CLIMATE COUNCIL

LAND CLEARING & CLIMATE CHANGE: RISKS & OPPORTUNITIES IN THE SUNSHINE STATE

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Key Findings

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Land-clearing policy in Queensland has had a significant impact on rates of vegetation clearing.

- Over recent decades changes in land-clearing regulations in Queensland have led first to a decrease in vegetation clearing (when strong laws were enforced) and then to an increase in vegetation clearing (when laws were relaxed).
- Relaxation of land-clearing regulations in 2013 in Queensland led to a significant increase in the vegetation clearing rate. More than one million hectares of woody vegetation, of which 41% was remnant vegetation, were cleared in Queensland between 2012-13 and 2015-16.
- 395,000 hectares of woody vegetation were cleared in 2015-2016, representing a 33% increase over the previous year. This is equivalent to roughly half of the forest cleared in the Brazilian Amazon rainforest in 2016.
- The 2015-16 clearing rate in Queensland was the highest since 2003-04 (490,000 hectares/year).
- Queensland has become Australia's hotspot for land clearing, accounting for between 50-65% of the total loss of native forests in Australia over the last four decades.

2

Vegetation clearing in Queensland has contributed to climate change.

- In 2015 the land use sector in Queensland generated 19 million tonnes of greenhouse gas pollution, which was more pollution than the agriculture sector or around 20% of the pollution from the entire energy sector including electricity, stationary energy and transport.
- In 2015 Queensland was responsible for around 80% of Australia's greenhouse gas pollution from land-use change.

3

A credible land use policy involves avoiding land clearing and protecting vegetation regrowth, as well as replanting vegetation on previously cleared lands.

- A current bill proposing amendments to Queensland's *Vegetation Management Act 1999* (if passed) would lead to a tripling of protected forest areas in Queensland from an estimated 500,000 hectares to an estimated 1.8 million hectares, leading to a reduction in emissions from land clearing.
- A complementary Land Restoration Fund proposes to re-establish vegetation and protect existing vegetation.
- Land carbon should not be used to "offset" emissions from burning fossil fuels because carbon stored in the land sector carries a risk of reversal. Land clearing as well as natural disturbances can trigger the release of significant amounts of land carbon back to the atmosphere.

1. Introduction

In December 2015 political action on climate change took a leap forward with the United Nations Paris Climate Change Agreement being endorsed by 195 countries. Under the agreement world leaders agreed to limit global temperature rise to well below 2°C above pre-industrial levels, and to pursue efforts to limit temperature rise to 1.5°C.

The Paris Climate Change Agreement states that global greenhouse gas pollution levels must reach "net zero" by 2050 - that is, a balance must be achieved between the greenhouse pollution that is emitted into the atmosphere, and the removal of such gases from the atmosphere by permanent storage methods. Australia's ratification of the agreement entered into force in December 2016. This ratification demonstrates tacit support for the goal of reaching net zero emissions by 2050, despite the fact that Australia's emissions reduction target is set at only 26-28% below 2005 levels by 2030, which is grossly inadequate in terms of meeting the Paris 2°C target. Furthermore, Australia has no target beyond 2030.

A major challenge to using land carbon to mitigate climate change is to retain the carbon in vegetation and soils. Unlike unburned fossil fuels that are left underground locked safely away from the atmosphere, storing carbon in land systems carries a risk of reversal – a potential to release sequestered carbon back to the atmosphere. One of the most important drivers of such reversals is a change in land clearing (DCCEE 2010). Natural disturbances such as bushfires, droughts, insect attacks and heatwaves, many of which are being made worse by climate change, can also trigger the release of significant amounts of land carbon back to the atmosphere. For this reason, land carbon should not be used to "offset" emissions from burning fossil fuels (*see Land Carbon: No Substitute for Action on Fossil Fuels* (Climate Council 2016)).

While rapidly and deeply reducing greenhouse gas emissions from the burning of fossil fuels is the most critical action to take, storing more carbon in Australia's land systems is also important as it removes from the atmosphere carbon that was emitted from earlier land-clearing activities. In general, the two most effective approaches for storing carbon on land are:

- Avoided land clearing, particularly the clearing of "mature" vegetation, which can sustain existing carbon stores, prevent greenhouse gas emissions from land clearing, and enable the ongoing sequestration of carbon in vegetation and soil (Keith et al. 2009; Nous Group 2010).
- Protection of vegetation regrowth, for example, the regrowth of native vegetation on land previously cleared of mature native vegetation.

BOX 1: VEGETATION AND THE ACTIVE CARBON CYCLE

1. Vegetation contains large amounts of carbon. When it is cleared, it releases much of that carbon in the form of heat trapping gases, primarily carbon dioxide (CO_2), that warm the atmosphere.
2. On the other hand, regrowing vegetation absorbs CO_2 and stores carbon in the vegetation, removing it from the atmosphere and reducing the rate of warming.
3. When vegetation is cleared, it prevents the future absorption of carbon – therefore reducing the land's ability to contribute to climate solutions.
4. Carbon stored in vegetation and soils is vulnerable to return to the atmosphere via land clearing and natural disturbances. In contrast, carbon from fossil fuels left in the ground is locked securely away from the atmosphere.

2. Flip-flop in Land-clearing Policy in Queensland

Queensland has become Australia's hotspot for land clearing, accounting for between 50-65% of the total loss of native forests in Australia over the last four decades (Evans 2016).

Queensland is also an excellent example of the influence of regulatory changes on vegetation clearing rates, i.e. strengthening legislation leads to less land clearing and therefore a reduction in land use emissions. Figure 1 (below) shows the history of vegetation clearing in Queensland from 1995-96 through 2015-16, as estimated by the Statewide Landcover and Trees Study (SLATs). The amount of land cleared (in 1000 ha) is divided into remnant forest vegetation and regrowth vegetation from earlier clearing. These two categories of cleared vegetation approximate the two approaches to storing carbon on land described earlier.

In Figure 1 clearing rates show variability from year-to-year but clear correlations are shown between land-clearing policy changes and vegetation clearing rates. The *Vegetation Management Act 1999* (hereafter the Act) first came into force towards the end of 2000 with the purpose of regulating clearing of vegetation on freehold land in Queensland. "Panic clearing" prior to the introduction of the Act in early 2000 (and shortly afterwards) led to a temporary spike in land clearing followed by steady declines from 2002 onwards (McGrath 2007).

Strengthening land-clearing policy in Queensland has led to reduced vegetation clearing, whereas relaxing land-clearing policy has led to increased vegetation clearing.

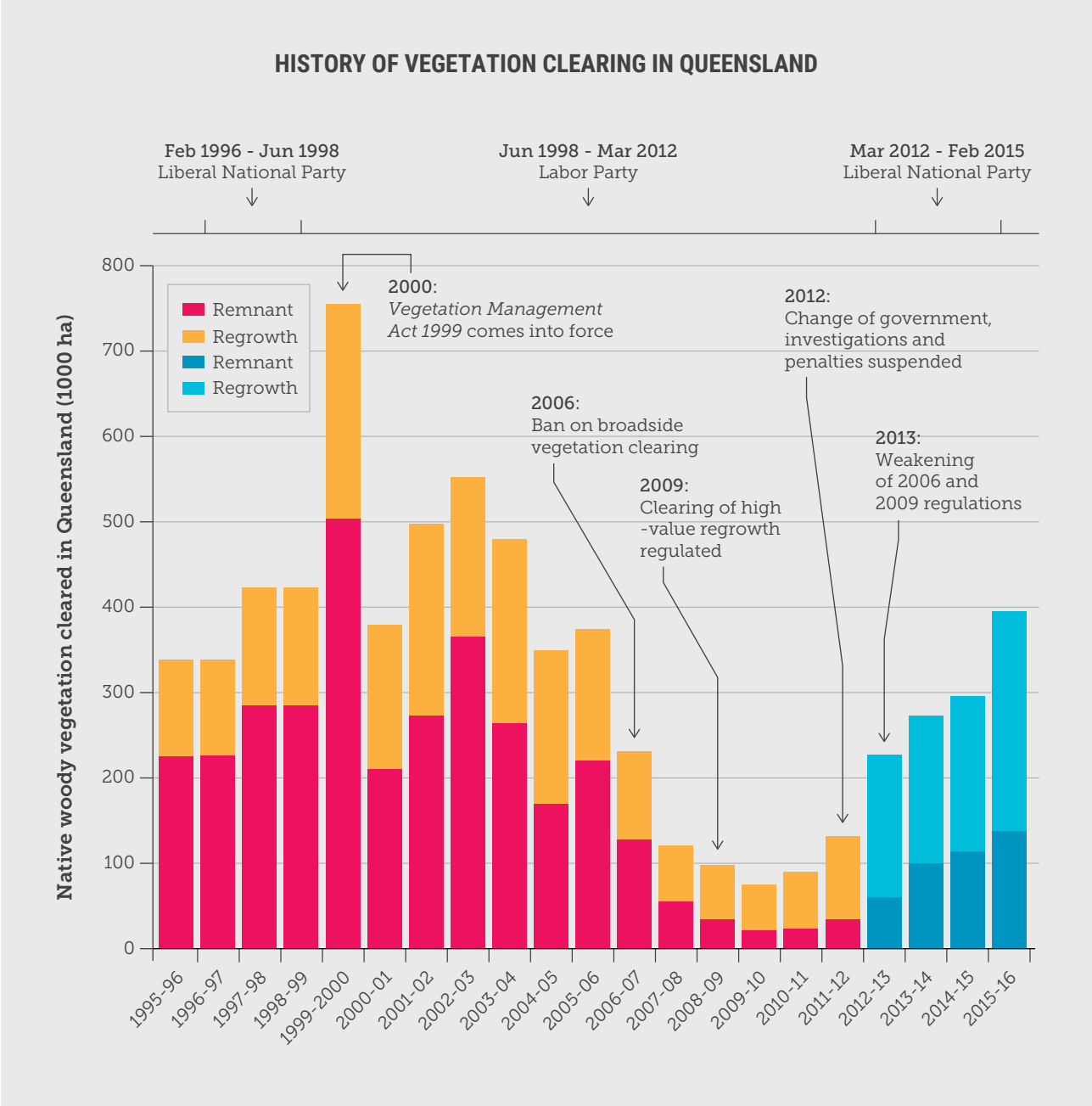

Figure 1: History of vegetation clearing in Queensland showing recently-reported increased clearing rates in blue (figure adapted from Queensland Government 2015; 2016; 2017 and Reside et al. 2017). Remnant vegetation is woody vegetation that has not been previously cleared or has been allowed to regrow to maturity after an earlier clearing. Regrowth is woody vegetation that has been recently cleared and is in the process of regrowing but has not yet reached maturity.

Figure 2: Recent vegetation clearing in Queensland.

In 2004 the Act was extended to leasehold land and extra regulations were introduced to end broad scale clearing of remnant vegetation for agricultural purposes. These changes came into effect in 2006, leading to a temporary increase in clearing prior to their introduction (between 2004 and 2006) due once again to "panic clearing." In 2009 the Act was again strengthened with extra protection afforded to high-value regrowth vegetation. The bans on broad scale clearing in 2006 and regulation of high-value regrowth in 2009 were likely major factors in driving the sharp decline in vegetation clearing from 2006 to the 2009-2011 period.

This progress was, however, reversed in 2013 by the Newman Liberal National Government when the *Vegetation Management Amendment Act 2013* was passed by Parliament, significantly weakening several aspects of the Act and leading to an increase in clearing of both remnant and regrowth vegetation in Queensland. These policy changes led to more than one million hectares of woody vegetation being cleared in Queensland between 2012-13 and 2015-16 (Queensland Government 2015; 2016; 2017a). In 2015-16 alone 395, 000 hectares were cleared, representing a 33% increase over the previous year. This was equivalent to almost half of the hectares of vegetation cleared in the Brazilian Amazon Rainforest in 2016 (INPE 2017). The 2015-16 clearing rate was the highest since 2003-04 (490,000 hectares/year) (Queensland Government 2017a).

Land clearing in Queensland in 2015-16 amounted to the equivalent of almost 50% of vegetation cleared in the Brazilian Amazon Rainforest in 2016.

BOX 2: STRENGTHENING THE BILL TO ACHIEVE BETTER CLIMATE OUTCOMES

Most clearing of vegetation in Queensland happens on lands that will continue to remain exempt from regulation. It is likely that at least some of the vegetation on this land would be classified as remnant vegetation or high value regrowth if a current survey were to be conducted. The most recent classification of remnant vegetation was conducted in the late 1990s so official and current data on this matter is lacking. It is important that these areas are reviewed and that remnant vegetation and high value regrowth in this category are reclassified to enable their full protection as important stores of carbon. Furthermore, the review process should include periodic updates based on changes in vegetation and scientific understanding. Loss of carbon can also be minimised by carefully regulating thinning operations for fodder and other purposes.

The Queensland government has also proposed the establishment of a $530 million Land Restoration Fund to support Queensland-based carbon offset projects. The Land Restoration Fund is complementary but separate to the proposed bill. The Land Restoration Fund aims to facilitate carbon offset projects with biodiversity co-benefits. It is imperative that a policy and fiscal firewall is established between that fund and offsetting fossil fuel emissions. That is, "offsetting" of emissions from burning fossil fuels by the land sector should be disallowed under any circumstances (see *Land Carbon: No Substitute for Action on Fossil Fuels* (Climate Council 2016)).

Reversals in policy and land clearing rates undermine the long-term potential for increased carbon storage and ultimately undermine climate action by generating an uncertain policy environment within which landowners must plan their long-term operations.

In December 2017 the Palaszczuk Labor government was re-elected in Queensland. To deliver on their election promise to ban broad-scale clearing in Queensland, the Labor Government has proposed a bill to Parliament that aims to strengthen land clearing regulations and protect remnant and high value regrowth vegetation. This bill is called the vegetation management and other legislation bill (hereafter the bill). The bill proposes to reverse most of the amendments made by the Newman Government in 2013 that weakened land clearing legislation. If the bill passes into law, it would triple the area of forest with some level of protection in Queensland from an estimated 500,000 hectares to an estimated 1.8 million hectares, and thus lead to a reduction in land clearing emissions (The Guardian 2018). However, a number of loopholes remain that need strengthening for the bill to reach its full potential to contribute to climate solutions.

3. What do Land-clearing Rates of Change Mean for Carbon Uptake or Loss?

From a climate perspective, the key question is what do these changes in rates of land clearing mean for carbon uptake or loss?

The Commonwealth Government's National Greenhouse Gas Inventory (National Inventory, or NI for short) uses internationally agreed definitions and methodologies for carbon accounting to translate changes in land use and cover (including land clearing) into changes in the uptake or loss of carbon. This translation is a complex process and depends on the land clearing history over the time series of clearing, not just the change for a single year. For example, first-time clearing of mature forest emits far more carbon than reclearing of regrowth forest or clearing of shrubland. This means that clearing of regrowth vegetation of low biomass results in negligible carbon emissions. However, this does not mean that clearing low-biomass vegetation is not important for the carbon

The bottom line is that changes in land-clearing policy have important climate change implications.

Around 80% of Australia's land use emissions in 2015 originated in Queensland.

cycle in the long term. On the contrary, clearing of such regrowth has important implications for land carbon because it removes the potential for sequestration of significant amounts of carbon if the regrowth vegetation had been allowed to continue to grow towards maturity.

For vegetation clearing in Queensland since 2012-13, both SLATs and NI estimate that about 40% of the clearing has been of remnant vegetation. The other 60% has been of low-biomass regrowth (sparse, low vegetation containing a small amount of carbon per hectare). In terms of emissions, 19 million tonnes of greenhouse pollution was generated by the land use sector in Queensland in 2015. This is equivalent to more greenhouse pollution than Queensland's agriculture sector or around 20% of the greenhouse pollution from the entire energy sector in Queensland including electricity, stationary energy and transport (AGEIS 2015a). An estimated 80% of Australia's total land use emissions in 2015 were generated in Queensland (AGEIS 2015b).

The fate of regrowth vegetation is an important part of the carbon equation. Queensland's current *Vegetation Management Act* states that vegetation that has been regrowing since 1989 (i.e. for almost 30 years) should be classed as "high value" and afforded some level of protection. The bill proposes to reduce this timeframe so that vegetation that has been regrowing for 15 years is classified as "high value". Whilst this would be an improvement on the current situation, the best approach from a climate change perspective is to protect both remnant vegetation and regrowth vegetation, regardless of the age of the regrowth.

The bottom line is that changes in land-clearing policy influence rates of loss or gain of vegetation, with important consequences for the climate through the uptake or loss of carbon. The proposed amendments to Queensland's land-clearing legislation would lead to a tripling of the amount of vegetation protected by regulation, with a subsequent decline in associated emissions. Nevertheless, there are further opportunities to strengthen the bill and improve its transparency, accountability and enforceability to ensure that carbon emissions from land clearing in Queensland are reduced even further.

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