Australia's National Report

to the Fourth Conference of the Parties to the Convention on Biological Diversity

AUSTRALIA

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Executive Summary

Australia ratified the Convention on Biological Diversity in June 1993. The Convention came into force in December 1993. In response to Decision II/17 of the Conference of the Parties, Australia has prepared its first national report addressing Article 6 of the Convention.

Australia is the world's sixth largest nation. It lies in the southern hemisphere and has seven external territories, including the Australian Antarctic Territory. The Australian Exclusive Economic Zone, at 16 million square kilometres, is more than twice the continental land area. In biodiversity terms, Australia is a mega-diverse country with a notably high proportion of terrestrial and marine endemic species. Australia's biodiversity makes a significant contribution to its economy and is regarded as an important part of the nation's heritage. It is essential to the identity and culture of Australia's indigenous peoples.

Australia is a federation of six self-governing States and two self-governing mainland Territories. States and Territories have established systems of Local Government. Environmental powers are not the sole responsibility of any one level of government, but State and Territory Governments have primary responsibility for land management legislation. Governments take a cooperative national approach to environmental matters through the Intergovernmental Agreement on the Environment. The private sector, academic institutions, non-government organisations and the general community also play an important role in environmental issues, including biodiversity conservation and sustainable use.

General measures for conservation and sustainable use

The National Strategy for the Conservation of Australia's Biological Diversity, to which each State and Territory is a signatory, provides the framework for Australia's implementation of the measures in the Convention on Biological Diversity. The goal of the Strategy is to protect biological diversity and maintain ecological processes and systems. It aims to bridge the gap between current activities and those measures necessary to ensure the effective identification, conservation and ecologically sustainable use of Australia's biodiversity.

Its implementation is guided by a number of cross-sectoral and sectoral-based plans, policies and programmes at the Commonwealth, State, Territory and Local Government level. The Natural Heritage Trust, by funding programmes addressing vegetation, rivers, biodiversity, land and coasts and oceans, will be the main means through which the Commonwealth will implement the Strategy, in partnership with the States and Territories. The States and Territories also have a number of programmes which contribute to implementing the Strategy and Convention, and most have developed or are developing their own complementary biodiversity strategies.

The Strategy also provides a framework for integrating the conservation and sustainable use of biodiversity into sectoral strategies, plans and programmes. Key sectors include agriculture and pastoralism, fisheries, water, forests, tourism and recreation and mining.

Identification and monitoring

The identification and monitoring of biodiversity is an important component in its management and sustainable use. Article 7 of the Convention requires Parties to identify and monitor important ecosystems, species and genetic components of biological diversity, as well as processes and activities that have, or are likely to have, significant adverse impacts on biological diversity.

Key processes for achieving this include:

- the Australian Biological Resources Study, which provides fundamental and comprehensive information on all forms of Australian biota for present and future generations;
- the state of the environment reporting process, which monitors and reports on the change in environmental quality over time;
- monitoring programmes under the Natural Heritage Trust, Regional Forest Agreement process, Coastal Monitoring Strategy, the proposed National Rangeland Monitoring Program, and other Commonwealth programmes;
- the work of Commonwealth, State and Territory museums and herbaria;
- a range of identification and monitoring programmes established by the States and Territories.

In-situ conservation

In-situ conservation of biodiversity as reflected in Article 8 of the Convention is a high priority for Parties and, accordingly, is an important component of the National Strategy for the Conservation of Australia's Biological Diversity. The Strategy promotes both on and off-reserve conservation, integrated through bioregional planning.

The National Reserve System Program, a five-year program funded by the Natural Heritage Trust, seeks to establish, in cooperation with the States and Territories, a comprehensive, adequate and representative terrestrial National Reserve System. This will be complemented by the Marine Protected Areas Program.

The Natural Heritage Trust will also contribute to conservation outside protected areas by providing assistance to community groups to improve the management of land, water and vegetation resources. The largest component of the trust, Bushcare, gives priority to projects that conserve wildlife habitat and biodiversity whilst focusing on national objectives and principles for sustainable management. State and Territory programmes, which may be voluntary or regulatory, or a combination of the two, play a crucial role in conserving biodiversity outside reserves. These are complemented by a range of Local Government programmes.

The Commonwealth and most States and Territories have legislation and programmes in place dealing with threatened species, ecological communities and threatening processes. Nationally, alien species are being addressed through the National Weed Strategy and the National Feral Animal Control Program, with funding from the Natural Heritage Trust. Again, national programmes are complemented by State and Territory programmes.

The National Strategy for the Conservation of Australia's Biological Diversity recognises that Aboriginal and Torres Strait Islander peoples have developed a unique knowledge of biodiversity and have a continuing economic and cultural interest in protecting indigenous species and environments. The Strategy includes actions to recognise and ensure the continuity of the contribution of their ethnobiological knowledge to the conservation of Australia's biodiversity.

Ex situ conservation

To complement in-situ conservation, Australia has established, and is maintaining, a wide range of measures and facilities for ex-situ conservation purposes through Commonwealth, State and Territory agencies, as well as tertiary institutions and scientific organisations. Several facilities have been used to support reintroduction programmes for threatened species.

Sustainable use of components of biological diversity

The sustainable use of components of biological diversity is a major theme that runs through Australia's biodiversity policies and programmes. Significant effort has gone into ensuring that the conservation of biological diversity is taken into account in decision-making at all levels of government.

Cooperative arrangements supporting biodiversity conservation and sustainable use have also been developed between the private sector, Aboriginal and Torres Strait Islander peoples and the community.

Incentive measures

A further measure to increase the involvement of industry and the community in biodiversity conservation is to provide incentives. A range of incentives are provided through Natural Heritage Trust programmes and many other State, Territory and Local Government programmes. Motivational, educational, voluntary, regulatory, property-right-based, price-based and financial instruments are all used in Australia.

Research and training

Australia undertakes significant research on biodiversity through its scientific and research institutions (such as the Commonwealth Scientific and Industrial Research Organisation), and cooperatively with the private sector through Cooperative Research Centres. Tertiary institutions and museums and herbaria are also important contributors.

Public education and awareness

Australian Governments promote environmental education by focusing upon public awareness, information and education initiatives, in addition to encouraging a coordinated approach to the formal education sector.

A number of initiatives, such as the National Curriculum Statements, Australian Environmental Education Network, Environment Resource and Information Network, and Community Biodiversity Network, help promote education and awareness.

Impact assessment and minimising adverse impacts

The Commonwealth, States and Territories all have environmental impact legislation in place which address impacts on biodiversity. Other legislation covers the assessment of imported species and their impact on biodiversity.

Access to genetic resources

Australia has set up a Commonwealth–State Working Group on Access to Australia's Biological Resources to investigate and report on action required to develop a nationally consistent approach to access to Australia's biological resources.

Access to and transfer of technology

Australia has created a regulatory and economic environment to support the access to and transfer of environmentally sound technologies. Technology transfer is intrinsic to Australia's overseas aid programme, with a key role played by the Australian Centre for International Agricultural Research.

Exchange of information and technical and scientific cooperation

Australia actively contributes to international cooperation through multilateral forums such as the United Nations Commission on Sustainable Development, South Pacific Regional Environment Program, United Nations Environment Programme and the Valdivia Group, and bilateral Memoranda of Understanding. Important information exchange mechanisms include the Environment Resource and Information Network, and the National Resource Information Centre.

Financial resources and financial mechanism

Australia has made a significant financial commitment to the conservation and sustainable development of biodiversity, particularly through the Natural Heritage Trust programme. The trust will outlay $A1.249 billion from 1997–98 to 2001–02. This will be supported by a similar level of funding from the States and Territories, and from the community.

Australia also provides significant international aid funding that helps countries, particularly those in the Asia–Pacific region, to conserve and sustainably use their biodiversity, while simultaneously assisting them to reduce poverty.

Background

This report describes aspects of Australia's implementation of the Convention on Biological Diversity. It has been prepared to fulfil Australia's obligation as a Party to the Convention under Article 26 of the Convention, which states that:

> *Each Contracting Party shall, at intervals to be determined by the Conference of the Parties, present to the Conference of the Parties, reports on measures which it has taken for the implementation of the provisions of this Convention and their effectiveness in meeting the objectives of this Convention.*

The reporting process is a common feature of most international agreements and provides a means to assess progress achieved in meeting the Convention's objectives, share national experiences between parties and assess implementation at the national level.

The second Conference of the Parties to the Convention, held in November 1995, decided that:

> *The first national reports by Parties will focus in so far as possible on the measures taken for the implementation of Article 6 of the Convention,* General Measures for Conservation and Sustainable Use*, as well as the information available in national country studies on biological diversity, using as a guide the annex to this decision.*

The structure of the national report reflects the guidance provided by the Second Conference of the Parties in the annex to its decision. The annex is included in this report as Appendix 2. Consistent with the guidelines in the annex, the report focuses on the processes Australia has put in place to implement the measures contained in the Convention on Biological Diversity. The report does not attempt to assess the effectiveness of these processes. It is likely that this will be addressed in subsequent national reports.

The Convention on Biological Diversity

On World Environment Day, 5 June 1992, at the Earth Summit in Rio de Janeiro, Australia signed the Convention on Biological Diversity. The Convention was subsequently ratified by Australia on 18 June 1993 and came into force on 29 December 1993.

The overall objectives of the Convention are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising from the utilisation of genetic resources.

The Convention was developed in recognition of the environmental, social, cultural and economic value of biodiversity, both now and in the future, and its significant ongoing reduction around the world. Through the Convention, Australia and other signatory countries are involved in an international partnership to help halt the global loss of biodiversity.

The Convention provides a framework for global action to conserve and use biological diversity in a sustainable manner. It addresses the full range of biological diversity at genetic, species and ecosystem levels in all environments, both within and outside protected areas. The Convention contains guiding concepts such as the precautionary principle and each country being responsible for the conservation and sustainable use of its biological resources. Importantly, the Convention provides for the needs of developing countries to enable them to implement the Convention measures, including new and additional financial resources and appropriate access to relevant technologies.

The report provides the background needed to understand the Australian context for the conservation and sustainable use of biodiversity, and then presents an overview of the various strategies, plans and programmes which have been put in place in Australia to address each of the articles of the Convention. The report draws on the National Strategy for the Conservation of Australia's Biological Diversity as the main implementing mechanism for the Convention in Australia.

How was the report written?

The process used to develop the national report was based on the following principles.

- Opportunities should be made available to reflect different perspectives on the processes Australia has put in place to meet the objectives of the Convention.
- The report should be user-friendly and available and meaningful for public consumption.
- The report should be useful in both a domestic and international context.

In order to fulfil these principles, a consultation process was established to effectively involve all interested parties, including Australian States and Territories and non-government organisations, in the development of the report.

Reference groups

A number of reference groups were established to:

- provide advice on the adequacy of the consultation process;
- provide advice on the scope of the report as developed by the editorial committee;
- ensure the consultation process operated effectively during the preparation of the report; and
- ensure stakeholder views were properly considered by the editorial committee.

The reference groups included a broad range of interests, with representation from all levels of government, community, industry and indigenous groups.

Wider consultation

Each Australian State and Territory Government was given an opportunity to provide material for the report and comment on the draft report. Local Government, and industry, conservation, indigenous and other relevant groups were also invited to provide input to the report and comment on the draft report. Advice was sought from the Biological Diversity Advisory Council to ensure that all key stakeholders were identified and consulted.

The Australian Context

Geography

Australia is the only nation to occupy an entire continent. In land area (7 682 300 square kilometres) it is the world's sixth largest nation. Australia lies in the southern hemisphere between the Pacific and Indian Oceans and has seven external territories including the Australian Antarctic Territory. Its closest neighbours are New Zealand to the east, Papua New Guinea to the north and Indonesia to the north-west.

Australia has a tropical monsoon climate in the north, a temperate to Mediterranean climate in the south and a vast, arid interior. Important features of its climate are the highly irregular rainfall, the extreme rate of evaporation of available water, and the large temperature ranges. The continent has a generally flat land surface, with relatively low precipitation and run-off rates. Mountain ranges in the south-east are often snow-covered in winter, but Australia generally experiences mild winters and hot summers. Australia is the second driest continent, with its freshwater and ground water resources having a limited capacity. Drought is a recurring climatic feature over most of the continent.

Many Australian soils are derived from ancient material and the rate of soil formation is slow. As a result, soils tend to be shallow and infertile. Significant deposits of minerals are found across the continent. These include oil, coal and gas, iron ore, bauxite, copper, nickel, zinc, gold, mineral sands, manganese, diamonds and uranium.

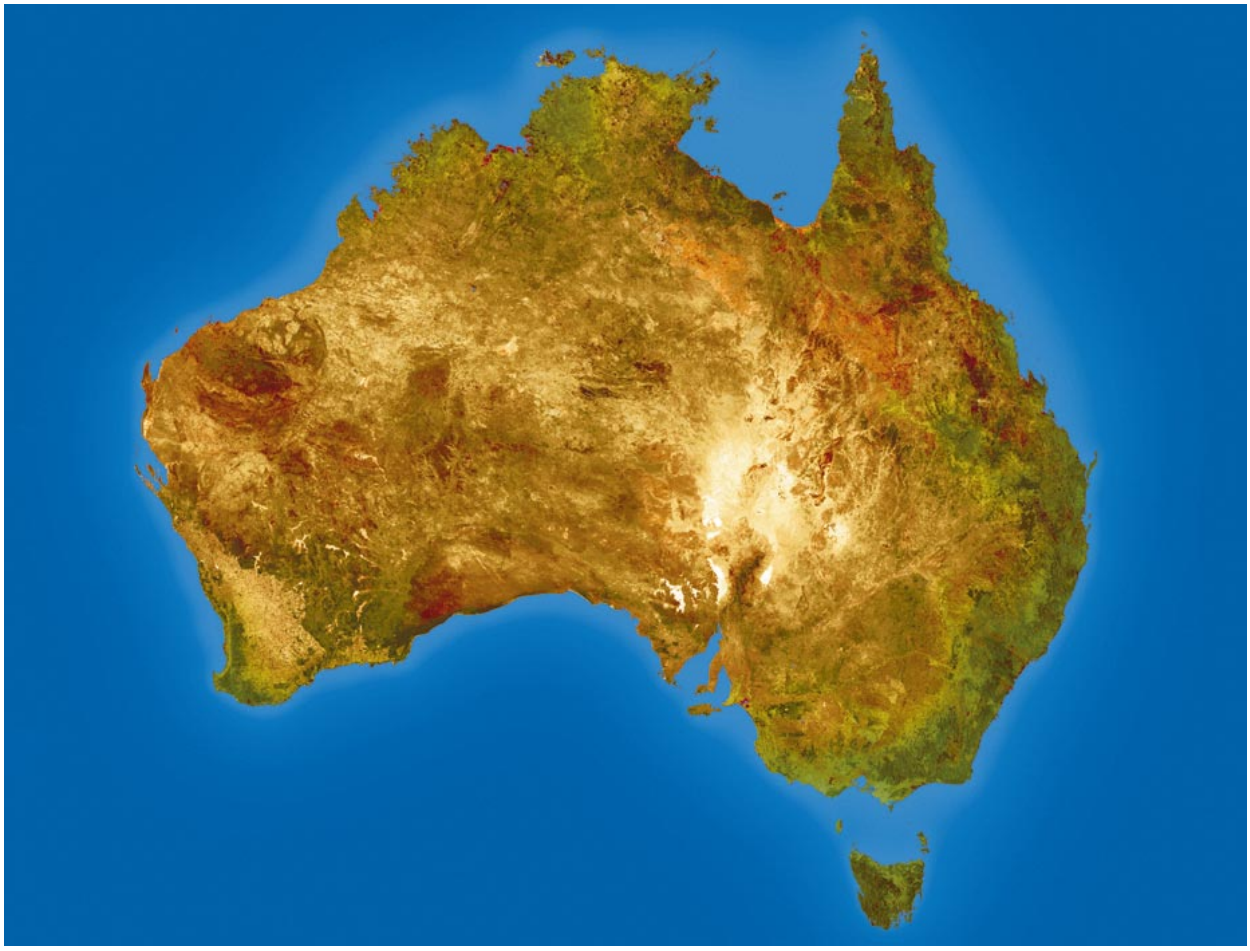
Australian waters span almost 60 degrees in latitude, from Torres Strait in the north to Antarctica in the south, and 100 degrees in longitude, from Norfolk Island in the east to Heard Island and the McDonald Islands in the west. They include a great range of geographic, geologic and oceanographic features, and around 12 000 islands. The waters surrounding Australia and its external territories are part of three large, interconnected oceans of the southern hemisphere: the Pacific, Indian and Southern Oceans.

The Australian mainland is surrounded by a continental shelf between 15 and 400 kilometres wide, and approximately 2.5 million square kilometres in area. The Australian Exclusive Economic Zone, at 16 million square kilometres, is more than twice the continental land area. The Exclusive Economic Zone and the extensions of the continental shelf that go beyond those limits contain major physical features that rival those of the continent itself. Fields of seamounts to the south of Tasmania contain peaks rising two to three times the height of Australia's highest terrestrial peaks. Steep slopes off the east coast drop even more significantly, some within a few kilometres of the continental shelf. The edge of the continental shelf is dissected by marine canyons, drowned river valleys and the scars of earlier periods of sea level change. Major coral reef complexes on the north-east and north-west form some of the most complex biological systems on earth. Many of the major shelf areas and abyssal plains and other deeps are unknown in any detail.

Source: Holger Rumpf

Christmas Island—one of Australia's external territories. Female red crabs prepare to enter the sea to spawn during their annual migration.

The Australian Continent—a view from space

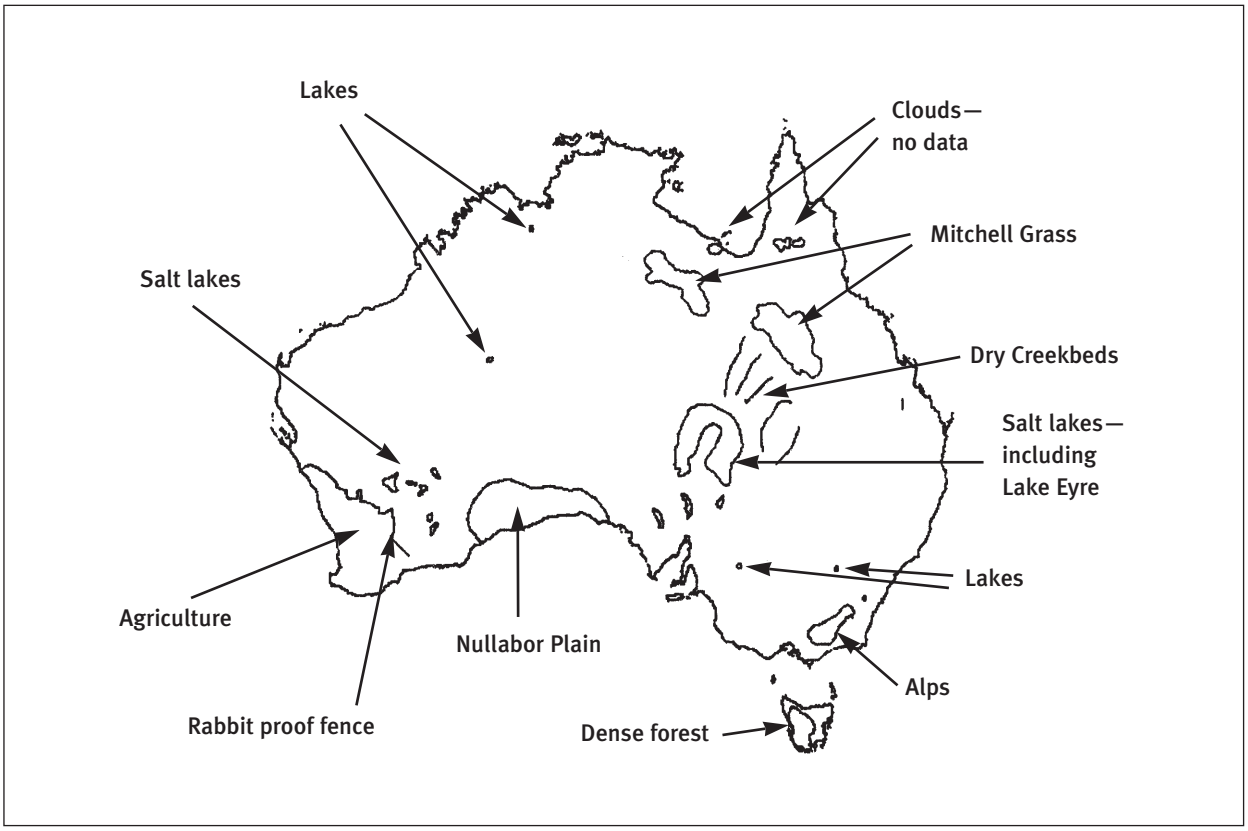


Satellite image guide

The colours in the image roughly equate to the amount of vegetative material in the landscape:

White	bare ground, such as sandy areas or dry salt lakes
Yellow/orange	nearly bare ground, often dried and grazed grassland on clay soil
Pale green	grasslands, pastures and crops
Dark green	forests, or denser bushland
Deep green	dense forest, rainforest

Satellite image guide



The Satellite

The image is from the NOAA 11 satellite—NOAA, the National Oceanographic and Atmospheric Administration, is part of the US Space Agency, NASA. The primary purpose of the NOAA satellites is to monitor weather, and to map sea-surface temperature.

NOAA data can be used for a number of environmental purposes, including vegetation and bushfire mapping, and long term environmental monitoring. Commercial uses include crop monitoring and production forecasting.

At all times there are two NOAA satellites in orbit 850 km above the earth. NOAA 11 (now replaced by NOAA 14) passed over Australia in the afternoon, capturing a 2,000km wide swathe of data in one sweep—nearly the size of the entire Australian continent. NOAA imagery has a resolution of approximately 1 km.

The data used here were captured by the AVHRR (Advanced Very High Resolution Radiometer) scanner on the NOAA satellite. The AVHRR scanner records five different frequencies in the visible and infrared regions of the electromagnetic spectrum. Only 2 of these bands, the Red, and the Near Infra-red, were used to create this image, producing colours as close to natural as possible.

The Image

The image is a composite of satellite information from January 1994. The composite approach is necessary to eliminate clouds, which cannnot be penetrated by the satellite's sensors. The outcome is a mosaic of images, showing how a cloud-free Australia might appear to an observer from space.

The season of the image is significant—in summer, most of the green areas represent perennial vegetation. It is a different story in winter, where crop areas also show up as green. This seasonal pattern can be used to differentiate perennial vegetation, mostly forest, from cropping areas.

With this knowledge of seasonal change, NOAA imagery can be used for mapping and monitoring vegetation.

Biodiversity

Biodiversity refers to the number and variety of all life forms: the different plants, animals and micro-organisms, the genes they contain and the ecosystems they form. We depend on biodiversity for our survival and quality of life. It is not a fixed entity, but a constantly changing pool that is augmented by new genetic variation and diminished by extinctions. Much of Australia's biodiversity is yet to be described and there is a dearth of knowledge about almost every major ecosystem type in Australia.

The prolonged isolation of Australia from other continents since its final severance from Antarctica 35 million years ago has encouraged the evolution of a unique biota. Australia is classified as one of about a dozen mega-diverse countries in the world. It has the planet's second highest number of reptile species (686), is fifth in flowering plant species (23 000) and tenth in amphibian species (over 180). The Australian continent and its islands have an estimated 146 (52%) of the world's 280 marsupials.

More significant, however, is the high percentage of organisms that occur only in Australia, with this endemism extending up to the higher taxonomic categories of genus and family. Seven families of mammals, including those of the platypus and the koala, and 12 of flowering plants are endemic, giving Australia far more endemic families than any other country. At the species level, the mean percentage of endemism for terrestrial vertebrates and flowering plants is 81%. Approximately 88% of Australia's reptiles, 70% of birds, 94% of frogs, and 99% of non-marine molluscs occur nowhere else in the world.

Source: ©Babs and Bert Wells/CALM

Numbat: half of the world's marsupials are found in Australia

Another unusual feature of Australian flora is that two of its dominant genera, *Eucalyptus* and *Acacia*, with a total of over 1800 species, occur throughout the continent. Those two genera between them dominate the top stratum of the vegetation over three-quarters of Australia, from the alps to coastal heaths and from deserts to wet forests, and include a remarkable diversity. Another interesting feature of Australian flora is that many Australian terrestrial plant species show adaptations that allow them to survive fire, and some vegetation patterns reflect the influence of frequent burning. These characteristics result from a high incidence of wildfire in the Australian environment and the use of fire by indigenous peoples over thousands of years in order to manipulate food resources.

Australia's marine biological diversity, like that of the land, is notable for its high proportion of endemic species. In the south of the continent, which has been geographically and climatically isolated for around 40 million years, about 80% to 90% of the species in most marine groups are considered to be endemic. Many species in Antarctica are endemic. In northern Australia only about 10% of the species in most groups are endemic. However, the species of Australia's tropical north are mostly shared only with the Indonesian archipelago, the epicentre of global marine biological diversity, but a region where many marine ecosystems are under threat.

Australia's biodiversity contributes substantially to the national economy through such industries as forestry, pastoralism and fisheries. Biodiversity is also an important resource to the tourism industry, with international visitor surveys showing that the majority of major tourist attractions in Australia are environmentally important areas. Further, whilst the potential of Australia's biodiversity as a source of food and useful pharmaceutical, medicinal and industrial products has scarcely been realised, attention is now being given to development of novel Australian bio-resources and bio-techniques.

The maintenance of biodiversity is also important for Australia's indigenous peoples. Protection of traditional food and plants is vital for the protection of cultural identity and the future education of young people and land users.

Cultural values of Aboriginal and Torres Strait Islander peoples

As a consequence of their long history in Australia, Aboriginal and Torres Strait Islander peoples have developed a unique knowledge of biological diversity and have a continuing economic and cultural interest in the protection of indigenous species and environments.

Traditional Aboriginal and Torres Strait Islander laws and religions reinforce the intimate connections between people, land and waters, and the species which share these resources, through ritual, and custodial and management responsibilities for country. This ensures that traditional knowledge is being passed down through generations.

These traditional approaches and outlooks persist in many parts of Australia; in other areas, despite the historical undermining of indigenous structures, contemporary Aboriginal and Torres Strait Islander cultures maintain a lively interest in, practical knowledge of, and concern for the well-being of the land and natural systems.

Although Aboriginal and Torres Strait Islander peoples may be willing to share some of their cultural knowledge, aspects of that knowledge may be held to be sacred and may not be available in the public domain.

Traditional Aboriginal and Torres Strait Islander management practices have proved important for the maintenance of biological diversity, and their integration into current management programmes should be pursued where appropriate.

The maintenance of biological diversity on lands and waters over which Aboriginal and Torres Strait Islander peoples have title, or in which they have an interest, is a cornerstone of the well-being, identity, cultural heritage and economy of Aboriginal and Torres Strait Islander communities.

Society

Evidence of human settlement in Australia is dated at more than 60 000 years. The ancestors of Australia's indigenous peoples are believed to have entered the continent from the north as a hunter-gatherer people skilled in the use of wooden and stone tools and fire. European settlement dates from 1788, 18 years after the continent was claimed for Britain.

Australia's population in June 1996 was approximately 18 million. Aboriginal and Torres Strait Islander peoples account for approximately 2% of the total population. Australia's population has more than doubled in the last 45 years, with immigration accounting for about half of the increase. Today, over 22% of Australia's population was born in another country, contributing to its multicultural character.

The Australian population is projected to increase to 26 million in 2031, assuming a continuation of current birth, death and migration rates. Population growth rates have been declining over the past few years, from 2.07% in 1970 to 1.02% in 1993.

Although Australia is several times larger than Western Europe in area, its population is just 5% of that of Europe. While Australia's overall population density is only two people per square kilometre, the population is highly urbanised. More than six million people, about 35% of the population, live in the two major cities of Sydney and Melbourne. Nearly 75% of Australians live in or within 50 kilometres of Australia's coastal cities. This is chiefly because 66% of the continent is classified as arid or semi-arid.

Economy

The Australian economy has performed well through the last century, reflecting a country that has grown from a small, resource-based economy to one with a diverse manufacturing and services sector with a significant export orientation. However, Australia's exports are still predominantly based on natural resources. The Australian economy has undergone considerable diversification and expansion over the last 30 years, with much of the expansion being related to the tertiary sector. There has been significant investment in export-oriented mining and energy products.

In the early 1990s, the Australian economy was affected by recessionary influences similar to those affecting most of the world's economies. Since then the economy has improved, with moderate to strong growth accompanied by a relatively low inflation rate.

Government

Australia's political system is a stable, democratic, constitutional monarchy. By world standards, Australia enjoys a high standard of living, a robust economy, a peaceful and well-educated society, an open and democratic political framework and a high level of personal freedom. Australians value these characteristics, just as they value their unique natural heritage.

Australia is a federation of six self-governing States – New South Wales, Victoria, Queensland, South Australia, Western Australia and Tasmania – and two self-governing mainland Territories – the Australian Capital Territory and the Northern Territory. The Commonwealth (Federal) Government's powers and responsibilities are defined in the Australian Constitution. The State and Territory Governments are responsible for all other matters which come under their respective jurisdictions.

The State and Territory Governments have established systems of Local Government. Australia has about 750 Local Government councils, accountable to diverse metropolitan, regional, rural and indigenous communities. Local Government is responsible for the provision of local services such as environmental health regulation, local road building and maintenance, traffic management, municipal waste management, land use planning and development control, pollution control and monitoring, local parks and open space, recreation facilities and community services.

The Commonwealth's powers encompass, among other things, interstate trade and commerce, taxation, postal and telecommunications services, defence, external affairs, banking, immigration and social welfare.

Environmental and natural resource management and Australian Governments

While environmental powers are not specifically referred to in the Australian Constitution, each level of government, Commonwealth, State and Local, has some responsibility for environmental and natural resource management. Most legislative responsibilities rest with the State and Territory Governments. For example, State and Territory Governments have primary responsibility for land management and pollution control legislation. The Commonwealth does have some powers to enact laws affecting the environment and sustainable development through its responsibility under the Constitution for areas such as international trade, external affairs and commerce. In recent times, Australian Governments have generally pursued environmental objectives through a variety of means, including leadership, cooperation and funding, rather than through legislative controls alone.

While the Australian Constitution does not specify a role for Local Government, it plays a major part in the on-ground implementation of programmes directed at improving environmental and natural resource management which contribute to achieving biodiversity objectives. As the form of government closest to the landholders and the community in general, Local Government can often facilitate and organise community action to tackle local problems. Community projects funded by the Commonwealth Government and State Governments are often implemented, and at times partially funded, by Local Government. Local Government also funds a range of biodiversity conservation projects in its own right. In addition, as the majority of land use decisions are made by Local Government, its actions can greatly affect the environment.

In 1992 all spheres of Australian Government became party to the Intergovernmental Agreement on the Environment, which defined a framework of environmental responsibilities and interests for each level of government. It also established agreed processes and principles to be put in place to accommodate those interests. Importantly, the agreement recognised that all levels of government share the responsibility for protecting Australia's environment.

In 1996 the Commonwealth Government agreed to coordinate a Review of Commonwealth–State Roles and Responsibilities for the Environment. A primary objective of the review was to make the Intergovernmental Agreement on the Environment operate more effectively. This was to be done by providing greater certainty in decision-making, minimising duplication of effort between governments, and developing more effective intergovernmental relations to deliver the required environmental outcomes. It is expected that Heads of Government will agree shortly to the outcomes of the review, a number of which are relevant to the conservation of biological diversity.

A related initiative is a Review of Commonwealth Environmental Legislation. In undertaking this review, the Commonwealth Government will be considering the development of a Biodiversity Conservation Act which would contribute to the effective implementation of the Convention on Biological Diversity.

There are also several forums through which the Commonwealth Government and State and Territory Governments can develop a coordinated approach to national environmental issues. They are as follows.

- The Council of Australian Governments is the peak intergovernmental body represented by Heads of Governments from the Commonwealth, State, Territory and Local Governments. Whilst this is a general forum for developing agreements between governments, the agreements reached set the context for environmental policy direction.
- The Australian and New Zealand Environment and Conservation Council comprises the Commonwealth, State, Territory and New Zealand Ministers responsible for the environment and conservation. It provides a forum for member governments to exchange information and experience and develop coordinated policies in relation to national and international environmental and conservation issues.
- The Agricultural and Resource Management Council of Australia and New Zealand comprises the Commonwealth, State, Territory and New Zealand Ministers responsible for agriculture, soil, water (both rural and urban) and rural adjustment policy. Ministers have agreed that the objective of this council is to:

  develop integrated and sustainable agricultural and land and water management policies, strategies and practices for the benefit of the community.

- The Ministerial Council for Forestry, Fisheries and Aquaculture comprises the Commonwealth, State, Territory and New Zealand Ministers responsible for forestry, fisheries and aquaculture. The council is a consultative forum which seeks to ensure that government actions promote effective management and the exchange of information on all aspects of forestry, fisheries and aquaculture.
- The Australian and New Zealand Mining and Energy Council comprises Commonwealth, State, Territory and New Zealand Ministers responsible for minerals and energy. Its mission is to promote the general welfare and progressive development of the Australian mining and minerals industry, and to consult on the nation's energy needs, resources and policies.
- The Intergovernmental Committee on Ecologically Sustainable Development comprises senior representatives of the Prime Minister and of State and Territory leaders. It oversees implementation of the National Strategy for Ecologically Sustainable Development and other matters requiring a broad range of government expertise, covering environmental, economic and social considerations.

Role of the community

Individuals and community groups have an increasingly important role in conserving biological diversity through such activities as tree planting, weed eradication, surveying and monitoring. Some 4200 Landcare and similar community-based groups now exist in Australia. They are proving extremely effective in disseminating information and in encouraging the adoption of ecologically sustainable natural resource management in the rural sector. National-level community groups such as the Australian Conservation Foundation, World Wide Fund for Nature, National Parks Associations, Society for Growing Australian Plants, and Greening Australia also contribute to the debate on such issues as institutional change.

Universities, scientific and other research organisations are playing an essential role in enhancing knowledge and understanding of biological diversity, and thus the ability to conserve it more effectively.

The private sector, too, is contributing to the conservation of biological diversity, not only through land ownership and natural resource management, but also through research, databases, technical expertise, donations, promotion and public awareness. Increasing numbers of resource managers in agriculture, forestry, mining, fishing and tourism industries are seeking and adopting new management methods that integrate ecological and economic considerations. These improved approaches and techniques are contributing to viable long-term economic returns for producers while at the same time allowing for the conservation of biological diversity.

State of Australia's Biodiversity

At a global level, current rates of decline and loss of biological diversity are the highest for at least 60 million years. The declines and losses are continuing. Estimates of probable global losses of species have been as high as 25% for the next 30 years.

Australia has suffered severe declines and extinctions, especially in the past 200 years. There have been fluctuations in rates of decline during this period, but the rates have been greatest in the past 50 years. Despite increased concern and efforts to maintain biological diversity in the last two decades, declines continue and the threat of further extinctions persists.

The report, *Australia: State of the Environment 1996*, presented to the Commonwealth Government in 1996 suggests that:

> *The loss of biological diversity is perhaps our most serious environmental problem. Whether we look at wetlands or saltmarshes, mangroves or bushland, inland creeks or estuaries, the same story emerges. In many cases, the destruction of habitat, the major cause of biodiversity loss, is continuing at an alarming rate.*

Clearing for agriculture, drainage of wetlands and the spread of urbanisation are major factors in the change of vegetation patterns and the loss of habitat for native species of wildlife. Changed fire regimes, salination resulting from agriculture, altered plant species compositions as a result of grazing by introduced herbivores, and contamination of waterways by fertilisers and pesticides have also contributed to change in biotic and abiotic composition of habitats, diminishing their ability to sustain the full range of indigenous species. Altered water regimes of aquatic systems are considered a major factor in habitat change.

The introduction of alien species may appear to increase species diversity, but in general these species have serious negative effects on native species, including loss of genetic variation, reduction in distribution and abundance, and extinction. Many introduced species, which are without predators or disease to control them, have increased rapidly in number and range and have had a devastating impact on other species or native vegetation. Introduced species now constitute up to 15% of Australian flora; the proportion is as high as 31% in Tasmania.

Although it is generally expected that the greenhouse effect will have an impact on Australia's climate, the precise level and extent of impact is difficult to estimate. Accordingly, the impact of the greenhouse effect on native flora and fauna is difficult to predict. Whilst in its own right global warming may not have a significant effect on the decline of biodiversity, as part of a broader chain of effects its contribution could be significant.

Extinction and decline in the distribution and abundance of species result in a loss of genetic diversity. Without genetic variability, a species is less able to evolve or adapt to changing environments and is probably more vulnerable to new conditions such as climate change or new diseases. Although they may not be classified as threatened nationally, many species are no longer found throughout their former range and may now occur only in reduced numbers. Large marine species such as sharks,

Source: A. Storrie

Alligator Weed invading creek in NSW

elephant seals, southern blue-fin tuna and whales have dramatically declined in number and distribution in historical or recent times, as have some ground-dwelling and ground-foraging birds, a number of frog populations, native fish populations, and many invertebrate species.

While pressures on biodiversity continue to be a major concern, there have been increasing efforts by governments to address the problem. Concern about clearing of forests led to colonial governments reserving areas for managed timber production during the 1870s. *The Forest and Trees Act No. 26 1873* in South Australia provided financial incentives for landowners to plant trees. Australia's first national park (now Royal National Park) was set aside in New South Wales in 1879. More recently, in 1985, South Australia became the first State in Australia to introduce legislation controlling clearing of vegetation on private land. The Woylie is no longer listed as a threatened or vulnerable species under the Commonwealth Endangered Species Act because of actions taken to improve its conservation. Recovery plans are being implemented for a number of other species.

Consequently, when Australia signed the Convention on Biological Diversity in 1992, it had many of the programmes in place needed to implement its measures. Despite this, it was recognised that the continuing decline in the state of Australia's biodiversity required more comprehensive action.

The National Strategy for the Conservation of Australia's Biological Diversity

Development of the Strategy

In 1991 Commonwealth, State and Territory Governments recognised the need to take urgent national action on biodiversity conservation and sustainable use and commenced the preparation of the National Strategy for the Conservation of Australia's Biological Diversity. With Australia's ratification of the Convention on Biological Diversity in June 1993, the Strategy became the principal means for coordinated implementation of the Convention.

Goal and objectives

The goal of the Strategy is to protect biological diversity and maintain ecological processes and systems.

The Strategy recognises that:

- the conservation of biological diversity provides significant cultural, economic, educational, environmental, scientific and social benefits for all Australians;
- there is a need for more knowledge and better understanding of Australia's biological diversity;
- there is a pressing need to strengthen current activities and improve policies, practices and attitudes to achieve conservation and sustainable use of biological diversity;
- we share the earth with many other life forms that have intrinsic value and warrant our respect, whether or not they are of benefit to us.

The aim of the Strategy is to bridge the gap between current activities and those measures necessary to ensure the effective identification, conservation and ecologically sustainable use of Australia's biodiversity. The Strategy acknowledges that much is being done which contributes to the conservation of biodiversity, and that all Australians – government, business, industry and the community – are important for its effective implementation.

The Strategy acknowledges the following core objectives of the National Strategy for Ecologically Sustainable Development:

- to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- to provide for equity within and between generations; and
- to protect biological diversity and maintain essential ecological processes and life-support systems.

The primary reason for developing the Strategy is to provide information and policy guidance for decision-makers. The Strategy sets a framework that outlines actions for all relevant government agencies to take in the areas of:

- environment and conservation;
- resource and industrial development;
- research; and
- education.

It also recognises the role of industry, business, and non-government organisations in biodiversity conservation. Specific issues and actions for various sectors of the community are also identified. A summary of the National Strategy for the Conservation of Australia's Biological Diversity is at Appendix 1.

The next part of this national report provides a more detailed examination of the way in which the Strategy addresses each of the articles in the Convention, as well as outlining the role of other major strategies, plans and programmes.

Developing Australia's Strategy

- The Minister responsible for the environment convened an 11-member Biological Diversity Advisory Committee in 1991, initially representing wide-ranging scientific disciplines, non-government conservation organisations, two State Governments, and the National Farmers' Federation. Later, four members were added from the forestry, fishing, tourism and mining industries. The committee met 11 times between April 1991 and August 1992. After analysing the status of threats to Australia's biodiversity, the adequacy of existing mechanisms, and the relevant international developments, it prepared the first draft of the Strategy.
- The draft strategy was available for public comment from March to May 1992.
- A national conference was sponsored by the Commonwealth Department of the Environment, Sport and Territories and the Ecological Society of Australia to encourage debate on the Strategy. At 10 conference workshops, chapters of the draft Strategy and key issues relevant to the Strategy were discussed.
- The Biological Diversity Advisory Committee then presented a draft Strategy to the Minister for the Environment in September 1992. The Minister referred the draft Strategy to the Australian and New Zealand Environment and Conservation Council (ANZECC), comprising environment Ministers from the Commonwealth, State and Territory Governments.
- An ANZECC Task Force on Biological Diversity (which also included representatives of the Agriculture and Resources Management Council of Australia and New Zealand, the Australian Forestry Council, the Australian and New Zealand Fisheries and Aquaculture Council, the Australian and New Zealand Minerals and Energy Council, and the Industry, Technology and Regional Development Council) considered the further development and finalisation of the Strategy.
- In October 1993 the ANZECC task force submitted a final draft of the Strategy to ANZECC. Following ANZECC's approval of the Strategy, it was endorsed by the Council of Australian Governments and published in 1996.

  Many of the interest groups and institutions invited to help prepare the Strategy participated fully in the Biological Diversity Advisory Committee and the ANZECC task force. An even broader range of participants took part in bilateral and multilateral meetings and public consultation, including all relevant ministries and other members of parliament; government departments and agencies at all levels; scientific, research, and academic institutions; business and industry; non-government organisations; professional societies; educational institutions; advisory councils; and interested individuals.

Strategies and Actions Adopted in Response to the Convention on Biological Diversity

Article 6

General measures for conservation and sustainable use

A fundamental aspect of the Convention on Biological Diversity, as expressed in Article 6, is the requirement for implementation through national strategies, plans and programmes, and the integration of conservation and sustainable use of biological diversity into plans, programmes and policies for sectors such as agriculture, fisheries, mining and forestry and for cross-sectoral matters such as land use planning and decision-making.

The National Strategy for the Conservation of Australia's Biological Diversity provides the framework by which Australia will implement the measures in the Convention. These overall goals and objectives will be achieved through a range of largely sectoral-based policies, plans, programmes and strategies which will be discussed later in this report under the relevant articles of the Convention. This section concentrates on the requirement in Article 6(b) of the Convention to:

> *Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programs and policies.*

and the means by which this is done in Australia.

National cross-sectoral plans, programmes and policies

Cross-sectoral strategies, plans and programmes in Australia which contribute to implementing the measures in the Convention include the following.

National Strategy for the Conservation of Australia's Biological Diversity

The Strategy recognises the need to integrate the conservation and ecologically sustainable use of biological diversity into relevant sectoral and cross-sectoral activities. Australian Governments have agreed that these policies will require:

- implementation on a bioregional basis;
- improved coordination and integration mechanisms between all levels of government, industry and community groups;
- better planning to overcome incremental decision-making;
- effective monitoring and development of performance indicators;
- rapid dissemination and application of new information;
- implementation measures, including regulatory arrangements, legislation, standards and economic instruments;
- proper evaluation of the full environmental, social and economic benefits and costs of the protection of biological diversity;
- greater public accountability.

National Strategy for Ecologically Sustainable Development

The National Strategy for Ecologically Sustainable Development was developed in 1992 after discussion between industry groups, unions, environmental and community groups and all levels of government. Australia's three tiers of government, Commonwealth (Federal), State and Local, adopted the strategy in December 1992 at a meeting of the Council of Australian Governments.

The goal of the strategy is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. Its core objectives are:

- to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- to provide for equity within and between generations; and
- to protect biological diversity and maintain essential ecological processes and life-support systems.

The National Strategy for the Conservation of Australia's Biological Diversity is consistent with this strategy and is an important mechanism for achieving the above objectives.

National Forest Policy Statement

The National Forest Policy Statement, signed by the Commonwealth and all States and Territories, sets out a vision for Australia's forests and forest industries into the next century. It also provides an agreed policy framework for achieving that vision, based on the principles of ecologically sustainable development, and details broad conservation and industry goals for the management of Australia's forest estate. The National Forest Policy Statement is the primary means by which the objectives of the National Strategy for the Conservation of Australia's Biological Diversity will be met in forest habitats.

Oceans Policy

Australia is currently developing a comprehensive and integrated national policy for marine areas under its jurisdiction. The Australian Oceans Policy is being developed by the Commonwealth in partnership with State and Territory Governments, and in consultation with Local Government, environmental, industry and more broadly based groups within the Australian community. The Australian Oceans Policy will provide the strategic framework for planning, management and ecologically sustainable ocean use, including fisheries, shipping, oil and gas, and other seabed resources, while conserving the biological base and maintaining the underlying ocean ecosystem processes.

The consultation phase is focusing on an initial consultation paper and a series of commissioned papers on issues such as indigenous interests, the conservation of marine biological diversity, integrated planning and management, best practice and incentive mechanisms.

A draft policy is due for release in early 1998 as part of the process of wide consultation, with the final Australian Oceans Policy to be launched in July 1998.

Source: T.Fontes

Sea Grass beds at the Great Barrier Reef

Natural Heritage Trust

The Natural Heritage Trust is a major government initiative introduced in 1997 and will be the most important mechanism by which the Commonwealth will contribute to implementing the National Strategy for the Conservation of Australia's Biological Diversity. The trust aims to accelerate activities in the national interest directed towards achieving the conservation, sustainable use and repair of Australia's natural environment.
The objectives of the trust are to:

- provide a framework for strategic capital investment which will be used to stimulate additional investment in the natural environment;
- achieve complementary environmental protection, including biodiversity conservation, sustainable agriculture and natural resource management outcomes consistent with agreed national strategies; and
- provide a framework for cooperative partnerships between communities, industry and all levels of government.

Source: Environment Australia

By taking part in revegetation, children develop skills and learn the importance of landcare

The trust funds environmental programmes across five key areas, as outlined in the box on the next page.

Natural Heritage Trust programmes

1. Vegetation

Bushcare (the National Vegetation Initiative) seeks to reverse the long-term decline in the quality and extent of Australia's native vegetation communities. Bushcare will work cooperatively with all levels of government, industry and the community to:

- conserve remnant native vegetation;
- conserve Australia's biological diversity; and
- restore, by means of revegetation, the environmental values and productive capacity of Australia's degraded land and water.

Funding is also being provided for the Farm Forestry Program, a related initiative under the trust which aims to encourage commercial tree growing on cleared agricultural lands for wood and non-wood production, as well as improving the sustainability of conventional farming systems. Improvements in the quality of vegetation management will also be achieved under other programmes funded by the trust, such as the National Landcare Program, the National Rivercare Program and the Murray–Darling Basin 2001 programme.

2. Rivers

Many waterways in Australia are currently under stress. In the Murray–Darling Basin, for example, if all existing water allocations were implemented, 90% of the average natural flow would be diverted. That system now experiences drought level flows three years out of every four, compared to one in 20 years under natural circumstances.

The National Rivercare Initiative will assist the sustainable management, rehabilitation and conservation of waterways outside the Murray–Darling Basin. This will be complemented by the Murray–Darling 2001 programme, which aims to improve the health of key river systems in the basin, encourage ecologically and economically sustainable land use, restore riverine environments and improve water quality. In addition, the National Wetlands Program will promote the conservation and wise use of wetlands across Australia.

These initiatives will result in improved water quality, increased environmental flows, retention of essential habitat and improved waste management practices to enable re-use of wastewater, stormwater and sewage.

3. Biodiversity

The National Reserve System initiative will develop, in conjunction with the States and Territories, a comprehensive, adequate and representative National Reserve System.

The National Reserve System will incorporate prime examples of Australia's biodiversity and significant natural values. It will ensure that a representative wide range of ecosystems are protected. This will include, for example, wilderness, wild rivers, wetlands, salt marshes and grasslands. The reserve system will also reflect the need to protect and promote the recovery of species and ecological communities that are endangered or vulnerable.

The National Reserve System will complement off-reserve conservation activities, such as Bushcare, the National Feral Animals Control Strategy and the National Weeds Strategy. It will also be supported by additional funding for the Endangered Species Program directed towards ensuring the recovery of endangered species and ecological communities, and additional funding for the improved management of Australia's World Heritage properties.

4. Land

The National Landcare Program encourages integrated natural resource management at the farm, catchment and regional level and underpins a suite of Natural Heritage Trust programmes. It embodies the principle of collective action by the community, in partnership with government, to manage the environment and natural resources sustainably, while recognising that individual resource managers and owners should take responsibility for the resources they own or control.

The programme's contributions to achieving the trust's objectives are:

- integrated catchment management, particularly land, water and related vegetation management; and
- sustainable agricultural productivity.

The National Landcare Program strategies/priority actions focus on capacity building and on-ground action that contribute directly to a number of integration and institutional, environmental, sustainable production and people outcomes and enhanced community capacity for change.

The trust will significantly increase funding for the National Landcare Program. The additional funding will provide support for implementation of plans based on a catchment and regional approach. Substantially increased support will also be provided for the development of projects initiated and managed by the community on public and private land.

In addition, funding for Advanced Property Management Planning will be provided under the Commonwealth Government's integrated rural policy, Agriculture – Advancing Australia, in recognition that farmers need to integrate the management of their natural resources with farm business planning.

These measures will be reinforced by the provision of income tax rebates and credits for qualifying Landcare works on private land.

Recognising the importance of dealing with weeds and feral pests as part of the overall natural resource management task, additional funding will also be provided for a National Feral Animal Control Program and for the implementation of the National Weeds Strategy.

To ensure that Australia's limited resources are used wisely and are focused on strategic priorities, the Natural Heritage Trust will fund a National Land and Water Resources Audit. This audit will provide the first comprehensive appraisal of the extent of land and water degradation in Australia and its environmental, social and economic costs to the nation. It will incorporate an assessment of water resources to determine the extent of the resource, as a step towards achieving a balance in water supply and use. Critically, it will provide essential information on the state of Australia's natural resources to underpin better decision-making for natural resource management in the future.

5. Coasts and marine

Australia's coastal zone supports about 86% of its population and much of the commercial and industrial activity. In addition, Australia's Exclusive Economic Zone represents some 16 million square kilometres of marine waters and their resources.

The goal of the Coasts and Clean Seas Program is to stimulate activities in the national interest to achieve the conservation, sustainable use and repair of Australia's coastal and marine environments.

Coasts and Clean Seas is a suite of programmes, including the Fisheries Action Program, designed to help tackle coastal and marine pollution problems, address threats to marine biodiversity and habitat degradation, and promote sustainable use of Australia's coastal and marine areas, including estuarine areas.

Coasts and Clean Seas promotes the reduction of pollution of the marine environment by wastewater and stormwater, management of introduced marine pests, protection of marine species, enhancement of the management and technical skills of coastal managers and an increase in the accessibility of coastal information. A comprehensive Oceans Policy and a national representative system of marine protected areas are also being established.

Under the Australian Constitution, States and Territories have the primary responsibility for land management. All States and Territories are signatories to the National Strategy for the Conservation of Australia's Biological Diversity and most have entered into partnerships with the Commonwealth to help deliver the Natural Heritage Trust. States and Territories have also developed strategies, programmes and policies at the State or Territory level which will contribute significantly towards implementing the Convention on Biological Diversity in Australia and the Strategy.

The Strategy commits State and Territory Governments to developing complementary biological diversity strategies where these do not already exist. Most States and Territories have developed, or are currently developing, such strategies.

Victorian Biodiversity Strategy

The State Government of Victoria released its Biodiversity Strategy in December 1997. The strategy comprises three documents, each of which performs a specific function in the overall promotion and achievement of better biodiversity outcomes in the State.

Victoria's Biodiversity: Our Living Wealth describes, with texts and pictures, the State's broad ecosystems and the plants and animals they support. *Victoria's Biodiversity: Sustaining Our Living Wealth* demonstrates how all Victorians – government, industry, landholders, interest groups and individuals – can integrate biodiversity conservation into actions throughout the community.

Victoria's Biodiversity: Directions in Management documents the methods which will be used to achieve the aspirations for conserving biodiversity into the future. This presents a systematic and robust approach to defining biodiversity assets and for reporting on performance management across the State. It presents a practical application of the biogeographical region approach which has been foreshadowed both internationally and nationally as an appropriate framework for planning and management of biodiversity. Descriptions of the landscape, its values, management, condition and management responses are detailed for each of the Victorian bioregions.

State and Territory programmes which contribute to national objectives for biodiversity conservation and sustainable use are described in the rest of this report. All States and Territories have developed mechanisms which seek to integrate the conservation and sustainable use of biological diversity into sectoral and cross-sectoral plans, programmes and policies. These mechanisms commonly use a catchment management framework to integrate biodiversity conservation and sustainable use into catchment planning (see following box).

Total catchment management framework in New South Wales

Total catchment management (TCM) in New South Wales seeks to conserve land and waterways and to achieve the sustainable management of natural resources. It is recognised in the Natural Heritage Trust Partnership Agreement as being the underlying institutional arrangement for the National Landcare Program. In most cases, TCM uses the natural boundaries of catchments as the logical framework for identifying the issues and solutions for the whole range of natural resource issues. TCM provides an overall vision for natural resource management in New South Wales and recognises that the management of the natural environment is complex, broad scale and interdependent.

Because TCM encompasses a wide range of issues, it integrates the activities of government agencies and local councils, communities, industries and individuals. TCM therefore seeks to coordinate resources, knowledge and effort towards healthy, productive and biologically diverse waterways and catchments. TCM recognises that each local area has its own sets of conditions and issues.

TCM is an umbrella policy under which a number of other natural resource management initiatives fit. Mechanisms for native vegetation management that will be effectively integrated into catchment planning have been developed. The State Rivers and Estuaries Policy and the Coastal Policy are also key components of the overall TCM framework.

Sectoral plans, programmes and policies

The National Strategy for the Conservation of Australia's Biological Diversity contains a range of specific actions which seek to integrate the conservation and sustainable use of biodiversity into major industry sectors. These sectors include the following.

Agriculture and pastoralism

The Strategy seeks to achieve the conservation of biological diversity through the adoption of ecologically sustainable agricultural and pastoral management practices.

Through the Strategy, governments have agreed to act to improve the knowledge base through additional coordinated research; strengthen services connected with management of agricultural and pastoral systems; and encourage landholders, other land managers, governments and industry organisations to protect biological diversity through improved management.

Viable and profitable agricultural and pastoral businesses depend upon sustainable management of the natural resource base, including biodiversity, both on and off-farm. The Commonwealth's Property Management Planning Campaign and FarmBis programmes are directed towards improving the business management practices of primary producers through culture change, the acquisition of business management skills and access to relevant farm business advice. Business management practices encompass all aspects of the farm business, including sustainable management of the natural resource base and sustainable production systems.

Australian agriculture is largely based on farming systems, including the main commercial crops and domestic animals, which evolved in the more fertile soils and reliable climates of Europe. Land management practices such as land clearing, cultivation, flood irrigation, and the introduction of cloven-hoofed animals and species such as the fox, the rabbit and the cat have placed Australian ecosystems under considerable stress. There is increasing recognition, research, development and adoption of agricultural production systems which better suit Australian agri-climatic conditions. Most effort directed and supported through the National Landcare Program is towards modifying conventional farming systems, for example, through the introduction of conservation tillage techniques, more efficient irrigation systems and better management of nutrients. There is an emerging interest in commercial trials of more uniquely Australian systems such as those based on indigenous pasture species, as well as other flora (for example, oils, seeds, herbs, cut flowers) and fauna (for example, emus, crocodile). Such endeavours, together with the Bushcare programme, which is encouraging the integration of native vegetation into conventional farming systems, have the potential value of a more ecologically informed approach to natural resource management at a landscape scale.

Fisheries

In endorsing the National Strategy for the Conservation of Australia's Biological Diversity, governments have agreed to increase data collection and coordinated research into the biological diversity and human use of the Australian Fishing Zone and estuarine and freshwater areas. Governments will also ensure that the implementation of fisheries ecosystem management is consistent with the conservation of biological diversity.

Source: Tasmanian Department of Primary Industry and Fisheries

Large catch of deep sea fish from water surrounding Tasmania

The Commonwealth is addressing the issue of conservation and sustainable use of Australia's fisheries resources through a range of policy and programme initiatives. These policies and programmes address issues such as bycatch, effects of fishing on the marine environment, environmental management frameworks and the development of industry codes of practice for the aquaculture industry. One program in particular, the Fisheries Action Program, is aiming to rebuild Australian fisheries so that they are more productive and able to operate at sustainable levels. The Fisheries Action Program will be run in close cooperation with State and Territory Governments and community groups and will mesh with existing State and Territory Fishcare activities.

The Fisheries Action Program will give priority to funding practical projects in freshwater, estuarine and marine environments that address the causes of the degradation of fisheries resources rather than the symptoms.

Commonwealth, State and Territory fisheries agencies are also developing a national translocation policy based on common principles and a series of policies covering specific categories of aquatic organisms. This will be complemented by a national environmental management framework and industry codes of practice for the aquaculture industry, being developed with the Australian Seafood Industry Council.

The fishing industry has also taken a number of initiatives to address issues such as bycatch and developing industry codes of practice. For example, the Queensland Commercial Fisherman's Organisation has developed a Dugong Conservation Strategy. This outlines procedures that fishers should take in order to minimise their impact on dugong populations. This is a voluntary exercise – there are currently no Commonwealth, State or Territory regulations in place relating to fishing activities in dugong-sensitive areas. Similarly, many industry participants have taken part voluntarily in trials of bycatch reduction devices and turtle exclusion devices. The Northern Prawn Fishery Management Advisory Committee is currently considering a bycatch action plan which it plans to implement.

The Fisheries Action Program

The Fisheries Action Program, with funding through the Natural Heritage Trust, will rebuild Australia's fisheries to more productive and sustainable levels. It will be closely integrated with other Commonwealth Government programmes such as Landcare and Coastcare. The program will sponsor initiatives aimed at:

- restoring and protecting fish habitats;
- encouraging community participation in activities to improve fisheries ecosystems;
- controlling aquatic pests;
- ensuring that fishing by commercial and recreational fishers is sustainable and responsible;
- raising community awareness;
- promoting related research which encourages integrated approaches to fisheries resources management and habitat conservation.

Key objectives of the Fisheries Action Program are to:

- develop an awareness amongst all resource users and the wider community of important fisheries issues, the sources of fisheries habitat problems and the actions required to remedy them;
- develop a sense of ownership and responsibility amongst all user groups for the sustainable use of the resource;
- encourage participation, particularly by the direct users of fisheries resources, in habitat rehabilitation, aquatic pest identification and other Fisheries Action Program activities;
- enhance sustainable resource use by fishers and 'upstream' groups by ensuring that impacts on fish resources and habitats are considered in their actions, processes and plans;
- integrate habitat considerations into fisheries management strategies;
- encourage development and use of sustainable fishing practices;
- integrate fisheries issues with regional planning.

Water

The National Strategy for the Conservation of Australia's Biological Diversity provides a framework for managing water resources in accordance with biological diversity conservation objectives and economic, social and community needs.

The Strategy commits governments to: improving knowledge about the biological diversity of aquatic and associated systems; protecting aquatic ecosystems by introducing effective legislative and policy frameworks; and ensuring that the activities of water management agencies are consistent with the conservation of biological diversity.

These actions also apply to the protection of aquatic biological diversity associated with mound and thermal springs, ground waters, artesian systems and caves.

All Australian Governments have in place, or are planning, measures to promote integrated catchment management approaches. Governments have undertaken activities to promote water trading and initiated action to progress interstate water trading. Issues relating to ground water management are also being examined through a national framework, as is management of stormwater and wastewater resources.

Council of Australian Governments Water Reforms

A national strategic framework for water reform, which was agreed by all governments through the Council of Australian Governments in February 1994, established a structured programme of reform measures to achieve more efficient and sustainable water resource use. The council agreed that action needs to be taken to arrest widespread natural resource degradation in jurisdictions, occasioned, in part, by water use.

The reforms, to be implemented over the period to 2001, cover both rural and urban areas and include measures in relation to water pricing, water entitlements and trading, environmental requirements, institutional reform, public consultation and education, and research. An important milestone of the reforms of the Council of Australian Governments is the allocation of appropriate environmental flows to stressed rivers by 1998.

The provision of environmental flows to reduce the impact of water extraction on rivers and wetlands is a fundamental component of the Council of Australian Governments Water Reform Framework. The overall objective of environmental flows is to protect the ecological and other values of rivers, riparian zones and flood plains.

National Rivercare Program

The national goal of Rivercare is to ensure progress towards the sustainable management, rehabilitation and conservation of rivers outside the Murray–Darling Basin and to improve the health of these river systems.

The primary outcome expected from the National Rivercare Program is improvements in the water quality and ecological values of river systems. Such improvements are expected to yield benefits in terms of environmental protection, biodiversity, natural resource management and sustainable agricultural outcomes. Complementary social and economic benefits are also expected from such improvements.

Water for ecosystems

The National Principles for the Provision of Water for Ecosystems were developed following a comprehensive consultation process.

The principles are non-prescriptive and cover aspects such as best available scientific information for decision-making; the need to legally recognise environmental water provisions; further allocations for any use to be made on the basis that ecological processes and biodiversity are sustained; and the use of appropriate demand and water pricing strategies.

The principles are balanced and set in an ecologically sustainable development context. For example, they recognise the rights and needs of existing users as well as the need to involve all stakeholders in decision-making when it comes to determining the provision of water for ecosystems.

National Water Quality Management Strategy

Water quality is being addressed through the National Water Quality Management Strategy. The strategy aims to achieve a nationally consistent approach to water quality management, while allowing flexibility to respond to differing regional and local circumstances, and embraces issues across the whole of the water cycle. It involves the cooperative development by governments of national guidelines and other documents which focus on part of the water cycle or a particular activity with potential to affect water quality. A key element of the process is community consultation.

The objectives of the strategy are being achieved through attention to diffuse sources of pollution in the rural environment, such as improving the quality of run-off from agricultural land through improved natural resource management and best management practices. Attention is also being given through the National Water Quality Management Strategy to point sources of pollution in the rural sector, for example, dairy shed effluent, dairy processing waste, winery wastes and other intensive industries. In these cases best management practices are being pursued by the respective industries to ensure that pollution is minimised and that the quality and biodiversity of receiving water systems are improved.

The strategy is nearing completion and will include guidelines for fresh and marine waters, drinking water, ground water protection and sewerage systems (trade wastes), as well as effluent management guidelines for specific industries.

National River Health Program

The National River Health Program is developing a biological monitoring tool (AUSRIVAS) as a national protocol to monitor the in-stream river health of Australian rivers.

The Environmental Flows Management Initiative is part of the National River Health Program. Principal new elements of the initiative are:

- support for improved techniques and tools for assessing the environmental flow requirements of rivers;
- development of decision support for environmental flow allocation and trade-offs with consumptive use;
- integrated strategic research into relationships between riverine ecology and flow regimes.

National Water Resources Assessment

The National Water Resources Assessment is part of the National Land and Water Resources Audit (see box in Natural Heritage Trust Section). The assessment will provide a comprehensive report of the current status of Australia's surface water and ground water and, where possible, identify changes and trends in the status of the resource. It will update and expand on previous reviews and provide a more comprehensive statement of the quantity, reliability, quality, availability, commitment and use of Australia's surface water and ground water resources. The assessment will also establish a database and framework to enable the assessment to be repeated at regular intervals so that up-to-date national water resource information continues to be available for decision-making and policy development.

Wetlands

The Commonwealth Wetlands Policy, launched in February 1997, encourages the management of wetland issues by the Commonwealth as part of integrated catchment and natural resource planning. Several States have developed, or are developing, similar policies to apply within their jurisdiction. These policies are being developed either as stand alone policies or as part of overall biodiversity strategies.

The Commonwealth Wetlands Policy is largely being implemented through the National Wetlands Program. The main aims of this program are to develop management plans for important wetlands; nominate new sites under the Ramsar Convention on Wetlands; support the surveying and monitoring of wetlands; and fund relevant community work.

The National Wetlands Program also includes the National Wetlands Research and Development Program. This aims to support the conservation, rehabilitation, restoration and long-term sustainable management of wetlands by the government and private sectors in Australia through targeted research and development.

Source: Geoffrey Smith

Involvement in water monitoring reinforces in young people the need to care for Australia's catchments

Australia, through the National Wetlands Program, is developing an Asia Pacific Wetland Managers Training Program. The training program aims to provide training and capacity building for wetland managers at all levels.

Waterwatch

Waterwatch Australia is a national volunteer water quality monitoring programme. Waterwatch helps to provide communities with the knowledge, skills and tools they need to care for their catchments. Through water quality monitoring, individuals, Landcare groups, schools and other community groups throughout Australia are voluntarily collecting information about the health of their local waterways. Waterwatch coordinators set up networks that help the volunteer monitors get together with Local Governments, water authorities, industry and other organisations to discuss the water quality issues in their catchments. Most Waterwatch groups regularly monitor indicators such as pH, temperature, phosphates, nitrates, dissolved oxygen, turbidity, *Escherichia coli*, macroinvertebrates and river bank vegetation.

Forests

Through the National Forest Policy Statement, the Commonwealth Government and State and Territory Governments are working to:

- establish a comprehensive, adequate and representative forest reserve system as part of maintaining an extensive permanent native forest estate managed in an ecologically sustainable manner so as to conserve the full suite of values that forests can provide for current and future generations; these values include biological diversity, heritage, Aboriginal and other cultural values;
- ensure that private native forests are maintained and managed in an ecologically sustainable manner, as part of the permanent native forest estate, as a resource in their own right, and to complement the commercial and nature conservation values of public native forests;
- develop an innovative, internationally competitive and ecologically sustainable timber products industry and build certainty for those communities dependent on forests;
- foster community understanding of and support for ecologically sustainable forest management and provide opportunities for effective public participation in decision-making;

Source: Lachie Wilkinson

Hardwood timber harvesting in the Victorian highlands

- increase Australia's national forest research to expand and integrate knowledge about the many aspects of native forests, plantations, forest management, conservation and forest product development;
- expand Australia's plantation and farm forestry industries.

The Commonwealth and States are developing Regional Forest Agreements to achieve the above goals. These agreements will indicate which areas are available for harvest and which areas are to be incorporated in reserves. Regional Forest Agreements will be reviewed periodically with a view to ensuring, among other things, that harvesting within the agreed region is taking place in an ecologically sustainable manner.

Before the Regional Forest Agreements are signed, each forested region is comprehensively assessed for all forest values including wilderness, old growth, biodiversity, national estate, indigenous, social, economic and World Heritage values. Assessments also seek to secure the protection of endangered species and to ensure that the use of all forests occurs in an ecologically sustainable way. Economic and social assessments ensure that the needs of regional communities are properly considered and that industry development opportunities are identified.

Regional Forest Agreements will provide the consistency of Commonwealth policy and State policies required to deliver a secure forest conservation reserve system, ensure long-term access to forests for production uses and provide the basis for an ecologically sustainable and internationally competitive forest products industry with the opportunity for greater value adding. A framework of regional indicators, based on the Montreal Process Criteria and Indicators, is being developed to monitor sustainable forest management in areas covered by

a Regional Forest Agreement and areas not covered by an agreement.

The Farm Forestry Program, as one of the initiatives of the Natural Heritage Trust, has an important role to play in the interface between agriculture, forestry and the environment. As well as providing economic returns from commercial tree growing for wood and non-wood production, farm forestry has the potential to provide substantial environmental benefits, including absorbing greenhouse gases, improving the hydrological balance at a catchment scale in areas affected by salinity, and restoring biodiversity.

Tourism and recreation

The National Strategy for the Conservation of Australia's Biological Diversity seeks to achieve the conservation of biological diversity through the adoption of ecologically sustainable management practices for tourism and recreation. It commits governments to improving the knowledge base through long-term monitoring of the impacts of current tourism and recreation activities.

The Strategy also encourages governments and participants in the tourism and recreation industry to conserve biological diversity by:

- reviewing the impact of tourism and recreation management activities on biological diversity and seeking changes where appropriate;
- for tourism operators using areas with significant biological diversity, developing and implementing codes of practice that acknowledge the need for any required changes to management practices;
- offering incentives for conservation activities, including rehabilitation programmes.

Where tourism depends on the natural environment, the Strategy encourages the development of management strategies in association with broader land use plans, including provisions for:

- tourism facilities and services to be provided in accordance with the biophysical limits of an area;
- the development of criteria and conditions under which commercial activities within or adjacent to protected areas may be appropriate;
- rehabilitation of existing tourism sites where appropriate.

Consistent with the above, the strategic environmental goal of the National Tourism Strategy is:

> *to provide for sustainable tourism development by encouraging responsible planning and management practices consistent with the conservation of our natural and cultural heritage.*

The National Ecotourism Strategy fits within the framework of the National Tourism Strategy. It aims to:

- identify the major issues that affect, or are likely to affect, the planning, development and management of ecotourism in Australia;
- develop a national framework to guide ecotourism operators, natural resource managers, planners, developers and all levels of government towards achieving the vision of an ecologically and culturally sustainable ecotourism industry;
- formulate policies and programmes to assist interested parties to achieve this vision.

Actions in the National Ecotourism Strategy address ecological sustainability, integrated regional planning, natural resource management, regulation, infrastructure, impact monitoring, marketing, industry standards and accreditation, ecotourism education, involvement of indigenous Australians, viability and equity considerations.

Source: Australian National Botanic Gardens

Ecotourism in Australia, based on its spectacular natural features, unique flora and fauna and diverse cultural heritage, has significant growth potential

The States, Territories and Local Government have also introduced strategies and programmes to ensure ecologically sustainable management practices are adopted for tourism and recreation (see following box).

Australian Capital Territory Nature Based Tourism Strategy

The Australian Capital Territory (ACT) Government adopted a Nature Based Tourism Strategy for the ACT in 1996. It aims to develop nature-based tourism in the ACT to enhance the long-term conservation, social and economic interests of the community. The strategy has identified a number of key outcomes the ACT Government needs to focus on with the industry, the community and other stakeholders to achieve its mission. These are:

- the Territory's natural and cultural values protected and appreciated by the community and the industry;
- a sustainable and profitable industry, shaped by the ACT's unique character, and returning benefits to the community;
- an industry offering a wide range of tourist and recreational experiences to both residents and visitors;
- an informed and rational capital investment process;
- wider recognition locally, nationally and internationally of the ACT as a unique nature-based tourism destination;
- continually improving standard of service to ensure high visitor satisfaction.

The strategy identifies a number of actions to achieve the above outcomes.

Tourism Council Australia, the national peak industry association, works with governments to integrate the conservation and sustainable use of biological diversity into relevant plans, programmes and policies. Initiatives include the following.

- The development of a Code of Environmental Practice and Environmental Guidelines for Tourist Developers. This work was undertaken in conjunction with an independent advisory committee comprising environmentalists, government officials and tourism industry representatives.
- Tourism Council Australia was actively involved over 1996–97 on a steering committee initiated by the Commonwealth Government to prepare a document entitled *Coastal Tourism: A Manual for Sustainable Development*. The manual outlines environmental, social and economic criteria to consider when planning, constructing or operating a tourism venture. It is designed to help tourism developers work with everyone interested in coastal tourism developments and to make their venture good, not only for their business, but also for the environment and the surrounding communities.
- Tourism Council Australia is currently developing Best Practice Environmental Management Guidelines for the tourism industry. This project is being funded by the tourism industry, the Office of National Tourism and the Commonwealth Department of the Environment. It will be conducted over three years, with a shifting focus upon different sectors of the tourism industry.

Mining

The National Strategy for Ecologically Sustainable Development seeks to further develop the mining industry, and efficiently manage the renewable and non-renewable resources on which it depends, in accordance with the principles of ecologically sustainable development. The strategy includes actions for the rehabilitation of mine sites, the application of minimum environmental standards to mines, and improved efficiency and performance in areas such as environmental monitoring, publication of environmental management plans and environmental audits. Actions in the strategy for nature conservation and land use planning and decision-making are also relevant.

The contribution of the Australian mining sector to biodiversity conservation is a substantial one. The baseline research undertaken as part of project approvals and management processes comprises a significant proportion of the biological research work being done in Australia and represents a significant contribution to basic taxonomic, biological and ecological information and understanding. The sector is also involved in species protection and enhancement programmes both on and off-site in an effort to manage and ameliorate the impacts of various mining projects on Australia's biodiversity. The sector also supports research programmes that contribute to the understanding of the ecology, biology or taxonomy of native species as well as the management, recovery and rehabilitation of ecosystems and species populations.

Minerals Council of Australia Environmental Workshops

The Minerals Council of Australia has conducted its annual environmental workshops for the past 22 years. The workshops now attract more than 350 delegates from the minerals industry, government, academia and research bodies in Australia and overseas. At the 1996 workshop, 22 countries were represented.

The objectives of the workshops are:

- to foster technical exchange between environmental professionals involved in the minerals industry in Australia and around the world;
- to discuss environmental management issues for exploration, mining and mineral processing projects;
- to demonstrate environmental management skills and technology for the minerals industry in Australia and internationally.

The workshops give delegates the opportunity to test the environmental standards of their industry and companies against world trends.

The workshops have grown to be the largest annual conferences for environmental professionals in Australia and are internationally recognised as one of the premier such conferences.

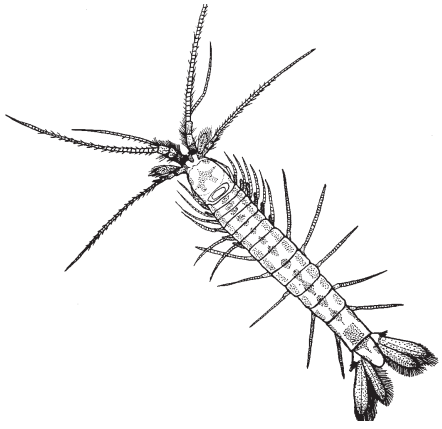
Complementing the workshops are a range of specialist courses on environmental management offered by organisations such as the Australian Centre for Minesite Rehabilitation Research, the Australian Mineral Foundation and the Australian Centre for Geomechanics.

Article 7 Identification and monitoring

Enhancing knowledge and understanding of biological diversity and the impacts on it are important measures addressed in the Convention on Biological Diversity. Parties are required to identify and monitor important ecosystems, species and genetic components of biological diversity, as well as processes and activities that have or are likely to have significant adverse impacts on biological diversity. Countries are then able to determine their priorities with regard to conservation and sustainable use measures which need to be undertaken.

The need to identify components of biological diversity important for its conservation and sustainable use is addressed in Action 1.1.1 of the National Strategy for the Conservation of Australia's Biological Diversity. The components of biological diversity listed in the box below reflect the list in Annex 1 of the Convention.

Consistent with the Convention, the Strategy also commits governments to identifying and monitoring the effects of processes and categories of activities that have or are likely to have significantly adverse impacts on the conservation and ecologically sustainable use of biological diversity.



The syncarid shrimp, Allanaspides hickmani*, (family Anaspididae) lives in crayfish burrows and surface pools in two small areas of south-western Tasmania. Its conservation status is Vulnerable, primarily to habitat loss through effects of fire and flood. The genus is of special phylogenetic significance as it resembles primitive forms present some 200 million years ago.*

Drawn by P. Horwitz/from *The Conservation Status of Australian Freshwater Crayfish*, ANPWS

Action 1.1.1 Components of biological diversity

Identify the terrestrial, marine and other aquatic components of biological diversity that are important for its conservation and ecologically sustainable use, including:

(a) ecosystems and habitats that contain high diversity, large numbers of endemic or threatened species, or wilderness, that are required by migratory species, that are of social, economic, scientific or cultural importance, or that are representative, unique or associated with key evolutionary or other biological processes;

(b) species and communities that are rare or threatened, that are wild relatives of domesticated or cultivated species, that are of medicinal, agricultural or other economic value, that are of social, scientific or cultural importance, or that are of importance for research into the conservation and sustainable use of biological diversity (such as indicator species);

(c) described genomes and genes of social, scientific or economic importance.

In particular, identify those components requiring urgent protective measures.

To achieve the above actions, the Strategy recognises the need to accelerate research into the taxonomy, geographic distribution and evolutionary relationships of Australian terrestrial, marine and other aquatic plants, animals and micro-organisms, giving priority to the least known groups, including non-vascular plants, fungi, invertebrates and micro-organisms.

Biodiversity monitoring is addressed in Action 4.1.7 of the Strategy.

Action 4.1.7 – Monitoring

Establish a national coordinated programme of long-term ecological monitoring to document patterns of change or lack of change in order to establish a baseline for understanding the impact of such change or lack of it on natural communities, ecosystems and ecological processes, and to detect changes in biological diversity and their causes. The programme will:

(a) combine remote sensing with a national network of secure field-based monitoring sites in representative habitats;

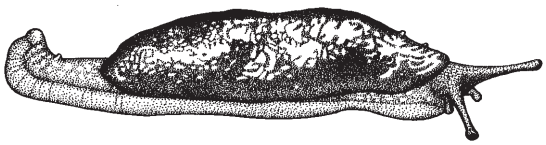
(b) develop and encourage the application of national monitoring protocols involving standardised sampling designs and techniques for testing management regimes and strategies, including rehabilitation and reintroductions;

(c) use biological diversity indicator groups to reveal the impacts of environmental disturbance;

(d) establish properly constituted and supported assessment panels or monitoring committees, or both, comprising representatives of industry, non-government conservation organisations, other appropriate community groups and governments;

(e) accelerate research into new, cost-effective methods of monitoring;

(f) integrate with an ecological research programme aimed at improving our understanding of long-term and event-driven ecological processes.



Slugs of the genus Cystopelta *(family Cystopeltidae) are found under logs and litter in forests of Eastern Australia. They are thought to feed on lichens and bacterial film on tree trunks. The separation of the tail and the soft visceral mass is a unique feature of this endemic family.*

Drawn by C. Eadie/from *Mollusca: the Southern Synthesis*, ABRS

Key Commonwealth programmes that will help to achieve the above actions include the following.

Australian Biological Resources Study

The Australian Biological Resources Study provides fundamental and comprehensive information on all forms of Australian biota for present and future generations. It provides this vital information to all sectors of the Australian community to improve understanding of our environment and encourage its responsible and sustainable management.

The aim of the study is to provide the underlying taxonomic knowledge necessary for the conservation and utilisation of Australia's biodiversity. Its objectives are to:

- coordinate at a national level the collection, description and classification of Australian biota;
- support studies of the origins, evolution and relationships of Australian biota;
- promote and fund research and training in taxonomy and biogeography;
- gather and disseminate information on taxonomic and biogeographic research and documentation in Australia;
- publish a series of books on Australian flora, fauna and other organisms;
- develop interactive identification tools and electronic information systems on Australian biota;
- maintain information on the scope and status of distributed taxonomic collections;
- develop partnerships to foster knowledge on Australian biodiversity.

State of the environment reporting

The aim of state of the environment reporting in Australia is to:

- describe the Australian environment;
- monitor and report on change in environmental quality over time;
- identify the agents responsible for change;
- monitor and report on the effectiveness of policies and programmes responding to change, including progress towards achieving targets;
- report on future implications of any identified trends.

The purpose for such work is to provide information which will:

- increase public understanding of the state of the environment;
- improve the quality of public debate on environmental issues;
- improve the quality of decisions which may affect the environment;
- assist in meeting international reporting obligations (for example, to the Organization for Economic Co-operation and Development and the Commission for Sustainable Development).

The first National State of the Environment Report was produced by an independent advisory council and presented to the Commonwealth Environment Minister in 1996.

Natural Heritage Trust

There are requirements for performance reporting at all levels of the Natural Heritage Trust, including reporting on the overall performance of the trust, on each programme and on individual, State, regional and local projects. The Commonwealth will have responsibility for reporting against the efficiency and effectiveness of the trust. To do this, it will need to report against the operational framework of the trust, as well as trust programmes and regional strategies/initiatives. The relevant Ministers have agreed that the performance of the Natural Heritage Trust will be measured and reported against the following Key Result Areas.

1. Integration and Institutions
2. Environment
3. Sustainable Production
4. People

The Environment Key Result Area will monitor:

> *Biodiversity conservation and improved long-term protection and management of environmental resources, including native vegetation, representative ecosystems and World Heritage Values.*

Performance indicators for each Key Result Area are being developed, drawing upon established work such as that undertaken by state of the environment reporting and the Montreal Process (see **Forests** below).

The Register of the National Estate

The register is an inventory of all those parts of Australia's natural, historic, and Aboriginal and Torres Strait Islander heritage which have special value for present and future generations. Any part of Australia, its territories or its territorial sea may be entered in the Register of the National Estate if it meets specified criteria. Of relevance to biological diversity is that a place may be entered on the register:

- because of its importance in the course, or pattern, of Australia's natural history;
- because it possesses uncommon, rare or endangered aspects of Australia's natural history;
- because it has potential to yield information that will contribute to an understanding of Australia's natural history;
- because the place is important in demonstrating the principal characteristics of:
  - a class of Australia's natural places, or
  - a class of Australia's natural environments.

Entry in the register alerts planners, decision-makers, business interests, researchers and the community at large to the existence and location of national estate places and to the heritage value of those places. This enables people to take heritage factors into consideration when they are making land management decisions.

National Wilderness Inventory and Commonwealth Wilderness Program

The Wilderness and Wild Rivers Section of Environment Australia, through the National Wilderness Inventory and the Commonwealth Wilderness Program, is identifying and delineating areas of wilderness in non-forest regions of Australia. It is also providing substantial input into the wilderness identification and reserve selection component of the joint Commonwealth–State Comprehensive Regional Assessment/Regional Forest Agreement process for forested regions.

Forests

Australia is a member of the Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests (the 'Montreal Process' Working Group).

The Montreal Process Criteria and Indicators will be used as the basis for assessing the sustainability of forest management as part of the comprehensive regional assessments currently being undertaken under the

National Forest Policy Statement. As the criteria and indicators have been developed for use at the national level, they will require adaptation for application in Australia. A framework of regional indicators is being developed for Australia which will provide:

- a basis for assessing progress towards the achievement of sustainable forest management at a regional (sub-national) scale;
- a mechanism for collecting information at a scale and in a manner so that it can be aggregated to a national level in a transparent and credible way for reporting against the Montreal Criteria and Indicators;
- direction to the regional assessment process concerning data collection and reporting on sustainable forest management.

Agriculture

The Commonwealth Government and State and Territory Governments are collaborating to develop indicators for sustainable agriculture through the National Collaborative Project on Indicators for Sustainable Agriculture. Indicators developed will be reported on at the national level and across 11 broad agro-ecological regions. The first project report is due for release in early 1998.

The indicators and attributes developed by the National Collaborative Project on Indicators for Sustainable Agriculture are aimed at providing a tool to assist policy-makers and managers at the national and regional scales. However, other applications may evolve, for example, in reporting on Australia's agricultural performance in international forums and in promoting trade in Australian agricultural produce.

At all scales, consideration is given in the development of indicators, attributes and measures of the sustainability of Australian agriculture to the need for integration between projects where this will result in more efficient, effective and appropriate outcomes, for example, the Land and Water Resources Audit (see the section on the Natural Heritage Trust, Article 6). Consideration is also being given to integration of indicators across industry sectors, for example, agriculture and forestry.

Fisheries

Australia collects information on the distribution, population dynamics and abundance of fish stocks and attempts to estimate the likely impact of fishing on a stock. These assessments of fish stocks rely on scientific research and regular data collection from fishing activities. In particular, information on fishing levels and catch levels are important.

Source: Lachie Wilkinson

Clearing of deep-rooted native plants and their replacement by introduced shallow-rooted crops has caused watertables to rise and many agricultural areas in Australia to be affected by dryland salinity. Monitoring of watertable depth identifies areas most at risk.

The Commonwealth Government and State and Territory Governments are currently investigating methods for determining whether the exploitation of fisheries resources and the carrying on of any related activities are conducted in a manner consistent with the principles of ecologically sustainable development (as required under the Fisheries Management Act 1991). Such methods may include the development of indicators, but at this stage no system of assessment has been adopted.

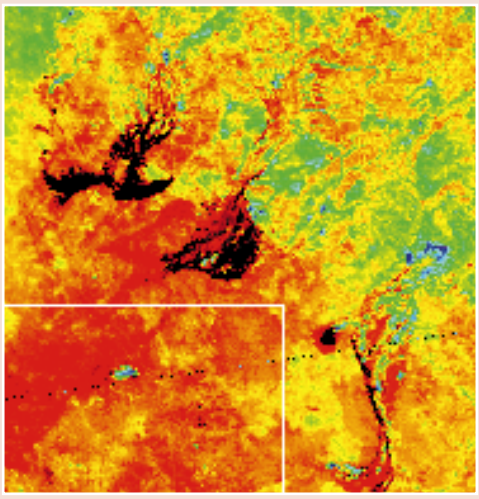
Other national programmes

The Coastal Monitoring Strategy and the proposed National Rangeland Monitoring Program will also contribute to biodiversity monitoring. In addition, significant progress has been made over recent years in the use of remote sensing, including satellite imaging to reveal changes in land cover. Recent work has focused on land cover change in agricultural areas, broad-scale land cover change, and mapping of woody and non-woody vegetation in the Murray–Darling Basin.

Satellites and Water Bird Monitoring

Cyclones in early 1997 sent a 'flood' down the Eyre, Diamantina, and Cooper creek systems. Images from the ERIN NOAA satellite image archive were used to follow the extent and progress of the floodwaters down the systems, as shown below. The images are approximately 485x460 kilometres. The South Australia-Queensland state border is shown as a white line, floodwater is black, growing vegetation is green to blue, whilst areas of low vegetation are red. Over the period of observations, the floodwater fills the northern channels and is moving south. By June, fresh vegetation has rapidly grown on the flood plains and is dominating the satellite sensor.

This information was used to plan the timing and route of a field trip to south-west Queensland for biological survey work (particularly waterbirds) undertaken by Wetlands International, Griffith University and the Queensland Ornithological Society, with support from the Australian Heritage Commission and Santos Limited. The timing of field trips to the arid and semi-arid wetlands is particularly important because of the ephemeral nature of the open water bodies and their waterbird populations. These ephemeral wetlands are very important to the breeding of many waterbirds. On this trip, 67 000 waterbirds representing 53 different species were counted.



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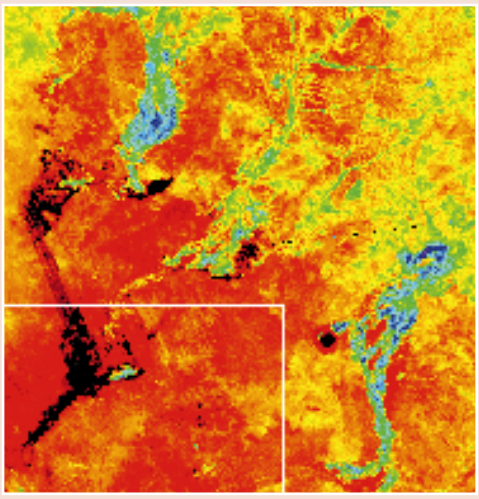

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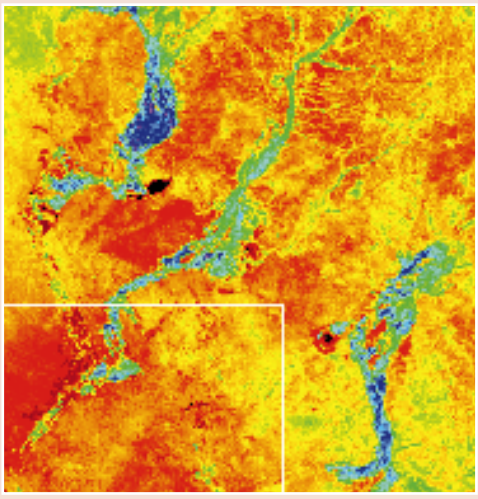

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State and Territory programmes for identification and monitoring

In addition to their contribution to national programmes, States and Territories have a range of programmes in place for the identification and monitoring of biodiversity. The New South Wales Biodiversity Survey Program provides an example of a statewide planning framework for biodiversity monitoring. The South Australian Biological Survey of the Anangu Pitjantjatjara Lands is an example of a programme where the value of indigenous knowledge is recognised in biodiversity identification (see boxes below).

Herbaria and museums

Each of the Australian States and Territories has an herbarium and/or museum funded by the Commonwealth or the State or Territory. Together these institutions hold over five million specimens of Australian plants and over 25 million specimens of fauna, both native and naturalised.

The aim of these institutions is to provide the underlying taxonomic knowledge for the biota of their regions.

They do this by:

- building comprehensive collections of preserved specimens for their States or Territories and for related areas;
- carrying out taxonomic research on these collections, to increase taxonomic information;
- providing an identification service for other institutions and the public;
- providing distributional and other data contained on their specimen labels to land managers and others as an aid to distributional studies;
- providing a forensic identification service for law enforcement bodies, including the police, quarantine service and others;
- preparing floras, zoological catalogues, monographs and other handbooks or identification manuals for their region;
- collaborating in national projects involving taxonomy (for example, the work facilitated by the Australian Biological resources Study);
- collaborating with each other and with the Commonwealth in building a nationally linked information network to nationally agreed standards.

New South Wales Biodiversity Survey Program

The New South Wales Biodiversity Survey Program aims to improve the knowledge and understanding of biodiversity in New South Wales. The primary role of the program is to provide a mechanism for a whole-of-government approach to biodiversity research in the State. The program coordinates the establishment of a comprehensive and cooperative suite of biodiversity inventories and monitoring projects that make best use of existing data and avoid duplication of effort.

The goal of the New South Wales Biodiversity Survey Program is to support and improve the biodiversity survey effort across the State.

To achieve this goal, the program has a number of objectives:

- to increase the variety of organisms which are surveyed to include invertebrates (for example, insects), non-vascular plants (for example, mosses) and other commonly neglected groups by promoting the development of survey methods and identification resources for these groups;
- to improve the survey methods used by negotiating to set survey standards and guidelines and promoting research into survey methods;
- to encourage data exchange across all organisations and community groups by working to set data management guidelines and facilitate data sharing and exchange;
- to implement monitoring surveys and long-term studies of biodiversity by encouraging the development of survey methods and a funding framework for long-term survey projects;
- to promote the study of other components of biodiversity, that is, genetic and ecosystem biodiversity.

It is planned that the New South Wales Biodiversity Survey Program will be established in all regions of the State by 2000. In the meantime, New South Wales plans to continue to implement its Biodiversity Survey Program to coordinate and standardise biological survey methodologies and to ensure the collation of data into appropriate biodiversity information systems.

Biological Survey of the Aṉangu Pitjantjatjara Lands, South Australia

Background

Since the late 1970s, the South Australian Department of Environment, Heritage and Aboriginal Affairs has been undertaking a systematic biological survey of South Australia on a region by region basis. In 1991 a regional biological survey was begun of the Aṉangu Pitjantjatjara (AP) Lands that constitute just under 10% of the land area of the State, in its relatively remote north-west corner. This survey has differed from all other regional surveys in that it has been a joint effort between departmental biologists and traditional Aboriginal owners, along with representatives of AP Land Management.

Recording Aboriginal ecological knowledge

The following principles were seen as important for recording Aboriginal ecological knowledge with greatest effect.

- Establishing and maintaining cooperative working relationships between Aboriginal peoples and survey biologists, with the Pitjantjatjara community retaining ownership and control of their own information.
- Working with Aboriginal informants on actual survey sites (rather than in communities) to facilitate the most effective information transfers. This enables landscapes, plants and animals to be located, described and discussed in both traditional and scientific terms, as well as in ecological, cultural and historical perspectives. Aboriginal informants are able to view plants or animals found and to see the habitats where they were located. They are also able to use their skills to locate species, by tracks and signs, which might not be otherwise recorded.
- Showing authentic specimens of plants collected or animals captured (or preserved museum specimens) to assist in correct identification of species. Use of photographic material meets with only limited success as Aboriginal informants have difficulty determining the actual size and proportions of photographed specimens.
- Employing experienced interpreters to work separately with male and female informants, ensuring that culturally appropriate question formats are used, informing biologists of social protocols and providing valuable cross-cultural interpretations of what is being seen, said and done.

Outcomes

The AP Lands biological survey has been very successful to date. It has:

- provided important cross-cultural experiences and exchanges of ideas on biodiversity sampling, recording and conservation management (for example, different results obtained from non-Aboriginal trapping techniques compared with Aboriginal tracking methods);
- systematically documented the biodiversity of representative habitats across much of the western and northern AP Lands (something not previously done from a non-Aboriginal or scientific perspective);
- identified several species of plant and animal not previously recorded for South Australia (including six ‘new’ reptile species);
- confirmed and highlighted the relatively recent extinctions of several species of mammal from the region (some within the lifetime of many of the traditional owners participating in the survey programme) and enabled biological information about these recently extinct species to be recorded from ‘eye-witness’ accounts;
- identified remnant populations of some locally endangered vertebrates which used to be much more widespread and abundant, but are now on the verge of extinction from the AP Lands

- identified traditional and non-traditional land management practices required to protect endangered populations of these species and encouraged their implementation (in particular, control of introduced predators to protect rock wallaby colonies, and mosaic patch-burning to protect and improve mallee-fowl habitats);
- initiated community ranger training work in Flinders Ranges National Park;
- identified key areas for biodiversity conservation, within a cultural framework, and encouraged discussion about setting aside areas for special nature conservation management;
- enabled draft vegetation maps to be prepared for areas surveyed (with mapping units described in both Aboriginal landscape terminology and vegetation floristic/structural terms), primarily to provide a useful planning tool for AP Land Management;
- provided a basis for discussing the potential of, and possible options for, Indigenous Protected Areas on the AP Lands;
- assisted Aboriginal trainee teachers in understanding biological survey techniques and the benefits which are derived from cooperative cross-cultural survey methodology, through incorporation of such survey work in the Aṉangu Teacher Education Program curriculum;
- provided a forum for AP schools to experience cooperative cross-cultural surveys and expand their knowledge of arid zone flora and fauna – one AP school has incorporated biological survey into various aspects of its curriculum;
- provided the basis for a half-hour TV documentary, 'Emu, possum, we want 'em back', produced and shown by the Australian Broadcasting Corporation.

Article 8 In-situ conservation

In-situ conservation is the conservation of ecosystems, natural habitats and species in their natural surroundings.

Parties are required to give emphasis to in-situ conservation through a broad range of actions, including the establishment and management of protected areas; conservation and sustainable use of biological resources within and outside protected areas; promotion of environmentally sound and sustainable development in areas adjacent to protected areas; rehabilitation and restoration of degraded ecosystems; control of alien species and genetically modified organisms; protection of threatened species and populations; and regulation of damaging processes and activities.

Consistent with Article 8 of the Convention on Biological Diversity, the National Strategy for the Conservation of Australia's Biological Diversity recognises that the management of the nation's biodiversity must integrate both on and off-reserve conservation, while taking into account the needs of human communities. The Strategy, in particular, focuses on bioregional planning and management; management for conservation; the establishment and management of a comprehensive, adequate and representative system of protected areas; the improvement of biological diversity conservation outside reserves; and is concerned with recognising the contribution of ethnobiological knowledge of indigenous peoples to the conservation of biological diversity.

Source: Lachie Wilkinson

Bioregional planning provides the means to link on and off-reserve conservation

The Australian Natural Heritage Charter

The Australian Natural Heritage Charter contains voluntary guidelines to assist those with an interest in the significance and conservation of natural heritage to make soundly based decisions on conservation of that heritage. It was developed over a two-year period in consultation with key people and organisations with an interest in nature conservation, and adopted by the Australian Committee for IUCN in December 1996. The charter has since been adopted by a number of Local Government Areas, and is being used at the Sydney Olympic Games site.

The charter can be applied to public and privately owned places, to terrestrial, marine or freshwater areas, and to protected and unprotected areas. It complements the *Australia ICOMOS Charter for the Conservation of Places of Cultural Significance* (the Burra Charter) which has guided cultural heritage conservation for over 15 years.

Australia's initiative in developing the charter was highly commended by the World Conservation Union (IUCN) at its world congress in Montreal, Canada, in October 1996. The IUCN fully supported the charter and encouraged other member countries to develop guidelines modelled on the Australian Natural Heritage Charter.

Bioregional planning

To achieve the conservation of biological diversity in conjunction with sustainable use of the natural environment, the Strategy commits Australian Governments to determining principles for establishing bioregional planning units which:

- emphasise regional environmental characteristics;
- are based on environmental parameters;
- take into account the productive uses as well as the identity and other needs of human communities.

As part of effective bioregional planning, this includes:

- identifying the biological diversity elements of national, regional and local significance, the extent to which they need to be conserved, and the extent to which they already occur in protected areas;
- identifying the major activities taking place within the region and in adjoining regions and analysing how these may adversely affect the region's biological diversity, to ensure its use is ecologically sustainable;
- identifying any areas that are important for biological diversity conservation and require repair or rehabilitation;
- identifying priority areas for biological diversity conservation and for ecologically sustainable use, and their relationship to essential community requirements such as infrastructure, and urban and industrial development;
- providing mechanisms for genuine, continuing community participation and proper assessment and monitoring processes;
- coordinating mechanisms to ensure ecologically sustainable use of biological diversity, with particular reference to agricultural lands, rangelands, water catchments and fisheries;
- incorporating flexibility to allow for changes in land use allocation, including multiple and sequential uses of particular locations, and to accommodate improvements in knowledge and management techniques and changes in institutional arrangements.

The Cape York Peninsula Land Use Strategy

The Cape York Peninsula Land Use Strategy (CYPLUS) was established in 1992 as a joint initiative of the Commonwealth and Queensland Governments to progress the implementation of ecologically sustainable development principles in the Cape York region in northern Queensland. The CYPLUS process incorporated the views of community groups and Local, State and Commonwealth Governments through the Cape York Regional Advisory Group. Due to the unique biodiversity of Cape York, bioregional planning was a major component of the CYPLUS process.

CYPLUS provided relevant authorities and the Cape York community with a decision-making framework that will ensure balanced and sustainable development occurs in the region. Both Stage 1 (involving an extensive data gathering process) and Stage 2 (which developed principles, policies and mechanisms for decision-making) have now been completed.

The conservation-related recommendations of Stage 2 covered a comprehensive range of ecological issues including land rehabilitation, enhancement of the Cape's protected areas, control of feral animals and weeds, fire management and endangered species assessment. These recommendations will be primarily addressed through a funding programme under the Natural Heritage Trust.

Protected areas

Another key objective of the Strategy is to 'establish and manage a comprehensive, adequate and representative system of protected areas covering Australia's biological diversity'. The Strategy seeks to achieve this through an adequately resourced Commonwealth, State and Territory cooperative programme, paying particular attention to the components of biological diversity identified as requiring special conservation measures (having regard to the indicative list in Annex 1 of the Convention). In developing the programme, immediate action is to be taken to identify those components of biological diversity that are known to be threatened or inadequately protected in reserves.

National Reserve System Program

To discharge its responsibilities under the Strategy, the Commonwealth has established a five-year programme with funding from the Natural Heritage Trust to establish, in cooperation with the States and Territories, a comprehensive, adequate and representative National Reserve System.

Through working with all levels of government, industry and the community, the National Reserve System Program will achieve the following objectives:

- the establishment and management of new ecologically significant protected areas which will be added to Australia's terrestrial National Reserve System;
- the provision of incentives for indigenous peoples to participate in the National Reserve System through voluntary declaration of protected areas on their lands and support for greater involvement of indigenous peoples in the management of existing statutory protected areas;
- the provision of incentives for landholders (both private and lessees) to strategically enhance the National Reserve System;
- the development and implementation of best practice standards for the management of Australia's National Reserve System.

To ensure that a National Reserve System encompasses the full range of biological and biophysical diversity across Australia, the Australian and New Zealand Environment and Conservation Council has developed and endorsed an Interim Biogeographical Regionalisation for Australia. This breaks Australia into 80 regions based on climate, lithology, geology, landform and vegetation, which can then be used as a basis for identifying priority areas for inclusion in the National Reserve System. Setting of priorities will also take into account:

- the various national strategies such as for biological diversity and ecologically sustainable development and the National Forest Policy Statement;
- other Commonwealth policies;
- the detailed scientific criteria and procedures for land acquisition already in place within each State and Territory.

A role for private land in the National Reserve System?

Given the high cost of land acquisition, Australian Governments are investigating options for cooperative management with landholders outside formally gazetted protected areas.

Investigations have shown that in all Australian jurisdictions there are no legal impediments preventing private landholders declaring their land as a protected area according to the IUCN protected areas categories.

There are a range of mechanisms within the various jurisdictions that apply protection to private land. However, an area of private land will only be considered for inclusion in the National Reserve System if it meets the IUCN definition of a protected area.

Several examples of private protected areas are already in place in Australia. Among them are Anglesea Heathlands in Victoria (Trust for Nature, Victoria), Gluepot Station in South Australia (Birds Australia), and the Drys Bluff and Liffey River Reserves of Tasmania (Bush Heritage Fund).

Proposals from community groups and industry for private protected area establishment will be considered for funding under the National Reserve System Program from 1998–99.

The Australian and New Zealand Environment and Conservation Council has developed Interim Scientific Guidelines as part of this overall framework for prioritising additions to the National Reserve System (see following box).

Developing national priorities for the National Reserve System

The Interim Biogeographic Regionalisation for Australia (IBRA) will be used as the environmental regionalisation, at continental scale, for planning the development of the National Reserve System and setting national priorities. There will be a need to use other approaches to provide for organisms (for example, migratory birds) and environments (for example, saltmarshes) that do not conform to existing regionalisations.

Priorities for reservation will take into account:

- how adequately the ecosystem is reserved and managed across the whole IBRA region, including outside reserves;
- uniqueness and distinctiveness of ecosystem, thereby providing a measure of the range of choices across the landscape which may exist for the inclusion of each ecosystem within a protected area system;
- degree to which each ecosystem is vulnerable to threatening processes and the extent to which reservation is considered necessary for the conservation of each ecosystem;
- specific needs of priority species and special conservation values. Priority will be given to ecosystems in most need of reservation.

Means to integrate or complement the development of the reserve system with off-reserve biodiversity conservation initiatives are being considered.

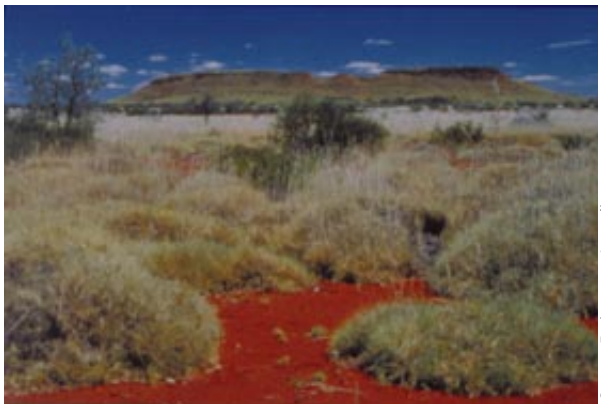
Marine Protected Areas Program

This program supports the development of a national representative system of marine protected areas. Such a system of protected areas will enable conservation of biodiversity across the full range of Australia's marine environments, protecting habitats and species, while supporting appropriate and sustainable use of marine resources.

Under the program, a bioregional planning framework, the Interim Marine and Coastal Regionalisation for Australia, has been developed jointly by the Commonwealth and the States and Northern Territory. The framework will help guide the identification of areas for inclusion in the national representative system of marine protected areas and ensure it is representative of the full range of Australia's marine environments. The States and the Northern Territory are also developing more detailed regional frameworks to plan additions to the marine protected area system within their jurisdictions (see following box).

In addition to developing Marine Protected Areas in its own jurisdictional waters (which start three kilometres from the coast), the Commonwealth approves funding on an annual basis to support projects to be undertaken by marine conservation and management agencies in the States and the Northern Territory.

To help coordinate the strategic development of the national representative system of marine protected areas and to guide the establishment of Marine Protected Areas, the Australian and New Zealand Environment and Conservation Council's Standing Committee on Conservation established the Task Force on Marine Protected Areas. The task force is made up of representatives from relevant State, Northern Territory and Commonwealth agencies.



Source: Environment Australia

The Cane River pastoral lease in the Pilbara area of Western Australia was acquired for its Acacia shrublands, Mulga, Snakewood and Triodia ecosystems

Developing a Marine Reserve System in Tasmania

In 1990 the Tasmanian Government released a Policy for the Establishment and Management of Marine Reserves in Tasmania. As well as outlining the benefits of marine reserves, the policy provided clear goals for establishing and managing a system of marine reserves, recommended that reserves in four specific areas be declared as a priority, and identified areas for further research, both in assessing future marine reserve sites and establishing a monitoring programme in the first reserves to be declared.

Tasmania is now updating the 1990 policy and will shortly be releasing a Tasmanian Marine Protected Areas Strategy for comment. To assist development of the strategy, the Tasmanian Government has undertaken a review of enabling legislation for Marine Protected Area establishment, set up a marine reserves steering committee comprising representatives from government, academia and the community, and held a stakeholder workshop to promote community understanding and ownership of the strategy. Further priorities being considered as part of the strategy include:

- preparation of proposals for representative marine reserves in bioregions not covered by the reserve system;
- evaluation of Marine Protected Area proposals produced by the peak fishing bodies, Tasmanian Fisheries Industries Council and Tasmanian Anglers and Sea Fishing Association, other stakeholder bodies, and the public;
- ongoing consultation with stakeholder groups, particularly fishing groups, and organisation of workshops/seminars to exchange ideas and information on issues such as bioregionalisation and fish propagation;
- consideration of the effectiveness of the existing Maria Island Marine Reserve and review of the reserve boundaries and management zoning;
- declaration of the waters around the sub-Antarctic Macquarie Island as a marine reserve;
- more detailed mapping of near-shore marine habitats;
- additional biological baseline studies of two new proposed marine reserves, once these are declared.

As well as the system of large representative reserves, other categories of reserves are planned which will complement the representative reserves in an integrated system. These are likely to be smaller and their locations based on different rationales than the protection of biodiversity within each bioregion. Specific purposes for which such reserves may be created include fish propagation, public education, and protection of recreational diving sites, seal and seabird breeding habitat, and historic or cultural sites.

Forest reserve system

As part of the process of establishing Regional Forest Agreements (see section on Article 6) designed to achieve sustainable forest management across Australia, governments have agreed to develop a comprehensive, adequate and representative forest reserve system. The following criteria, applied flexibly to ensure acceptable economic and social impacts, will be used as a basis to establish the reserve system:

- as a general criterion, 15% of pre-1750 distribution of each forest ecosystem;
- at least 60% of existing forest ecosystems that are recognised as vulnerable;
- all remaining occurrences of rare and endangered forest ecosystems;
- 60% of existing forest ecosystems that are identified as old-growth;
- all practicable occurrences of rare or depleted old-growth within a forest ecosystem;
- 90% (or more if practicable) of high quality wilderness that meet minimum area requirements.

States and Territories have also made considerable progress towards developing a comprehensive system of reserves within their respective jurisdictions. The following box describes the programmes in place to achieve this goal in Victoria.

Comprehensive, adequate and representative forest reserve systems

Comprehensiveness

Comprehensiveness covers the full range of forest communities recognised by an agreed national scientific classification at appropriate hierarchical levels.

This principle requires that the reserve system samples the full range of forest communities across the landscape.

Adequacy

Adequacy covers the maintenance of ecological viability and integrity of populations, species and communities.

Adequacy addresses the difficult question of extent and what is the level of reservation that will ensure viability and integrity of populations, species and communities.

Representativeness

Representativeness covers those sample areas of the forest that are selected for inclusion in reserves which should reasonably reflect the biotic diversity of the communities. This principle is designed to ensure that the diversity within each forest ecosystem is sampled within the reserve system.

Source: Lachie Wilkinson

Regional Forest Agreements will establish a comprehensive, adequate and representative forest reserve system

Development of a reserve system in Victoria

The Land Conservation Council (1971–1997) advised successive Victorian Governments on the use of public land in Victoria. The membership of the council was drawn from both the public service and the community, and provided expert scientific advice on resource use and management. When established, the council's statutory provisions for public participation were seen as creative, providing for continuing public input as the council compiled background reports and proposed final recommendations. A measure of the support for, and the effectiveness of, the council's process were the tens of thousands of submissions provided by the community and the participation of groups and individuals in numerous meetings, and the fact that in excess of 95% of its final recommendations have been accepted by Victorian Governments.

The *Land Conservation Act 1970* was one of the first pieces of legislation in Australia which explicitly recognised the need for the preservation of habitat and natural landscape and, most importantly, recognised the validity of these land uses. The council, in recommending parks and reserves, took into account the need to establish a statewide system of protected areas that contains adequate representations of all the land systems, major vegetation types and habitats occurring on public land, as well as outstanding natural features. As a result of the council's recommendations to successive Victorian Governments, 13.4% of the entire area of Victoria, or 34.6% of public land, is now managed under the National Parks Act 1975. This comprises more than 100 national, State, wilderness, marine and coastal parks as well as other areas managed under the Act.

As the Land Conservation Council has now carried out the work for which it was principally established, it has been replaced by the Environment Conservation Council. Like the Land Conservation Council, the Environment Conservation Council is an independent body appointed to provide scientific and technical advice to the Government, but it has a wider role, providing advice on a broader range of natural resource matters. Community input is still a fundamental element of the Environment

Conservation Council review process and its advice to the Government will be publicly available. The Environment Conservation Council will take into account the full range of issues affecting resource use, including national and international agreements, arrangements and decisions, and the social and economic impacts of any decisions.

Management plans for protected areas

The Strategy recognises the need to develop management plans for protected areas. These plans should ensure that genotypes, species or communities that depend on a particular protected area for their security are given high priority in management. They should also recognise interactions with surrounding areas and include provisions for monitoring and review of management objectives. Governments are required to ensure that there is public participation in the development and implementation of management plans, using, where appropriate, the traditional knowledge and skills of Aboriginal and Torres Strait Islander and local peoples.

The Commonwealth Government and State and Territory Governments have programmes in place to prepare management plans for protected areas under their control. Management plans have been developed and are being implemented for most major protected areas in Australia. To enhance protected area management, the Australian and New Zealand Environment and Conservation Council Working Group on National Parks and Protected Area Management is undertaking a Benchmarking and Best Practice Program. To date, five projects have been completed under this program: Staff Training Processes; Stakeholder Management (Neighbour Relations); Asset Management; User Pays Revenue; and National Data Standards on Protected Area Visitation.

In addition to the completed projects, the following have been commenced or are under consideration: Natural Resource Management and Performance Standards; Risk Management; Commercial Services; Weeds and Feral Animals in Protected Areas; Use of Fire for Management of Biodiversity and Hazard Reduction in Protected Areas; Interpretation and Education; Walking Track Classification; Management Planning; and Historic Place Management.

National parks and indigenous peoples

Over the past 20 years there has been increased acknowledgment within Australia of the importance of indigenous culture and of the potential for improved conservation outcomes flowing from the re-establishment of traditional land management practices.

Several significant cultural and natural areas in Australia are owned by indigenous peoples. Arrangements have been made with the traditional owners of these lands to allow their continued management as national parks (see following box). Opportunities for partnerships and agreements with indigenous groups for the cooperative management of existing protected areas are also being pursued by State and Territory conservation agencies with support from the Commonwealth Government's Indigenous Protected Areas Program.

Joint management of protected areas

The Commonwealth Government is responsible for managing three national parks on the Australian mainland, each of which is subject to joint management. Under the joint management model, the park is established on land to which title has been granted to traditional Aboriginal owners. The land is leased to the Commonwealth Government for 99 years for management as a national park, in return for an annual lease payment and a proportion of park-use fees paid by visitors. The model also includes a board of management with a majority of Aboriginal representatives and employment of traditional owners as rangers and advisers. Traditional knowledge and skills of Aboriginal peoples, particularly the use of fire, are being applied in park management.

Joint management as pioneered by the Commonwealth Government is being increasingly adopted by State and Territory conservation agencies, most recently in the State of New South Wales which passed legislation in 1996 providing for the handback and joint management of several protected areas in that State. While the precise details of the arrangements differ among the various jurisdictions in Australia, all share the common attributes of land ownership, leaseback to a conservation agency and joint management through a board with Aboriginal representation.

Conservation outside protected areas

At present more than two-thirds of Australia (some 500 million hectares) are managed by private landholders, while about 40 million hectares are within the terrestrial reserve system. The National Strategy for the Conservation of Australia's Biological Diversity recognises that, as conservation of biodiversity cannot be achieved in a reserve system alone, there is a need to strengthen off-reserve conservation of biological diversity. The Strategy highlights the need for adequate, efficient and cost-effective incentives to conserve biological diversity. Priority areas for action under the Strategy include those important for:

- migratory species;
- threatened indigenous species;
- remnant vegetation;
- wetlands;
- corridors between protected areas.

The Strategy also gives priority to establishing voluntary wildlife refuges and negotiating conservation covenants and heritage agreements between owners, managers and government, and providing sufficient resources, including trained facilitators, on a regional basis to assist in the implementation phase.

Australian Governments have also agreed that there is a need to promote the conservation of biological diversity in urban areas by encouraging retention of habitat.

The major Commonwealth mechanism to achieve these actions will be the Natural Heritage Trust (see section on Article 6). Funding provided by the trust will assist community groups to improve the management of the nation's land, water and vegetation resources and the native animals which rely on these resources. The programmes funded through the trust recognise that management of these resources must be coordinated. Groups seeking funding are encouraged to integrate their activities with other local, catchment and regional activities, particularly where regional strategies and catchment plans exist.

The trust recognises that well-targeted investment and integrated activity at the regional level provide the best opportunity to advance sustainable management and environmental protection. It will assist the development of regional strategies and their implementation. Partnerships will be forged with State and Territory agencies, industries, Local Government, community groups and individual landholders and managers.

The largest trust programme, Bushcare, gives priority to projects which:

- conserve wildlife habitat and biodiversity;
- rehabilitate degraded areas;
- lower saline water tables, improving water quality and wetlands management;
- absorb greenhouse gases;
- create jobs and commercial opportunities through the production of timber, flowers and foliage, oils, fruits and nuts, honey and services, including shade, shelter and pest control.

The Council for Sustainable Vegetation Management has been established as an expert advisory group to advise the Minister for the Environment on national goals and principles for sustainable native vegetation management, priority issues and regions requiring national action, and best practice measures and policy instruments to achieve the aims of Bushcare. The council also advises the Minister on effective mechanisms by which the Commonwealth Government can support State and Territory initiatives to manage native vegetation more sustainably, national research requirements, and a national approach to sustainable farm forestry and native plant species.

State and Territory programmes play a crucial role in achieving national objectives for conserving biodiversity outside protected areas. These programmes are based on a cooperative approach, recognising the important contribution landholders play in biodiversity conservation. A range of voluntary programmes, regulatory mechanisms, and a combination of the two (for example, conservation covenants on land title which are entered into voluntarily but then become binding on the landowner) are used to facilitate biodiversity conservation on private land (see following box).

Land for Wildlife in Victoria

(An example of a voluntary scheme for biodiversity conservation)

The voluntary Land for Wildlife scheme, which began in 1981, is administered by the Department of Natural Resources and Environment. The scheme encourages and assists landholders to manage their land for wildlife or integrate nature conservation with other land management objectives.

The Land for Wildlife scheme seeks to encourage attitudinal change and adoption of an ethic of conserving nature on private land. The scheme has three main thrusts:

- Land for Wildlife registration, which caters for landholders who feel they have a role to play and wish to be kept informed and enthused; registration is a means of providing encouragement and support to landholders;
- a broader scheme which aims to assist landholders to find better solutions to their management problems through protection and enhancement of wildlife habitat;
- provision of cost-effective conservation management of private land supported by education and training programmes.

As at July 1997, there were 4192 properties involved in the scheme, on which 96 182 hectares have been identified by landholders as being managed for wildlife. The registration scheme provides advice to landholders via a team of extension officers supported by Department of Natural Resources and Environment staff and volunteers, newsletters, technical notes and field days. Registration is acknowledged by a certificate and a sign which serves to advertise that the property supports the principles of Land for Wildlife. Land for Wildlife group registration has been recently introduced to encourage cooperative endeavours involving a number of landholders at a landscape level. This concept provides an ideal way for a group formed under Landcare landholder groups pursuing ecologically sustainable management to also become involved in Land for Wildlife, promoting the networking of vegetation and land management community initiatives. Land for Wildlife does not provide financial incentives of its own but offers advice on the assistance available elsewhere. Land for Wildlife is developing strategic plans for regions of the State and has undertaken numerous targeted extension projects relating to key habitat areas.

Source: Ms Frankie MacLellan, Land for Wildlife Extension Officer

Regulations for Biodiversity Conservation – Native Vegetation Act, South Australia

The *Native Vegetation Act 1991* (South Australia) provided the basis for setting up the Native Vegetation Council, which is responsible for making decisions relating to the conservation and clearing of native vegetation. Landholders are required to obtain the consent of the Native Vegetation Council before clearing can be undertaken. Where consent is given to clear isolated plants or scattered trees, conditions requiring revegetation are attached to that consent. The conditions must ensure that the environmental benefits provided by the revegetation significantly outweigh the environmental benefits provided by the vegetation clearing.

One of the main advantages of the Native Vegetation Act is that it allows some clearing for management purposes but in most cases requires a landholder to also set aside an area for conservation. This has two effects. It ensures that areas for conservation are established in areas where clearing is occurring and it also is an education tool as now most people requesting consent to clear land provide an area that they feel can be set aside for conservation.

Local Government

Local Government plays a vital role in educating and mobilising the public towards biodiversity conservation and protection. Local Government initiatives and programmes include the following.

- Conservation programmes aiming to conserve local biodiversity. For example, significant numbers of councils have developed, or are developing, roadside management plans. These plans generally aim to conserve biodiversity on roadsides. In several cases these remnants contain rare and threatened species of flora and fauna. These roadsides also have an important function as wildlife corridors.
- Council reserves are often created for the sole purpose of biodiversity conservation. In addition, councils have given strong support to the creation of other reserves for biodiversity conservation.
- Rate incentives are provided by some councils to encourage landowners to conserve biodiversity.
- Many Councils have incorporated conservation zones and/or other environmental controls on land use, such as controls on removing native vegetation, in their planning schemes.
- Some councils have included biodiversity conservation as a key principle of their conservation/environmental strategy.
- Local Government support for Landcare and similar community-based activities. For example, 69% of councils in Western Australia provide financial support for Landcare; 85% provide in-kind support.

An example of the work of Local Governments is the Brisbane City Council and other Local Governments in south-east Queensland which have developed incentive arrangements linking rebates on rate payments to conservation-focused land development zoning. Some 600 hectares of Brisbane City land has been protected under these arrangements.

Industry

An example of industry working to achieve off-reserve conservation is the RGC Wetlands Centre in Capel, Western Australia. As the following case study illustrates, a low-lying area, which was formerly pine forest and then mined for mineral sands, has been transformed into a self-sustaining wetland for waterbird conservation.

RGC Wetlands Centre: A case study

The severe depletion of wetlands in the south-west of Western Australia due to settlement and agricultural land use provided the impetus and context for the RGC Wetlands project to create a wetlands chain from a series of mineral sand mine pits.

Following mining of low-productivity pine plantation and grazing areas, the company, RGC Limited, was left with a series of freshwater lakes intersecting the ground water table, with a total surface area of approximately 44 hectares. Initial rehabilitation work concentrated on re-establishing pastures and planting trees and shrubs around the lakes. Meanwhile, wetland flora colonised various parts of the lakes and waterbirds visited them.

Source: RGC Limited

Pacific Black Duck—49 species of waterbirds have been recorded at the RGC Wetlands Centre

In 1985 the company commissioned a report by the Royal Australian Ornithological Union. The report identified significant potential for the lakes to develop a self-sustaining wetlands ecosystem for the benefit of waterbird conservation, as well as opportunities for research, education and recreation.

Rather than returning the area to its previous land use or to a maintenance-free bushland, as is usual with mineral sand mining operations, the opportunity was taken to substantially improve the nature conservation values of the whole area, as well as the region in general. The RGC Wetlands project was initiated in 1986 and a management committee with broad community representation was established to oversee its development and management. By 1994, 49 species of waterbirds and 61 species of bush birds were recorded at the centre.

The RGC Wetlands Centre is widely used as an education and visitor centre to raise public awareness of wildlife values and the importance of wetlands conservation. It also demonstrates rehabilitation techniques which can be used for disturbed land. The Science Teachers' Association of Western Australia provides a part-time on-site teacher and has produced an activity book based on the wetlands for primary school students. About 3000 people visit the RGC Wetlands Centre each year.

Threatened species and ecological communities

Objective 1.7 of The National Strategy for the Conservation of Australia's Biological Diversity aims to enable Australia's species and ecological communities threatened with extinction to survive and thrive in their natural habitats and to retain their genetic diversity and potential for evolutionary development, thereby preventing additional species and ecological communities from becoming threatened.

This objective is also the aim of the draft strategy, Conservation of Australian Species and Ecological Communities – A National Strategy. This draft strategy has been agreed by all jurisdictions and is awaiting formal endorsement by the Council of Australian Governments.

The Commonwealth *Endangered Species Protection Act 1992* provides for the development and implementation of recovery plans for threatened species and ecological communities, as well as the development and implementation of threat abatement plans to address key threatening processes. The Commonwealth is implementing an Endangered Species Program, in partnership with the States and Territories. The program involves the following.

Action on species and communities

Action plans and conservation overviews review major plant and animal groups, identify species at risk and develop nationally agreed priorities for conservation action, including amending the list of nationally threatened species in Schedules to the *Endangered Species Protection Act 1992*.

During 1996–97 action plans for marsupials and monotremes, cetaceans and frogs were published, and overviews of non-marine invertebrates and non-vascular plants completed. Action plans for seals and dugong, and conservation overviews of marine fish and invertebrates, and marine plants are currently in preparation.

Threatening processes

The *Endangered Species Protection Act 1992* provides for listing of, and action on, key threatening processes, and the preparation of nationally coordinated threat abatement plans. Threat abatement plans are currently being prepared for the European fox, feral cats, feral goats, rabbits, incidental catch (or bycatch) of seabirds during longline fishing operations, and the dieback fungus *Phytophthora*.

Community education and involvement

Community understanding and support is being encouraged by the Commonwealth through:

- maintaining networks such as the Threatened Species Network which facilitate information exchange and cooperation between government and the community;
- producing and distributing educational materials;
- encouraging community involvement in recovery planning.

Most States and Territories have also introduced legislation and programmes dealing with threatened species and communities (see following box).

Addressing threats to Albatross at the international and national level

In May 1997, the Conference of the Parties to the Convention on Migratory Species adopted an Australian proposal that the eleven species of albatross found in southern hemisphere waters be listed on the Appendices to the Convention. The listing places an obligation on Range States, including Australia, to endeavour to conclude a Regional Agreement for their conservation. It is expected that Australia, as the country which nominated albatross species for listing and as a State already active in seabird conservation, will take the lead in developing an agreement.

The Regional Agreement will complement the actions already taken by Australia and New Zealand within their respective Exclusive Economic Zones, and will provide a necessary and complementary addition to the range of international actions already underway to deal with albatross-fishing interactions. Australia has been active on albatross conservation in the Commission for the Conservation of Southern Bluefin Tuna and the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), and was actively engaged in the development of CCAMLRís Conservation Measures to reduce incidental mortality of albatross in longline fishing.

Domestically, Australia has initiated comprehensive action to overcome the problem of seabird bycatch in long fisheries in Commonwealth areas. The threat has been listed under the *Endangered Species Protection Act 1992* as a key threatening process, and a draft threat abatement plan to mitigate the incidental catch of seabirds during oceanic longline fishing within the Australian Fishing Zone will shortly be released for public comment. The draft threat abatement plan contains specific actions on three key areas: mitigation of the threat, education, and information collection and analysis.

Source: Rosemary Gales, Tasmanian Parks and Wildlife Service

A study funded by the Australian Government in 1993 found that six of the worlds' 14 species of albatross are declining in numbers

New South Wales threatened species conservation legislation

The New South Wales Threatened Species Conservation Act, enacted in January 1996, provides the legislative framework for the conservation of biodiversity in New South Wales.

The Act establishes a variety of mechanisms to conserve and recover threatened species, populations and ecological communities, including recovery planning and threat abatement planning, the identification and declaration of critical habitat, and integration with all stages of the New South Wales planning process. The legislation also provides for the preparation of a State Biological Diversity Strategy to protect the native biological diversity of the State and maintain ecological processes and systems.

The National Parks and Wildlife Service, the lead agency for biodiversity conservation in New South Wales, is responsible for implementing both the Act and the Biological Diversity Strategy. Over the past two years, the service has focused on the following processes:

- Encouraging compliance with the mandatory provisions of the Act, such as licensing and threatened species impact assessment.
- Assisting other government agencies and the community to implement mandatory provisions through policy development, community education programmes, training and assistance with individual projects and initiatives. In 1998 the National Parks and Wildlife Service will conduct a major education campaign for rural landholders, concentrating on the relationship between current agricultural practices and conservation needs.
- Developing operational frameworks and interpretative material relating to a range of Threatened Species Conservation Act mechanisms, such as guidelines for identifying critical habitat.
- Developing strategic approaches to the conservation of threatened species, populations and ecological communities, in consultation with Local Government. The approach has been to promote the early integration of threatened species issues into project planning and strategic land use planning and to link the threatened species components of these assessments to general biodiversity conservation.
- Commencing work on longer term mechanisms such as recovery plans. The National Parks and Wildlife Service proposes to prepare 40 recovery plans each year for the next three years and adapt a further 24 Commonwealth plans for the purposes of the New South Wales legislation. It has also embarked on a major upgrade of the State's wildlife database, which currently contains 550 000 records of threatened flora and fauna species.

There is considerable complementarity between the Commonwealth *Endangered Species Protection Act 1992* and the New South Wales Threatened Species Conservation Act, particularly in terms of the definitions of endangered, vulnerable and presumed extinct species, endangered ecological communities and key threatening processes, and in the processes for recovery planning and threat abatement planning. The Commonwealth Act does not specifically provide for the listing of endangered populations.

The schedules to the New South Wales Act for endangered, vulnerable and presumed extinct species and endangered ecological communities are cross-referenced to indicate where the item also appears in the Schedules to the Commonwealth Act. In addition, the New South Wales Act requires its Scientific Committee to consider listing any New South Wales species or ecological community added to the Commonwealth Act.

Local Government also contributes to the conservation of threatened species and communities through developing conservation strategies, managing conservation reserves, planning controls and incentive programmes, and promoting public education and awareness. Industry is another important stakeholder group as its actions can frequently affect threatened species (see following box).

Biotechnology

The Genetic Manipulation Advisory Committee, a non-statutory body, currently oversees the development and use of novel genetic manipulation techniques in Australia. The committee, which reports to the Minister for Industry, Science and Tourism, coordinates assessment of the risks of new genetically modified organisms, although it does not have legislative force. This approach has worked quite well, but now needs to be enhanced as genetically modified organism products are starting to be commercialised. Other bodies have relevant powers over some aspects of the use of genetically modified organisms, including the Australian Quarantine and Inspection Service and the National Registration Authority for Agricultural and Veterinary Chemicals.

Building on the recommendations of a working party of Commonwealth, State and Territory officials from agricultural agencies, the Commonwealth Government has proposed a package of measures that will be introduced to provide appropriate regulation of gene technology. The package includes the following.

- The proposed establishment of a Gene Technology Office within the Commonwealth. The office would ensure that comprehensive scientific analysis and risk assessment are undertaken before genetically modified organisms are released. The office will coordinate the release of genetically modified organisms by existing bodies, make decisions on release of genetically modified organisms not covered by existing bodies, and regulate gene technology research.
- The establishment of consultations with, and a communication plan for, the public and State and Territory Governments.
- As an interim measure, the establishment of a Gene Technology Liaison Committee to operate alongside the Genetic Manipulation Advisory Committee and provide advice on urgent issues which are not able to be addressed under current regulatory systems.

The Western Pebble-mound Mouse

The Pilbara region in Western Australia is a unique environment in which the Western Pebble-mound Mouse, *Pseudomys chapmani*, was only identified as a separate species approximately 20 years ago. At this time, it was thought that the species was extremely rare, living only in restricted areas of the Hamersley Ranges.

During the environmental assessments undertaken by Hamersley Iron before development of the Marandoo iron ore mine (located in the Pilbara), it appeared as if the presence of this mouse at the proposed mine site represented one of the few large populations of *Pseudomys chapmani*.

As part of the Marandoo Environmental Review and Management Program, extensive work was undertaken to increase the knowledge and understanding of the Pilbara environment, including the mouse. More than 60 scientists and 21 major consulting groups worked on the review and management programme, which was funded and coordinated by Hamersley Iron. Hamersley also funded broad surveys of the distribution of the mouse throughout the region.

This research has shown that populations of the mouse exist over much of the region and the extinction of the species is no longer feared. The research has also contributed substantially to the general knowledge of the Western Pebble-mound Mouse and the Pilbara environment. Identification of certain rocky slopes as the mouse's preferred habitat has allowed these areas to receive special attention in subsequent fauna management studies in the Pilbara.

Extending from this research, Hamersley Iron has developed an environmental kit for School of the Air and other remote area students. The kit takes 11- and 12-year-old students through a 10-week course which provides a general understanding of living things, from biological diversity to rare and endangered species. A population of pebble-mound mice has been established at Perth Zoo, with similar educational objectives.

Staff at the Marandoo Mine are continuing to manage mining areas so that a viable mice population is maintained at Marandoo.

Alien species

Under the National Strategy for the Conservation of Australia's Biological Diversity, Australian Governments have agreed to address alien species through:

- conducting research into the biology and ecology of alien species that threaten biological diversity in Australia;
- coordinating programmes for the control or eradication of those alien species identified as a threat to biological diversity;
- reviewing and, if necessary strengthening, quarantine laws and other regulations, penalties, enforcement and public education arrangements covering the control of the import of species into Australia;
- promoting the use of local indigenous species in rehabilitation and discouraging the use of non-local native species in revegetation schemes.

National Weed Strategy

Weeds are among the most serious threats to Australia's primary production and natural environment. The National Weed Strategy was endorsed in late 1996 by the Commonwealth Government and all State and Territory Governments.

The weed strategy provides the guidelines under which weed management measures can be used more strategically and effectively, integrating the efforts of all stakeholders – government at all levels, industry, landholders and land managers, community groups and the general public. The strategy addresses weed problems of national significance, in particular:

- weed problems which threaten the profitability or sustainability of Australia's principal primary industries;
- weed problems which threaten conservation areas or environmental resources of national significance;
- weed problems where remedial action may be required across several States and Territories;
- weed problems which constitute major threats to Australia's biodiversity.

National Feral Animal Control Program

Feral animals have highly deleterious impacts on both agricultural production and nature conservation.

The National Feral Animal Control Program aims to manage effectively the impact of feral animals on the natural environment and agricultural production.

Major outcomes sought will include integration and institutional outcomes such as the development and implementation of strategies, in an integrated regional/catchment planning process, to control the damage to the natural environment and primary production caused by feral animals. Environmental and sustainable production outcomes will include threat abatement plans for key threatening processes caused by feral animals, development of new techniques and technologies that will allow land managers to control feral animals more effectively, priority setting for future work based on improved knowledge of feral animal management, and the strategic assessment of the status, nature and scale of the impact of feral animals, leading to best practice management.

The Commonwealth, States and Territories will develop best management practices that can then be implemented by State and Territory agencies with responsibility for feral animal control, the National Landcare Program, and community and landholder groups.

Source: C. Potter, Australian National Parks and Wildlife Service

Cats and foxes prey on a wide range of native animals and have been implicated in the decline, if not the extinction, of a number of species

All States and Territories have legislation and programmes in place aimed at controlling or eradicating major or significant alien species (see following box).

Western Shield

In Western Australia, 10 species of native mammals are extinct and around 30 animal species are at risk from predation. Six of these species are now restricted to tiny islands.

Western Australia's Department of Conservation and Land Management (CALM) has successfully pioneered programmes to control foxes to prevent further extinctions, using a toxin which occurs naturally in the south-west of the State and to which native wildlife have developed a high tolerance. This means it is possible to control introduced predators with baits that do not harm wildlife.

These early programmes led to the launch of Western Shield in 1996 to save native animals and return them to areas where they once thrived. It is believed to be the biggest campaign of its kind against feral predators.

Western Shield has an annual budget of $1.5 million and already covers nearly three and a half million hectares of CALM-managed lands. This area will grow to a total of more than five million hectares in key areas around the State. More than 700 000 fox baits have been used to date. Community-based baiting programmes on private land are also being encouraged to boost Western Shield's effectiveness even further.

Under Western Shield, fox-baiting will be carried out on a scale never before attempted and research into feral cat control will be substantially increased. This will allow the natural recovery of native animal populations and, as predators are controlled in target areas, allow species to be returned to former habitats. CALM has also established a number of captive breeding programmes, in collaboration with other agencies, for animals whose numbers are extremely low in the wild.

By the end of the century CALM hopes to return at least 13 native species to more than 40 areas that once formed part of their habitat. Natural recovery will, of course, result in many more species increasing in range and abundance. Some of Western Australia's more vulnerable animal species are already benefiting from fox control.

For example, Woylie numbers have increased to the extent that the species has been removed from the State and Commonwealth threatened species lists in 1996. This was the first time on mainland Australia that the lists have been amended as the result of a recovery plan.

Previously unknown populations of native animals have also increased, leading to an increase in reported sightings. The most significant find to date has been the rediscovery of Gilbert's Potoroo on the south coast. Gilbert's *Potoroo, Potorous tridactylus gilbertii*, had not been officially recorded since 1879.

Source: ©Babs and Bert Wells/CALM

The Western Shield has secured the future of the Woylie

Local Government also contributes to the control or eradication of alien species. The City of Newcastle in New South Wales, for example, has an Environment Management Plan in place which addresses, amongst other issues, the control of pest and weed species. The plan is based on integrated pest management using physical, cultural, biological and chemical methods of treatment.

Sustainable use of wildlife

The management of wildlife in Australia is generally the responsibility of States and Territories. Where export of wildlife products is proposed, the *Wildlife Protection (Regulation of Exports and Imports) Act 1982* requires that an appropriate management regime be approved to ensure the harvesting of the particular species is not detrimental to its survival. In 1996 new regulations outlining the requirements of management regimes came into effect, giving clearer guidance to industry and affected stakeholders.

State and Territory controls also tightly regulate the harvesting of wildlife. In most States and Territories, culling of native animals is usually only permitted where the animal is causing economic hardship to a landholder by damaging crops, pastures and fences. The Northern Territory, however, is examining ways to conserve wildlife through sustainable use.

Source: Environment Australia

The harvesting of kangaroos is strictly regulated in Australia

A Strategy for Conservation through Sustainable Use of Wildlife, Northern Territory

This strategy seeks to enhance the conservation of Northern Territory plants and animals through the development of programmes incorporating their sustainable use.

The Northern Territory Government believes that, with careful planning and responsible management, sustainable use programmes can:

- reduce conflict between conservation and development interests;
- create long-term income-earning capacity from habitats that may otherwise have no economic value and are vulnerable to being destroyed or replaced for other forms of gain;
- create economic incentives to rehabilitate habitats degraded through unsustainable use, feral animals or noxious weeds;
- undermine illegal trade in wildlife;
- provide economic and employment opportunities for people in remote areas, particularly indigenous peoples for whom employment in wildlife industries is consistent with the maintenance of hunter–gatherer traditions and culture;
- increase the knowledge of species and ecosystems;
- quantify the responses of wildlife to use, which can help assess the conservation risks of increased mortality from any source.

The strategy details actions to:

- develop, test and implement management programmes incorporating sustainable use;
- gather information needed to formulate, implement or improve management programmes involving sustainable use;
- identify species and habitats whose conservation can be enhanced by management programmes incorporating sustainable use;
- ensure that indigenous peoples can maintain traditional uses of wildlife and have the option to develop commercial uses on a sustainable basis;

- investigate options for enhancing the role of landowners in wildlife management through cooperative management agreements;
- make information available to the public on conservation, sustainable use, and the operation of management programmes incorporating sustainable use.

Biological diversity and Aboriginal and Torres Strait Islander peoples

Article 8(j) of the Convention requires Contracting Parties, subject to their national legislation, to:

> *respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilisation of such knowledge, innovations and practices.*

Through the Strategy, Australian Governments have agreed to the following.

- Provide resources for the conservation of traditional biological knowledge through cooperative ethnobiological programmes.
- Provide access to accurate information about biological diversity for Aboriginal and Torres Strait Islander peoples, and involve them in research programmes relevant to the biological diversity and management of lands and waters in which they have an interest.
- Ensure that the use of traditional biological knowledge in the scientific, commercial and public domains proceeds only with the cooperation and control of the traditional owners of that knowledge, and ensure that the use and collection of such knowledge results in social and economic benefits to the traditional owners. This will include encouraging and supporting the development and use of collaborative agreements safeguarding the use of traditional knowledge of biological diversity, taking into account existing intellectual property rights; and establishing a royalty payments system from commercial development of products resulting, at least in part, from the use of traditional knowledge. Such arrangements take into account relevant work in international forums such as the United Nations Commission on Human Rights; they should also take into account Australian obligations under the Convention on Biological Diversity.
- Provide resources for the establishment of cooperative species recovery plans for endangered and vulnerable species of particular significance to Aboriginal and Torres Strait Islander communities.
- Recognising that a representative reserve and off-reserve system to conserve biological diversity will extend across the boundaries of Aboriginal and other tenure systems, negotiate cooperative arrangements for conservation management that recognise traditional land tenure and land management regimes.
- Recognising the importance of harvesting of indigenous plant and animal species, both on land and in water, to the well-being, identity, cultural heritage and economy of Aboriginal and Torres Strait Islander peoples, provide assistance for the establishment of management programmes for ecologically sustainable harvesting of wildlife by individual communities.
- Ensure that curricula at all levels in Australia promote an understanding of the importance of traditional knowledge and the social and economic benefits of ethnobiology. This will include an understanding of Aboriginal and Torres Strait Islander practices that have been instrumental in shaping the biological resources of Australia; and an appreciation of the cultural heritage of biological knowledge in Aboriginal and Torres Strait Islander communities.

Programs such as those for identification and monitoring of biodiversity (see section on Article 7), the Indigenous Protected Areas Program, co-management of protected areas (covered earlier in this Article), and measures for customary use of biological resources (see section on Article 10), contribute to implementation of the above actions. In addition, the 1997 National Aboriginal and Torres Strait Islander Rural Industry Strategy includes actions that will allow for economic empowerment of indigenous peoples in various rural enterprises, including those based on the bush food industry.

A number of government policy and inquiry instruments have been formulated which contribute to redressing underlying and fundamental causes of indigenous inequality and disadvantage. These include the 1992 *National Commitment to Improved Outcomes in the Delivery of Programs and Services for Aboriginal Peoples and Torres Strait Islanders*, the 1991 Royal Commission into Aboriginal Deaths in Custody and the 1986 Law

Traditional land management in the Western Desert: A new look at old ways

CRA Exploration (CRAE) began searching for a variety of minerals in the Western Desert in Western Australia in 1972. While exploration activities have had little impact on the environment, early efforts to rehabilitate vehicle tracks and other areas of disturbance were disappointing. In response, CRAE employees began looking at broader ecological problems in the region and talking to Aboriginal people about the issues.

Scientists had noted an alarming decline in the number of native mammals in the desert. This corresponded with the movement of Aboriginal people away from traditional desert life into missions and settlements. With the Aboriginal people went their traditional land management practices, including their use of fire. For thousands of years, Aboriginal people had used fire as an important management tool in the arid regions. The desert was always burnt in small patches, giving a 'mosaic' effect to the vegetation. Some areas would have been recently burnt, others not burnt for many years.

Fortunately, the traditional Aboriginal owners of the land had maintained knowledge about how to conduct mosaic burning. CRAE have now employed these people, together with younger Aboriginal people who did not have the knowledge, to carry out fire-stick farming in rehabilitation areas. This provides an opportunity for the Aboriginal people of the area to earn an income in their own traditional lands and on their own terms. It also provides an opportunity for the younger generation to learn traditional land management skills which would have been lost otherwise.

Reform Commission Report, *Recognition of Aboriginal Customary Laws*. Implementation of these instruments complements the intentions of Article 8 (j).

The Commonwealth Government has agreed to establish a national network of Indigenous Land Management Facilitators to promote indigenous natural resource management activities. These positions are being established under the Natural Heritage Trust. The primary role of the facilitators will be to promote participation in sustainable land management and nature conservation by indigenous peoples. The facilitators will foster a commitment to national, regional and local goals for achieving ecologically sustainable development. They will act as a link between indigenous land managers and other individuals and organisations involved in promoting sustainable land management and conservation. They will also assist with improving the access by indigenous Australians to government programmes and services, including the Natural Heritage Trust.

Article 9 Ex-situ conservation

While the Convention on Biological Diversity emphasises that in-situ conservation is fundamental to the protection of biological diversity, it acknowledges that ex-situ measures also have an important role to play. Ex-situ conservation means conservation outside natural habitats, for example, in zoos, botanic gardens and seed banks. Parties are to take ex-situ measures, while ensuring that ecosystems and natural populations of species are not threatened.

The National Strategy for the Conservation of Australia's Biological Diversity addresses this article of the Convention by committing all Australian Governments to strengthening ex-situ conservation, including the provision of adequate resources to relevant institutions and organisations, by:

- enhancing the Australian Network for Plant Conservation and the Australasian Species Management Program to ensure that those species which require ex-situ measures are being managed effectively;
- establishing or strengthening networks of culture collections of microbial species, including those of medicinal, agricultural and industrial importance;
- encouraging germplasm banks to identify and develop commercial and other applications of germplasm relevant to the conservation of biological diversity, especially those involving the use of plants for rehabilitation.

Australia has established and is maintaining a wide range of measures and facilities for ex-situ conservation purposes through Commonwealth, State and Territory agencies, as well as tertiary institutions and scientific organisations. Important examples of facilities include botanic gardens, seed or gene banks such as the network of plant genetic resource centres and the Australian Tree Seed Centre, aquaria, zoos, microbial collections such as the CSIRO Culture Collection of Microalgae, and the Animal Gene Storage Resource Centre of Australia (see following box).

Animal Gene Storage Resource Centre of Australia

The Animal Gene Storage Resource Centre of Australia was established in 1995 as a joint partnership between the Zoological Parks Board of New South Wales and the Institute of Reproduction and Development, Monash University. The partnership has since expanded to include a number of zoological and academic institutions. The centre has initiated the following conservation and research projects.

Building our genome bank

Cooperative research projects have commenced which include laboratory and field programmes for assisted breeding in selected model Australian mammals, that is, those closely related to endangered species. Techniques developed have enabled the centre to begin collecting and freeze-storing reproductive tissues of related endangered species.

Elephant Conservation Program, Nepal

This project, currently awaiting funding approval, will include a four-year research development and training programme to improve the reproductive performance of the 50 remaining working elephants in the Royal Chitwan National Park.

International 'Save the Black Rhino' Project

The Western Plains Zoo at Dubbo in New South Wales has the largest herd of captive Black Rhino outside Africa. This project involves collecting and freezing semen, and doing biological studies of the reproductive cycles of the females, before introducing assisted breeding to improve fertility results. Progeny produced will be reintroduced to Africa once safe habitats are available.

Endangered frogs

Pilot research studies are evaluating the freezing of amphibian oocytes and embryos in an attempt to preserve the gene base of endangered frog species. Common species are targeted to develop systems that can then be used to save the Green and Golden Bell Frog.

Breeding superior guide dogs

Allied to the wildlife programme, the centre has established an international breeding programme for improving the quality and performance of Australia's Guide Dogs for the Blind. This programme involves utilising gene banks and developing assisted reproductive technology using import semen and embryos from the United States, United Kingdom and Europe, and collections from Australian elite breeders.

Networks such as the Australian Network for Plant Conservation and the Australasian Species Management Program have been established to coordinate ex-situ conservation activities for threatened native plant and animal species respectively. Both seek to ensure that ex situ measures are conducted in the context of in situ conservation. Increased coordination and communication between stakeholders is enabled by the broad cross-sectoral membership of the networks. The membership of the Australian Network for Plant Conservation, for example, includes conservation agencies, botanic gardens, mining companies, researchers, farmers, power authorities, local government and community groups.

The Australian Network of Plant Genetic Resources includes a number of centres which maintain living collections of relevance to the conservation of biodiversity in both Australia and other parts of the world where type specimens are sourced. These include the Australian Tropical Field Crops Genetic Resource Centre, the Australian Tropical Forages Genetic Resource Centre and the Australian Sugar Cane Genetic Resource Centre.

As well as carrying out conservation activities, many of the ex-situ institutions, for example the Australian National Botanic Gardens and the Australian Tree Seed Centre, undertake considerable research on species in their collections or within their sphere of interest.

Reintroduction

The National Strategy for the Conservation of Australia's Biological Diversity commits Australian Governments to integrating ex-situ and other measures for the conservation of threatened species, particularly through research and the development of a strategy for the recovery, rehabilitation and reintroduction of each such species to its natural habitat.

Most States and Territories have captive breeding and propagation programmes as a support to in-situ conservation. For example, the Department of Environment in Queensland maintains a small captive animal breeding programme for Bilbies, Bridled Nailtail Wallabies and Yellow-footed Rock-wallabies, all of which are endangered in Queensland. The main purpose of this programme is to breed animals for reintroduction to their natural environment at appropriate locations and times, and/or to supply researchers or other ex-situ conservation establishments with animals, so that the in-situ populations are not further reduced. Similar programmes exist in other States and Territories, and have had several successes. One such example is the Eastern Barred Bandicoot in Victoria (see following box). Often, programmes involve cooperative efforts between government, industry and institutions such as zoos and universities. For example, zoos have assisted by breeding endangered animals such as the Western Swamp Tortoise, Rufous Hare-wallaby and mallee-fowl for release back to the wild.

Non-threatening collection

The Strategy requires governments to regulate and manage the collection of biological resources from natural habitats for ex-situ conservation purposes to ensure that it does not threaten ecosystems and in-situ populations of species. The taking of threatened species from the wild for ex-situ conservation purposes should occur only when it offers the best chance for, and is directed towards, the long-term survival of the species in the wild.

The collection of wildlife is controlled by relevant Commonwealth, State and Territory legislation.

Eastern Barred Bandicoot recovery programme

Background

By the late 1970s it had become apparent that the Eastern Barred Bandicoot *Perameles gunnii*, one of the few marsupials that are grassland/grassy woodlands specialists in south-eastern Australia, needed a major conservation programme to ensure its survival. Formerly found across the western volcanic plains, from Melbourne to south-eastern South Australia, the species was, by that time, restricted to the Victorian City of Hamilton and surrounds. Initial studies showed that the population was still declining, with the range becoming more fragmented and the population showing signs of stress. Although many young were born each year, very few survived to adulthood.

A management plan was prepared, identifying threats to the Hamilton population. The threats comprised loss of suitable habitat; predation by introduced predators, especially domestic cats; and road deaths. Responses included planting and double-fencing to promote revegetation; providing artificial secure shelters; reviewing plans for clearing of public land areas; initiating a domestic cat management programme with the involvement of Local Government; and identifying and signing bandicoot 'hot spots' on local roads. These activities were all undertaken as part of an intensive community education campaign.

Captive breeding and reintroduction to original habitats

Another strategy was to begin reintroducing bandicoots to original habitats. A captive breeding colony was established at a potential reintroduction site on the outskirts of Melbourne. The bandicoots bred and, by April 1989, reintroduction began with a release to this site and later to a site in Hamilton.

Despite these efforts, the original Hamilton bandicoot population was still declining, and computer modelling predicted that the wild population would become extinct within a decade. The response was to upgrade the captive breeding programme and initiate further reintroductions at selected sites. The Zoological Board of Victoria took over management of captive breeding, and learned that it was possible to keep and breed these bandicoots in a much more 'close-order' environment than used previously. Associated with this new style of husbandry was a detailed review of veterinary practices related to bandicoots and the establishment of a studbook.

Further releases of bandicoots occurred from 1992 onwards. Reintroduction sites have been unfenced, with shooting, 1080 poisoning and experimental cyanide baiting used to control foxes. This appears to be working – in 1997 there were 400–500 bandicoots at seven sites on public and private land. Numbers do fluctuate, in response to climatic conditions, higher than expected levels of predation and demographic variations. Studies on the biology and ecology have revealed much about the capacity of this species to survive in a changing world, and helped us to apply new techniques of population and habitat modelling. However, populations of Eastern Barred Bandicoots in Victoria are still small, isolated and at risk, and the conservation programme must continue for some years yet.

Source: © J. H. Seebeck

Eastern Barred Bandicoot at a captive breeding and re-introduction site, on the outskirts of Melbourne

Article 10

Sustainable use of components of biological diversity

Various measures are to be undertaken by Parties to the Convention on Biological Diversity to promote sustainable use of biological diversity. These include integrating consideration of the conservation and sustainable use of biological resources into national decision-making; adopting measures for the use of biological resources which avoid or minimise adverse impacts on biological diversity; supporting local populations to develop and implement remedial action in degraded areas; and encouraging cooperation between government authorities and the private sector in developing methods for the sustainable use of biological resources.

Integrating biodiversity conservation into national decision-making

The National Strategy for the Conservation of Australia's Biological Diversity commits governments to integrating the conservation of biological diversity into the decision-making of all levels of government, in accordance with the principles of the National Strategy for Ecologically Sustainable Development. This occurs on both a sectoral and cross-sectoral basis as detailed under Article 6.

Customary use of biological resources

The Strategy explicitly recognises the importance of the harvesting of indigenous plant and animal species, both on land and in the water, to the well-being, identity, cultural heritage and economy of Aboriginal and Torres Strait Islander peoples. In response, governments are committed to providing assistance for the establishment of management programmes for ecologically sustainable harvesting of wildlife by individual communities. There are many examples of customary use of biological resources by these groups. Traditional practices by Aboriginal and Torres Strait Islander peoples are allowed and protected on indigenous lands, in various parks and reserves, and on many other lands.

There is increasing recognition of the value of combining traditional indigenous knowledge with modern science. For example, a project in north-east Arnhem Land to produce guidelines for the sustainable use of sea turtles has been developed as a collaborative research effort between the Dhimurru Aboriginal Land Management Corporation, the North Australia Research Unit of the Australian National University, the Northern Territory Parks and Wildlife Commission and Environment Australia. The project recognises the significant role that indigenous peoples have in managing and conserving sea turtles, and in managing Australia's wildlife and lands in general.

A number of States and Territories also have programmes covering customary use of wildlife. In Queensland, for example, the Nature Conservation Regulation 1994 includes provisions which give authority for the traditional use of natural and cultural resources in national parks and other protected areas by Aboriginal and Torres Strait Islander peoples. These authorities recognise the important role that traditional practices play in the life of Aboriginal and Torres Strait Islander peoples, and their continuing traditional affiliations to many protected areas. The granting of an authority ensures that the traditional use of natural resources is ecologically sustainable.

Supporting remedial action in degraded areas

The Natural Heritage Trust (see section on Article 6) will fund a number of initiatives which will support local populations that wish to develop and implement remedial action in degraded areas. In addition, assistance is currently provided to local populations to develop and implement remedial action in degraded areas through various State and Territory Government programmes. Examples of these include Parkcare and Landcare in the Australian Capital Territory (see following box).

Parkcare and Landcare in the Australian Capital Territory: A case study of community involvement

Parkcare and Landcare groups include members of the community who wish to assist with the management of both private and public land.

Parkcare is a volunteer community programme for people with an interest in the natural environment. Parkcare volunteers contribute to protecting natural and cultural sites through activities such as seed collection; plant propagation; tree planting; weed removal; erosion control; vegetation mapping and recording; water quality monitoring; community awareness-raising; and maintenance and restoration of heritage places.

Landcare is an environmental movement where people organise themselves to do something about local land and water problems. Action on the ground is the heart of Landcare. A typical Landcare group has a project site where people monitor the water and wildlife, look after the soil, replant native vegetation, and work to improve the environment. Most community Landcare groups want to involve children in their activities. There are over 100 Landcare groups in the Australian Capital Territory and region.

Parkcare and Landcare are partnership arrangements with typically a substantial hands-on land management component. The level of government agency involvement can vary considerably – from financial support, coordination and guidance (such as a Parkcare group undertaking weed control in a nature reserve), through facilitation and coordination (such as with a school programme pursuing a Landcare goal), to minimal intervention, with participation mainly as a group member (such as a catchment-based Landcare group).

Private sector and industry cooperation

There are a number of forums at all levels of government that facilitate cooperation between government and the private sector. The private sector is represented on a number of boards and other bodies that have been established by government to manage or advise on biological diversity. The National Strategy for the Conservation of Australia's Biological Diversity was prepared in consultation with the private sector and the Biological Diversity Advisory Council, which comprises persons with relevant expertise, representatives of industry, non-government organisations, the scientific community and private individuals, has been established to advise on its implementation. Strategic alliances are being developed with Local Government and industry sectors under Bushcare. Such alliances recognise the potential for the private sector to play a much greater role in biodiversity conservation through sectoral approaches such as developing industry codes of practice, identifying and promulgating best practice measures, and sponsoring better ways of doing business.

Source: Environment Australia

The Biological Diversity Advisory Council advises governments on biological diversity conservation issues, including the ecologically sustainable use of biological resources and the implementation of the National Strategy for the Conservation of Australia's Biological Diversity

As an example of industry and government cooperation, both Kakadu National Park and Uluru–Kata Tjuta National Park have tourism consultative committees comprising tour industry officials, tour operators, traditional owners and park management. These forums provide advice to the park managers on the management of tourism and recreational issues. Another example is the Cooperative Agreement between the Commonwealth Government and the Australian Petroleum Production and Exploration Association, the peak body of the oil and gas industry in Australia (see following box).

Cooperative Agreement between the Commonwealth and the Australian Petroleum Production and Exploration Association

The formal cooperative agreement between the Biodiversity Group of Environment Australia and the Australian Petroleum Production and Exploration Association provides a framework for increasing cooperation between the two organisations so that each might pursue its activities and responsibilities in a more efficient and effective way. The agreement focuses on exchange of information, cooperation in research, and marine management. The two organisations will develop an annual work programme to implement the agreement.

A key to the agreement is the recognition of the importance of consulting the other organisation at the earliest possible opportunity when developing proposals and activities. Examples will include the Biodiversity Group's indicative list of marine reserve proposals, and regulatory and legislative changes. The Australian Petroleum Production and Exploration Association, in turn, will encourage member companies to consult the Biodiversity Group when developing their exploration and development proposals, and will provide its annual list of proposed exploration and production development projects.

Article 11

Incentive measures

The Convention on Biological Diversity encourages Parties to adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity.

In response, the National Strategy for the Conservation of Australia's Biological Diversity requires governments to ensure that there are adequate, efficient and cost-effective incentives to conserve biological diversity. These would include the use of appropriate market instruments and appropriate economic adjustments for owners and managers, such as fair adjustment measures for those whose property rights are affected when areas of significance to biological diversity are protected. Priority should be given to

- protecting areas important for migratory species, threatened indigenous species, remnant vegetation, wetlands and corridors between protected areas;
- maintaining environmental conditions, including associated flora and fauna, for the conservation of microbial diversity;
- establishing voluntary wildlife refuges and negotiating conservation covenants and heritage agreements between owners and managers and governments, and providing sufficient resources, including trained facilitators, on an area or regional basis to assist in the implementation phase.

Australia has a range of programmes in place which provide incentives for biodiversity conservation. These can be considered under the following categories.

Motivational, educational and information instruments

These encourage attitudinal change and the adoption of an ethic of biodiversity conservation. The Commonwealth and all States and Territories have education and public awareness programmes in place (see section in Article 13).

Voluntary instruments

Most States and Territories operate voluntary programmes where participants will agree to adopt certain measures or restrictions to conserve biodiversity (see, for example, the Land for Wildlife case study in Article 8). Some of these programmes provide incentive payments, such as for fencing remnant vegetation.

Regulatory instruments

The Commonwealth, States and Territories have a wide range of regulatory instruments in place which seek to achieve the conservation and sustainable use of biodiversity. These include, for example, controls on clearing native vegetation on private land (see section on Article 8), fishing quotas and restrictions, land use controls which restrict development in areas of high conservation value, and export controls over wildlife.

Property-right-based instruments

These include a number of measures which may contribute to conserving biodiversity by either restricting property rights or by allocating rights in a way that will lead to the conservation and sustainable use of biodiversity. These include, for example:

- covenants over private land which restrict certain land uses and which bind subsequent owners (see section on Article 8);
- granting of ownership rights to resources (for example, legislation in Victoria allows the separation of tree and land ownership as a way of encouraging commercial tree planting on private land);
- transferable fishing quotas (see following box);
- transferable development rights;
- transferable water entitlements to be developed through the Council of Australian Governments water reform process.

The use of transferable quotas in the Australian fishing industry

Australia actively pursues the use of economic instruments for fisheries management. The Commonwealth considers that output controls (using total allowable catch limits and individual transferable quotas) are the best method of protecting stocks and achieving an efficient and sustainable fishery. The advantage of individual transferable quotas is that they allow operators in the fishery to adjust to their most efficient level, while maintaining sustainable catch levels.

Currently there are four Commonwealth fisheries that are managed using individual transferable quotas – the Southern Blue Fin Tuna Fishery, the South-east Trawl Fishery, the South-east Non-Trawl Fishery and the Macquarie Island Fishery. Individual transferable quotas have had differing degrees of success in each of these fisheries. The establishment of a system of tradeable access rights such as individual transferable quotas is an important step toward ensuring that a fishery resource is exploited in an economically efficient way. It does not, however, guarantee that the resource is being exploited efficiently. Provided a number of preconditions are met, individual transferable quotas remain the preferred form of fisheries management, in line with Commonwealth Government and Australian Fisheries Management Authority policy.

Price-based and financial instruments

These types of instruments are in common use by the Commonwealth Government and State and Territory Governments. The following are some examples.

- **Bushcare – The National Vegetation Initiative**. Bushcare will provide incentives for land users to conserve biodiversity outside the reserves system, in particular, by encouraging the sustainable management of remnant vegetation. This will involve innovative combinations of rate relief (working through Local Government), management agreements or covenants, direct subsidies for fencing, and technical support to extend best practice management of bushland remnants (see also Article 8).

Source: Environment Australia

Bushcare will encourage the sustainable management of remnant vegetation outside reserves

- **Rate rebates and concessions**. A number of Local Governments are providing incentives to landowners for protecting habitat and endangered species. The incentives provided are usually in the form of concessions on land rates. For example, in Western Australia the *Local Government Act 1995* allows Local Governments to impose differential rates on land for a range of activities, including Landcare. Land Conservation Zones can be declared through town planning schemes, with reduced rates applying in these zones.

  The use of concessions promotes biodiversity conservation in two ways. Firstly it removes a perverse incentive to develop land as rates are often based on the potential value of land assuming that the land can be developed for commercial purposes without consideration of biodiversity objectives. Secondly, it provides a positive financial benefit and hence community recognition of the conservation effort being made by private landholders.

- **Donations**. Taxation deductions can be made for cash contributions to non-government organisations listed on the Register of Environmental Organisations.
- **Income tax**. Deductions allowed under the *Income Tax Assessment Act 1936* provide incentives which may help to conserve and sustainably use biodiversity. While costs of conserving biodiversity are not explicitly provided for, full deductibility in the year of expenditure is available for a number of activities that may provide biodiversity conservation benefits, for example, controlling pests and weeds, fencing out degraded areas, and fencing areas identified in an approved management plan.

Using a revolving fund to conserve biodiversity in Victoria

The revolving fund concept involves the purchase of land, application of a statutory covenant to protect conservation values, and resale to a sympathetic purchaser. The concept is still in its infancy in Australia, but it has been used for several years with success by Trust for Nature (Victoria), a statutory authority in Victoria that has operated for 25 years with a charter to conserve remnant vegetation on private land. Through its statutory status, the trust is exempt from stamp duty on property purchases and sales. The trust's non-government status is also important in attracting sellers and purchasers to the scheme.

Before acquiring land for the revolving fund, the trust assesses its conservation significance and marketability. Experience has shown that land on the fringes of conservation reserves are readily marketable. These properties typically attract sympathetic owners who make good managers, control pest plants and animals and maintain the conservation value of the property, providing a valuable buffer to the reserve. Purchasers are also attracted to other areas, including very remote areas.

The trust is able to keep transaction costs low by maintaining a schedule of interested purchasers and marketing land themselves through conservation journals at no cost. It recognises that it may suffer a loss on some properties, particularly if it means a better outcome for conservation such as forgoing a subdivision. To date, with five properties sold and a further five for sale—a total value of the 10 properties in excess of $600 000—the trust is close to break even. The programme is attractive to donors and bequests as it allows the use of donated funds over and over to provide permanent conservation protection on private land.

Article 12 Research and training

Article 12 of the Convention on Biological Diversity requires Parties to establish a research and training base which contributes to the conservation and sustainable use of biological diversity and promotes international cooperation in research. Parties should also take into account the special needs of developing countries in providing support to research and training activities.

In a country as vast and diverse as Australia, the collection and analysis of data and information to assist decision-makers is a major challenge. There are many gaps in knowledge of the continent, its physical and biological resources, and the impacts of human activity on the environment. These gaps are perhaps most pressing at the local, State and Territory level.

The National Strategy for the Conservation of Australia's Biological Diversity recognises that:

> *Full and effective implementation of many of the actions identified in the Strategy requires considerable improvement in our knowledge and understanding of Australia's biological diversity in terrestrial, marine and other aquatic environments.*

In response, the Strategy includes a number of actions which seek to: 'Provide the knowledge and understanding of Australia's biological diversity essential for its effective conservation and management'. These include:

- coordinating, collating and synthesising available data and information from collections, survey results and geographic information systems to provide a basis for assessing research needs and priorities;
- establishing a joint Commonwealth, State and Territory programme to carry out rapid assessment of Australia's biological diversity;
- carrying out research which assists resource use industries to integrate the protection of biological diversity and other ecologically sustainable use objectives;
- supporting research in conservation biology, including ecology and physiology, aimed at maintaining biological diversity and identifying patterns of genetic variation within and between species;
- accelerating research into the taxonomy, geographic distribution and evolutionary relationships of Australian terrestrial, marine and other aquatic plants, animals and micro-organisms, giving priority to the least known groups, including non-vascular plants, invertebrates and micro-organisms;
- facilitating and supporting the development of collaborative taxonomic training programmes by existing institutions such as museums, herbaria and universities;
- establishing a national coordinated programme of long-term ecological monitoring (see section on Article 7);
- recognising the value of the knowledge and practices of Aboriginal and Torres Strait Islander peoples and incorporating this knowledge and those practices, where permitted, in biological diversity research and conservation programmes;
- ensuring that information about Australia's biological diversity is readily accessible for national and regional planning, development, management and decision-making.

Commonwealth Scientific and Industrial Research Organisation

Research, education and training programmes relating to the conservation and sustainable use of biological diversity are undertaken by a wide range of institutions in Australia. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is Australia's largest research organisation, with a staff of 7200 located throughout Australia and a budget exceeding A$700 million.

It conducts strategic research in the national interest across a very broad range of fields, including natural resources (and forests), rural production and processing, minerals and energy, environment, manufacturing and information technologies.

Research on biodiversity is organised in the following broad areas:

- knowing our biodiversity;
- the functional role of biodiversity;
- using biodiversity;
- sustainable tourism;
- conserving and monitoring biodiversity;
- integrating biodiversity with resource management;
- managing environmental pests, weeds and diseases.

Recent research work on biodiversity by CSIRO has contributed to:

- integration of biological control of *Salvinia* water weed into the management system at Kakadu National Park, Northern Territory;
- monitoring of the health of freshwater ecosystems using bio-indicators;
- action by the shipping industry and port authorities to deal with the pest risks of ballast water;
- adoption of fire and animal management plans, developed with Aboriginal people, at Uluru–Kata Tjuta National Park;
- software for handling unlimited size data sets of biodiversity characteristics, in worldwide use;
- utilisation of rapid biodiversity assessment techniques in the forest Comprehensive Regional Assessment process and in Papua New Guinea;
- establishment of a comprehensive incentives framework for off-reserve conservation.

Cooperative Research Centres

Cooperative Research Centres (CRCs) are collaborative research ventures bringing together researchers from universities, the public sector and business. The objective of the CRC Program is to maximise the capture of the benefits of research through the development of cooperative linkages between researchers and research users in the public and private sector. The Commonwealth Government contributes approximately $140 million per year, through the CRC Program, to the centres. Industry has already made commitments of more than $400 million for the period of the seven-year contracts.

CRCs are now forging strong strategic international links based on the high international regard for CRC researchers. Under these arrangements, both international companies and research agencies are developing long-term strategic research relationships with CRCs.

Source: D. McKillop

Blue Pullers and Yellow Damsels on Bowden Reef

CRCs undertake collaborative research and education programmes in the fields of natural sciences and engineering, with a strong focus on commercial and other applications. The following have particular relevance to biodiversity.

CRC for Biological Control of Vertebrate Pest Populations

This centre is developing a new method of biological control that will reduce the birth rate of feral pests, initially targeting the rabbit, fox, and mouse.

CRC for Ecologically Sustainable Development of the Great Barrier Reef

This centre is working with industry and environmental managers to address strategic issues relating to the ecologically sustainable development and multiple use of the Great Barrier Reef region. The research programmes are investigating the status of the Great Barrier Reef environment and its relationship to a wide range of regional and local external and internal stresses.

CRC for Freshwater Ecology

This centre exists to provide the ecological basis for the sustainable management of Australian temperate region surface water. It has a number of relevant research programme areas:

- flowing waters – establishing an understanding of the major processes and organisms involved in the ecology of our rivers and streams;
- flood plain and wetland ecology – understanding the interaction between healthy rivers, their flood plains and flooding;

- water quality and ecological assessment – developing cost-effective and improved methods for assessing river health;
- fish ecology – understanding the recruitment processes in native fish populations, the stream flow needed to sustain fish communities and habitats in regulated rivers, fish migration and techniques for providing fish passage at barriers, threatened species, fish as monitoring tools and the ecological effects of alien species such as carp in freshwater.

CRC for Tropical Rainforest Ecology and Management

This centre's research efforts are bringing a deeper understanding of Australia's tropical rainforests and help ensure the ecological sustainability of rainforest resources for commercial and recreational uses. Research focuses on biodiversity and dynamic processes of tropical rainforest ecosystems to develop systems of management for the rainforest heritage. It contributes to the development of scientific and economic strategies for rehabilitating degraded land and sustainable rainforest tourism in the wet tropics.

CRC for the Sustainable Development of Tropical Savannas

This centre undertakes research and education to enhance the sustainable development of Australia's tropical savannas through research programmes which serve the major stakeholder groups – pastoralists, the mining and tourism industries, Aboriginal landowners and conservation interests. A programme determines how soil, water and nutrient availability and natural or human disturbances affect the occurrence and productivity of trees, grasses and other savanna plants, and studies water availability to, and water use by, the vegetation to allow limits to be set on savanna use without compromising sustainability.

A second programme examines the diversity of plants and animals of the savannas and determines the importance of vegetation patches in the savannas in maintaining biodiversity and how savanna use affects them.

A third programme identifies 'indicators' that can be used to predict how the land and its flora and fauna may change under various uses, when it will change, and how long it will take to occur.

CRC for Conservation and Management of Marsupials

This centre's programmes are gaining an understanding of fundamental aspects of marsupial reproduction and genetics strategic to the development of practical conservation and management tools and policies. These include gamete maturation and fertilisation and their endocrine regulation; genetic characterisation of reference species; applied research to develop such practical skills as hormone-based manipulation of reproductive activity, semen collection, assessment, storage and artificial insemination; and knowledge of processes threatening rare or endangered marsupials. The centre is also developing humane methods of population control for marsupials suitable for application to the different problems of Australia and New Zealand.

Australian Antarctic Division

The Australian Antarctic Division undertakes research programmes in glaciology, terrestrial and marine biology, human impacts, atmospheric and space physics, and polar medicine, as well as providing support for the research programmes in Antarctica of other organisations. Research projects in the biological sciences are based around the following themes:

- ecosystem structure and function;
- conservation and biodiversity;
- global change and the biota;
- local change and the biota;
- management of Antarctic living resources.

Australian Geological Survey Organisation

To further improve the level of knowledge about Australia's biological diversity, the Australian Geological Survey Organisation is heavily involved in geomorphological research of terrestrial and marine environments.

Australian Geological Survey Organisation Coastal is the main national coastal geoscience mapping body, and has developed a number of highly specialised remotely sensed technologies for enhancing shallow-water habitats and coastal lowland environments. The group is about to embark on a programme in Arnhem Land at the invitation of the Northern Land Council's Wetlands Project, which aims to provide some predictive capacity about likely changes in biodiversity due to global warming-induced rise in sea level.

Other research programmes

Other Commonwealth bodies such as the Environmental Research Institute of the Supervising Scientist (part of the Commonwealth Environment Portfolio) and the Land and Water Resources Research and Development Corporation (part of the Commonwealth Primary Industries portfolio) fund and manage research. The Australian Biological Resources Study operates a research grant scheme to support the documentation of Australia's biological diversity and to improve and increase the national taxonomic effort. The intent of the scheme is to support rigorous taxonomic treatment at species level and work contributing to regional or continental generic or higher level reviews, including the development of identification tools.

There is a variety of research on projects relating to the impacts of climate change on biodiversity which has been carried out under the Commonwealth's Climate Change and National Greenhouse Research programmes. The projects aim to enhance our knowledge of the likely impacts of climate change so that environmental, economic and other costs and benefits of climate change can be identified, and inform decisions which are made on mitigative and adaptive responses. The outcomes of these projects are disseminated to various audiences through a variety of publications.

In addition to their input to CRCs, tertiary institutions carry out a wide range of research programmes which address biodiversity issues. Many of these programmes are well regarded internationally. State and Territory Governments, museums and herbaria, and a number of private bodies, including industry, also have extensive research programmes (see following box).

The Australian Museum

The Australian Museum is one of the largest research institutions in Australia, dealing with systematics and taxonomy of Australian fauna. Through the Centre for Evolutionary Research and the Centre for Biodiversity and Conservation Research, the museum is now a major contributor to biodiversity assessment and monitoring. It is currently involved in several major biodiversity conservation projects, including:

- a study of habitat networks in western New South Wales to determine whether small isolated patches of remnant vegetation are significant for conservation purposes;
- formulation of guidelines for reserve selection using genetic criteria for vertebrates;
- work with museums across Australia to test whether animal distributions are correlated with biogeographic regions;
- development of a major public exhibition on the biodiversity of Australia, scheduled to be opened in 1998.

Article 13 Public education and awareness

Article 13 of the Convention on Biological Diversity requires Parties to promote and encourage understanding of the importance of, and the measures required for, the conservation and sustainable use of biodiversity. The Convention also encourages international cooperation in developing educational and public awareness programmes.

The National Strategy for the Conservation of Australia's Biological Diversity commits governments to increasing the availability and accessibility of information about biological diversity, including the need and methods for its conservation and the current and potential benefits it can provide. Governments are also required to facilitate greater public involvement and participation in measures to conserve biological diversity.

Governments have provided a leadership role in promoting environmental education by focusing upon public awareness, information and education initiatives, in addition to encouraging a coordinated approach to the formal education sector.

The Commonwealth Department of the Environment, for example, produces a range of general and specific information materials about Australia's biodiversity. An example of this is the Biodiversity Series, which provides information relating to all aspects of Australia's biodiversity – why it is globally significant, the conservation status of its components, threatening processes and current levels of knowledge. A wide range of material is also produced by State and Territory Governments.

Education

A priority action in the Strategy is to have in place in primary, secondary and tertiary curricula, by the year 2000, clearly defined elements on the conservation of Australia's biological diversity, emphasising the inter-relationships between disciplines.

Since 1988, at the instigation of the Australian Education Council, the Commonwealth Government and State and Territory Governments have worked together on a major national education initiative to produce statements and profiles in eight broad areas of learning. Two of these are relevant to biodiversity and are detailed below:

- Science;
- Studies of Environment and Society.

National Curriculum Statements and National Curriculum Profiles supporting these areas of learning were published in 1994. They were developed after extensive consultation between parents, teachers (from both government and non-government schools), teacher educators, professional associations, subject and discipline specialists, curriculum developers, community groups, employers and unions.

These National Curriculum Statements provide a framework for curriculum development in each broad area of learning. They define the broad scope, outline the essential elements of the curriculum, show what is distinctive about the area of learning, and describe a sequence for developing an individual's knowledge and skills. Examples of some of the education initiatives are described below.

- The curriculum statement for Science, called 'Life and Living', identifies biodiversity: change and continuity as one of the key concepts to be taught.
- The curriculum statement for Studies of Environment and Society involves the study of natural surroundings, such as ecosystems, and social surroundings, such as the built environment, in different places at different times.

Tertiary education in Australia is the responsibility of the Commonwealth Government, while actual curriculum development is the responsibility of the various individual tertiary institutions. It should be noted that some tertiary institutions are now offering Australian students courses with a biodiversity focus.

To further raise public awareness and knowledge of the need to conserve Australia's biological diversity, the Commonwealth Government has implemented programmes which enhance the professional development of teachers in Australian schools.

These programmes stimulate teachers' environmental awareness so that their knowledge and skills can be passed on to Australian students. Examples of such programmes include the National Professional Development Program and the Projects of National Significance Program.

In June 1995 a project was funded by the Standards and Curriculum Council through the Aboriginal and Torres Strait Islander Curriculum Consortium based at the Far North Queensland Institute of Technical and Further Education in Cairns. This project, called 'Caring for Country' Curriculum Development Project, is aimed at developing a nationally recognised curriculum for courses in the vocational education and training sector for indigenous peoples to assist them to work in caring for country.

Australian Environmental Education Network

The Australian Environmental Education Network establishes a national network of environmental education and information programmes, materials and publications.

The network includes access to:

- materials and programmes produced from within the Commonwealth Environment portfolio;
- State and Territory environmental education resources;
- lists of current school and community environmental programmes;
- environmental programmes for schools available through the Internet;
- links with tertiary resources;
- a bulletin board for the exchange of ideas.

The network will expand to include additional material as it comes on-line.

Public awareness

The Strategy commits Australia to raising the awareness of the broader community about biodiversity issues and motivating all sectors of society to make commitments to sustainable practices.

The Natural Heritage Trust (see Article 6) provides funding for environmental activities at the community, regional, and State and Territory levels. Local communities, in particular, will have a greater opportunity to participate in conservation by identifying sites for environmental action and applying for funding to conserve, protect, rehabilitate and better manage local areas. Such initiatives heighten public awareness of the need for environmental protection and ecologically sustainable agriculture.

Another important aspect of the educative and awareness-raising functions of the trust has been the establishment of regional and community-based facilitators in the various programmes of the trust such as Bushcare, Landcare, Rivercare and Coastcare. For example, the Bushcare facilitators are a network of regional facilitators with vegetation management and biodiversity expertise. They play a key role in assisting communities and government agencies to develop integrated regional strategies to address biodiversity conservation and sustainable land management.

Source: Environment Australia

Waterwatch helps to provide communities with the knowledge, skills and tools they need to care for their catchments

Community Biodiversity Network

The Community Biodiversity Network was established by the Humane Society International, with Commonwealth support, to increase public awareness of biodiversity issues and to disseminate information on biodiversity conservation through a broad network of community organisations. The network has a strong focus on raising awareness of government policies and activities to conserve biodiversity. Its outputs to date include:

- a bi-monthly *Australian Biodiversity Bulletin* distributed in hard copy and via the Internet to an expanding network of groups and individuals;
- articles published in newspapers, magazines and newsletters;
- promotion of biodiversity conservation through speeches, workshops and other forums;
- provision of advice to the Humane Society International member of the Biological Diversity Advisory Council, conveying community views to the council, and providing information on council outcomes via the network.

State and Territory Governments also have a range of programmes in place to increase public awareness of biodiversity conservation and sustainable use. Many programmes target and actively involve school children, the next generation of adults. Frequently, these programmes also provide considerable benefits to the community.

Source: Stuart Humphries, The Australian Museum

'Earth Alive 97' celebrated Australia's biodiversity and its conservation. One of its major events was a nationally broadcast panel discussion 'Earth Alive! Confronting the Challenge of the 21st Century' held by The Australian Museum Society, the British Council, and the Community Biodiversity Network. The panel involved top scientists, a farmer lobbyist, ecotourism and sustainable development experts, and a green economist.

City Beach Primary School, Western Australia

City Beach Primary School has been involved in Landcare activities since 1989. The school has developed successful award-winning programmes through the involvement of students, teachers and parents in practical ecological projects, which are integrated into all aspects of the school curriculum. The City Beach Primary School model has been successful in educating students utilising on-ground activities as educational resources, while raising environmental awareness in their parents and other community members. A great strength of the school's programmes is the involvement of scientists at a community level, which ensures that practical ecological projects are developed which deliver solutions to environmental problems. The Bush Guardians, a children's ecological club and winner of the 1995 State Landcare Award, have become an integral part of Landcare activities in the school and community.

State of the environment reporting

State of the environment reporting provides information on biodiversity to the public, industry, non-government organisations and all levels of government. It allows regular reports on changes and trends in agreed sets of national indicators of environmental condition, in much the same way as well-accepted economic indicators are used to report on the state of the economy. Australia's first national State of the Environment Report was published in 1996 (see section on Article 7). An education kit based on all the main chapters of the 1996 report was released in November 1997 for primary and secondary school children.

The Environment Resource Officer Scheme

The Environment Resource Officer Scheme has been operated by the Commonwealth Environment Department for the past five years as a primary mechanism for the delivery of information on Commonwealth environmental policies to Local Governments. The scheme places dedicated environmental officers in each of the peak State Local Government Associations and, as of July 1997, an eighth (the national Environment Resource Officer) in Environs Australia (the Local Government Environment Network).

The Commonwealth provides funding for salaries and part of the direct costs of employing the officers, such as travel, and coordinates the scheme. The host organisations are expected to cover the remaining costs of the Scheme.

The main role of the Environment Resource Officers is to promote and disseminate information on Commonwealth Government environmental programmes and policies to Local Government. They operate as a one-stop-shop for Commonwealth environmental programme information. They are also increasingly involved in State, Territory and regional level programmes and committees in which the Commonwealth has an interest, and with community consultative committees, thus providing a direct link between the Commonwealth and the interests of local communities.

In addition to their principal role, the Environment Resource Officers are expected to generally assist Local Government with environmental management, and to encourage the incorporation of environmental and sustainability principles into the core business of councils. They also facilitate communication between councils, providing a linkage point, not only between councils within each State and Territory, but also across State and Territory boundaries, by regularly communicating with each other. The scheme is expected to provide a visible sign of Commonwealth involvement with, and support for, Local Government's environmental management role.

The scheme also provides an intelligence gathering and consultation service for the Commonwealth Environment Department, with Environment Resource Officers regularly reporting back on Local Government responses to Commonwealth initiatives and on the incorporation of environmental and sustainability factors into general Local Government operations.

Environment Australia's website can be found at http://www.erin.gov.au

Environment Resource and Information Network

The Environment Resource and Information Network is a national facility available on the Internet which facilitates the electronic publication of Environment Australia's biodiversity documents, thus allowing the public ready access to a wide range of key information on the Australian environment. Areas on the web site of interest include biodiversity, the Natural Heritage Trust, marine, Environment in Government, and state of the environment. Comprehensive text search facilities are provided as part of the web site and ensure the rapid and accurate recovery of information across the entire range of documents maintained by the various agencies within Environment Australia.

The network has constructed advanced spatial search facilities that allow information to be extracted from on-line databases via a simple mouse click on the area of interest. Databases that can already be queried in this manner include the Register of the National Estate, Australian Public Lands and Protected Areas, Nature Conservation Reserves and the Environment Resource and Information Network species database.

The address of the web site is: http://www.erin.gov.au/erin.html. Article 17 contains further information on the network.

Article 14

Impact assessment and minimising adverse impacts

Under Article 14 of the Convention on Biological Diversity, Parties are to introduce appropriate procedures for environmental impact assessment of projects, programmes and policies that are likely to have significant adverse effects on biological diversity. The Convention also provides for the notification of activities which are likely to significantly damage biological diversity, and the promotion of emergency response arrangements.

Environmental impact assessment procedures

The National Strategy for the Conservation of Australia's Biological Diversity commits governments to:

> *Ensure that all governments make environmental, including biological diversity, impact assessment procedures an integral part of policy formulation, planning and development activities.*

The *Commonwealth Environment Protection (Impact of Proposals) Act 1974* seeks to ensure that matters affecting the environment to a significant extent are fully examined and taken into account in Commonwealth Government processes. Environmental impact legislation is also in place in each State and Territory. The application and scope of such legislation vary considerably between jurisdictions.

To support greater consistency in the application of environmental impact assessment processes, in 1996 the Australian and New Zealand Environment and Conservation Council developed *Guidelines and Criteria for Determining the Need for and Level of Environmental Impact Assessment in Australia*. In addition, the Intergovernmental Agreement on the Environment provides a mechanism for the Commonwealth and States and Territories to accredit their respective assessment processes, and emphasises the need to avoid duplication. Under the Intergovernmental Agreement on the Environment, the Australian and New Zealand Environment and Conservation Council has also developed a 'Basis for a national agreement on environmental impact assessment' to provide a general framework for the administration of environmental impact assessment for proposals that involve, or are likely to involve, more than one jurisdiction. The Council of Australian Governments has not yet endorsed this document under the intergovernmental agreement.

Governments have also introduced a range of policies and guidelines that support or complement their environmental impact assessment legislation, for example, those developed to help conserve wetlands in Western Australia (see following box). At the local level, planning legislation in each State or Territory generally requires bodies making decisions on development applications to consider environmental impacts. This is in addition to any requirements that might apply under environmental impact assessment legislation.

Minimising impacts on wetlands, Western Australia

The Western Australian Environmental Protection Authority, through its environmental impact assessment (EIA) process, seeks to minimise the impacts of urban, industrial, agricultural and other developments on the values and functions of wetlands in Western Australia. Where substantial impacts are unavoidable, there is a requirement for replacement of those values and functions, either in the same locality or, if that is not practicable, elsewhere. Alternatively, the requirement may be to secure other comparable wetlands within the local area for conservation. A recent example of this policy in practice is the requirement for the Main Roads Department to fund the purchase of around 180 hectares of land containing approximately 100 hectares of wetlands for inclusion in the proposed Jandakot Botanic Park as compensation for the loss of wetlands associated with extension of the Kwinana Freeway south of Perth.

The Environmental Protection Authority and the Department of Planning and Urban Development (now the Ministry for Planning) have jointly developed a set of guidelines for use by planners so that environmental impacts can be better managed where development is to proceed. The 1994 document, *Environmental Planning, Referral and Implementation Guidelines*, pays particular attention to the needs of wetlands and provides guidance on such aspects as identifying the presence of a wetland and determining its boundary, defining the extent of a wetland buffer, determining wetland management categories and managing likely impacts.

The Strategy also requires that EIA procedures allow for informed and comprehensive public participation. Mechanisms for public involvement in determining matters that should be considered in EIAs and in reviewing environmental documents are included in the various legislation that covers EIA in each jurisdiction. The establishment of Consultative Committees to guide the preparation of Environment Effects Statements for major developments in Victoria have been particularly useful in ensuring the document produced addresses a wide range of concerns (see following box).

Environmental impact assessment— The use of Consultative Committees

Under Victorian law, the Minister for Planning decides on the need for an Environment Effects Statement on a case-by-case basis and determines the procedure to be followed during the EIA process, including the requirements for advertising and the use of public inquiries. Since 1990 the Minister has established a Consultative Committee for each Environment Effects Statement.

The purpose of the Consultative Committee is to guide the preparation of the Environment Effects Statement so that it addresses key issues and provides a fair treatment to them. They give parties with an interest in the proposal an opportunity to exchange views and have an input into the information provided to the public and decision-makers. The committee will generally be chaired by an officer from the Office of Planning and Heritage in the Victorian Government and often include:

- the proponent, and his/her consultants;
- relevant government departments;
- Local Government in the area in which the proposal is located;
- conservation groups;
- relevant community groups;
- economic development bodies;
- indigenous groups.

The input from Consultative Committees during the preparation of Environment Effects Statements has frequently resulted in changes to the proposal and/or a more thorough examination of key issues, which has resulted in greater public acceptability of the project and a lessening of environmental impacts.

Assessment of imported species

Through its administration of the *Quarantine Act 1908*, the Australian Quarantine and Inspection Service helps to fulfil Australia's obligations under a number of international treaties which promote safe trade in animals and plants and their products. Powers under the *Quarantine Act 1908* are limited to actions relating to pests and diseases of animals, plants and humans. In accordance with Australia's international obligations under the World Trade Organization's Agreement on the Application of Sanitary and Phytosanitary Measures, the Australian Quarantine and Inspection Service's role is to protect Australia from pests and diseases with measures which are either consistent with relevant international standards or which are based on scientific information, risk assessment and a consistent approach to risk management. If scientific evidence does not exist, quarantine measures may be applied on a provisional basis.

The Australian Quarantine and Inspection Service conducts its import risk analyses in accordance with standards developed under the International Plant Protection Convention and the World Organisation for Animal Health. Impact of any proposed new importation on the environment is one factor which is considered in the import risk analyses. The scope of the International Plant Protection Convention is limited to actions against quarantine pests, which are defined as 'pests of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled'.

In some areas, risk assessment methodology has been developed in conjunction with Environment Australia. The recently adopted Weed Risk Assessment system which the Australian Quarantine and Inspection Service uses to assess the weed potential of new plant species proposed for importation was approved by the Standing Committee on Conservation.

Many Australian Quarantine and Inspection Service programmes by their nature incidentally protect Australia's biological diversity. For example, ballast water is managed because it is a possible vector for unwanted marine pests and diseases. This management also helps prevent the entry of other organisms which may threaten biological diversity, even if they do not present a significant threat to human health or the economy.

Environment Australia, through the *Wildlife Protection (Regulation of Exports and Imports) Act 1982*, has a role with the Australian Quarantine and Inspection Service in relation to the assessment and control of imported live animals, which may include genetically manipulated organisms, to assess whether their importation may introduce exotic pests or diseases. Protocols have been developed for assessing a range of organisms including biological control agents, birds and fish. Import application forms issued under the *Quarantine Act 1908* now require prospective importers to state if a proposed import is a genetically manipulated organism or is derived from a genetically manipulated organism and, if so, permits issued draw attention to an importer's responsibility to comply with Genetic Manipulation Advisory Committee Guidelines.

International obligations

Article 14 of the Convention requests Parties to put in place measures to promote, on the basis of reciprocity, notification, exchange of information and consultation on activities under their jurisdiction or control which are likely to significantly affect adversely the biological diversity of other States or areas beyond the limits of national jurisdiction, by encouraging the conclusion of bilateral, regional or multilateral arrangements, as appropriate.

Emergency response arrangements and contingency plans exist at the national, State, Territory and local level for various activities and events such as oil spills and fire. For example, a number of regional arrangements have been put in place to cover marine pollution.

Article 15 Access to genetic resources

Genetic resources are defined as 'any material of plant, animal, microbial or other origin containing functional units of heredity of actual or potential value'. The Convention on Biological Diversity recognises the national sovereignty of Parties over their genetic resources and encourages them to facilitate access to those resources for environmentally sound uses. The Convention aims to promote the fair and equitable sharing of benefits arising from the use of genetic resources by Parties which are not countries of origin or have not acquired the resources in accordance with the Convention.

The National Strategy for the Conservation of Australia's Biological Diversity commits Australian Governments to establishing a Commonwealth–State working group to investigate and report on matters relating to access to Australian genetic resources, including the strengthening of existing controls and legislation.

In response, the Commonwealth–State Working Group on Access to Australia's Biological Resources was established in May 1994 to investigate and report on action required to develop a nationally consistent approach to access to Australia's biological resources. The working group's task was to:

> *... investigate and report on action required to develop a national approach to access to Australia's biological resources (defined as materials of plant, animal, microbial or other non-human, biological origin with actual or potential use or value to humanity) including:*
>
> - *the identification of benefits for the Australian community, including the protection and promotion of Australia's commercial, nature conservation and scientific interests;*
> - *principles to be applied in the assessment of mechanisms and in negotiations concerning grant of access; and*
> - *the mechanisms which may be employed governing access, collection, processing, development and export of Australia's biological resources.*

After considering the issues and consulting broadly within Australia, the working group has produced a draft discussion paper, *Managing Access to Australia's Biological Resources: Developing a Nationally Consistent Approach*, which considers arrangements for managing access to Australia's biological resources, and proposes a nationally consistent approach. Public consultation is currently occurring on this discussion paper.

As an example of how the social and economic benefits of genetic material and products derived from Australia's biological diversity accrue to Australia, a joint Queensland Herbarium/Griffith University project is currently under way to sample all native and naturalised vascular plant taxa in Queensland and adjacent regions. These plant specimens are being screened for their potential pharmaceutical chemicals and samples are being taken to ensure that collection does not adversely affect the viability or conservation status of any species or populations.

Article 16 Access to and transfer of technology

Access to and transfer of technology are essential elements for achieving the objectives of the Convention on Biological Diversity. Parties will undertake to provide and/or facilitate access to and transfer of relevant technologies, such as survey and inventory techniques and methods for the control of pest species. Benefits from technologies developed from genetic resources are to be shared with the Parties providing the resources.

The National Strategy for the Conservation of Australia's Biological Diversity seeks to 'ensure continued and effective international cooperation in the conservation of biological diversity, directly between governments'. Australian Governments are also committed to 'ensuring that opportunities to increase the level of technology transfer relevant to biological diversity conservation are included in relevant aid programs and projects'.

Australia does not consider that government should have a dominant role in imposing obligations for the transfer of environmentally sound technologies by private financial institutions, which should be permitted to make decisions that are to their greatest net benefit.

Where government in Australia does play a vital role is in setting the standards and creating enabling conditions for technological development. In particular, Australia sets the context through:

- stable macro-economic management;
- adoption of market-oriented policies;
- reduction of trade and investment barriers;
- effective and accountable institutions including:
  - banking and customs
  - intellectual property regimes.

Australia supports the work of the World Intellectual Property Organization and the World Trade Organization. Australia's intellectual property laws are consistent with the treaties of the above two organisations which deal with intellectual property; and to which Australia is a signatory. Examples include the World Trade Organization Agreement on Trade-Related Aspects of Intellectual Property Rights, the Paris Convention for the Protection of Industrial Property (the Paris Convention) and the Patent Cooperation Treaty. Australia believes a strong intellectual property regime will promote technology transfer.

Australia also promotes the transfer of information through the Clearing-house Mechanism. This has been established as part of a collaborative effort to develop a Clearing-house Mechanism as laid out in Article 25 of the Convention on Biological Diversity.

International aid

Technology transfer is intrinsic to Australia's overseas aid programme which is managed by AusAID, the Australian Agency for International Development. It includes education and training, workshops and conferences, institution-strengthening, technical assistance and collaborative research. The section on Article 20 contains further details of support under the aid programme.

An important vehicle for Australia's overseas technology transfer is the Australian Centre for International Agricultural Research. The centre has developed collaborative research programmes to assist partner countries to identify and solve their major agricultural problems and, at the same time, to strengthen their own research capacity, including in areas associated with biodiversity conservation and sustainable use.

Conservation through sustainable use is a strategy used by the research centre as a basis of its portfolio of research and technology transfer activities, whereby biodiversity is an important tool for:

- achieving improved productivity, stability and disease-resistant crops, trees, livestock and aquatic animals in agriculture, forestry and fisheries;
- reducing the impact of pests and diseases and managing weeds through biological control.

The Australian Centre for International Agricultural Research contributes over $6 million each year for research into biodiversity conservation, improvement and utilisation. This contribution provides for collaborative bilateral projects between Australia and scientists of developing countries. It also supports biodiversity-related programmes of the International Agricultural Research Centres, which have a global mandate from the international agricultural community.

Articles 17 and 18

Exchange of information and technical and scientific cooperation

The Convention on Biological Diversity calls on Parties to facilitate information exchange such as exchange of results of technical, scientific and socio-economic research, as well as information on training and surveying programmes, specialised knowledge, and indigenous and traditional knowledge. Parties should also promote international technical and scientific cooperation, particularly with developing countries.

Consistent with Articles 17 and 18 of the Convention, the National Strategy for the Conservation of Australia's Biological Diversity recognises the need to ensure continued and effective international cooperation in the conservation of biological diversity, whether it be directly between governments or through relevant international government and non-government organisations. The Strategy particularly focuses upon bilateral and multilateral aid, international scientific collaboration and other forms of cooperation such as the:

- United Nations Commission on Sustainable Development;
- South Pacific Regional Environment Program;
- Global Environment Facility;
- Organization for Economic Cooperation and Development;
- World Conservation Union;
- United Nations Environment Programme;
- United Nations Educational, Scientific and Cultural Organization;
- Valdivia Group.

Key programmes for information exchange and international cooperation include the following.

Environment Resource and Information Network

The Environment Resource and Information Network is a national environmental information facility which is available on the Internet. It provides policy-developers, decision-makers, educators and the public ready access to key information on the Australian environment. This information is a key requirement for the conservation of Australia's biological diversity and the promotion of ecologically sustainable management.

With the latest computing technology, the network uses analytical tools to interpret the vast reservoir of information it contains on the Australian environment. Comprehensive text search facilities are also provided to ensure the rapid and accurate recovery of information.

The information contained within the Environment Resource and Information Network is drawn from many sources. It includes maps, species distributions, educational materials, documents and satellite imagery, covering environmental themes ranging from endangered species to drought and pollution. The network also provides links to other relevant environment-related web sites. In this way, the Commonwealth is promoting the exchange of information, thereby meeting the educational and regional land management needs of the Australian people, in a form which is readily accessible to international users. More importantly, the Environment Resource and Information Network provides the kind of information which helps determine where conservation effort should be targeted.

National Resource Information Centre

The National Resource Information Centre is a branch of the Bureau of Resource Sciences, a professional independent scientific bureau within the Department of Primary Industries and Energy. The bureau's mission is to enhance the sustainable use of Australia's agricultural, fisheries, forestry, mineral and petroleum resources and their industries by providing high quality scientific and technical advice to government, industry and the community.

The National Resource Information Centre is a multidisciplinary scientific research facility. It analyses national sustainable development issues, such as drought, land degradation, hazardous waste and multiple land use, in areas such as the Murray–Darling Basin, Cape York Peninsula, Lake Eyre, south-east forests and the coastal zone. It uses advanced computing techniques to produce models and visualisations of these issues for

use by policy–makers. The centre is vigorously transferring these skills to both national and international clients, especially in South-east Asia, through the training activities of its Advanced System Institute.

Clearing-house Mechanism

The first meeting of the Conference of the Parties decided to implement the provisions of Article 18 of the Convention for the establishment of a Clearing-house Mechanism to promote and facilitate technical and scientific cooperation. Australia has been an active participant in developing the Clearing-house Mechanism for information pertaining to biological resources. As a result of this work, Australia has developed its own National Focal Point of the Clearing-house Mechanism, a draft version of which is currently on the Internet.

The role of Australia's National Focal Point is to serve the information needs of those organisations involved in implementing the provisions of the Convention. Its role is also to provide the relevant information linkages to the other National Focal Points and relevant Thematic Focal Points to facilitate the fair and equitable sharing of the benefits arising from the utilisation of genetic resources.

Memoranda of Understanding

Australia has environmental Memoranda of Understanding (MOUs) with China, the European Commission, France, Germany, Italy, Japan, Korea, Russia, Singapore, the South Pacific Regional Environment Program, United States of America and Vietnam. All have some relevance to biodiversity conservation and sustainable use. An example is an MOU between the Australian Nature Conservation Agency (now Environment Australia) and the Indonesian Directorate General of Forest Protection and Nature Conservation. This MOU was signed on 13 November 1995 and provides for cooperation between Indonesia and Australia in relation to matters of mutual conservation interest. While it was envisaged that the MOU would principally deal with matters between the two agencies, it was also intended that it extend to cooperation between other institutions working through the two principal agencies in order to fulfil its mandate.

Valdivia Group

The Valdivia Group is a coalition of temperate southern hemisphere nations formed to facilitate information exchange, identify positions, and establish common courses of action and cooperation on international environmental and related science issues. Member countries include Australia, Argentina, Brazil, Chile, New Zealand, South Africa and Uruguay. The group was established at Australia's initiative and first met in Chile in 1995. It comprises a Coordinating Committee and six working groups (Biodiversity, Climate Change, Forests, Ozone, Chemicals and Desertification), which have a key role in building links between scientific research and policy development. Australia chaired the Coordinating Committee in 1996 and continues to actively participate in the work of the group, particularly in its role as Chair of the Biodiversity Working Group.

Article 19

Handling of biotechnology and distribution of its benefits

The Convention on Biological Diversity makes provision for Parties which provide genetic resources for biotechnological research to participate in and share in the results arising from such research. There are also requirements relating to the safe trade in genetically modified organisms.

Australia is an active participant in the negotiation of a Biosafety Protocol, currently under way under the auspices of the Convention on Biological Diversity.

The assessment and control of the importation of genetically manipulated organisms into Australia involves the Australian Quarantine Inspection Service. The section on Article 14 contains details of the service's role in the process.

Australia has established the Genetic Manipulation Advisory Committee as a non-statutory body to oversee the development and use of novel genetic manipulation techniques in Australia, and is developing a more comprehensive national regulatory framework for gene technology applications. The section on Article 8 contains more detail.

Article 20

Financial resources and financial mechanism

Domestic obligations

Article 20 of the Convention on Biological Diversity states that each Party should undertake to provide, in accordance with its capacities, financial support for the implementation of the Convention.

The National Strategy for the Conservation of Australia's Biological Diversity recognises that its implementation requires a commitment from all spheres of government, the private sector and the community. A priority action in the Strategy is to establish, by the year 2000:

> *mechanisms for resourcing the development and implementation of programs and plans for the continuing management of Australia's biological diversity on public and private lands.*

Governments have also agreed to:

> *review funding and administration of existing programs that relate to the conservation of biological diversity to identify potential for reallocation of resources for improved efficiencies and the need for increased funds to ensure implementation of the Strategy.*

The funding allocated to the conservation and sustainable use of biodiversity in Australia is very difficult to quantify. The Commonwealth Government, State and Territory Governments, Local Government, the private sector and the community all contribute significant resources, some of it in kind. Many of these resources are not reported in official figures and thus it is not possible to reflect accurate overall figures in a national report. In addition, biodiversity conservation is often fully integrated into programmes for resource use. Consequently, it can be difficult to separate biodiversity conservation and sustainable use expenditure from other related expenditure.

The major Commonwealth commitment to implementing the strategy is reflected in the Natural Heritage Trust programme (see section on Article 6). Funding under the Natural Heritage Trust will be spent on the environment, sustainable agriculture and natural resource management in a partnership between the Commonwealth Government, State and Territory Governments, and the community. The trust will outlay $A1.249 billion from 1997–98 to 2001–02. This will be supported by a similar level of funding from the States and Territories, and from the community.

In the 1997–98 budget the Commonwealth Government also allocated $4.4 million over the next two financial years to pursue the objectives of the Strategy and to meet Australia's obligations under the Convention. This includes Australia's contributions to the Convention's Trust Fund.

International obligations

Article 20 of the Convention also commits developed country Parties to providing new and additional financial resources to assist developing countries to meet their obligations under the Convention.

Australia's overseas aid programme assists developing countries to reduce poverty and improve the standard of living of their people through sustainable development. AusAID, the Australian Agency for International Development, manages Australia's official overseas aid programme, which is valued at $1.43 billion in the 1997–98 financial year. Its main focus is the Asia–Pacific region. Aid projects are developed and implemented in consultation with developing countries, responding to their most pressing needs and taking account of areas of Australian expertise.

The overseas aid programme is funding programmes and projects that help to conserve and sustainably use biodiversity, while simultaneously assisting developing countries, primarily in the Asia–Pacific region, to reduce poverty.

AusAID is currently funding more than $26 million of biodiversity-related projects and activities. This assistance is provided through the following mechanisms.

- **Strengthening human and institutional resources**. These projects seek to increase the capabilities and knowledge of people in developing countries to protect existing biodiversity. For example, through the Rapid Biodiversity Resource Appraisal Project (BioRap), funding of over $500 000 is being provided

by AusAID to equip teams of in-country specialists with analytical tools for assessing conservation priorities. The Australian Conservation Training Initiative, undertaken jointly with the Zoological Parks Board of New South Wales and the New South Wales National Parks and Wildlife Service, provides a range of professional training programmes for nationals from developing countries.

- **Direct efforts to conserve biodiversity**. Ecosystems and species which are threatened in their natural habitats can be protected through both on and off-site conservation measures. Such conservation also helps improve the lives of people who depend on these species. A total of $2.6 million has been made available through the South Pacific Regional Initiative on Forest Genetic Resources Project. The project seeks to develop on-site and off-site conservation strategies for priority tree species through the designation of reserves and through germplasm collection and propagation. AusAID has also funded efforts to reintroduce the famous Tahki horse, which used to range the Gobi Desert until the 1960s.

Source: © Western Plains Zoo

Tahki horses are being bred at the Western Plains Zoo for re-introduction to Mongolia.

- **Supporting multilateral and regional efforts**. In recognition that biodiversity loss is a global problem, contributions have been made to the Global Environment Facility. The facility is a source of funds for developing countries to use for environmental projects. Australia has committed nearly $73 million to the Global Environment Facility over the period 1991–92 to 1997–98, of which 35% went to biodiversity projects. AusAID support is also provided for the implementation of international agreements, such as the Convention on Wetlands of International Importance (Ramsar Convention), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Australia has in the past four years made a number of voluntary contributions to assist work under the Convention. These have included:

- $162 580 to assist developing countries, in particular those in the south-east Asia and south Pacific regions, to participate in a range of meetings related to the Convention;
- $55 000 to assist Indonesia host the second Conference of the Parties to the Convention on Biological Diversity in 1995 and for co-sponsorship of the successful International Biodiversity Technology Fair and the Global Biodiversity Forum, held at the first and second Conference of the Parties to the Convention;
- $155 938 to fund two indigenous knowledge positions in the Convention Secretariat.

As discussed under Article 16, the Australian Centre for International Agricultural Research contributes over $6 million each year for research into biodiversity conservation, improvement and utilisation.

Monitoring and evaluation of the Strategy

As shown in the previous chapter, Australia has a wide range of strategies, plans and programmes in place which contribute to implementing the Convention on Biological Diversity. Many of these, including the programmes funded by the Natural Heritage Trust, incorporate monitoring and evaluation processes to assess their effectiveness. However, as the National Strategy for the Conservation of Australia's Biological Diversity is the primary vehicle in Australia for implementing the Convention, an assessment of its effectiveness will provide the best overall guide to the degree to which Australia has met its obligations under the Convention. This chapter consequently focuses on the processes that have been put in place to monitor and evaluate implementation of the Strategy.

Monitoring and evaluating the Strategy

The Strategy assigns the Australian and New Zealand Environment and Conservation Council (ANZECC) a central role in its coordination and review. The Strategy identifies that ANZECC, in consultation with other Ministerial Councils, will:

- assume overall responsibility for coordinating the implementation of the Strategy at the national level;
- monitor outcomes of the Strategy and undertake five-yearly reviews of its implementation;
- provide to governments regular publicly available reports on the state of Australia's biological diversity – these 'state of biological diversity' reports should form part of the 'state of the environment' reports that are to be prepared by the States, Territories and the Commonwealth;
- report regularly to Heads of Government on progress in implementing the Strategy.

To discharge these responsibilities, ANZECC subsequently established the Biodiversity Strategy Executive Group. This small group of senior government officials includes a Commonwealth Chair and representatives from ANZECC, the Ministerial Council on Forestry, Fisheries and Aquaculture, and the Agricultural and Resource Management Council of Australia and New Zealand. The group met for the first time in February 1996.

The Terms of Reference for the group are to:

1. Coordinate, at the national level, implementation of the National Strategy for the Conservation of Australia's Biological Diversity.
2. Develop intermediate milestones to guide the achievement of agreed objectives and priorities as set out in the National Strategy.
3. Monitor the outcomes of the National Strategy and prepare five-yearly reviews.
4. Prepare regular reports to the ANZECC Standing Committees as input to ANZECC's reports to Heads of Government on the progress of implementing the National Strategy.

The group, to date, has focused on the Priority Actions in the Strategy as these include a comprehensive set of targets to achieve by specified deadlines. While Australia appears to be well placed to meet most of these targets, some targets will prove difficult to meet. The group is currently considering measures which could be undertaken to address these problems.

Appendix 1

Summary of The National Strategy for the Conservation of Australia's Biological Diversity

The National Strategy for the Conservation of Australia's Biological Diversity

The structure of the Strategy reflects the need to address six target areas. These target areas, and the objectives in the Strategy which address each area, are as follows.

1. Conservation of biological diversity across Australia

Past policies and programmes for conserving components of biodiversity have been insufficient. New management approaches and increased coordination and cooperation are required. A major focus of the Strategy will be to mange biodiversity on a regional basis to integrate conservation activities both within and outside protected areas.

Objectives include:

- identifying important biodiversity components and threatening processes;
- managing biodiversity on a regional basis;
- improving standards of biodiversity management;
- establishing and managing a comprehensive, adequate and representative system of protected areas;
- strengthening conservation outside protected areas;
- maintaining and strengthening wildlife conservation;
- protecting threatened biodiversity;
- recognising and maintaining the contribution of Australia's indigenous peoples to biodiversity;
- establishing and maintaining facilities for ex-situ research into biodiversity.

2. Integrating biological diversity conservation and natural resource management

The long-term viability of Australia's industries based on natural resources depends on the effective management of biodiversity, and much of Australia's biodiversity occurs in areas used for productive purposes.

Objectives include:

- developing and implementing national integrated policies for biological resources;
- adopting ecologically sustainable agricultural, pastoral, fisheries, forestry, tourism and recreation management practices;
- managing water resources to conserve biodiversity and meet economic, social and community needs;
- adopting ecologically sustainable wildlife management practices;
- ensuring that Australia receives the social and economic benefits derived from the use of genetic material and products.

3. Managing threatening processes

The major threatening processes to biodiversity need to be managed and their impacts minimised.

Objectives include:

- monitoring, regulating and minimising processes and activities which threaten biodiversity;
- retaining and managing native vegetation;
- controlling the introduction and spread of alien species and genetically modified organisms;
- minimising and controlling the effects of pollution on biodiversity;
- reducing adverse impacts of human-induced climate change on biodiversity;
- repairing and rehabilitating areas to restore their biodiversity values;
- assessing the potential impacts on biodiversity of projects and other development activities.

4. Improving our knowledge

An adequate understanding of biodiversity is essential for its effective long-term conservation and management.

Objectives include:

- compiling and making existing knowledge readily available;
- developing rapid assessment methodologies;
- supporting and standardising biodiversity research;
- developing taxonomic training programmes;
- establishing a national coordinated programme of long-term ecological monitoring;
- incorporating knowledge and practices of indigenous Australians in biodiversity research and conservation programmes.

5. Involving the community

Individuals and groups in the community have an important role to play in conserving biodiversity.

Objectives include:

- increasing public awareness of and involvement in conservation of biodiversity;
- expanding biodiversity studies in educational curricula.

6. Australia's international role

The conservation of biodiversity is a global issue. Australia can do much to conserve its own biodiversity and contribute to the conservation and ecologically sustainable use of biodiversity on a global scale.

Objectives include:

- Australia participating in existing and new international agreements for the conservation of biodiversity;
- making efforts to ensure that the activities of Australians outside Australia are consistent with the conservation of biodiversity;
- making efforts to ensure continued and effective international cooperation in the conservation of biodiversity between governments and international government and non-government organisations.

Appendix 2

Suggested guidelines for national reporting on the implementation of Article 6 (annex to decision of second Conference of the Parties to the Convention on Biological Diversity)

(a) **Executive summary**: a brief summary of the action plan report, stating succinctly the importance of biodiversity, the commitment to the Convention, the mandate, the participants list, the biotic wealth and national capacity, the goals and gaps, strategic recommendations and characteristics of the action (who will do what, when, where, with what means and funding).

(b) **Introduction**: describe why biodiversity is important to the country and its local communities. Explain the Convention and the nation's commitment to its provisions. Present the aim of the national biodiversity action plan and specify to whom it is directed.

(c) **Background**: describe the legal and policy framework that provides the mandate and instructions for preparing the action plan report. Provide a short summary of the nation's biotic assets, capacity (human resources, institutions, facilities, and funding) and ongoing programmes. Explain the institutional arrangements and responsibilities, with a view to informing people of the manner in which the strategic recommendations will be implemented.

(d) **Goals and objectives**: state the vision for biodiversity and its place in the society, focusing on its protection, scientific understanding, sustainable use, and on the equitable sharing of its benefits and costs. The specific targets to meet the local, national, and international goals in terms of protecting, assessing, utilizing, and benefiting from biodiversity and its components need to be determined.

(e) **Strategy**: summarize the gaps between the current situation in the country and the stated vision, goals and objectives. Summarize the strategic recommendations, including the activities, policies, and tasks that have been selected for implementation to cover the gaps. Assign relative priorities to each.

(f) **Partners**: describe the public and private entities, communities and industries that have participated in the process and have agreed to be responsible for particular activities and investments.

(g) **Action**: present the detailed activities, tasks and policies to be implemented. Explain which partner (Ministry, industry, indigenous group, NGO, or university) will implement each item, where, and what measures the partners will employ.

(h) **Schedule**: present a timetable for the implementation of the various tasks, reflecting the priorities that have been assigned. Note signposts to help signal progress or delay.

(i) **Budget**: provide the budget for the plan of action, showing funding requirements for operating expenses, capital purchases, transport, field costs, etc. List the personnel needed by category of skill or background, the facilities and services required, and possible international technical and financial cooperation.

(j) **Monitoring and evaluation**: explain the measures to be used for tracking the results of the action plan and for monitoring changes in the economy, environment and society. Give the indicators that will be used. Present the individuals and organizations who will carry these responsibilities and how they were selected. Note the audience for the reports, along with the document's content and timing of implementation.

(k) **Sharing of national experience**: present information and case studies which reflect the range of experiences of countries encountered in the implementation of Article 6, taking into account local and external factors.