Forest Management and the Carbon Cycle in Native Forests on the Mid North Coast of New South Wales

Prepared by:
Justin Williams
Planning Manager

Logging and regenerating Blackbutt forests 1950-1975

Hastings Forest Way 1955

Growth and Development - resilience

A lot has changed

Photos by Bronwyn Ellis

- Still Local - >75% of timber is manufactured locally, supports ~1,000 local jobs

- Still high-value focused - >60% of the timber goes into high-value specialized products – flooring, decking, poles, structural timber

- Smaller estate, smaller logs

- More mechanized - harvesters
- Less mills but larger and more specialised

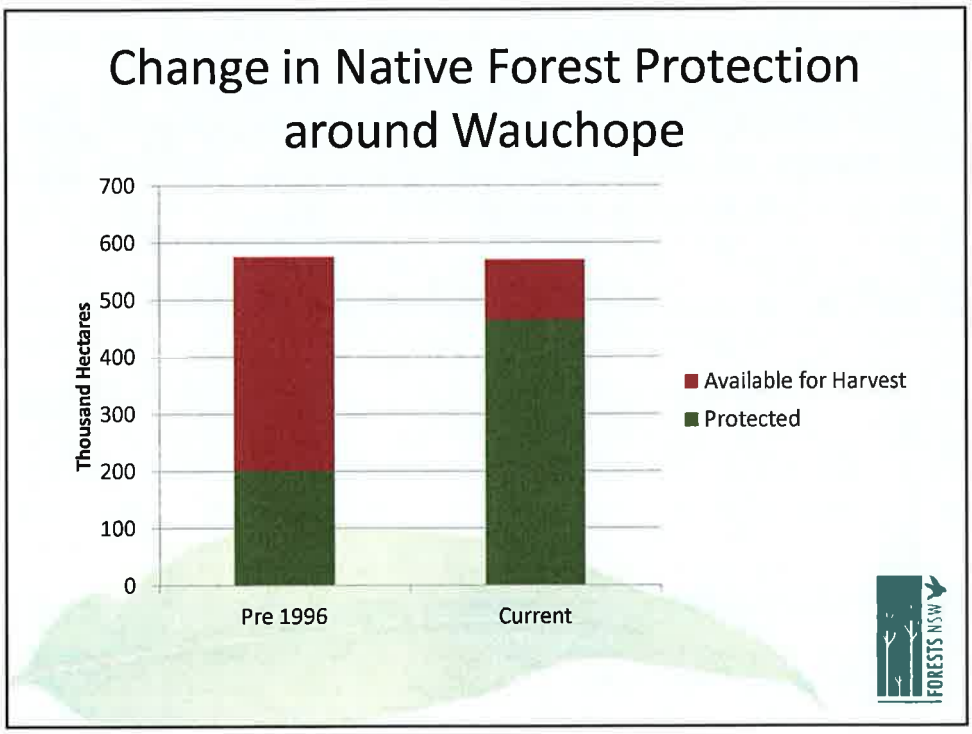
- All aspects of Forest management are done to a standard

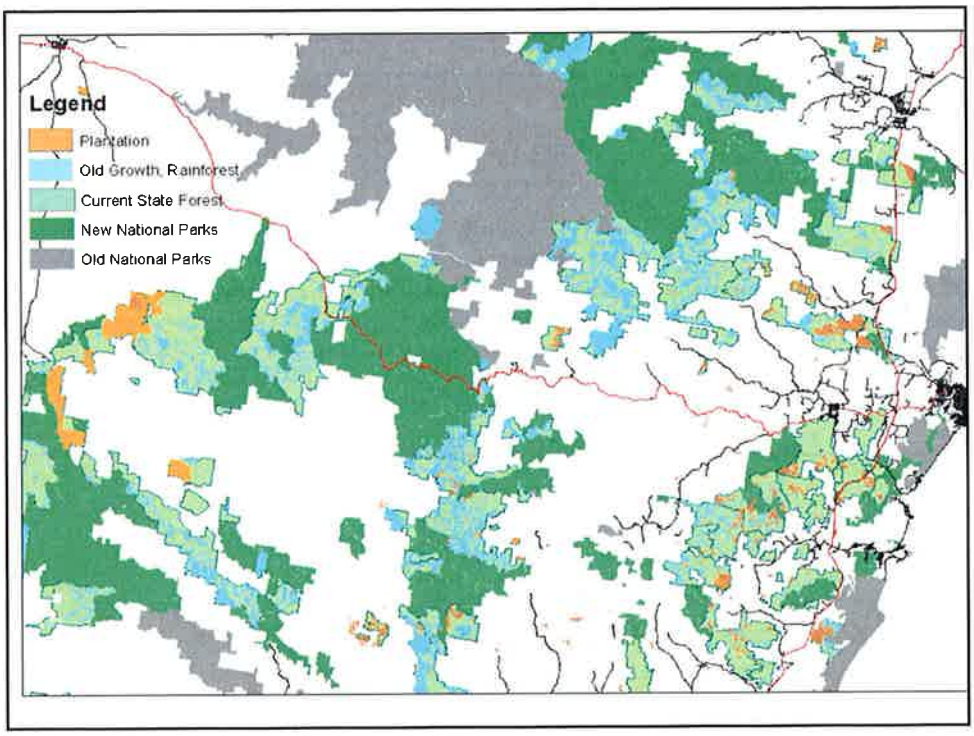
Australian Forestry Standard

Systematic Management	
Biodiversity	Public Participation
Productive Capacity	**Carbon Cycle**
Ecosystem Health	Social and cultural Values
Soil and Water	Social and Economic Benefits


NSW
TOURISM
AWARDS
2011
FINALIST


CASE
31 3 2006

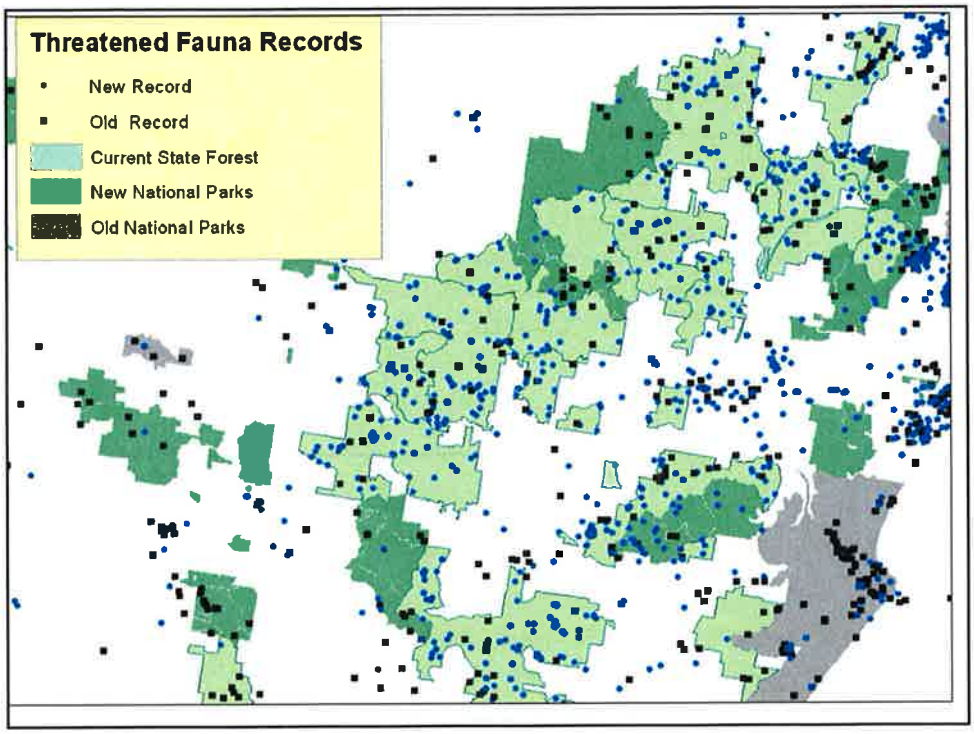

Change in Native Forest Protection around Wauchope
700
600
500
400
300
200
100
0
Thousand Hectares
Pre 1996
Current
Available for Harvest
Protected
FORESTS NSW



Threatened Species Surveys – 10 years on the North Coast

Survey	Effort	Results
Flora and Fauna Traverse	7,000 km	60 Threatened Flora species Endangered Ecological Communities (EEC's) Glossy Black-cockatoo – 4,991
Spotlighting/ Call Playback	4,550 km 4,140 sites	Barking Owl – 72 Koala – 3,940 Masked Owl – 305 Powerful Owl - 444 Yellow-bellied Glider – 2,938
Frogs and Bats	3,700	Giant-barred Frog – 616 Stuttering Frog – 2,731 Sphagnum Frog – 367 Golden-tipped Bat - 374
Total Surveys	>27,000	>140 different species, 60 flora >14,000 records >196,000 individuals

FORESTS NSW



Wildlife Management - During Harvesting

Landscape Prescriptions

Hollow-bearing Trees– 5 trees/ha + recruitment trees

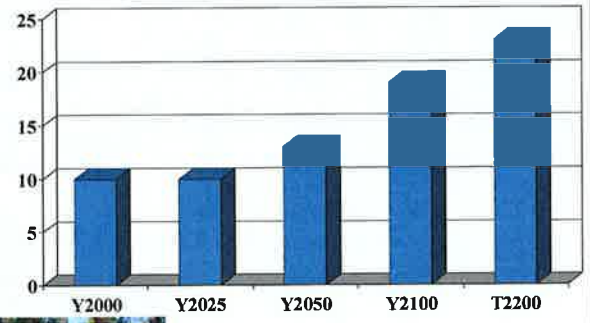
Feed trees – koalas, winter flowering, gliders, cockatoos

Rainforest/Old Growth/Riparian Buffers – mapped exclusions from harvesting

Site-specific – rocky outcrops, wetlands, EECs

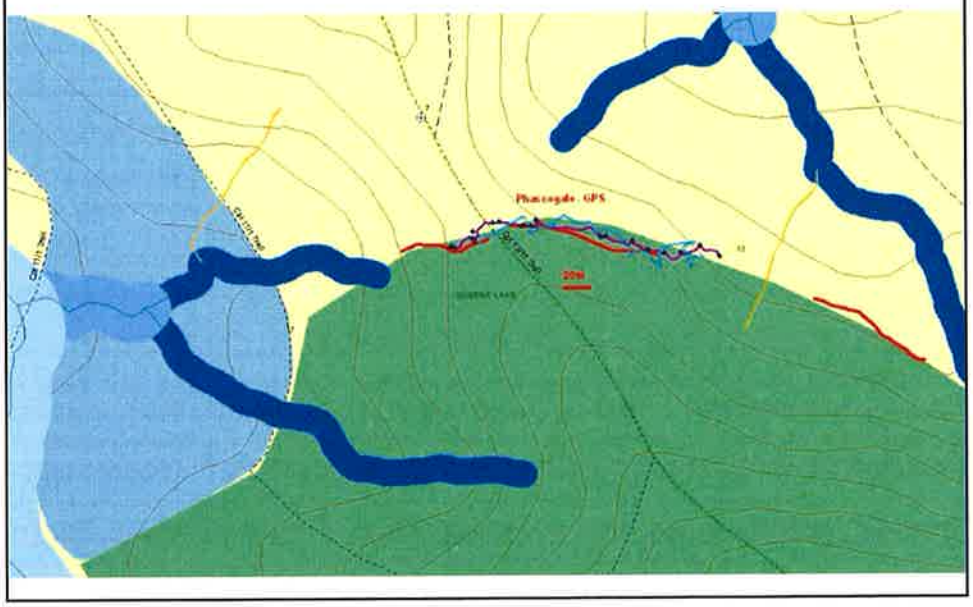
Mark-up search – Officers trained to identify site-specific features

Average number of hollow trees/ha across landscape including harvested and reserved areas



FORESTS NSW

Breaches



How to decide how to log and regenerate? Eucalypt Natural Regeneration strategies

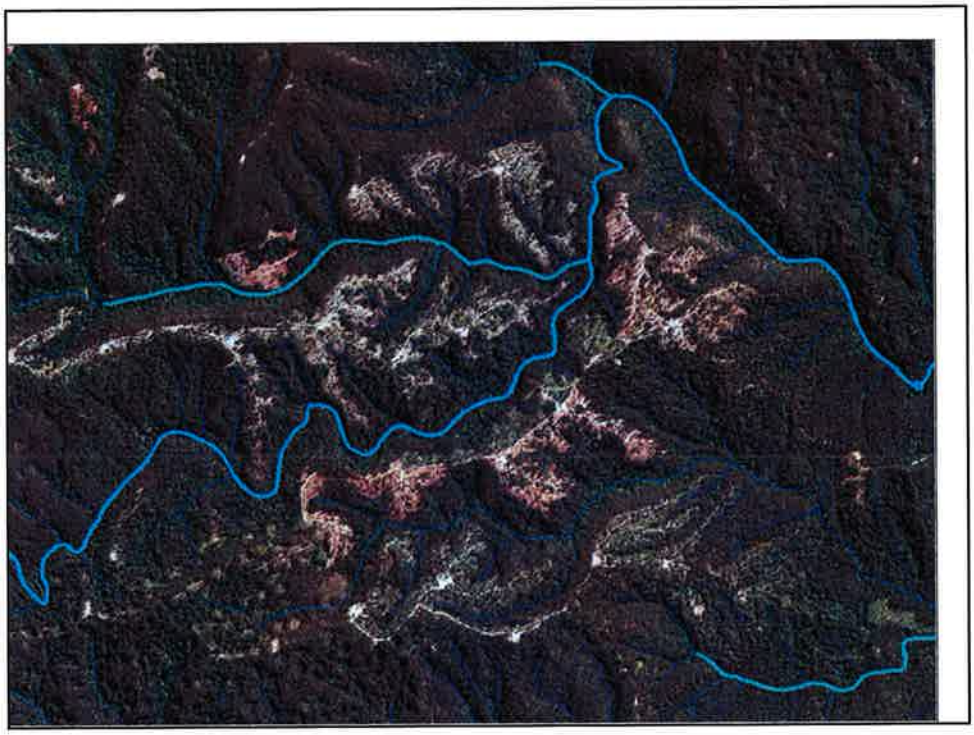
Seedlings, lignotubers or coppice

Successful regeneration of Eucalypts from seed = heavy logging

Mineral soil

Copious light (no shade)

Seed source – tiny seed

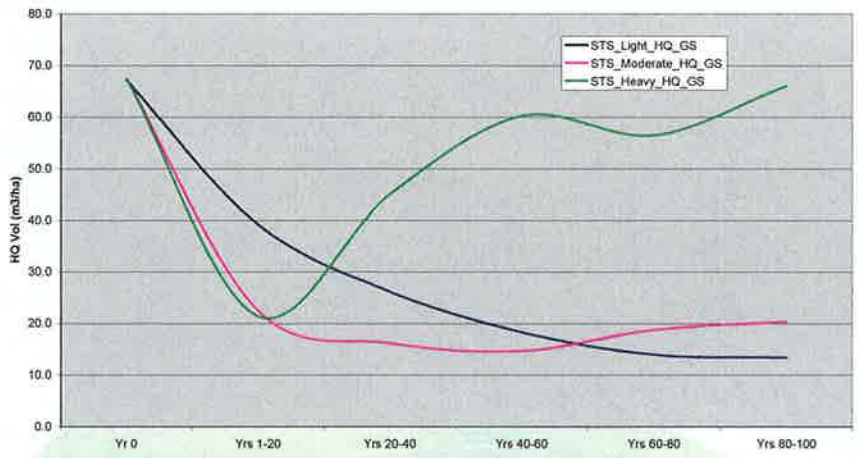


Regeneration Results

Silviculture Type	Adequate Regeneration	Inadequate Regeneration	Stocking (stems/ha)
Group Selection (AGS)	36	24 (40%)	Average - 1,000 Range 100-5,000
Light Selection	5	9 (64%)	700 (76-1232)
Regeneration Harvesting	17	0 (0%)	3,500 (1875-5440)

Adequate Regeneration = >65% of sites stocked >625 stems/ha

Silviculture and Growth



Net Carbon Sink – Central Region

- **Forest growth and storage exceed emissions – the forest estate is a net carbon sink**

Store – 138Million Tonnes (Mt) CO2e

Growth – +1.2Mt/annum

Removals – -652Thousand Tonnes (Kt)/annum

Sink = +548Kt/annum

Forest Residues = 219 Kt/annum

Simple response to why Use forest residue

- 219Kt per annum produced during current logging, is burnt and/or left to decay
- This costs money to manage and creates a fire risk to the commuity
- If ~30% was utilized for bio-energy we could avoid at least 65kT of local emissions – equivalent to powering >5,000 homes
- No extra trees need to be cut down to do it

In Forest Residue

Bigger Picture is complex and more compelling

Production Forests	Conservation Forest
In Forest – standing trees and residue (measured in forest inventory and assessed in research to work out carbon in leaves, trunks, bark stem)	**In Forest** – live and dead trees + coarse woody debris
In Wood Products Life-cycle analysis – how long is the carbon stored in each wood product (Local research by Ximenes + international research) Net effect after management emissions – harvesting and transport (local and international research)	**Leakage effect** – wood products sourced from another forest by protecting this one
Substitution Effect – emissions of using alternative products local and international research	

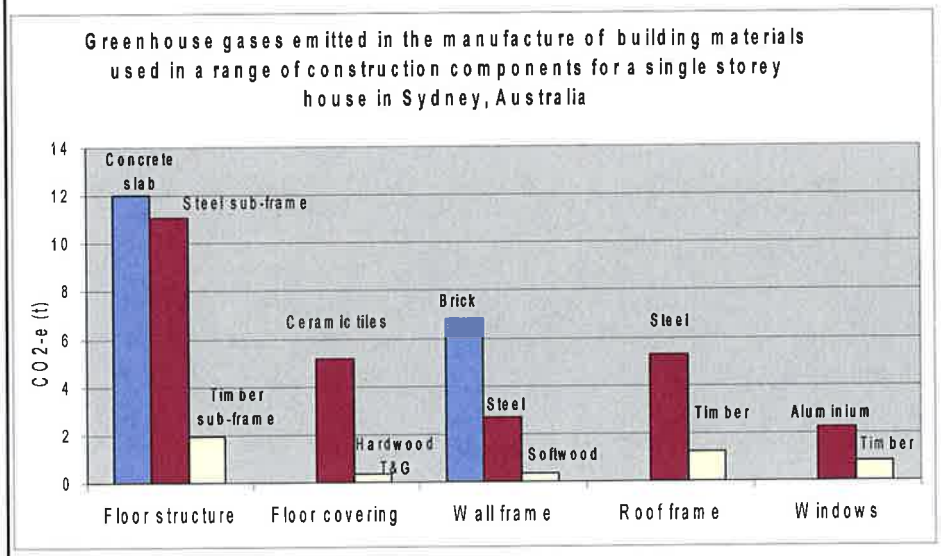
In Forest Pool

Regrowth

Old Growth

Wood Products Pool

Substitution



Leakage

Hardwood and softwood are often not directly substitutable

Tropical rainforest logs produce ~5 times the CO2e emissions of equivalent local log

>60% of tropical hardwood timber imported into Australia is illegally logged, mostly from Indonesia

50% of Indonesian logs come from land conversion to agriculture and palm oil

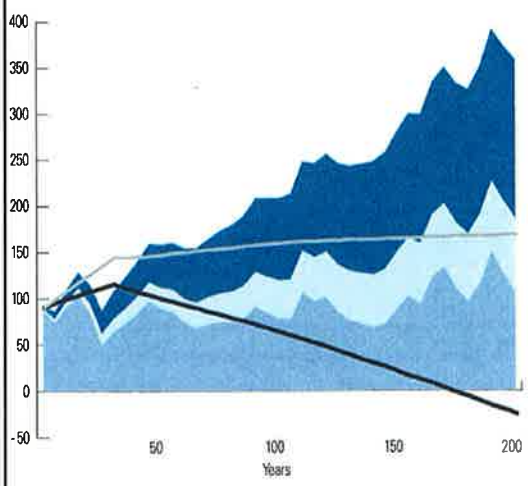
Illegal logging in PNG is now going through the roof

No Harvey No campaign drives consumers away from Australian timber to illegal timber

Net Result for Carbon sequestration in Blackbutt forests

Using residues improves this scenario by 13% excluding sawmill residue

Carbon under the current harvesting regime in a representative North Coast native forest



Cut forest

- Product substitution effect: Net carbon emissions avoided through using timber products compared to more emissions-intensive alternatives. If logging residue was efficiently utilised for biochar or energy, the net product substitution effect would be much greater.
- Carbon stored in products
- Carbon stored in retained trees and from all parts of harvested trees left in the forest.

No cut forest

- Carbon stored if the forests are not harvested.
- Net carbon stored: Net impact of not harvesting forests on carbon stocks, including the effect of substituting the sawlog products with more emissions-intensive alternatives.

This model excludes potential emissions due from wildfire. If included the carbon storage of the protected forests is much lower.