

RACE TO THE BOTTOM

The selling out of nature in Australia since Rio



REPORT DETAILS

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SUMMARY

Twenty years ago, at the first United Nations Earth Summit, the Australian Government signed the Rio Declaration and committed to transforming the way Australians treat the environment. Australia signed each of the subsequent international agreements intended to propel national action to overcome the great planetary threats of climate change, biodiversity loss, and desertification and degradation.

Australia has a great deal at stake. About 600,000 of the planet's species (more than 5% of the total) live in our seas and on land, including more than 12% of terrestrial vertebrates and fungi. Most species on land and in our southern oceans are found only here, and we have more endemic terrestrial vertebrates and plant families than anywhere else. Our biodiversity and economy are highly vulnerable to climate change and our ancient landscapes are suffering great degradation.

Yet, 20 year later, on the eve of the third Earth Summit (Rio+20), we are heading the wrong way, and rapidly so, on virtually all indicators. Apologists will cite a long list of environmental programs and strategies with laudable goals, and a few successful outcomes, but in terms of what counts – whether our land is returning to health, where we are protecting our species and ecosystems, whether we are playing our part in stopping dangerous climate change – Australia is unequivocally failing. And since Rio, we have been world leaders in failure: per person, responsible for more greenhouse gas emissions, more habitat lost, and greater biodiversity decline than any other developed country.

REDUCE GREENHOUSE GAS EMISSIONS – FAIL

Australia is a profligate user of fossil fuels and has been the highest per capita emitter in the OECD for most of the two decades since Rio. Emissions (excluding land use change) have risen by about 30% since Rio. Australia's burgeoning coal exports will be a major impediment to global efforts to keep mean temperatures within safe limits.

HALT THE LOSS OF BIODIVERSITY – FAIL

Since Rio, the number of listed threatened fauna has risen by 249 (178%) and the number of threatened plants by 417 (47%), to a total of almost 1700, and many more species not listed are in steep decline. We have been per capita leaders in biodiversity decline, and also one of the world's most rampant land clearers for much of the period since Rio. But progress has been made in protecting habitat: clearing of remnant bush has recently been curtailed by about two-thirds, and about 6% of Australia's land and marine area have been added to reserves since Rio. Although there is some better management of destructive industries (grazing, fishing and mining), major threats (habitat loss, invasive species, damaging fire regimes, grazing, water extraction, mining and climate change) have not been averted or reversed.

REVERSE LAND DEGRADATION IN AUSTRALIAN DRYLANDS – FAIL

Australia has major degradation problems, particularly soil erosion, acidification, salinity and loss of soil carbon. Since Rio, some progress has been made in improving land management, and the spread of salinity may have slowed due to drought. But far too little has been done to address legacy and ongoing problems due to overclearing and overgrazing, and irreparable damage is resulting.

Australia has no excuses. By global standards, we are extremely wealthy. Despite being only the world's 54th most populous nation, we have the 13th largest economy and the 6th largest per capita gross domestic product. We rank second on the Human Development Index, a combined measure of income, education and health. And yet the work of preventing and repairing damage to our environment is chronically and manifold underfunded, and there are systemic economic biases in favour of destruction. Taxation subsidies offered to damaging industries – mining in particular – far exceed the level of public funding for the environment.

Australia has the economic and social capacity to move to a low carbon economy, protect biodiversity and remediate degradation but political priorities and allocation of public resources favour the converse of these goals. Benefits to the few in the present have more political weight than the great cost to be borne by all in the future.

At a time when Australia clearly needs stronger environment laws, they are about to be weakened. At the urgings of business, which has been granted an insider advisory role not permitted for any other sector in society, the Council of Australian Governments is proposing to fast track development and transfer most federal powers of assessment and approval under national environment laws to state and territory governments, which have frequently demonstrated an aversion to acting in the national environmental interest.

In the following report, we review Australia's environmental performance in some key areas in the decade since the second Earth Summit in Johannesburg in 2002.

Protected areas: Since 2002, there has been a moderate increase, with an additional 4% of land area (much of it Indigenous Protected Areas) and 3% of marine area added to the reserve system. A major advance was the rezoning of the Great Barrier Reef Marine Park to strictly protect 33%. A considerable further expansion of the reserve system is required to adequately encompass threatened biodiversity and protect representative ecosystems. Undermining effectiveness are the predominant focus on multiple use marine parks, an increasing push to use terrestrial reserves in damaging ways, and inadequate management to prevent threats such as the catastrophic decline of mammals in northern Australia.

Mining: The past decade has seen enormous growth in the mining of fossil fuels. Climate change and other long term impacts are ignored in the highly deficient regulation of mining. Associated infrastructure such as ports and processing plants are likely to have a major impact on coastal environments and more shipping will increase risks of oil spills. UNESCO has warned Australia that the Great Barrier Reef World Heritage Area could be listed as *In Danger* if current mining projects proceed as proposed.

Climate change: Australia has been a profligate user and exporter of fossil fuels over the past decade and recent and looming approvals for coal mining will undermine the planetary capacity to mitigate climate change. Australian biodiversity will become increasingly vulnerable to climate change damage due to interactions with other stressors such as habitat loss and invasive species.

Land clearing: Australia has lost several million hectares of wildlife habitat, but substantial progress has been made through stronger vegetation laws in Queensland and NSW. High value areas continue to be cleared for urban expansion, mining and agriculture; vegetation quality is deteriorating over large areas; and the legacy of past clearing and fragmentation is manifesting in severe biodiversity declines. Australia has barely embarked on the necessary task of restoration. There is increasing recognition of the immense value of the large tracts of remnant vegetation across northern Australia for biodiversity and carbon storage but also conflicting proposals for large-scale development.

Grazing: There have been advances in slowing land clearing and improving grazing management but grazing remains the dominant pressure over more than half of Australia's land area, with overall worsening impacts on biodiversity.

Invasive species: Australia has failed to implement the biosecurity systems and programs essential to protect biodiversity from the ever-growing threat of invasive species. Weed regulation in particular lags far behind that for most other environmental threats. Although there are some excellent programs to eradicate and control invasive species, the focus is far too narrow and investment far too little. Australia needs a more ecologically informed approach to invasive species management.

Fishing: Federal fisheries management has improved over the past decade, with reduced fishing pressure in several fisheries. But more than 10% of federally managed stocks are overfished, including some threatened species, and the status of 30% is uncertain. Fisheries management by state and territory governments is probably less effective, and the impacts of recreational fishing pressure are not assessed. Much more progress is needed to achieve ecologically sustainable management.

Australia should have no higher priority than to secure a healthy environmental future. Our continent has already suffered too much damage and loss, and can't afford another 20 years of failure.

INTRODUCTION

Despite mounting efforts over the past 20 years, the loss of the world's biological diversity, mainly from habitat destruction, over-harvesting, pollution and the inappropriate introduction of foreign plants and animals, has continued. Biological resources constitute a capital asset with great potential for yielding sustainable benefits. Urgent and decisive action is needed to conserve and maintain genes, species and ecosystems...Effective national action and international cooperation is required.

Agenda 21, 1992

In August 2009, a small band of bat biologists recorded the ultrasonic call of a Christmas Island pipistrelle, a smaller-than-thumb-sized, insect-eating vesper bat found only on this speck of an island off the coast of Western Australia. No calls have been heard since. The biologists were on a mission to rescue pipistrelles to breed them in captivity but instead were witness to probably the last days of the last survivor of the species.

The Christmas Island pipistrelle should not have been lost. For at least four years, the Australian Government, which has management responsibility for the island, had been warned that it was likely to follow three other endemic Christmas Island mammals to extinction unless rapid action was taken. Although it's not clear exactly what killed the pipistrelle – probably one or more of several invasive species – it was in effect lost due to political indifference and neglect.

This most recent in a long list of Australian extinctions was not an unfortunate aberration. Of all Australian animals that should be secure, it is koalas – these much-loved marsupials are widespread and contribute millions of dollars as a tourist icon. But they have just joined 1700 other species on the national threatened list (for populations in Queensland, NSW and the ACT) because of rampant clearing of their habitats and disease.

That even koalas are threatened is indicative of something going very wrong with conservation in Australia – and there are government data and reports galore to substantiate that: a burgeoning list of threatened species; catastrophic mammal declines in northern Australia; woodland birds disappearing from southeastern woodlands; massive coral bleaching events; weeds and feral animals spreading rampantly. Meanwhile, Australia has just recorded the fastest economic growth rate in the OECD and has the world's sixth largest per capita GDP. Governments are ticking off huge mining and development projects as fast as possible, and plan to hasten them by transferring powers to approve nationally significant projects to state and territory governments.

Twenty years ago, along with 187 other nation participants in the 1992 United Nations Earth Summit, the Australian Government signed the Rio Declaration and committed to transforming the way Australians treated the environment. In conventions arising out of the Earth Summit, Australia committed to halting biodiversity loss, reducing greenhouse gas emissions and reversing land degradation.

On the eve of the second Earth Summit in Johannesburg in 2002, in a review commissioned by environment groups, Dr Peter Christoff concluded that Australia was failing to meet its Rio commitments, that the economy was unsustainable, and environmental health declining:

Over the past decade, in ecological terms, Australia has been a continent in reverse. It is going backwards on nearly every major indicator of our environmental health, including the loss of plants and animals, land clearing and degradation, the condition of Australia's inland waters, and greenhouse gas emissions. Per capita, Australians generate more greenhouse gases and clear more land than the people of any other wealthy nation.¹

Another decade on, on the eve of the third Earth Summit (Rio+20), here is an assessment of Australia's progress since Rio+10. We outline what Australia has at stake – its great natural wealth of species and ecosystems found nowhere else – and review some of the major environmental threats: mining, climate change, land clearing, grazing, invasive species and fishing. We compare Australia's performance globally and assess the extent to which we have failed to meet our global commitment to redress climate change, biodiversity loss and land degradation. We outline why Australia is failing so badly on these priority challenges of the 21st century. Australia has the legal, social and economic capacity to move to a low carbon economy, protect biodiversity and remediate degradation but political priorities and allocation of public resources currently favour the converse of these goals.

AUSTRALIA'S ENVIRONMENTAL STATUS

In this section, we outline the rich diversity and uniqueness of species and ecosystems for which Australia is responsible, the state of our precious, partial and vulnerable protected area estate and the extent of degradation and loss suffered by our land and biota.

- Australia's natural wealth
- Protected areas
- Decline and degradation



AUSTRALIA'S NATURAL WEALTH

Australia is gloriously rich in biological treasures, one of 17 'megadiverse' countries,² with more than 5% of the planet's species. Of an estimated 11 million species worldwide, about 570,000 are native to Australia.³ Australia is particularly diverse in vertebrate animals (those with backbones) and fungi, with about 12% of the world's species.

Our national responsibility for conserving the planet's biological diversity is even greater by virtue of the uniqueness of the Australian biota. Most terrestrial species and most species in our southern oceans are found nowhere else.⁴ Australia supports by far the most endemic terrestrial vertebrate species of any country and the most endemic plant families. More than 80% of our mammals, reptiles, frogs and plants are unique, as are about 70% of insects.⁵ Only a quarter of our species have been scientifically described.

Table 1. Australian species diversity and endemism. Source: Chapman 2009⁶

Group	Number of estimated species	% of estimated world total	% endemic
Mammals	386	7	87
Birds	828	8.3	45
Reptiles	917	10.5	93
Amphibia	227	3.5	94
Fish	~5000	16	24
Vertebrates	~7 363	11.9	40.4
Invertebrates	~98,703	7.3	unknown
Plants	24,716	7.9	86
Fungi	11,846	11.9	unknown
Others	>4 186	6.2	unknown

Australia has a dazzling diversity of terrestrial and marine ecosystems. One of the planet's great biological wonders is the Great Barrier Reef, the largest coral reef complex in the world, with more than 500 corals, 1600 fish and 3000 mollusc species.⁷ Our seagrass meadows are the largest in the world, with the greatest diversity of seagrass species.⁸ A 300,000 km² region in the southwest of Western Australia was selected as one of 25 global biodiversity hotspots,⁹ in recognition of its exceptional plant diversity – about 6500 vascular species, more than half endemic.¹⁰

Australia has 16 natural areas listed as World Heritage Areas, 7.5% of the global total listed for natural values, more than any other country. Several other areas, such as Cape York Peninsula, the Kimberly and the Tarkine, warrant world heritage recognition.

AUSTRALIA'S WORLD HERITAGE AREAS
<ul style="list-style-type: none"> • Great Barrier Reef • Kakadu National Park • Willandra Lakes Region • Lord Howe Island Group • Tasmanian Wilderness • Gondwana Rainforests of Australia • Uluru-Kata Tjuta National Park • Wet Tropics of Queensland • Shark Bay, Western Australia • Fraser Island • Australian Fossil Mammal Sites (Riversleigh / Naracoorte) • Heard and McDonald Islands • Macquarie Island • Greater Blue Mountains Area • Purnululu National Park • Ningaloo Coast

Australia is fortunate to still have vast areas of uncleared vegetation and rivers running freely. Of three global biomes—tropical and subtropical grasslands, shrublands and savannas, deserts and xeric shrublands, and Mediterranean forests, woodlands and scrub—we have the largest remaining wild areas of any country.¹¹

PROTECTED AREAS

One positive trend for conservation in the past decade has been an increase in land and sea in protected areas, and land and sea managed by indigenous Australians, and adoption by all governments of protected area targets. However, many protected areas are vulnerable to damage from inappropriate uses or insufficient management.

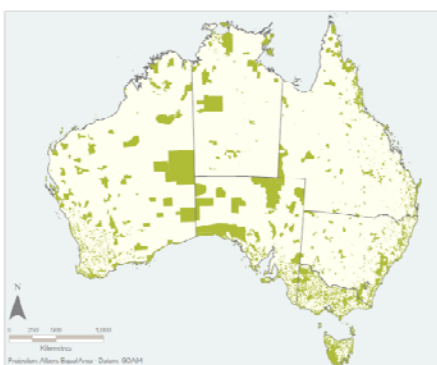
Australia's terrestrial reserve system, including national parks, indigenous protected areas and private conservation reserves, covers about 100 million hectares (less than 14% of Australia).¹² A small (4 million hectares) but rapidly increasing area is managed by private owners. About three-quarters of the area is strictly protected.

There is still a considerable way to go for Australia to meet its protected area targets. A 2011 WWF-Australia assessment found that just five of 85 bioregions met the national target for comprehensiveness, 20 of 403 subregions met the target for representativeness and another 70 million hectares is needed for adequacy.¹³ There is an even greater way to go to achieve one of the fundamental goals of a reserve system: to adequately protect threatened species. Only a small proportion of threatened species – mostly those with large ranges – are well represented in reserves. About one in eight of threatened species are not present at all in protected areas and 80% are not adequately represented.¹⁴

The effectiveness of protected areas is being undermined by poor management, damaging uses and insecure tenure. There has been a catastrophic loss of mammals in Kakadu National Park, probably due to invasive species and a failure to implement appropriate fire regimes.¹⁵ The Victorian Government introduced cattle grazing into alpine national parks before being over-ruled by the Australian Government, the Queensland Government permits recreational fishing and proposes to allow horse riding and trail bike riding, and the NSW government allows horse riding and proposes to allow recreational hunting.¹⁶ Many protected areas are vulnerable to mining. More than 100 nature refuges in Queensland (private land with a conservation covenant) are contained within mineral and coal exploration permits.¹⁷

About one-quarter of Australia's national reserve system (> 26 million hectares) is owned and managed by Indigenous Australians.¹⁸ A Working on Country Program supports the employment of Indigenous Rangers in environmental management.

Map 1. Terrestrial protected areas in Australia. Source: Environmental Resources Information Network for National Reserve System Section, Parks Australia. August 2010

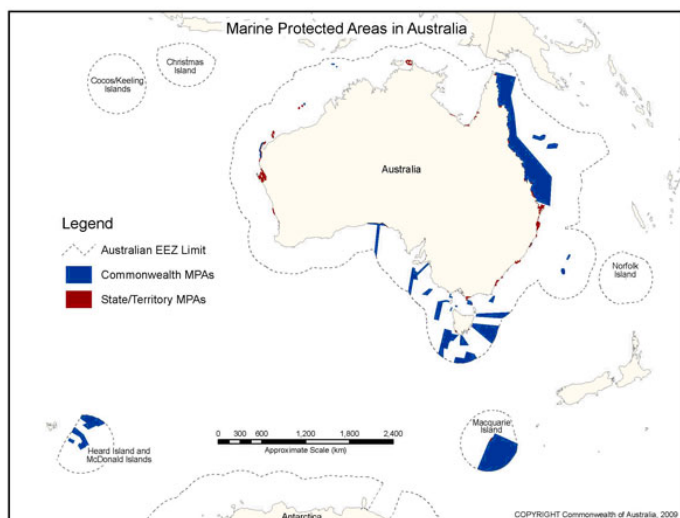


As with the terrestrial environment, the majority of Australia's marine waters are open to potentially damaging economic exploitation. Marine parks cover about 88 million hectares, about 10% of Australia's ocean area, excluding the Australian Antarctic Territory.¹⁹ As of 2008, just 38 million hectares (4.3%) were highly protected, with fishing and mining prohibited.

They do not cover a representative range of ecosystems. Most of the highly protected areas are in offshore deep waters or on the Great Barrier Reef, and not on the continental shelf and shoreline, where exploitation pressures are highest and biodiversity values under most pressure.²⁰

One major advance has been in the 2003 rezoning of the Great Barrier Reef Marine Park, with a seven-fold increase in highly protected areas to 33% of the park area. This has brought major benefits, with greater fish and shark populations and coral cover in areas closed to fishing.²¹

Map 2. Australia’s marine protected areas. Source: Australian Government 2009.²²



The area of land and sea in protected areas has been increasing (see Tables 2 and 3) and Australia has adopted the targets agreed to under the Convention on Biological Diversity in October 2010, to protect 17% of land surface and 10% of the oceans by 2020.

Table 2. Terrestrial protected areas in Australia (total area and % of Australian land area). Source: Australian Government²³

	Area protected, million ha (% land area)	Area strictly protected (IUCN I-IV)
1997	59.8 (7.8%)	47.7 (6.2%)
2000	61.4 (8%)	48.8 (6.3%)
2002	77.5 (10.2%)	54 (7.1%)
2004	80.9 (10.5%)	55.8 (7.3%)
2008	98.5 (12.8%)	71.9 (9.3%)
2012	106 (13.8%)	

Table 3. Marine protected areas in Australia: total area and % of Australia’s ocean area, excluding Australian Antarctic Territory. Source: Australian Government²⁴

	Area protected million ha (% marine area)	Area strictly protected (IUCN categories I and II)
1997	38.9 (4.3)	2.8 (0.3)
2000	53.4 (6.0)	2.2 (0.3)
2002	64.6 (7.2)	17.3 (1.9)
2004	71.8 (8.0)	29.6 (3.3)
2008	88 (9.8)	38.1 (4.3)

10 YEAR VERDICT

There has been a moderate increase in protected areas in Australia, with an additional 4% of land area and 3% of marine area added to the reserve system. A major advance for marine protected areas was the rezoning of the Great Barrier Reef Marine Park to strictly protect 33% of the area. A considerable further expansion of the reserve system is required to

adequately encompass threatened biodiversity and protect representative ecosystem areas. Limiting the effectiveness of protected areas are the predominant focus on multiple use marine parks and an increasing push to use terrestrial reserves in damaging ways. The values of some important areas are declining due to inadequate management of threats.

DECLINE AND DEGRADATION

BIODIVERSITY IN CRISIS

The current destruction of the earth's biological diversity is humanity's most disastrous mistake ... An era of loneliness is in store for us.

Biologist Professor EO Wilson²⁵

Old Australian species necessarily have great endurance, many with ingenious mechanisms for surviving extreme conditions. But colonisation by Europeans, initiated just over 220 years ago, has imposed an unprecedented rate of change, far too rapid to allow natural adaptive mechanisms.

Australia has a terrible extinction record, the worst in the world for mammals since 1600. Since European colonisation, at least 56 animal and 42 plant species have gone, and hundreds more are threatened. As of June 2012, 1304 plant and 389 animal species or subspecies and 56 ecological communities were listed under national laws as threatened (see Figure X). A much larger number are threatened or in decline. The National Land and Water Resources Audit identified over 2800 threatened ecosystems.²⁶

Table 4. Species, subspecies and ecological communities listed as extinct or threatened under the *Environment Protection and Biodiversity Conservation Act 1999*. Source: Australian Government Species Threats and Profiles Database.²⁷ (*This should not be taken as a comprehensive list, particularly of ecological communities, because the listing process is not systematic and there is a lack of information about the status of much of Australia's biodiversity.*)

	Extinct	Critically endangered	Endangered	Vulnerable	Conservation dependent	Total threatened
Mammals	27	4	35	56		95
Birds	23	6	44	61		111
Reptiles	0	4	16	37		57
Frogs	4	3	15	11		29
Fish	1	4	17	26	4	51
Other animals	1	20	17	10		47
Fauna (total)	56	41	144	200	4	389
Flora (total)	42	122	531	651		1304
Ecological communities		21	34	1		56

Patterns of extinction and decline vary across groups of organisms and different habitats. Mammals, the most threatened group, have suffered their greatest losses and declines in arid Australia due to foxes and cats, livestock grazing and feral herbivores, and altered fire regimes.²⁸ More than a third of Australian's desert mammals have been lost, and ten mammal species survive only on predator-free islands. Many have distributions covering less than 20% of their former range.²⁹ Upland frogs have been decimated by an exotic pathogen, chytrid fungus. The majority of bird extinctions have been on islands due to rats and other invasive species, and habitat loss is the major mainland threat. Similarly, the main drivers of

decline for reptiles are habitat loss and exotic predators. Fish species in intensive land use areas are declining. Native fish populations in the Murray-Darling Basin are at less than 10% of pre-European levels.³⁰ Most plant extinctions and declines have occurred where land clearing has been most extensive.

There is increasing evidence that Australia is paying an extinction debt (a time-lag in species loss following habitat change) as local and regional losses of species accumulate.³¹ According to the State of the Environment 2011, almost all biodiversity groups are in poor condition and deteriorating (see Table 5). Of great concern is recent evidence that populations of previously common and widespread species thought to be secure are sharply declining: many mammals and granivorous birds in northern Australia, and woodland birds in southeastern Australia, particularly in the Murray-Darling Basin.³²

Table 5. The condition and trend of biodiversity groups, as assessed in Australia State of the Environment 2011.

Terrestrial mammals	Very poor condition; deteriorating trend
Terrestrial birds	Poor condition; deteriorating trend
Terrestrial reptiles	Poor condition; deteriorating trend
Terrestrial amphibians	Poor condition; deteriorating trend
Terrestrial invertebrates	Poor condition; unknown trend
Plants in high-altitude, remote or very dry areas	Good condition; stable trend
Plants in areas most suitable for urban development or agriculture	Poor condition; deteriorating trend
Aquatic species & ecosystems, northern and central Australia	Good condition; stable trend
Aquatic species & ecosystems, southern, eastern & south-western Australia	Poor condition; deteriorating trend
Species other than plants and animals, vegetation largely intact	Good condition; unknown trend
Species other than plants and animals, agricultural lands	Poor condition; deteriorating trend

Current threatened listings are not comprehensive, as there is too little known about many species, and listing processes are slow. Even for Australian birds, the State of the Environment 2011 notes that "monitoring is generally piecemeal and too short term to detect meaningful trends". Far less is known about poorly surveyed groups such as invertebrates and fungi, most of which are not even described. In Victoria, which has been more intensively surveyed than most parts of Australia, more than half of all known plants are either listed as threatened or under assessment, and more than a quarter of birds are listed as threatened or under assessment. At both smaller (genetic) and larger scales (ecological communities), the state of Australia's biodiversity is very poorly understood. Currently, 56 ecological communities are listed as nationally threatened but there are hundreds more eligible for listing that have not been assessed.

Many species with important roles in ecosystem functioning are functionally extinct or threatened: long-distance pollinators (eg. regent honeyeaters and grey-headed flying-foxes) that will be vital for many Australian plants to adapt to climate change; and mammals (such as bilbies) and ground birds that dig burrows and turn over soil, enhancing soil water penetration.³³

Australia's State of the Environment 2011 identified the following as major pressures on biodiversity:

- clearing and fragmentation
- invasive plants, animals and pathogens
- inappropriate fire regimes
- grazing pressure
- changed hydrology
- climate impacts

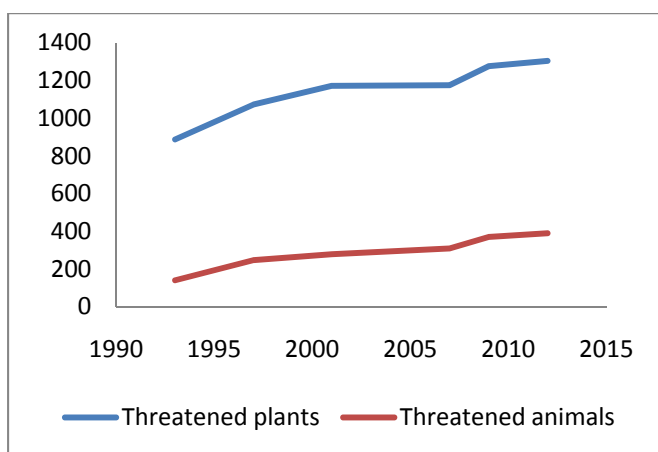
The State of the Environment recorded that impacts from most of these pressures are ongoing or increasing:

Most pressures on biodiversity that arise directly or indirectly from human activities appear to still be strong. Those pressures that have decreased, such as land clearing, continue to have legacy effects that will continue for some years or decades. However, other pressures, such as those from invasive species, are generally increasing.

This is reflected in the steady rise in threatened species listed nationally (see Figure X, although the list is far from comprehensive and some changes reflect increased information rather than change in threat status).

Table 6 and Figure 1. The rise in threatened plant and animal species /subspecies listed under national environmental laws 1993–2012.³⁴

Year	Threatened plants	Threatened animals
1993	887	140
1997	1072	247
2001	1171	278
2007	1175	309
2009	1276	370
2012	1304	389



WIDESPREAD DEGRADATION

“Australian landscapes are generally not well suited to many of the land use and management practices imported from other continents over the last 200 years.”³⁵ Our soils and vegetation have suffered extensive degradation due to clearing, overgrazing, erosion, over-use of irrigation water, the impacts of invasive species and the failure to manage for climate variability.³⁶

Because it takes about 1000 years for the formation of just 1 mm of soil from rock weathering, soil is essentially a non-renewable resource. Rates of soil loss by water erosion across much of Australia exceed soil formation by several hundred-fold to several thousand-fold. Up to 10 million hectares of land, mostly in subtropical Queensland, will lose their topsoil in less than 500 years unless erosion is controlled. The land’s loss is also a problem for inland and coastal waters damaged by excessive sediments and nutrients. Better grazing practices, conservation tillage, enforcement of forestry codes and engineering reforms have reduced losses, but soil conservation programs are needed across large areas to control this chronic form of land degradation.

Levels of soil carbon (vital for nutrient cycling, water storage and soil structure) are low in many Australian agricultural systems, due to land clearing, which typically reduces soil carbon by 20–70%. Northern Australian savannas have high potential for increasing soil carbon stores, but this will require changes in grazing pressures and fire regimes.

Soil acidification affects about half of Australia's agriculturally productive soils. It is widespread in the grazing lands of southern Australia and common in intensive systems, while trends in the tropical savannas are uncertain. In many regions, the severity and extent are increasing due to inadequate treatment and intensification of land use. If acidification is not treated, irreparable damage can result. Impacts include loss of soil organisms for nitrogen fixation, accelerated leaching of nutrients, reduced productivity and carbon sequestration, erosion and mobilisation of heavy metals.

Dryland salinity is a fourth process that damages soil health and has affected large areas cleared of native vegetation. There is need to re-evaluate the extent to which it will be a future threat, as its spread has been halted in the worst affected areas by recent drought and predicted drier climates under climate change will limit future spread. However, the salinity impacts of recent large-scale clearing have yet to be manifested.

Australia's State of the Environment 2011 concluded that the extent and quality of vegetation are poor in intensive land use zones (eastern, southeastern and southwestern Australia) and good outside these zones but vegetation quality is deteriorating in both zones. Declines in vegetation quality have been caused by clearing and fragmentation, climate events such as drought and cyclones, grazing, damaging fire regimes and invasive species. In particular, there is deterioration in fragmented remnants in intensive land use areas that are subject to pressures such as grazing.

Native vegetation outside intensive land use zone	Extent very good; stable trend
	Quality good; deteriorating trend
Native vegetation in intensive land use zone	Extent poor; stable trend
	Quality poor; deteriorating trend

Historical and current land uses are the over-riding influence on the condition of Australia's soil and vegetation. About 60% of the land area is used for primary production, most of it for livestock grazing. The State of the Environment 2011 found that grazing, cropping, residential and mining uses are all having a 'high' impact on Australia's land environment.

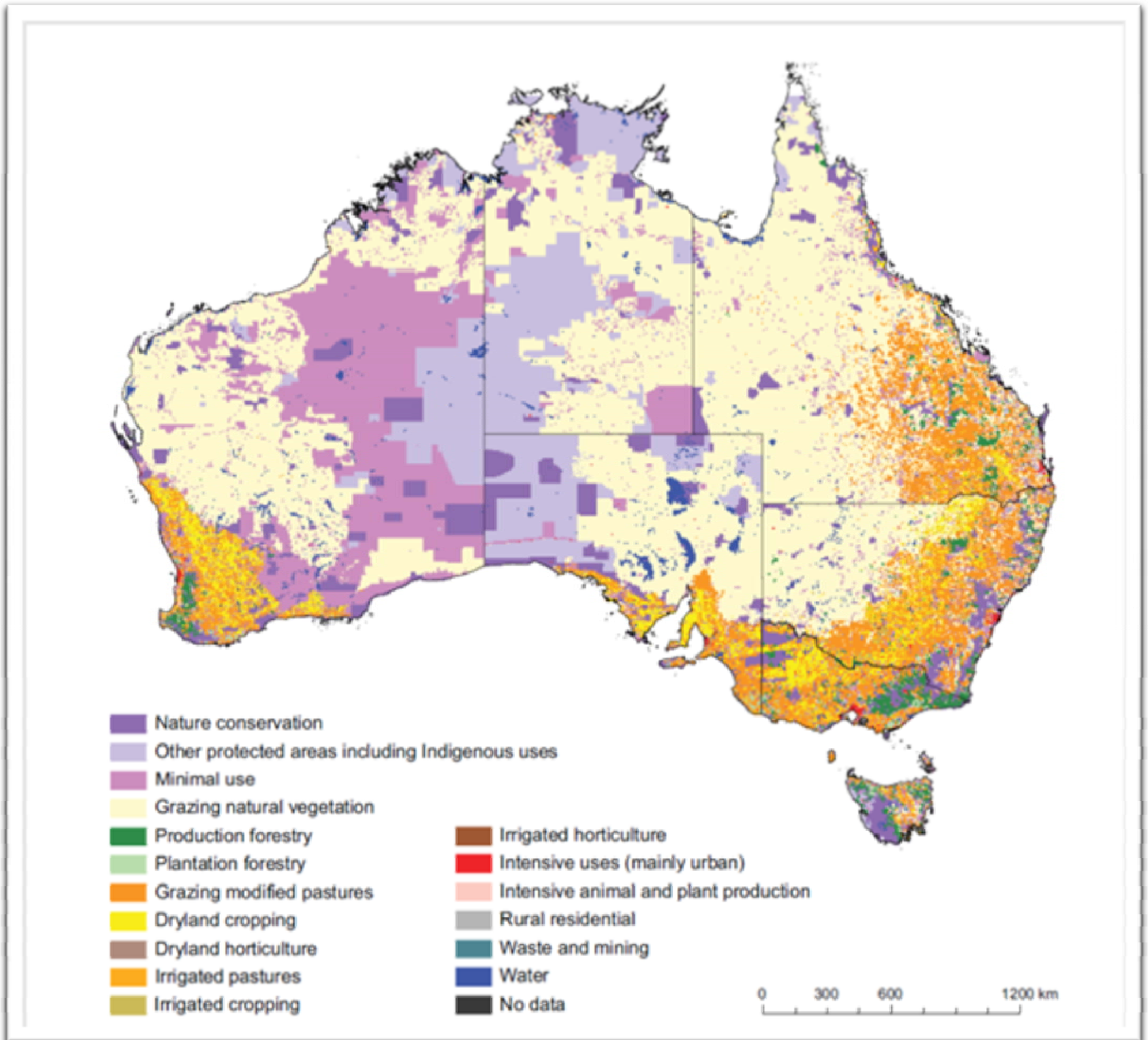
Table 7. Land use in Australia. Source: Australian Bureau of Agricultural and Resource Economics³⁷

Land use	Million hectares	% land area
Grazing		
- native vegetation	356	46
- modified pasture	72	9
Nature conservation and other protected uses (including indigenous use)	159	20
Minimal use	124	16
Dryland cropping	26	3
Production forestry	13	1.8
Irrigated and intensive agriculture	3.1	0.3
Urban and rural residential	2.5	0.3
Mining and waste	0.2	<0.1
Water	13	1.6
Total	769	100

Since the 1990 launch of the National Landcare Program, the Australian Government has rolled out a series of natural resource management programs with laudable goals to arrest degradation and protect biodiversity. Undertaken in partnership with state and territory governments and community groups, they have invested about \$6 billion over 23 years. Although funding has increased over time, and there have been many beneficial projects, these programs have represented "a piecemeal, small-scale approach to problem solving"³⁸ and have failed to achieve their objectives. Auditors reported being unable to measure the impact of programs on the condition of natural resources or trends of land degradation at the landscape scale.³⁹ Of the phase 2 programs, the Australian National Audit Office in 2008 found that:

At the time of the evaluations there was little evidence that there has been any substantial movement towards landscape scale repair and replenishment of natural resources as envisaged by the [Natural Heritage Trust]. Nor was there evidence of significant progress towards preventing, stabilising and reversing salinity trends as envisaged by the [National Action Plan].⁴⁰

Map 3. Land use in Australia. Source: Australian Bureau of Agricultural and Resource Economics⁴¹



10 YEAR VERDICT

Australia has failed to take measures necessary to halt biodiversity loss and reverse environmental degradation, and the gap between problems and responses is widening. Biodiversity loss is accelerating, as many pressures increase and the legacy of past clearing is increasingly manifesting. Although many agricultural practices have improved and land clearing has been reduced, Australia's soils and vegetation are deteriorating in quality over large areas. Despite dedicated community effort and a range of national programs and policy initiatives, the overall investment and rate of reform has been grossly inadequate to address problems.

THREATS

In this section, we briefly review some of the major threats and government responses to these threats in the decade since the second Earth Summit, held in Johannesburg in 2002. The threats covered here are not comprehensive (others include inappropriate fire regimes, water extraction and pollution).

- Mining
- Climate change
- Land clearing
- Grazing
- Invasive species
- Fishing



MINING

Mining is booming in Australia, and greenhouse gas intensive fossil fuels, in particular, are being hauled up and shipped out at an unprecedented rate. In thrall to mining revenue, Australian governments are avowed industry facilitators: fast-tracking approvals, providing infrastructure and over-riding most other competing land uses and public interests. Mining projects are almost never refused on environmental grounds.

Australia is one of the world's largest exporters of coal, iron ore, uranium, nickel, gold and natural gas. Coal production has soared exponentially over the past few decades (see graph), and Australian exports, the largest in the world, account for more than a quarter of the world's total.⁴² If current mining proposals are realised, exports would double to triple within the next decade.⁴³ Coal seam gas mining has emerged as a major industry in just over a decade, and could increase production ten-fold over the next two decades. Ocean mining of liquid hydrocarbons and natural gas, mostly in the northwest and south, is also expanding rapidly. Recent investments are predicted to triple exports of liquid natural gas by 2015.⁴⁴

Table 8 and Figure 2. Black coal (raw) production in Australia, 1960-2010. Sources: Mudd 2009, Australian Government⁴⁵

Year	Coal production (Mt)
1960	23
1970	49
1980	93
1990	201
2000	304
2005	399
2010	449

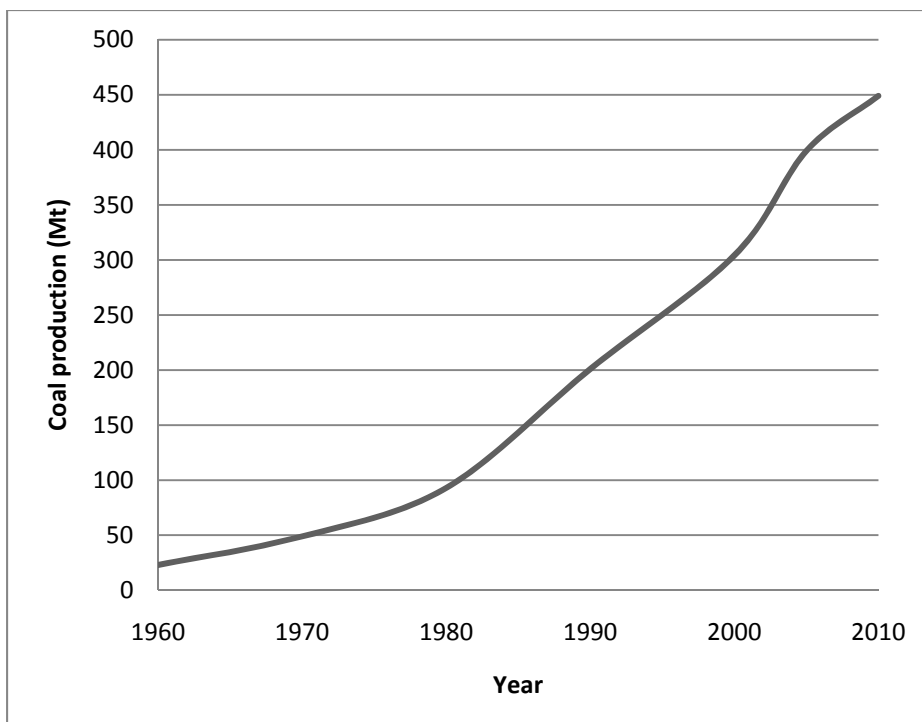
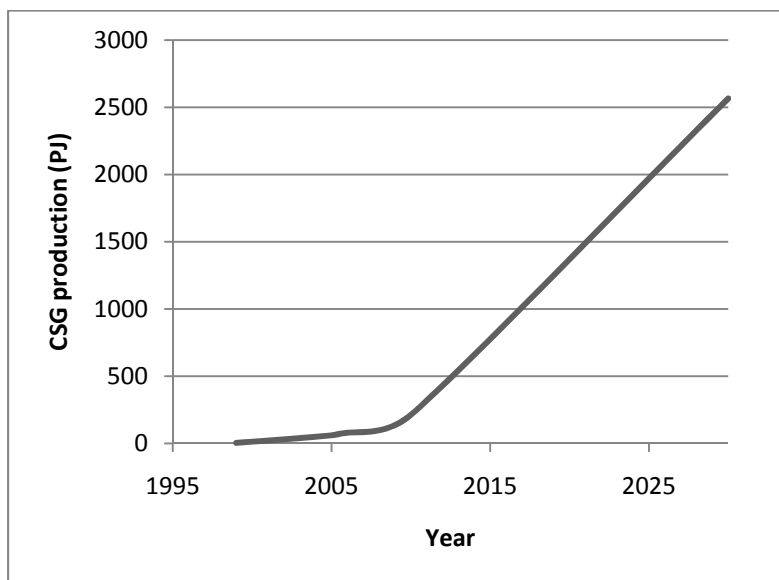


Table 9 and Figure 3. Coal seam gas production 1999-2010 and projected to 2030. Source: Australian Government.⁴⁶

Year	CSG production (PJ)
1999	4
2003	40
2006	80
2010	212
2030	2566



A large proportion of Australia's land area, including more than three-quarters of Queensland, is under some form of exploration or mining lease or claim.⁴⁷ Although mining currently occurs over only a small portion of Australia's land and ocean area, it can be highly destructive, and affect much larger areas because of associated infrastructure (roads, pipelines, ports) and waste products (toxic tailings, greenhouse gas emissions). Australia's State of the Environment 2011 rated mining as 'high' impact, with a deteriorating trend, noting that "the scale of disturbance in some regions is transforming the landscape and causing profound environmental change."

Mostly to facilitate mining, Australia's coastline is being burdened with new processing plants, and new and expanded ports, particularly in Queensland, the Northern Territory and Western Australia. The national demand for port capacity is forecast to double each coming decade.⁴⁸ A large expansion of coal export infrastructure is proposed along the Great Barrier Reef World Heritage Area coastal area over the next decade.⁴⁹

The mining boom and the Great Barrier Reef

Some of the world's largest coal mines are proposed for the Galilee Basin in central Queensland, and coal exports through ports in the Great Barrier Reef World Heritage Area are proposed to increase as much as six-fold, to more than 900 million tonnes by 2020.⁵⁰ In June 2012, UNESCO warned Australia that the unprecedented scale of development "poses serious concerns over its long-term conservation" and if approved by the government could lead to the World Heritage Area being listed as endangered.⁵¹

The proposed large-scale coal mines will require considerable associated infrastructure, including railways and ports. Six new coal terminals and expansion of two existing terminals are underway or have been proposed along the Great Barrier Reef World Heritage Area. UNESCO has urged the Australian Government to not permit port development outside the existing ports.

Since 2007, the Australian Government has approved dredging of 52 million cubic metres of the World Heritage Area for port development and approval for another 60 million cubic metres is being sought.⁵² The Australian Government has issued approvals to dump 22 million cubic metres of that dredge spoil back into the World Heritage Area, with

another 2 million cubic metres of offshore dumping under application.⁵³

The mining boom would bring much greater shipping traffic through the World Heritage Area. The proposed port developments could support a six-fold increase in ship numbers by 2020.⁵⁴ (Queensland's Mining Council says it will be up to a three-fold increase.⁵⁵) Increased shipping traffic will increase the risk of collisions, groundings, introduction of invasive marine pests and spills of toxins. Since 1985, an average of more than two major shipping incidents (such as collisions or groundings) have occurred annually.⁵⁶

Table 10. Coal port expansions and shipping increases in the Great Barrier Reef. Source: Greenpeace 2012

Throughput 2011 (tonnes)	FY 2011 Vessels	Current capacity (mtpa)	Proposed capacity (mtpa)	Predicted 2020 vessels
156	1722	257	944	10,150

Disposal of waste products is a major issue for some forms of mining. The coal seam gas industry extracts and disposes of very large volumes of underground water, volumes which could exceed more than 300 gigalitres a year, far greater than that extracted for any other use (extraordinarily for the driest inhabited continent on earth, water extraction does not require assessment under national environment laws). The industry could generate more than 30 million tonnes of waste salt over the next 30 years.⁵⁷

Ocean mining brings a considerable risk of oil spills. In August 2009, a wellhead accident in the Timor Sea resulted in the uncontrolled daily discharge of hundreds of barrels of crude oil for 74 days, killing marine animals and affecting seabeds up to 70 km away.⁵⁸

Australia's State of the Environment 2011 identified several deficiencies with regulation of ocean mining, including a lack of strategic environmental assessments, little consideration of regional cumulative impacts, limited baseline information and no transport management systems that take account of sensitive species and habitats. It said that marine planning "was driven by commercial constraints" and that "resource projects are not denied on environmental impact grounds."

The impact of fossil fuels mined in Australia is globally significant due to the extremely high emissions that will result from their use domestically and overseas (see climate change section) but this is ignored in environmental assessments.

Mining is a very powerful industry in Australia, and miners' rights over-ride those of most other land users, generating a growing protest movement as farmers and conservationists try to defend agricultural land and conservation areas from destruction. There are 10 mines (most open-cut) proposed for the Tarkine – Australia's greatest tract of cool-climate rainforest and under assessment for world heritage nomination.⁵⁹ Even areas that are part of the formal conservation estate are open to mining, including nature refuges (private properties with a conservation covenant) in Queensland.⁶⁰

10 YEAR VERDICT

The past decade has seen enormous growth in the mining of fossil fuels, with major climate change implications. But this and other long term and cumulative impacts are ignored in the highly deficient regulation of mining in Australia. Associated infrastructure such as ports and processing plants are likely to have a major impact on coastal environments and more shipping will increase risks of oil spills. The mining industry exerts a powerful influence over Australian environmental policy, and mining projects are virtually never refused on environmental grounds. UNESCO has warned Australia that the Great Barrier Reef World Heritage Area could be listed as endangered if current mining projects proceed as proposed.

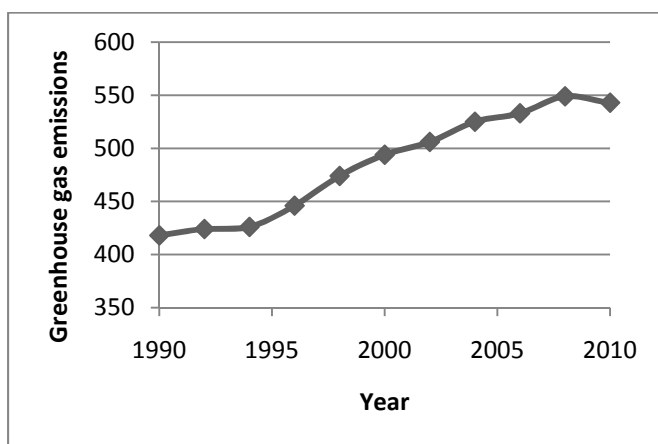
CLIMATE CHANGE

Australia is highly vulnerable to climate change and yet is one of the world's top greenhouse gas emitters and the largest exporter of coal. Australia has just 0.3% of the world's population but contributes about 1.5% of emissions, and we have been the highest per capita emitter in the OECD for most of the past two decades.⁶¹

Australian emissions have grown rapidly, increasing by 31% since 1990 (excluding those due to land use changes), reaching about 550 Mt CO₂-e in 2011.⁶² The energy sector is responsible for almost 70% of Australia's emissions, mostly due to burning fossil fuels for electricity, transport and manufacturing. Just 5% of Australia's electricity generation comes from renewable sources.⁶³

Table 11 and Figure 4. Australian greenhouse gas emissions: 1990-2011, gigatonnes carbon dioxide equivalent, excluding emissions due to land use, land-use change, and forestry activities. Source: Australian Government⁶⁴

Year	Emissions (excluding land use changes)	Emissions (including land use changes)
1990	418	549
1992	424	
1994	426	
1996	446	503
1998	474	
2000	494	553
2002	506	
2004	525	565
2006	533	596
2008	549	583
2010	543	561
2011	546	



Australia finally signed the Kyoto Protocol in 2007, after many years of government resistance and despite a Kyoto target that allowed Australia to increase its emissions (to 108% of 1990 levels).

On current trajectories, Australian emissions would rise by 24% from 2000 levels by 2020.⁶⁵ However, a carbon tax due to start in July 2012, a 20% renewable energy target backed by a renewable energy fund, and other abatement programs are predicted to reduce annual emissions to achieve an overall 5% decrease in emissions by 2020.⁶⁶ Although the current federal opposition has agreed to the extremely modest target of 5% reduction by 2020, it has said it will scrap the carbon tax should it win government in 2013.⁶⁷

AUSTRALIA'S GREENHOUSE GAS EMISSIONS TARGETS⁶⁸

Kyoto target: 108% of 1990 levels across 2008-12.

2020 target: reductions of between 5% and 25% below 2000 levels:

- 5% in the absence of a global commitment
- 15% if there is a global agreement in which advanced economies accept reductions comparable with Australia's but which falls short of securing stabilisation at 450 ppm CO₂ equivalent
- 25% if there is a global agreement capable of securing stabilisation at 450 ppm CO₂ equivalent or less.

2050 target: reduction of 80% below 2000 levels

Renewable Energy Target: to source 20% of Australia's electricity supply from renewable resources by 2020.

Australia's contribution to global climate change is much greater than its domestic emissions. Already the largest coal exporter, Australia will double to triple coal exports by 2020 if mines currently proposed are approved. These proposals represent a major impediment to global efforts to limit climate change. The accumulated emissions from the burning of the coal mined over 30 years would add over 70 Gt of CO₂ to the atmosphere by 2050, which is more than 10% of the total carbon budget that can be emitted between now and 2050 if warming is to be limited to 2 degrees.⁶⁹

Average Australian temperatures on land have increased 0.9 degrees since 1950, and the rate of warming is accelerating.⁷⁰ Human-induced climate change has probably contributed to extreme climate patterns experienced since 1950 – including being responsible for about half of the decreased rainfall in southwest Western Australia over the past 30 years.⁷¹ Sea levels at monitored sites in Australia have risen by about 1.2 mm/year from 1920 to 2000, and the acidity of marine waters has increased.

A 2009 review commissioned by the Australian Government concluded that without early and vigorous mitigation, climate change by the second half of the 21st century has the potential to “become an overwhelmingly profound and pervasive driver of change in Australia's biotic fabric”, leading to substantial losses of biodiversity and ecosystem services.⁷² Climate change will be an additional major stressor for an already greatly perturbed biosphere, and will interact with other stressors in complex ways.⁷³ Australia's failure to deal with existing threats such as habitat fragmentation and invasive species will render biodiversity much more vulnerable to climate change.

The most dramatic example of biodiversity impacts has been eight mass bleaching events on the Great Barrier Reef triggered by unusually high sea surface temperatures, with the most serious affecting up to 50% of the marine park. No serious bleaching events were known prior to 1979.⁷⁴ Ocean acidification due to increased CO₂ uptake is also occurring. It has potentially devastating impacts on marine organisms such as shellfish and corals that rely on calcification, and probably in combination with temperature stress has already reduced calcification in at least one coral species on the Great Barrier Reef by more than 14%.⁷⁵

10 YEAR VERDICT

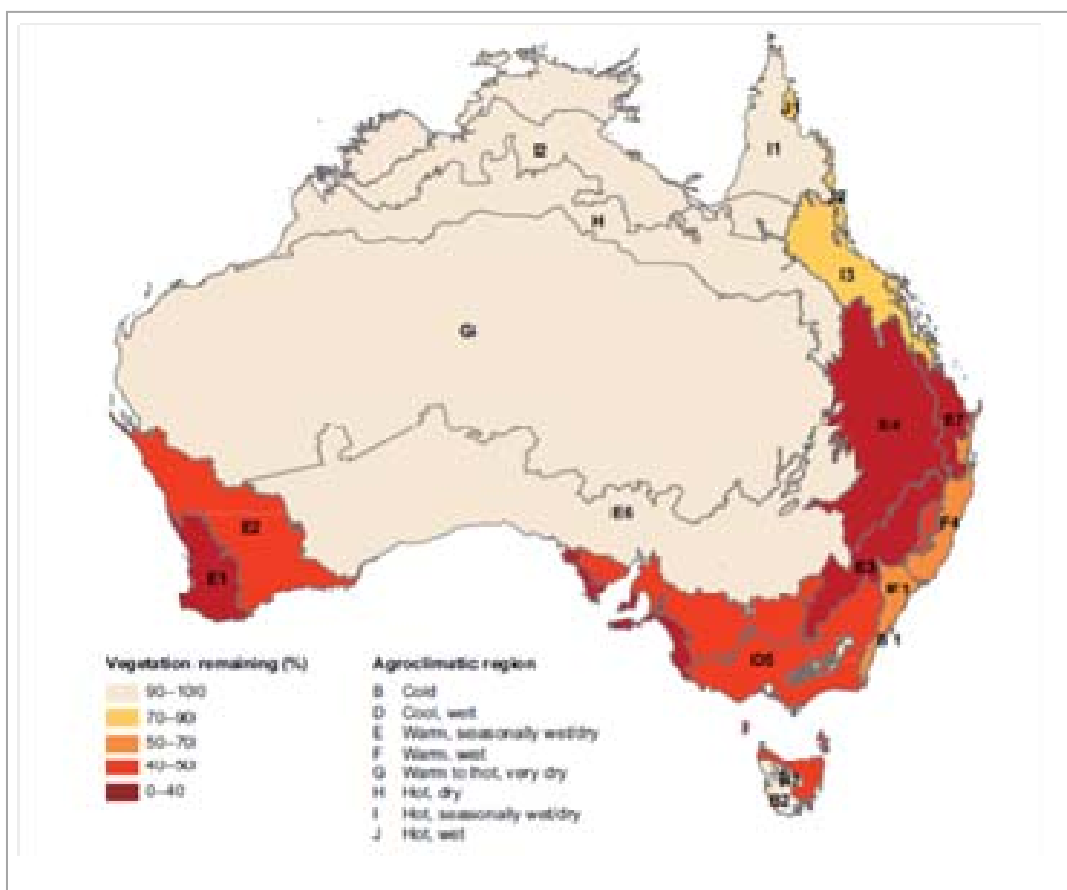
Australia has been a profligate user and exporter of fossil fuels over the past decade despite ever increasing evidence of our vulnerability to climate change. The Australian Government has refused to consider greenhouse gas emissions as a matter that must be assessed under national laws, and approvals granted for mining of fossil fuels will undermine the planetary capacity to mitigate climate change. While Australia will meet its Kyoto target (an 8% increase in emissions since 1990) and is likely to meet its 2020 target (a 5% reduction since 2000), this will do little to reduce climate change. Australian biodiversity will become increasingly vulnerable to climate change damage due to interactions with other stressors such as habitat loss and invasive species. “We are thus facing the climate change challenge with a biotic heritage that is already impoverished in many ways and which continues to face most of the historic stressors that have operated over the past two centuries.”⁷⁶

LAND CLEARING

Land clearing has been the major cause of biodiversity decline and land degradation in Australia.⁷⁷ Although clearing rates have fallen, the legacy of past and present clearing will continue to imperil species and damage habitats for decades to come.

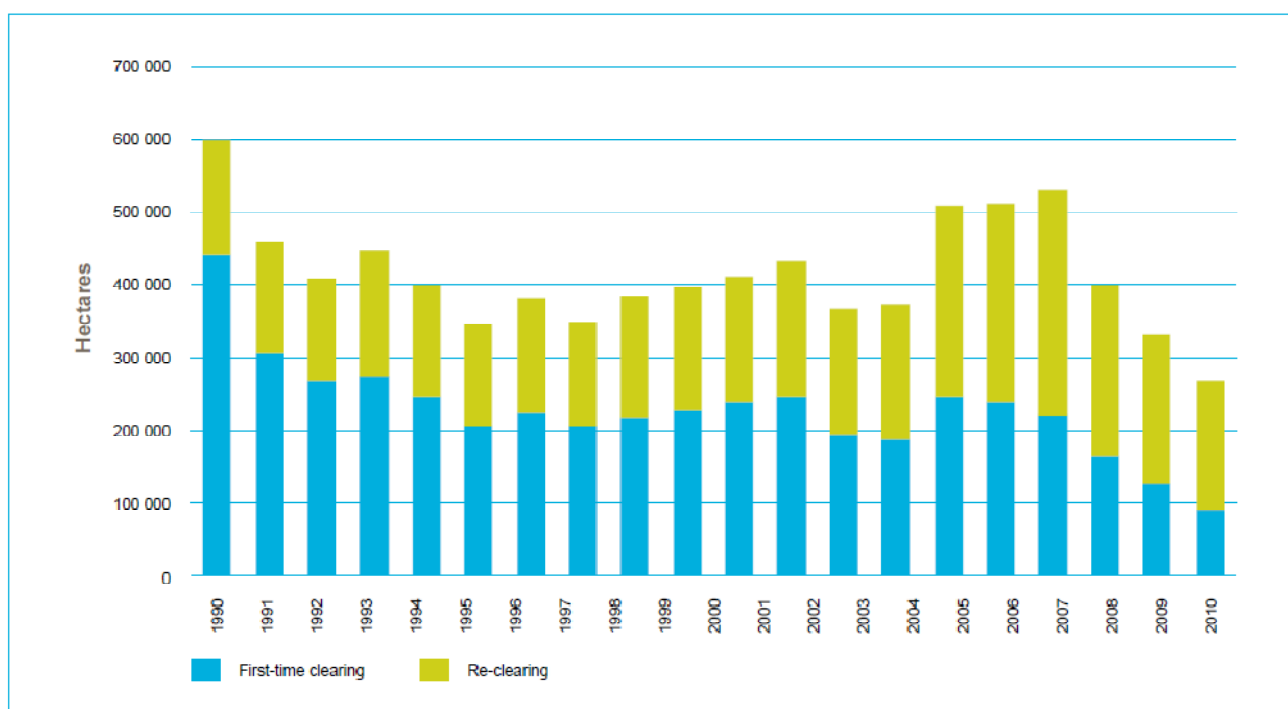
Since European settlement in 1788, eastern, south-eastern and south-western Australia (the 'intensive land use zone') have been severely damaged by land clearing, most of which has occurred since 1950 for grazing. About one third of Australia's total forest area has been cleared. More than 60% of wetlands in southern and eastern Australia, 99% of temperate grasslands and four-fifths of temperate woodlands have been lost.⁷⁸ Exacerbating the loss has been the disproportionate targeting of the most productive and fertile areas. However, Australia still has vast tracts of largely intact vegetation across northern and central Australia, where most bioregions still have more than 90% of original vegetation.

Map 4. Percentage of Australian native vegetation remaining by agroclimatic region. More than half of remnant vegetation has been cleared in six major agroclimatic regions, and one-third or more in two other regions. In some subregions in southern Australia and southeast Queensland, less than 10% of the original vegetation remains. Source: Environmental Resources Information Network, Department of Sustainability, Environment, Water, Population and Communities 2011⁷⁹



In what counts as Australia's greatest conservation success in the past decade, law reforms in Queensland and NSW have substantially reduced clearing, particularly of remnant vegetation (see Table 13). Greenhouse gas emissions from clearing have dropped by 60% since 1990.⁸⁰ Prior to a Queensland ban on broadscale clearing of remnant vegetation from 2007, Australia has had one of the highest land clearing rates in the world. More than 7 million hectares of mature forest and woodland has been razed since 1990,⁸¹ as well as large areas of grasslands.

Tables 12 and 13. Clearing of remnant and regrowth vegetation in Australia from 1990 as used for Australia’s greenhouse accounts. (This does not include clearing of grasslands.) Source: Australian Government Greenhouse Inventory 2010.⁸²



Rates of Forest Conversion and Reclearing (kha)						
Year	National		NSW		NT	
	Conversion	Reclearing	Conversion	Reclearing	Conversion	Reclearing
1990	442.06	157.79	65.55	45.67	0.81	0.39
1991	306.23	151.57	52.62	49.89	1.23	0.66
1992	268.84	140.88	35.69	36.40	1.05	0.66
1993	275.85	171.70	36.01	41.52	0.65	0.50
1994	249.17	151.45	32.41	37.42	0.66	0.51
1995	207.01	139.15	24.94	38.30	0.89	0.65
1996	225.17	157.47	27.88	44.80	1.18	0.89
1997	206.09	143.79	25.56	41.00	0.99	0.76
1998	219.24	165.02	24.67	50.95	0.70	0.72
1999	226.27	171.45	25.07	52.41	0.65	0.68
2000	238.11	174.22	20.94	44.15	0.45	0.62
2001	249.32	183.00	21.85	45.85	0.50	0.65
2002	194.79	172.62	19.05	42.19	0.45	0.62
2003	187.98	186.07	19.65	44.59	0.47	0.67
2004	248.46	263.06	31.87	75.89	0.65	1.19
2005	240.95	274.45	23.54	59.43	0.91	2.80
2006	225.50	310.77	29.56	92.51	0.88	3.27
2007	164.70	237.19	22.04	64.10	0.54	2.07
2008	123.37	204.46	19.80	60.16	0.42	2.13
2009	104.16	201.02	19.13	63.10	0.56	2.26
2012	80.89	154.35	16.98	51.32	0.52	1.72

Nonetheless, high value areas continue to be cleared for agriculture, urban areas and mining, and clearing pressure for each of these purposes is likely to increase. More than 40% of the eastern Australian coastline between Nowra and Noosa is predicted to be urbanised by 2050⁸³ and there are proposals to substantially increase agricultural output – for example, doubling food production in Queensland by 2040⁸⁴ – that are likely to involve more clearing. The new Queensland

government has also indicated that it plans to weaken enforcement of vegetation laws, which is likely to see a rise in illegal clearing.⁸⁵

Despite being acknowledged as the major threat to biodiversity, land clearing in itself does not trigger assessment under Australia's national environment laws, and the majority of clearing over the past decade has not been assessed for impacts on species or ecological communities meant to be protected under the EPBC Act. The application of the Act has also been limited by the government's failure to comprehensively list threatened ecological communities. Just 56 of probably several hundred threatened ecological communities have been assessed and listed.

Habitat loss, mostly due to clearing, is the major cause of biodiversity decline in Australia, affecting more than 80% of threatened terrestrial and freshwater species⁸⁶ as well as the majority of threatened ecological communities listed under the EPBC Act. Clearing is also the major cause of land degradation, leading to erosion, acidification, salinity and loss of soil carbon.

In the most intensively cleared landscapes, fragmented vegetation remnants are declining due to changed fire regimes, lack of regeneration, altered soil properties and invasive species. The process of 'extinction debt' continues to deplete plant and animal populations long after the cessation of clearing.⁸⁷ As the State of the Environment 2011 report points out, addressing the legacy effects of clearing "will be complex, long term and potentially expensive". Some large-scale restoration programs have been initiated – notably Gondwana Link, which aims to protect and restore a series of core wilderness areas over 1000 km in southwestern Australia, linked by continuous habitat and surrounded by supportive land uses.⁸⁸

As well as contributing to Australia's greenhouse gas emissions (see climate change section), land clearing has probably also had a direct impact on regional climates, by increasing temperatures and reducing rainfall, resulting in longer-lasting and more severe droughts.⁸⁹ Modeling indicates that the 2002-03 El Niño drought in eastern Australia was on average 2°C hotter as a direct result of vegetation loss.⁹⁰

10 YEAR VERDICT

During the past decade, Australia has lost several million hectares of remnant vegetation and wildlife habitat due to clearing. Substantial progress has been made in curtailing clearing through the recent imposition of stronger vegetation laws in Queensland and NSW, but high value areas continue to be cleared for urban expansion, mining and agriculture. Vegetation quality is deteriorating over large areas and the legacy of past clearing and extensive fragmentation is manifesting in severe biodiversity declines. Australia has barely embarked on the necessary task of restoring vegetation in the most intensively cleared bioregions, some of which have lost more than 80% of vegetation. There is increasing recognition of the immense value of the large tracts of remnant vegetation across northern Australia for biodiversity and carbon storage but also conflicting proposals for large-scale development.

GRAZING

A single industry dominates the majority of Australia's land area – the grazing of cattle (27 million in 2007-08) and sheep (46 million in 2007-08) across 55% of Australia.⁹¹ An Australia-wide analysis of total grazing pressure found that cattle contributed 66% of the grazing pressure, sheep 30% and kangaroos 4%.⁹² Grazing has major impacts on biodiversity and land condition due to clearing, overgrazing (particularly during droughts), invasive species, altered fire regimes, and greenhouse gas emissions.⁹³

The State of the Environment 2011 rated grazing as having 'high' impacts on soil, vegetation and biodiversity, concluding that it continued to be a major pressure, particularly in combination with drought and fire. The trend is 'deteriorating' for biodiversity.

There is considerable geographical variation in grazing impacts, (see Table X), with vegetation largely intact in tropical and subtropical areas but extensively cleared in southern and rangelands areas. Grazing has been responsible for the majority of land clearing in Australia (see land clearing section).

Table 14. Geographical variation in livestock grazing. Source: Williams and Price 2010⁹⁴.

Southeast Australia and southwest Western Australia	Substantially cleared; remnant patches of native vegetation and scattered trees; some native pastures in southeast, none in southwest.
Semi-arid rangelands, central & western Australia	Vegetation largely intact but modified by weeds that affect fire regimes; artificial waterpoints widespread
Semi-arid rangelands, western NSW & Queensland	Broadscale clearing; weeds and artificial waterpoints widespread; goats add grazing pressure.
Tropical savannas	Vegetation largely intact but modified by weeds that affect fire regimes.
Subtropical grassy woodlands	Some clearing but vegetation largely intact.

About one-sixth of the area grazed (9% of Australia’s land area) has been converted to introduced (and often invasive) pasture plants such as buffel grass and kikuyu.⁹⁵ Exotic grasses introduced for grazing are one of the most severe threats to many environments.⁹⁶ High biomass grasses such as gamba grass and buffel grass are establishing monocultures over large areas in northern and central Australia and fueling destructive fires. State and territory governments have been reluctant to regulate the use of plants valued by graziers, to the great detriment of the natural environment.

Even in areas not cleared or invaded by weeds, pastoralism can substantially alter vegetation composition, with grazing-tolerant species dominating and grazing-sensitive plants disappearing. Pastoralism is “so pervasive in northern Australia, and that hegemony has extended throughout almost the entire period of European settlement of the region, that, somewhat paradoxically, it is now difficult to discern its environmental impact: the whole landscape has changed at least subtly because of it.”⁹⁷

The hard hoofs of livestock – Australian wildlife do not have hoofs – have been damaging to Australian soils, causing compaction, erosion and loss of biological crust. At least two-thirds of the estimated nutrient and sediment flux contaminating the Great Barrier Reef is estimated to come from grazing lands. Sediment deposition onto the Great Barrier Reef is four to five times higher than prior to European settlement, dissolved inorganic nitrogen is two to five times higher and phosphorous four to ten times higher.⁹⁸

Overgrazing, particularly during droughts, leads to loss of ground cover and erosion. There is much greater awareness of the risks of over-grazing and generally lower stocking rates, but even so, during the recent severe millennium drought, agricultural officers found that livestock in many areas of Queensland were retained “in excess of the capacity to support those animals in the long term and permit pasture to return to reasonable condition” after the drought ended.⁹⁹ Feral animals – goats, camels, horses and others – add to the degradation, and are sustained by a dense array of artificial watering points for stock.

Fire regimes have been greatly altered by grazing, in some areas intensifying and in others suppressed. Vegetation changes affecting fuel loads, either removal of biomass due to clearing and grazing or increased fuel loads due to exotic pasture plants, as well as the use of fire to encourage new pasture growth, have altered fire regimes essential for maintenance of some native species.

Grazing, including due to clearing and emissions from livestock, has contributed upward of 15% of Australia's emissions.¹⁰⁰

Federal environment laws have played almost no role in limiting environmental damage caused by grazing – with almost no assessments of land clearing or exotic pasture plantings. Although the vast majority of land clearing during the life of the Act has been for agriculture, from 2000-2008 only 22 agricultural-related land clearing referrals were made, and only three resulted in an assessment, involving the clearing of less than 2000 ha.¹⁰¹ There are proposals to greatly increase agricultural production in Australia, particularly in northern Australia, which could exacerbate damage.

10-YEAR VERDICT

There have been major conservation advances in substantially slowing land clearing for grazing and improved grazing management to limit degradation. But grazing remains the dominant pressure over more than half of Australia's land environment, with overall worsening impacts on biodiversity. The legacy effects of past clearing and overgrazing will be manifesting for decades to come. Other major threats associated with grazing – invasive species and damaging fire regimes – are increasing and will be further exacerbated by climate change.

INVASIVE SPECIES

In Australia, invasive species (plants, animals, fungi and microbes spreading outside their natural range) are a ubiquitous and dire threat to biodiversity.¹⁰² We are notorious for having lost by far the highest number of mammals in recent times, with foxes, cats or rabbits implicated in most. Many bird and invertebrate species on islands have been wiped out by introduced rats, and an exotic fungus has killed off frogs. Invasive species are an escalating threat: exotic plant pathogens (*Phytophthora cinnamomi* and the newly arrived myrtle rust) threaten hundreds of endemic plants, exotic predators (foxes, cats, rats) imperil many mammals and birds, and rabbit numbers are surging. Weeds are increasingly dominating numerous ecosystems, fundamentally altering their composition and function – high biomass African grasses such as gamba grass, for example, fuel intense fires that kill trees, and rubbervine forms dense thickets along waterways and smothers trees.

Invasive species have caused the majority of animal extinctions in Australia, and imperil more than 70% of threatened species¹⁰³ and more than 80% of threatened ecological communities listed under national environment laws. They are the most serious threat to the biodiversity of Australia's more than 8000 islands.

The impacts of invasive species have been more severe in Australia than on any other continent, and the worst is yet to come as more arrive, as existing invaders spread, and as interactions with climate change exacerbate their impacts. An estimated 20 new weeds, pests and diseases establish each year, according to CSIRO.¹⁰⁴ Among those to establish recently are a fungus (myrtle rust) that attacks hundreds of Australia's dominant plant family (the Myrtaceae) and Asian honeybees. It will take decades to centuries for the impacts of many invaders to fully manifest:¹⁰⁵

Australia is in the throes of ecological upheaval, and most of this change is coming not from new invaders but from old pests tightening their grip on the land. It is important to understand that most pests in Australia have yet to occupy their full range; they are still migrating outwards or increasing in density (infilling) or both.

Biologist Tim Low, Feral Future¹⁰⁶

The State of the Environment 2011 rated the impacts of invasive species on biodiversity and natural heritage as 'very high' and 'deteriorating', and their management for biodiversity was scored as 'ineffective'. The report found that government responses "are uncoordinated at the national level, reactive, focused on larger animals, biased towards potential impact on primary industry at the expense of the total ecosystem, and critically under-resourced" and that under climate change "an explosion in the number and impacts of invasive species is plausible".¹⁰⁷ In a review of climate change for the Australian Government, Professor Ross Garnaut warned that:¹⁰⁸

The ultimate outcomes [of climate change] are expected to be declines in biodiversity favouring weed and pest species (a few native, most introduced) at the expense of the rich variety that has occurred naturally across Australia.

One of the greatest environmental and agricultural reforms of the past two decades was the 1997 reform of quarantine to require risk assessment of new exotic species proposed for import into the country. But if an invasive or potentially invasive species is already in Australia and not the target of official control efforts, it can be freely imported, including new varieties that are more invasive. As international trade and travel burgeon, there are also escalating risks of accidental imports. Australia is under-prepared to prevent, detect and respond to new incursions that could threaten biodiversity.

There are more exotic plant species (about 30,000) in Australia than there are natives. More than 10% have already established in the wild, and another 20% are weedy in other parts of the world, suggesting a potential for weediness here. Due to lax laws in most states and territories, the majority of invasive and potentially invasive plants can be freely planted in new areas. The 2009 independent review of federal environment laws found that the movement of exotic plant species within Australia “is effectively unconstrained”, that they “represent a vast reservoir of potential future problems”, and that there has been “a substantial failure of State and Territory-based environmental regulation.”¹⁰⁹ The Australian Government has the legal capacity to regulate the use of damaging species but has failed to do so.

Australia has undertaken some very impressive eradications, for example bovine tuberculosis and brucellosis in a 20-year program, and exotic predators and goats from more than 100 islands. Current ambitious eradication programs include red imported fire ants from southeast Queensland, foxes from Tasmania, and rabbits and rodents from Macquarie Island. There has also been a sustained national focus on controlling several of Australia’s very worst weeds (the Weeds of National Significance program) and programs to control feral animals in some areas (such as the Flinders Ranges Bounceback Program and Western Shield). Volunteers make a huge contribution to weed control in bush rehabilitation projects. But, overall, Australia’s investment in invasive species management is far too limited and single-species focused, and far exceeded by the damage being caused. Investment probably needs to increase by at least an order of magnitude to protect biodiversity.¹¹⁰

10 YEAR VERDICT

Australia has failed to implement the biosecurity systems and programs essential to protect biodiversity from the ever-growing threat of invasive species. There are major gaps in biosecurity laws; weed regulation in particular lags behind that for most other environmental threats. Although there are some excellent programs to eradicate and control invasive species, the focus is far too narrow and the investment far too small and inconsistent with the scale of the threat. Australia needs a more ecologically informed approach to invasive species management.

FISHING

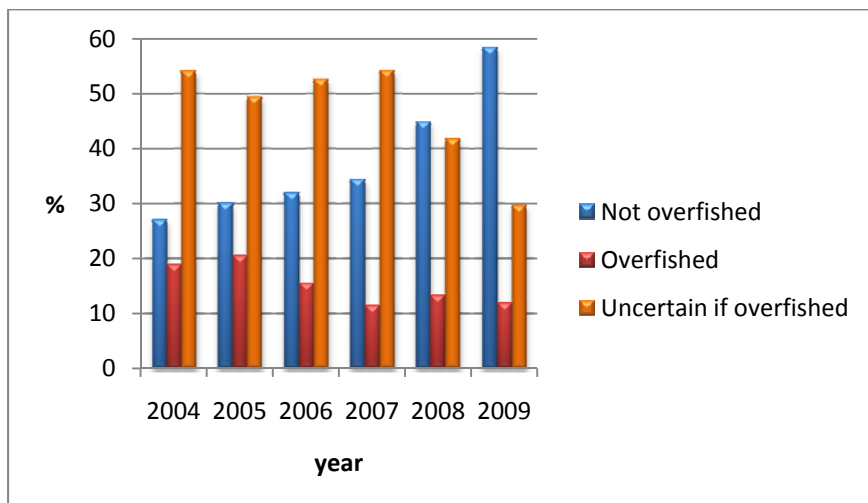
Australia has the third largest marine estate in the world and exceedingly high marine biodiversity.¹¹¹ But our oceans are not highly productive, and we rank 46th in volume of fish caught, producing less than 1% of the world’s seafood.¹¹² Low productivity means that Australia’s fisheries are vulnerable to overexploitation. Of federally managed fisheries, 42% are either overfished or their status is uncertain.¹¹³

Australia has recently improved its fisheries management, driven in part by the requirement for Commonwealth and export fisheries to be assessed under the national environment laws. The State of the Environment 2011 reported that pressures are decreasing overall but that “in the worst areas of the south-east, east and south-west, pressures are widespread and causing serious degradation, and the east continues to degrade.” The report also found that “trophic structures in the oceans are heavily impacted—ecosystem resilience to trophic impacts, cumulative impacts and potential time to recovery are uncertain.”

Assessments of federally managed fisheries from 1992 to 2005 showed a trend of increasing numbers of overfished stocks and high levels of uncertainty about the status of many stocks. In late 2005 the Australian Government introduced a \$220 million package to reduce overfishing, which resulted in lower fishing capacity in several fisheries, and an improvement in their status. Because of this and for economic reasons, wild-caught fisheries production has decreased by more than a quarter since 2005.¹¹⁴ The proportion of overfished stocks managed by the Australian Government dropped from 19% (2004) to 12% (2009) and the proportion of uncertain stocks dropped from 54% to 30%.¹¹⁵ However, fishing strategies manage the biomass of targeted populations to an agreed level typically only about 40% of undepleted levels.¹¹⁶

Figure 5. Changes in the status of fishing stocks managed by the Australian Government (101 stocks – species, subspecies or populations – were assessed in 2009.) Source: Australian Government 2009¹¹⁷

	Not overfished	Overfished	Uncertain if overfished
2004	27	18.9	54.1
2005	30.1	20.5	49.4
2006	31.9	15.5	52.6
2007	34.4	11.4	54.2
2008	44.9	13.3	41.8
2009	58.4	11.9	29.7



Because of commercial sensitivities, nominations to list several fish species as threatened have taken several years to finalise, and they have not all been listed in categories as scientifically warranted. In 2006, the environment laws were amended to allow marine fish to be listed as conservation dependent even if they qualified for listing in a higher category so as to allow continued exploitation. Despite qualifying as endangered and critically endangered respectively, orange roughy and southern bluefin tuna have been listed as conservation dependent, as have two other species for which fishing is the primary threat.

Fishing threatens several not-target species caught as bycatch, including sea turtles, sharks, dugongs and albatross. There are very few recovery plans in operation for threatened marine species, and no species has recovered to secure population levels. Just two threat abatement plans have been approved to protect marine species (relating to the impacts of marine debris and the bycatch of seabirds in longline fishing).

Fisheries assessments under the EPBC Act have led to a greater focus on ecosystem-based management and the Fisheries Management Authority is developing environmental management strategies for each Commonwealth fishery. A 2007 international assessment of ecosystem-based management rated Australia's federally managed fisheries as 'acceptable' but in need of improvement.¹¹⁸ Most fisheries (producing 70% of the catch weight) are managed by state and territory governments, and the same international assessment awarded a fail mark to regional fisheries managed by New South Wales, scoring them 20% lower than federally managed fisheries. Recreational fishing pressure on favoured species is likely to be higher than commercial pressure but recreational impacts are not assessed.¹¹⁹

It is difficult to evaluate ecosystem impacts because of a lack of nationally integrated analysis of cumulative impacts on ecosystem structure and function.¹²⁰ Although fishing practices have considerably improved, legacy effects of past "intense fishdown of virgin stocks" are a "dominant feature of the population structure of most fishable species".¹²¹ Consequently, offshore and coastal fish populations are depleted, leaving Australia's oceans much less resilient to combined effects of climate change, habitat loss and fishing pressure. One example of this is that fished areas in the Great Barrier Reef Marine Park have almost four times more outbreaks of crown-of-thorns starfish (the main cause of coral mortality) than highly

protected areas, where fishing is not allowed.¹²² Coral cover is markedly higher in the non-fished areas. Shark fishing strategies neglects the vitally important role of these keystone predators in maintaining healthy ecosystems.¹²³ School shark, which are listed as nationally threatened, were assessed as overfished in 2010, at less than 20% of their unfished biomass.¹²⁴

Of concern for conservation is that the Australian Government has said it intends to move away from conducting assessments of fisheries under the environment legislation to accredit assessments and management arrangements by other government fishery managers. This would likely reduce the potential for improved environmental management and could compromise gains already made.

10 YEAR VERDICT

Federal fisheries management has improved over the past decade, with fishing pressure in several fisheries reduced. But more than 10% of federally managed stocks are overfished, including some threatened species, and the status of 30% is uncertain. Fisheries management by state and territory governments is probably less effective, and the impacts of recreational fishing pressure are not assessed. Much more progress is needed to achieve ecologically sustainable management. Increased fish and shark populations and coral cover in strictly protected areas in the Great Barrier Reef Marine Park (increased in 2004 from just 4.5% of the park area to 33%) demonstrate the necessity for healthy marine ecosystems of reducing fishing pressure.

A GLOBAL PERSPECTIVE

In this section, we compare Australia's performance on the environment and on economic and development indicators with those of other nations, and then review Australia's lack of progress in meeting the major goals arising out of Rio to redress climate change, biodiversity loss and environmental degradation.

- Australia's performance compared globally
- From Rio to Rio+20



AUSTRALIA'S PERFORMANCE COMPARED GLOBALLY

Australia is one of the world's leading nations on multiple measures, including income, education and health. With the world's sixth largest GDP per capita, Australia is one of the countries most able to afford environmental protection. But Australia is an environmental laggard and is living way beyond its ecological means.

Human Development Index	2 nd	GDP per capita	6 th	Environmental performance index	48 th	Ecosystem vitality	106 th
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AUSTRALIA'S ECONOMIC AND DEVELOPMENT STATUS

Australia is one of the world's most developed countries, and its citizens are by global standards extremely wealthy. Despite being only the world's 54th most populous nation, we have the 13th largest economy, and we rank second on the Human Development Index, a combined measure of income, education and health.

Table 15. Australia's economic status

Economic measures	World Ranking
Gross Domestic Product (GDP) ¹²⁵ (2012)	13 th (US\$1.47 trillion)
GDP per capita ¹²⁶ (2011)	6 th (US\$ 65,477)
Budget expenditures ¹²⁷ (2011)	11 th (\$506 billion)
Personal consumption expenditure ¹²⁸ (2005)	7 th
Military spending ¹²⁹ (2011)	13 th (\$US26.7 billion)
Population ¹³⁰ (2012)	54 th (22 million)
Population density ¹³¹ (2005)	209 th

Table 16. Australia's development status

Measures of development	World ranking
Human Development Index Rank ¹³² (2011)	2 nd
Life expectancy at birth ¹³³ (2009)	3 rd
Personal consumption expenditure ¹³⁴ (2005)	7 th
Wellbeing index (by survey) ¹³⁵ (2010)	10 th

AUSTRALIA'S ENVIRONMENTAL PERFORMANCE

We lead the world in land degradation. ... We lead the world in recent mammal extinctions. We lead the world in the overall number of threatened species. We lead the world in the number of per capita threatened species. Biodiversity loss is a symptom of poor environmental management. By all accounts we lead the world in poor environmental management.

Ecologist Professor David Lindenmayer 2007¹³⁶

As attested by 5-yearly state of the environment reports, Australia's environmental performance is abysmal. Even in the midst of a global biodiversity crisis and planetary climate change, we stand out as an environmental reprobate. We have had the highest greenhouse gas emissions per capita of developed countries over the past 20 years, and our emissions continue to increase. An average Australian accounts for as much carbon dioxide emissions in two days as an average citizen of Malawi or Rwanda in a year. Our mining of fossil fuels will be a major impediment to constraining global warming. We are world leaders in biodiversity loss, with the highest per capita number of threatened species.¹³⁷

Australia is rated as a ‘modest’ performer in the Environmental Performance Index, ranked 48th globally in 2012, on a par with countries like Georgia, Estonia, Cuba, Bulgaria, Sri Lanka and Egypt.¹³⁸ Australia scored highly (99/100, ranked 10th) for environmental health (effects of air and water on human health, environmental burden of disease), but poorly (38/100, ranked 106th) for ecosystem vitality.

It’s not as though Australia is generally a nation of underperformers. When we strive to achieve, we can attain a high global ranking. Australia, for example, has been in the top five for medals won in the past four Olympic Games and 19 Australian sporting teams hold ‘top three’ world rankings.¹³⁹

Table 17: Australia’s environmental performance

Note: in most measures a low number indicates poor performance

Measures of environmental performance	Global ranking
Greenhouse gas emissions ¹⁴⁰ (2009)	15 th (highest)
Greenhouse gas emissions per capita in the OECD ¹⁴¹ (1990/1995/2000/2005/2009)	2 nd /1 st /1 st /1 st /2 nd (highest)
Global Footprint ¹⁴² (2007)	8 th (largest)
Environmental Performance Index (EPI) ¹⁴³ (2012)	48 th (best)
Ecosystem vitality ¹⁴⁴ (part of EPI)	106 th (best)
Composite environmental impact ¹⁴⁵ (2010)	10 th (worst)
Natural habitat conversion ¹⁴⁶	6 th (worst)
Water footprint ¹⁴⁷ (1996-2005)	12 th (largest)
Electricity consumption per capita ¹⁴⁸	10 th (highest)
Terrestrial protected areas % area ¹⁴⁹ (2010)	113 th (largest proportion)
Extinctions since 1600 - mammals	1 st (most)
Number endangered species (IUCN) ¹⁵⁰ (2009)	7 th (most)
- Mammals	9 th (most)
- Birds	13 th (most)
- Reptiles	2 nd (most)
- Fish	6 th (most)
- Molluscs	2 nd (most)
- Other invertebrates	2 nd (most)

20 YEAR VERDICT

In light of Australia’s great relative wealth, relatively small population, technical sophistication and stellar global performance on other measures, we are in serious contention for ‘world’s worst’ environmental performance since Rio.

FROM RIO TO RIO+20

The 1992 Rio Earth Summit identified three great challenges for the planet: climate change, biodiversity loss, and desertification and degradation. Australia signed up to each of the international agreements intended to propel national action to overcome these great threats to the future of the environment and humanity.

Focus	Agreement	Ratified	Main goal for Australia
Climate change	United Nations Framework Convention on Climate Change (1992)	1992	Reduce Australia's greenhouse gas emissions
Biodiversity loss	United Nations Convention on Biological Diversity (1993)	1993	Halt the loss of Australia's biodiversity
Desertification and land degradation	United Nations Convention to Combat Desertification (1994)	2000	Prevent and remediate degradation in semi-arid and arid Australia

As the preceding sections make clear, Australia is highly vulnerable to climate change, biodiversity loss and land degradation, and has already suffered great damage. Apologists can cite a long list of environmental programs and strategies with laudable goals to address these problems, and some successful outcomes, but in terms of what counts – whether our land is returning to health and the biota of our land and seas is being protected – Australia is unequivocally failing. In the 20 years since Rio, indicators in all these areas have declined.

REDUCE AUSTRALIA'S GREENHOUSE GAS EMISSIONS – FAIL

Australia is a profligate user of fossil fuels and has been the highest per capita emitter in the OECD for most of the period since Rio. Emissions (excluding land use change) have risen by about 30% since Rio. Australia's burgeoning coal exports will be a major impediment to global efforts to keep mean temperatures within safe limits.

HALT THE LOSS OF AUSTRALIA'S BIODIVERSITY – FAIL

Since Rio, the number of listed threatened fauna has risen by 249 (178%) and the number of threatened plants by 417 (47%), to a total of almost 1700, and many more species not listed are in steep decline. We are per capita leaders in biodiversity decline, and have also been one of the world's most rampant land clearers for much of the period since Rio. But progress has been made in curtailing clearing and expanding protected areas: since Rio, clearing of remnant bush has been reduced by about two-thirds, and about 6% of Australia's land and marine area have been added to reserves. Although there is some better management of destructive industries (grazing, fishing and mining), major threats (habitat loss, invasive species, damaging fire regimes, grazing, water extraction, mining and climate change) have not been averted or reversed.

REVERSE LAND DEGRADATION IN AUSTRALIAN DRYLANDS – FAIL

Australia has major degradation problems, particularly soil erosion, acidification, salinity and loss of soil carbon. Since Rio, some progress has been made in improving land management, and the spread of salinity may have slowed due to drought. But far too little has been done to address legacy and ongoing problems due to overclearing and overgrazing, and irreparable damage is resulting.

Blessed with great ecological and economic wealth, Australia should be a world leader in conservation. But while we grow richer in economic terms, we pursue environmental poverty. Our ancient land and biota, much of Gondwanan origin, are being sacrificed to short-term economic or political gain. Australia is the model of what United Nations Secretary General Ban Ki-Moon addressing The World Economic Forum in January 2011, warned against:

For most of the last century, economic growth was fuelled by what seemed to be a certain truth: the abundance of natural resources. We mined our way to growth. We burned our way to prosperity. We believed in consumption without consequences. Those days are gone...Over time, that model is a recipe for national disaster. It is a global suicide pact.

Australia has the legal, social and economic capacity to move to a low carbon economy, protect biodiversity and remediate degradation – and countless government reports and strategies have attested to the importance of doing so – but political priorities and allocation of public resources favour the converse of these goals. Benefits to the few in the present have more political weight than the great cost to be borne by all in the future.

Since Australia adopted new national environment laws designed to implement its international commitments for the environment, the *Environment Protection and Biodiversity Conservation Act* 1999 has failed to fulfill either its potential or Australia's Rio commitments:

- It fails to cover the range of threats to our environmental health, omitting to assess activities with high greenhouse gas emissions and water use, logging of native forests and many agricultural practices.
- It favours development over protection; it is easier and quicker to get a coal mine approved than a threatened species or key threatening process listed. Once a species is listed, development and implementation of recovery plans is slow and underfunded, and fewer than 60% have recovery plans.¹⁵¹
- The Act allows wide ministerial discretion, and more than 99% of referred development proposals are approved.¹⁵² Enforcement is underfunded and not a political priority.

At a time when stronger national environmental laws are needed, it is about to get worse. The Australian Government has recently agreed to weaken national environmental laws and fast-track unsustainable development. At the urgings of business, which has been granted an insider advisory role not permitted for any other sector in society, the Council of Australian Governments has agreed to transfer most federal powers of assessment and approval to the states and territories.¹⁵³ Environmental assessment processes in most states and territories are weaker than under the federal government, and state and territory governments have frequently demonstrated a disinterest in the national environmental interest. It threatens to reverse 30 years of incremental improvement in national laws initiated when the federal government stepped in to prevent the Tasmanian government from damming the Franklin River.

A short-term deal-making mentality prevails in Australia, in which nature is viewed as entirely negotiable. This is starkly exemplified by the mining boom in which, with no regard for the planetary future, fossils fuels are being hauled out of land and sea as quickly as possible. Government decision-makers do not even contemplate refusal for mining projects. The best of them try to get a better deal for nature – a few more conditions and a few more offsets on project approvals.

The Australian Government offers lucrative deals for industries that damage the environment and chronically underfunds the work of preventing or repairing damage. Levels of public funding for the environment are commensurate with neither the value of the environment to the human economy nor the scale of damage and decline.

Good businesses invest in the maintenance of capital assets at around 10–20% of their value. This means we should be investing tens of billions of dollars per year in biodiversity conservation. We are not. This allocation failure by Australian governments partly reflects two common mistakes: we are not good at looking after things we inherited for free, nor are we good at valuing the lives of future generations.

Ecologist Professor Hugh Possingham¹⁵⁴

Even for iconic environmental assets well-recognised for their economic value, funding is miserly. Since 2004, annual investment in management of the Great Barrier Reef Marine Park has been less than 0.9% (and decreasing) of its estimated economic value.¹⁵⁵ The shortfall in budgets for essential environmental work is at least five- to ten-fold.¹⁵⁶ So dire is the underfunding that some ecologists have proposed selling off some national parks to buy others.¹⁵⁷

Environment budgets are small by comparison with many other areas of public expenditure. The 2012-13 budget of the Australian Government allocated the environment department just over \$2 billion, 0.55% of the total, and the climate change department less than \$1 billion, 0.26% of the total.¹⁵⁸ The government grants about as much to the mining industry

in fuel tax credits as it spends on the environment portfolio.¹⁵⁹ It spends as much on a low emissions coal initiative (to help entrench coal as the primary energy source but with no prospect of turning it into a low emissions fuel) as it does on managing the Great Barrier Reef Marine Park, whose greatest threat is coal.¹⁶⁰

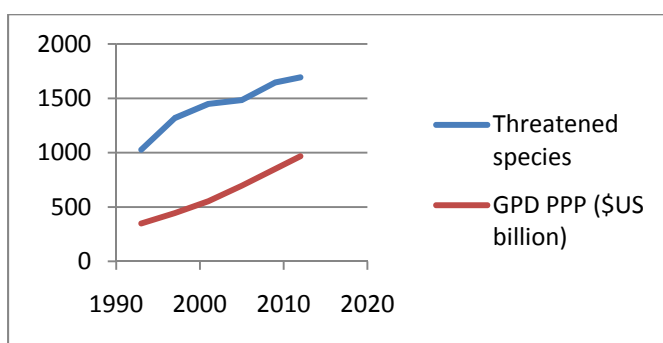
Far more is expended on subsidising environmental damage than on protecting the environment. More than \$9 billion federally goes annually to subsidise the mining and use of fossil fuels, primarily through tax breaks and tax exemptions.¹⁶¹ Additional uncalculated subsidies include those for research and development, as well as those provided by state governments, including for aluminum production (below-market prices for electricity) and electricity generation (below-market prices for coal).

Taxpayers also bear the cost burden of health and environmental damage caused by fossil fuels. The Australian Academy of Technological Sciences and Engineering estimated the health costs from burning coal at \$2.6 billion a year.¹⁶² Coal would be the most expensive of fuels if the external costs of burning it (health impacts and greenhouse gas emissions) were recovered from the industry.¹⁶³

Governments incentivise unsustainable practices in other industries as well. Over the past decade, the Australian Government has granted \$4.5 billion in exceptional circumstances assistance,¹⁶⁴ which provides “incentives to pastoralists to damage their own resource base and then pays relief for the impact that this has on their enterprises”.¹⁶⁵ Taxpayers have paid for the breeding and cultivation of harmful invasive plants¹⁶⁶ and to subsidise logging of native forests.¹⁶⁷ Taxpayers pay for remediation, not those who profit from degrading the environment by planting weeds or overstocking. There has been a chronic failure by Australian governments to decouple economic growth and environmental degradation and to require industries to pay the full costs of damage they cause.

Figure 6. The rise in GDP (purchasing power parity-adjusted) and threatened species in Australia, 1993-2012. Sources: Australian Government,¹⁶⁸ Economy Watch¹⁶⁹

	Threatened species	GPD PPP (\$US billion)
1993	1027	349
1997	1319	444
2001	1449	554
2005	1484	696
2009	1646	851
2012	1693	967



Australia should have no higher priority than to secure a healthy environmental future. Our continent has already suffered too much damage and loss, and can't afford another 20 years of failure. Australia's daunting but doable task will require a dismantling of the pervasive myth that environmental loss is the price that has to be paid for a healthy economy, and a much more active citizenry to reject the selling out of nature and our planetary future.

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Climate change budget at <http://www.climatechange.gov.au/about/accountability/budget/pbs-201213.aspx>.

These allocations do not reflect environmental spending in total, some of which would come from other departments. But not all the money allocated to the environment department is for the environment, eg. there are allocations to the Bureau of Meteorology and for non-environmental Antarctic activities.

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Concessional fringe benefit tax treatment of company cars	\$1.22 billion
Exemption from fuel tax for aircraft	\$1.05 billion
Concessional tax treatment of oil from north west shelf	\$0.06 billion
Accelerated depreciation for planes, oil and gas assets and commercial vehicles	\$1.00 billion
Exemption from excise for LPG, LNP and CNG	\$0.32 billion
Fuel tax credits scheme for vehicles used in mining, agriculture, and other non-road purposes	\$5.29 billion
Total 2011-2012	\$9.46 billion

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