



# Trees- the forgotten solution to climate change

A briefing paper from The Wilderness Society, November 2006

*“Curbing deforestation (land clearing) is a highly cost-effective way of reducing greenhouse gas emissions and has the potential to offer significant reductions fairly quickly.”*  
*Stern Review into Climate Change, October 2006.*

## Background

Greenhouse gases in the atmosphere keep the Earth warm. Man-made emissions of these gases, especially *carbon dioxide*, have caused the amount of greenhouse gases to increase by about 30% since pre-industrial times. 40% of this increase has come from tree clearing and logging.

The recent intense debate on climate change in Australia has focused on greenhouse gas pollution coming from fossil fuel energy sources- oil and coal. Largely forgotten in the debate is the major role played by trees and other vegetation in absorbing greenhouse gas pollution and storing it out of the atmosphere. Also forgotten is the contribution of tree clearing and logging to increases in CO<sub>2</sub> in the atmosphere.

When we clear land of trees and log forests, we release carbon that has been stored out of the atmosphere, often for many centuries. The stored carbon is released into the atmosphere when trees are burnt or rot following clearing or logging operations or are used for short lived products such as paper. This in turn causes more global warming. Other land management activities which affect trees, vegetation and soil can also reduce our greenhouse gas pollution.

As noted in the just released Stern Review on the Economics of Climate Change, protecting trees and other vegetation needs to be a major part of the basket of solutions we use to reduce climate change. We detail here the amounts of pollution that could be reduced by protecting trees in native forests and bushland.

## Landclearing

Land clearing (also called *deforestation*) is the permanent removal of native forests and other bushland. In Australia most land clearing is done to extend grazing and farming land. Some native bushland is also cleared for housing and urban development and some areas are cleared to create young tree plantations for wood production.

When trees and bushland are bulldozed and burnt or left to rot, the trees and other plants release huge amounts of carbon dioxide.

Landclearing produces over 10% of Australia's greenhouse gas emissions according to Australia's official reporting to the UN Climate Secretariat.

A few recent media commentaries have implied that land clearing has now ceased in Australia, and that this has allowed the Federal Government to reach the generous targets set out for Australia under the Kyoto Agreement. This is, at best, only partially correct. Very large areas of bushland are still being cleared in some Australian states. The latest figures indicate that land clearing in Queensland and NSW is about equal to the pollution from 7.4 and 2.8 million cars respectively.

In Queensland the Beattie Government now has comprehensive controls on clearing. These laws put in place a phase out of large scale land clearing at the end of this year. Although illegal clearing is still at worrying rates in Queensland, at this stage this phase out appears to be largely on target.

The Federal government acknowledged that ending broadscale tree clearing in Queensland has contributed an overall reduction of 5% to Australia's greenhouse gas emissions, yet no funding was provided by the Federal government to implement this policy.

The Queensland land clearing controls were strongly opposed by the Howard Government when they were introduced by Premier Beattie 2004.

The NSW government promised to end land clearing by the end of 2005. However, clearing at high rates continues. In 2006, the NSW Auditor General found that 740 square kilometres of bushland (74,000 hectares) was cleared in 2005. The Auditor General found that attempts to curb clearing were impeded by poor monitoring and compliance by the NSW Government. The Auditor General found that 40 % of the clearing (around 30,000 hectares) was illegal.

Other states have lesser amounts of clearing (Table 1). However, Tasmania and the Northern Territory are of particular concern. Despite its small size Tasmania continues to have very high rates of clearing and the current regulatory regime will allow this to continue. In the Northern Territory proposals for large scale land clearing operations are increasing.

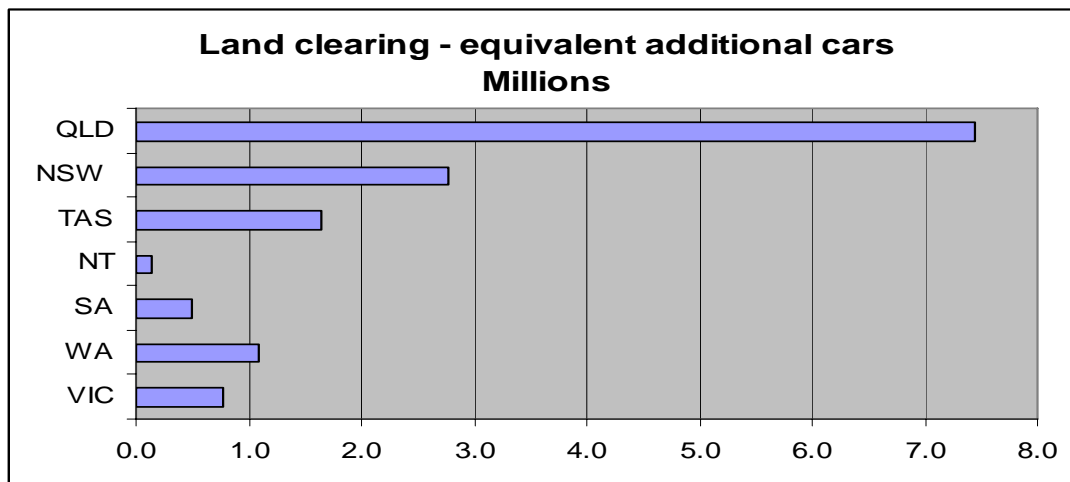
**Table 1. Greenhouse emissions from land clearing**

| State   | NSW     | QLD     | VIC   | WA    | SA    | NT    | TAS   | National |
|---|---------|---------|-------|-------|-------|-------|-------|----------|
| <b>Area cleared hectares /year</b> <sup>(2,3,5)</sup>             | 74,000  | 267,000 | 8,000 | 9,000 | 3,000 | 1,000 | 7,000 | 341,000  |
| <b>Emissions</b> <sup>(1,2,4)</sup><br><b>millions tonnes CO2</b> | 11.4    | 30.5    | 3.2   | 4.5   | 2     | 0.6   | 6.7   | 58.9     |
| <b>Percentage of total clearing emissions</b>                     | 19.4%   | 51.8%   | 5.4%  | 7.6%  | 3.4%  | 1.0%  | 11.4% | 100.0%   |
| <b>Social Cost, \$millions/year</b>                               | \$1,254 | \$3,355 | \$352 | \$495 | \$220 | \$66  | \$737 | \$6,479  |
| <b>Equivalent millions of cars</b>                                | 2.8     | 7.4     | 0.8   | 1.1   | 0.5   | 0.1   | 1.6   | 14.4     |

Sources: The latest available land clearing figures are used for each state. 1.NSW pollution figure come from Spatial Estimates of Biomass in Mature Native Vegetation, Australian Greenhouse Office and 2.NSW Auditor General Report data. 3. SLATS; Landcover change in Queensland 2003-2004 a Statewide Landcover and Trees Study Report. 4. State and Territory Greenhouse Gas Inventories; 2004, Department of Environment and Heritage, 5.Greenhouse Gas Emissions from Land Use Change in Australia: Results of the National Carbon Accounting System 1988-2003.

NB. These figures ignore the CO<sub>2</sub> emissions from logging.

**Figure 2. Landclearing greenhouse pollution as car equivalents**



The Stern Review estimated the global social cost from global warming through carbon dioxide emissions at \$110 per tonne of carbon dioxide today. At this price landclearing in NSW alone is costing the globe \$1.2 billion every year. Nationally Australian land clearing inflicts global costs of \$ 6.4 billion annually.

Ending land clearing in Australia would make a major impact in reducing greenhouse gas pollution.

## **Logging**

Logging is the removal of mature trees from native forest and woodlands for timber. In the process many other trees and vegetation is usually damaged or killed, especially during 'clearfelling' operations. This releases large amounts of carbon dioxide when it burns or rots or is used for short lived products like paper.

Recent studies estimate that at least 150 tonnes of carbon is released per hectare following intensive logging operations in Australian forests. The research takes into account the carbon taken away as logs and stored in the timber and paper products that are produced. The figures are much higher for logging in wet, old growth forests. For instance, the net loss from converting 'old growth' forest in the Styx Valley, Tasmania to regularly logged re-growth is 1200 tonnes of carbon per hectare.

The young trees that are left after logging operations, or are planted if a forest is converted to a tree plantation, will absorb carbon dioxide as they grow. However, the research found that forests are expected to take more than 50 years to recover only 75% of their full carbon carrying capacity. It would take at least 150 years for a forest's carbon carrying capacity to return to greater than 90% of its pre-logged levels. Old-growth forests store the most carbon.

Most intensive logging of native forests occurs in NSW, Victoria and Tasmania. The current volumes and costs in greenhouse gas pollution are shown in Table 2.

**Table 2. Greenhouse pollution from logging native forests**

| State                                   | South East NSW           | Victoria                 | Tasmania                  | National        |
|---|--------------------------|--------------------------|---------------------------|-----------------|
| <b>Amount of forest logged annually</b> | 9,280 ha <sup>1</sup>    | 8,995 ha <sup>2</sup>    | 34,328 ha <sup>3</sup>    | 52,603 ha       |
| <b>Emissions (tonnes of CO2)</b>        | 5,104,000 <sup>4,5</sup> | 9,506,567 <sup>4,5</sup> | 18,880,400 <sup>4,5</sup> | 33,490,967      |
| <b>Equivalent number of cars</b>        | 1.3 million              | 2.3 million              | 4.6 million               | 8.2 million     |
| <b>Social cost from Stern Review \$</b> | \$561 million            | \$1,045 million          | \$2,076 million           | \$3,682 million |

Sources. <sup>1</sup>This figure is only from forests logged between 2002-2003, on the South coast of NSW only. No other data are currently available. <sup>2</sup> Victorian Government Department of Sustainability and Environment (2006), Monitoring Annual Harvesting Performance : statewide wide summary report (2004-2005). <sup>3</sup> Tasmania Forest Practices Board Annual Report (2006) <sup>4</sup> Roxburgh, S.H., Wood, S.W., Mackey, B.G., Woldendorp, G. and Gibbons, P. (in press), Assessing the carbon sequestration potential of managed forests: a case study from temperate Australia, Journal of Applied Ecology. <sup>5</sup> Dean, C., Mackey, B.G., and Roxburgh, S.H. (2003), Growth Modelling of *Eucalyptus regnans* for carbon accounting at the landscape scale, In: Amaro, A., Reed, D., Soares, P. (eds.), Modelling Forest systems, CABI Publishing, Wallingford, U.K.

## **Other Land management**

Other land management work can make major differences in whether greenhouse gas pollution is emitted or absorbed. There are numerous ways in which cost effective reductions in greenhouse gases can be made. Just two examples are given here:

### ***Reducing fires in savannas***

New research from CSIRO shows that intense wildfires currently cause major emissions of greenhouse pollution annually in the tropical savannas across northern Australia. The fires burn off carbon stored in logs, trees and other plants. If fires are reduced through using fire breaks and small control burns than the savanna vegetation will absorb and store more carbon. There is over one million square kilometres of savanna in northern Australia, much of which is currently burnt severely and in an ecologically inappropriate way.

### ***Revegetation***

There are now large areas in eastern and south-western Australia that have been cleared of the native bushland. In many areas this over clearing has caused salinity and other environmental problems. If re-vegetated with trees these areas would absorb and store greenhouse gas pollution and reduce land degradation problems.

## **Solutions to Climate change**

As part of a basket of solutions to fixing climate change, Federal and State Governments need to include the protection of trees and native bushland. This will provide *guaranteed, cost-effective and immediate* ways to reduce greenhouse gas pollution.

The cost savings for this are potentially massive. Using the Stern Report estimate of costs of a tonne of greenhouse pollution (\$110), stopping large scale land clearing alone would save over \$6 billion. Stopping native forest logging in just two states (Victoria and NSW) would save \$1.5 billion.

To prevent dangerous change we need to reduce greenhouse pollution by 80%. This mammoth task can only be achieved if we apply immediate practical solutions to reduce greenhouse gas pollution. With 20% of global greenhouse emissions coming from land clearing globally it is clear the world cannot avoid dangerous climate change unless forests and woodlands are protected. It is cost effective and provides almost immediate reductions in greenhouse emissions.

The current debate in Australia on solutions has unfortunately focused mostly on environmentally damaging nuclear power and research into methods that *might* stop pollution from fossil fuels. Proposals into clean affordable use of fossil fuels remain unproven. Clean renewable energy provides affordable and proven alternatives for the energy sector. Largely ignored in all of this has been the protection of trees and native vegetation.

The likely reduction of landclearing in Queensland this year will reduce emissions of Australia's greenhouse gas pollution. However, landclearing rates remain high in NSW and Tasmania, and threaten to increase in the Northern Territory. Logging of native forests remains a major cause of greenhouse gas pollution. Other changes to land management such as fire prevention in our northern savannas would also greatly reduce greenhouse gas pollution.

### **Authors of this briefing paper**

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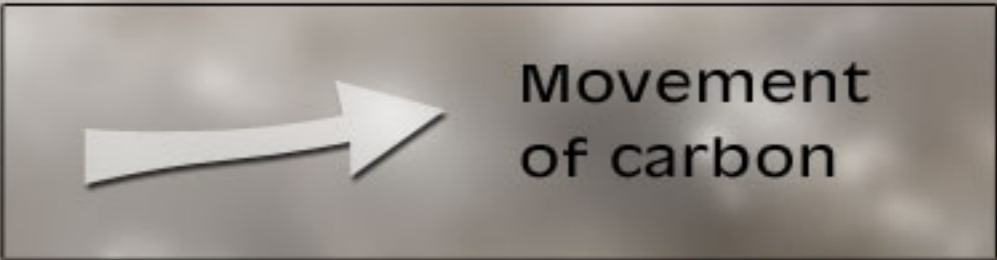
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**The Carbon Cycle.** Vegetation removes carbon from the atmosphere through photosynthesis, reducing the Greenhouse Effect. In old growth and mature ecosystems, huge quantities of carbon are turned into wood or pumped into the soil, creating a massive carbon store. Logging and landclearing releases much of this carbon back into the atmosphere. Protecting forests and woodlands, and revegetating damaged landscapes, will help combat global warming.



**The "carbon blanket" - the Greenhouse Effect**

# The Carbon Cycle

**The "carbon store" - vegetation, soil & oceans**

**Logging & land clearing**

**Oil, gas & coal**

