

Australia's extraordinary diversity

Australia is one of the world's 17 'megadiverse' countries. These countries cover less than 10% of the Earth's surface but support 70% of its biological diversity. Indeed, Australia is the most megadiverse of developed countries - it has almost 10% of the world's known species. It also has 10% of the world's threatened species.¹

Australia is home to an estimated 566,000 species, many of which are found nowhere else in the world. About 92% of our vascular plants, 87% of our mammals, and 45% of our birds are endemic - that is, they are only found in Australia.² The marine environment is home to thousands of marine species, many of which are unique to Australia.

The challenge of conserving Australia's biodiversity is compounded by the fact that at least 75% of our native species remain undiscovered or undescribed from a western taxonomic perspective. Almost half of Australia's land mass has not been fully biologically surveyed.³

Box 2. Examples of Australia's biological diversity

Victoria alone has around 270 species of orchid; on the other hand, the entire North American continent has only 165 species of orchid, while Europe has only 116 species. Australian deserts have a greater number of lizard species per square kilometre than do either the Kalahari or American deserts. With an estimated 4000 species, Australian ants are also highly diverse compared with elsewhere. Britain, for example, has only 41 species of native ants. This number is well exceeded by the 452 hectare Black Mountain Nature Reserve in Canberra, which has more than 100 species of native ant.⁴

What condition is Australia's biodiversity in?

*"Over the last 200 years Australia has suffered the largest documented decline in biodiversity of any continent. Despite efforts to manage threats and pressures to biodiversity in Australia, it is still in decline."*⁵

Almost half of all mammal extinctions in the last 200 years have occurred in Australia. According to the International Union for Conservation of Nature, Australia is in the 'top five' countries with exceptionally large numbers of threatened species.⁶

A total of 1,667 species are listed as threatened under the Environment Protection and Biodiversity Conservation Act as threatened, as of March 2010⁷. A further 103 are listed as extinct. A total of 48 ecological communities are also listed as threatened under the EPBC Act. This is far from being a comprehensive listing of threatened species, as many species have not been scientifically described, and others have not been through the nomination

¹ Department of Environment, Water, Heritage and the Arts, *Australia's fourth national report to the UN Convention on Biological Diversity*, Canberra, 2009.

² A. Chapman, *Numbers of Living Species in Australia and the World*. 2nd ed. Aust. Biological Resources Study, 2009. Available at www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/index.html accessed 15 June 2010.

³ Dept of Environment, Water, Heritage and the Arts 2009, above.

⁴ Dept of Environment, Water, Heritage and the Arts 2009, above.

⁵ Aust. Dept of the Environment, Water, Heritage and the Arts website www.environment.gov.au/biodiversity/conservation/index.html accessed 29 March 2010.

⁶ J. Baillie *et al.*, *A Global Species Assessment*. 2004 IUCN Red List of Threatened Species. IUCN, Gland & Cambridge, 2004.

⁷ www.environment.gov.au/epbc/about/lists.html

and assessment process that precedes listing. Many more species are assessed as being of concern, at least at a regional level, including 39% of freshwater fish species, 31% of birds, and 56% of mammals.⁸ It is also worth noting that listing only occurs at the latter stages of decline of a species.

The *Assessment of Australia's Terrestrial Biodiversity 2008*⁹ for the Commonwealth Government found that many of Australia's biological assets are still in decline, and threats are ongoing and compounded by climate change. Moreover, the report stated that there are insufficient data to report on national trends in important aspects of Australia's biodiversity.

About 90% of the native vegetation in the eastern temperate zone has been removed for human habitation, industry and transport, or replaced by introduced pastures and crops. About 50% of rainforests have been cleared and the proportion of Australia covered by forest or woodland has been reduced by more than one-third. Extensive clearing and vegetation modification continue to result in severe reduction and fragmentation of the mallee, mulga and brigalow woodlands.¹⁰

Australia's coastal and oceanic waters are largely unexplored and there is little information about Australia's marine biodiversity, especially for the more remote, deeper oceanic areas. Expert opinion based on observations of significant decline in some marine species in some areas suggests that there is a continuing decline occurring in Australia's marine biodiversity and ecosystems.¹¹

Analysis of the 1977–81 and 1998–2001 Bird Atlas surveys showed that 29 species (out of 497 species) had significantly decreased reporting rates over the 20-year period. Grassland, woodland and ground-nesting species were particularly affected.¹² Some important aquatic indicator species have declined, including many species of aquatic macro-invertebrates, freshwater fish, frogs, and waterbirds.

Expert opinion in 2001 was that a large proportion (39 %) of Australia's 85 bioregions have more than 30% of their ecosystems described as threatened. Many of Australia's threatened species are in the Murray–Darling Basin, south-west Western Australia, populated coastal regions, and in the Tasmanian Midlands. Some areas contain more than 150 threatened species. More than half of the ecosystems in the developed coastal areas and the Murray–Darling Basin are under severe pressure and significant declines are likely.¹³

On the tenth anniversary of the Convention on Biological Diversity, in 2002, Australia and other parties adopted the 2010 Biodiversity Target: to reduce significantly the rate of biodiversity loss at global, regional and national levels. The Target was subsequently endorsed by the United Nations General Assembly and incorporated into the Millennium Development Goals. On the available evidence, Australia has failed to achieve its 2010 Biodiversity Target.

⁸ B. Mackey, 'The state of biodiversity in Australia.' In M. Blakers (ed) *Biodiversity Summit 2006: Proceedings*. Green Institute and Lawyers for Forests, Hobart, 2006.

⁹ Biodiversity Assessment Working Group, *Assessment of Australia's Terrestrial Biodiversity 2008*, National Land and Water Resources Audit, report for the Australian Government, Canberra, 2009.

¹⁰ Dept of Environment, Water, Heritage and the Arts 2009, above.

¹¹ Dept of Environment, Water, Heritage and the Arts 2009, above.

¹² S. Garnett, G. Crowley and G. Barrett 'Birds', in *Australian Terrestrial Biodiversity Assessment*, National Land and Water Resources Audit, Commonwealth of Australia, Canberra, 2002.

¹³ R. Beeton *et al.*, *Australia State of the Environment 2006*. Independent report to the Australian Government Minister for the Environment and Heritage. Canberra, 2006.

Threatening processes

Two reports to the Natural Resources Ministerial Council¹⁴ have identified the major current and long term threats to Australia's biodiversity as being:

- loss, fragmentation and degradation of habitat
- climate change and enhanced climate variability
- the spread and introduction of new invasive species and diseases
- marine and coastal pollution, including from land based sources and vessels
- changes to the aquatic environment and to water flows
- inappropriate grazing and fire regimes
- population growth and unsustainable development.

“Science can help ensure that decisions are made with the best available information, but ultimately the future of biodiversity will be determined by society.”¹⁵

Further reading

Department of Environment, Water, Heritage and the Arts, *Australia's fourth national report to the UN Convention on Biological Diversity*, Canberra, 2009. Available at <http://www.environment.gov.au/biodiversity/publications/cbd/pubs/fourth-report.pdf>

R. Beeton *et al.*, *Australia State of the Environment 2006*. Independent report to the Australian Government Minister for the Environment and Heritage. Canberra, 2006.

P. Olsen, *The State of Australia's Birds 2008*. A five year review. Birds Australia, Melbourne, 2008. Available at www.birdsaustralia.com.au/soab/state-of-australias-birds.html

¹⁴ Marine Biodiversity Decline Working Group, *A National Approach to Addressing Marine Biodiversity Decline*. Report to the Natural Resource Management Ministerial Council, Canberra, 2008, and Biodiversity Decline Working Group, *A National Approach to Biodiversity Decline*. Natural Resource Policies and Programs Committee report to the Natural Resource Management Ministerial Council, Canberra, 2005.

¹⁵ Millennium Ecosystem Assessment, *Ecosystems and Human Well-being: Biodiversity Synthesis*. World Resources Institute, Washington, DC, 2005.