

# Why Logging Old-Growth Forest is Bad for Climate Change

by the Australian Conservation Foundation

## How important are Our Native Old-Growth Forests for Climate Change?

What many people do not realize, is that these forests are major stores of carbon and therefore vital for maintaining climatic stability.

When old-growth forests are destroyed and replaced with commercial plantations it leads to a significant increase in the amount of carbon dioxide (CO<sub>2</sub>) in the atmosphere. The CO<sub>2</sub> released from the annual clearing of old-growth forest areas in the East Gippsland region alone, is substantial. The clearing and breakdown of this area's forest timber will release an amount of CO<sub>2</sub> equivalent to 2% of Australia's total emissions in 1990 – equal to the annual emissions of a coal fired power station!

While there is a strong argument for not logging old-growth forest, this does not mean trading schemes should allow fossil-fuel emitters to gain 'credit' for preserving these forests. Australia should not have to sell 'carbon pardons' in order to protect the important carbon stores in our old-growth forests. Protecting a forest does nothing in the atmosphere to discount the impact of new fossil-fuel emissions.

## What do native old-growth forests have to do with the greenhouse effect?

Trees absorb the greenhouse gas CO<sub>2</sub> from the atmosphere and store it as fixed carbon. However, as well as being 'sinks' for carbon storage, forests also emit CO<sub>2</sub>. When forests are cut down carbon is released as CO<sub>2</sub> back into the atmosphere through the burning and decomposition of waste timber and wood products.

CO<sub>2</sub> traps heat in the atmosphere. Therefore, an increase in CO<sub>2</sub> from deforestation contributes to rising temperature levels.

## How does the Kyoto Protocol deal with forests?

The 1997 International Climate Summit, held in Kyoto, Japan, agreed on a protocol allowing forest plantations to be considered as carbon sinks. This means that countries or companies emitting high levels of CO<sub>2</sub> are able to get credit points for tree growing initiatives in order to 'offset' or absorb their CO<sub>2</sub> emissions (largely industrial pollution emissions). These sinks could be used as part of 'emission trading' schemes.

Although the Kyoto Protocol does not directly prohibit or allow the replacement of old-growth forest with plantations or other land-uses, imprecise wording and vague definitions have introduced potential loopholes.

This might encourage old-growth forests to be cleared for new 'sinks'.

Some countries might cut down their high carbon storing forests before 2008-12, the time period when emissions levels agreed on at Kyoto will be measured.

Emissions for deforestation between 1990 and 2007 are reported in annual inventories but are not counted in the 2008-12 commitment period. This means that old-growth forest could be cut down before 2008-12 so that these emissions are not counted in the commitment period. In addition to this problem, a loose definition of 'reforestation' in the Kyoto Protocol might lead to old-growth forest being cut down and 'reforested' with fast growing plantations.

## What do scientists say about carbon storage in forests?

It is clear that old, large trees contain much more carbon than young small trees. Younger trees accumulate carbon more quickly than older ones but older trees store a greater amount of carbon.

"When a forest is young it makes little contribution to storing carbon and preventing it from being in the atmosphere. As the forest gets older, it makes a greater contribution by storing more carbon"

It is the amount of carbon that is locked away and the length of time it is locked away from the atmosphere that is important for the carbon storage, not the 'sequestration' rate.

In a study that compared the carbon content of old-growth forests with commercial plantations, old-growth forests were found to store much more carbon. It was found that commercial plantations on average store only about 1/3 of the carbon of an old-growth forest.

For example, a 450 year old Douglas Fir (*Pseudotsuga menziesii*) and Hemlock (*Tsuga*) forest in the United States was found to contain over 600 tonnes of carbon per hectare (tC/ha). A 60 year old Douglas Fir plantation held only about 260 t C/ha. This study concluded that: "Conversion of old-growth forests to young plantations invariably reduces C[arbon] storage, even when structural components in buildings are considered".

## Will plantations as sinks make up for the carbon lost from old-growth forests?

The high absorption rate of carbon in young growing trees is one of the main arguments for the use of plantations, rather than mature forests, as carbon sinks. Most plantations are harvested before they reach 30 or 40 years old. This means that trees are in the ground during the peak of their growth rate, when carbon is absorbed

fastest. Once a plantation is harvested, another is planted to again take advantage of the optimum carbon absorption period. It is argued by some people that this is the most effective way to absorb carbon from the atmosphere. This argument could be falsely used, to justify the replacement of Australia's old-growth forests with plantations.

Plantations are of little benefit for carbon sequestration if they are cut and used as wood products that return CO<sub>2</sub> to the atmosphere quickly. This is especially so where old-growth forests are cut down for plantation establishment. Plantations must absorb all carbon emitted from the original forest before there is any carbon sequestration benefit i.e. before any fossil-fuel emissions absorbed could be considered as offset. So if anything, replacing old-growth with plantations only results in a flow of CO<sub>2</sub> into the atmosphere.

It is not only the replacement of old-growth with plantations that results in a flow of CO<sub>2</sub> into the atmosphere. Replacing old-growth forest with other land-uses, for example pasture, cropland or grassland, also results in carbon being released into the atmosphere.

#### How much carbon do Australian old-growth forests store?

Various studies show that old-growth eucalypt forests in Australia contain between 200 – 400 t C/ha in above-ground biomass. Forest types that can store this level of carbon include Mountain Ash (*Eucalyptus regnans*), Flooded Gum (*E. grandis*), Alpine Ash (*E. delagatensis*), Messmate stringybark (*E. obliqua*) and Shining Gum (*E. nitens*) among many others. However further research needs to be done to confirm the carbon storage capacity of Australian old-growth forests.

Old-growth forests are assumed here to have an average carbon content of around 300 t C/ha. It must be noted, that the amount of carbon stored in a forest is highly variable and is dependent on many factors such as, climate, rainfall and soil/nutrient status. Below-ground biomass i.e. roots, are around 20% of that held above-ground. This means old-growth forests in Australia emit around 360 t C/ha, which converts to 1,320 tonnes of CO<sub>2</sub> per hectare, when cut down [conversion: tonnes Carbon x {44/12} = tonnes CO<sub>2</sub>].

#### What happens when an old-growth forest is replaced by a commercial plantation?

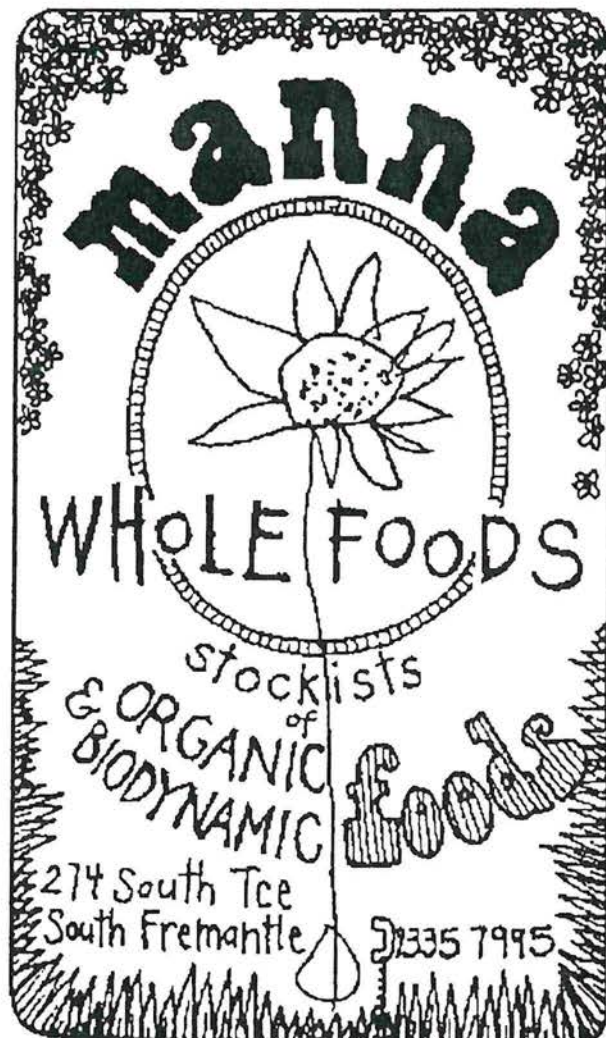
A eucalypt that is 200 years old contains much more carbon than a 30 year old plantation eucalypt. It has been suggested that over time commercial plantations will be able to accumulate as much carbon as old forests. However, a plantation harvested every 30-40 years releases the carbon that it has absorbed over that period, therefore resulting in zero carbon sequestration benefit. Even if the carbon is stored in long-lived wood products, it is eventually released as CO<sub>2</sub>.

If 1000 hectares of old-growth was logged, about 1,320,000 tonnes of CO<sub>2</sub> would be released. If this were replaced with softwood plantations eg. *Pinus radiata*

which sequester carbon at around 3.6 t C/ha/yr, 3600 tonnes of carbon would be absorbed annually. At this rate it would take about 100 years (three crop rotations!) to absorb the carbon released from harvesting of the old-growth forest alone. Additional fossil-fuel emissions are not being absorbed because each plantation rotation is effectively only absorbing the emissions of the previous plantation.

Wood products do not have lifetimes long enough to extend the carbon storage time of plantations to match that of old-growth forests. Paper stores carbon for no longer than 3 years, 'slash' or unused wood decays within 7 years and timber used for housing and construction only locks away the carbon for 50 years.

In most cases, regardless of what the plantation timber is used for, it takes many years for plantation rotation to make up for the carbon released from the old-growth forest: "... even when full credit is given for the carbon stored in harvested products and the fossil-fuel emissions avoided ... when the cycle of producing forest products includes initial harvest of a forest with a large standing stock of biomass, there is likely to be a long-standing debit in terms of net carbon emissions to the atmosphere.... recovery to the pre-harvest C balance can take a century or more, or perhaps never occur."



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Plantations can make a contribution to absorbing fossil-fuel emissions, when they are grown on previously not forested land and when the plantation is not cut-down. Fossil-fuel emissions are also reduced when plantation timbers substitute for greenhouse intensive products such as aluminium and steel, and when they are used as biomass for energy to replace fossil fuels.

### How much CO<sub>2</sub> is released from the cutting down of Australian old-growth forest?

It is not known how much CO<sub>2</sub> is emitted from old-growth harvesting nationally, as there is currently no national data on old-growth deforestation. The 'State of the Forests Report 1998', touted by the government as a comprehensive overview of the current state of Australia's forest resource, contains no information on current old-growth stands or harvesting rates. The amount of old-growth will be officially quantified at the completion of the Regional Forestry Agreement process.

However there is some information on smaller regions, such as East-Gippsland in Victoria. From these figures we can get a rough idea of how much CO<sub>2</sub> is released annually from logging these forests. This also indicates how much CO<sub>2</sub> might be released from harvesting other old-growth areas in Australia.

Every year between 1993 and 1998 an average of 6,630 hectares was logged from forests in East Gippsland, 93-95% of which was old-growth. If it is assumed that these forest contain around 360 t C/ha, they would release approximately 8.7 million tonnes of CO<sub>2</sub> annually. This amounts to around 2% of what Australia's total greenhouse emissions were in 1990.

There were around 225,000 hectares of old-growth forest in East-Gippsland prior to 1996. About 70% is in conservation reserves which leaves approximately 67,500 unprotected. If the current rate of old-growth deforestation continues, all of the unprotected old-growth will be gone in 10 years and over 87 million tonnes of CO<sub>2</sub> will be released into the atmosphere. ■

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# US Government Vows to Step Up Protection of Forests

by Randy Fabi

**WASHINGTON** The U.S. Forest Service has unveiled a plan that it said would cut down on agency bureaucracy and give environmental groups a bigger say in planning how federal forests are used.

The forest service has been criticised for making timber sales and livestock grazing higher priorities than the protection of water, animal life, plants and trees.

"We are announcing more than just a change in policy. This is a fundamental change in philosophy," said Agriculture Secretary Dan Glickman. The forest service is an agency within the U.S. Agriculture Department.

The proposed regulations centre around giving environmental groups and the public a bigger say in developing plans for how forests are used, Glickman said. They will also try to find a better balance between protecting the environment and satisfying demands for lumber and recreational areas.

The agency will also make better use of technology and science in drawing up plans for how the national forests are used, he said.

"The proposal calls for including the public and scientists much earlier in the planning process so that we can develop a common vision for how our forests should look and function," Glickman said.

Environmental groups praised the reforms but said they remained sceptical.

"We applaud the emphasis on ecological sustainability," said Rodger Schlickeisen, president of Defenders of Wildlife. "However, we are also quite concerned that the new regulations provide sufficient

assurances that the stronger conservation vision is actually achieved."

Meanwhile, timber industry officials criticised the changes, citing the absence of their industry in forest service discussions of policy.

"This is certainly more regulation of our industry," said Derek Jumper, a spokesman for the American Forest and Paper Association, which represents the forest products industry.

A recent analysis by Congress' investigative arm, the General Accounting Office, found that some \$1 billion in tax money was used to subsidise timber industry logging in the national forests. The report cited the forest service as vulnerable to waste, fraud and mismanagement.

The forest service manages some 192 million acres of land, or about 9% of the nation's total land. Under federal law, it allows companies to lease land for timber, natural gas, oil, minerals, and livestock grazing.

About half of American national forests have been logged, mined, or opened for oil and gas drilling or other development, according to environmentalists.

"If implemented, this plan will help the Forest Service stem those tax losses and begin restoring the forests that provide us with drinking water, give homes to wildlife and offer opportunities for us to hike, hunt, camp, canoe and fish," said Sean Cosgrove, a forest expert with the Sierra Club.

SOURCE: Planet Ark News, 1 October 1999