

3

NATURE AND BIODIVERSITY MANAGEMENT*

Features

- National guidance and regional delivery
- The growth in terrestrial and marine protected areas
- Halting the clearance of native vegetation
- Protecting biodiversity on private land, including through market-based instruments

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 1998. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy.

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Australia:

- further increase the *terrestrial and marine area* under formal protection while progressing towards the objective of a comprehensive and representative National Reserve System;
- persevere with efforts to protect, *manage and restore* wetlands;
- strengthen the recovery of *threatened species and ecological communities* through co-ordination of recovery plans and pest management plans on the regional level;
- ensure that *regional natural resource management (NRM) plans* give due consideration to biodiversity issues and are co-ordinated with local authority land use plans;
- continue to develop and apply *market-based instruments* to protect biodiversity values on private land, as appropriate; ensure effective off-reserve conservation;
- enhance the collection of taxonomic data and collation of *nationally coherent information*.

Conclusions

Australia substantially increased its *efforts to protect biodiversity* during the review period. The terrestrial area protected by formal reserves increased by 30% during the review period, and marine protected areas grew by 66%. Altogether, over 10% of Australia's landmass is now protected. Many nature protection activities are now *organised on a national scale*, such as the National Reserve System, the National Framework for the Monitoring and Management of Australia's Native Vegetation or the National Weeds Strategy, and the same will soon be true for *marine protected areas*. The delineation of bioregions which classify the biodiversity value of various ecosystems has helped to take a more strategic approach to nature management, and to identify remaining gaps in the reserve system. The devolution of the delivery of some national programmes to a regional or landscape scale has led to greater engagement of local communities and citizen groups. The EPBC Act has given renewed emphasis to species recovery and threat abatement planning. All Australian governments have agreed to stop loss of native vegetation through *land clearing*, long the chief threat to biodiversity in Australia. Innovative *market-based instruments* for the protection of biodiversity on private land (e.g. BushTender, tradable bio-diversity

credits), are being tested in several states. Substantial Commonwealth funding through the Natural Heritage Trust has effectively leveraged state/territory and local funding including for nature management activities.

Even so, there remain several areas where efforts are not commensurate with the challenge. *Downward trends* in the conservation status of Australian species still dominate positive ones; some major *pressures* on Australia's mega-biodiversity (e.g. weeds and invasive species, climate change) have not eased during the review period. Overall, conservation efforts have not been proportional to the *economic benefits* derived through tourism and environmental services from nature and biodiversity conservation. The *resources* available for the management of the National Reserve System have not kept pace with the expansion of protected areas. The National Reserve System does not yet meet the test of being comprehensive, adequate and representative. A sharp increase in the number of species recovery plans and threat abatement plans has revealed the need to co-ordinate and streamline, perhaps through multi-species approaches. The integration of biodiversity concerns into the catchment management plans of the regional natural resource management bodies is still patchy. While biodiversity considerations are sometimes taken into account in *land use planning decisions*, as a rule there is much room for improvement. Although the existence of the Australian Biological Resources Study and the creation of the National Land and Water Resources Audit are important steps in the right direction, *lack of policy-relevant information*, including taxonomic and trend data, still hampers biodiversity and nature conservation.



1. Nature Management Framework

1.1 Legislation and objectives

The Australian States and Territories have long had their *own legislation, strategies and plans dealing with nature management and species protection*. However, much greater emphasis has been placed on the Australian Government's engagement and nationwide approaches since the country ratified the UN Convention on Biological Diversity in 1993. There has been a concurrent trend to shift delivery of conservation programmes to a regional and landscape scale through a new set of catchment management bodies.

The Australian Government updated its nature management legislation with the Environment Protection and Biodiversity Conservation (EPBC) Act 1999, which defines the responsibilities of the Australian Government in environmental matters and specifies “matters of national environmental significance” that may trigger its involvement in any particular issue. Seven matters of national environmental significance have so far been listed (World Heritage sites; Ramsar wetlands of international importance; nationally threatened species and ecological communities; internationally protected migratory species; Commonwealth marine areas; uranium mining; Australian National Heritage sites). The EPBC Act is the main instrument at the Australian Government level incorporating international conventions (e.g. World Heritage, Biological Diversity, Ramsar, Bonn, CITES) into Australian law. The provisions of the EPBC Act also apply to actions outside protected areas where those actions could have a significant impact on the matter concerned.

The *overarching national policies* for protecting biodiversity are the National Strategy for the Conservation of Australia’s Biological Diversity (1996) and the National Objectives and Targets for Biodiversity Conservation 2001-05¹ (Table 3.1). The latter contains a large number of actions (e.g. amending laws, setting up programmes, developing instruments) to be undertaken by all Australian jurisdictions in pursuit of the following priorities: protect and restore native vegetation and terrestrial ecosystems; protect and restore freshwater ecosystems; protect and restore marine and estuarine ecosystems; control invasive species; mitigate dryland salinity; promote ecologically sustainable grazing; minimise the impacts of climate change on biodiversity; maintain and record Indigenous peoples’ ethnobiological knowledge; improve scientific knowledge and access to information; and introduce institutional reform.

This chapter will mainly *discuss progress made during the review period with respect to national programmes* that address some specific nature and biodiversity management issues (Table 3.1). It will also show that Australia has made impressive progress in terms of the recommendations of the 1998 OECD Environmental Performance Review (Table 3.2).

1.2 Institutional arrangements for nature management

Park and wildlife agencies

The States and Territories have their own *nature management agencies* responsible for policy, protected areas and wildlife protection.² The Department of the Environment and Water Resources (DEW), the Australian Government organisation with chief responsibility for nature management and biodiversity, develops and implements national policy and programmes in consultation with the States and Territories. Within

Table 3.1 Selected national nature and biodiversity approaches

	Title	Purpose
1989	National Wetlands Program	Promote the conservation, repair and wise use of wetlands across Australia
1992	National Forest Policy Statement	Promote the inclusion of biodiversity goals in the management of Australian native forests
1996	National Strategy for the Conservation of Australia's Biological Diversity	Protect biological diversity and maintain ecological processes and systems
1997	National Weeds Strategy	Reduce the detrimental impact of weeds on the sustainability of Australia's productive capacity and natural ecosystems
1997	Wetlands Policy of the Commonwealth Government of Australia	Conserve, repair and manage wetlands wisely
1998	Oceans Policy	Apply integrated and ecosystem based planning and management for all of Australia's marine jurisdictions
1999	Australian Guidelines for the Development of the National Reserve System	Outlines an agreed nation wide approach for determining priority values to be protected in planning the expansion of the protected area system
2000	National Action Plan for Salinity and Water Quality	Prevent, stabilise and reverse trends in dryland salinity affecting the sustainability of production and the conservation of biological diversity; improve water quality and secure reliable allocations for human uses, industry and the environment
2000	National Framework for Management and Monitoring of Australia's Native Vegetation	Provide an outline of best practices for managing native vegetation, including roles and responsibility of governments and the community; planning and assessment activities; the formal reserve system
2001	National Objectives and Targets For Biodiversity Conservation 2001-05	Set objectives and targets for ten priority outcomes that the Australian Government, States and Territories will pursue up to 2005
2001	National Approach to Firewood Collection and Use in Australia	Ensure that all firewood collection, including commercial cutting, is ecologically sustainable and not a major cause of loss and degradation of remnant and woodland ecosystems or the habitats of threatened species
2003	Framework for a National Co-operative Approach to Integrated Coastal Zone Management	Address issues regarding land and marine sources of pollution, climate change, introduced pest plants and animals, and the allocation and use of coastal resources
2004	Commonwealth Marine Protected Areas Program	Manage the Australian Government owned marine estate

Table 3.1 **Selected national nature and biodiversity approaches** (*cont.*)

	Title	Purpose
<i>In statu nascendi</i>	National Representative System of Marine Protected Areas (NRSMPA)	Effect intergovernmental co-operation to set up an NRSMPA throughout Australia's marine jurisdiction
2004	National Biodiversity and Climate Change Action Plan 2004-07	Improve understanding of potential climate change impacts on biodiversity to a point where specific strategies can be developed
2005	Directions for the National Reserve System – A Partnership Approach (Natural Resource Management Ministerial Council)	Sets objectives and targets for the development of the national reserve system and outlines a series of directions to improve the policy framework

Source: OECD, Environment Directorate.

DEW, Parks Australia directly manages six national parks,³ 13 marine protected areas and two botanic gardens declared under the EPBC Act. The Wildlife Branch of DEW is responsible for managing trade in wildlife and wildlife products, including implementation of the CITES convention. The *Natural Heritage Trust*⁴ (NHT) has become an important catalyst for funding natural resource management (NRM), including biodiversity protection, at the national and regional level.

National policy and monitoring frameworks

In order to achieve a degree of *national coherence while maintaining the flexibility to accommodate the differences* among them, Australian jurisdictions have developed a series of “frameworks” intended to serve as a common structure for framing policy objectives and monitoring results. Frameworks with particular relevance to biodiversity are: National Objectives and Targets for Biological Diversity Conservation; National Framework for Management and Monitoring of Australia's Native Vegetation; National Framework for NRM Standards and Targets; NRM Monitoring and Evaluation Framework (still under development); Directions for the National Reserve System; and the Murray-Darling Basin Commission targets for Integrated Catchment Management.

The framework approach promises to be influential as long as the associated *monitoring and reporting* are actually carried out. There is still considerable progress to be made before the required monitoring is in place. In addition, significant overlap among the frameworks will impose a burden on reporting agencies. Streamlining

**Table 3.2 Implementation of the recommendations
of the 1998 OECD Environmental Performance Review**

Recommendations	Performance as of July 2006
Continue and intensify efforts to halt and reverse negative trends threatening biodiversity by strongly increasing the pace of ongoing programmes and developing new, creative mechanisms for the conservation of biodiversity in and outside protected areas, combining efforts from the Australian Government, State/Territory and local governments.	The adoption of the EPBC Act 1999 was a major step forward and considerable efforts were made during the review period, backed by substantial financial resources. The regional approach to natural resource management promises to be very positive for biodiversity.
Set more quantitative and operational targets for habitat areas and species population numbers, both on and off reserves, putting more focus on results in existing and new programmes and in instruments such as the National Reserve System.	Australian authorities adopted a very rigorous approach through the classification of bioregions and through striving for a comprehensive, adequate and representative reserve system for terrestrial and marine protected areas.
Consider a major increase in financial resources to strengthen the hands-on management of protected areas and to fund acquisitions and conservation management agreements.	Operational funding has not kept pace with investment in the acquisition of new protected areas.
Further improve the knowledge base for Australian biodiversity management; expand research efforts, notably to support the preparation of inventories, improved monitoring and the development of the reserve system.	The creation of the National Land and Water Resources Audit has already yielded good results and needs to be continued. More effort needs to be made in regard to increasing knowledge about native species.
Improve the integration of biodiversity conservation objectives into the management of off-reserve land (both leasehold and freehold) and develop related new instruments (e.g. conservation easements, covenants, management agreements).	The regional approach in principle integrates biodiversity into natural resource management, land clearing, salinity, invasive species, etc.
Further develop biological conservation programmes and mechanisms for the 14% of Australia's land under Indigenous ownership and management, in close co-operation with Indigenous populations.	Some progress was made in terms of co-management of some parks and Indigenous protected areas.
Further translate strategic commitments to sustainable agriculture, forestry and fishing into actual changes in agricultural, forestry and fishery practices.	See Chapter 5.

Source: OECD, Environment Directorate.

information flows, presumably through the National Land and Water Resources Audit (an NHT programme established to encourage the collection of consistent data to enable reporting of results on a national scale), might therefore be helpful.

The new regional model for natural resource management

Biodiversity conservation on private land was given a significant boost during the review period with the establishment of 56 regional catchment management bodies (the names of these bodies differ somewhat across jurisdictions) with responsibilities for natural resource management, including biodiversity aspects. Covering the whole of Australia, the catchment management bodies (in association with relevant State/Territory government agencies) are responsible for formulating and implementing NRM strategies and investment plans for their regions (Chapter 2), as well as for implementing the National Action Plan for Salinity and Water Quality (NAP) (Chapter 5).

The *regional NRM plans* incorporate specific, measurable and time-bound targets for natural resources' condition. They are based on an assessment of environmental, social and economic factors. By May 2006, 54 regions had both an accredited regional plan (i.e. approved by the Australian and relevant State/Territory governments) and an approved investment strategy identifying activities to address their NRM targets. Another region had an approved "strategic directions plan" and investment strategy. Incorporation of biodiversity issues in these plans is still patchy. The NRM plans and investment strategies are still new and need to be "bedded in" to the existing institutional landscape; in particular, potential synergies with local land use and bioregional planning⁵ are yet to be fully exploited.

To ensure that NRM plans are consistent with national objectives, they must be structured to fit into the *National Framework for Natural Resource Management Standards and Targets* (NRMMC, 2002a). This framework encourages integrated management of land, water and biodiversity on a landscape scale. Bilateral agreements between the Australian and State/Territory governments are all based on the ten "Resource Condition Matters for Targets" and the three "Management Action Matters for Targets" listed in the framework. Performance will eventually be measured in terms of a set of national indicators that, as of mid-2006, were yet to be developed.

A recent evaluation of the biodiversity outcomes of regional investment (Griffin, 2006) concluded that the *regional model is working for biodiversity conservation* because it has: a strong strategic focus; a good balance of national and regional priorities; increasing key stakeholder engagement and community commitment; increasing and more targeted overall investment; and growing integration.

2. Current Status and Threats

Australia is among the 17 most "megadiverse" countries in the world and, with Mexico and the United States, is one of only three OECD members to have this status. It harbours up to 10% of the world's biodiversity, of which 80% is native to

Australia (WWF, 2006). Australia is also the world's driest permanently inhabited continent,⁶ with high rainfall variability from one year to another.

About 87% of Australia's *pre-European vegetation* remains, although clearance has not been uniform across major vegetation types (Table 3.3). Slightly more than one-quarter of native forests and woodland has been cleared, mainly in what is now the intensive land use zone. Most hummock grasslands (the most widespread pre-European vegetation type, covering about 23% of land area) remain, although grazing and other pressures may have degraded their condition. About 87% of heath and low

Table 3.3 Areas of remaining pre-1 750 vegetation types and share in reserves, early 2000s^a

Major vegetation group	Area remaining (km ²)	Area in reserves (km ²)	% of remaining vegetation in reserves
Rainforest and vine thickets	35 200	19 149	54.4
Eucalyptus tall open forest	35 344	11 876	33.6
Eucalyptus open forest	272 121	61 771	22.7
Eucalyptus low open forest	3 952	1 387	35.1
Eucalyptus woodlands	892 920	72 327	8.1
Acacia forests and woodlands	408 632	35 960	8.8
Callitris forests and woodlands	32 296	1 970	6.1
Casuarina forests and woodlands	149 262	27 613	18.5
Melaleuca forests and woodlands	99 561	10 056	10.1
Other forests and woodlands	72 414	7 169	9.9
Eucalyptus open woodlands	458 905	28 452	6.2
Tropical eucalyptus woodlands/grasslands	112 481	14 398	12.8
Acacia open woodlands	314 040	23 867	7.6
Mallee woodlands and shrublands	271 529	99 923	36.8
Low closed forest and tall closed shrublands	16 278	4 965	30.5
Acacia shrublands	851 274	85 127	10.0
Other shrublands	123 464	23 088	18.7
Heath	8 071	3 559	44.1
Tussock grasslands	525 888	15 777	3.0
Hummock grasslands	1 367 973	135 429	9.9
Other grasslands, herblands, sedgeland and rushlands	64 810	11 147	17.2
Chenopod shrublands, samphire shrubs and forblands	436 801	55 037	12.6
Mangroves	9 325	3 087	33.1
Total	6 562 541	753 133	11.5

a) Except for the NSW component, where most data are from 1997.

Source: Department of the Environment and Heritage.

forest and shrublands (one of the less common pre-European major vegetation types) remains. Two-thirds of pre-European rainforests and vine thickets remain.

As for *aquatic habitats*, 90% of pre-European floodplain wetlands in the Murray-Darling Basin, 50% of coastal wetlands in New South Wales and 75% of wetlands on the Swan Coastal Plain in southwest Western Australia have been lost due to altered flow regimes (Arthington, 2002). The biotic condition of Australia's rivers, as measured by the Aquatic Biota Index (macroinvertebrates), suggests that more than two-thirds of assessed rivers (48 793 km) are in good condition, while one-third of the river length assessed (21 909 km) has lost between 20 and 100% of the various kinds of aquatic invertebrates that should be present (Table 2.6). Many estuaries and coastal waters are in good condition, but problems exist in developed areas (Chapter 2).

Land clearance, overgrazing, exotic weeds, feral animals and changed fire patterns are among the most significant *threats to species and ecosystems* across much of Australia. These threats are widespread and pervasive (Sattler and Creighton, 2002). Fragmentation of remnants, increased salinity, soil acidity and firewood collection are threats to biodiversity in the highly modified regions of southern and eastern Australia. For example, over the last 20 years almost 30 mammal and bird species have shown reductions in farming areas, especially where land has been cleared or overgrazed. Until it was largely banned in 2004, clearing of native vegetation in the eastern part of the country, which can cause salination, was considered the single largest threat. About 57 000 km² of land (0.74% of Australia's territory) is affected by, or at high risk of developing, dryland salinity, a form of land degradation. Climate change is increasingly regarded as an additional threat (Box 3.1). Concerning freshwater ecosystems, excess nutrients, sediments and salinity impair the health of rivers. Water extractions for human use and other activities that alter flows are a significant threat to aquatic species. Dams and weirs on rivers hinder the migration of native fish species. Engineering flood control measures, such as the removal of snags,⁷ have also reduced freshwater biodiversity. Rivers discharging nutrients, sediments and other types of pollutants from inland areas into estuaries and coastal waters affect marine biota and coral reefs (Chapter 2).

3. Progress in Protecting Areas

During the review period, Australia developed and adopted a *biogeographic framework for managing biodiversity on a national scale*, the Interim Biogeographic Regionalisation for Australia (IBRA), thereby achieving one objective of the 1996 biodiversity strategy. IBRA divides the Australian continent into 85 bioregions

Box 3.1 Climate change and biodiversity

In 2001, the Third Assessment Report of the Intergovernmental Panel on Climate Change concluded that Australia's fragile biodiversity would be vulnerable to the changes in temperature and rainfall projected to occur over the next 100 years. There is still much uncertainty about how individual species and ecosystems will respond to the combined impact of future climate change. However, there is now wide scientific agreement concerning the expected types of *impact on species and ecosystems*. There is also a growing list of documented changes that are consistent with climate change predictions. For example:

- several species are believed to be threatened, including the endangered mountain pygmy possum, which could lose its entire alpine habitat with just a 1 °C rise in mean annual temperature;
- rising sea temperatures could place reefs at risk from *coral bleaching*, which occurs when water temperatures exceed long-term averages by 1.5-2 °C. Once this temperature threshold is exceeded, algae in the coral tissues are expelled, allowing the white skeleton to show through the clear tissue cover. If temperatures remain above normal levels for more than a few weeks, the coral can die. On reefs where the majority of corals have died, the plants and animals that depend on a healthy reef lose their habitat and a wide variety of biodiversity is lost. Widespread bleaching events occurred in Australia in 1998 and 2002, causing extensive stress throughout the reef ecosystems. Although Australia was not affected as badly as other regions, a small proportion of reefs were severely damaged in each bleaching event. For example, bleaching killed 70-90% of corals on reefs around Bowen in 2002, and similar coral mortality was reported on reefs in the Coral Sea in 2002 and on Scott Reef off northern Western Australia in 1998.

The issue of climate change and biodiversity was recognised in the 2001 National Objectives and Targets for Biodiversity Conservation, which called for the development by 2003 of an *action plan* to identify and address the potential impact of climate change on Australia's biodiversity. In 2004, the Natural Resource Management Ministerial Council (NRMCC) adopted the National Biodiversity and Climate Change Action Plan 2004-07. The action plan aims to co-ordinate the activities of all Australian jurisdictions on this issue, both in terms of improving knowledge and formulating adaptation programmes.

The approach will be to promote in situ conservation of species and ecological communities to facilitate their natural adaptation, rather than using high-cost interventions such as translocation and captive breeding. This will include promoting ecological connectivity to aid the migration (corridors) and dispersal of species, protecting refuges and creating specific management zones around important habitats. In 2007, the Australian Government established an *Australian Centre for Climate Change Adaptation*, a major focus of which will be climate change and biodiversity.

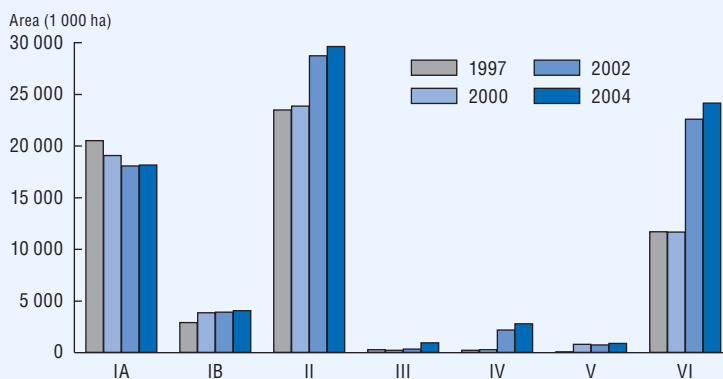
Source: NRMCC, ABS.

and 404 subregions, based on major geomorphic features in each bioregion. The bioregions and subregions are the reporting units for assessing the status of native ecosystems and their protection within the national reserve system, and for use in the monitoring and evaluation framework of Australia's NRM programmes.

3.1 Terrestrial protected areas

Australia made impressive progress in extending the area of formally protected ecosystems during the review period. Total terrestrial protected areas grew by 35% between 1997 and 2004 to reach 808 951 km² (10.5% of Australia's territory, just above the IUCN guideline). Moreover, 69% of protected areas are classified in IUCN categories I-IV (Figure 3.1). In terms of the IBRA classification, 91 of the 404 subregions have more than 10% of their area in conservation reserves. Among the protected areas are 15 World Heritage⁸ sites.

Figure 3.1 Area of Australian terrestrial protected areas, by IUCN management category,^a 1997-2004



- a) IA: Strict nature reserves, protected areas managed mainly for science;
 IB: Wilderness areas, managed mainly for wilderness protection;
 II: National parks, managed mainly for ecosystem protection and recreation;
 III: Natural monuments, managed mainly for conservation of specific natural features;
 IV: Habitat/species management areas, managed mainly for habitat and species conservation through management intervention;
 V: Protected landscapes/seascapes, managed mainly for landscape/seascape conservation and recreation;
 VI: Managed resource protected areas, managed mainly for the sustainable use of natural ecosystems.

Source: Collaborative Australian Protected Areas Database.

The establishment in 1997 of the *National Reserve System programme* (NRS), another objective of the national biodiversity strategy, was an important step in setting priorities for the acquisition of protected areas. The Australian Government, the States and Territories, NGOs and Indigenous landholders all participate in the NRS programme, which encourages a strategic approach (based on the IBRA classification) to biodiversity conservation across the landscape regardless of land ownership. The NRS programme provides i) 50% NHT co-funding towards the cost of land acquisition by State/Territory conservation agencies and ii) 66% towards the cost of land acquired by community groups and conservation NGOs for the voluntary establishment of protected areas on private land. An evaluation of progress in the second five-year period (2002/03-2006/07) was underway in 2006.

As of 2002, two-thirds of Australia's *ecosystem types* were found in national parks and formal reserves, with a further 5% included in other protected areas and covenants on private land (Sattler and Creighton, 2002). Nevertheless, there is considerable variation in the extent to which different vegetation types are protected in reserves (Table 3.3). Using the IBRA classification, the following gaps can be identified: 42 out of 85 bioregions should have high priority for further reservation actions to ensure that Australia has a comprehensive, adequate and representative⁹ system of protected areas; about 1 500 ecosystems identified as poorly conserved (and in many cases threatened) should be the focus of further reservation; 57 subregions in the intensive land use zone have less than 30% vegetation remaining and 88 subregions show little connectivity between remnants, so that the opportunity to develop a comprehensive, adequate and representative protected area system is rapidly diminishing; 175 subregions have less than 2% of their area in conservation reserves, and 33 of these have less than 30% of native vegetation remaining.

Successive Australian *protected area objectives*¹⁰ evolved during the review period and have gradually become somewhat more specific. The findings of the Australian Terrestrial Biodiversity Assessment, although dating from 2002, indicate that the objective of protecting by 2005 a representative sample of each bioregion within the National Reserve System or the network of Indigenous Protected Areas, or on private land managed for conservation under a conservation agreement, would not have been achieved. The same assessment found that examples of 67% of extant regional ecosystems were protected in 2002, a figure that can be compared with the NRS objective of protecting examples of at least 80% of the bioregions in each IBRA region by 2010-15.¹¹ This would leave a further 13% (involving an estimated 220 000 km²) to be protected by 2010-15 (WWF, 2006).

The NRS programme had a budget of AUD 85 million over the first five years, but in the latter part of the review period NHT *funding for NRS land acquisition*

dwindled to AUD 2.99 million in 2003-04 and AUD 3.87 million in 2004-05. Nevertheless, a 2002 report for the Prime Minister's Science, Engineering and Innovation Council found that the NRS is one of the most cost-effective investments governments can make to secure Australia's biodiversity. The report also suggested that an investment of AUD 300-400 million would achieve the NRS objective for 2010-15, saving many native species and yielding collateral benefits of AUD 2 000 million (PMSEIC, 2002).

Local governments also have access to NRS funding (and some councils have designated protected areas), but through lack of awareness they have so far not fully taken advantage of the opportunities available under the programme. There also remains considerable potential for local governments to play a greater role in the development of protected areas on private land through grants to landholders, differentiated rates (local taxes) for covenanted land, and management agreements or covenants with landowners. The NRS programme includes funding of community awareness programmes and projects aimed at developing or acquiring private protected areas (including covenants) and protected area networks.

Management of national parks and reserves

State/Territory governments manage the great majority of Australian parks. The Australian Government is directly responsible for six terrestrial parks¹² and 13 marine protected areas. A significant proportion of the number of (mostly smaller) parks and reserves in the NRS that are managed by States (New South Wales, Queensland, Western Australia, Tasmania) still lack *management plans* (Griffin, 2004); where these plans exist, they have been formulated after public consultation. The plans include arrangements for managing visitor impact and rules for commercial activities inside parks.

Australian governments have adopted different approaches to *funding parks management* (Box 3.2). It is not clear to what extent operational spending on parks and reserves has kept pace with the increase in the area protected during the review period. The 2004-05 budget of Parks Australia for the management of parks and reserves was broadly the same as in 1998-99. The Australian Senate was due to report by the end of 2006 on an inquiry into the country's national parks, conservation areas and marine protected areas, including whether governments were providing sufficient resources to meet objectives and management requirements.

3.2 Forests

The total area of Australian forests is 1 640 000 km², of which 13% is conservation forest. The 1992 National Forest Policy Statement promoted the

Box 3.2 Funding parks management

Allocations from government budgets are Australian park authorities' main *source of revenue*, but jurisdictions also derive revenue from other sources. For example, in New South Wales entrance and camping fees raised AUD 17.2 million in 2005-06, the equivalent of almost 6% of park expenditure by the NSW National Parks and Wildlife Service. Such fees come in various forms:

- entrance fees are sometimes levied only in the more frequented parks; for instance, New South Wales applies fees at 44 of its 670 parks and reserves. At remote sites in some States, there may be *self-registration systems* (e.g. “honesty boxes” or coin-operated “pay and display” machines) with fees payable upon entering the park;
- the Australian Government's parks agency, Parks Australia, manages three parks that attract large numbers of visitors per year: Booderee (420 000), Kakadu (165 300) and Uluru-Kata-Tjuta (348 500). *Entrance fees* are charged at Booderee and Uluru-Kata-Tjuta, while those at Kakadu were abolished in 2004;
- day passes often relate to vehicles and motorbikes (around AUD 10-15), not to people. There are also annual unlimited access passes valid at all state parks and reserves (around AUD 50-80);
- visitors to the Great Barrier Reef Marine Park pay an *environmental management charge* to the commercial tourist operator (e.g. boat tour or charter), which transfers the revenue to the park authority.

On the other hand, Parks Victoria derived 43% of its total income of AUD 137 million in 2004-05 from an annual “*parks charge*” levied on residential and commercial properties throughout greater Melbourne. The parks charge funds the development and management of a network of regional parks, gardens, trails, waterways, bays and other significant recreation and conservation assets within the greater metropolitan area. The parks charge has been included on the water, sewerage and drainage bills issued to domestic and non-domestic properties since 1958. The amount charged is based on the net annual value of commercial and residential properties, with a minimum charge of just over AUD 50 for the majority of ratepayers. Queensland has a similar system.

Source: Australian government websites.

inclusion of *biodiversity goals in the management of Australian native forests* through Regional Forest Agreements (RFAs). The RFAs cover regions where commercial timber production is a major native forest use and provide a long-term (20-year) basis for all Australian governments to meet their forest conservation, environmental, social and industry goals. The RFA process has increased the reserved forest area in

RFA regions by about 39% since 1992. There are now ten RFAs in four States: New South Wales, Victoria, Western Australia and Tasmania. Together they represent 232 000 km² or about 14% of total forested area (DAFF, 2007). Through the NHT, private reserves and ecological corridors have recently been developed under RFAs and catchment management plans, which will enhance forest biodiversity on the catchment and regional scale. The Tasmanian Community Forest Agreement of May 2005, supplementing the Tasmanian RFA (1997), further secures Tasmania's unique and endemic biodiversity in a series of new reserves.

Australia's National Forest Policy Statement 1992 set out 11 national goals to be pursued within a "regionally based planning framework that integrates environmental and commercial objectives so that, as far as possible, provision is made for all forest values". Codes of Practice which give attention to environmental goals and constraints now govern forestry practice in most States. However, the context is one in which the area of *plantation forests* in Australia increased by 60% from 1995 to 2004 as a result of government policy to increase the plantation estate on previously cleared land while reducing harvesting of native forests. There are still concerns about the adequacy of the attention given sustainability issues in forestry planning, such as the impacts of plantations on water use and biodiversity and the adequacy of integration of forestry and water policy. Plantations, whether exotic or native, have highly simplified ecosystems (fewer species of plants and animals) compared to old growth forests. The extent to which environmental considerations are reflected in the Australian Forestry Certification Scheme (AFCS) has been questioned by some (Australian Conservation Foundation, 2005a). Environmental, economic and social interests were represented in developing the Scheme, which has been endorsed by the Program for the Endorsement of Forest Certification (PEFC). Some questions still exist, in areas such as southeast New South Wales, concerning the extent of implicit subsidisation of the sector through exemptions from local government taxation, provision of roads, port facilities and other infrastructure, and grants for equipment and training (Australian Conservation Foundation, 2005b).¹³ Income tax concessions can also be a factor in commercial forestry.

3.3 Wetlands

Australia has recorded 4 700 wetlands of regional significance. The Australian Wetlands Database lists 904 *wetlands of national and international significance* with a total area of 579 043 km² (including wetlands in marine and coastal areas). There are 64 Ramsar sites with a total area of 73 715 km² (about the combined size of Belgium and the Netherlands), of which 15 (with a total area of 22 214 km²) were added during 1998-2005.¹⁴

The *condition of nationally significant wetlands* is generally good, particularly in northern Australia, where wetlands in several subregions have been assessed as near pristine. In southern Australia the situation is not as favourable; 28% of wetlands in assessed subregions require significant intervention to bring about their recovery. The condition of riparian zones, in particular, often is not as good as that of wetlands as a whole. Across southern and eastern Australia, riparian zones in 31% of assessed subregions were classified as degraded (i.e. recovery is unlikely in the medium term) and in 38% of assessed subregions they require significant management intervention to achieve recovery (Sattler and Creighton, 2002).

During the review period Australian jurisdictions adopted or updated a range of *measures to protect wetlands* such as: the wetlands policies of individual States and Territories,¹⁵ as well as the 1997 Wetlands Policy of the Australian Government (Table 3.1); funding under the National Wetlands Program during the first phase of the NHT; regional NRM bodies' increasing role in wetlands conservation in association with community groups, including with the help of the NHT Rivercare programme in implementing rehabilitation and conservation projects; efforts to set environmental flows and eliminate the overallocation of water in certain river basins under the National Water Initiative, as well as the Living Murray Initiative (Box 2.1); protection of wetlands designated as Ramsar sites under the EPBC Act. To date, there are management plans or draft plans in place for 55 of the 64 listed Australian Ramsar wetlands of international importance. However, not all of them have been actively implemented. The management status of Australia's Ramsar sites, including their management plans, is currently subject to a review/audit. NGOs, Indigenous groups and the corporate sector are also involved in the delivery of wetland conservation and rehabilitation projects (e.g. the Revive Our Wetlands partnership between BHP Billiton and Conservation Volunteers Australia).

Implementing these policies and restoring degraded wetlands will remain *a challenge for some time to come*. About 230 nationally important wetlands are subject to one or more types of pressure, such as water diversions, river flow regulation, changed flooding regimes due to clearing for horticulture or mixed farming, aquifer drawdown and saltwater intrusion. It is predicted that, at current rates, the number of wetlands of national significance affected by salinity will grow from 80 at present to 130 by 2050. Trends in the condition of many wetlands are therefore in the wrong direction: this was the case for nationally important wetlands in 38% of assessed subregions, and for riparian zones in 73% of assessed subregions across Australia (Sattler and Creighton, 2002).

3.4 Marine protected areas

Although establishing marine protected areas is politically difficult in most countries, Australia managed to extend its *marine protected areas* (MPAs) by 100% during the review period. These areas are expected to exceed 930 million ha by the end of 2007, approximately equal to 10% of Australia's marine jurisdiction (excluding the Australian Antarctic Territory). The last national report on the extent of Australia's marine protected area was completed in 2004 (Table 3.4). The Australian Government, the States and the Northern Territory have jointly developed the National Representative System of Marine Protected Areas (NRSMPA) in order to build a national system of MPAs that will be comprehensive, adequate and representative. The Australian Government is implementing a national network of MPAs for all Australian Government waters. Further extensive areas are expected to be designated in 2008.

Table 3.4 **National marine protected areas**, by IUCN management category, 2004

Category	No. of reserves	No. of management zones ^a	Area in ha ^b
IA	18	19	14 674 788
IB	2	2	202
II	43	49	15 062 242
III	9	9	345
IV	99	109	17 347 773
I-IV Total	171	188	47 085 350
V	0	0	0
VI	29	35	24 715 160
V-VI Total	29	35	24 715 160

a) An individual marine protected area may have multiple management zones. Each protected area is assigned an IUCN management category based on the category of the dominant management zone. Area calculations are based on areas calculated for the management zones.

b) The total of these areas per IUCN category is greater than the total 64 803 076 ha because of some double counting.

Source: Collaborative Australian Protected Areas Database.

An example of a *marine area that received protection during the review period* is the Great Barrier Reef Coast Marine Park in the intertidal coastal strip between the Queensland mainland and the edge of the Great Barrier Reef Marine Park (created

in 2004). In 2002, Victoria passed legislation to protect 5.3% of its marine waters in marine national parks, the strongest form of legal protection available. In May 2006, the Australian Government announced that it would designate a further 225 766 km² across 13 marine protected areas in the waters off south-eastern Australia.

Many marine protected areas are in remote locations and therefore receive few *visitors*, but the Great Barrier Reef Marine Park attracts approximately 1.9 million visitors each year. Tourism is the largest commercial activity in the Great Barrier Reef region, generating over AUD 5.1 billion per year. The marine tourism industry is a major contributor to the local and national economy. In marine protected areas managed by the Australian Government, visitor impact is assessed through comprehensive biodiversity and abundance surveys every two to three years in reserves where there is some level of visitation.

4. Progress in Protecting Species

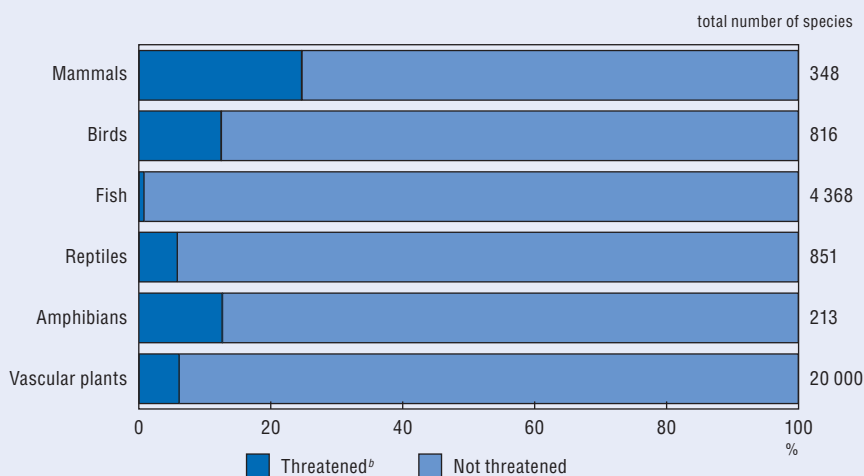
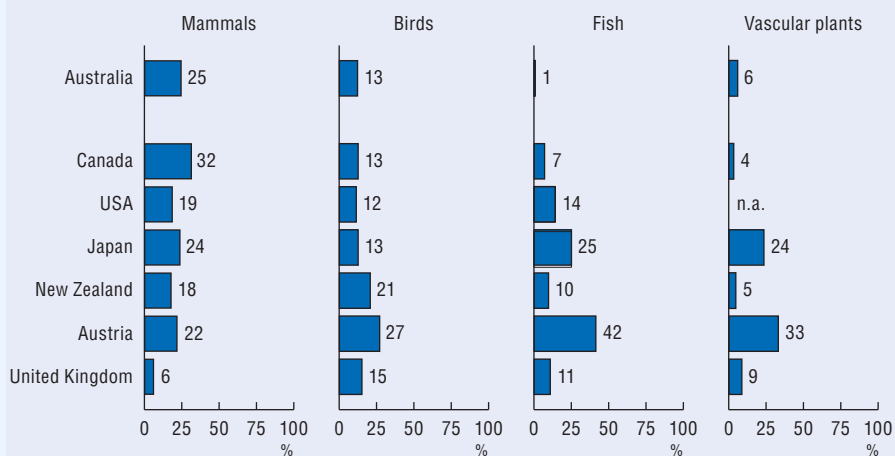
Lack of basic knowledge about the large number of unknown endemic species and their *conservation status* remains a major impediment to biodiversity protection in Australia. Changes in biodiversity cannot be easily assessed over short time periods, and updates of lists of threatened species usually reflect improved knowledge rather than real trends. A 2001 assessment of the conservation status of components of terrestrial biodiversity therefore remains valid: some 8% of Australia's higher plants, 14% of birds, 23% of marsupials, 8% of reptiles and 18% of amphibians are extinct, endangered or vulnerable at the national level (Figure 3.2). Serious concern also exists about the conservation status of many invertebrate groups and non-vascular plants as a result of habitat destruction and modification (Williams, 2001).

Of the 60 Australian species on the *IUCN 2006 Red List of Threatened Species*, six are considered critically endangered, 12 endangered and 13 vulnerable. The most recent IUCN List of Threatened Plants lists 2 245 out of 15 638 recorded vascular plants (14.4%) as threatened (Walter and Gillett, 1998). As far as fauna species are concerned, the EPBC Act casts its net much wider than the IUCN Red List: its List of Threatened Fauna currently comprises 380 species. The EPBC List of Threatened Flora contains 1 303 species, far fewer than the IUCN list (Table 3.5).

Trends in conservation status

The conservation status¹⁶ of Australian species shows both positive and negative trends, but a negative *tendency is more common*. Of the 60 Australian entries on the IUCN Red List, 25 species showed a downward trend in conservation status while the trend was uncertain for 12 species. The conservation status of three species in each

Figure 3.2 Fauna and flora

State in Australia,^a early 2000sThreatened species^b

a) Mammals: include monotremes and marsupials; birds: estimated data; threatened species of vascular plants refer to threatened species of all plants.

b) IUCN categories "critically endangered", "endangered" and "vulnerable" in % of known species.

Source: OECD Environment Directorate.

Table 3.5 Number of species listed under the EPBC Act, 2004

	Extinct	Critically endangered	Endangered	Vulnerable
Ecological communities	0	3	28	1
Frogs	4	0	15	12
Birds	23	5	37	64
Mammals	27	2	34	52
Fish	1	2	16	20
Reptiles	0	1	11	38
Invertebrates	0	4	5	6
Plants	61	57	509	676
Total	116	71	627	868

Source: Department of the Environment and Heritage.

group was either improving (three vulnerable birds) or stable (one endangered bird, one vulnerable bird and one vulnerable snail)¹⁷ (IUCN, 2006). The 2002 National Land and Water Resources Audit found that threatened birds are declining in 240 out of 384 subregions, and that threatened mammals are rapidly declining in 20 subregions and declining in 174 subregions (Sattler and Creighton, 2002).

Recovery and threat abatement plans, approved conservation advice

The EPBC Act provides for the listing of species or ecological communities as threatened, which triggers remedial action through recovery plans. Recovery plans set out the research and management actions necessary to stop the decline, and support the recovery, of listed threatened species or threatened ecological communities. Recovery plans now in force or in preparation cover over 840 species and ecological communities, i.e. about 52% of over 1 600 listed species and ecological communities. The emphasis has been on the most seriously threatened species and ecological communities: 92% of critically endangered and 60% of endangered species are covered. The EPBC Act also allows for the listing of key threatening processes leading to the formulation of threat abatement plans; 18 of these have been listed (Table 3.6). Nearly a dozen abatement plans are now in place, such as for i) competition and land degradation by feral goats and feral rabbits; ii) predation by feral cats and the European red fox; and iii) incidental catch (or by-catch) of seabirds during longline fishing operations. From February 2007, amendments to the EPBC Act require approved conservation advice to be in place for each listed threatened species and ecological community.

Table 3.6 **Threatening processes**, listed under the EPBC Act^a

Threatening Process	Effective
Competition and land degradation by feral goats	16 July 2000
Competition and land degradation by feral rabbits	16 July 2000
Dieback caused by the root-rot fungus (<i>Phytophthora cinnamomi</i>)	16 July 2000
Incidental catch (by-catch) of sea turtles during coastal otter-trawling operations within Australian waters north of 28 degrees south	4 April 2001
Incidental catch (or by-catch) of seabirds during oceanic longline fishing operations	16 July 2000
Infection of amphibians with chytrid fungus resulting in <i>chytridiomycosis</i>	23 July 2002
Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris	13 August 2003
Land clearance	4 April 2001
Loss of biodiversity and ecosystem integrity following invasion by the yellow crazy ant (<i>Anoplolepis gracilipes</i>) on Christmas Island, Indian Ocean	12 April 2005
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	4 April 2001
Predation by exotic rats on Australian offshore islands of less than 1 000 km ² (100 000 ha)	29 March 2006
Predation by feral cats	16 July 2000
Predation by the European red fox (<i>Vulpes vulpes</i>)	16 July 2000
Predation, habitat degradation, competition and disease transmission by feral pigs	6 August 2001
Psittacine circoviral (beak and feather), disease affecting endangered psittacine species	4 April 2001
Biological effects, including lethal toxic ingestion, caused by cane toads (<i>Bufo marinus</i>)	12 April 2005
Reduction in biodiversity of Australian native fauna and flora due to the imported red fire ant, <i>Solenopsis invicta</i>	2 April 2003

a) Environment Protection and Biodiversity Conservation Act 1999.

Source: EPBC Act.

It is too early to evaluate the effectiveness of these recovery and threat abatement plans. However, it is clear that *effective implementation is proving difficult*, as it is almost impossible to deal with so many plans simultaneously. An alternative approach is currently being tested through recovery plans for an entire region, incorporating recovery and threat abatement actions for all of the region's listed threatened species and ecological communities. Such an approach would make it easier to harmonise the activities of State/Territory nature protection agencies and those of regional NRM bodies. The February 2007 amendments to the EPBC Act provide for the creation or adoption of regional recovery plans.

5. Encouraging Biodiversity on Private Land

In addition to the protection of public nature reserves and threatened species, Australian governments are *placing increasing emphasis on addressing threats to biodiversity on private land* through nationwide programmes and a mix of instruments. Vegetation clearance, overgrazing, exotic weeds, feral animals and changed fire patterns are pervasive threats to biodiversity in many landscapes across the continent. Fragmentation of vegetation remnants, urbanisation, increased salinity and firewood collection are threats to biodiversity in the highly modified regions of southern and eastern Australia (Chapter 6).

5.1 Ecosystem loss due to land clearance

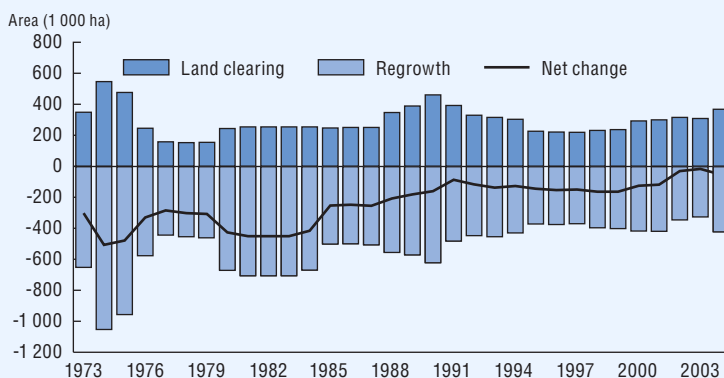
Clearing of native vegetation has long been one of the most significant threats to species and ecosystems.¹⁸ Significant clearing continued until recently in north-eastern Australia, where estimates indicate that about 2 480 km² of land was cleared in 2001, of which around 70% in Queensland (ABS, 2004). In southern Australia the effects of historical land clearing continue to be felt on habitat and population viability, but in the arid and semi-arid interior of Australia native vegetation cover largely remains. Land clearing in salinity risk areas is the primary cause of dryland salinity.

Since the beginning of the decade, all Australian jurisdictions have framed their efforts to protect native vegetation in terms of the *National Framework for the Management and Monitoring of Australia's Native Vegetation*. The framework recognises the close link between the conservation of biodiversity and the sustainability of primary industries, and sets out best management practices for protecting native vegetation and criteria for monitoring outcomes. It also contributes to helping reduce net greenhouse gas emissions, as increasing and protecting vegetation cover enhances Australia's greenhouse gas sink capacity.

However, a recent Productivity Commission¹⁹ inquiry into the impact of native vegetation and biodiversity regulations found that the *effectiveness of restrictions on clearing native vegetation was compromised* by: i) lack of clearly specified objectives; ii) disincentives for landholders to retain and care for native vegetation; iii) the costs and compliance burdens for landholders of native vegetation, and iv) inflexible application of targets and guidelines across regions with differing characteristics (Productivity Commission, 2004). The Commission recommended greater devolution to a regional level, which has already occurred with respect to the NRM bodies taking up their functions.

The 2004 agreement among all Australian governments to *phase out all broad-scale land clearing* represented a major step forward. They thereby met one of the key goals of Australia's National Objectives and Targets for Biodiversity Conservation 2001-05, which was for all jurisdictions to put in place clearing controls that "prevent clearance of ecological communities with an extent below 30% of that present pre-1750". Broad-scale land clearance had already decreased by about 40% during the 1990s (Figure 3.3). Clearings are continuing, although at a slower rate, and

Figure 3.3 **Net forest change in Australia, 1973-2004**



Source: Australian Greenhouse Office.

they are no longer considered a major policy issue.²⁰ Some of the issues raised by the Productivity Commission, such as whether landowners or the community should pay for protecting native vegetation, are still being addressed, for example through the search for effective market-based instruments to encourage landholders to voluntarily protect native vegetation on their properties.

5.2 Dryland salinity

At least 25 000 km² (5% of cultivated land) is currently affected by dryland salinity (Chapter 2). *Dryland salinity threatens biodiversity* as well as agricultural production (Chapter 6). In nine subregions more than 10% of remaining native vegetation is currently found in areas with a high risk of dryland salinity. Moreover, trend assessments have suggested that 22 subregions will fall into this category

by 2050 (NLWRA, 2001). In agricultural areas affected by salinity, this problem can have secondary effects on biodiversity such as declines in bird populations.

The regional catchment management bodies, through their integrated catchment management and investment plans, carry out *preventive and remedial actions* funded through the NHT and the 2000 National Action Plan for Salinity and Water Quality (NAP). The NAP targets 21 priority regions most affected by dryland salinity. Catchment plans (Table 3.1) may contain measures to map the risk of salinity, maintain and improve the condition of existing native vegetation, and develop engineering works such as salt interception devices and groundwater pumping.

5.3 Weeds and invasive species

The control of weeds and invasive species is a central element of biodiversity conservation in Australia. Since 1997, Australian governments have operated a National Weeds Strategy aimed at tackling problem weeds of national significance (“wons”); in addition, individual States operate their own weed strategies for “non-national” weeds.²¹ All but five of the 17 threats listed in the EPBC Act are related to weeds or invasive species. A National Environmental Alert List for Environmental Weeds was developed in 2000 to identify plants in the early stages of becoming weeds which have the potential to significantly impact biodiversity; the list is made up of 28 exotic weeds that have established naturalised populations in the wild. Weeds are recognised in the majority of NRM regions as major threats to biodiversity conservation, agricultural production, healthy waterways or cultural assets.

*Introduced pests are not covered by an umbrella national strategy,*²² but the “threatening processes” mechanism available under the EPBC Act is being used to control the European red fox, feral goats, rabbits, cats and pigs, the yellow crazy ant (Box 3.3) and the red fire ant. Although not covered under the Act, wild dogs have a negative impact on biodiversity through predation on native mammals;²³ they also kill introduced species of predators, including rodents. The regional integration model proposed for the delivery of EPBC species recovery and threat abatement plans may well be the most effective approach. Despite the attention devoted to weeds and invasive species, a 2005 review observed that *this attention was not always reflected in the resources allocated* to address these issues (Bellamy *et al.*, 2005).

6. Economic Aspects of Biodiversity Conservation

6.1 Economic value of biodiversity

A series of studies on the economic value of Australian biodiversity (e.g. service value, tourism value) was carried out during the review period. One 1997 study

Box 3.3 Australia's Christmas Island National Park

Christmas Island National Park covers about 85 of the 135 km² of *Christmas Island*, which is located in the Indian Ocean 2 800 km west of Darwin and 360 km south of the western head of Java. In addition to this terrestrial area, the Park includes a marine area extending 50 m seaward of the low water mark where terrestrial areas of the Park include the coastline. The Park was first declared in 1980, and further extended in 1986 and 1989.

The ecology of Christmas Island features high biodiversity and a high degree of endemism. The Park contains the world's last remaining nesting habitat of the endangered Abbott's booby, as well as the largest and most diverse land crab community anywhere, which includes the world's largest remaining robber crab (*Birgus latro*) population. Although the island was mined for phosphates during much of the past century, most of the natural ecosystem remains intact.

Nevertheless, a research and monitoring programme started in 2003 shows that *Christmas Island's unique biodiversity is in decline*. At least 22 native plant species are in decline, and 42 others should be regarded as nationally threatened. Endemic reptiles and mammals are also in decline, with at least six species reduced to remnant populations or no longer recorded. Of the 199 endemic invertebrates, 76 have not been recorded since the 1980s. Birds are faring comparatively well, although endemic species such as the Abbott's booby and the Christmas Island frigatebird remain at risk.

Research also shows that the *invasive yellow crazy ant* (*Anoplolepis gracilipes*) is threatening as many as 20 animal species on the island and has killed about 30 million red crabs (*Geocarcoidea natalis*), one-quarter of the population. Red crabs are critical to the dynamics of the island's rainforest communities. The exotic yellow crazy ant was accidentally introduced to Christmas Island between 1915 and 1934. It has since become widespread throughout the island. Crazy ants are recognised by their pale yellow body colour, unusually long legs and antennae. The species derives its name from the ants' frantic movements and frequent changes in direction, especially when disturbed. Crazy ants can form multi-queened super-colonies in which the ants occur in very high densities.

Parks Australia is implementing an intensive *crazy ant control programme* that has halted the decline in red crabs and other species and led to some recovery. As there are no native ant species on the island, control methods such as contact sprays, dusts and toxic baits can be used safely. Even so, the ants have been present on the island for a long time and complete eradication is unlikely. A continuing effort to keep population numbers under control will therefore be necessary.

Source: Agtrans Research and N. Dawson; SoE Report.

estimated the *value to Australia of terrestrial and marine ecosystem services* at USD 245 billion and USD 640 billion per year, respectively (Jones and Pittock, 1997). Australia's GDP was of the order of USD 400 billion in the same year.

Australian protected areas' natural and cultural heritage is an important asset for the *tourism industry*. In 2005, over 2.3 million international tourists visited national parks and spent AUD 6.7 billion (about one-third of total spending by foreign tourists). The 2003 Tourism White Paper makes clear that Australia's natural and cultural environment is a major tourist attraction, and that protecting these assets is a cornerstone of sustainable tourism development. In terms of governmental integration, the White Paper proposes enhanced ministerial co-ordination across a wide range of agencies, from environment to transport, small business and Indigenous affairs. Given that the Great Barrier Reef attracts an estimated AUD 4.3 billion in tourism revenue per year, and that its resilience to climate change threats may need to be enhanced through measures that go beyond nutrient/sediment control, a form of accelerated exit adjustment assistance might be considered for sugar farmers creating pressure on the reef.

The *economic value of national parks* and nature reserves is significantly greater than the size of their operational budgets. In Victoria, three national parks (Port Campbell, Grampians and Wilson's Promontory) were estimated to contribute AUD 487 million to the State's economy in 2001-02, while total expenditure by Parks Victoria on park management services in the three parks amounted to AUD 7.5 million in the same year (Parks Victoria, 2005). An earlier study involving a sample of 23 non-metropolitan parks (national parks, state parks, etc.) concluded that visitors enjoyed a net benefit of on average AUD 19 per visitor per day. The total recreational value of all 23 parks for the years 1997/98 was over AUD 173 million, again much greater than the cost of park management (Biological Diversity Advisory Committee, 2005).

Studies have also been carried out on the *economic value of threatened species*. In a 2001 study, the conservation value of Leadbeater's possum (*Gymnobelideus leadbeateri*) alone was estimated to be AUD 40-84 million per year, *or two to three times the value of the timber cut in its habitat*. The cost of conserving all 700 endangered species was estimated at between AUD 160 and 340 million per year. Government expenditure on flora and fauna conservation at the time of the study was AUD 10 million (Biological Diversity Advisory Committee, 2005).

6.2 Conservation incentives

Grant programmes

The Natural Heritage Trust (NHT) finances *three investment streams at national, regional and local levels* (AUD 3 billion for the 12 years to 2008). At the national

level, the Australia Government sets priorities for investment (without calling for funding applications from the public) that reflect national priorities and address activities with a Commonwealth-only, national or broad-scale outcome. For example, the NHT initiated the establishment of the National Land and Water Resources Audit with the aim of improving the availability of and access to nationally linked data and information for natural resource management. Projects are implemented under bilateral agreements between the Australian Government and each jurisdiction.

The *bulk of NHT investment is at the regional level*, further augmented by State/Territory funding. Regional NRM bodies have been made responsible for delivering both the NHT programmes and the separately funded²⁴ National Action Plan for Salinity and Water Quality (NAP) (Chapter 5).

The NHT *Envirofund* finances small projects by community groups aimed at conserving biodiversity and at sustainable resource use (ceiling of AUD 50 000 per project). In 2004-05, a total of AUD 19.8 million for Envirofund projects was allocated to nearly 1 300 projects. Since 2002, funding has been allocated through four strategic programmes: the Landcare Program to reverse land degradation and promote sustainable agriculture (AUD 2.1 million in 2004-05); the Bushcare Program to conserve and restore habitat for native flora and fauna that underpins the health of landscapes (AUD 8.4 million); the Rivercare Program to improve water quality and the environmental condition of river systems and wetlands outside the Murray-Darling Basin (AUD 6.2 million); and the Coastcare Program to protect coastal catchments, ecosystems and the marine environment (AUD 1.6 million).

Other biodiversity grant programmes include the Threatened Species Network Community Grants scheme, jointly run by the NHT and WWF Australia, which encourages communities to take responsibility for species and ecological communities that are threatened. By 2005, AUD 3.5 million had been allocated to almost 300 projects. A further grants scheme provides funding for environmental and heritage organisations to help them with office expenses.

Taxation measures and revolving funds

The Australian Government instituted a range of *tax measures* in 2001 in support of the conservation and protection of the natural environment. Donors of AUD 5 000 or more to an environmental or heritage organisation can deduct this amount on their tax returns over a five-year period. Eligible conservation organisations are exempt from capital gains taxes on gifts of property received through a will. Landowners (including States, Territories, some local governments and some NGOs) entering conservation covenants with eligible organisations can claim income taxation concessions. Environmental organisations have deductible gift recipient status.

Some of the above tax measures are aimed at encouraging the use of covenants to protect biodiversity on private land. Over 10 000 km² on 3 000 properties across Australia is currently covered by a conservation covenant. *Revolving funds* are a different kind of measure used to purchase land with high conservation value, and to attach a conservation covenant to the title of the land to provide for conservation management in perpetuity. These properties are resold to buyers who have indicated their interest in maintaining biodiversity values. The proceeds from the sale of properties are used to buy more properties and sell them with a conservation covenant in place. The Australian Government has provided funding under the Bush for Wildlife initiative to four not-for-profit organisations to operate revolving funds: the Trust for Nature in Victoria, the National Trust of Australia in Western Australia, the South Australian Nature Foundation and the Nature Conservation Trust of New South Wales.

Developing market-based instruments

Australian authorities are *encouraging capacity building and experimentation* with various market-based instruments (MBIs) as part of the implementation of biodiversity and NRM programmes on private land, notably at the regional level. MBI trials are conducted under a sub-programme of the NAP, the National Market-Based Instruments Pilots Program; AUD 10 million has so far been committed during the first two rounds. Trials suggest that MBIs, especially auctions, represent better value for money than traditional natural resource management instruments (National Market-based Instrument Working Group, 2005). A national Environmental Stewardship Program, announced by the Australian Government in 2006, aims to use market-based approaches to maintain and improve targeted high public value environmental assets, including purchasing relevant environmental services from private land managers under contracts for up to 15 years.

Among MBIs, *auctions of conservation contracts* are well-suited to tackling non-point source problems. For instance, under the BushBids scheme²⁵ in the Eastern Mount Lofty Ranges (a biodiversity hotspot near Adelaide) landholders set a price for the management services²⁶ they are prepared to undertake to improve native vegetation on their property. This price forms the basis of their bid, and will be compared against bids from all other participating landholders. Successful bids are those that offer the best value for money. A comparable scheme, called BushTender, has been implemented in Victoria (Box 3.4). One advantage of the auction schemes is that they turn a liability (i.e. land not available for production) into an asset by giving landholders an additional source of income from the work undertaken to improve native vegetation. Given the considerable amount of native vegetation in need of conservation on private land, however, experience with the BushTender scheme suggests that substantial ongoing government funding will be required to secure these biodiversity benefits in the long term (Box 3.4).

Box 3.4 The BushTender and BushBroker programmes in Victoria

The *conservation of native vegetation on private land* is important for salinity control, water quality, soil protection, greenhouse gas emissions reduction, landscape protection and, above all, for the conservation of native flora and fauna. In the State of Victoria:

- 12% of Victoria's 10 000 km² of native vegetation remaining on private land supports 30% of its threatened species populations; and
- 60% of the native vegetation remaining on private land is a threatened vegetation type (i.e. its conservation status is endangered, vulnerable or depleted).

An auction-based approach

BushTender is an auction-based approach for improving the management of native vegetation on private land. It is one of the approaches being implemented as part of the current experimentation with market-based instruments in Australia. Many private landholders are already engaged in the management of native vegetation through various incentive and extension schemes. *BushTender* is an additional tool intended to further extend landholder participation in active native vegetation management and target priority native vegetation. Under this system, landholders competitively tender for contracts to improve their native vegetation. Successful bids are those that offer the best value for money, with successful landholders receiving periodic payments for their management actions under agreements signed with the Victoria Department of Sustainability and Environment. These actions are based on management commitments over and above those required by current obligations and legislation.

Two *trials of the BushTender* approach have been completed. The first was undertaken in selected areas of north-eastern/north-central Victoria between late 2001 and early 2002, and the second in selected areas of Gippsland between late 2002 and early 2003. During these trials, over 4 800 ha of native vegetation was secured under management agreements with landholders. A total of AUD 1.2 million was allocated to landholder payments during the trials.

In the *Gippsland trial area*, 73 bids were received from 51 landholders (some landholders having bid separately on each of their sites), of which 33 with a total area of 1 684 ha were accepted on the basis of "best value for money". Management agreements with periods of three or six years were offered to landholders, with the further option of ten-year protection or permanent protection covenants following the management agreement period. Of the successful bids, all but one opted for at least a six-year management agreement period, with almost half of all bids committing to further protection. On approximately half of the area covered by the contracts there is vegetation of high or very high conservation significance.

A different type of market-based instrument was introduced in early 2006. Victoria aims to achieve a net gain in native vegetation across the landscape, which requires overall gains in the quality and quantity of native vegetation to be greater than overall losses. Net gain can be achieved by additions to the stock of native vegetation through the *restoration of existing areas and revegetation*. Offsetting clearing of native vegetation helps maintain the overall level of existing stocks.

Box 3.4 The BushTender and BushBroker programmes in Victoria (cont.)*Trading native vegetation credits*

BushBroker is a system to register and trade native vegetation credits. A native vegetation credit is a gain in the quality and/or quantity of native vegetation that is subject to a secure and ongoing agreement. Native vegetation credits are listed on the *BushBroker* register. They can be bought by another party and subsequently used as an offset for the approved clearing of native vegetation. Permit applicants may source offsets through the *BushBroker* register.

Native vegetation credits can be established in four ways: i) landholders pay to establish the native vegetation credits and enter into an agreement with a public agency; ii) through a credit auction, similar to *BushTender*, landholders propose a price for the establishment of credits and the credits are subsequently sold to permit applicants; iii) a permit applicant locates a landholder and funds the establishment of native vegetation credits; and iv) private land is contributed to the public conservation reserve system.

Source: Victoria Department of Sustainability and Environment website.

The 2006 New South Wales Threatened Species Conservation Amendment (Biodiversity Banking) Act created an offset scheme called *BioBanking*. Individuals can set up and manage *BioBank* sites under a conservation agreement (lands secured and managed in perpetuity to protect and enhance their biodiversity values). Establishing a *BioBank* site generates “credits” that can be sold to developers, which use them to offset the impact of developments elsewhere. Funds generated by the sale would be used for future management of the *BioBank* site. The scheme will encourage landholders and developers to minimise the impact of development on biodiversity. If it is impossible to avoid detrimental effects, developers can use biodiversity offsets, i.e. appropriate actions to counterbalance the impact of development on biodiversity including at a different site. A pilot scheme was initiated in 2007.

7. International Commitments

Much of the actions and responsibilities of the Australian Government concerning nature and biodiversity management builds on Australia’s commitments under international agreements, including the UNESCO World Heritage Convention (Box 3.5), the Ramsar, Bonn and Washington Conventions, and the UN Convention on Biological Diversity.²⁷

Box 3.5 International Heritage Commitments

Australia acceded to the *UN Convention concerning the Protection of the World Cultural and Natural Heritage* (World Heritage Convention) in 1974. The country's first three sites were added to the World Heritage List in 1981. There are currently 17 Australian sites on the list, 11 of which are recognised for their value as natural areas. All the Australian sites have been managed by State governments and protected under the Environment Protection and Biodiversity Conservation Act 1999. Recently, the Environment Protection and Heritage Council became the body responsible for managing World Heritage issues at the national level. This change was designed to streamline and make consistent the arrangements for managing each of Australia's World Heritage properties.

The Australian Government, in consultation with State/Territory governments, is currently developing a *World Heritage Tentative List* to identify new sites for nomination to the World Heritage List. This is the first time all Australian jurisdictions have co-operated to develop a full inventory of natural and cultural heritage areas of outstanding value. Recognising the potential impacts of climate change on Australia's 17 World Heritage sites, the Department of the Environment and Water Resources has commissioned in 2006 a comprehensive study to determine their vulnerability and adaptive capacity.

The *Convention on the Conservation of Migratory Species of Wild Animals* (the Bonn Convention) entered into force in Australia in 1991. During the review period, Australia also became a signatory to the Memorandum of Understanding on Marine Turtles and their Habitats in the Indian Ocean and South-East Asia, and a Party to the Agreement on the Conservation of Albatrosses and Petrels. Its most recent report (2005) to the CMS Secretariat lists extensive activities in support of migratory species, including the creation in 2004 of a National Shark Recovery Group and a National Turtle Recovery Group.

Australia is a Party to the *UN Convention on Biological Diversity* and meets its general obligations domestically through implementation of the National Strategy for the Conservation of Australia's Biological Diversity. It has not signed the Convention's Cartagena Protocol on Biosafety, which relates to the transboundary movement of living modified organisms. The Department of Environment and Heritage played a prominent role in international negotiations leading to the development and adoption of the *Bonn Guidelines* on Access to Genetic Resources and Benefit-sharing. The EPBC Act regulates access to and use of genetic resources in Commonwealth-owned areas, and the 2000 National Biotechnology Strategy states the intention to "address matters involving Indigenous people and their ownership of biological resources".

Notes

1. Signed in 2001 by the environment ministers of the Australian Government, New South Wales, Victoria, South Australia, Western Australia and the Australian Capital Territory (ACT).
2. New South Wales National Parks and Wildlife Service; Parks Victoria; Tasmania Parks and Wildlife Service; Department for Environment and Heritage in South Australia; Department of Conservation and Land Management in Western Australia; Parks and Wildlife Commission of the Northern Territory; Queensland Parks and Wildlife Service; Environment ACT.
3. The term “national park” denotes the level of protection in terms of the IUCN classification rather than ownership. Hence, national parks may be owned and managed by the Australian Government or by a State or Territory. Some national parks are managed in association with their Aboriginal owners.
4. The Australian Government set up the NHT in 1997 with the proceeds from the partial sale of the telephone company, which it owned.
5. A bioregional plan, defined by EPBC Act Explanatory Memorandum, provides a “blueprint” for the ecologically sustainable management of natural resources within a bioregion (one or several connected ecosystems), taking into account social and geographical elements.
6. Although hosting tropical biotopes.
7. Areas containing snags (e.g. trees that have fallen into a river) have a diverse river biota and provide habitat for plants and animals. They trap leaves and other organic matter, which are sources of food for invertebrates. Snags also provide breeding sites.
8. For example, the Great Barrier Reef, Kakadu National Park, Willandra Lakes Region, Tasmanian Wilderness, Lord Howe Island group, Australian Central Eastern Rainforest Reserves.
9. Comprehensive: containing examples of the full range of ecosystems. Adequate: of appropriate size and configuration to ensure the conservation of biodiversity and integrity of ecological processes. Representative: reflecting the habitat that protected areas were chosen to represent.
10. As set out in i) the 1996 National Strategy for the Conservation of Australia’s Biological Diversity, ii) the 2000 National Objectives and Targets for Biodiversity Conservation 2001-05 and iii) the 2005 Directions for The National Reserve System – A Partnership Approach.
11. Achieving this objective would satisfy the comprehensiveness criterion. A second objective is to protect at least 80% of the number of extant regional ecosystems in each subregion that are to be represented in protected areas by 2010-20, which would meet the representativeness test.
12. Parks Australia manages the Kakadu, Booderee and Uluru-Kata Tjuta national parks jointly with their Aboriginal owners.
13. Although this is consistent with programmes and assistance provided to other rural and regional industries.
14. Of which more than 19 000 km² in the Coral Sea Islands Territory.
15. For example, the 2005 New South Wales Wetland Recovery Plan (AUD 26.8 million) and the Queensland Wetlands Program, including the pilot Great Barrier Reef Coastal Wetlands Protection Program.
16. Positive trends can sometimes also be problematic. For example, a population of native grey-headed flying foxes (*Pteropus poliocephalus*, one of the largest bat species in the world, which weighs up to 1 kg with a wingspan of 1.5 m) overwintering in Melbourne is causing the defoliation of trees in the city’s botanic gardens. There is public controversy about what to do with them.

17. No determination was made for the remaining species.
18. When less than 30% of native vegetation remains in an area, species loss is accelerated and it is more difficult to maintain connectivity between native vegetation remnants.
19. The Commission is an independent review and advisory body on micro-economic policy and regulation constituted under an act of the Australian Parliament.
20. Australian authorities do not consider enforcement of the ban to be problematic.
21. For example, Western Australia developed an environmental weed strategy in 1999, followed in 2002 by a wider weed plan for the State. The environmental strategy identified 34 weed species with an actual or potential high impact on biodiversity. Only one of the 34 species was also included among the 28 species on the National Alert List for Environmental Weeds. In Tasmania, there were 13 new weed alerts between 1999 and 2001. Seven weeds were known to adversely impact biodiversity values and 12 to affect agricultural production.
22. Although such a strategy has been suggested (Agrtrans and Dawson, 2005).
23. Dingoes have been integrated into established predator-prey relationships and may play a constructive ecological role in regulating populations.
24. AUD 1.4 billion, of which half from the Australian Government, over seven years (2001-07).
25. The scheme is part of the Australian Government's Biodiversity Hotspots Program.
26. That is, actions beyond landholders' regulatory responsibilities or management obligations (e.g. as set out in industry codes of practice).
27. For CITES and marine issues, see Chapter 8. For Australia's Ramsar sites, see section 3.3.

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The government documents, OECD documents and other documents used as sources for this chapter included the following. Also see list of websites at the end of this report.

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REFERENCES

I.A Selected environmental data

I.B Selected economic data

I.C Selected social data

II.A Selected multilateral agreements (worldwide)

II.B Selected multilateral agreements (regional)

III. Abbreviations

IV. Physical context

V. Selected environmental websites

I.A: SELECTED ENVIRONMENTAL DATA (1)

	CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	
LAND													
Total area (1000 km ²)													
Major protected areas (% of total area)	2	8.7	9.2	25.1	17.0	9.6	18.5	32.4	28.0	3.4	15.8	11.1	9.1
Nitrogenous fertiliser use (t/km ² of agricultural land)		2.5	1.2	2.7	9.0	20.1	0.2	2.6	2.9	10.7	6.9	7.8	5.9
Pesticide use (t/km ² of agricultural land)		0.06	0.04	0.08	1.24	1.20	-	0.02	0.09	0.69	0.10	0.11	0.06
Livestock densities (head of sheep eq./km ² of agr. land)		192	256	191	1011	1560	62	685	492	1790	287	912	290
FOREST													
Forest area (% of land area)		45.3	33.9	32.6	68.9	63.8	21.4	34.7	41.6	22.4	34.1	12.7	75.5
Use of forest resources (harvest/growth)		0.4	0.2	0.6	0.4	0.1	0.6	..	0.7	0.9	0.7	0.7	0.7
Tropical wood imports (USD/cap.)	3	1.6	0.2	2.1	10.7	6.1	4.0	3.4	0.4	24.2	0.3	3.8	1.4
THREATENED SPECIES													
Mammals (% of species known)		31.6	34.0	18.8	24.0	17.9	24.7	18.0	22.0	30.5	18.9	22.0	11.9
Birds (% of species known)		12.9	17.0	11.6	12.9	13.3	12.5	21.0	27.3	28.1	49.5	13.2	13.3
Fish (% of species known)		7.3	34.4	14.4	25.3	9.2	0.8	10.0	41.7	23.8	40.0	15.8	11.8
WATER													
Water withdrawal (% of gross annual availability)		1.5	15.9	19.2	20.4	36.2	4.8	1.7	5.0	32.5	12.7	4.1	2.1
Public waste water treatment (% of population served)		72	35	71	67	79	..	80	86	46	71	88	81
Fish catches (% of world catches)		1.2	1.4	5.3	4.7	1.7	0.2	0.6	-	-	-	1.1	0.1
AIR													
Emissions of sulphur oxides (kg/cap.)		76.3	12.2	49.4	6.7	10.4	123.6	18.6	4.4	14.5	22.2	4.0	16.4
(kg/1000 USD GDP)	4	2.6	1.4	1.4	0.3	0.6	4.2	0.8	0.2	0.5	1.4	0.1	0.6
% change (1990-2005)		-27	..	-31	-14	-46	58	39	-55	-58	-88	-88	-64
Emissions of nitrogen oxides (kg/cap.)		78.4	12.0	63.9	15.8	24.4	78.0	39.0	24.7	26.3	32.3	34.3	40.5
(kg/1000 USD GDP)	4	2.7	1.4	1.8	0.6	1.3	2.7	1.7	0.9	0.9	2.0	1.1	1.5
% change (1990-2005)		-6	18	-19	-2	47	25	16	-3	-24	-40	-32	-32
Emissions of carbon dioxide (t./cap.)	5	17.2	3.6	19.8	9.5	9.6	17.6	8.1	9.2	11.1	11.6	9.4	13.2
(t./1000 USD GDP)	4	0.57	0.39	0.54	0.36	0.50	0.61	0.36	0.31	0.40	0.69	0.32	0.47
% change (1990-2004)		29	27	20	15	105	36	49	31	7	-23	1	25
WASTE GENERATED													
Industrial waste (kg/1000 USD GDP)	4, 6	..	..	..	40	40	20	10	..	50	30	10	110
Municipal waste (kg/cap.)	7	420	340	750	400	380	690	400	560	460	290	740	470
Nuclear waste (t./Mtoe of TPES)	8	6.2	0.1	1.0	1.5	3.2	-	-	-	2.2	1.7	-	1.9

.. not available. - nil or negligible.

1) Data refer to the latest available year. They include provisional figures and Secretariat estimates.

Partial totals are underlined. Varying definitions can limit comparability across countries.

2) IUCN management categories I-VI and protected areas without IUCN category assignment; national classifications may differ.

3) Total imports of cork and wood from non-OECD tropical countries.

4) GDP at 2000 prices and purchasing power parities.

Source: OECD Environmental Data Compendium.

OECD EPR / SECOND CYCLE

FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	SLO	ESP	SWE	CHE	TUR	UKD*	OECD*
549	357	132	93	103	70	301	3	42	324	313	92	49	506	450	41	779	245	35042
13.3	31.5	5.2	8.9	9.5	1.2	19.0	17.1	18.9	6.4	29.0	8.5	25.2	9.5	9.5	28.7	4.3	30.1	16.4
7.6	10.4	2.9	5.8	0.7	7.9	5.2	-	13.8	10.1	4.8	2.3	3.7	3.5	5.2	3.6	3.6	6.3	2.2
0.27	0.17	0.14	0.17	-	0.05	0.58	0.33	0.41	0.08	0.06	0.40	0.16	0.14	0.05	0.10	0.06	0.21	0.07
514	689	245	207	65	1139	488	4351	2142	845	315	498	226	339	409	794	290	674	208
31.6	30.2	22.8	19.5	1.3	9.4	23.3	34.5	9.5	39.2	30.0	36.9	41.6	33.3	73.5	30.8	27.0	11.6	34.4
0.6	0.5	0.6	0.5	-	0.7	0.5	0.5	0.6	0.5	0.6	0.8	0.5	0.5	0.7	0.8	0.5	0.6	0.6
6.8	1.8	2.7	0.1	2.8	11.2	7.2	-	15.6	3.6	0.3	17.6	0.1	6.2	2.2	0.6	0.5	2.7	4.0
19.0	41.8	37.8	71.1	-	1.8	40.7	51.6	18.6	3.4	14.1	17.7	22.2	26.3	22.4	32.9	22.2	6.3	..
19.2	27.3	1.9	18.8	44.0	5.4	18.4	50.0	21.5	7.7	8.6	13.7	14.4	25.5	19.1	36.4	30.8	15.4	..
31.9	68.2	26.2	32.1	-	23.1	29.0	27.9	48.9	-	7.0	22.9	24.1	52.9	16.4	38.9	9.9	11.1	..
17.5	18.9	12.1	4.7	0.1	2.3	44.0	3.3	10.0	0.9	18.3	12.0	1.3	33.3	1.5	4.7	17.0	22.4	11.4
79	93	56	57	50	70	69	95	99	76	59	60	52	55	85	97	35	98	68
0.7	0.3	0.1	-	1.9	0.3	0.3	-	0.6	2.7	0.2	0.2	-	0.9	0.3	-	0.5	0.7	26.2
9.0	7.4	46.3	24.5	35.0	24.5	11.6	6.7	5.3	4.9	38.1	28.4	19.0	37.3	6.5	2.3	25.2	16.9	27.5
0.3	0.3	2.6	1.7	1.2	0.8	0.4	0.1	0.2	0.1	3.5	1.5	1.6	1.7	0.2	0.1	3.4	0.6	1.1
-60	-89	4	-76	22	-48	-63	-80	-58	-58	-55	-9	-81	-29	-45	-60	18	-73	-41
22.6	17.2	28.9	17.9	90.4	31.0	22.2	38.1	26.6	46.9	20.8	27.8	19.0	34.7	27.1	11.4	13.1	26.8	34.2
0.8	0.7	1.6	1.2	3.1	1.0	0.8	0.7	0.9	1.3	1.9	1.5	1.6	1.6	1.0	0.4	1.8	1.0	1.4
-29	-48	11	-24	-2	5	-34	-27	-28	-5	-38	13	-53	14	-25	-46	35	-43	-18
6.4	10.3	8.5	5.6	7.7	10.2	7.9	24.9	11.4	7.9	7.8	5.7	7.0	7.7	5.8	6.0	2.9	9.0	11.1
0.23	0.40	0.43	0.38	0.24	0.31	0.30	0.45	0.39	0.21	0.65	0.31	0.55	0.34	0.20	0.20	0.40	0.32	0.44
9	-12	33	-19	19	37	16	7	18	26	-15	52	-34	59	1	8	63	-4	17
50	20	..	30	10	40	20	30	40	20	120	50	130	30	110	-	30	30	50
540	600	440	460	520	740	540	710	620	760	250	470	270	650	480	650	440	580	560
4.2	1.2	-	1.7	-	-	-	-	0.1	-	-	-	3.0	1.2	4.1	1.9	-	1.0	1.5

UKD: pesticides and threatened species: Great Britain; water withdrawal and public waste water treatment plants: England and Wales.

5) CO₂ from energy use only; sectoral approach; international marine and aviation bunkers are excluded.

6) Waste from manufacturing industries.

7) CAN, NZL: household waste only.

8) Waste from spent fuel arising in nuclear power plants, in tonnes of heavy metal, per million tonnes of oil equivalent of total primary energy supply.

I.B: SELECTED ECONOMIC DATA (1)

	CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK
GROSS DOMESTIC PRODUCT											
GDP, 2005 (billion USD at 2000 prices and PPPs)	990	983	11049	3477	958	596	94	246	294	182	164
% change (1990-2005)	51.3	53.8	55.3	21.6	125.0	64.5	58.2	38.2	33.2	22.7	38.1
per capita, 2005 (1000 USD/cap.)	30.6	9.3	37.3	27.2	19.9	29.3	22.9	29.9	28.2	17.8	30.3
Exports, 2005 (% of GDP)	37.9	29.9	10.5	14.3	42.5	19.1	27.9	54.4	86.3	71.6	48.5
INDUSTRY 2											
Value added in industry (% of GDP)	32	27	23	31	43	26	25	32	27	40	27
Industrial production: % change (1990-2005)	46.7	51.3	55.9	3.2	210.9	30.5	29.5	70.1	21.0	11.8	38.3
AGRICULTURE											
Value added in agriculture (% of GDP)	3	3	4	2	1	4	7	2	1	4	3
Agricultural production: % change (1990-2005)	25.6	41.5	27.6	-12.3	19.3	25.4	47.9	9.9	13.0	..	0.7
Livestock population, 2005 (million head of sheep eq.)	118	275	787	53	30	283	99	17	25	12	24
ENERGY											
Total supply, 2005 (Mtoe)	272	177	2340	530	214	122	17	34	57	45	20
% change (1990-2005)	29.9	42.0	21.4	19.3	128.9	39.3	22.9	37.1	15.2	-7.7	9.6
Energy intensity, 2005 (toe/1000 USD GDP)	0.27	0.18	0.21	0.15	0.22	0.20	0.18	0.14	0.19	0.25	0.12
% change (1990-2005)	-14.2	-7.7	-21.8	-1.8	1.7	-15.3	-22.3	-0.8	-13.5	-24.8	-20.6
Structure of energy supply, 2005 (%)	4										
Solid fuels	10.2	4.9	23.8	21.1	23.1	44.5	11.9	11.9	9.1	43.6	19.1
Oil	35.5	58.8	40.8	47.4	45.0	31.1	40.4	42.5	40.7	21.6	42.1
Gas	29.4	25.0	21.8	13.3	12.8	18.9	18.9	24.2	25.2	16.6	22.6
Nuclear	8.8	1.6	9.0	15.0	17.9	-	-	-	22.1	14.0	-
Hydro, etc.	16.1	9.7	4.7	3.2	1.2	5.5	28.9	21.4	2.9	4.2	16.3
ROAD TRANSPORT 5											
Road traffic volumes per capita, 2004 (1000 veh.-km/cap.)	9.8	0.7	16.2	6.5	3.2	9.8	12.3	9.3	9.0	4.6	7.8
Road vehicle stock, 2005 (10 000 vehicles)	1883	2205	24119	7404	1540	1348	271	502	559	439	245
% change (1990-2005)	13.8	129.3	27.8	31.1	353.5	37.9	47.0	36.0	31.2	69.4	29.5
per capita (veh./100 inh.)	58	21	81	58	32	66	66	61	54	43	45

.. not available. - nil or negligible.

1) Data may include provisional figures and Secretariat estimates. Partial totals are underlined.

2) Value added: includes mining and quarrying, manufacturing, gas, electricity and water and construction;
production: excludes construction.

Source: OECD Environmental Data Compendium.

OECD EPR / SECOND CYCLE

FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	SLO	ESP	SWE	CHE	TUR	UKD	OECD
153	1693	2165	225	156	10	141	1521	26	478	180	475	194	73	995	269	231	568	1699	30283
37.4	29.5	26.6	56.3	33.3	57.2	156.5	20.9	90.8	40.4	59.6	68.2	37.2	35.9	54.5	35.2	17.1	75.6	43.3	44.3
29.1	27.8	26.2	20.3	15.4	33.8	34.2	26.0	56.8	29.3	39.0	12.4	18.4	13.6	22.9	29.7	31.0	7.9	28.3	25.9
41.8	26.0	40.7	20.8	66.4	32.0	81.2	26.3	159.3	69.9	45.3	37.2	28.6	77.3	25.5	48.6	47.9	27.4	26.4	24.3
32	25	30	23	31	27	42	29	20	26	38	30	29	32	30	28	27	31	26	29
75.6	18.2	16.9	19.5	92.2	..	312.8	10.5	57.6	20.8	35.5	113.0	15.1	19.5	27.0	55.3	27.6	78.3	8.6	34.6
4	3	1	7	4	9	3	3	1	3	2	3	4	5	3	2	1	12	1	3
-3.9	0.9	-4.7	10.1	-10.5	5.4	2.6	10.7	13	-9.2	-9.4	-15.8	1.1	..	7.4	-10.2	-4.3	18.2	-8.0	..
8	156	117	21	12	1	50	64	6	42	9	58	19	6	100	13	12	111	113	2639
35	276	345	31	28	4	15	185	5	82	32	93	27	19	145	52	27	85	234	5548
19.8	21.1	-3.2	39.7	-2.8	66.9	47.5	25.2	33.7	22.6	49.3	-6.9	53.1	-11.7	59.4	9.7	8.6	60.9	10.3	22.6
0.23	0.16	0.16	0.14	0.18	0.36	0.11	0.12	0.18	0.17	0.18	0.20	0.14	0.26	0.15	0.19	0.12	0.15	0.14	0.18
-12.8	-6.5	-23.6	-10.7	-27.1	6.2	-42.5	3.5	-29.9	-12.7	-6.4	-44.7	11.5	-35.0	3.2	-18.9	-7.2	-8.4	-23.1	-15.1
14.8	5.1	23.7	29.2	11.3	2.7	17.8	9.1	1.8	10.2	2.3	58.1	12.6	22.2	14.1	5.0	0.6	26.3	16.2	20.4
32.0	32.5	35.8	57.7	26.5	24.5	56.7	45.2	70.3	41.0	42.8	23.6	59.8	18.1	49.1	28.3	48.1	35.0	36.3	40.6
10.8	14.6	23.4	7.7	44.4	-	23.0	39.0	26.2	44.0	15.6	13.0	14.1	30.8	20.5	1.6	10.5	26.7	36.4	21.8
18.1	41.9	12.3	-	13.3	-	-	-	-	1.3	-	-	-	24.4	10.3	35.9	23.0	-	9.1	11.0
24.3	5.9	4.8	5.4	4.5	72.7	2.6	6.7	1.7	3.6	39.3	5.3	13.5	4.5	6.0	29.2	17.9	11.9	2.0	6.2
9.7	8.6	7.1	8.7	2.3	10.2	9.5	8.9	8.9	8.0	7.8	3.9	7.4	2.7	4.8	8.2	8.0	0.8	8.2	8.4
282	3617	4803	552	333	21	198	3894	34	806	252	1472	552	150	2516	463	419	843	3217	64939
26.2	27.1	28.8	118.7	49.4	59.8	108.5	30.2	68.0	40.7	29.9	126.8	151.3	44.4	74.2	17.9	28.9	257.1	35.0	38.7
54	59	58	50	33	72	48	66	74	49	55	39	52	28	58	51	56	12	54	56

3) Agriculture, forestry, hunting, fishery, etc.

4) Breakdown excludes electricity trade.

5) Refers to motor vehicles with four or more wheels, except for Italy, which include three-wheeled goods vehicles.

I.C: SELECTED SOCIAL DATA (1)

	CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK
POPULATION											
Total population, 2005 (100 000 inh.)	323	1053	2965	1278	481	203	41	82	104	102	54
% change (1990-2005)	16.6	25.4	18.8	3.5	12.3	19.2	21.9	6.7	4.7	-1.4	5.3
Population density, 2005 (inh./km ²)	3.2	53.8	30.8	338.2	483.3	2.6	15.2	98.2	341.9	129.6	125.7
Ageing index, 2004 (over 64/under 15)	72.3	18.6	59.7	140.3	44.4	65.4	54.9	97.1	97.2	91.6	79.5
HEALTH											
Women life expectancy at birth, 2004 (years)	82.4	77.6	80.1	85.6	80.8	83.0	81.3	82.1	82.4	79.0	79.9
Infant mortality, 2004 (deaths /1 000 live births)	5.3	19.7	6.9	2.8	5.3	4.7	6.2	4.5	4.3	3.7	4.4
Expenditure, 2004 (% of GDP)	9.9	6.5	15.3	8.0	5.6	9.6	8.4	9.6	10.1	7.3	8.9
INCOME AND POVERTY											
GDP per capita, 2005 (1000 USD/cap.)	30.6	9.3	37.3	27.2	19.9	29.3	22.9	29.9	28.2	17.8	30.3
Poverty (% pop. < 50% median income)	10.3	20.3	17.0	15.3	..	11.2	10.4	9.3	7.8	4.4	4.3
Inequality (Gini levels)	2	30.1	48.0	35.7	31.4	..	30.5	33.7	26.0	26.0	24.0
Minimum to median wages, 2000	3	42.5	21.1	36.4	32.7	25.2	57.7	46.3	x	49.2	32.3
EMPLOYMENT											
Unemployment rate, 2005 (% of civilian labour force)	4	6.8	3.5	5.1	4.4	3.7	5.1	3.7	5.2	8.4	7.9
Labour force participation rate, 2005 (% 15-64 years)	79.2	58.6	66.0	78.0	68.5	77.1	67.8	78.4	67.7	71.1	81.0
Employment in agriculture, 2004 (%)	5	2.6	15.9	1.6	4.5	8.1	3.7	7.5	5.0	2.0	4.3
EDUCATION											
Education, 2004 (% 25-64 years)	6	84.3	22.6	87.9	84.0	74.4	64.1	77.6	80.2	63.6	89.1
Expenditure, 2003 (% of GDP)	7	6.1	6.8	7.5	4.8	7.5	5.8	6.8	5.5	6.1	4.7
OFFICIAL DEVELOPMENT ASSISTANCE											
ODA, 2006 (% of GNI)	8	0.30	..	0.17	0.25	..	0.30	0.27	0.48	0.50	..
ODA, 2006 (USD/cap.)	114	..	76	91	..	103	62	183	187	..	411

.. not available. - nil or negligible. x not applicable.

1) Data may include provisional figures and Secretariat estimates. Partial totals are underlined.

2) Ranging from 0 (equal) to 100 (inequal) income distribution; figures relate to total disposable income (including all incomes, taxes and benefits) for the entire population.

3) Minimum wage as a percentage of median earnings including overtime pay and bonuses.

Source: OECD.

OECD EPR / SECOND CYCLE

FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	SLO	ESP	SWE	CHE	TUR	UKD	OECD
52	609	825	111	101	3	41	586	5	163	46	382	106	54	434	90	74	721	600	11690
5.2	7.3	3.9	10.0	-2.8	16.1	17.9	3.3	18.5	9.2	9.0	0.3	7.0	1.7	11.7	5.5	10.8	28.3	4.8	12.0
15.5	110.8	231.0	84.1	108.4	2.9	58.8	194.5	175.9	393.0	14.3	122.0	114.8	109.9	85.8	20.1	180.2	92.5	245.0	33.4
89.6	88.5	134.5	121.5	98.7	52.2	53.5	133.1	75.3	74.2	74.3	76.9	107.8	66.8	116.0	97.3	100.8	19.4	87.1	70.2
82.3	83.8	81.4	81.4	76.9	82.7	80.7	82.5	81.0	81.4	82.3	79.4	80.5	77.8	83.8	82.7	83.7	73.8	80.7	..
3.3	3.9	4.1	4.1	6.6	2.8	4.9	4.1	3.9	4.1	3.2	6.8	4.0	6.8	3.5	3.1	4.2	23.6	5.1	..
7.5	10.5	10.6	10.0	8.0	10.2	7.1	8.8	8.0	9.2	9.2	6.5	10.1	5.9	8.1	9.1	11.6	7.7	8.4	..
29.1	27.8	26.2	20.3	15.4	33.8	34.2	26.0	56.8	29.3	39.0	12.4	18.4	13.6	22.9	29.7	31.0	7.9	28.3	25.9
6.4	7.0	9.8	13.5	8.2	..	15.4	12.9	5.5	6.0	6.3	9.8	13.7	..	11.5	5.3	6.7	15.9	11.4	10.2
25.0	28.0	28.0	33.0	27.0	35.0	32.0	33.0	26.0	27.0	25.0	31.0	38.0	33.0	31.0	23.0	26.7	45.0	34.0	30.7
x	60.8	x	51.3	37.2	x	55.8	x	48.9	47.1	x	35.5	38.2	..	31.8	x	x	..	41.7	..
8.4	9.9	9.6	9.8	7.2	2.6	4.4	7.7	4.5	4.7	4.6	17.7	7.6	16.3	9.2	6.4	4.5	10.0	4.8	6.6
74.6	69.3	78.2	64.9	60.0	84.6	72.5	62.6	69.1	77.9	79.1	63.9	77.5	68.7	71.3	78.3	86.3	53.0	76.0	68.7
4.9	3.5	2.4	12.6	5.3	6.3	6.4	4.5	1.3	3.0	3.5	18.0	12.1	5.1	5.5	2.1	3.7	34.0	1.3	6.1
77.6	65.3	83.9	56.2	75.4	60.0	62.9	48.2	62.3	70.7	88.3	50.1	25.2	84.7	45.0	82.9	84.5	26.1	65.1	67.5
6.1	6.3	5.3	4.2	6.1	8.0	4.4	5.1	3.6	5.0	6.6	6.4	5.9	4.7	4.7	6.7	6.5	3.7	6.1	5.8
0.39	0.47	0.36	0.16	..	..	0.53	0.20	0.89	0.81	0.89	..	0.21	..	0.32	1.03	0.39	..	0.52	0.30
157	171	126	35	..	..	235	62	633	334	631	..	37	..	86	437	220	..	209	63

4) Standardised unemployment rates; MEX, ISL, TUR: commonly used definitions.

5) Civil employment in agriculture, forestry and fishing.

6) Upper secondary or higher education; OECD: average of rates.

7) Public and private expenditure on educational institutions; OECD: average of rates.

8) Official Development Assistance by Member countries of the OECD Development Assistance Committee.

II.A: SELECTED MULTILATERAL AGREEMENTS (WORLDWIDE)

Y = in force S = signed R = ratified D = denounced

		CAN	MEX	USA
1946	Washington	Conv. - Regulation of whaling	Y D	R R
1956	Washington	Protocol	Y D	R R
1949	Geneva	Conv. - Road traffic	Y R	R
1957	Brussels	Conv. - Limitation of the liability of owners of sea-going ships	Y S	
1979	Brussels	Protocol	Y	
1958	Geneva	Conv. - Fishing and conservation of the living resources of the high seas	Y S	R R
1959	Washington	Treaty - Antarctic	Y R	R
1991	Madrid	Protocol to the Antarctic treaty (environmental protection)	Y R	R
1960	Geneva	Conv. - Protection of workers against ionising radiations (ILO 115)	Y	R
1962	Brussels	Conv. - Liability of operators of nuclear ships		
1963	Vienna	Conv. - Civil liability for nuclear damage	Y	R
1988	Vienna	Joint protocol relating to the application of the Vienna Convention and the Paris Convention	Y	
1997	Vienna	Protocol to amend the Vienna convention	Y	
1963	Moscow	Treaty - Banning nuclear weapon tests in the atmosphere, in outer space and under water	Y R	R R
1964	Copenhagen	Conv. - International council for the exploration of the sea	Y R	R
1970	Copenhagen	Protocol	Y R	R
1969	Brussels	Conv. - Intervention on the high seas in cases of oil pollution casualties (INTERVENTION)	Y	R R
1973	London	Protocol (pollution by substances other than oil)	Y	R R
1969	Brussels	Conv. - Civil liability for oil pollution damage (CLC)	Y D	D S
1976	London	Protocol	Y R	R
1992	London	Protocol	Y R	R
1970	Bern	Conv. - Transport of goods by rail (CIM)	Y	
1971	Brussels	Conv. - International fund for compensation for oil pollution damage (FUND)	Y D	D S
1976	London	Protocol	Y R	R
1992	London	Protocol (replaces the 1971 Convention)	Y R	R
2000	London	Amendment to protocol (limits of compensation)	Y R	R
2003	London	Protocol (supplementary fund)		
1971	Brussels	Conv. - Civil liability in maritime carriage of nuclear material	Y	
1971	London, Moscow, Washington	Conv. - Prohib. emplacement of nuclear and mass destruct. weapons on sea-bed, ocean floor and subsoil	Y R	R R
1971	Ramsar	Conv. - Wetlands of international importance especially as waterfowl habitat	Y R	R R
1982	Paris	Protocol	Y R	R R
1987	Regina	Regina amendment	Y R	R
1971	Geneva	Conv. - Protection against hazards of poisoning arising from benzene (ILO 136)	Y	
1972	London, Mexico, Moscow, Washington	Conv. - Prevention of marine pollution by dumping of wastes and other matter (LC)	Y R	R R
1996	London	Protocol to the Conv. - Prevention of marine poll. by dumping of wastes and other matter	R	S
1972	Geneva	Conv. - Protection of new varieties of plants (revised)	Y R	R R

OECD EPR / SECOND CYCLE

Y = in force S = signed R = ratified D = denounced

JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	SVK	ESP	SWE	CHE	TUR	UKD	EU
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
D		D			D		D	D	D	D			R		S		D	D	R	R		R	D	R		D	
		R			R			S	S							R			R	R		R		R		D	
		R	S		R		R	R	R			S	S			R			R	R		R		R		R	
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	S	R	R	S	R	R	R	R	S			R	R	R	R		S	R	R	S			R	
R					R	R	R	R	R	R	R	R			R	R	R	R	R	R	R	R	R	R	R	R	R
		S			S				S					S		R			R								
					R				R										R		R	S				S	
					S	R	R	R	S	R	R	R			R	R	R	R	R	S	R	S	R	S	R	S	S
					S				S			S			S				S								
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	S	R	R	R	R	R	R	R
					R	R	R	R	R		R	R		R	R		R	R	R	R	R	R	R	R	R	R	R
					R	R	R	R	R		R	R		R	R		R	R	R	R	R	R	R	R	R	R	R
R	S	R	R		R	R	R	R	R	S		R	R	R		R	R	R	R	R	R	R	R	R	R	R	R
		R	S		R	R	R	R	R			R	R		R	R		R	R	R	R	R	R	R	R	R	R
D	D	D	D		D	D	D	D	D	D		D	D	D	R	D	D	D	D	D	D	D	D	D	D	D	D
R	R	R			R	R	R	R	R	R	R	R	D	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R		R	R	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
					R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
D	D	D	D		R	D	D	D	D	D		D	D	D		D	D	D	R		D	D	D	D	D	D	D
R		R	R		R	R	R	R	R	R	R	R	D	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R		R	R	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
					R	R	R	R	R			R	R		R	R	R	R	R	S	R	R				S	
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
					R	R	R	R	R	R		R			R					R	R		R				
R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
					R	R	R	R	R		R	R			S	R				R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R

II.A: SELECTED MULTILATERAL AGREEMENTS (WORLDWIDE) (cont.)

Y = in force S = signed R = ratified D = denounced

		CAN	MEX	USA
1978	Geneva Amendments	Y	R	R R
1991	Geneva Amendments	Y		R
1972	Geneva Conv. - Safe container (CSC)	Y	R	R R
1972	London, Moscow, Washington Conv. - International liability for damage caused by space objects	Y	R	R R
1972	Paris Conv. - Protection of the world cultural and natural heritage	Y	R	R R
1973	Washington Conv. - International trade in endangered species of wild fauna and flora (CITES)	Y	R	R R
1974	Geneva Conv. - Prev. and control of occup. hazards caused by carcinog. subst. and agents (ILO 139)	Y		
1976	London Conv. - Limitation of liability for maritime claims (LLMC)	Y		R
1996	London Amendment to convention	Y	S	
1977	Geneva Conv. - Protection of workers against occupational hazards in the working environment due to air pollution, noise and vibration (ILO 148)	Y		
1978	London Protocol - Prevention of pollution from ships (MARPOL PROT)	Y	R	R R
1978	London Annex III	Y	R	R
1978	London Annex IV	Y		
1978	London Annex V	Y	R	R
1997	London Annex VI	Y		S
1979	Bonn Conv. - Conservation of migratory species of wild animals	Y		
1991	London Agreem. - Conservation of bats in Europe	Y		
1992	New York Agreem. - Conservation of small cetaceans of the Baltic and the North Seas (ASCOBANS)	Y		
1996	Monaco Agreem. - Conservation of cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area	Y		
1996	The Hague Agreem. - Conservation of African-Eurasian migratory waterbirds	Y		
2001	Canberra Agreem. - Conservation of albatrosses and petrels (ACAP)	Y		
1982	Montego Bay Conv. - Law of the sea	Y	R	R
1994	New York Agreem. - relating to the implementation of part XI of the convention	Y	R	R S
1995	New York Agreem. - Implementation of the provisions of the convention relating to the conservation and management of straddling fish stocks and highly migratory fish stocks	Y	R	R
1983	Geneva Agreem. - Tropical timber	Y	R	R
1994	New York Revised agreem. - Tropical timber	Y	R	R R
1985	Vienna Conv. - Protection of the ozone layer	Y	R	R R
1987	Montreal Protocol (substances that deplete the ozone layer)	Y	R	R R
1990	London Amendment to protocol	Y	R	R R
1992	Copenhagen Amendment to protocol	Y	R	R R
1997	Montreal Amendment to protocol	Y	R	R
1999	Beijing Amendment to protocol	Y	R	R
1986	Vienna Conv. - Early notification of a nuclear accident	Y	R	R R
1986	Vienna Conv. - Assistance in the case of a nuclear accident or radiological emergency	Y	R	R R
1989	Basel Conv. - Control of transboundary movements of hazardous wastes and their disposal	Y	R	R S

II.A: SELECTED MULTILATERAL AGREEMENTS (WORLDWIDE) (cont.)

Y = in force S = signed R = ratified D = denounced

		CAN MEX USA				
1995	Geneva	Amendment				
1999	Basel	Prot. - Liability and compensation for damage				
1989	London	Conv. - Salvage	Y	R	R	R
1990	Geneva	Conv. - Safety in the use of chemicals at work (ILO 170)	Y		R	
1990	London	Conv. - Oil pollution preparedness, response and co-operation (OPRC)	Y	R	R	R
2000	London	Protocol - Pollution incidents by hazardous and noxious substances (OPRC-HNS)				
1992	Rio de Janeiro	Conv. - Biological diversity	Y	R	R	S
2000	Montreal	Prot. - Biosafety (Cartagena)	Y	S	R	
1992	New York	Conv. - Framework convention on climate change	Y	R	R	R
1997	Kyoto	Protocol	Y	R	R	S
1993	Paris	Conv. - Prohibition of the development, production, stockpiling and use of chemical weapons and their destruction	Y	R	R	R
1993	Geneva	Conv. - Prevention of major industrial accidents (ILO 174)	Y			
1993		Agreem. - Promote compliance with international conservation and management measures by fishing vessels on the high seas	Y	R	R	R
1994	Vienna	Conv. - Nuclear safety	Y	R	R	R
1994	Paris	Conv. - Combat desertification in those countries experiencing serious drought and/or desertification, particularly in Africa	Y	R	R	R
1996	London	Conv. - Liability and compensation for damage in connection with the carriage of hazardous and noxious substances by sea (HNS)			S	
1997	Vienna	Conv. - Supplementary compensation for nuclear damage				S
1997	Vienna	Conv. - Joint convention on the safety of spent fuel management and on the safety of radioactive waste management	Y	R		R
1997	New York	Conv. - Law of the non-navigational uses of international watercourses				
1998	Rotterdam	Conv. - Prior informed consent procedure for hazardous chemicals and pesticides (PIC)	Y	R	R	S
2001	London	Conv. - Civil liability for bunker oil pollution damage				
2001	London	Conv. - Control of harmful anti-fouling systems on ships				S
2001	Stockholm	Conv. - Persistent organic pollutants	Y	R	R	S

Source: IUCN; OECD.

OECD EPR / SECOND CYCLE

Y = in force S = signed R = ratified D = denounced

JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	SVK	ESP	SWE	CHE	TUR	UKD	EU	
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II.B: SELECTED MULTILATERAL AGREEMENTS (REGIONAL)

		CAN MEX USA	
1948	Baguio	Agreem. - Establishment of the Asia-Pacific fishery commission	Y R
1956	Rome	Agreem. - Plant protection for the Asia and Pacific region	Y
1958	Geneva	Agreem. - Adoption of uniform conditions of approval and reciprocal recognition of approval for Y motor vehicle equipments and parts	Y
1964	Brussels	Agreem. - Measures for the conservation of Antarctic Fauna and Flora	Y R
1968	Paris	Conv. - Protection of animals during international transport	Y
1979	Strasbourg	Protocol	Y
1969	London	Conv. - Protection of the archaeological heritage	Y
1972	London	Conv. - Conservation of Antarctic seals	Y R R
1976	Apia	Conv. - Conservation of nature in the South Pacific	Y
1979	Honiara	Conv. - South Pacific Forum Fisheries Agency	Y
1980	Canberra	Conv. - Conservation of Antarctic marine living resources	Y R R
1985	Rarotonga	Conv. - South Pacific nuclear free zone treaty	Y
1986	Noumea	Conv. - Protection of the natural resources and environment of the South Pacific region	Y R
1986	Noumea	Protocol (prevention of pollution by dumping)	Y R
1986	Noumea	Protocol (co-operation in combating pollution emergencies)	Y R
1993	Apia	Agreem. - South Pacific Regional Environment Programme (SPREP)	Y S
1987	Port Moresby	Treaty - South Pacific fisheries	Y R
1989	Wellington	Conv. - Prohibition of fishing with long driftnets in the South Pacific	Y R
1990	Noumea	Protocol	Y R
1990	Noumea	Protocol	Y S
1992	Honiara	Treaty - Cooperation in fisheries surveillance and law enforcement in the South Pacific region	Y
1993	Tokyo	Memorandum of understanding on port state control in the Asia-Pacific region	Y R
1993	Canberra	Conv. - Conservation of Southern Pacific bluefin tuna	Y
1993	Rome	Agreem. - Establishment of the Indian Ocean Tuna Commission	Y
1994	Lisbon	Treaty - Energy Charter	Y
1994	Lisbon	Protocol (energy efficiency and related environmental aspects)	Y
1995	Port Moresby	Conv. - Regional convention on hazardous and radioactive wastes (Waigani Convention)	Y
2000	Santiago	Agreem. - Conservation of living marine resources on the high seas of the south Pacific (the Galapagos agreement)	

Source: IUCN; OECD.

OECD EPR / SECOND CYCLE

JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GR	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	SVK	ESP	SWE	CHE	TUR	UK	DEU	
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Reference III

ABBREVIATIONS

AAA	Agriculture Advancing Australia
AADC	Australia Antarctic Data Centre
AAQ	Ambient air quality
ACT	Australian Capital Territory
ADRs	Australian Design Rules
AFCS	Australian Forest Certification Scheme
AGEIS	Australian Greenhouse Emissions Information System
AHC	Australian Heritage Council
ALGA	Australian Local Government Association
AMSA	Australian Maritime Safety Authority
ANCA	Australian Nature Conservation Agency
ANZECC	Australian and New Zealand Environment and Conservation Council
APEC	Asia-Pacific Economic Co-operation
AQIS	Australian Quarantine and Inspection Service
ARIES	Australian Research Institute in Education for Sustainability
AusAID	Australian Agency for International Development
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CDM	Clean development mechanism
CFCs	Chlorofluorocarbons
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNG	Compressed natural gas
CO ₂	Carbon dioxide
COAG	Council of Australian Governments
CRC	Co-operative research centre
DAC	Development Assistance Committee of the OECD
DAFF	Department of Agriculture, Fisheries and Forestry
DEC	Department of Environment and Conservation (NSW)
DECC	Department of Environment and Climate Change (NSW)
EEZ	Exclusive economic zone
DEH	Department of Environment and Heritage

DEW	Department of Environment and Water Resources
DFAT	Department of Foreign Affairs and Trade
DITR	Department of Industry, Tourism and Resources
DTRS	Department of Transport and Regional Services
DVE	Diesel vehicle emissions
EEBP	Energy Efficiency Best Practice
e-ELF	Electronic Environment Licensing Form
EIA	Environmental impact assessment
EIS	Environmental impact statement
EPA	Environment Protection Authority
EPBC	Environment Protection and Biodiversity Conservation
ESD	Ecologically sustainable development
FAO	Food and Agriculture Organization of the United Nations
FSC	Forest Stewardship Council
FSM	Federated States of Micronesia
GDP	Gross domestic product
GM	Genetically modified
GNI	Gross national income
GVG	Green Vehicle Guide
HAFC	Harmful anti-fouling compound
HBFCs	Hydrobromofluorocarbons
HC	Hydrocarbon
HCFCs	Hydrochlorofluorocarbons
HDPE	High-density polyethylene
IBRA	Interim Biogeographic Regionalisation for Australia
ICESD	Intergovernmental Committee on Ecologically Sustainable Development
ICLEI	International Council on Local Environment Initiatives
IEA	International Energy Agency
IGAE	Intergovernmental Agreement on the Environment
IMO	International Maritime Organization
ITTO	International Tropical Timber Organization
IUCN	International Union for Conservation of Nature
IUU	Illegal, unregulated and unreported (fishing)
LA21	Local Agenda 21
LBL	Load-based licensing
LETDF	Low Emissions Technology Demonstration Fund
LPG	Liquefied petroleum gas
LRA	Load reduction agreement
LULUCF	Land use, land use change and forestry

MARPOL	London Convention on Prevention of Pollution from Ships
MBI	Market-based instrument
MDBC	Murray-Darling Basin Commission
MCE	Ministerial Council on Energy
MEPS	Minimum energy performance standards
MRET	Mandatory renewable energy target
N ₂ O	Nitrous oxide
NAP	National Action Plan for Salinity and Water Quality
NEHS	National Environmental Health Strategy
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NFEE	National Framework for Energy Efficiency
NGO	Non-governmental organisation
NHandMRC	National Health and Medical Research Council
NHT	Natural Heritage Trust
NLP	National Landcare Program
NLWRA	National Land and Water Resources Audit
NO _x	Nitrogen oxide
NRM	Natural Resources Management
NRMMC	Natural Resource Management Ministerial Council
NRS	National Reserve System
NRSMPA	National Representative System of Marine Protected Areas
NSW	New South Wales
NWI	National Water Initiative
OCPs	Organochlorine pesticides
ODA	Official development assistance
ODP	Ozone-depleting potential
ODS	Ozone-depleting substance(s)
OPRC	International Convention on Oil Pollution Preparedness, Response and Co-operation
PAHs	Polycyclic aromatic hydrocarbons
PAN	Pollution abatement notice
PCBs	Polychlorinated biphenyls
PEFC	Program for the Endorsement of Forest Certification
PFCs	Perfluorocarbons
PIMC	Primary Industries Ministerial Council
PIN	Pollution infringement notice
PM ₁₀	Particulate matter less than ten microns in diameter
PNG	Papua New Guinea
PPA	Purchasing power parity

PPP	Polluter-pays principle
PRP	Pollution reduction programme
RCD	Rabbit calicivirus disease
RFA	Regional Forest Agreement
SF ₆	Sulphur hexafluoride
SO ₂	Sulphur dioxide
SPP	Specific purpose payment
SPREP	(South) Pacific Regional Environmental Programme
TBT	Tributyltin
TDM	Travel demand management
TPES	Total primary energy supply
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
VOCs	Volatile organic compounds
WA	Western Australia
WEEE	Waste electrical and electronic equipment

Reference IV

PHYSICAL CONTEXT

Australia occupies an entire continent and adjacent islands, covering 7.68 million km² between the Pacific and Indian Oceans. Its closest neighbours are New Zealand, Papua New Guinea and Indonesia. Mainland Australia extends about 3 500 kilometres from the tip of Cape York in the north to the southernmost point of the State of Tasmania, and about 4 000 kilometres from east to west. Apart from the eastern uplands, most of the country is a broad flat platform, broken by low hills and basins. Average elevation is 330 metres, and uplands rarely exceed 1 200 metres.

Australia has a tropical monsoon climate in the north, a Mediterranean climate in the south and west, a temperate climate in the south-east, and a vast arid or semi-arid interior. Nearly a third of Australia lies in the tropics and over 80% in arid or semi-arid climatic zones. Drought is a recurring feature over most of the continent. Annual rainfall averages 465 mm and is highly variable, partly because Australia lies close to the El Niño Southern Oscillation. Australia has few permanent freshwater lakes and little river water. The largest river system, the Murray-Darling in the south-east, has an average flow volume of only 0.5 million litres per second.

The dry climate, combined with shallow, often infertile soil, strongly influences Australia's land use patterns. Only 12% of the country can sustain dense vegetation or intensive agriculture. Overall, agriculture occupies about 60% of the land surface, mostly as grassland and shrublands; forests and other wooded land account for 20%, settlements 1% and other areas 19%.

Reference V

SELECTED ENVIRONMENTAL WEBSITES

Website	Host institution
<i>Government</i>	
www.abare.gov.au	Australian Bureau of Agriculture and Resource Economics
www.abs.gov.au	Australian Bureau of Statistics
www.daff.gov.au	Department of Agriculture, Fisheries and Forestry
www.greenhouse.gov.au	Australian Greenhouse Office
www.environment.gov.au	Department of Environment and Water Resources
www.greenvehicleguide.gov.au	Department of Transport and Regional Services
enhealth.nphp.gov.au	Environmental Health Council
www.ephc.gov.au	Environmental Protection and Heritage Council
www.gbrmpa.gov.au	Great Barrier Reef Marine Park Authority
www.ilc.gov.au	Indigenous Land Corporation
www.lwa.gov.au	Land and Water Australia
www.mdbc.gov.au	Murray-Darling Basin Commission
www.nht.gov.au/index.html	Natural Heritage Trust
www.nlwra.gov.au	National Land and Water Resources Audit
www.nwc.gov.au	National Water Commission
www.npi.gov.au/	National Pollutant Inventory

State/Territory

www.environment.nsw.gov.au	Department of Environment and Conservation (New South Wales)
www.dnr.nsw.gov.au	Department of Natural Resources (New South Wales)
www.dse.vic.gov.au/dse/index.htm	Department of Environment and Sustainability (Victoria)
www.epa.vic.gov.au	Environment Protection Authority (Victoria)
www.epa.qld.gov.au	Environmental Protection Agency/Parks and Wildlife Service (Queensland)
www.nrw.qld.gov.au	Department of Natural Resources and Water (Queensland)
www.environment.sa.gov.au	Department of Environment and Heritage (South Australia)
www.epa.sa.gov.au	Environment Protection Authority (South Australia)
www.dec.wa.gov.au	Department of Environment and Conservation (Western Australia)
www.dtae.tas.gov.au	Department of Tourism, Arts and the Environment (Tasmania)
www.dpiw.tas.gov.au	Department of Primary Industries and Water (Tasmania)
www.nt.gov.au/nreta	Department of Natural Resources, Environment and The Arts (Northern Territory)
www.environment.act.gov.au	Environment and Recreation (Australian Capital Territory)

Non-government

www.ancid.org.au	Australian National Committee on Irrigation and Drainage
www.iclei.org/index.php?id=home	ICLEI Local Governments for Sustainability Oceania

www.ittis.org

International Tropical Timber Information
System

www.tai.org.au

Australia Institute

www.travelsmart.gov.au

Travel Smart Australia

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Signs

The following signs are used in Figures and Tables:

. . : not available

– : nil or negligible

. : decimal point

The sign * indicates that not all countries are included.

Country Aggregates

OECD Europe: All European member countries of the OECD (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey and United Kingdom).

OECD: The countries of OECD Europe plus Australia, Canada, Japan, the Republic of Korea, Mexico, New Zealand and the United States.

Country aggregates may include Secretariat estimates.

Currency

Monetary unit: Australian dollar (AUD)

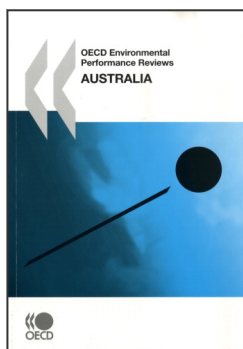
In 2006, AUD 1.332 = USD 1.

Cut-off Date

This report is based on information and data available up to May 2007.

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