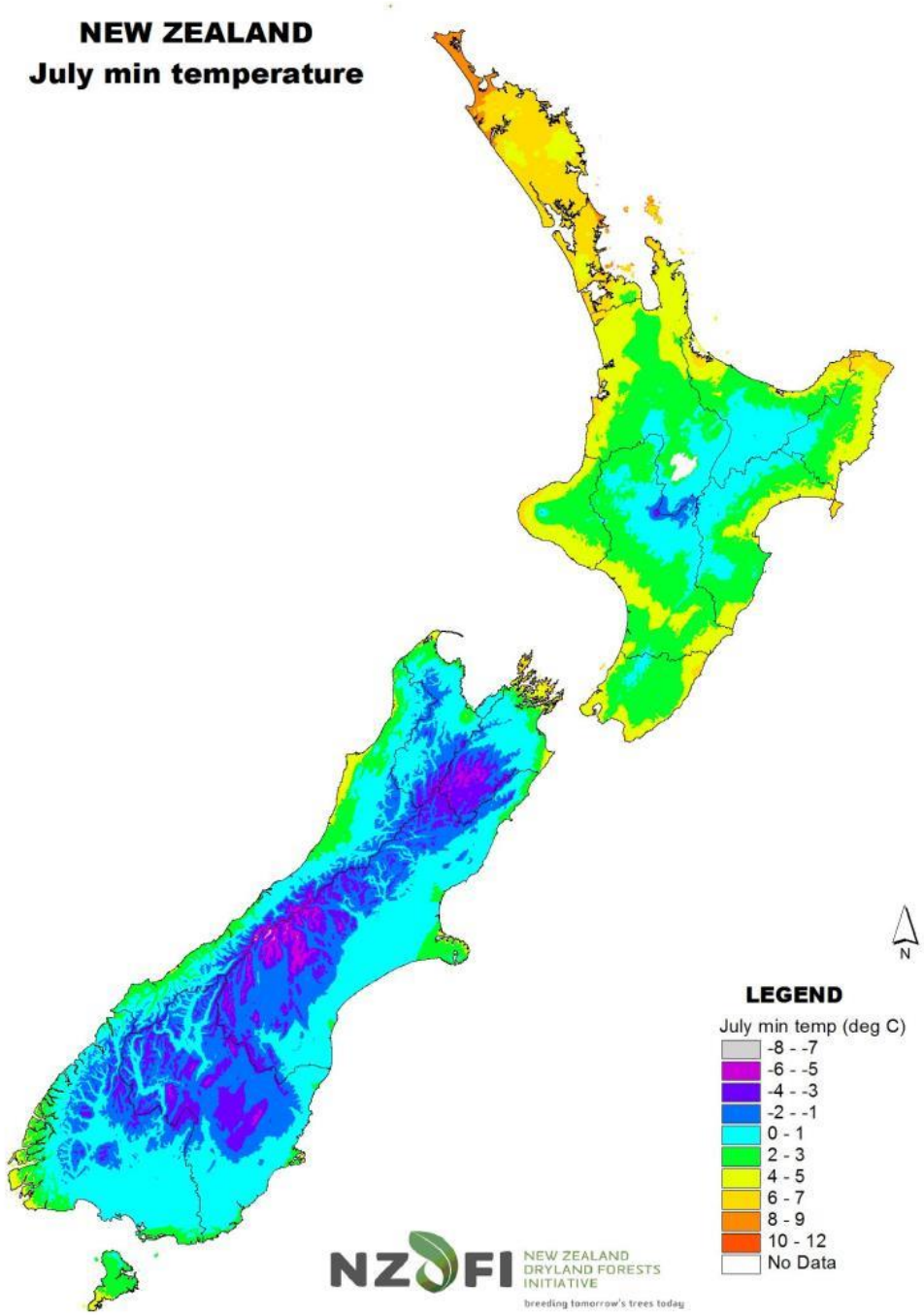
rainfall

and

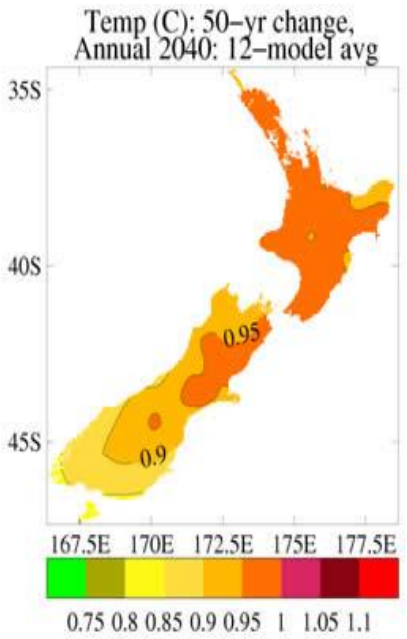


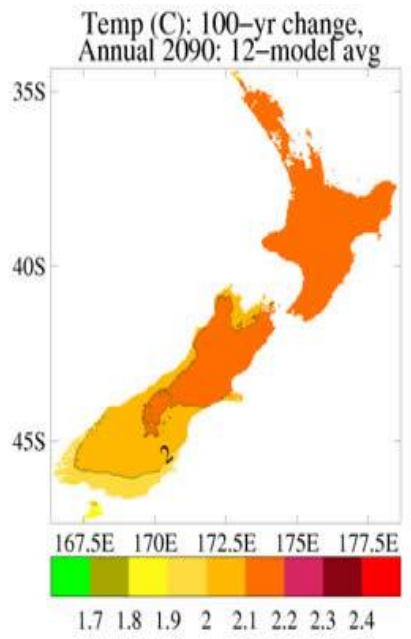
SWP

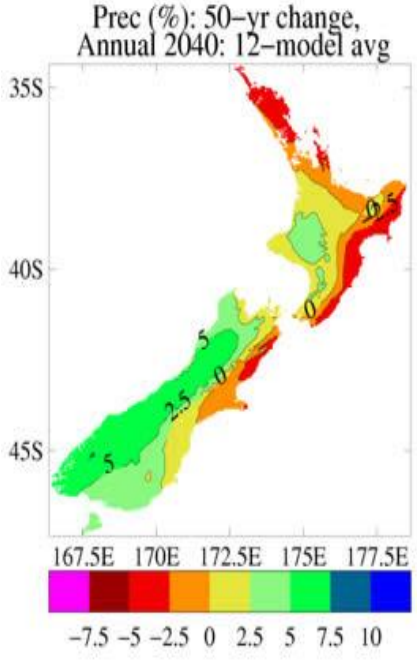
minimum winter temperatures

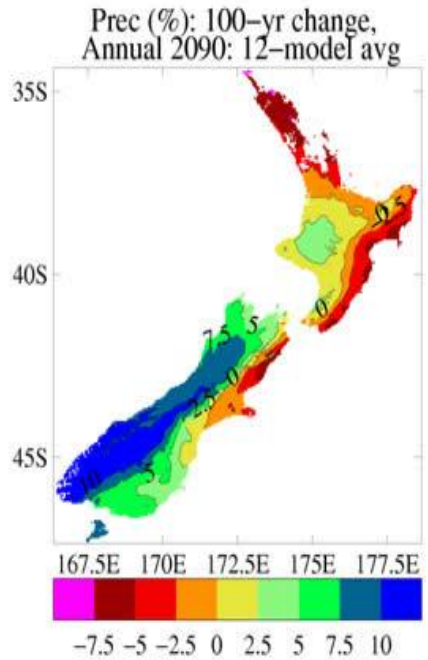


Some regions to get warmer and drier under climate change scenarios









2019 NIWA assessment of exposure to coastal flooding

Continuing research and education at the University of Canterbury's NZ School of Forestry

NZDFI's Science Team is led by the School of Forestry, University of Canterbury.

PhD research and undergraduate courses include:

- Wood quality, processing, products and markets for durable hardwood.
- Genetics and tree breeding of NZDFI species.
- Site species matching and modelling heartwood production of NZDFI species.
- Eucalypt health and protection.

Small scale post processing (2019) – Lismore NSW

(Photos Marco Lausberg, SWP manager)

Round-up lathe

Commercial thinning (from below of 15-20 year old stands)

Total lathe set up cost ~$300k

Small scale post processing trials in NZ – Peake Equipment 2020 (play video) and Dashwood Timber planned 2021

SWP

Potential to develop NZ's small scale sawmilling industry

- Over 1100 portable sawmills are reported to have been sold in New Zealand.
- NZ companies that manufacture sawmills include Peterson, Mahoe and Turbo.
- Imported sawmills include Wood-Mizer (US), Lucas(Aust) and others.
- Using figures of sawmill use provided by manufacturers, annual sawn production is estimated at **80,000 m3 and value of $85M.**

SWP

Making it happen: establishing new sustainable forests in NZDFI target regions

- One Billion Trees Partnership grant to accelerate production of improved planting stock of NZDFI's two priority species:
  - *Eucalyptus bosistoana*
  - *Eucalyptus globoidea*

- First generation of over 300,000 genetically improved nursery stock being planted from 2021 onwards

- Seed production and clonal propagation work led by Proseed NZ Ltd, North Canterbury (NZDFI partner)

The XyloGene® brand

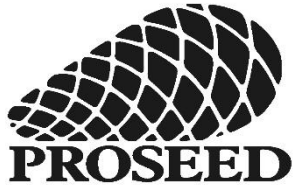
- NZDFI's genetically improved nursery stock will be sold under the 'Xylogene' brand
- NZDFI IP Ltd has registered the XyloGene trademark to certify genetically improved durable eucalypt seed/germplasm.
- A royalty will be collected on sale of improved seed or plants for continuing research.
- The XyloGene brand could add value to future hardwood forests and timber products.
- The formation of a co-operative or other legal entity of XyloGene forest growers and processors that produce XyloGene hardwood products will be investigated.

Additional benefits:

NZDFI eucalypts are fast-growing and drought tolerant.

- **Carbon sequestration** – eucalypts are fast-growing and have very high wood density with some double that of pine.
- **Soil conservation** – eucalypts coppice, so roots continue to protect soils after harvest.
- **Biodiversity** – eucalypts produce large quantities of pollen and nectar, providing a food source often at times when other supplies are scarce..

NZDFI partners, supporters and some of our 33 landowner hosts



SWP

Thanks to an excellent team of dedicated people

- Shaf van Ballekom, Chairman NZDFI (Proseed NZ Ltd, Amberley)
- Gerald Hope, Finance Manager (Marlborough Research Centre Trust, Blenheim)
- Professor Bruce Manley, HoD (School of Forestry, UoC)
- Dr. Clemens Altaner, Wood science (School of Forestry, UoC)
- Assoc Professor Luis Apiolaza, Tree Genetics (School of Forestry, UoC)
- Professor Euan Mason, Physiology & modelling (School of Forestry, UoC)
- Dr. Steve Pawson, Forest entomology (School of Forestry, UoC)
- Dr. Justin Morgenroth, Forest GIS systems (School of Forestry, UoC)
- Ruth McConnochie, Consultant tree breeder (under contract to NZDFI)
- Harriet Palmer, Communications consultant (under contract to NZDFI)
- Roger May, Forestry GIS mapping specialist (under contract to NZDFI)
- Ash Millen, Forestry technician (under contract to NZDFI)
- Kevan Buck and Mandy Mitchell, Administration (MRC Trust, Blenheim)
- Other UC staff and 8 PhD students
- Check out www.nzdfi.org.nz for more information

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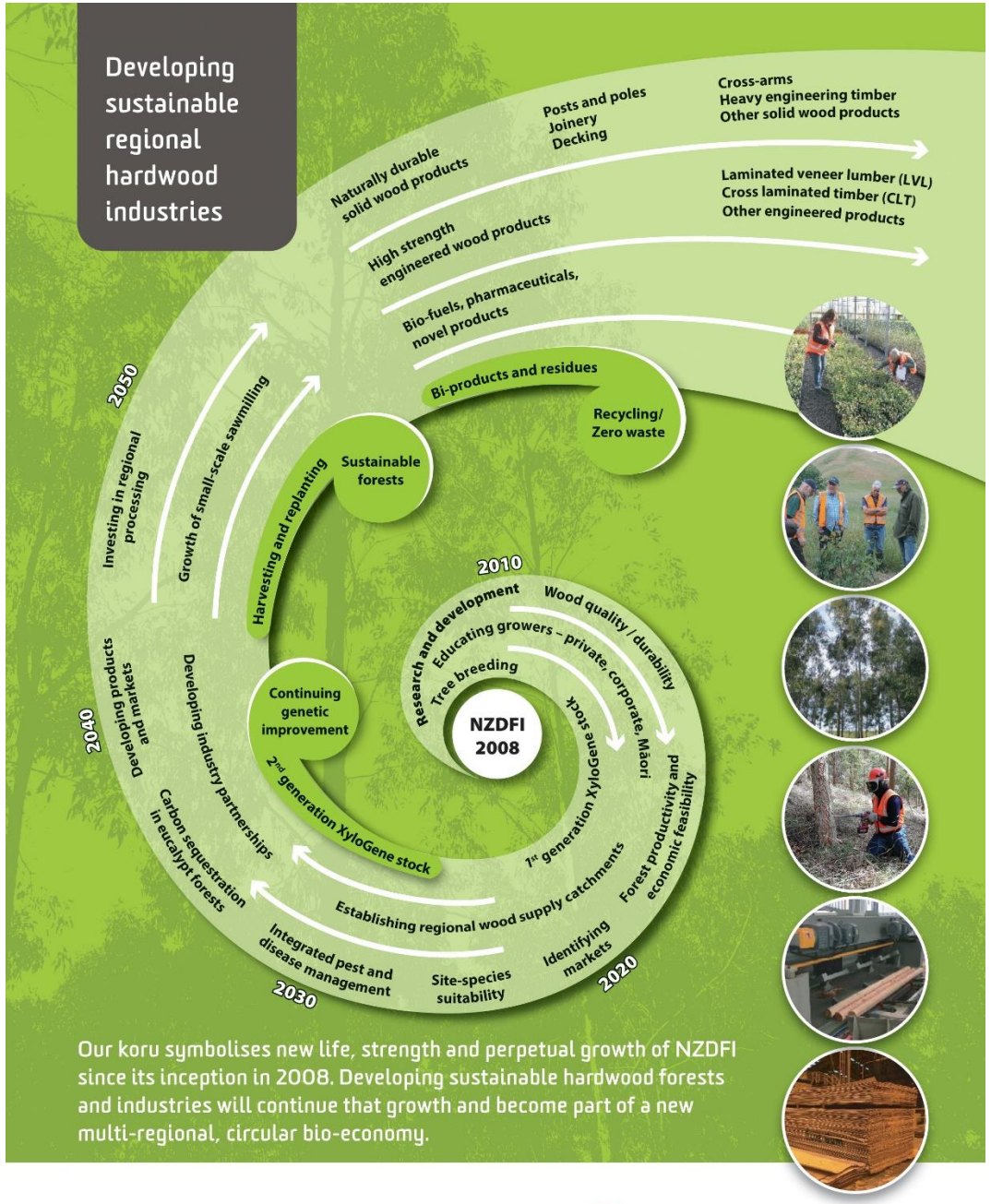

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