

TOWARDS **ZERO** DEFORESTATION

A plan to:

- End deforestation and land clearing**
- Save our iconic native animals like the koala**
- Invest in ecological restoration of our forests and bushlands**
- Create a new income stream for landholders**
- Significantly reduce our carbon pollution footprint**



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Contact: info@wilderness.org.au | 1800 030 641 | www.wilderness.org.au

FRONT COVER IMAGE: Cape York Peninsula, Kerry Trapnell.

The Wilderness Society recognises Australia's Aboriginal and Torres Strait Islander communities as the Traditional Owners and custodians of all Country in Australia and pays its respect to Elders past and present. We acknowledge that this land was never ceded. We support efforts to progress recognition of the distinct rights of Indigenous peoples as well as reconciliation, land justice and equality. We welcome actions that better seek to identify, present, protect and conserve Aboriginal cultural heritage, irrespective of where it is located.

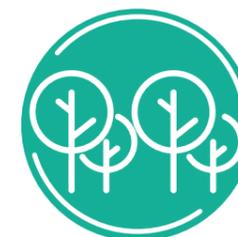
Threat and opportunity—this is what defines the future of Australia's forests and bushlands, our native wildlife and our response to accelerating climate change.

On the one hand, we are in the midst of an escalating deforestation and land clearing crisis, with an MCG-sized area of forests and bushlands destroyed every three minutes. This is killing tens of millions of native animals each year—including the iconic koala—while harming the land, polluting rivers and damaging the Great Barrier Reef. After declining over the last decade, carbon pollution from deforestation and land clearing is once again skyrocketing—now equalling a third of emissions from all of the coal-fired power stations in Australia. When native forest logging emissions are included, this is equal to at least half the carbon pollution of all coal-fired power stations.

But on the other hand, we are on the cusp of an exciting opportunity to transform and restore degraded landscapes, while creating new revenue streams for landholders—driven by action on climate change. The science is clear. In order to reach the goals set out under the Paris Climate Agreement, we have to stop polluting the atmosphere with greenhouse gases

and draw down as much carbon as possible out of the atmosphere by regrowing and restoring forests and bushlands. Australia is one of the best-placed nations worldwide to succeed in such a large-scale ecological restoration agenda. If done right and in tandem with strong protections for our remaining intact forests and bushlands, this will protect and build on our natural carbon stocks as well as create an entirely new industry and income stream for landholders. It will ensure greater investment is flowing from the cities to the bush.

Below are the three key things Australia needs to do to end the destruction of our forests and bushlands, save our wildlife, support the emerging ecological restoration industry and landholders, and significantly reduce our carbon pollution footprint. This report expands on each of these, providing the case for strong and urgent action.



Permanently protect our forests and bushlands

- Permanently protect all old growth, remnant and high conservation value forests and bushlands through enhanced regulations and an improved protected area network. Regulations should apply equally across all sectors—mining, urban, logging and agriculture.
- Disallow the burning of native forests as a form of renewable energy.



Transform deforested and degraded landscapes

- Establish a National Nature and Climate Fund and provide tax incentives to enable large-scale ecological restoration, ensuring minimum biodiversity standards and supporting communities to take advantage of this economic opportunity.
- Ensure there is no direct offsetting of fossil fuel emissions with land carbon credits either domestically or internationally.



Provide world-leading transparency

- Implement a national deforestation and ecological restoration monitoring program—with regular, detailed data made available to the public.
- Reform greenhouse gas emissions accounting and reporting to fully disaggregate all land sector data and separate land sector emission reduction targets from non-land sector targets.

Key facts and figures

Only 50% of forests and bushlands remain intact in Australia



Eastern Australia is a global deforestation front — alongside places like the Amazon, the Congo and Borneo

Every 3 minutes an area of forest and bushland the size of the MCG is bulldozed

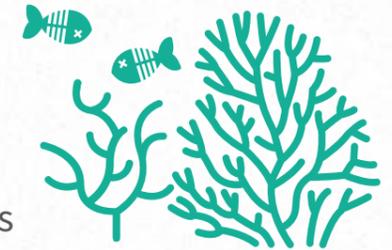


1 million hectares of forests and bushlands were destroyed in Queensland alone in the past three years

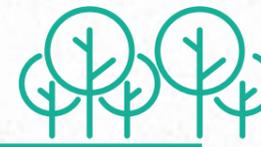


Every second an animal is killed in Queensland as a result of deforestation and land clearing

480,000 hectares of clearing occurred in Great Barrier Reef river catchments in Queensland since the Newman LNP Government weakened deforestation laws



1/2 of all Australian coal power pollution = the annual emissions from deforestation when including native forest logging (1/3 when native forest logging is excluded)



20-35 million hectares is the technical area across Australia that could be restored with biodiverse plantings, driven by a good carbon price

6-8 gigatonnes of carbon drawdown possible to 2050 with biodiverse plantings



Just 0.04% of Federal Government expenditure will go to biodiversity and carbon drawdown projects in 2020-21, unless more funding is made available



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Permanently protect our forests and bushlands



VALUES OF AUSTRALIA'S FORESTS AND BUSHLANDS

Australians love the great outdoors—it defines our way of life and national identity. A fundamental aspect of this is our forests and bushlands. From towering eucalyptus forests, to verdant rainforests, to hardy bushlands and dense mangrove communities on our coastlines, they are a major source of recreation, well-being, cultural meaning and pride. Forests and bushlands provide homes and food for our native wildlife, and the plants that make them up are unique and varied.

Our forests and bushlands are also simply essential to our survival—purifying the air we breathe and the water we drink. They maintain the health of our soils and waterways; are a major source of food and medicine; act as a buffer in natural disasters like floods and cyclones, absorbing and lessening impacts to our farms, towns, cities and infrastructure; regulate local climate including rainfall; protect the marine environment, including the Great Barrier Reef from excess sediment and nutrient loads; and store vast amounts of carbon—providing a brake on runaway climate change.

Australia's forests and bushlands have uniquely evolved due to a range of factors, including: the continent's geology and ancient soils, conditions associated with continental drift over hundreds of millions of years (including a long period of isolation from other global landmasses), global and local shifts in climate tending towards increasing dryness, and interaction with co-evolving wildlife. Indigenous peoples have managed Australia's forests and bushlands for tens of thousands of years, which has further shaped the distinct complexion of our flora and fauna.

Eucalyptus, acacias, melaleucas, casuarinas, callitris, mangroves, and a suite of rainforest, grassland and chenopod species now make up our unique collection of dominant vegetation. Many of the plants within these forests and bushlands are uniquely Australian and are found nowhere else on Earth.¹ Likewise, much of the wildlife that depend on and are part of these ecosystems are known only to Australia. They are central to our national identity, including the koala, kangaroo, quoll, wombat, numbat, lyrebird and emu to name a few.

All Australians share the responsibility to protect our forests and bushlands for future generations and for the ongoing survival of our native plants and wildlife.

AUSTRALIA'S RECORD OF FOREST AND BUSHLAND DESTRUCTION

For tens of thousands of years, Indigenous peoples have managed Australian forests and bushlands, including with fire-stick farming.² While this has indisputably shaped the complexion of our forests and bushlands—including maintaining open vegetation where trees may otherwise grow—the real destructive and disruptive changes to Australia's environment came with European arrival.³ Firstly, Indigenous burning practices were abruptly stopped in many places, which changed the structure of many forest and bushland ecosystems. Meanwhile, rapid deforestation and land clearing quickly followed the establishment of early colonisation, as forests and bushlands were wiped out for timber and agricultural land for new towns and cities.⁴

Waves of mass deforestation for cropping and livestock grazing occurred first in Victoria, South Australia and New South Wales in the late 1800s and early 1900s.⁵ This was followed by Western Australia which experienced its highest levels of clearing in the mid-1900s, and then Queensland where most of the clearing has occurred over the last 50 years with the advent of the highly destructive method of running a huge chain between two bulldozers to tear down trees en masse.⁶ Throughout these years, tenure requirements meant that landholders risked eviction if they did not clear, which meant removing native trees permanently from the ground. This continued in Queensland right up until the 1980s.⁷ There were also low-cost finance and tax concessions to further incentivise deforestation and land clearing,⁸ while many financial institutions (including government-

owned) even made access to farm finance conditional on clearing.⁹

Logging also accelerated from the mid-1900s, as the industry became increasingly mechanised and industrial in scale. Urban and mining expansion also have added to the clearing tally in recent decades as our industrial footprint has grown.

As a result of this, now just 50% of Australia's forests and bushlands remain intact compared with pre-European arrival.¹⁰ The other 50% has been either permanently destroyed and replaced with another land use or is classed as degraded forests and bushlands—most of which is previously cleared but regrowing vegetation of different ages.¹¹

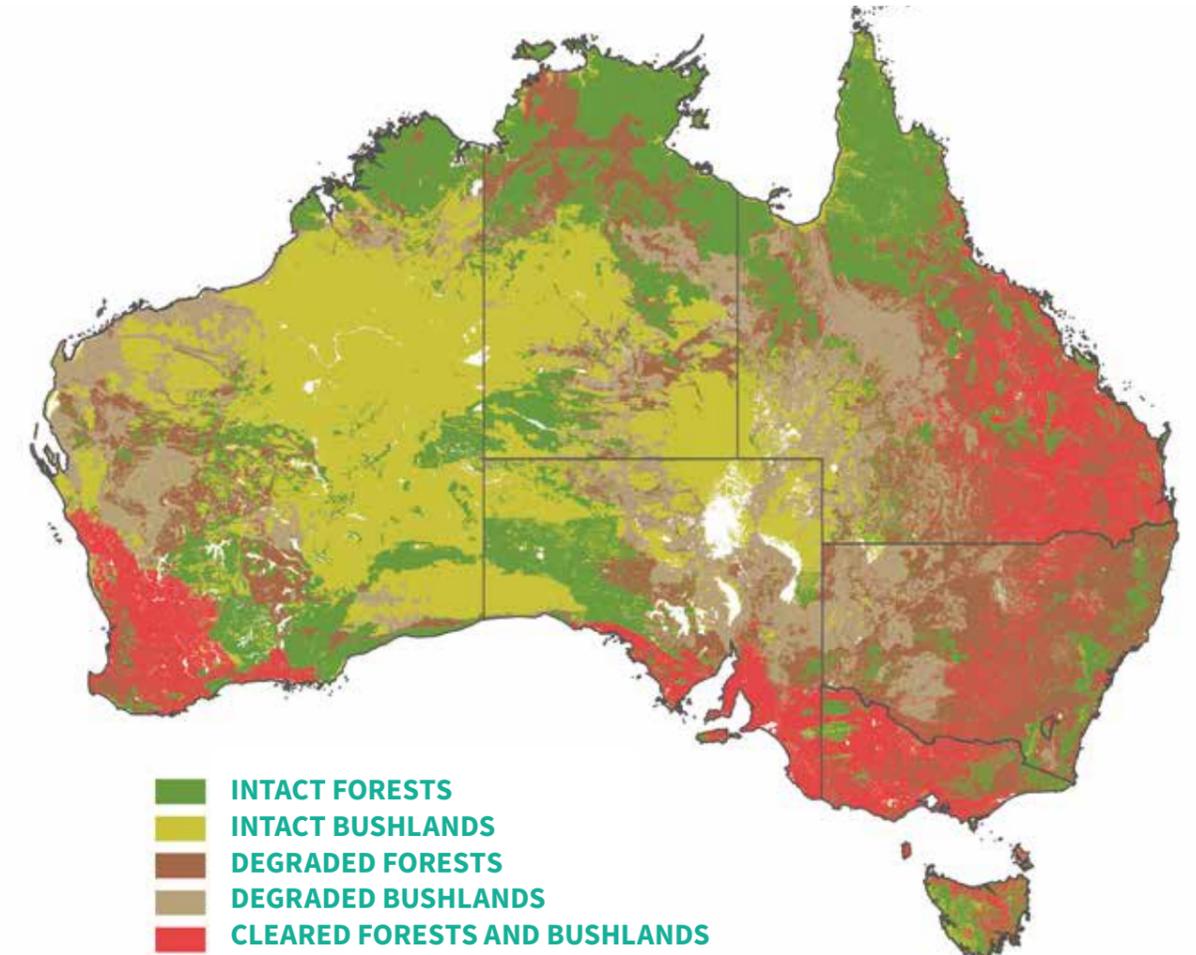
In addition, much of the remaining intact forests and bushlands are broken up into small, isolated and degraded patches, preventing the movement of plants and wildlife and exposing these areas to threats. They face increasing pressures from the incursion of invasive species, poor fire management, overgrazing of cattle and sheep, infrastructure development and a rapidly changing climate.¹³

Largely as a result of this rapid deforestation and land clearing of forests and bushlands, many Australian species have been completely wiped out and are now extinct. This includes 27 mammal species (Australia has the worst rate of mammal extinction in the world), 22 bird species and 36 plant species.¹⁴ Tragically, this trend continues—in a survey of leading scientists by the Ecological Society of Australia, deforestation and land use change was ranked as the highest existing threat to biodiversity in Australia¹⁵ (with climate change ranked as the highest future threat).

Just 50% of Australia's forests and bushlands remain intact compared with pre-European contact. The other 50% has been either permanently destroyed and replaced with another land use or is classed as degraded forests and bushlands

 **Figure 1**

The state of our forests and bushlands in 2008



Largely as a result of this rapid deforestation and land clearing of forests and bushlands, many Australian species have been completely wiped out and are now extinct.

Olive Vale Station, Cape York Peninsula, The Wilderness Society collection

This map shows the conditions of Australia's forests and bushlands compared with pre-European arrival (1750 is the date used in this dataset). It is an adaptation of data from Australia's Vegetation Assets, States and Transitions (VAST) version 2¹⁶, and Australia's Native Vegetation Information System (NVIS). Here the term 'Forests' incorporates all ecosystems referred to as forest, woodland, or mangrove; while the term 'bushlands' incorporates all other vegetation communities. Note that most of the forests classed in New South Wales as degraded are actually extensively cleared areas—this is a flaw in the VAST dataset.

‘forests and bushlands’

‘deforestation and land clearing’

Deforestation in South-East Queensland,
The Wilderness Society Collection



Box 1

‘Forests and bushlands’ and ‘deforestation and land clearing’—our use of terms explained, and the inclusion of native forest logging

An array of terms is commonly used to describe Australia’s vegetation communities, wildlife habitat, and the major processes that destroy them. Indigenous peoples have their own range of terms to describe Country and vegetation, while English-speaking Australians most commonly use a combination of forest, bush and scrub. Scientists have a wider and more specific vocabulary, categorising vegetation by the height and density of the trees or bushes and the major plant species that make up an ecosystem.

In this report we use the phrase ‘forests and bushlands’ to cover all vegetation communities. This incorporates the malleable Australian term ‘bush’, that speaks to our unique diversity of vegetation better than any other term. It captures values beyond just native forests, but also our native grasslands and shrublands—the type of hardy vegetation associated with the outback. When these terms are used separately in this report, forests refer to the technical Australian definition where there is a 20% vegetation canopy cover, and trees with the potential of growing to two metres. Bushlands used separately refers to all other vegetation.

‘Deforestation’ is an internationally recognised term for the destruction, logging and loss of forest (which technically excludes non-forests—sparser and more stunted vegetation communities).¹⁸ But of course deforestation doesn’t capture fully the Australian context, where bushland—including sparse woodlands, shrublands or grasslands (i.e. non-forest)—is also subject to destruction.

This is where the distinctive Australian term ‘land clearing’ comes in. It refers to the bulldozing of vegetation to make way

for agricultural, plantation, mining or urban development. This commonly involves attaching a large, heavy chain between two bulldozers and dragging it across the land, which is often followed by burning, wiping out everything in its path—a practice pioneered personally by former Queensland Premier Joh Bjelke-Petersen.

Deforestation and land clearing is therefore the matching phrase to describe the destruction of forests and bushlands. There is a technical overlap of the words in both phrases but together we believe they cover the full gamut of vegetation communities and forms of destruction.

It must be noted that our use of deforestation encompasses native forest logging, even though in Australia’s National Greenhouse Accounts ‘forest management’ is separated from deforestation in the statistics. This is because native forest logging is an important part of the national picture of forest destruction. We include it wherever necessary to lay out the national story, facts and figures. We also include national policy asks that cover native forest logging.¹⁹ However, much of the focus of this report centres on what is typically referred to as land clearing. This is because there is a serious lack of awareness about the very recent return of high land clearing rates and the depth of regulatory, monitoring and accounting problems associated with it.

It is also important to note that our definition of deforestation is a more expansive one than the technical term used for the Kyoto Protocol in the National Greenhouse Accounts. The Kyoto Protocol definition of deforestation refers to permanent conversion of forest to another land use, whereas for the purposes of this report we are describing the loss of native forest.

AUSTRALIA'S FAILURE TO REIN IN FOREST AND BUSHLAND DESTRUCTION

From the early 1990s, Australia's Federal Government and state governments began to more systematically introduce and tighten protections for our remaining forests and bushlands. This includes through protected areas in small pockets and at the larger scale via land clearing laws that applied across most land tenures. By the mid 2000s, this led to a striking drop in deforestation and land clearing rates. However in the last few years, land clearing controls in key states have been wound back or seriously compromised, and there remains gaps in protections elsewhere. As a result, land clearing rates have started to rise across the country.

In Queensland, the former Newman Government weakened Queensland's land clearing laws and compliance efforts in 2012, while in New South Wales

and Tasmania, the current governments have followed suit in 2017. Poor land clearing regulations remain in Western Australia and the Northern Territory. Meanwhile, despite much progress being made on the protection of native forests from logging, some remaining areas of high conservation value forests are still unprotected and subject to logging—particularly in Victoria, New South Wales, Tasmania and Western Australia.

As a result, deforestation and land clearing rates have surged—dominated by destruction in Queensland, which has jumped from 78,378 hectares in financial year 2009–2010 to 395,000 hectares in 2015–2016.²⁰ An MCG-sized area of forests and bushlands is now being cleared every three minutes, and Australia is now the only developed country with a deforestation front—one of eleven global deforestation hotspots next to the Amazon, the Congo and Borneo.²¹ The three worst states for deforestation by size in Australia are Queensland, New South Wales and Western Australia.

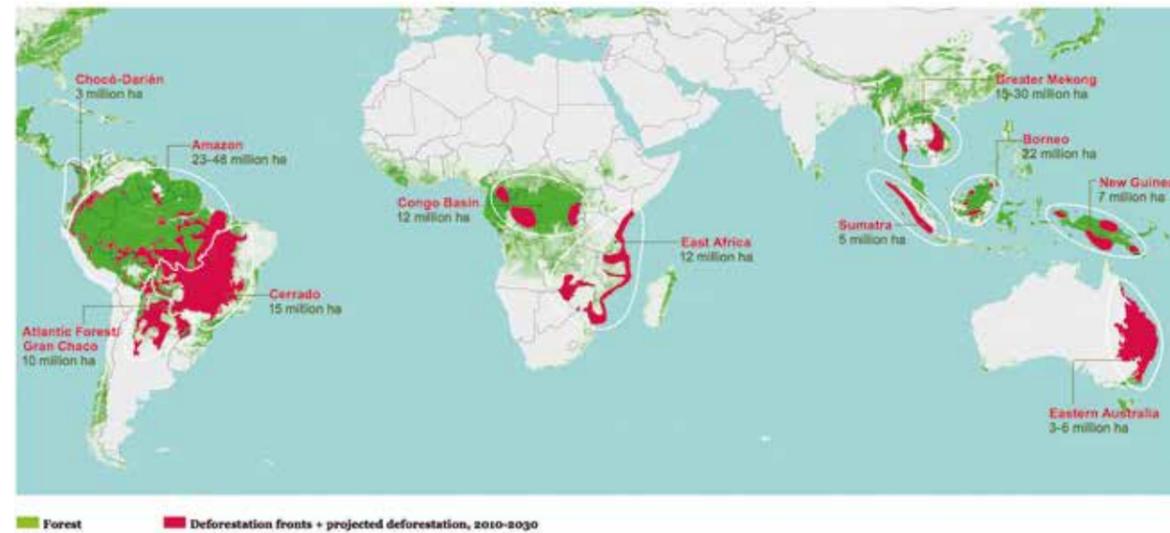
While in Australia the data is patchy state-by-state, it is clear that the biggest driver of the destruction of forests and bushlands at a national scale is livestock grazing by a large margin (of which beef production makes up the largest share). For example in Queensland—where the data is most complete—91% of vegetation loss in 2014–2015 was for livestock grazing,²³ with about 500 landholders responsible for about 75% of all clearing.²⁴ Other key drivers include cropping, logging, urban expansion and mining—and in some states these account for more deforestation and land clearing than livestock grazing.

Deforestation and land clearing kills tens of millions of native mammals, birds and reptiles every year,²⁵

and also impacts on amphibians and fish. Half of all the native species listed as threatened under the Federal Government's *Environmental Protection and Biodiversity Conservation Act 1999 (the EPBC Act)* are at risk from habitat loss caused by deforestation and land clearing.²⁶ A total of 74 ecological communities are on the Federal threatened list—with virtually all of these coinciding with areas of high current or historic deforestation and land clearing.²⁷ The trend is more species heading towards the endangered or critically endangered category, which means they are near the verge of extinction.²⁸ Forest and bushland destruction is pushing our native animals and plants to the brink.

 Figure 2

Global deforestation fronts, from WWF-International²²



This map shows the world's 11 major deforestation fronts. Based on deforestation modelling, literature review and interviews with experts around the world, it shows the places where the bulk of the world's deforestation is projected to take place from 2010–2030 under

business-as-usual scenarios. Note that this research was conducted in 2015—already the projected area for Eastern Australia would be higher as deforestation rates have increased during that time.

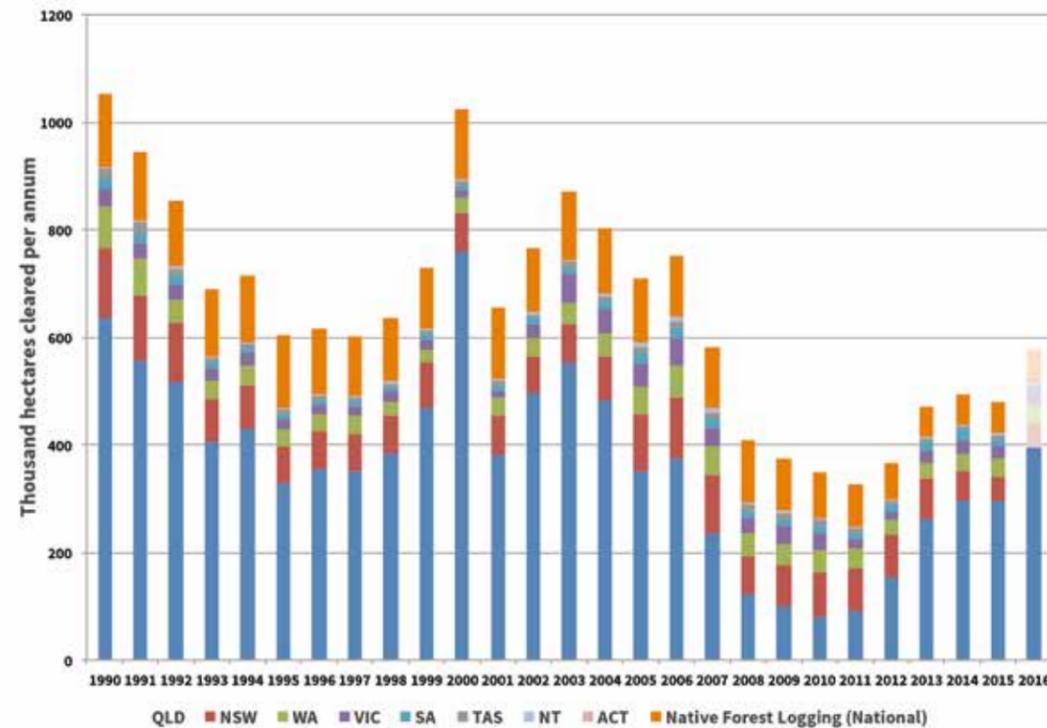


Deforestation and burning from bauxite mining, Cape York Peninsula | Glenn Walker

Australia is now the only developed country with a deforestation front—one of eleven global deforestation hot spots next to the Amazon, the Congo and Borneo.

Figure 3

Deforestation and land clearing from 1990–2016, with caveats



There is no complete and reliable dataset on deforestation and land clearing in Australia. The best dataset is Queensland’s Statewide Landcover and Trees Study (Queensland SLATS) which itself is most precise from 2000 onwards. This chart has been compiled using the Queensland SLATS data from 2000–2016, with the data for other states and Queensland from 1990–1999 sourced from the National Greenhouse Accounts. The significant problem with the latter is that it only accounts for land clearing in forest areas with a greater crown cover of more than 20% and reaching two metres in height. Land clearing under this threshold in the National Greenhouse Accounts is counted but not separated out as a hectare figure from other natural losses of vegetation. So, what is shown here for all states outside of Queensland is certainly an under-representation of the true picture of all bushland destruction, potentially in the order of a hundred thousand hectares per year.²⁹

Native Forest Logging is shown as a national figure only, as a state-by-state breakdown is not

publicly available and this data is separated in the National Greenhouse Accounts from other forms of deforestation and land clearing.³⁰ There is a gap between the vegetation loss data from Queensland SLATS and the National Greenhouse Accounts deforestation figures from Queensland (see Figure 9, p.56).

For 2016, only Queensland SLATS data is available—data for other states is not yet available so is shown here as light shades and replicates the figures for 2015.

It is most important to note the trend, with clearing rates dropping from the mid-2000s—primarily, as a result of tighter land clearing laws in New South Wales and Queensland—and the recent resurgence on the back of higher land clearing rates returning in Queensland. The figures include regrowing forest of varying ages that has been cleared again. The incomplete data issue is explored in more detail in Part III of this report.

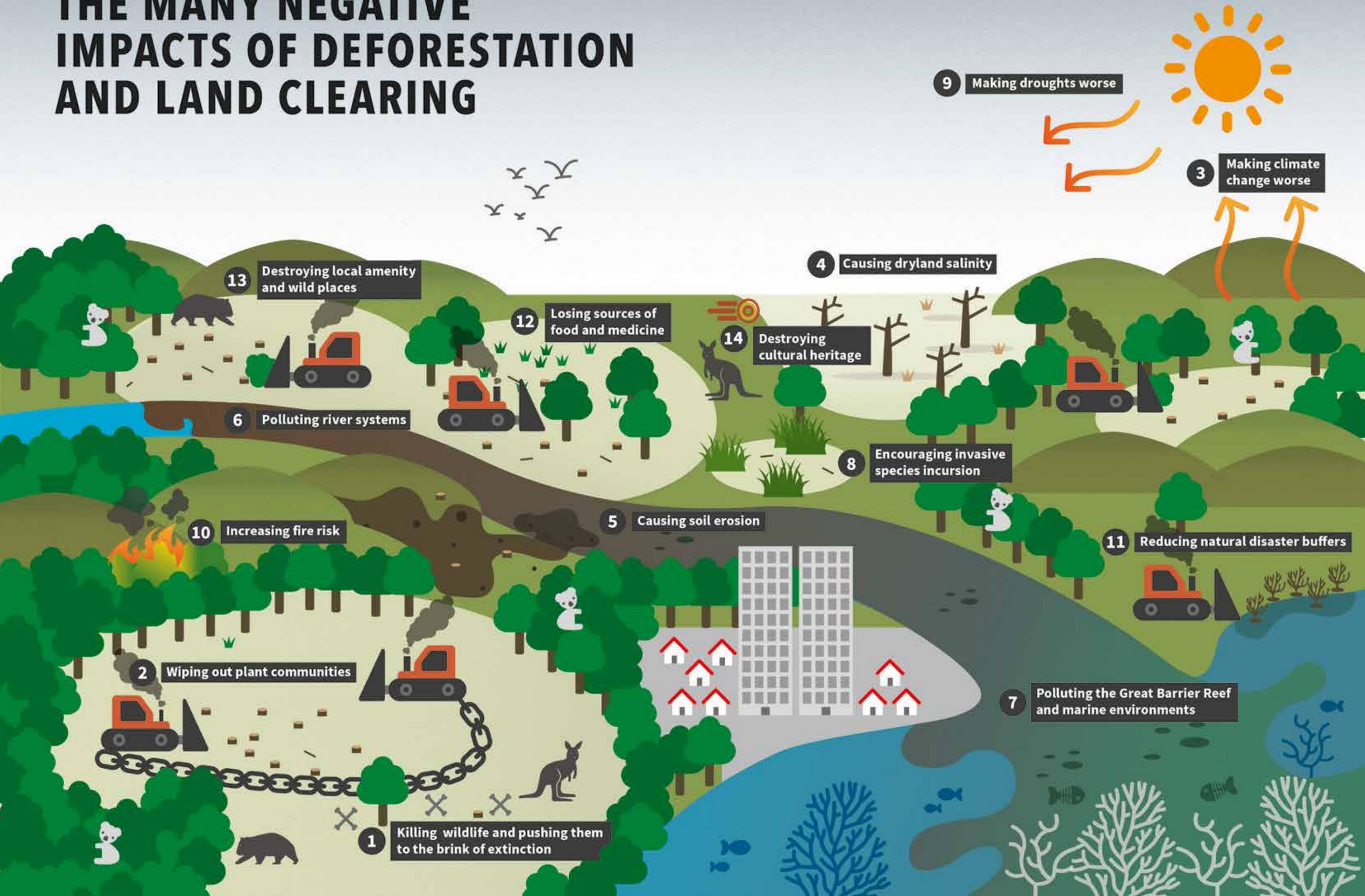
Table 1

Data for deforestation and land clearing from 1990–2016 in thousands of hectares

	QLD	NSW	WA	VIC	SA	TAS	NT	ACT	NFL	Total
1990	637	129	78	32	21	16	4	0	134	1051
1991	556	122	68	30	17	21	4	1	126	944
1992	516	111	43	29	15	13	6	1	120	853
1993	407	78	35	23	10	10	3	0	124	690
1994	429	81	37	23	9	9	3	0	124	714
1995	331	67	33	20	8	9	2	0	137	606
1996	356	69	32	19	8	7	3	0	123	617
1997	351	70	32	19	8	8	4	0	111	603
1998	385	69	27	18	8	7	3	0	118	636
1999	468	85	25	19	10	7	3	0	111	728
2000	758	74	27	16	9	6	3	0	130	1023
2001	380	75	33	13	11	6	3	0	134	656
2002	498	68	33	26	11	6	3	0	121	767
2003	554	70	39	55	12	10	3	1	126	870
2004	482	83	42	45	15	10	3	1	123	804
2005	351	107	52	41	20	12	7	1	120	710
2006	375	114	58	51	21	11	8	1	112	751
2007	235	108	53	36	17	11	7	0	115	582
2008	123	72	42	27	11	14	5	0	115	409
2009	100	76	41	33	12	11	4	0	97	375
2010	79	84	43	30	13	12	4	0	84	349
2011	92	79	37	16	13	9	3	0	77	326
2012	154	80	29	14	13	6	3	0	67	365
2013	261	76	30	22	17	6	3	0	57	472
2014	296	57	29	26	19	7	3	0	57	495
2015	296	45	34	21	14	7	5	0	57	479
2016	396	45	34	21	14	7	5	0	57	579

This is the data table that makes up Figure 3, with the same sources and caveats applying. NFL = Native Forest Logging.

THE MANY NEGATIVE IMPACTS OF DEFORESTATION AND LAND CLEARING





Box 2

The many negative impacts of deforestation and land clearing

- 1 Killing wildlife and pushing them to the brink of extinction**
Deforestation and land clearing kills tens of millions of animals every year and is sending wildlife towards extinction. For example in Queensland and New South Wales, about 50 million mammals, birds and reptiles are killed each year.³¹ Amphibians and fish are also impacted as rivers and wetlands are polluted and damaged.
- 2 Wiping out plant communities**
A total of 74 ecological communities in Australia are threatened by deforestation and land clearing.³² Virtually all of these threatened communities coincide with areas of high, current or historic deforestation and land clearing.³³
- 3 Making climate change worse**
Deforestation and land clearing has a double impact on climate change—the trees can no longer draw down carbon pollution out of the atmosphere. In addition they release carbon and other greenhouse gases into the atmosphere as they are burnt or left to rot. The greenhouse gas emissions from deforestation and land clearing (including native forest logging) in Australia are equal to about half of all of the coal-fired power stations emissions in Australia.³⁴
- 4 Causing dryland salinity**
In many places, as forests and bushlands are destroyed, water that was once soaked up by tree roots penetrates deeper down than usual into the bedrock. There it accumulates, raising the underlying water table. Carrying vast amounts of salt as it reaches the surface, the water leaves large salt scars on the land—making it impossible for most vegetation to grow. Millions of hectares of land and tens of thousands of farms in Australia are affected by salinity, with predictions of 17 million hectares affected by 2050.³⁵
- 5 Causing soil erosion**
When vegetation is bulldozed and destroyed the underlying soil is exposed to erosion from wind and water. This process removes the topsoil and in many places creates large rills and gullies where the land is washed away by rainfall and surface water flows.³⁶ This affects soil fertility, agricultural productivity and the ability to restore native vegetation.
- 6 Polluting river systems**
The soil erosion and salinity caused by deforestation and land clearing significantly affects the water quality, temperature, sediment and nutrient loads of river systems.³⁷ This not only pollutes our rivers, wetlands and lakes, but it changes their physical characteristics and the habitat they provide, threatening the species that depend on clean water, as well as our own water sources. Reduced tree canopy cover on stream banks further exacerbates this problem.³⁸
- 7 Polluting the Great Barrier Reef and marine environments**
There is a clear connection between deforestation and land clearing and poor water quality flowing into marine environments such as the Great Barrier Reef—as a result of higher sediment, pesticide and nutrient loads.³⁹ As soil is exposed from clearing, it erodes and runs off into waterways, increasing sediment and nutrient loads. Farming practices that often follow clearing include the use of pesticides, which also leach out into river systems as they are used. In the Reef, this leads to the⁴⁰ of coral, more algae and disease, and crown-of-thorns invasions.⁴¹ It is one of the biggest threats to this global natural wonder next to climate change, coastal development and illegal fishing.⁴² From mid 2012 to mid 2016 480,000 hectares of forests and bushlands were cleared in Reef catchments alone.⁴³
- 8 Encouraging invasive species incursion**
Clearing native vegetation facilitates the invasion of weed plant species,⁴⁴ in many cases deliberately planted by landholders (such as Buffel Grass). The fragmentation of habitat also allows for easier access to native wildlife by invasive predators such as cats and foxes.⁴⁵
- 9 Making droughts worse**
Trees and vegetation hold water, which transpires into the atmosphere with heat, helping to create localised rain clouds and rainfall. Removing these can therefore reduce the moisture available for rain, as well as reduce the reflection of heat back into the atmosphere (plants are often better reflectors than bare earth). For example, researchers have found that in South-East Queensland the clearing of trees and vegetation has made drought situations more pronounced by reducing rainfall and increasing heat.⁴⁶
- 10 Increasing fire risk**
Disturbance associated with logging and clearing native forests increases localised drying, changes forest structure and introduces new points of physical access for people, increasing the risk of arson or other human ignition.⁴⁷ Combined with heightened fire conditions due to climate change, logging in particular increases the frequency and severity of destructive wildfire and its associated impacts on wildlife and communities.
- 11 Reducing natural disaster buffers**
Forests act as a buffer to natural disasters—for instance in a cyclone or storm surge, mangrove communities slow the flow of water and reduce surface waves.⁴⁸ This capacity is reduced by deforestation and land clearing. Likewise at a river catchment level, less vegetation means more and quicker runoff during flood events—increasing the severity of the flood.⁴⁹
- 12 Losing sources of food and medicine**
Australia's native plants found in forests and bushlands are a rich source of traditional Indigenous medicine and food and also modern medical research. Deforestation and land clearing continue to deplete these resources and opportunities for medical discovery.
- 13 Destroying local amenity and wild places**
Australians value forests and bushlands as a place to spend time with family and friends and to simply be amongst nature. With industrial impacts scarring much the continent already, further destruction of our remaining forests and bushlands depletes this important social resource.
- 14 Destroying cultural heritage**
For Indigenous peoples, the personal and community connection to forests and bushlands remains embedded in culture. This includes viewing heritage at the landscape level, meaning loss of heritage to deforestation and land clearing is not always constrained to damage to specific, known and recorded sites of significance.

Box 3

What happens to wildlife when the bulldozers roll in?

When the bulldozers flatten forests and bushlands, many mammals, birds and reptiles are instantly crushed to death by the machinery itself. Most survivors die a horrible death soon after from severe injury, starvation or predation—having lost their homes and food sources.⁵⁰ Some are hit by vehicles, attacked by other animals or are tangled in fences.⁵¹ Others may flee to other intact habitat, however these are typically already occupied by similar species who defend their patch or compete for food and shelter with the newcomers, leading to more deaths.⁵²

Ongoing habitat fragmentation and degradation leaves more wildlife still at risk of death, population decline and even extinction, as the small remaining patches are vulnerable to additional external pressures such as fire and invasive species.⁵³ The smaller patches also lead to increased predation and reduced breeding success.⁵⁴

It is estimated that each year in Queensland and New South Wales alone, about 50 million mammals, birds and reptiles are killed as a result of deforestation and land clearing.⁵⁵

According to another analysis, following the first two years after the Newman Government’s weakening of land clearing laws in Queensland, an estimated 68 million animals were killed as a result: 1.8 million mammals, 5.2 million birds and 61.2 million reptiles.⁵⁶ This means that in Queensland an animal is killed every second from deforestation and land clearing, giving clear reason for labelled the issue the single greatest animal welfare crisis facing Queensland.⁵⁷

One of the animals worst hit by deforestation and land clearing is the iconic koala, whose populations are rapidly dropping in key areas. About 84,000 hectares of critical koala habitat was destroyed between 2013 and 2015 in Queensland and New South Wales,⁵⁸ with an estimated 180 koalas killed in South-East Queensland alone during this time.⁵⁹ As a result of recent changes to the New South Wales land clearing laws, over two million hectares of koala habitat are now under threat from clearing.⁶⁰ Across Queensland there has been a 43% decline in koala populations over 20 years (1990-2010).⁶¹



Leadbeater's Possum | Vitoria Parks



Black Throated Finch | Eric Vanderduys



Numbat | S J Bennett

Wildlife threatened by deforestation and land clearing



Dead Koala, Queensland, WWF-Australia

Box 4

Why is deforestation and land clearing such a threat to the Great Barrier Reef?

Deforestation and land clearing significantly affect the health and water quality of river systems which flow into the Great Barrier Reef.⁶² As soil is exposed from clearing, it erodes and runs off into waterways, increasing sediment and nutrient loads. Farming practices that often follow clearing include the use of pesticides, which also leach out into river systems as they are used. This leads to smothering of coral, more algae and disease, and crown-of-thorns invasions.⁶³

The United Nations Educational, Scientific and Cultural Organisation (UNESCO), which monitors the management of World Heritage Areas, recently highlighted its concerns about

water quality in the Great Barrier Reef. The expert advisory body to UNESCO this year singled out stronger land clearing laws in Queensland as a key measure required to improve Reef health.⁶⁴

Between mid-2012 and mid-2016 (data is not available beyond this date), 480,037 hectares of forests and bushlands have been cleared in Reef catchments.⁶⁵ A further 150,930 hectares have been notified for clearing under self-assessable codes on 240 properties in Reef catchments in just seven months from August 2016 to February 2017.⁶⁶ These deforestation and land clearing rates are clearly out of control and run directly counter to efforts to improve the health of the Reef.



The Great Barrier Reef, The Wilderness Society Collection.



The destruction of forests and bushlands is bad for the climate on many fronts.

THE LINK BETWEEN CLIMATE AND DEFORESTATION AND LAND CLEARING

Forests and bushlands play a vital role in stabilising the world's climate by drawing down and storing large amounts of carbon out of the atmosphere that would otherwise contribute to climate change. On the global scale, there is an estimated 1,474 gigatonnes of carbon stored in forests and bushlands (including the underlying topsoil)⁶⁷—this is almost 40 times the carbon emitted globally from fossil fuels per year. In the fight against climate change, forests and bushlands are critical.

The destruction of forests and bushlands is bad for the climate on many fronts. When trees or bushes are destroyed by bulldozing or logging, carbon dioxide is released via the decomposition of the vegetation—including the plant matter in the soil. Often the vegetation is also burnt, which releases added greenhouse gases. The loss of vegetation cover reduces the moisture available to make rain clouds and loses the natural heat reflectors of leaves, exacerbating drought at local and regional levels.⁶⁸ In addition, the destruction of forests and bushlands also destroys a carbon sink—an area that draws down carbon out of the atmosphere.

The harmful impacts of forest destruction also occur when native forests are burnt as fuel for power generation. On top of the carbon released when the forests are logged and burnt, only a smaller portion of carbon is drawn down as the forests regrow before the next logging cycle, resulting in net carbon emissions.⁶⁹ A substantial international body of peer reviewed research confirms that producing electricity from

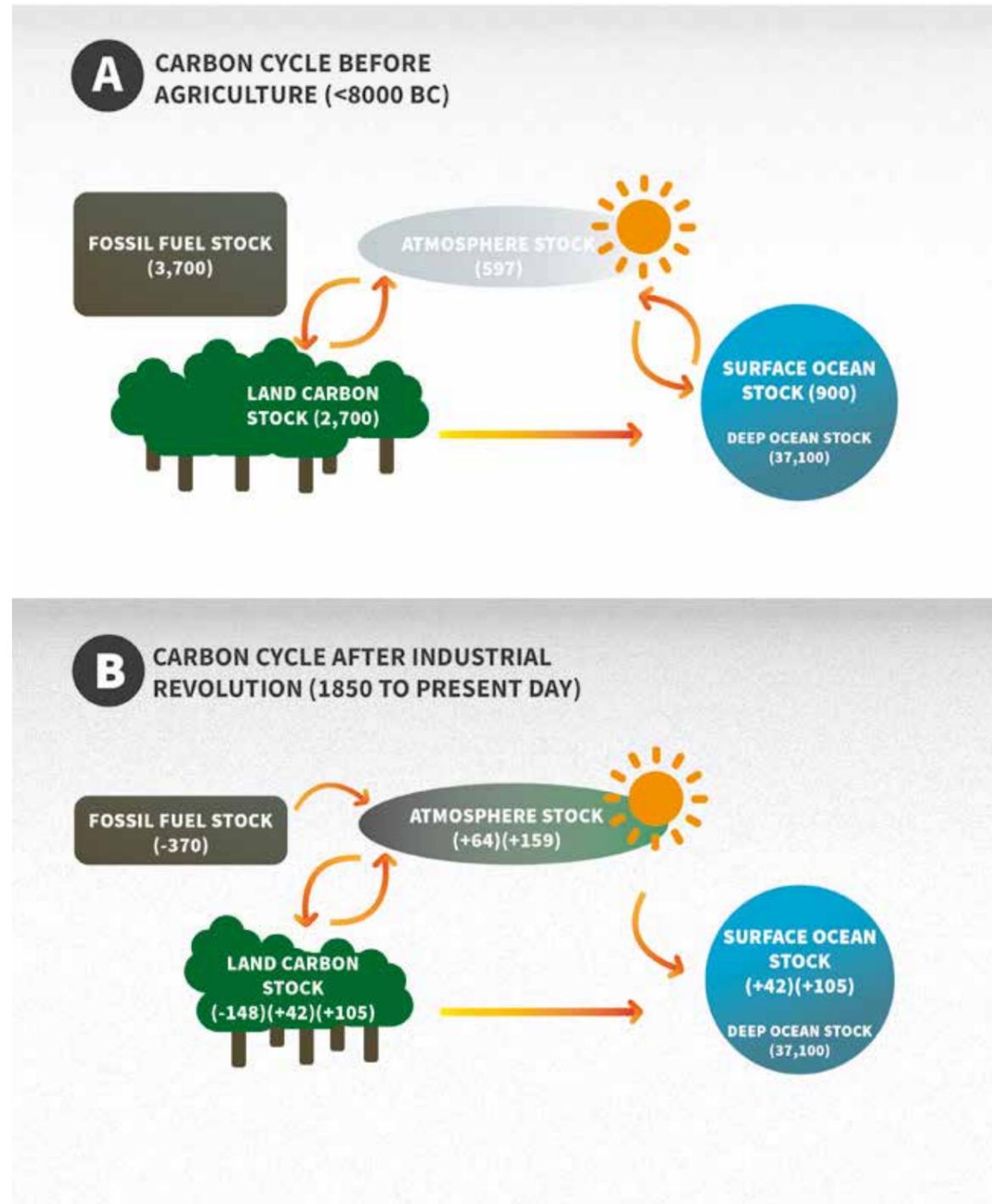
wood in many circumstances has little or no emission reduction benefits over fossil fuels.⁷⁰ Perversely, the logging industry and others have advocated for the burning of native forest wood waste as an eligible source for Renewable Energy Certificates under the Renewable Energy Target or an equivalent scheme. This would only serve to increase pressure on our remaining native forests and would displace genuine renewable energy technologies.

Prior to the 1940s, global deforestation and land clearing were the primary sources of the world's greenhouse gas emissions.⁷¹ They were rapidly overtaken by fossil fuels in the post-war era, due to the surge in population growth and fossil fuel use.⁷² However, deforestation and degradation of forests and bushlands still account for about 12% of global carbon emissions—second only to the energy sector.⁷³

In international carbon accounting, emissions from deforestation and land clearing falls under the category of Land Use, Land Use Change and Forestry (LULUCF—but referred to in this report more simply as the 'land sector'). The land sector also includes emissions from forest and bushland fires, change in vegetation growth from climatic conditions, and other emissions arising from a change in how the land is used (for example the management of wetlands). It also includes the drawdown of carbon back into the land, including regrowing native vegetation and monoculture plantations. The land sector accounts are most often presented as a net figure, with both emissions and drawdowns added together to give an overall positive or negative emissions number. This means the full emissions from deforestation and land clearing are often masked in national and international accounts.

Figure 4

The global carbon cycle and role of land carbon, adapted from Mackey et al⁷⁴



Carbon dioxide is the most significant of the greenhouse gases by volume—trapping heat within the Earth’s atmosphere and causing rapid global warming. For about 800,000 years, the concentration of carbon dioxide in the atmosphere has oscillated between about 180 parts per million and 280 parts per million.⁷⁵ But since the 1940s, this has skyrocketed to about 410 parts per million and is still rising extremely fast.⁷⁶

Prior to agricultural intensification by human societies (before about 8000 BC), the exchange of carbon between the land, the ocean and the atmosphere was relatively stable, with no use of fossil fuels.⁷⁷ This involved carbon being released from the land into the atmosphere from natural plant decay and soil microbial processes (or fire)—with some organic matter transported by rivers into the oceans. Conversely, carbon was drawn down back into the land from the atmosphere as vegetation grew. This pre-agricultural global carbon cycle is represented in **A**. The numbers indicate the estimated gigatonnes of carbon stored in each stock, and the arrows indicate the movement of carbon between the main stocks.

In the pre-industrial era (between 8000 BC and 1850 in this model), where agricultural activity increased and more forests were cleared, the global carbon balance shifted so there was slightly less carbon in the land and more in the atmosphere and oceans.⁷⁸ And as the industrial revolution kicked in post-1850, humans began clearing even more land for agriculture and urban expansion—upwards of 40% of all forests by 2005⁷⁹—exacerbating this carbon transfer to the atmosphere further.

But the biggest change occurred as humans began mining and burning fossil fuels as a source of energy, which accelerated dramatically in the latter half of the 1900s.⁸⁰ This has meant that a major new source of carbon previously locked away underground has now entered the global carbon cycle, throwing the system into significant imbalance and driving rapid changes in the global climate. This post-industrial revolution global carbon cycle is represented in **B**, with the numbers indicating the estimated gigatonne change in carbon for each stock from the pre-agricultural cycle.

One way to understand the role of land carbon in this cycle is to consider that there is a land carbon debt accrued over centuries of deforestation and land clearing that should be repaid as much as possible by replanting and restoring natural ecosystems (of course, on top of halting existing global deforestation and land clearing).⁸¹ This is active carbon that naturally cycles between the land, the atmosphere and the ocean, which is currently out of balance due to excessive deforestation and land clearing.⁸²

Fossil fuels, on the other hand, are a new permanent source of carbon that has been buried underground for millions of years. The most effective way of addressing this problem is by stopping the mining and burning of coal, oil and gas as soon as possible. These emissions cannot simply be offset by drawing carbon into the land as there is already the existing land carbon debt to repay. The challenge is to simultaneously draw down carbon back into natural ecosystems *and* stop burning fossil fuels as quickly as possible.



Deforestation burning for bauxite mining, Cape York Peninsula | Kerry Trapnell

Including the land sector, Australia’s emissions fell by -2% from 1990–2016; excluding the land sector however, Australia’s emissions increased by 28%.

AUSTRALIA’S INCREASING DEFORESTATION AND LAND CLEARING EMISSIONS

Deforestation and land clearing have historically made up a large proportion of Australia’s overall greenhouse gas emissions—even without factoring in the incompleteness of the data (for more on this see section: Providing world-leading transparency). In 1990—the date that official emission records commence—deforestation of forests made up at least 28% of our overall emissions (excluding native forest logging and land clearing of sparser bushland).⁸³ While this has now dropped to at least 10% of our overall emissions in 2017,⁸⁴ this remains a high figure and is still equal to more than the entire emissions of South Australia, Tasmania, the Australian Capital Territory and Northern Territory combined. This number increases when native forest logging and land clearing of sparser bushland is included, which in total could be as high as 100 million tonnes per annum, or equivalent to about half of all coal fired power pollution in Australia (see pp.54-55 for more explanation of how we arrived at this figure). The figure would be higher still if uncounted emissions from ongoing soil erosion caused by deforestation

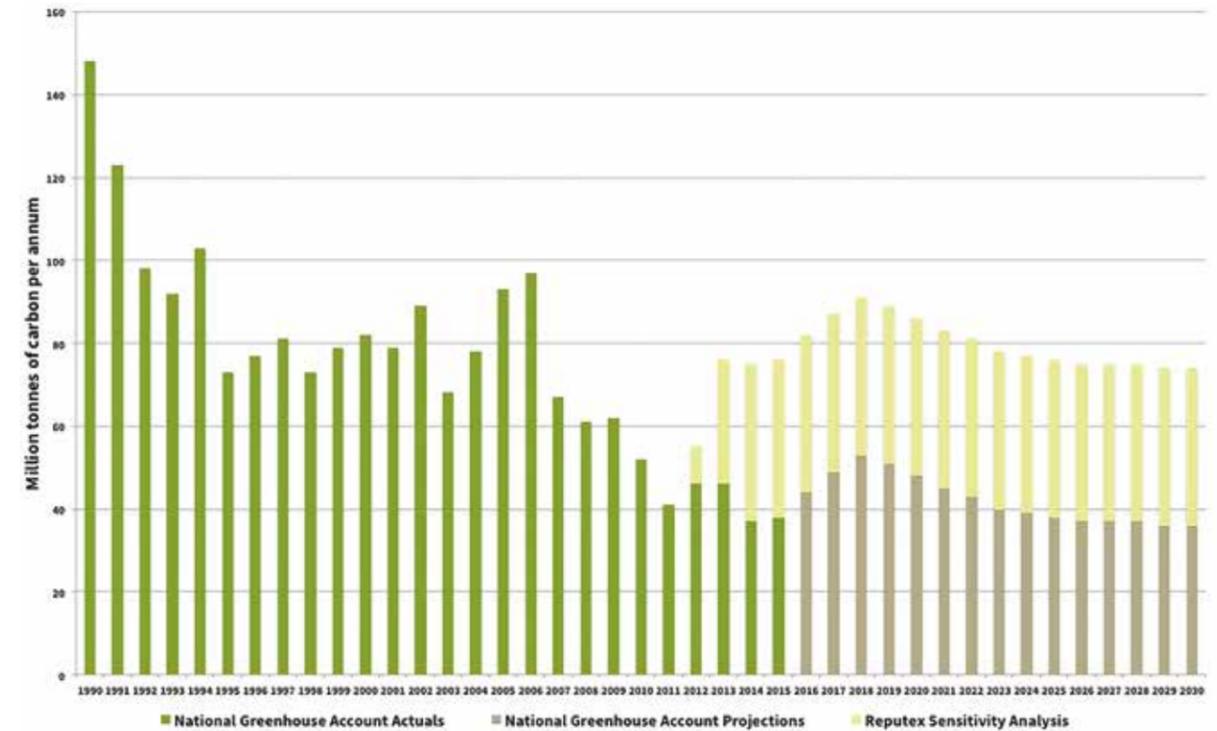
and land clearing (leading to ongoing soil carbon loss) were properly accounted for.⁸⁵

The drop in deforestation emissions since 1990 is largely attributed to the strengthening of land clearing laws from state governments—particularly in Queensland from 2000. However, as demonstrated in this report, land clearing rates have once again increased due to a weakening of these laws.

In the international climate treaty under which we currently operate—the Kyoto Protocol—Australia has used this decline in deforestation emissions to minimise effort required to reduce emissions from fossil fuel use. Specifically, under the Howard Government, Australia negotiated the Australia Clause, which allows us to use historically very high 1990 deforestation emissions as a baseline to calculate our emission reduction target (other developed nations wanted to exclude the land sector when setting these baselines). This clause is the reason we have been able to meet our Kyoto Protocol targets. Including the land sector, Australia’s emissions fell by -2% from 1990–2016; excluding the land sector however, Australia’s emissions increased by 28%.⁸⁶

Figure 5

Deforestation emissions from forests from 1990–2015 and projections to 2030, with caveats



There is no complete and reliable dataset on deforestation and land clearing emissions in Australia. This chart has been compiled from the National Greenhouse Accounts and Federal Government emission projections⁸⁷—where the data only accounts for deforestation in areas with a greater crown cover than 20% and reaching two metres in height. Land clearing under this threshold in the National Greenhouse Accounts is counted but not separated out as a hectare figure from other natural losses of vegetation.

So it does not include all bushland destruction. Nor does it include emissions from native forest logging, which are unavailable as a set of data. A sensitivity analysis, by Reputex, is applied to demonstrate the potential upper bound of emissions when factoring in higher emissions as recorded by the Queensland Government (the sensitivity means there is uncertainty in the data so this effectively represents a possible upper bound for emissions).⁸⁸ The incomplete data issue is explored in Part III of this report.



Since the former Newman Government weakened Queensland’s land clearing laws in 2012, deforestation and land clearing has spiked dramatically (see Figure 3, p.12). Deforestation emissions are projected to rise further over the next few years as a result. Similar moves by the New South Wales Government in 2017 and a push to destroy bushlands in Western Australia’s Kimberley region for large agricultural schemes are likely to increase emissions further.

This rising problem of greenhouse gas emissions from deforestation and land clearing is not fully understood or appreciated because of the opacity of Australia’s greenhouse gas accounting system and a poor national deforestation and land clearing monitoring system. Land sector emissions in the National Greenhouse Accounts are presented as net emissions, which includes carbon drawdown from timber plantations and natural forest and bushland regeneration. So when Australia’s emissions are presented, it masks a clear underlying emissions source.

Modelling commissioned by The Wilderness Society and conducted by Reputex Advisory demonstrates that ending deforestation and land clearing is a fast, cheap

and effective way to cut Australia’s carbon pollution.⁸⁹ The report shows that ending land clearing by 2020 would save 400-750 million tonnes of carbon from 2021-2030 (depending on whether calculations are based on the lower National Greenhouse Accounts figures or the Queensland SLATS figures). Even gradually phasing out land clearing by 2030 would save 300–650 million tonnes of emissions. As per the data issues pointed out in this report (see Part III of this report), these do not include emissions from native forest logging, the clearing of sparse or low height bushland, or the degradation of existing forests and bushlands from poor fire management and overgrazing—including these would further increase the emissions savings.

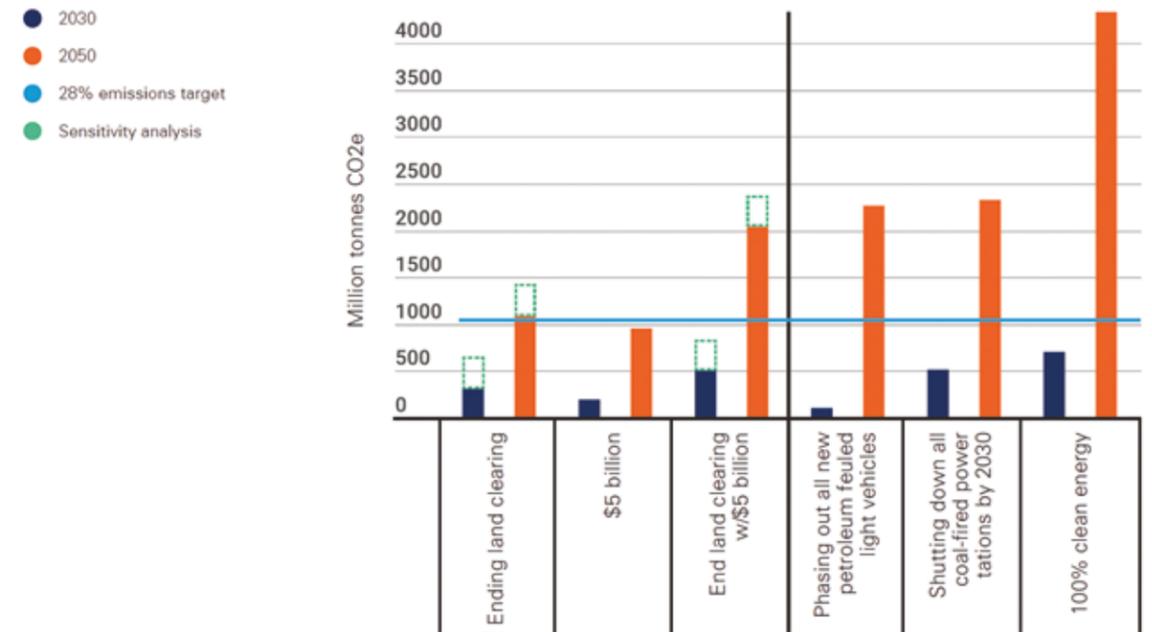
Ambitious policy in the land sector is an important way for Australia to meet our existing and future Paris Climate Agreement goals. Protecting our forests and bushlands is an immediate priority as it yields quick and ongoing climate benefits. Looking ahead, restoring degraded ecosystems now will yield significant future carbon drawdown as regrowing trees mature—as well as maximise our ability to adapt to a changing climate.

Ending deforestation and land clearing is a fast, cheap and effective way to cut Australia’s carbon pollution.



Figure 6

Emissions savings from ending deforestation and land clearing, compared with other key policy options, from Reputex⁹⁰



This chart shows the greenhouse gas emissions savings from 2021–2030 (in blue) and 2021–2050 (in orange). The sensitivity analysis, shown stacked-on top of the bars, represents further potential emissions savings if higher rates of land clearing and emissions as recorded by the Queensland Government are factored in. The \$5 billion refers to an upfront investment in forest and bushland restoration—which is explored further in the next section of this report. The blue line represents the upper bound of Australia’s weak emissions reduction target of 26-28% by 2030 on 2005 levels.

While a phase out of fossil fuels in Australia’s energy sector yields by far the largest emissions savings over the long term, ending deforestation

and land clearing is clearly a critical part of Australia’s overall approach to reducing emissions. Up to 2030, it compares favourably with a full switch to 100% clean renewable energy.

It must be noted that these estimations do not include emissions from clearing sparse or low height bushland, native forest logging, or forest and bushland degradation (where the vegetation isn’t cleared but fire management and stock grazing can affect carbon carrying capacity). These figures are not fully measured or disaggregated in the National Greenhouse Accounts. Emissions savings would be greater when factoring these in.

THE CASE FOR SUBSTANTIAL REGULATORY REFORM

Australian states and territories currently retain primary powers and responsibilities to regulate deforestation and land clearing. For land clearing specifically, this is done mostly through environment and planning frameworks, which prohibit certain forms of clearing and allow others either via permitting or landholder self-regulation systems. For native forest logging, this is done via Federal Government-endorsed Regional Forest Agreements (10 in total) that identify areas of public land available for logging.

There is little consistency of approach to land clearing regulations across jurisdictions, and comprehensive monitoring of actual land clearing occurrences is very poor or non-existent outside Queensland (see Table 2, pp.30-31 and Table 3, p.53). Land clearing laws are subject to periodic policy ping-pong, as gains made in protecting forests and bushlands are eroded or removed with a change of government. This has occurred in recent times, most prominently in Queensland and New South Wales.

Land clearing regulatory loopholes are common across all state and territory jurisdictions, in particular for large agricultural, mining and urban development projects—where proponents are often either exempt or allowed to clear based on dubious offsetting schemes (where they have to protect another similar area of a forest or bushland).

The Federal Government has some responsibility to regulate land clearing when it affects ‘matters

of national environmental significance’—through national environment laws (*the EPBC Act*). This includes responsibility to protect threatened species and ecological communities, migratory species, World Heritage Areas and National Heritage Areas, internationally important wetlands, and Commonwealth marine areas—including the Great Barrier Reef.

In practice, these powers are very rarely used to prevent land clearing or to enforce the laws where breaches have likely happened. For example, an analysis by WWF-Australia has found that between July 2013 and July 2017, there were 7,658 properties in Queensland that had cleared or had proposed to clear, that potentially triggered *the EPBC Act*—with 99.9% of these proceeding without approval.⁹¹ Many of these are in Great Barrier Reef catchments, despite a Federal Government commitment to police land clearing there.⁹² To date, the Department of Environment and Energy will not reveal how many properties it has formally investigated—but there have been no prosecutions.

This pervasive inaction on national environment laws occurs even though ‘land clearance’ is listed as a ‘key threatening process’ under *the EPBC Act*. A Threat Abatement Plan (which usually follows from the identification of a key threatening process) has not been created to date for land clearing by the Department of Energy and Environment.

The EPBC Act was established in 1999 to confirm clearer powers for the Federal Government to deliver on international commitments to protect nature—principally under the UN Convention on

Biological Diversity. Yet the latest national State of the Environment Report covering 2012–2016, demonstrates a further major decline in biodiversity, with land clearing noted as a major contributing factor.⁹³ In other words, *the EPBC Act* and the way it is being applied is not effectively performing its role of conserving Australia’s biological diversity.

In addition to *the EPBC Act*, in 2012 the Council of Australian Governments agreed on *Australia’s Native Vegetation Framework* to guide the ecologically sustainable development of native vegetation.⁹⁴ While the framework contains sound goals aimed at protecting forests and bushlands, it does not contain any real regulatory backing so has to date been ineffective.

With respect to native forest logging, there is little to no federal oversight of environmental impacts due to the Regional Forest Agreements, which defer regulatory powers to state governments through special bi-lateral agreements. The agreements give special treatment to the logging industry by exempting public native forest logging operations from the application of *the EPBC Act* and allowing state governments to set a low bar for environmental protection, which is often poorly enforced. The logging exemption in *the EPBC Act* means the Federal Government is unable to intervene even when logging threatens the survival of endangered species like the Leadbeater’s Possum, Swift Parrot and Giant Freshwater Lobster. No other industry receives such exemptions.

For example, the recently re-signed Tasmanian Regional Forest Agreement, the first to be extended for a rolling 20-year term, enshrines this exemption. Additionally, it amends the terms of the original agreement to explicitly provide for logging of old growth and rainforest tree species (some with a minimum age of 300 years) in established conservation reserves. This together with a 2014 legislative change, exposes longstanding reserves declared explicitly to protect values from logging, to the threats associated with logging.

The Regional Forest Agreements are a major failure of public policy—they have not delivered on their stated objectives to provide security to the timber industry, deliver sustainable forestry and a secure conservation reserve system. Instead we have seen timber industry collapse, poorly directed taxpayer subsidies, significant environmental damage, uplisting of endangered species, and ongoing community and market conflict.

The stark facts are that we continue to lose forests and bushlands, biodiversity continues to decline, and carbon pollution from deforestation and land clearing is rising. This is the indisputable and damning evidence that the current regulatory system has failed. Comprehensive and urgent reform is required.

The stark facts are that we continue to lose forests and bushlands, biodiversity continues to decline, and carbon pollution from deforestation and land clearing is rising... Comprehensive and urgent reform is required.

***The EPBC Act* and the way it is being applied is not effectively performing its role of conserving Australia’s biological diversity.**

Table 2

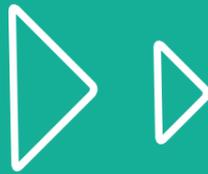
Summary of problems with the regulatory system for deforestation and land clearing, across the main jurisdictions

KEY ISSUES	
Federal	<ul style="list-style-type: none"> Systemic failure to use <i>the EPBC Act</i> to regulate relevant land clearing, including to protect threatened species habitat and the Great Barrier Reef. No effective oversight of land clearing, despite this being: the a major cause of biodiversity loss, a significant cause of Great Barrier Reef damage, other major land degradation issues, and causing substantial carbon pollution. Native forest logging is excluded from the operation of <i>the EPBC Act</i> by the provisions of the Regional Forest Agreements. In practice, this means it is legal to log habitat of forest-dependent threatened and endangered species.
QLD	<ul style="list-style-type: none"> The Newman Government weakened land clearing laws and compliance and monitoring which has resulted in a significant rise in clearing from 2012. Of particular concern, there has been a steep rise in the destruction of forests and bushlands and the amount of clearing in Great Barrier Reef catchments. A high amount of clearing occurs under self-regulation / lack of permits. For instance in just seven months, between August 2016 and February 2017, 273,000 hectares of land were notified in Queensland—most of this falling under the controversial thinning category, which allows the bulldozing of up to 75% of trees in a forest.⁹⁵ The Queensland LNP currently oppose any reform, creating significant policy uncertainty moving forward without bipartisan certainty.
NSW	<ul style="list-style-type: none"> Previously, state land clearing laws successfully reduced tree clearing between 2006–2013. However in 2016, the Baird Government has abolished the <i>Native Vegetation Act 2003</i> and replaced it with a new law that will increase the amount of clearing that can be undertaken without a permit. Over eight million hectares, including over 2.2 million hectares of koala habitat, has been potentially opened for clearing under the new laws according to analysis by Eco-Logical.⁹⁶ The Regional Forest Agreements for New South Wales have failed to provide a comprehensive, adequate and representative reserve system, and overall there is poor compliance and lack of enforcement of state logging regulations for forest dependent threatened species.⁹⁷



KEY ISSUES	
WA	<ul style="list-style-type: none"> In 2013, the Western Australian <i>Native Vegetation Regulations</i> were relaxed to allow up to five hectares of clearing at a time without a permit, and clearing of regrowing forests up to 20 years old. Large amounts of land clearing are frequently approved (233,082 hectares between 2005–2015), yet there is no reporting by the Western Australian government showing deforestation or emissions trends.⁹⁸ According to the latest National Greenhouse Accounts figures, Western Australia now has the second highest rate of primary deforestation in the country.⁹⁹ Ancient, high conservation value native forests continue to be logged in the South West of the State, with poor compliance and enforcement of logging regulations for forest dependent threatened species.
NT	<ul style="list-style-type: none"> Changes to provisions under the <i>Pastoral Land Act</i> commenced on 1 January 2014. These changes made permits easier to obtain and able to be approved for up to 30 years.
SA	<ul style="list-style-type: none"> Decent land clearing regulations in place, however as with other jurisdictions there are major exemptions for mining activities.
VIC	<ul style="list-style-type: none"> In 2013, changes to Victoria’s clearing laws and guidelines weakened the objective from a ‘net gain’ to ‘no net loss’ in biodiversity. The clearing laws are currently under further review. There is poor compliance and lack of enforcement of state logging regulations for forest dependent threatened species (for example 27 breaches recently documented),¹⁰⁰ and the Andrews government has not strengthened or increased protections for forests or for forest-dependent threatened species. VicForests has failed to attain Forest Stewardship Council certification for logging operations despite numerous attempts.
TAS	<ul style="list-style-type: none"> The Hodgman Government reviewed and re-published the Permanent Native Forest Estate policy in 2017, abandoning a long standing commitment to ban land clearing. A recent overhaul of state planning laws also maintains an exemption for logging, mining and agricultural activities to destroy forests. The Hodgman Government continues to attempt to open up conservation reserves for logging. The failed Tasmanian Regional Forest Agreement has been resigned for rolling 20 year terms, with significant exemptions for logging under <i>the EPBC Act</i>. The state-owned logging agency has failed to attain Forest Stewardship Council certification for logging operations despite numerous attempts.

Policy actions



Permanently protect all old growth, remnant and high conservation value forests and bushlands through enhanced regulations and an improved protected area network. Regulations should apply equally across all sectors—mining, urban, logging and agriculture.

Why? To protect the many values of our best remaining and regrowing forests and bushlands. High conservation value refers to vegetation classed as mature, old growth, remnant and primary. This also includes regrowing vegetation with important values or in important areas—all falling within the six internationally recognised high conservation value categories.¹⁰¹ This should include: threatened species habitat and endangered ecological communities; riparian vegetation within an appropriate buffer zone from watercourses; and expansive protection for important water catchment areas such as the Great Barrier Reef catchments and the Murray Darling Basin.

How? State governments must strengthen their laws and invest in a strengthened protected area network. The Federal Government must also step up to firstly act on its current responsibilities



Box 5

How can the Federal Government better regulate deforestation and land clearing?

There are four steps the Federal Government should take to better regulate deforestation and land clearing. The first two are urgent immediate steps while the reform, planning and funding is established for the following two.

1

Immediately enforce the EPBC Act and apply equally to all industries.

This involves ensuring full and proper assessment of forest and bushland destruction with the potential to impact on matters of national environmental significance, including the Great Barrier Reef and nationally-listed threatened species habitat and threatened ecological communities. This includes preventing developments where values are clearly

under *the EPBC Act*, then establish clear legislative powers to prevent state governments from winding back legislation and to intervene where nationally-determined targets are not being met (see Box 6). Regulation should be applied equally across all sectors with no exemptions. National investment in a strong protected area network is also critical. These steps are vital in order to meet international obligations under the Paris Climate Agreement and the UN Convention on Biological Diversity.

Disallow the burning of native forests as a form of renewable energy.

Why? The logging industry and others have advocated for the burning of native forest wood waste as an eligible source for Renewable Energy Certificates under the Renewable Energy Target or equivalent scheme. This means there would effectively be special subsidies available for native forest logging. It would only serve to increase pressure on our remaining native forests and would displace genuine renewable energy technologies.

How? State and territory governments and the Federal Government should prevent native forest wood waste eligibility for Renewable Energy Certificates or equivalent.

threatened, and prosecuting developers that breach requirements under the Act. In addition, where relevant clearing has proceeded without referral or approval, landholders or companies should be made to revegetate cleared land.

Particular focus should be given to the Great Barrier Reef river catchment areas in Queensland, where the cumulative impact of multiple clearings should be assessed as a matter of urgent priority.

2

Immediately strengthen the EPBC Act to bolster Federal Government powers to further prevent deforestation and land clearing.

This should include a specific land clearing trigger under the Act, making it a matter of national environmental significance as a threatening process directly impacting on Federal Government responsibilities. This should also include, at a minimum, requiring Federal Government clearing permits in the Great Barrier Reef river catchment areas (the Great Barrier Reef Marine Authority could take on this role) given the clear imperative to protect the Reef from harmful runoff.

3

Establish stronger national strategic leadership and regulatory powers on the environment, including independent oversight and enforcement.

While the above steps can help serve a short-term stopgap, an entirely new regulatory approach is required to fix the more systemic failure of environmental governance in Australia. The Australian Panel of Experts in Environmental Law argue that the Federal Government should, and has the sufficient constitutional power to, provide such leadership. This includes the ability to override states and territories where they are not meeting key targets.¹⁰² This does not mean taking on full responsibility of all existing state environmental laws and administration arrangements; it means having greater financial incentives and regulatory power to both incentivise and enforce all Australian government jurisdictions to comply with national environmental plans and targets.

The Places You Love Alliance—made of up Australia's leading environmental organisations—advocating for two new independent federal institutions. One is an independent commission, roughly modelled on the Reserve Bank of Australia and has carriage to set a National Environment Plan and regional plans (and should include targets to reduce deforestation and land clearing). The second is an independent federal assessment and enforcement agency that ensures states, territories and development proponents are operating within the terms of the National Environment Plan and regional plans. It would have the power to prescribe conditions, monitor compliance, reject applications and enforce regulation—with applications only entertained for areas outside those specifically protected by law.

With regards to land clearing, this would involve setting and enforcing clear national and regional targets to rapidly and substantially reduce clearing rates. With native forest logging it would involve ensuring the independent regulator enforces logging regulations, and assesses wood forecast, yields and models in the context of bushfires, climate change, and meeting conservation requirements (including population recovery) for forest-dependent threatened species.

4

Expand and strengthen the National Reserve System.

The current formal protected area system is not comprehensive, adequate and representative—the three key formal scientific objectives agreed by all Australian governments.¹⁰³ New and expanded formal and informal protected areas are required to protect critical threatened species habitat and threatened ecological communities. Management of new and existing protected areas should include regular assessment of the presence and population health for all threatened species and endorsed by scientific advisory committees to ensure they are adequate and scientifically-based. In addition, Commonwealth Recovery Plans for threatened species listed under *the EPBC Act* should be reviewed, or where there still are none, developed.

Large-scale restoration involves re-establishing the many important functions intact ecosystems perform that sustain our communities—like water purification, pollination, soil health, local climate regulation, buffers from natural disasters and even just providing a pleasant place to be.

Savanna woodlands in the Northern Territory | Glenn Walker

Transform deforested and degraded landscapes

THE BENEFITS OF ECOLOGICAL RESTORATION

There is a growing global movement of communities, businesses and governments seeking to repair the serious damage done by human industrialisation of our natural environment. This involves restoring ecosystems to a stable, healthy and resilient state, where native plants and animals can once again thrive. It involves re-establishing the many important functions intact ecosystems perform that sustain our communities—like water purification, pollination, soil health, local climate regulation, buffers from natural disasters and even just providing a pleasant place to be.

Ecological restoration is also among the most effective and cheap ways to draw carbon out of the atmosphere. It is a natural climate solution. At the same time as helping to reduce the warming of the planet, well targeted restoration also helps our plants, wildlife and communities adapt to a rapidly changing climate. Ecological restoration benefits include providing natural corridors for species to move across landscapes, increasing tree cover to help mitigate against localised rainfall reduction and drought, restoring natural buffers to floods and storms (like

mangrove communities), and many other adaptation benefits. The science and best practice shows that landscape recovery is possible.¹⁰⁴

At the international level, the Bonn Challenge is the key large-scale (voluntary) restoration initiative seeking to nurture the global restoration movement. It aims to bring 150 million hectares of deforested and degraded land into restoration by 2020, and 350 million hectares by 2030.¹⁰⁵ Importantly, it integrates goals under both the UN Convention on Biological Diversity and the Paris Climate Agreement—by enhancing and protecting biodiversity and increasing the drawdown of carbon out of the atmosphere. Thirty-nine countries and one major company have signed up to the challenge, but Australia has not.

Although Australia has not signed up to the challenge, there is a groundswell of ecological restoration activity well underway here through a myriad of local, state and national government programs and other private initiatives (government and private investment is often combined as well). This takes many forms but most commonly involves: planting trees; allowing naturally regrowing forests and bushlands to regenerate; improving cattle and sheep grazing practices (including removal altogether); reinstating

traditional Indigenous fire management practices; removing or managing invasive plants and animals; restoring natural water flows to rivers and wetlands; and erosion control. Good examples of landscape-scale restoration projects involving multiple partners include Gondwanalink in Western Australia, Habitat 141 in Victoria, and WildEyre in South Australia.¹⁰⁶

Importantly, facilitating ecological restoration at scale has the potential to create a sizeable restoration economy, which will require a range of services and technologies to be provided by new and expanding

businesses. On top of new potential income streams for landholders, these economic benefits are likely to flow primarily to rural areas, where ecological restoration projects are most feasible.¹⁰⁷ In many places, particularly remote Indigenous communities, the positive social benefits of the jobs and involvement in projects working on Country are already clearly discernible and only likely to increase with more investment.¹⁰⁸



Eucalyptus Lesoueff | Dennis Sarson

 Box 6

Ecological restoration priorities

The following are five key examples of ecological restoration priorities in Australia, all of which can be aligned with maximising carbon drawdown and climate adaptation strategies.

- 1 Landscape connectivity, including wildlife corridors**

Many of our remaining intact forests and bushlands are either in isolated patches or are cut off from other vegetation communities by heavily cleared and degraded land. Reconnecting habitat at both regional and continental scales allows plants and animals to better move across landscapes and adapt to a changing climate.¹⁰⁹

4 Heavily cleared forest and bushland communities

Remaining forest and bushland communities are an important surrogate for biodiversity. One ecological restoration approach is to aim to restore heavily cleared forest and bushland communities to at least 30% of original extent (before European arrival in the 1700s).¹¹³
- 2 Threatened species habitat**

Many Australian plants and animals are threatened because their habitat has been destroyed or heavily degraded. This includes destruction by invasive species. Targeting ecological restoration to regrow habitat adjacent to remnant forests and bushlands can help increase the chances of survival of these threatened species.¹¹⁰ Similarly, removing clearfell logging from native forests can restore more natural forest structure and biodiversity.

5 Northern Australia savanna burning

Removing Indigenous fire management practices has changed the vegetation structure and composition across much of Australia, with a particularly negative impact on the habitat and survival of small mammals in northern Australia (in interplay with other pressures, particularly feral cats).¹¹⁴ Reinstating Indigenous fire management practices can help reduce the risk to species under threat.
- 3 Great Barrier Reef and other river catchments**

Improving the quality of the water flowing from rivers into the Great Barrier Reef is a key priority for maintaining Reef health.¹¹¹ Increasing forest and bushland cover over these catchment areas—particularly along river banks—will help stabilise erosion and greatly reduce run off.¹¹² Similarly, the health of degraded river systems such as the Murray-Darling Basin can be improved with targeted forest and bushland regeneration.



THE CRITICAL IMPORTANCE OF CARBON DRAWDOWN

The Paris Climate Agreement sets out a goal to limit global temperature rise to well below 2°C above pre-industrial levels and to pursue efforts to limit the increase to 1.5°C.¹¹⁵ This will require urgent and transformative action by all nations, as the window to achieve even the upper bound of 2°C is closing very quickly and global greenhouse gas emissions continue largely unabated.¹¹⁶

The largest part of this action must involve stopping the extraction and burning of coal, oil and gas, as this is the dominant form of pollution heating up the Earth. But even if every nation were to dramatically exceed expectations in cutting this fossil fuel use, vast amounts of carbon must also be drawn down out of the atmosphere to reduce the buildup of carbon pollution already there (no matter how quickly the transition away from fossil fuels is).¹¹⁷ Modelling by the International Panel on Climate Change (IPCC) confirms that to reach even a 2°C goal, a high level of carbon drawdown is required.¹¹⁸ As shown in Figure 4 of this report (pp.22-23), with regards to land carbon alone, there is already a large carbon debt to be repaid due to historical global deforestation.

The ecological restoration of degraded and deforested landscapes is where the vast majority of carbon drawdown is likely to occur—at least for the next several decades.¹¹⁹ This is because nature has already devised the solution to store carbon in our forests, bushlands, soils and wetlands. We just need to provide the land, labour and capital to make it happen (combined with scientific and local know-how). It involves replenishing a carbon store that was originally there, rather than trying to create a new one (as some technological solutions attempt to do). It also has the big additional benefit of re-establishing plants, wildlife, water quality and landscape health.

Even if every nation were to dramatically exceed expectations in cutting this fossil fuel use, vast amounts of carbon must also be drawn down out of the atmosphere to reduce the buildup of carbon pollution already there.

Other carbon drawdown options primarily centre around carbon capture and storage where carbon pollution is captured from a power plant (or equivalent) and injected deep underground. A variation of this involves growing and burning trees then capturing the carbon released to inject underground (known as bio-energy carbon capture and storage or BECCS). Others include climate engineering solutions such as capturing carbon directly from the air or fertilising the oceans to increase marine plant growth.

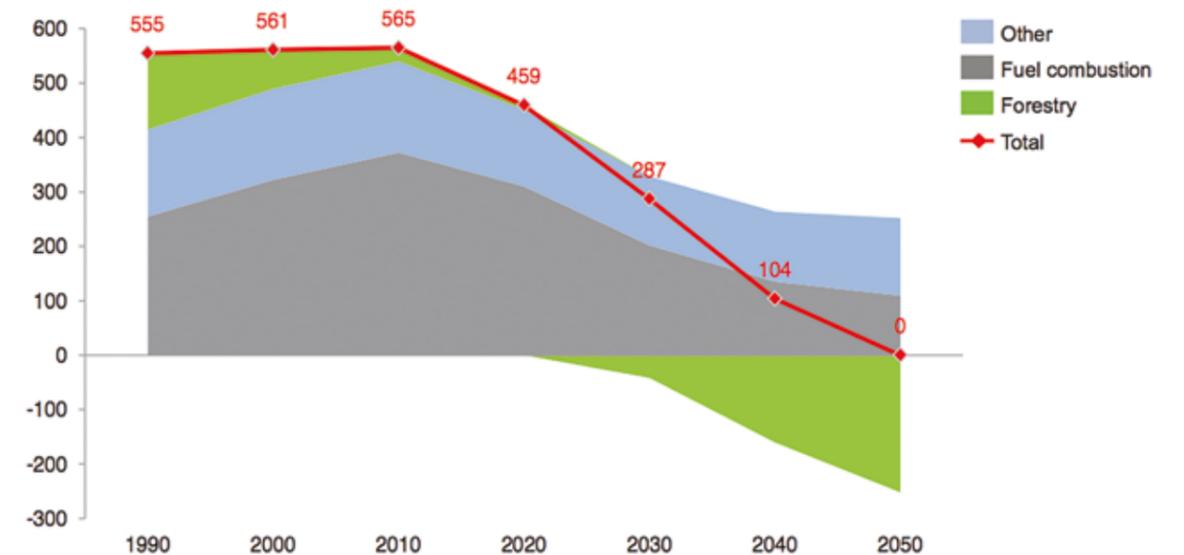
The major problem with these technologies is that none have yet proven to be feasible at scale.¹²⁰ In the case of carbon capture and storage, this is despite significant public and private investment. They are likely decades away from potential deployment (if at all) and for the short to medium term are in no sense financially and technologically easier than reducing current emissions in the first place.¹²¹

Reflecting the importance of this priority area of carbon drawdown, the Paris Climate Agreement states that nations should protect and enhance sinks and reservoirs of greenhouse gases, including forests. It encourages incentivising non-carbon benefits of ecological restoration (such as biodiversity and water quality), as advocated in this report.¹²²

Australia has huge potential to deliver on this front. A major study, led by ClimateWorks and the Australian National University, examined our pathways to reach net zero greenhouse gas emissions by 2050, found that Australia has a significant amount of available land to plant trees to draw down carbon out of the atmosphere, which makes net zero achievable.¹²³ It showed that rather than emitting hundreds of millions of tonnes of greenhouse gases per year, Australia could completely reverse this and draw down hundreds of millions of tonnes of carbon per year, becoming a significant net sink of carbon.

Figure 7

ClimateWorks' greenhouse gas emission trajectory in millions of tonnes of carbon dioxide equivalent from 1990–2050



This chart shows projected emissions when deploying a number of policies and technologies to decarbonise the Australian economy. The green wedges of Forestry show the capacity of Australia to shift the land sector from being a major contributor of greenhouse gas emissions, to a major carbon sink. Other studies have shown that Australia can transition our energy system far faster than outlined in the ClimateWorks report,¹²⁴ which effectively means Australia could become an even greater contributor of net carbon

drawdown than suggested here. It must be noted that the modelling for Forestry in this research includes a large proportion of monoculture plantations. As argued in this report (see Box 9 and p.49), this is not a sustainable or desirable outcome; instead, this should and can be more resilient biodiverse plantings. Nonetheless, the broad conclusion that Australia can become a leader in carbon drawdown holds and is an exciting vision for the future.

AUSTRALIA'S LARGE-SCALE ECOLOGICAL RESTORATION OPPORTUNITY

The growing imperative to transform and repair Australia's damaged forests and bushlands, combined with the pressing need to draw down carbon out of the atmosphere, creates a big opportunity for Australia to invest heavily in ecological restoration. Coupled with strong regulations to end destructive deforestation and land clearing, providing substantial financial incentives for landholders to restore land is the breakthrough Australia desperately needs to reverse our calamitous trend of species loss and

increasing land damage. It would ensure much greater investment and financial support is flowing from the cities to the bush in acknowledgement of the critical role landholders play in restoring and caring for our natural heritage.

The significant change in recent years that makes this opportunity more feasible is the global push to price greenhouse gases (as both emissions and carbon drawdown). It puts real monetary value on protecting our remaining intact forests and bushlands and restoring those we have already damaged. While the true and full value of intact nature is immeasurable and should never be reduced to the price of carbon

alone, the practical reality is that landholders require new and steady income streams to be able to carry out the ecological restoration work necessary. In some cases, they will have to discontinue or scale down other land uses, such as intensive cattle grazing, or clearfell logging of high conservation value native forests, in order for ecological restoration to be successful. Paying landholders—which in some instances are state governments—creates the necessary counter-incentive to harmful farming or logging practices and will help protect, rather than erode, the intrinsic values of plants, wildlife and a healthy environment.

Much of the research to date on valuing restoration and providing income to landholders has been focussed on carbon value alone. Specifically, the majority of the research examines how a varying price per tonne of carbon over a hectare of land compares with the income landholders are already receiving from their current land use. The argument is that when the prices paid for carbon crosses a threshold where a landholder can be paid more to restore forests and bushlands, this provides a major financial incentive to change the business and land use model.

The most recent nationwide analysis and modelling, by the CSIRO, found that new plantings in Australia have the technical capacity to cover 60 million hectares, and draw down up to 13.2 gigatonnes of carbon out of the atmosphere by 2050, and have an average annual drawdown rate of about 513 million tonnes per year from 2031–2050 (which is almost equal to Australia's current entire annual domestic greenhouse gas emissions).¹²⁵ They found that the ideal price range per tonne of carbon to see this happen is between \$50–\$150 per tonne. This modelling factored in the price threshold that would need to be crossed for landholders to change land use, as well as a lag in uptake as landholders take time to shift their business models.

As the CSIRO stresses, this is one scenario representing the upper theoretical bound of technically possible plantings. The research has been criticised for over-optimistic assumptions.¹²⁶ In reality, the numbers are likely smaller. For example, when one factors in the needs to exclude monoculture plantations (see Box 9, p.49) and consider other land use trade-offs (primarily, competing demands for agricultural products), the theoretical land that could be transformed and amount of carbon drawdown drops. For example, while it is difficult to give any precise figures due to the nature of the modelling presented, a broad

range of about 20-35 million hectares and around 6-8 gigatonnes of carbon drawdown by 2050 appears technically possible when focussing on biodiverse plantings.¹²⁷ This is broadly consistent with the 34 million hectares the Wentworth Group of Concerned Scientists has estimated based on previous modelling from the Australian Bureau of Agriculture and Resource Economics.¹²⁸ As these are hypothetical models they should always be considered with caution—we stress the phrase “technically possible” here. However, the models do serve to illustrate an exciting restoration vision for Australia and help to identify the environmental, social, economic and technical barriers that would need to be overcome to achieve this vision.

In one key area, the CSIRO modelling was in fact short on ambition: that is the lack of recognition that millions of hectares of land do not actually require new plantings—there is already either naturally regrowing forests and bushlands on site or there is viable seed stock in the soil. So rather than large upfront costs for full-scale plantings, what is required is management practices to assist natural regeneration, such as restricting or excluding stock and stopping repeated land clearing, logging and burning. This also helps ensure native species are grown that include the full diversity of species.¹²⁹ This situation is most prevalent in the Brigalow Belt—the bioregion that spans across Queensland and New South Wales and is also the major deforestation and land clearing front in the country.¹³⁰

Queensland researchers have identified that up to about seven million hectares of this type of land could be restored at a relatively low carbon price of \$20 per tonne. At this price, it will be more profitable for landholders to assist natural forest and bushland regeneration than to continue their current land use (which is mostly cattle and sheep farming).¹³¹ This further strengthens the case that large-scale, positive transformation of deforested and degraded land is possible with the right financial incentives. From a climate perspective alone, the value for investment is high. As modelling by Reputex shows, a \$5 billion investment could draw down almost one gigatonne by 2050 (see Figure 6, p.27), primarily through this sort of assisted natural regeneration of forests and bushlands.

These models and research do not factor in the additional potential carbon drawdown or emissions savings from other ecological restoration management practices that also improve environmental conditions. For example, researchers have shown that in the

Great Western Woodlands of Western Australia carbon drawdown could be increased by hundreds of millions of tonnes through better fire management, reducing timber cutting, and better management of cattle.¹³² Some argue that reducing feral animal numbers—particularly camels—can also reduce greenhouse gas emissions (methane from flatulence).¹³³ Restoring wetlands too can draw down carbon, as they are highly effective at storing carbon in the underlying soil when in a healthy state.¹³⁴

In northern Australia, reinstating Indigenous fire management practices (coupled with modern technology) both improves biodiversity and reduces greenhouse gas emissions as it leads to less intense and less extensive fires.¹³⁵ The positive social and economic benefits for remote Indigenous communities from funding these sorts of projects is well established and only likely to increase with more investment.¹³⁶

Aside from these documented social and economic benefits of Indigenous savanna burning, there is surprisingly little examination of the larger social and economic benefits of a greatly expanded ecological restoration industry. There is the obvious benefit of some landholders having an option to increase their income comparative to their current land use or even as part of a diversification strategy. However, the true nature of the full supply chain and flow-on jobs benefits has not been fully examined, with the exception of some work that broadly concludes additional jobs could come from plantings.¹³⁷ There is clearly great potential in this industry so the economic benefits should be examined in more detail as a matter of priority.

What is needed to fully realise Australia's large-scale ecological restoration opportunity is a clear, holistic

plan and program that seeks to maximise carbon drawdown and environmental benefits while also ensuring social and economic returns for regional communities. Over the past couple of decades, Australia has attempted at least part of this in various guises, including the Natural Heritage Trust, the Biodiversity Fund, Landcare, the Carbon Farming Initiative and most recently through the flawed Emissions Reduction Fund (see Box 8, p.46). None have successfully combined climate and ecological restoration goals at scale.

A new National Nature and Climate Fund that seeks to bring together these goals in a clear and holistic way, building on or replacing some existing programs, is our recommended solution (see Figure 8, p.48). While the current orthodoxy is tipped towards favouring a carbon offsets market, the negatives of such a model outweigh the benefits, which is why we recommend a public fund.

For the financial year 2016-2017 the Federal Government spent \$747 million on biodiversity and carbon drawdown projects, or 0.16% of total government expenditure, though in the forward estimates for 2020-21 this is due to drop to just \$223 million, or 0.04% of total government expenditure.¹³⁸ The biggest items for 2016-2017 were vegetation and savanna burning projects under the Emissions Reduction Fund (\$346 million), Natural Heritage Trust (\$229 million), Green Army (\$74 million), Biodiversity Fund (\$42 million), Environmental Stewardship (\$10 million) and Great Barrier Reef Foundation (\$3 million). In future years, there is strong case to both better target much of the currently budget through a Nature and Climate Fund but also most importantly to increase spending on biodiversity and carbon drawdown projects to at least \$1 billion annually.

Coupled with strong regulations to end destructive deforestation and land clearing, providing substantial financial incentives for landholders to restore land is the breakthrough Australia desperately needs to reverse our calamitous trend of species loss and increasing land damage.

What is needed to fully realise Australia's large-scale ecological restoration opportunity is a clear, holistic plan and program that seeks to maximise carbon drawdown and environmental benefits while also ensuring social and economic returns for regional communities.



Stirling Ranges, Western Australia | Glenn Walker



Box 7

Why a public fund over a carbon offsets model?

1 The land carbon cycle just isn't the same as the fossil fuel carbon cycle

Carbon stored in forests and bushlands and other natural ecosystems is different to fossil fuel carbon. Land carbon is active and naturally cycles between the land, the atmosphere and the ocean. But it is currently out of balance due to excessive deforestation and land clearing, meaning far more carbon is in the atmosphere than it should be.¹⁴³ On the other hand, fossil fuel carbon is usually permanently locked away, for example in seams of coal buried underground. The burning of fossil fuels creates a new permanent source of carbon that has until recently been buried underground for millions of years.¹⁴⁴ Carbon drawdown from the atmosphere and into forests and bushlands is just repaying the land carbon debt from previous deforestation and land clearing—this does not technically offset fossil fuel emissions (see Figure 4, pp.22-23).

Land carbon stores are also inherently more unstable than fossil fuel stores. Fire, droughts, floods, cyclones and pests can release land carbon into the atmosphere—as can deforestation caused by a sudden change in state government policy, as witnessed in Queensland.¹⁴⁵ For example, consider the situation where a polluter offsets the burning of fossil fuels by purchasing land carbon credits, but that land carbon is then released to the atmosphere through a disturbance event. In this case, the total atmospheric store of carbon will have increased, making the offsets ineffective.¹⁴⁶

2 Land sector carbon offsets could delay overall action on climate change

A key risk with land carbon offsets is that fossil fuel-intensive industries will not be required to make necessary structural and technological changes in the short term while it is cheaper

and easier to, purchase land-based offsets credits, particularly with the scale of low cost assisted natural regeneration projects that could be available (see p.40). This risk is particularly acute in the absence of strong overall national emission reduction targets and with a low carbon price where longer-term investment signals to change are lacking.

Delayed action to decarbonise key businesses and industries means steeper reductions and more abrupt changes will be required in the future as emission reduction targets inevitably increase over time and actions in the land sector become more expensive or are exhausted.¹⁴⁷ This makes the inevitable structural economic change in Australia harder. It risks locking in emission intensive infrastructure that could become stranded assets, rather than ensuring clear investment bias towards cleaner infrastructure and helping ensure a smoother transition for the economy and for workers.¹⁴⁸

An example of where an influx of cheap carbon offsets has delayed action in other sectors is the European Union's Emissions Trading Scheme. Here the oversupply of cheap (non-land sector) international offset in the first two phases of the scheme contributed to the bottoming out of the carbon price to under five Euros (alongside the global financial crisis and oversupply of credits at the start of the scheme).¹⁴⁹ The European Commission, in a review of the Emissions Trading Scheme in 2012, said the surplus of credits brought a "real risk of seriously undermining" scheme and that the inclusion of international offset credits "is a major driver for the build up of credits."¹⁵⁰ In 2012, for example, offsets provided the compliance instrument for a quarter of all emissions.¹⁵¹ This led the European Union to end the importation of international credits into the scheme by 2020.¹⁵²

In the European Union's Emissions Trading Scheme, the build up of surplus credits appears to have delayed the necessary transition of fossil fuel and other industries. Independent advice to the United Kingdom from its Committee on Climate Change warned against including offset credits in the scheme, arguing that the "use of credits would substitute for appropriate domestic ambition."¹⁵³ Carbon Market Watch concluded that European Union member states would overachieve the union's 20% greenhouse gas reduction target for 2020 without implementing any new policies or measures.¹⁵⁴

Australia has already taken advantage of a de-facto offsets situation where a reduction in deforestation rates has masked inaction in virtually all other parts of the economy. Under the Kyoto Protocol, Australia has been able to meet our targets by including the land sector in the baseline, with emissions decreasing by -2% from 1990–2016. However, excluding the land sector, Australia's emissions increased by 28%.¹⁵⁵ In other words, Australia has been able to offset declining rates of deforestation against emission reductions in other parts of the economy. It is time Australia stopped using the land sector as cover for climate inaction elsewhere—something a carbon offsets model risks perpetuating.

3 A publicly controlled fund maximises benefits for Australia

Instead of an offsets scheme, funds should be raised from polluters and other sources and directed strategically to ecological restoration projects. Well targeted and supported investment in ecological restoration can yield significant carbon drawdown, environmental and community benefits. But this requires clear planning and prioritisation of biodiversity benefits - something that cannot simply be left to a carbon offsets market (which values the price of carbon alone). A government-administered fund, such as the National Nature and Climate Fund we propose, could through an expert advisory panel ensure that only projects with

multiple co-benefits are funded. In contrast, an open carbon offset markets carries higher risks for perverse outcomes (such as through supporting monocultural plantations). It is far more prone to ad hoc project investment in different geographies rather than targeted investment in key locations where biodiversity and community benefits can also be maximised. In addition, on the open market it is likely that cheaper land carbon offsets will be available internationally, meaning Australian landholders could miss out on the opportunity to fund ecological restoration projects.

4 We need a firewall between the land sector and other polluting industries

For all of the reasons outlined above it is important to have a firewall between the land sector and other industries. This includes reforming greenhouse gas emissions accounting and reporting to separate land sector emission reduction targets from non-land sector targets so there is clear delineation between action on the land and reducing fossil fuel emissions (see Part




Box 8

The flaws of the Federal Government's Emissions Reduction Fund

III of this report).

The Federal Government's current flagship climate policy is the \$2.55 billion Emissions Reduction Fund (ERF), which pays businesses (including landholders) to reduce emissions or draw down carbon out of the atmosphere. About \$2.24 billion has been spent so far for 189 million tonnes of greenhouse gas abatement (which is mostly accounted for over a number of years rather than the year the abatement is purchased).¹⁵⁶ Of this, 122 million tonnes, or 65% has been for vegetation projects, which primarily involve paying landholders not to clear their mature or regrowing forests and bushlands.¹⁵⁷

At the same time, the Federal Government has done virtually nothing to halt deforestation and land clearing, including via its regulatory powers that exist within *the EPBC Act*. Queensland and New South Wales have received 92% of the Emission Reduction Fund money for vegetation projects—the very states where land clearing laws have been weakened. At the current rate of 49 million tonnes of carbon emissions per year from deforestation (using the Federal Government's conservative numbers),¹⁵⁸ the 122 million tonnes of purchased abatement is cancelled out in just two and a half years.

Under the Emissions Reduction Fund, the average cost of a tonne of carbon for abatement is \$11.83.¹⁵⁹ In 2017, there has been 49 million tonnes of deforestation carbon emissions;¹⁶⁰ at

\$11.83 per tonne, that is a minimum cost of \$579 million of deforestation per year. When using our estimation of the potential carbon emissions that includes native forest logging and sparse bushland (up to 100 million tonnes per annum, see pp.54-55), the sum is upwards of \$1.18 billion per year worth of deforestation and land clearing. In other words, the lack of regulation of deforestation and land clearing completely undermines any gains made under the Emissions Reduction Fund.

In addition, the Emissions Reduction Fund does little to seek to maximise ecological restoration and biodiversity benefits alongside the carbon abatement or prioritise where investment occurs. It is singularly focussed on carbon abatement and is missing a large opportunity to align multiple ecological restoration benefits into one program.

As a guiding principle, strong regulation of deforestation and land clearing must come before any investment in land sector carbon drawdown. While there are some elements of the Emissions Reduction Fund that could be transferred or built upon for our proposed National Nature and Climate Fund (see Figure 8, p.48), in its current form the Emissions Reduction Fund fails on the fundamentals and is a poor use of public funds.

Policy actions



Establish a National Nature and Climate Fund and provide tax incentives to enable large-scale ecological restoration, ensure minimum biodiversity standards and support communities to take advantage of this economic opportunity.

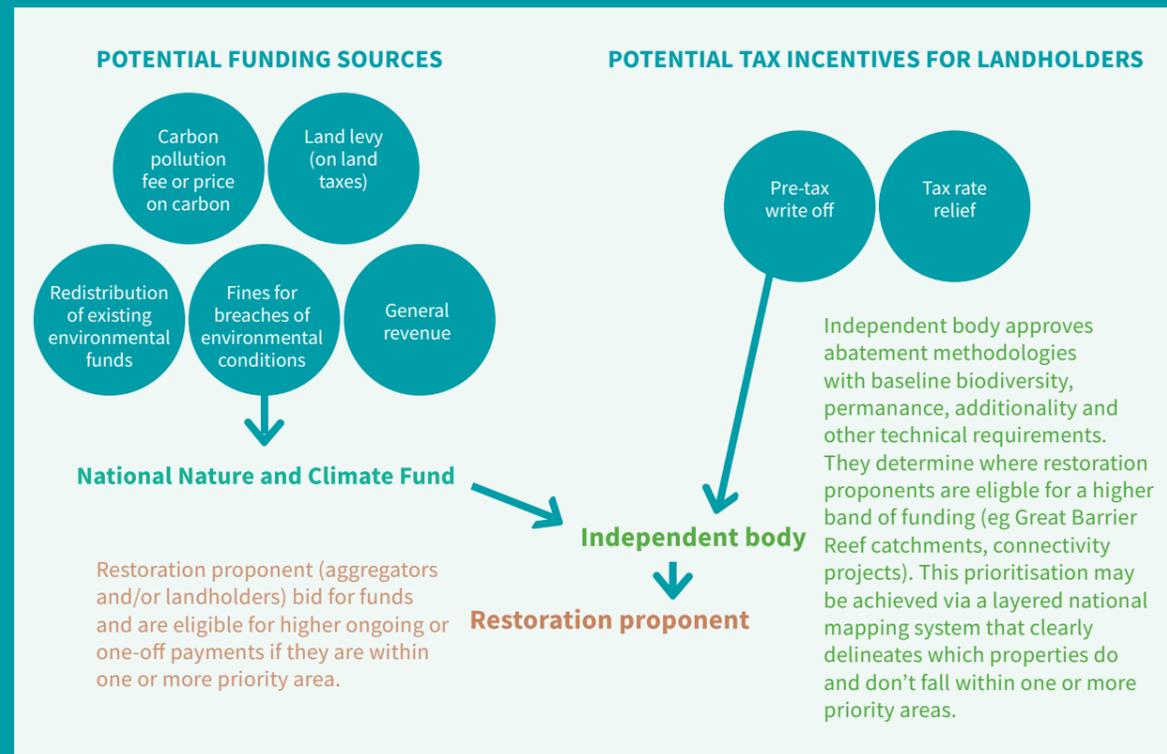
Why? There are many benefits to investing in ecological restoration, including climate mitigation and adaptation, biodiversity improvement, landscape and waterway health, Great Barrier Reef health, community wealth generation, and job creation. An holistic approach that seeks to maximise all of these benefits together wherever possible will deliver the best value for money and positive impact for the country and the climate.

How? Establish a National Nature and Climate Fund for ecological restoration projects and further tax incentives for participating landholders and businesses (see Figure 8, p.48). All projects should meet minimum standards for biodiversity and resilience outcomes - including by excluding monoculture plantations. The Federal Government should take the lead and work with state and territory governments to determine priority areas for ecological restoration, ensuring that the benefits from these projects flows to a wide range of communities and landholders. This prioritisation could be determined by an independent expert panel. This includes providing skills and enterprise development, infrastructure, and support for lower income / disadvantaged communities to remove barriers to participation in projects.

Ensure there is no direct offsetting of fossil fuel emissions with land carbon credits either domestically or internationally.

Why? The science on land carbon cycles versus fossil carbon cycles does not support the proposition that land carbon drawdown can offset fossil fuel emissions: they are subject to unique permanence concerns. Additionally, offset markets under some sort of carbon pricing scheme run the risk of delaying action from polluters in other parts of the economy by providing a cheap or cheaper supply of credits as opposed to paying the full price of pollution.

How? The Federal Government should ensure there is no direct offsetting of fossil fuel emissions with land carbon credits either domestically or internationally.


Figure 8


Proposed National Nature and Climate Fund

The fund—presented here as a model to build on rather than a fixed idea—could draw on multiple funding sources, with further tax incentives provided for landholders to participate. Restoration proponents (either landholders or aggregators on multiple landholders' behalf) could then apply to go on the fund register, much like the existing Emissions Reduction Fund system. To successfully be put on the register, projects must meet minimum biodiversity, permanence, additionality and other technical requirements—explicitly excluding monoculture plantations (see Box 9, p.49). This should include explicit measures to ensure payments do not encourage an increase in deforestation or other emission-intensive activities elsewhere on a landholders property, thereby cancelling out any perceived emission reduction (in other words, localised carbon leakage).

Again like the Emissions Reduction Fund, this could be achieved by setting strict standards for ecological restoration methods—that is, any proposed project must elect the method they are seeking to employ and how they will meet the standards. These methods could be set by

the independent body or another appropriate technical committee.

The independent body—made up of relevant experts and community interests—could set national spatial priorities for ecological restoration with a mapping system as the key output. Developed through consultation with other experts and community groups and taking into consideration bioregional context, the mapping system could allow for multiple layers of priorities, where some parcels of land may meet more than one priority.

If a project is successful in meeting the first hurdle of getting on the register, the independent body—advised by the relevant Federal Government department—could assess each project's eligibility for further payments based on how many priority ecological restoration areas it falls within. A restoration premium could then be decided for each project (effectively a guarantee of minimum funding, under terms and conditions), so proponents are then able to assess how they approach the reverse auction bidding stage. This could include an offer of specific tax incentives as an addition or alternative.

Once on the register and with the restoration premium

calculated, regular reverse auctions (like the Emissions Reduction Fund), could be used to allow competitive bidding for baseline funding. This baseline funding could be set as a dollar per tonne of carbon. If a project has been allocated a high restoration premium, then they would have the capacity to bid lower and out-compete other projects that don't fall within as many priority ecological restoration areas. This means the funding would naturally skew to high carbon drawdown, high ecological restoration priority projects.

The Federal Government could also assess the effectiveness of buying properties, including in partnership with non-government organisations (such as Bush Heritage and the Australian Wildlife Conservancy). In some particular

circumstances, this may be a better use of public funds than payments to restoration proponents.

There are clearly a good deal of details to be worked through for this type of model to work, particularly the mapping and pricing that informs the restoration premium, but it also builds on much of the architecture already existing from the Carbon Farming Initiative and now the Emissions Reduction Fund. There may be variations of this model that work more effectively and efficiently and another option could include charging the independent body to assess and devise the most appropriate system of payments, but the fundamentals of paying for dual-carbon drawdown and ecological restoration priorities should remain.


Box 9

Why monoculture plantations should be excluded in place of biodiverse plantings

Monoculture plantations—made up of tree species selected for their ability to grow rapidly with as much biomass as possible—have the capacity to draw down carbon relatively fast.¹⁶¹ For this reason the forestry industry and some researchers suggest this type of carbon forestry could play a large role in Australia's efforts to bring down our greenhouse gas emissions and drawdown carbon out of the atmosphere.¹⁶²

But there are major pitfalls with this assumption. Firstly, while able to initially grow quickly, monoculture plantations actually store less carbon than natural forests and bushlands under the same environmental conditions (in some cases significantly less carbon),¹⁶³ so any strategy favouring monocultures limits the carbon drawdown potential over the long-term. Secondly, monocultures are less resilient than natural forests and bushlands to threats such as fire, drought and climate change,¹⁶⁴ and can even spread diseases and pests to neighbouring

native forests.¹⁶⁵ Finally, supporting monoculture plantations misses the large and important opportunity to restore deforested and degraded landscapes and maximise environmental outcomes.

The win-win of biodiverse plantings is that, with the right strategy and prioritisation, they can maximise both carbon drawdown and environmental benefits.¹⁶⁶ Across much of the cleared areas of Queensland and New South Wales, new plantings are not even required as there are forests and bushlands that can naturally regrow if assisted to do so. In both cases, such regrowing forests and bushlands would be naturally regenerating over time, saving ongoing management costs. There is simply no case to justify funding or encouraging high risk monoculture plantations when these superior options exist.

Provide world-leading transparency



THE URGENT NEED FOR A NATIONAL MONITORING SYSTEM

Data is critical to understanding deforestation and land clearing and monitoring the effectiveness of policy responses. An effective national deforestation and land clearing data system must be transparent, accurate, up-to-date and regularly published. It must provide: a picture of vegetation change across the country; a picture of the environmental health and values of forests and bushlands (for example, whether it is intact, degraded or regrowing); and measurements of the emissions lost or carbon drawn down from clearing and restoration. It must also be publicly available in a digestible format. The current system is

inadequate when assessed against these criteria. National datasets that attempt to measure deforestation and land clearing and the health of remaining stands of forests and bushlands do exist. However, these are not sufficiently detailed nor are they regularly published and updated (see Table 3, p.53). As a result, the default dataset on national vegetation cover and health has become the National Greenhouse Accounts, which are used for international reporting on national emissions, reporting annually but with a two year time lag. However, this system does not currently provide public data on the total national land clearing figures, and the associated greenhouse gas emissions from that activity.

 Box 10

Limitations of National Greenhouse Accounts in providing national deforestation and land clearing dataset

- 1 There is no disaggregated data on the clearing of sparse, low height bushlands.**
 The National Greenhouse Accounts only record deforestation of forests and bushlands with a minimum of 20% canopy cover, a minimum height of two metres, covering a minimum area of 0.2 hectares. This was the definition of forests chosen by Australia for the purposes of reporting under international climate instruments (it is worth noting that the Food and Agriculture Organisation of the UN and other countries use a far more expansive definition of forest, for example a 10% canopy cover¹⁶⁷). Instead, bushland that does not meet this definition is classified as sparse woody vegetation. For bushland under this threshold, losses are recorded in an aggregated category which includes cyclones and the cyclical dieback of vegetation during drier periods. In other words, purposeful clearing by developers isn't separated from other natural events in this category. We do not have a national record of how much sparse woody vegetation is being cleared.
- 2 Native forest logging is measured and accounted for differently to deforestation.**
 Logging is classed in a forest management category, even though it too destroys conservation values and releases greenhouse gases into the atmosphere. Top line national figures of hectares of native forest logging are provided, but not a state-by-state or regional breakdown of associated emissions.
- 3 There remains significant discrepancies between the National Greenhouse Accounts and Queensland SLATS.** Importantly, there are clear discrepancies between the National

Greenhouse Accounts data on hectares cleared and the data on hectares cleared from Queensland SLATS (see Figure 9, p.56).

Australia's primary national environmental reporting system—the State of the Environment Report—uses the National Greenhouse Accounts' incomplete data to measure and explain the impact of deforestation and land clearing on our environment. At a basic level, this is not sufficient as the climate accounting does not measure a broader range of environmental values such as loss of habitat for threatened species. But of most concern is that the report highlights land clearing as easily one of the biggest threats to Australia's environment,¹⁶⁸ yet it is not transparent about the true scale of this problem as it does not count all land clearing (but only that portion defined as "forest").

The only jurisdiction with regular, complete and reliable data on deforestation and land clearing is Queensland, which publishes its annual Queensland SLATS report. Though there is a time lag in reporting—it is usually published a year or more after the period covered—it offers the country's most comprehensive picture of where clearing is happening and who is doing it, including a detailed breakdown by region and vegetation community. The methodology incorporates detailed validation data captured from extensive field surveys built up over decades and exhaustive manual checks on a computer screen by trained remote sensing scientists. Twenty-eight eminent scientists, including remote sensing specialists, all vouch for Queensland SLATS as Australia's best dataset.¹⁶⁹

 Table 3

Assessment of Australia's deforestation and land clearing datasets

	Assessment
Federal	<ul style="list-style-type: none"> No single accurate comprehensive dataset for ongoing monitoring of deforestation and land clearing. Instead, multiple datasets are used, each with unique limitations, as outlined below: The Vegetation Assets, States and Transitions (VAST) classifies vegetation condition at a coarse one kilometre grid scale and is not regularly updated—was last updated in 2008. Native Vegetation Information System (NVIS) classifies Australia's major vegetation groups at 100m grid scale, including recording where vegetation has been cleared. However, it was last updated fully in 2012 and the previous update was in 2001. National Forest Inventory (NFI) classifies Australia's forests at 100m grid scale but does not distinguish between cleared areas and other non-forest areas (which are all one uniform colour in the maps)—was last updated in 2013, and before that 2008 and 2003. National Greenhouse Accounts (sometimes referred to as the National Greenhouse Gas Inventory) predominantly used to measure emissions from land use change but drawn on for deforestation and land clearing analysis despite limitations outlined—was last updated this year for 2015 and is updated with a two year lag annually. Uses a 25m grid scale.
QLD	<ul style="list-style-type: none"> Queensland SLATS comprehensively measures woody vegetation loss of all forests and bushlands at a 30m grid scale. It was last updated this year for 2015–2016 and is updated with a yearly lag.
NSW	<ul style="list-style-type: none"> Vegetation Information System is under development. NSW has trialled studies similar to Queensland SLATS but the last update was 2011.
WA	<ul style="list-style-type: none"> No statewide monitoring system—the Land Monitor Project covers some vegetation monitoring for the south-west region, but even this is sporadic.
NT	<ul style="list-style-type: none"> No territory-wide monitoring system—the Queensland SLATS team was at one stage engaged to perform this analysis, however this did not eventuate.
SA	<ul style="list-style-type: none"> No statewide monitoring system—the Change Detection Program (CDP) covers some vegetation monitoring in agricultural areas but is not publicly available.
VIC	<ul style="list-style-type: none"> Native Vegetation Information Management (NVIM) system has one report from 2008 on statewide native vegetation cover— no further information is available.
TAS	<ul style="list-style-type: none"> Monitoring Vegetation Extent Program (MVEP) covers statewide vegetation changes at five-yearly cycles—last available for 2005–2010.

FLAWS IN AUSTRALIA'S EMISSIONS AND CARBON DRAWDOWN ACCOUNTING SYSTEM

The purpose of Australia's National Greenhouse Accounts is to clearly track and report on what is causing Australia's greenhouse gas emissions so policies can then be designed to bring them down. The land sector is one of five sectors measured for greenhouse gas emissions in National Greenhouse Accounts—alongside energy, industrial processes, agriculture, and waste. Greenhouse gas emissions from deforestation as well as carbon drawdown from regrowing forests and bushlands and other restoration measures are accounted for within this sector.

Land sector accounting is a complex and evolving science. This is because—unlike the other four sectors in the National Greenhouse Accounts—there are both significant emissions and carbon drawdown that need to be measured. On top of this, there are continental-scale land use changes to track and natural disturbance events such as fire, flood and drought that complicate the ability to determine what is and isn't significant human-induced change.

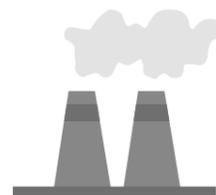
To make matters more confusing, the United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol have two separate (but related) classification systems for tracking and recording land sector emissions and carbon drawdown. Australia uses these interchangeably in public reports that track our greenhouse gas emissions. While the details are yet to be agreed, the accounting system under the Paris Climate Agreement appears likely to be based on the

more comprehensive UNFCCC system, which means the Kyoto Protocol system will be phased out.

In most summary public reporting—those reported by the media or used most extensively by policy-makers—the greenhouse gas emissions from the land sector are presented as a net figure. That is, only the balance between emissions and carbon drawdown is shown, rather than separating this out to clearly show that there remains a significant source of emissions from deforestation and land clearing. This is problematic as it defies the purpose of the National Greenhouse Accounts—without full transparency and clear communications on what is causing emissions, it is very difficult to design the appropriate policy responses.

For example, in recent years, the net land sector emissions for Australia have included negative figures (-8 million tonnes in 2015 and 2013, and -6 million tonnes in 2012).¹⁷⁰ This is primarily due to the following: carbon drawdown from newly growing trees in an expanded national timber plantation estate where there was a spike in new plantings between 2000–2010; some regrowing native forests and bushlands elsewhere, including recovery from fire; and less logging of native forests, which dropped from about 130,000 hectares in 2000 to about 60,000 hectares in 2015¹⁷¹ (see page on why net reporting is problematic). Although the Federal Government has begun providing summary land clearing emission figures in supporting data in emission projection reports,¹⁷² even this does not in fact cover all emissions from the destruction of forests and bushlands

Combined, all emissions from native forest and bushland destruction emissions could feasibly be as high as 100 million tonnes of carbon per annum—equal to almost 20% of Australia's greenhouse gas emissions or about half of the carbon pollution from all of Australia's coal-fired power stations



Box 11

Limitations of National Greenhouse Accounts for emissions and carbon drawdown accounting

- 1 There is no disaggregated data on the clearing of sparse, low height bushlands.** The land clearing emissions figure does not include the clearing of sparse or low height bushlands falling outside of the technical definition of forest. Losses of this type of bushland have averaged about 1,700,000 hectares annually for the past 15 years,¹⁷³ which includes losses from cyclones and cyclical dieback of vegetation during droughts, alongside mechanical or other forms or clearing. It is very difficult to estimate what the annual emissions from this clearing would be given there is no attempt to quantify this separately in the national data. However, it may be in the realm of at least five million tonnes of carbon and possibly more.¹⁷⁴
- 2 Native forest logging is measured and accounted for differently to deforestation.** The land clearing category does not include logging of native forest emissions, which could be as high as 38 million tonnes of carbon per annum on public native forest lands alone.¹⁷⁵ Instead, harvested native forests are reported in the National Greenhouse Accounts as a net figure separate to deforestation. This includes emissions and carbon drawdown from regrowing

native forests in designated production areas and plantation forestry; this is consistently a net drawdown total (for example 2015 is recorded as -29 million tonnes of carbon).¹⁷⁶

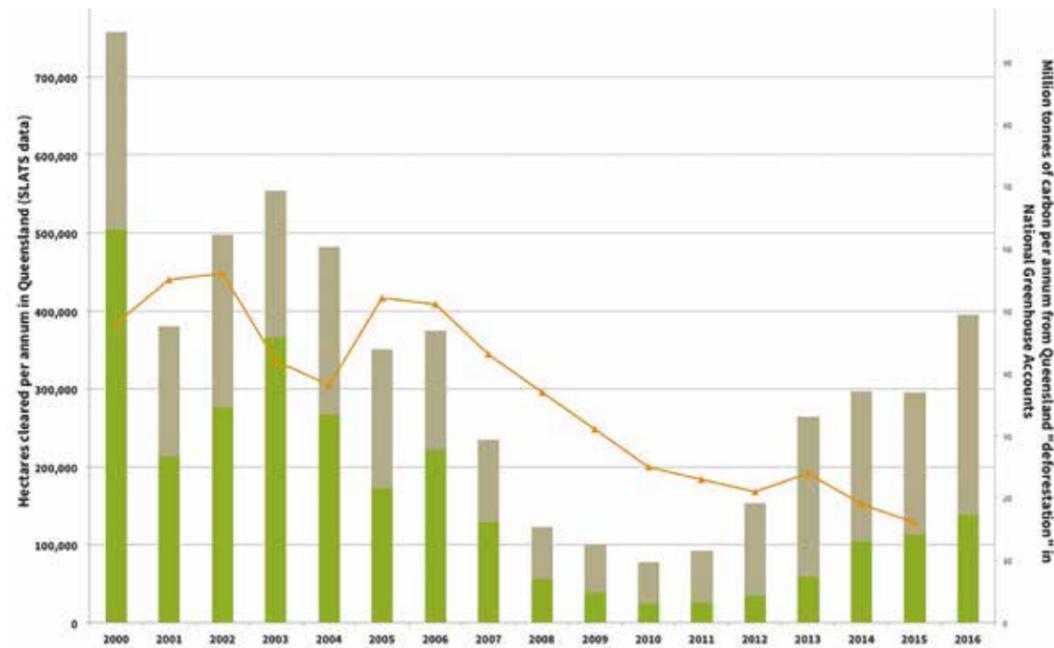
3 There remain significant discrepancies between the National Greenhouse Accounts and Queensland SLATS. There are large discrepancies between Queensland SLATS data and the National Greenhouse Accounts' Queensland emissions data. Discrepancies exist between the two datasets for the quantum of hectares recorded as destroyed, and the associated emissions (see Figure 9, p.56). These issues have been identified for over a decade,¹⁷⁷ yet the Federal Government still cannot fully reconcile the differences. This is underscored by large data corrections made in the recent annual National Inventory Report for the National Greenhouse Accounts where from the period of 1990–2015, an additional 5 million hectares of clearing has been added to the forests accounts, bringing those accounts closer to the Queensland figures but still not fully reconciled with Queensland SLATS.

Combined, all emissions from native forest and bushland destruction emissions could feasibly be as high as 100 million tonnes of carbon per annum—equal to almost 20% of Australia's greenhouse gas emissions or about half of the carbon pollution from all of Australia's coal-fired power stations.¹⁷⁸ The figure would be higher still if uncounted emissions from ongoing soil erosion caused by deforestation and land clearing (leading to ongoing soil carbon loss) were properly accounted for.¹⁷⁹ Yet the way the land sector

data is presented, this large source of carbon pollution is placed out of sight and out of clear public gaze. This includes the fact that much of the deforestation and land clearing undertaken is for agriculture, yet these emissions are not really attributed to this sector the way they are presented in the National Greenhouse Accounts. The case for a new, fully transparent national deforestation and land clearing monitoring system, including reporting of emissions, is clear.

Figure 9

Queensland SLATS land clearing data compared with Queensland National Greenhouse Accounts forest emissions



The blue bars are the total hectares of land cleared for that year (with a half-year adjustment as Queensland SLATS is recorded by financial year, so for example 2015 = 2014–2015). The dark blue represents remnant vegetation cleared—the technical definition being relatively undisturbed ecosystems where the vegetation is at least 70% the height of its undisturbed state and with a canopy covering more than 50% of its undisturbed predominant canopy cover. The lighter blue represents non-remnant vegetation—ecosystems that don’t meet the above definition, and encompass regrowing native forests and bushlands. These are shown separately as they are relevant to carbon emissions, that is, remnant vegetation tends to carry more carbon. The orange points and line represent the carbon emissions recorded in the National Greenhouse Accounts according to Kyoto accounting standards (Queensland figures are not available for UNFCCC accounting standards and are only available to 2015). The Queensland SLATS data has been used here as it is indisputably the most robust land clearing dataset.¹⁸⁰

Clearly there is not high alignment between

the National Greenhouse Account data and the Queensland SLATS data. While there is a general agreement in the trend of declining emissions and clearing from 2006 to 2011 (when Queensland’s tighter land clearing regulations came into force), either side of this there is little alignment. In particular, the National Greenhouse Account data fails to record the large spike in land clearing / emissions in 2000 and 2003–2004. It is trending down in most recent years despite the growth in land clearing as recorded by Queensland SLATS.

These are not trivial differences. According to the National Greenhouse Account data, Queensland clearing in 2015 was about 60,000 hectares less and 8 million tonnes of carbon emissions less than in 2013 (again going against the Queensland SLATS trend). In other words, a 60,000 hectare difference can equate to almost 10 million tonnes of carbon emissions.

The Federal Government asserts that the differences between the two systems are a result of divergent methodologies to serve different purposes (Queensland SLATS for land clearing

monitoring, the National Greenhouse Accounts for emissions from the land sector).¹⁸¹ This includes having different definitions for age of vegetation, and the fact that the National Greenhouse Accounts only covers forest (20% canopy cover, potential of growing to two metres), whereas Queensland SLATS includes all vegetation communities. While the Federal Government may argue that non-forest land clearing emissions are captured in another part of the National Greenhouse Accounts as sparse

woody vegetation, it is impossible to properly verify this as that part of the data is not fully disaggregated so is not publicly available. What is clear is that the true picture of deforestation and land clearing emissions is not fully known or well communicated. If the National Greenhouse Accounts methodology is unable to accurately track national vegetation change, then it will not be possible to accurately count emissions from that vegetation change.

THE CASE FOR REFORMING AND SEPARATING OUT LAND SECTOR CLIMATE ACCOUNTS

Carbon stored in forests and bushlands and other natural ecosystems is different to fossil fuel carbon. Land carbon is active and naturally cycles between the land, the atmosphere and the ocean. But it is currently out of balance due to excessive deforestation and land clearing, meaning far more carbon is in the atmosphere than it should be.¹⁸² On the other hand, fossil fuel carbon is usually permanently locked away, for example in seams of coal buried underground. The burning of fossil fuels creates a new permanent source of carbon that has until recently been buried underground for millions of years.¹⁸³ Carbon drawdown from the atmosphere and into forests and bushlands is just repaying the land carbon debt from previous deforestation and land clearing—this does not technically offset fossil fuel emissions (see Figure 4, pp.22-23).

Despite these important differences, the standard international approach for setting and accounting for national emission reduction targets allows countries to adopt one overall net target set to a baseline year; it does not recognise the intrinsic differences between land and fossil fuel carbon. So for example, a country can say a tonne of carbon emissions from burning coal is “negated” by a tonne of carbon estimated to be stored in a forest.

The scientifically dubious foundation provides a basis for some perverse policy outcomes and comes with risks. Importantly, it underplays the instability of some land carbon stores—where fire, droughts, floods, cyclones and pests can return carbon from these sources into the atmosphere.¹⁸⁴ For example if

Australia were to focus heavily on meeting our national target under the Paris Climate Agreement by ecological restoration *without* urgent action in other sectors, there is a risk of a sudden increase in emissions from natural or human-caused disasters.

Another key risk is that fossil fuel-intensive industries will not be required to make necessary structural and technological changes in the short term while it is cheaper and easier to cut emissions from the land. This makes structural economic change harder as it means steeper reductions and more abrupt changes will be required in the future as emission reduction targets inevitably increase and actions in the land sector are exhausted.¹⁸⁵ It risks locking in emission intensive infrastructure that could become stranded assets, rather than ensuring clear investment bias towards cleaner infrastructure and helping ensure a smoother transition for the economy and for workers.¹⁸⁶

Unfortunately Australia has to date taken full advantage of international accounting rules to use land sector emissions to delay action in other sectors. Indeed as the Kyoto Protocol was being negotiated, Australia successfully negotiated to use our historically very high 1990 land sector emissions to be included in our baseline emissions calculations. This is the reason why Australia has been able to meet our Kyoto Protocol targets. Including land sector in the baseline, Australia’s emissions decreased by -2% from 1990–2016. However excluding the land sector, Australia’s emissions increased by 28%.¹⁸⁷ In other words, Australia has been able to offset declining rates of deforestation against emission reductions in other parts of the economy and has made no emissions reductions in the key sectors driving emissions, such as the energy sector.

Tellingly, since the negotiation of the Kyoto Protocol, the international community has consistently raised questions and concerns about Australia's approach to and transparency with our climate accounting, particularly the land sector.¹⁸⁸

Under the Paris Climate Agreement, Australia will be using 2005 as the baseline year for emission calculations (where land sector emissions were about half that of 1990), the capacity to further reduce deforestation and land clearing, and draw down substantial amounts of carbon from the atmosphere, means that Australia may continue to be able to delay mitigation action in other parts of the economy—particularly if our emission reduction targets remain so low (currently 26-28% to 2030 on 2005 levels).

On top of this, land sector emissions are not fully disaggregated from carbon drawdown in the National Greenhouse Accounts, so deforestation and land clearing sources of emissions are not well communicated or understood. It means, for example, that emissions from destroying an old growth or remnant forest or bushland can be superficially netted off against a growing timber plantation, when in reality the mature forest or bushland is a higher value carbon store due to its relative stability (not to mention environmental and community values). This failure to properly account for more resilient natural carbon stores and the overall poor transparency of the accounts means it is difficult to have a true picture of land sector emissions and carbon storage. Without this true picture, it is difficult to measure how effectively (or not) different policy responses are in bringing greenhouse gas emissions down within the land sector, or determine where opportunities lie for further emission reductions.

Acting urgently on deforestation and ecological restoration is an essential part of the climate solution. It just must be recognised that it is no substitute for keeping fossil fuels in the ground.¹⁸⁹

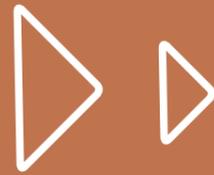
In recognition of its uniqueness, the land sector should have its own separate transparent emissions accounts and policy prescriptions. This includes providing two separate accounts and targets as part of our international emissions reporting: one for the land sector and one for all other sectors. The land sector target should be ambitious and include bringing down deforestation and land clearing levels to virtually zero, and drawing down significant amounts of carbon out of the atmosphere over the coming decades. Considering the numbers presented in this report, including modelling from Reputex, the sequestration target should include at minimum between -100 and -150 million tonnes of carbon per annum.

Reformed land sector accounting should also provide full disaggregated information on emissions and carbon drawdown, available at a state and regional basis and attributing deforestation and land clearing by sector. In addition, the total amount of carbon currently stored in land systems and the full potential carbon carrying capacity, should be measured and categorised by the stability of the carbon (using health and naturalness of vegetation as a surrogate).¹⁹⁰ This means rather than just measuring emissions and carbon drawdown, there would be clear measurements of how much carbon exists or could exist as a whole within healthy forests and bushlands in Australia. While under the Paris Climate Agreement there will likely be standardised emission accounting practices, given the large existing and potential role of the land sector in our emissions profile, Australia should be setting an example of world-leading transparency above and beyond the minimum requirements.

Acting urgently on deforestation and ecological restoration is an essential part of the climate solution. It just must be recognised that it is no substitute for keeping fossil fuels in the ground.



Policy actions



Implement a national deforestation and ecological restoration monitoring program, with regular, detailed data made available to the public.

Why? There is currently a patchwork of monitoring systems for vegetation across the country, including a poorly resourced national system without the depth to provide reliable state, regional and sectoral breakdown of data. This lack of high quality data makes effective policy making difficult. Without accurate data, it is difficult to set effective policy and to measure whether policies are being effective.

How? The Federal Government should establish a national system that monitors all deforestation and land clearing, and the progress of ecological restoration efforts—including disaggregated greenhouse gas emissions. It should take the best elements from the National Greenhouse Accounts, Queensland SLATS and the latest remote sensing technologies. This includes Queensland's rigorous approach to manually validating suspected clearing events and attributing clearing events by sector. The data should be readily available to the public as soon as it is scientifically validated—including raw GIS data, interactive maps and detailed breakdown of clearing, emissions and carbon drawdown by land use and sector.

Reform greenhouse gas emissions accounting and reporting to fully disaggregate land sector data and separate land sector emission reduction targets from non-land sector targets.

Why? The current accounting and reporting system is opaque and masks the true picture of emissions from deforestation and land clearing by presenting land sector emissions as net figures, which include carbon drawdown in recovering forests and bushlands. The growing role of ecological restoration and the carbon drawdown this represents will also mask emissions from other sectors if land sector figures are not carefully presented as separate to non-land sector targets.

How? The Federal Government should account for and provide full disaggregation of land sector emissions and carbon drawdown, as well as recording carbon currently stored in land systems and categorising the stability of the carbon (using health and naturalness of vegetation as a surrogate). This data should be provided at national, state and regional levels, and attribute deforestation and land clearing by sector. The Federal Government should also provide two separate international accounts and targets: one for the land sector and one for all other sectors.



Conclusion

Australia's forests and bushlands are central to our national identity, essential to our survival, and are homes for our much-loved native wildlife. They draw down and store carbon, helping to provide a brake on runaway climate change, and help keep our waterways and the Great Barrier Reef healthy. We all share the responsibility to protect these vital natural assets for future generations.

After nearly 230 years of European settlement in Australia and the widespread deforestation that followed, just 50% of our forests and bushlands remain intact. Despite progress being made over the past 30 years in reducing deforestation and land clearing rates, the bulldozers are back and destruction of forests and bushlands is once again on the rise. This is driven largely by Queensland's former Newman Government from 2012 weakening land clearing laws, but also includes ongoing deforestation and native forest logging across Australia.

Eastern Australia is now designated a global deforestation hotspot, alongside places like the Amazon, the Congo and Borneo. An MCG-sized area of forests and bushlands is now being cleared every three minutes. This is killing tens of millions of native animals each year—including the iconic koala—while harming the land, polluting rivers and damaging the Great Barrier Reef.

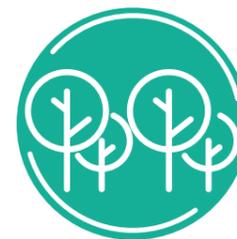
It is not just our natural world and wildlife that are under threat. After declining over the last decade,

carbon pollution from deforestation and land clearing is once again skyrocketing—now equalling a third of emissions from all of the coal-fired power stations in Australia. When native forest logging emissions are included, this is equal to at least half the carbon pollution of all coal-fired power stations.

The regulatory system has completely failed to stop this escalating destruction. Australia also has a seriously inadequate deforestation monitoring system and problems with monitoring and accounting associated greenhouse gas emissions. Strong action must be taken by governments—particularly the Federal Government—to end this destruction once and for all and provide world-leading transparency of data.

Action should not stop at ending deforestation and land clearing. Australia must seize the opportunity to become a leader in large-scale ecological restoration and undo some of the damage already done by human industrialisation of our natural environment. This will bring back wildlife from the brink of extinction and help restore the health of our land and waterways. It will draw down significant amounts of carbon and provide a new income stream for landholders. It will ensure much greater investment and financial support is flowing from the cities to the bush in acknowledgement of the critical role landholders play in restoring and caring for our natural heritage.

These are the three key actions Australian governments must take now:



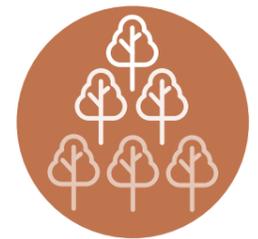
Permanently protect our forests and bushlands

Enact and enforce strong deforestation laws and disallow burning native forests for renewable energy



Transform deforested and degraded landscapes

Establish a National Nature and Climate Fund to enable large-scale ecological restoration



Provide world-leading transparency

Implement a national deforestation and ecological restoration monitoring program and reform emissions accounting



Pilbara, Western Australia | Glenn Walker

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