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Forestry : Information Day
Waiora Northland
Whangarei Harbour Group

22nd November 2014

Agenda

- Presentation topics
  - National & Regional Information
  - Rayonier Matariki
  - Glenbervie Crown Forest License
    - Forest Cycle
    - Maungatapere Forest
  - References to BMP documents

90 ft Tower Cable Hauler – Yarder

Forestry New Zealand 12mths – 31/12/12

- **Commercial Forests 1,719,500 ha** nationally
  - 6% of NZ land mass
  - 6.5 million ha (soil & water conservation) Indigenous/Natural Forest
  - Pasture & arable lands 43% @ 11.4 million ha
- **Exported 13.8 million m3** (50.2%) **12 months Dec 2013**
  - Value of exported logs $1.6 billion
    - 50+% exports sent to China
    - China; Korea & India major log export destinations
- **Domestic Consumption 13.7 million m3** (49.8%) - **Dec 2013**

FOA Facts & figures 2012-2013

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Forestry New Zealand 12mths – 31/12/12

- **Total value** Forest Products exported **$4.5 billion**
  - 10% of all Merchandise exports
- **Forestry Sector Contribution to GDP**
  - NZ's Third Largest export earner
  - **3.3%** of National GDP
- **Forestry & Logging employs 6990** people nationally
  - An additional 10,700 employed in 1st stage processing
  - Direct employment 17690 total.

FOA Facts & figures 2012-2013

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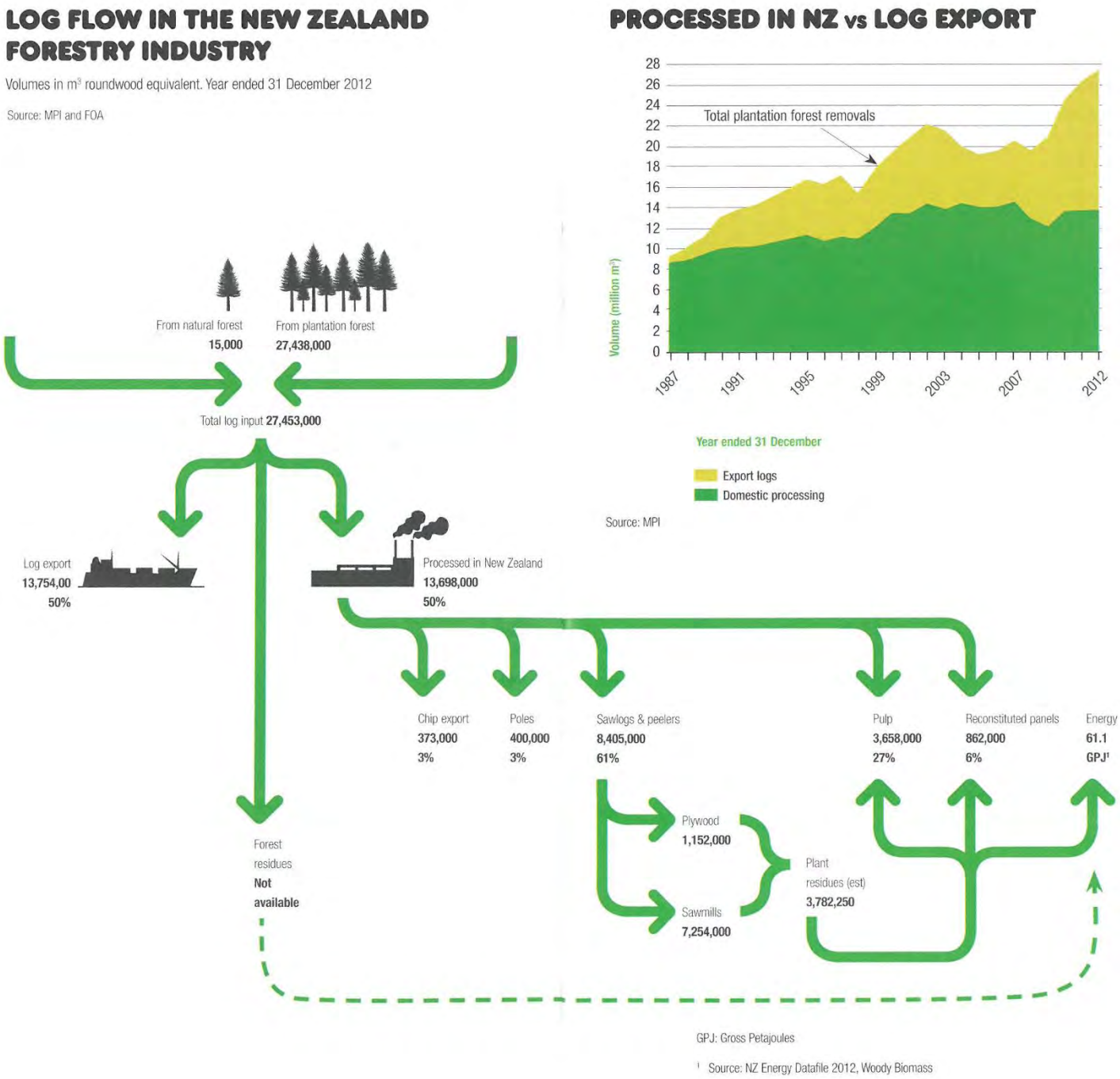


National Harvested Wood Flow

12 months to 31/12/12

Forestry In Northland

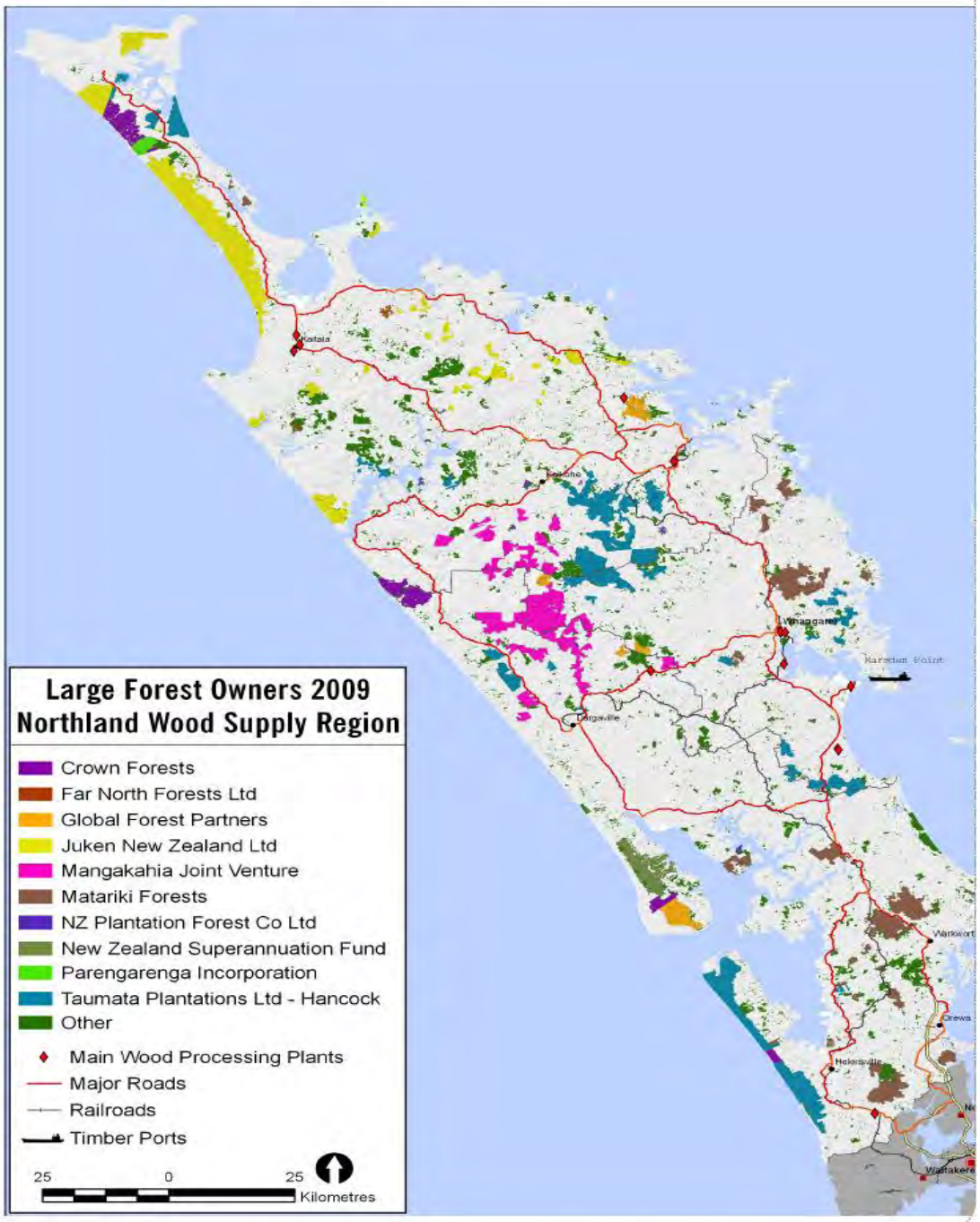
- Forestry work combined with Harvesting/Transport
  - Rapid growth industry past 4-5 years
  - *Fastest growth industry in Northland @ 2009 to 2010
    - 20.2% growth.
- *Wood processing 4th fastest growing industry
  - 2.8% growth 2009 to 2010
- *Forestry and Wood Processing contributed 7.9% of Northland's GDP in 2010,
    - Same period Agriculture @ 8.6% and Tourism @ 6%

***Data sourced from, 'Northland , Annual Economic Profile, 2010', prepared by Infometrics for the Northland Regional Council.**

Area By Council

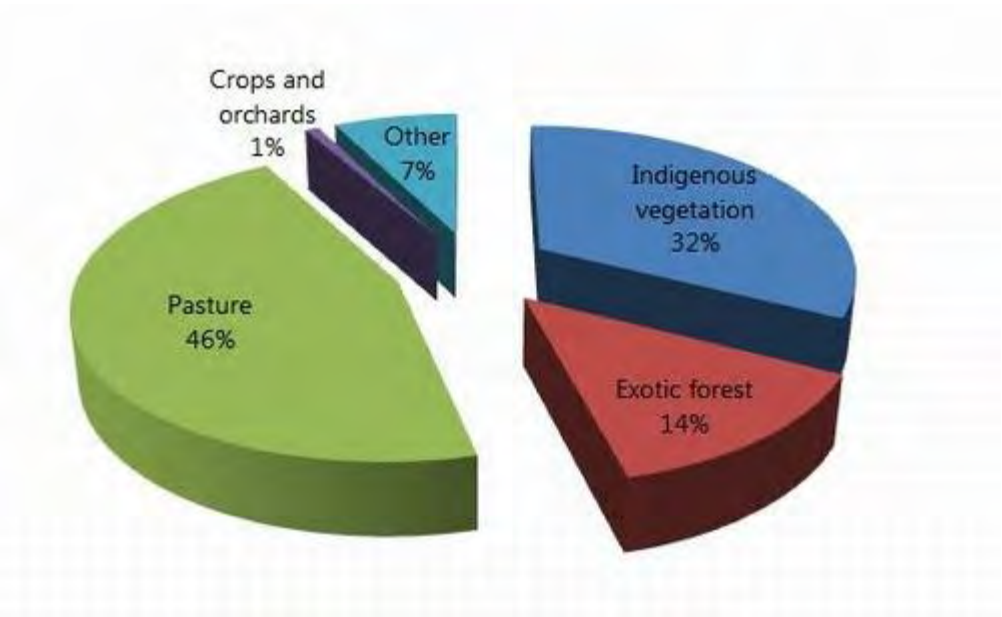
- FNDC 94.6k ha
- WDC 35.3k ha
- KDC 39.6k ha
- Ex Rodney
  - 32.7k ha

FIGURE 2.1: MAP OF THE NORTHLAND FOREST INDUSTRY



Forestry In Northland

- 11% of National plantings 202k ha
  - 3rd largest region (CNI 30% & Southland 12%)
  - Forestry @ 14% is 30% of area Pasture /Arable lands **(NRC data)**



- 70 - 77% through put @ Marsden Point Forest Products

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Ground cover common with Northland's sub tropical climate even with higher stocking rates

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Rayonier/Matariki

- Matariki
  - Initially three owners
    - Rayonier/RREEF Infrastructure consortium
      - Purchased 95k ha ex CHH Forest (2005)
      - Rayonier sold its remaining forest areas into Matariki
    - RNZ Part owner in joint venture
- 143,00ha estate
    - 3rd largest forest owner in NZ
- Rayonier
  - RNZ contracted Managers to Matariki
  - Associated with NZ since 1988

Matariki

- Matariki
  - 5 regional Offices
    - Northland; BoP; H/Bay; Canterbury; Southland;
    - Head Office Auckland
    - 90-95 staff throughout NZ
  - Harvest & Market over 2.0million m3 p.a. NZ wide
    - 60% consumed domestically
    - 40% exported
      - China; India; Korea

Matariki Northland

Five distinct forest areas

- 18,500ha
  - Glenbervie; Mahurangi; Topuni; Tinopai; Riverhead.
    - Glenbervie six separate forests; one CFL
- Land tenure
  - CLF, Forest right; Free-hold.
- Current Harvest 160,000 tonnes p.a.
- age controls harvest harvested 420-450 k t p.a. 6-7 years ago.

- Contracted Workforce 50 **(22 + 12+ 10 + truck drivers 5-7)**
  - 3 Harvesting crews **(22 people)**
    - Mechanised Ground based harvest Crew
    - Two hauler crews
    - Standard Ground based crew
  - Tree crop operations
    - Planting & establishment (5 month pulse 24-28 people =11.76 FTE)
    - Waste thinning (10-12 people)

Forwarder; All wheel drive processed Log carrier

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Forest Cycle

- Age 26-30 the crop is harvested
    - 480-620 tonnes per hectare
  - 9-15 months following harvest areas are Replanted
- Establishment process
  - Mechanical site preparation
    - Wharekohe soils
      - hard pan compact require *"breaking up"* for seedling growth
      - Spot mound or line rip
  - Preplant aerial weed control apply agri-chemical
    - Weed management easiest before planting
  - RMF Plant 1000 Stems per ha
  - Hand top-dress phosphate fertilizer (Nthld)
  - Release seedling from weed competition
  - Monitor competition 3yrs

Forest Cycle

- Age 5 collect and analyze foliage Nutrient Balance
  - Sampling of nutrient balance ongoing through rotation

- Phosphate major growth limiting nutrient deficiency
  - Poorer sites may require 2-3 aerial applications in life cycle
    - 73kg elemental P /ha
      - Some sites require N & some micro nutrients
        - Boron; Magnesium

- Age 9-11 Stand height 16-18 meter
    - lower stem branch control
    - Wind resistance - taller less strength
  - Thin to final crop stocking 420-450 spha

Forest Cycle

- Monitor & Protect forest health
  - Possum Management
  - Fungal & Insect damage- incursions
  - Wild Fire Control
- Measure and record crop type (age 19-22)
  - Plan harvest by
    - Anticipated market requirements
    - Crop type
      - anticipated market volume & product mix availability
- Plan & create access
- Contract harvesting & transport for clear fell

Forest Management Requirements

- Undertake all operations Safely
- Safety is Paramount.
  - Safety is an industry wide focus
    - Challenge - many hazards can only be minimized **(environment)**
  - Moving to address safety as an industry
    - 1980's 4 key forest owners NZFS, NZFP, Fletchers, CHH
    - 2014 Diverse ownership of forests
    - 16 owners with 1,088,000 ha (63% of 1,719k ha)
      - Remainder in small farm woodlot or small company ownership
    - 16 range from 247,000ha – 16,000 ha
  - Industry has undertaken an independent review of safety
    - Report findings recently published
    - Actions now being planned - undertaken.

Forest Management Requirements

- Archaeological Sites & Sites of Cultural significance
  - Stakeholder Consultation
    - Relevant Maori organizations
    - Historic Places Trust
  - Prior to any soil disturbance activities
  - Sites include
    - Urupa
    - Pa
    - Terraces & Pits
    - Remnants from Mining
    - Gum Digging
    - Kauri Forest Harvesting
  - PuhiPuhi North Forest
    - 2 layers of archaeology
    - Miners used kauri dam timbers

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Forest Management Challenges

- Over a rotation operating conditions change
  - Glenbervie Forest - Initial planting 1947
  - 3 rd plantings now ongoing
  - adjacent land use has changed significantly
  - Was large sheep/beef farm holdings
    - Now- Life style blocks and rural sub divisions
      - Reverse sensitivity quiet green back drop
      - Neighbors can be unhappy
        - Harvest- back drop no longer appealing
        - Sharing roads (logging trucks)
        - Noise – talkie tooters & start times for crews
        - Use of agrichemicals & aerial application methods.
        - Shade - if the trees are shading you then you are probably too close !!
- Forests were established on marginal farm land
  - Erosion prone; poor nutritional value; weed covered.

Forest Management Challenges

- Increasing expectations around Environment
- Sediment generation - major environmental impact
  - Water quality – turbidity- Northland fine clay soils.
    - Period of soil disturbance,
      - operations creating disturbance
    - Access formation
    - Log extraction
  - Timing of works controlled by NRC
    - Seasonal 1/10 – 30/4
      - Can apply for formal expension
    - PA &/or Consent rules
  - Duration of effects slope & geology dependent
    - 3-6 years
    - Cycle 26-30 years
      - No credits for soil and water conservation contribution
        - Minimum 70% of cycle! At least 20 years

Forest Management Challenges

- Sediment Management
  - Planning
    - Determining access route that minimize soil disturbance
    - Recognizing higher risk areas & managing appropriately
    - Ground proof/comfirm
      - water way status
      - archeological site presence
      - RTES presence.
        - Kiwi timing of nesting
        - Aquatic species presence : water way protection
      - Additional access or pull across/through gully
  - Process
    - Plant technology applied to specific area
    - Timing of operation
    - Deflection; butts lifted in haul

Forest Management Challenges

- Sediment Management
  - Auckland Council Process past ten years
    - Adapted Urban & Civil works sediment control processes
      - TP 9 TP 90 became TP223 for application to Forestry
    - Difference in forest environment not recognized-accepted
      - Slash and under-storey interception stabilization of site
        - Sites not hard bare surfaces awaiting storm water (culverts) management
  - TP 223 Concentrate & treat storm water
      - Geology not considered
      - Containment structure specified @ 2% of catchment area!
    - 1m3 size per 50 m2 catchment rectangular length 3x width
    - 1m3 of water = 1 tonne!
    - Utilize Rip rap with water tables any slope over 2%

Forest Management Challenges

- Sediment Management
  - **Historic Industry** approach ***"Dilute & Disperse Storm water"***
    - Reduce volume; minimize damage;
      - Minimise sediment transport capability
    - Cut offs/water bars on tracks
      - Space cut outs & culverts to ensure no cut/rilling; Soil & Slope specific
  - Elevated Landings- Storm water dispersed; flows out wards
    - Diluted-dispersed along in haul route
      - Down hill extraction concentrates storm water flow a point
  - Multiple small cut out and sediment capture structures
    - Contain the heavier particles
    - Turbidity issue; transportation of fine particles
      - determined by weather event. water volume

Best Practice Soil Disturbance Activities

- Numerous publications offer advice
  - Corporate Forestry; in house Environmental Standards
- NZ FOA Engineering Manual & Operator guideline
  - http://www.nzfoa.org.nz/publications-5
  - Published several years ago replacing an original LIRO publication
- Forest Industry & NRC Guideline
  - Created over a 3 year period - launched 2012
    - www.nrc.govt.nz/Download/?.../**Northland**%20**Forestry**%20Earthworks ...**Forestry**. Earthworks & Harvesting **Guidelines** for Northland. Issue 1 – March 2012 ...

Publications on Post-harvest sediment yields

Where	Annual yield t km^{-2} y^{-1}	Reference
Maimai (native) - West Coast	**80 - 450**	O'Loughlin et al. (1980)
Big Bush (native) - Nelson	**18 - 44**	Fahey (unpub)
Glenbervie - Northland	**46**	Hicks & Harmsworth (1989)
Pakuratahi - Hawke's Bay	**18 - 112**	Fahey et al (2003)
Motueka - various Nelson	**21 - 148**	Hewitt (various 2001-2002)
Blue Mountains - Otago	**16**	Duncan (2012)
Coromandel - Whangapoua	**59 - 116**	Phillips et al (2005)
Coromandel - Opitonui	**10 - 279**	Wild & Hicks (2005)

10's to low 100's t km^{-2} y^{-1}

*Phillips CJ, Marden M, Rowan D (**2005**). Sediment yield following plantation harvesting, Coromandel Peninsula, North Island, New Zealand. Journal of Hydrology (NZ) 44(1):29-44.*

*Basher LR, Hicks DM, Clapp B, Hewitt T (**2011**). Sediment yield response to large storm events and forest harvesting, Motueka River, New Zealand. New Zealand Journal of Marine and Freshwater Research 45(3): 333-356.*

Forward view Forestry

- MPI; MfE; Industry & Councils NES
  - Standardized national rules related to core forest operations

- Increased mechanization of higher risk activities
  - Improve safety outcomes by
    - place operators in cabs felling
    - Mechanize breaking out
    - Mechanize log processing.

- Forestry lands converting to dairy farming use
  - Creating some concern in specific catchments (Lake Taupo)
  - Low Carbon value conversion unhindered
    - Attractive dairying returns

Benefits of Forestry

- Improved rural community road infrastructure
  - Wellington/Labour Jim Anderton
    - introduced a road improvement process Northland & East coast
    - Rural road networks dramatically improved over 8 year period.
- Forest Companies (Resources) Wild Fires management
    - Personnel trained Vegetation Fire Control
      - Attend international suppression efforts USA; Aussie
    - 4 X4 tankers specific pumps & water way equipment.
      - Urban brigades use 70-90mm hose; rural 41 & 25 mmm!
- Soil & Water Protection 70-80% plantation cycle
  - Waterways afforded set backs riparian
  - Wetlands protected, not developed/no burning
  - indigenous forest remnants protected
  - Introduced browsing mammal management

Benefits of Forestry

- Bio diversity
  - Many RTES present within forests- Plantations & reserves
    - Predator control/management
      - GLB 2800ha indigenous 28% of area
      - Mahurangi 1100 ha reserves 20% of area.
    - NZ Falcon; Kiwi; Hochstetter Frog; Fresh water Koura
    - Plant specie's.
- Recreational use especially former State Forests
  - Woodhill forest over 250,000 visitors annually
  - Glenbervie Primary fun run Glenbervie Forest 800+ people
- Waste management- Waitangi Forest Wetlands
    - Paihia & Kerikeri sewerage management & filter

Re-established 2 yr old stand wetland and scrub intact wall to wall vegetative cover

Fill batter new road grass seeded to minimize sediment generation -Stabilizing the bare area

Slash Stabilised - bare soil covered

- Erosion control
- Planting next!

Bench Formation Excavator and Compactor
All fill areas are benched and compacted

Sediment Control with cut out pipe and flume over fill area. Fill face Hydro Seeded- Satbilised

Water table rip rapped- slash pulled back over bare soil off edge of formation- awaits Metal.

Logs fully suspended across a sensitive portion of the in haul.

Field Trip

- Car Pool
- Drivers maintain head count
- Follow the White Highlander
- If I stop pull over please do the same
- Travel with head lights on
  - 2 - 2.5 hrs
  - Change of Plan
  - we are now visiting Glenbervie Main Forest
- When we stop to view a site keep together

Field trip

- Stop One
- Glenbervie Forest Main Block Office
  - Resurgent understory in paddocks planted 1992
  - Kauri plantings 1948 & 1952
  - 3rd planting 8yr old trees with cutover on horizon

Stop Two

- Nursery Flat / Mangakino road
  - Harvested successively past 1-6 years
  - Views of site re-vegetation
  - Weeds dominated by Gorse total cover 3 years following harvest
    - Gorse may require several chemical controls post plant
  - Mechanical land prep
  - Indigenous high forest riparian

Stop Three

- Hauler harvest site completed 9 months ago.
  - Vegetation regenerating
  - Yet to receive preplant spray weed control
  - 9 year old stand to NE
    - Harvested without damage to native

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