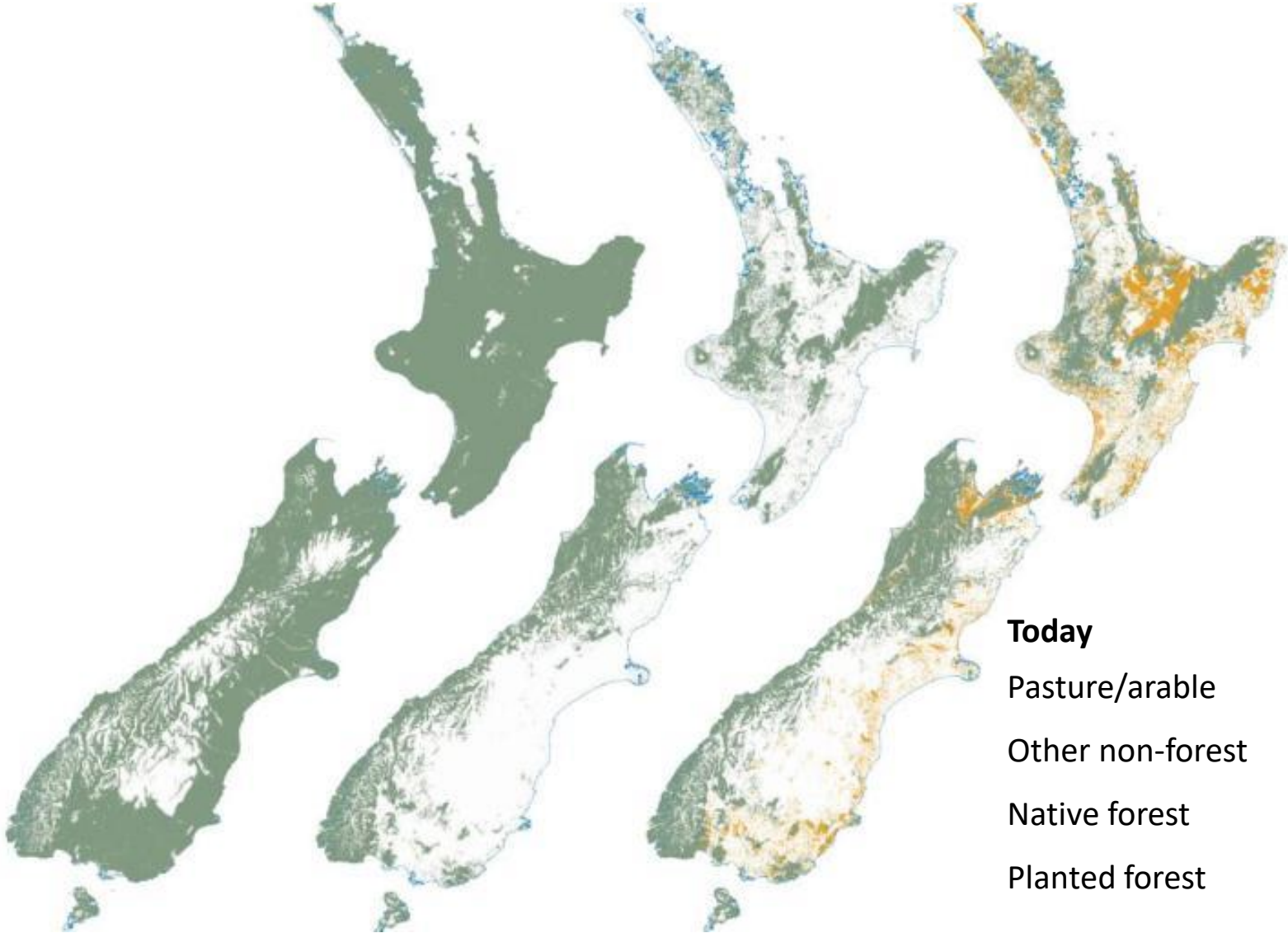


# Future forest systems- indicators for a changing world

Tim Barnard and Tim Payn



# New Zealand's forest story ...



?

Meeting future aspirations and needs

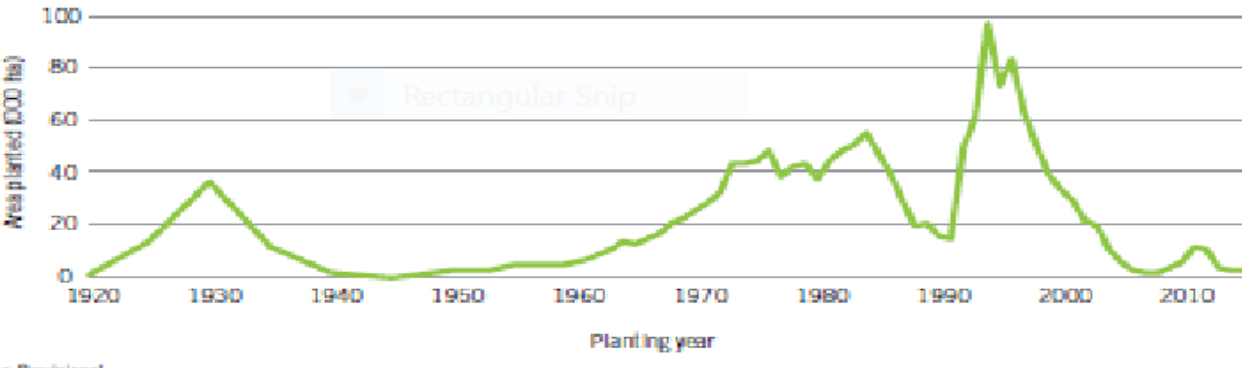
<b>Today</b>	
Pasture/arable	43%
Other non-forest	26%
Native forest	24%
Planted forest	7%

Pre-human

Existing Native Forest

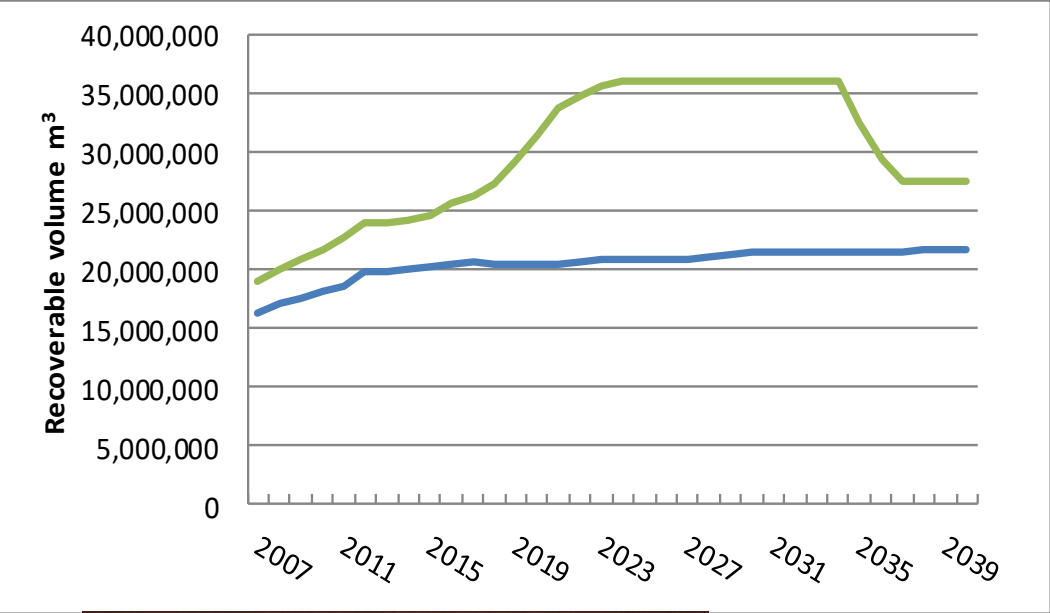
Existing Total Forest Cover

**Figure 3 New forest plantings 1920-2016**



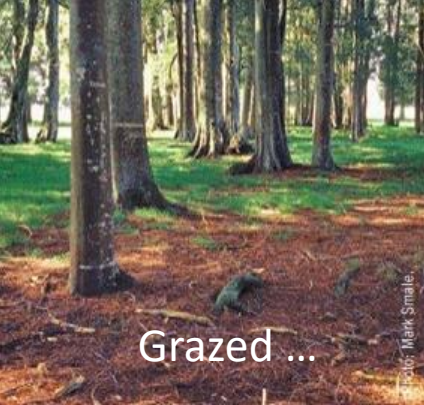
p Provisional

**Source: National Exotic Forest Description, 2016**



# Plantations today

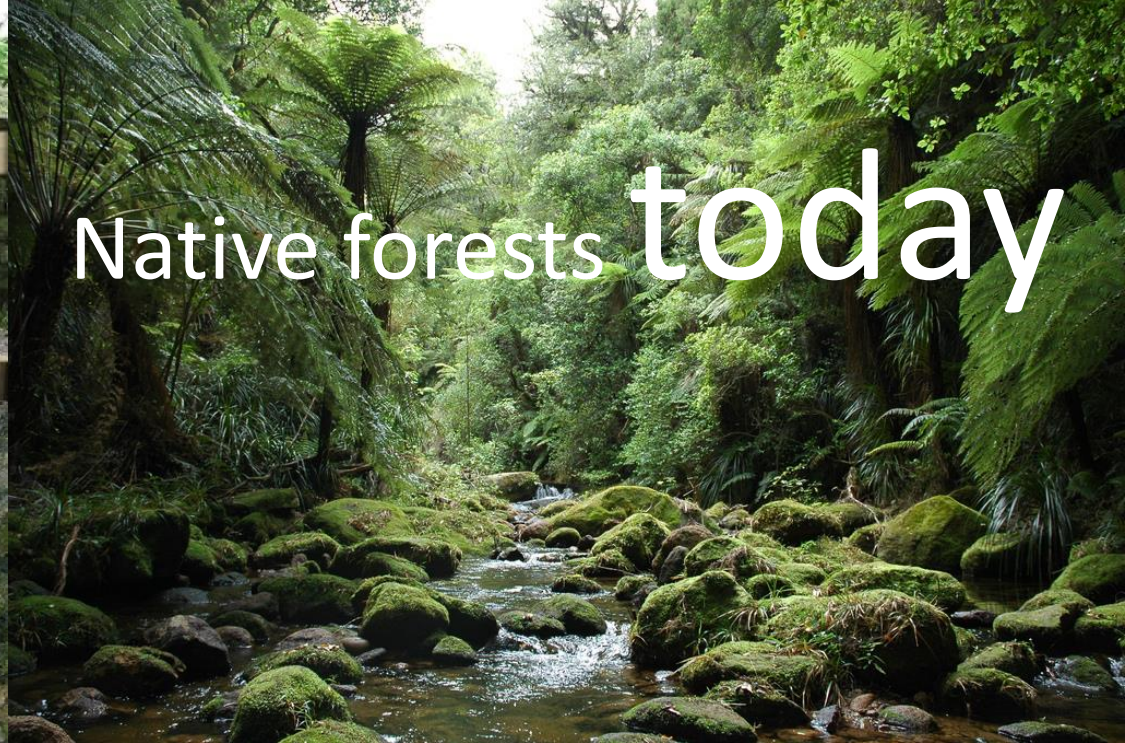




Grazed ...



Un-grazed



# Native forests today



Table 1.3: Indigenous forest area and percentage by forest class (1999–2003)

Indigenous forest class	Area (000 ha)	% total indigenous forest area
Podocarp	65.2	1.0
Broadleaved	348.3	5.3
Beech	2 184.4	33.3
Podocarp-broadleaved	1 246.5	19.0
Beech/broadleaved	98.1	1.5
Podocarp-broadleaved/beech	1 831.8	27.9
Kauri	91.6	1.4
Coastal	5.2	0.1
Unspecified indigenous	501.0	7.6
Subalpine scrub	193.1	2.9
<b>TOTAL</b>	<b>6 565.2</b>	<b>100.0</b>



Source: Shepherd et al, 2005.

# 1 BILLION TREES PROGRAMME



**Te Uru Rākau**  
Forestry New Zealand

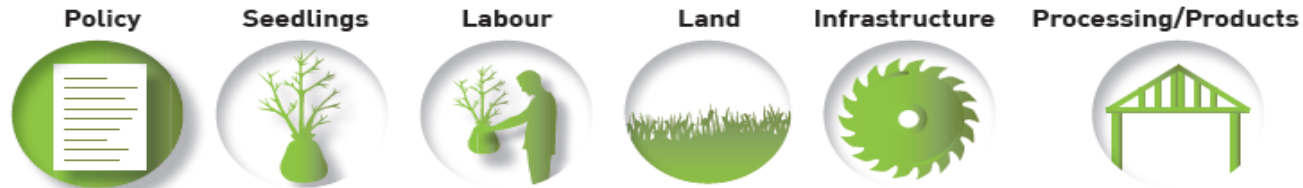


# One billion trees – Reclaiming our forest heritage together

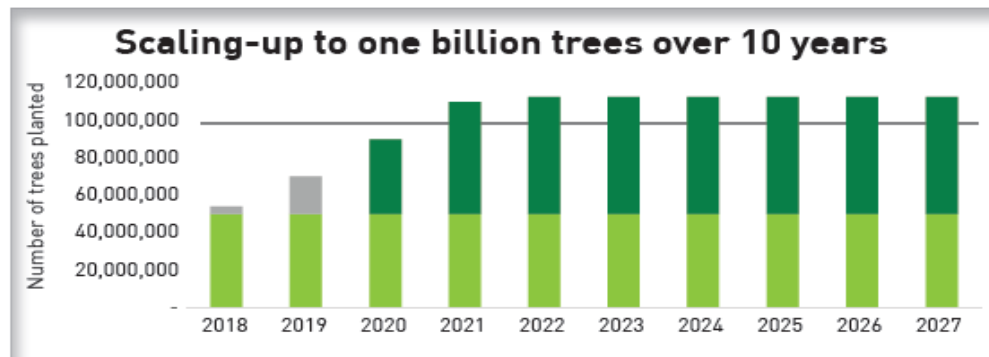
## It's about:



## It requires:



## It's a 10 year programme:



- Additional planting enabled by the programme to date
- Additional planting the programme will need to deliver, approach for delivering the planting yet to be confirmed
- Baseline forecast of trees to be planted (including replanting)
- Average annual planting over 10 years

## We'll do it together:



**Commercial sector**  
Base planting of 50 million/  
year projected  
Plant nurseries



**Coalitions**  
Government departments,  
Māori and NGOs working  
together



**Crown Forestry**  
Lease or joint venture  
Existing and new foresters  
Commercial criteria  
Land size, terrain,  
accessibility  
Radiata crop



**Ministry for Primary Industries schemes**  
Afforestation Grant Scheme  
Erosion control funding programme  
Hill country erosion programme  
New grant mechanisms  
Emissions Trading Scheme



**Crown land**  
**Department of Conservation**  
**Private landowners**



**Skills and training**  
Jobs  
Career pathways



**Regional Councils**  
Catchment assessments  
Infrastructure  
Funding and partnership  
initiatives  
Riparian and gully planting



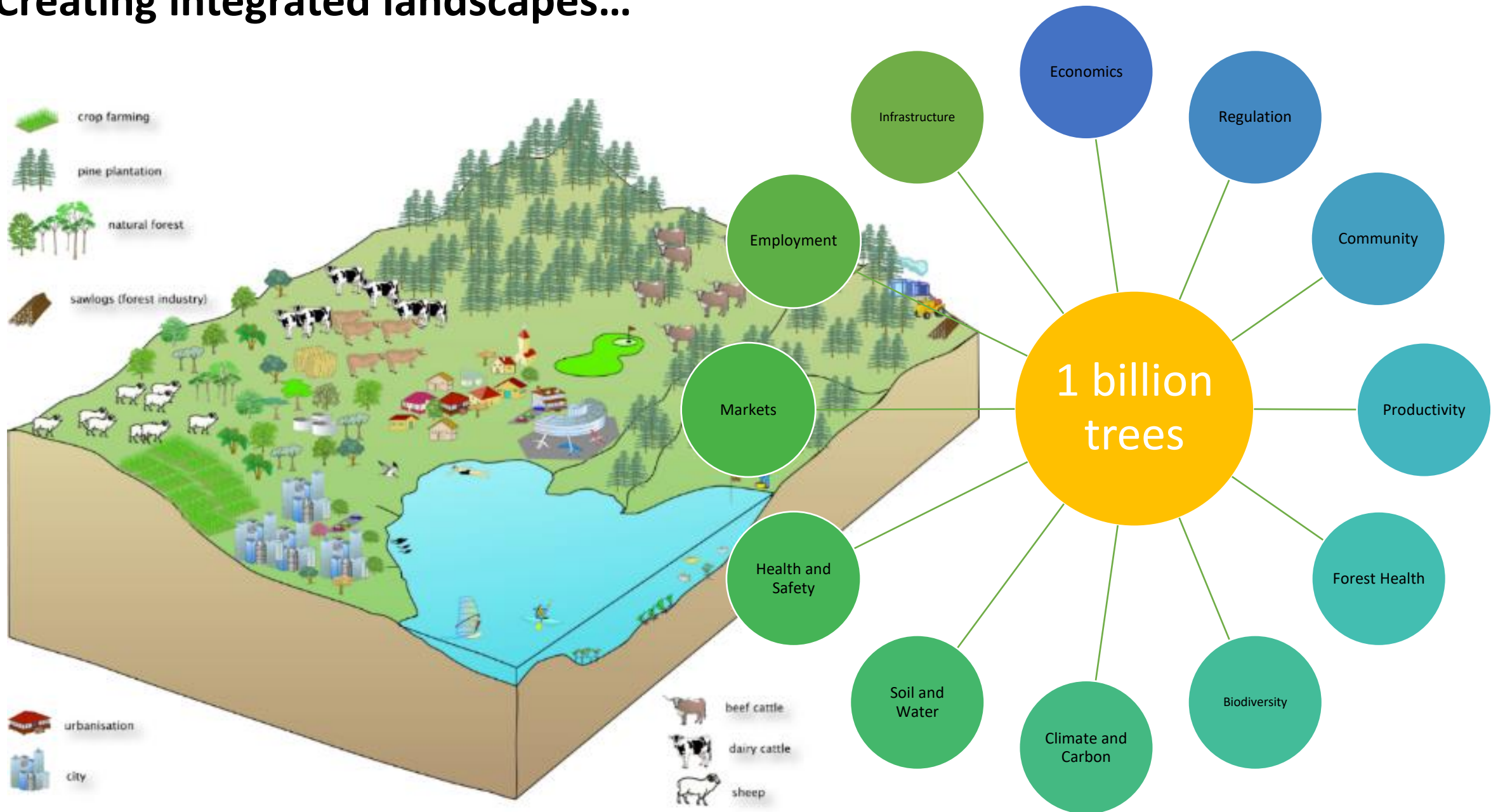
**Community participation**  
Schools, plant nurseries  
and farmers

## We'll plant:

Natives and exotics in traditional  
and innovative locations



# Creating integrated landscapes...







# Montreal Process Criteria and Indicators

## Criterion 1: Conservation of biological diversity

### 1.1. Ecosystem Diversity

1.1.a Area and percent of forest by forest ecosystem type, successional stage, age class, and forest ownership or tenure

1.1.b Area and percent of forest in protected areas by forest ecosystem type, and by age class or successional stage

1.1.c Fragmentation of forests

### 1.2. Species Diversity

1.2.a Status of on site and off site efforts focused on conservation of species diversity

## Species

1.2.c Status of on site and off site efforts focused on conservation of species diversity

### 1.3. Genetic Diversity

1.3.a Number and geographic distribution of forest-associated species at risk of losing genetic variation and locally adapted genotypes

1.3.b Population levels of selected representative forest-associated species to describe genetic diversity

1.3.c Status of on site and off site efforts focused on conservation of genetic diversity

## Criterion 2: Maintenance of productive capacity of forest ecosystems

2.a Area and percent of forest land and net area of forest land available for wood production

2.b Total growing stock and annual increment of both merchantable and non-merchantable tree species in forests available for wood production

2.c Area, percent, and growing stock of plantations of native and exotic species

2.d Annual harvest of wood products by volume and as a percentage of net growth or sustained yield

2.e Annual harvest of non-wood forest products

## Criterion 3: Maintenance of forest ecosystem health and vitality

3.a Area and percent of forest affected by biotic processes and agents (e.g. disease, insects, invasive alien species) beyond reference conditions

3.b Area and percent of forest affected by abiotic agents (e.g. fire, storm, land clearance) beyond reference conditions

## Criterion 4: Conservation and maintenance of soil resources

### 4.1 Protective

4.1.a Area and percent of forest designation or land management is the protection of soil or water resources

### 4.2 Soil

4.2.a Protection and management of soil resources

## Soil

4.2.b Protection and management of soil resources

### 4.3 Water

4.3.a Protection and management of water resources

## Water

4.3.b Protection and management of water resources

## Criterion 5: Maintenance of forest contribution to global carbon cycles

## Carbon

5.c Avoided fossil fuel carbon emissions by using forest biomass for energy

## Criterion 6: Maintenance and enhancement of long-term socio-economic benefits

### 6.2 Investment in the forest sector

6.2.a Value of capital investment and annual expenditure in forest management, wood and non-wood forest product industries, forest-based environmental services, recreation and tourism

6.2.b Annual investment and expenditure in forest-related research, extension and development, and education

### 6.3 Employment and community needs

## Employment

6.3.c Resilience of forest-dependent communities

6.3.d Area and percent of forests used for subsistence purposes

## Community

### 6.4 Recreation and tourism

6.4.a Area and percent of forests available and/or managed for public facilities available

### 6.5 Cultural, social and spiritual needs and values

6.5.a Area and percent of forests managed primarily to protect the range of cultural, social and spiritual needs and values

6.5.b The importance of forests to people

## Criterion 7: Legal, institutional and economic frameworks for forest conservation and sustainable management

### 7.1 a Legislation and policies

## Regulation

7.1.a Legislation and policies and programme coordination

7.2.a Taxation and other economic strategies that affect sustainable management of forests

7.3.a Clarity and security of land and resource tenure and property rights

7.3.b Enforcement of laws related to forests

7.4.a Programmes, services and other resources supporting the sustainable management of forests

7.4.b Development and application of research and technologies for the sustainable management of forests

7.5.a Partnerships to promote the sustainable management of forests

7.5.b Public participation and conflict resolution in forest-related decision making



## Use C&I to explore forest futures

