



Maintaining a comprehensive approach

The new and recent measures already outlined in this *Environment Budget Overview* build on a myriad of environmental achievements, supported by record levels of funding across Government. In the Environment and Heritage Portfolio, the Australian Government's milestones and achievements are tracked against six themes: climate change; land and inland water; coasts and oceans; heritage; the impacts of human settlements; and, the Antarctic, together with the activities of the Bureau of Meteorology.

Climate change

Australia is vulnerable to the impacts of climate change, which in the future is expected to bring more frequent extreme weather events. Australia's strong economy is heavily dependent on the domestic use and export of our abundant and valuable fossil fuel reserves.

With energy accounting for 68 per cent of our national emissions, energy sector emissions must be reduced as part of an effective climate change response in a way that minimises adverse economic impacts. Through current measures and partnerships with government, industry and the broader community, Australia is expected to deliver annual energy and industrial emissions abatement of 85 million tonnes by 2010. This has us on track to meet our Kyoto target of reducing overall emissions to 108 per cent of 1990 levels by 2008–12. This will be done while maintaining a vibrant energy sector and a prosperous economy.

The Australian Government remains committed to developing a robust and comprehensive global and national response to climate change. Australia's challenge is to deliver a response to climate change that meets our international obligations and reduces our greenhouse signature, while maintaining a strong economy that provides for the well being of all Australians. The Government's strategy is based on strong, practical action to increase the range of options and lower the cost of meeting future greenhouse objectives. The Australian Government is also working with the states and territories on climate change through the February 2006 Council of Australian Governments Climate Change Action Plan. The Australian Government has now committed almost \$2 billion to combating climate change, focusing and integrating measures in the following strategic areas:

EMISSIONS MANAGEMENT — focusing on measures to deliver on current commitments, while preparing Australia to respond to potential long-term emissions constraints. Measures will integrate greenhouse issues into business and community decision making, reduce greenhouse gas emissions and accelerate the uptake of energy efficiency and low/zero emission technologies. The Government's June 2004 energy white paper — *Securing Australia's Energy Future* — introduced measures to address market barriers to the take-up of renewable technologies and to develop and demonstrate technologies with the potential to significantly reduce future greenhouse emissions. These measures deliver a combined reduction in the level of greenhouse emissions of 85 Mt CO₂-e by 2010. Some of these measures are being jointly implemented with the Industry, Tourism and Resources portfolio.

The Mandatory Renewable Energy Target is an example of how the Australian Government has responded to climate change using an emissions management approach. This target is administered by the Office of the Renewable Energy Regulator. The target places a legal liability on wholesale purchasers of electricity to proportionately contribute towards the generation of an additional 9,500 gigawatt-hours of renewable energy per year by 2010.

INTERNATIONAL ENGAGEMENT — contributing to the development of an effective global response to climate change. Australia is demonstrating international leadership and convened the inaugural Ministerial meeting of the 2006 Asia-Pacific Partnership on Clean Development and Climate in January 2006. The Partnership brings together government and industry leaders from the US, China, India, Japan, Korea and Australia to lay out a framework to develop, deploy and transfer cleaner, more efficient technologies to reduce greenhouse gas emissions. Australia also continues to participate actively through the United Nations Framework Convention on Climate Change, bilateral partnerships and other international technology initiatives.

IMPACTS AND ADAPTATION — addressing the risks, capturing the opportunities and preparing Australia for the impacts of climate change, through the National Climate Change Adaptation Programme. The Australian Government has released the *Risk and Vulnerability* report, which analyses the risks to Australia from the impacts of climate change over the next 30 to 50 years. Various actions are in train to build national capacity to adapt to the impacts of climate change, including through developing with the states and territories in 2006, a Council of Australian Government national framework on climate change adaptation.

SCIENCE AND MEASUREMENT — building our understanding of the science of climate change, through the Australian Climate Change Science Programme in partnership with leading science agencies, notably the CSIRO and the Australian Academy of Sciences, and maintaining and improving our capacity to measure greenhouse emission trends accurately.





INDUSTRY GREENHOUSE AWARD WINNERS

The Greenhouse Challenge Plus Awards are part of the Australian Government's \$31.6 million Greenhouse Challenge Plus programme — a partnership between the Australian Government and industry to reduce Australia's greenhouse gas emissions. The Awards recognise organisations that have implemented innovative processes and systems to help reduce greenhouse gas emissions.

In 2005 the winners were:

Small Business Award: CRF (Colac Otway) — CRF is a state-of-the art lamb and veal processing facility. Since 2000, CRF has reported an increase in its production by 680 per cent while reducing its energy use by 75 per cent per unit of production.

Medium Business Award: Godfrey Hirst Australia Pty Ltd — Godfrey Hirst Australia Pty Ltd is a manufacturer of high quality carpets and floor coverings. It has increased its energy efficiency by improving its carpet dyeing process and reports a 60 per cent reduction in greenhouse emission by adopting recycling initiatives such as removing wool from waste streams.

Large Business Award: Woodside Energy Ltd — Woodside Energy Ltd is Australia's largest publicly listed independent hydrocarbon exploration and production company and supplies natural gas to both Australia and overseas nations. Since joining Greenhouse Challenge Plus in 1997, Woodside has reported a 6.5 per cent reduction in its greenhouse emissions.

Government + Essential Services Award: QR (Queensland Rail) — QR is one of the nation's leading integrated transport businesses. It carries approximately 176 million tonnes of freight and 50 million passengers per year. In the past six years, QR has reduced its greenhouse gas emissions by approximately one million tonnes — about 14 per cent. In 2004–05, QR achieved greenhouse gas abatement of approximately 229,000 tonnes.

See: www.greenhouse.gov.au; www.orer.gov.au; www.industry.gov.au; and www.dfat.gov.au/environment/climate/.

Land and inland waters

The outstanding diversity of life supported by Australia's 7.6 million square kilometres of land and fresh waters is threatened by weed and feral pest invasion, disease, poor fire management, urban development and overgrazing.

The Australian Government is implementing a range of natural resource management approaches to encourage ecologically sustainable resource use, to prevent land and water decline, and to ensure fresh water is available for the environment, for communities and for productive purposes.

The most significant is the \$3 billion Natural Heritage Trust, which, in parallel with the National Action Plan for Salinity and Water Quality (a joint commitment of \$1.4 billion with the states and territories), provides a long-term, coordinated approach to tackling the major environmental challenges facing our nation. The Department of the Environment and Heritage and the Department of Agriculture, Fisheries and Forestry jointly deliver these programmes. Natural resource management plans for 56 regions across Australia under the Natural Heritage Trust and National Action Plan for Salinity and Water Quality will be in place by the beginning of 2006–07.

INDIGENOUS AUSTRALIANS — The Australian Government is working to support Indigenous Australian people in managing the land, sea and the environment. Indigenous Land and Sea Ranger groups are being funded to undertake conservation work such as identifying marine turtle nesting areas for protection and management, botanical surveys, feral animal control and clearing marine debris.

The Australian Government is also working on a number of Shared Responsibility Agreements and Regional Partnership Agreements where Indigenous people are working to conserve and improve the natural and cultural resources. For example, Indigenous Australian communities along the Great Barrier Reef Marine Park will be monitoring and assessing coral bleaching within the marine park.

CONSERVING BIODIVERSITY — Following endorsement by the Natural Resource Management Ministerial Council, the Australian Government will continue to work closely with state and territory governments to further develop and implement actions in the 'National Approach to Address Biodiversity Decline' report, including implementation of actions to achieve the objectives of the 2004 National Biodiversity and Climate Change Action Plan.

The Maintaining Australia's Biodiversity Hotspots Programme has contributed to protecting biodiversity in hotspot and high conservation value regions through voluntary acquisition of properties and establishing incentive schemes to purchase biodiversity conservation outcomes from private and leasehold land managers.

INVASIVE SPECIES — The Australian Government is leading the development of the Australian Biosecurity System for Primary Production and the Environment (AusBIOSEC). This is an initiative of the Natural Resource Management and Primary Industries Ministerial Councils, which will provide a comprehensive and integrated approach to managing invasive species. The Government is also providing national leadership in the development of the Australian Pest Animal Strategy and the review of the National Weeds Strategy. The Australian Government is providing financial support to the development of controls for environmental pests such as cane toads and cats.

WEEDS — Weeds do immense damage to the environment, agricultural industries, and to the nation's biodiversity. The most effective weed strategies are prevention and early detection. Through the Defeating the Weeds Menace programme, the Australian Government has committed \$44.4 million towards supporting continued success in the prevention, control and eradication of weeds in Australia through research, biological control, community awareness and action to manage Australia's most threatening and invasive weeds.

NATIVE VEGETATION — The rate of loss of native vegetation is expected to drop significantly over the next three years, in part due to agreements negotiated with states and territories under the Natural Heritage Trust and National Action Plan for Salinity and Water Quality. Ongoing work with the states and territories includes:

- seeking support for the recommendations of the Productivity Commission inquiry *Impacts of Native Vegetation and Biodiversity Regulation* to reduce the effects of native vegetation regulation on landholders while still achieving conservation objectives;
- continuing the review of the National Framework for the Management and Monitoring of Australia's Native Vegetation, including development of performance indicators and good practice information;
- resolving the irregularities in mapping native vegetation communities across state and territory borders, a nationally agreed approach to reporting on changes in conditions, and developing products to assist researchers and decision makers using the National Vegetation Information System; *and*
- continuing to support the 10 regional forest agreements.



To protect the conservation values of our rangelands, the Australian Government has developed a number of guides to help land holders in managing their properties for biodiversity conservation and is examining ways to identify and map these values. The Government has also been exploring the use of market-based incentives in the rangelands as a means to encourage sustainable rangeland management. In collaboration with the states and territory governments, the Australian Government has been supporting development of the Australian Collaborative Rangelands Information System and governments will be preparing a status report on change in mid-2007.

PARKS AND RESERVES — Through the Director of National Parks, the Australian Government will continue to manage the 20 national parks and reserves established under the *Environment Protection and Biodiversity Conservation Act 1999*, including Kakadu, Uluru - Kata Tjuta and Booderee National Parks. Support will continue for the National Reserve System and the Indigenous Protected Areas Programmes under the Natural Heritage Trust.

NANTAWARRINA INDIGENOUS PROTECTED AREA

The Nantawarrina Indigenous Protected Area (IPA) in South Australia is one of 19 declared IPAs included in Australia's National Reserve System, which is the national network of protected areas. With support from the IPA programme funded from the Natural Heritage Trust, Indigenous landowners commit themselves to manage their lands for the protection of natural and cultural features. The Nantawarrina IPA was declared in 1998, the first in Australia. In June 2000, in recognition of their commitment to the Nantawarrina IPA, the Andymathanha Nepabunna Community was elected to the Global 500 Roll of Honour for outstanding contributions to the protection of the environment. Management of the Nantawarrina IPA is central to the Nepabunna community, providing significant training, employment and capacity building opportunities and a focus for community based activities.

PROTECTED WETLANDS — The Australian Government will continue to identify wetlands of international importance — Ramsar wetlands — and update the *Directory of Important Wetlands in Australia*. Work will continue on the strategic national approach to implementation of the Ramsar Convention in Australia, including progressing wetland inventory, Ramsar nomination guidelines and an ecological character description framework.

RIVER AND GROUNDWATER BASINS — The Australian Government has committed \$200 million over five years from 2004–05 to the \$500 million *Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray-Darling Basin*. The Agreement will support measures to reduce water over-allocation and achieve environmental benefits, in particular the recovery of water for environmental use under the Living Murray Initiative first step decision. Water recovery measures may include investment in water infrastructure, encouragement of behavioural change, and purchase of water on the market. The first project to be funded, the Victorian Goulburn-Murray Water Recovery Project, will be the first project to deliver water by making available 120 gigalitres by July 2007, with a further 25 gigalitres by June 2009. The Australian Government is providing \$37.2 million of the total project cost of \$93 million. Recovered water will be set aside for environmental purposes, with a focus on six icon sites in the Murray-Darling Basin: Barmah-Millewa Forest; Gunbower-Koondrook Pericoota forests; Hattah Lakes; Chowilla Floodplain (including Lindsay-Wallpolla); the Murray Mouth Coorong and Lower Lakes; and the Murray River Channel.

In 2005–06 \$16.5 million was provided to the operation of the Murray-Darling Basin Commission. This included support for the multi-year \$150 million Environmental Works and Measures Programme. Projects under this programme include the development of hydraulic models, watering trials on drought stressed redgums, enhancement of water flows to wetland habitats and completion of a number of fishways in the Basin.

The Australian Government will continue to support and work with the states and territories to protect the Lake Eyre Basin (the intergovernmental agreement will be reviewed in late 2006). The Australian Government will also continue to support joint remedial works in the Great Artesian Basin and the Western Australian Carnarvon Artesian Basin, including the capping of old, free flowing bores and replacing open earthen drains with pipes. It is anticipated that the 10-year investment in the Great Artesian Basin will result in capping and piping of approximately half the uncontrolled bores and open bore drains existing at the commencement of the initiative. After six years (end June 2005) of the programme, it is estimated that over 100,000 megalitres of water is being saved each year.

Active participation in the Convention on Biological Diversity, Convention on Wetlands (Ramsar Convention) and the Convention to Combat Desertification will continue. This includes helping to negotiate an international regime on genetic resources and sharing Australian expertise in wetlands and desertification issues.

NATIONAL VEGETATION INFORMATION SYSTEM

Since July 2002, the Department of the Environment and Heritage has invested \$1.46 million in a national native vegetation information project, funded by the Natural Heritage Trust. Over \$1 million of this investment has been committed to developing the National Vegetation Information System as a detailed database of the variety of vegetation types that occur in Australia. The National Vegetation Information System now has an improved capacity to quickly collate and synthesise the wide variety of vegetation data provided by state and territory custodians, and can be used to generate a range of information products for use at multiple scales.

The principal national-scale information products from the National Vegetation Information System are maps of Australia's *Major Vegetation Groups* and *Major Vegetation Sub-groups*. These maps show what kinds of vegetation occur in which parts of Australia, and the estimated vegetation cover at the time of European settlement, as well as the current cover today.

These products have recently been updated for the 2006 State of the Environment report. This update greatly improves the information base for priority setting, planning, research and education in native vegetation management. As these products have been prepared with the direct input of a number of Australia's leading vegetation information experts, they also have considerable standing in the scientific and natural resource management community.

See: www.nht.gov.au; www.nrm.gov.au; www.deh.gov.au/biodiversity; www.deh.gov.au/land; www.deh.gov.au/parks; www.deh.gov.au/water; and www.napswq.gov.au.



Coasts and oceans

Australia's coasts are in relatively good condition but under increasing pressure near agricultural and urban areas. The main risks are reduced water quality and loss of habitat. In 2006–07 the Australian Government will invest approximately \$39 million in coastal protection under the Natural Heritage Trust.

INTEGRATED MANAGEMENT — The Australian Government will continue to work with the states, Northern Territory and local governments to implement the framework for a national cooperative approach to integrated coastal zone management. In addition, this year the Australian Government will focus on further developing and implementing the northern and south-western bioregional marine plans.

GREAT BARRIER REEF — Through the Great Barrier Reef Marine Park Authority, the Australian Government continues to undertake extensive education and enforcement programmes to ensure understanding, acceptance and compliance with the world's largest network of highly protected marine areas — a third of the Great Barrier Reef Marine Park. The Government has also continued to support commercial fishing businesses and others affected by the changes, through additional funding of \$30.4 million for the structural adjustment package in 2005–06, bringing the total approved budget to date to \$86.7 million.

COASTAL POLLUTION — The Australian Government will continue to work with the Queensland Government and key stakeholders to implement the Great Barrier Reef Water Quality Protection Plan. Support will continue for water quality improvement plans under the Coastal Catchments Initiative (\$34.4 million over 2002–08) to address coastal water quality hotspots around Australia. Programmes for this purpose cover the Peel-Harvey Estuarine System, Port Phillip Bay and Western Port, Derwent Estuary, Adelaide's Port Waterways, Myall and Wallis Lakes, Moreton Bay and six additional hotspots are to be addressed over the next 12 months. The Government will also develop a national programme of action for the protection of the marine environment from land-based activities.

MARINE PROTECTED AREAS — Australia is well placed to meet its commitment of a national representative system of Marine Protected Areas by the international target date of 2012, with the first of the Marine Protected Area networks associated with regional marine planning to be declared in 2006–07. The south-east Marine Protected Area network will be the largest network of temperate and deep water Marine Protected Areas in the world and will complement a range of environmental management measures that recognise both the ecological and economic importance of Australia's south-east oceans.

SUSTAINABLE FISHERIES — Australia has the third highest number of seafood products of any country endorsed by the international Marine Stewardship Council. The Australian Government will continue to promote ecosystem based fisheries management through fisheries environmental assessments, both domestically and internationally, consistent with the principles and application of guidelines for ecologically sustainable fisheries.

INTERNATIONAL ENGAGEMENT — The Australian Government will continue to participate in the Convention on Migratory Species and the International Whaling Commission to reduce the risk to protected marine and migratory species. Continuing participation in the International Maritime Organisation will help to prevent and control marine pollution from shipping, sea dumping and sea installations such as artificial reefs. The Government will also continue to call for improved governance arrangements on the high seas through the United Nations, and to help Pacific island countries and Asia-Pacific Economic Cooperation members with oceans management issues.

See: www.deh.gov.au/biodiversity; www.deh.gov.au/coasts; www.oceans.gov.au; www.gbrmpa.gov.au; and www.nrm.gov.au.

AUSTRALIA MARKS YEAR OF THE TURTLE 2006

The Australian Government has encouraged support from around the south-east Asian region to get behind an international campaign to conserve turtles. The Year of the Turtle campaign was launched by the United Nations Environment Programme in 2006 and focuses on the Indian ocean and south-east Asian regions. Six of the world's seven species of marine turtles inhabit Australian waters, which include some of the world's most important populations.

The Australian Government has provided funding for the first three years of this campaign under the Natural Heritage Trust in partnership with 24 other countries. Australia has championed greater participation by countries that share turtle migrations. Projects supported include the development of a turtle education guide, satellite tagging to improve our understanding of turtle migratory patterns and the development of protocols for assisting stranded turtles.

Natural, Indigenous and historic heritage

Australia's unique natural, Indigenous and historic heritage makes a significant contribution to our sense of national identity and purpose. In 2003–04, the Australian Government introduced a new National Heritage System (including an independent expert advisory body, the Australian Heritage Council) to identify, recognise and protect places of outstanding heritage value to the nation. The Australian Government has maintained its commitment to identifying and conserving our heritage at a national level, allocating a total of \$73.3 million in 2006–07.

WORLD HERITAGE — The Australian Government is committed to the nomination of appropriate places for the World Heritage list and the protection of Australia's existing World Heritage Areas. In February 2006, the Government submitted a world heritage nomination for the Sydney Opera House on the basis that it represents a masterpiece of human creative genius. In 2006–07 the Government will be working in collaboration with the states and territories on nominations for convict sites and an extension to the Fraser Island World Heritage Area in Queensland.

NATIONAL HERITAGE — The Australian Government is committed to the progressive addition of Australia's most important heritage places to the National Heritage List. Details of current nominations can be found at: www.deh.gov.au/cgi-bin/epbc/heritage_ap.pl.

In 2005, the Government announced the National Heritage Investment Initiative, a four-year, \$10.5 million programme commencing in 2005–06, that provides financial incentives to restore and conserve Australia's most important historic heritage places. Under the programme, priority will be given to places in the National Heritage List. Since its launch, the programme has generated considerable interest from owners of a wide range of historic heritage places across the nation. Almost 400 grant applications have been received and are being assessed. In 2006–07 the Australian Government will continue to assist owners of listed historic heritage places and provide funding of \$3.8 million under the programme to support essential restoration and conservation works.

INDIGENOUS HERITAGE — The Australian Government has re-affirmed its commitment to protect Australia's Indigenous heritage through the Indigenous Heritage Programme which supports the identification and maintenance of Indigenous heritage sites. In 2006–07, \$5.2 million will be provided under this programme. In addition, the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* continues to provide protection for areas and objects of traditional significance to Indigenous people



when these are under threat, and when the states or territories do not provide effective protection. The Australian Government will engage in further consultation with Indigenous groups on reforming this legislation to provide a new national scheme that will ensure protection of Indigenous areas and objects to the best contemporary standards. The primary role of state and territory laws and the views of Indigenous people and other stakeholders will be central to this reform.

REGIONAL NATURAL HERITAGE PROGRAMME — The \$10 million Regional Natural Heritage Programme, established in 2004, works with non-government organisations and regional governance organisations to support projects that deliver on-ground outcomes for biodiversity hotspot conservation within our Asia-Pacific region. In 2005–06 the Australian Government committed almost \$1 million under the programme for seven projects, building on the \$5.2 million previously provided for 24 projects funded under the programme. The programme has been extended for a further year and \$3 million of uncommitted programme funds have been moved to 2006–07 to enable a fourth round of project funding.

HERITAGE OBJECTS — The Australian Government is ensuring that Australia's significant heritage objects are identified, protected and preserved using mechanisms including the *Historic Shipwrecks Act 1976*, the *Protection of Movable Cultural Heritage Act 1986* and the National Cultural Heritage Account.

SYDNEY HARBOUR — Through the Sydney Harbour Federation Trust, the Australian Government is ensuring that former defence and other Commonwealth lands on or near the foreshores of Sydney Harbour are conserved and protected for the benefit of present and future generations. Providing public access to the lands, rehabilitating their natural values and interpreting their histories are important objectives of the Sydney Harbour Federation Trust. Recent examples of Sydney Harbour Federation Trust's work include the leasing of buildings and facilities on a number of sites (Chowder Bay, Georges Heights, Woolwich Dock, and Watsons Bay), the continued rollout of the expressions of interest process for other sites, the implementation of refurbishment, landscaping, civil and conservation works on most sites, ongoing public tours of sites, and a schools programme on Cockatoo Island. The Sydney Harbour Federation Trust will prepare a comprehensive plan for the future uses of the Defence site, HMAS *Platypus* at Neutral Bay.

RETURN OF CHINESE FOSSILS

September 2005 saw a major event in the history of the *Protection of Movable Cultural Heritage Act 1986* — a repatriation ceremony held in Perth, where Australia returned to China a massive haul of illegally imported Chinese fossils. This came after more than a year of work and collaboration between the Department of the Environment and Heritage, the Australian Federal Police and Customs. Over 10,000 fossil pieces of all shapes and sizes were handed back, valued at over \$5 million. The fossil pieces included thousands of dinosaur eggs (single and in nests) regarded as national treasures in China, fossils of the sabre-tooth cat, early elephants, rhinoceros, fish and reptiles up to 230 million years old.

The Minister for Environment and Heritage, Senator the Hon Ian Campbell formally returned the fossils to Chinese Vice Minister of Land and Resources, Yun Xiaosu. Division Director Yang Yuejun, from the Chinese Ministry of Land and Resources, described the handover as "a milestone in the collaboration between China and Australia in protecting our cultural and natural heritages". The returned fossils will be used as valuable material for education and scientific research in China.

See: www.deh.gov.au/heritage; www.heritage.gov.au; www.ahc.gov.au; whc.unesco.org; and www.harbourtrust.gov.au.

Impacts of human settlements

Most Australians live and work in cities and towns and the challenge for the community and the Australian Government is to achieve the right balance between urban development and environment protection.

The Government is working with industry and other governments on nationally significant environment protection and heritage issues with a special focus on standard setting for air quality and vehicle emissions.

RESEARCH — The Australian Government is investing \$100 million over five years in collaborative world class, public good research addressing the environmental challenges facing Australia. An open and competitive application process is under way for research hub funding under the \$60 million nation-wide component. Applications were sought across four priority research areas with successful applicants to be announced by mid-2006. Separately, \$40 million is being directed to the establishment of a Marine and Tropical Sciences Research Facility. A research investment strategy was released for the facility, and an annual research plan detailing the research programme under the facility will be completed in May 2006. A series of transitional projects were funded during 2005–06 on research relating to the Great Barrier Reef and its catchments, and tropical rainforests including the Wet Tropics World Heritage Area and Torres Strait. For example, the annual seagrass and coastal habitat monitoring survey has been completed in six regions. The baseline information will be used to assess the effects on these areas from the Gladstone oil spill in January 2006 and will be incorporated into the Oil Spill Response Atlas to improve risk and mitigation measures in high risk shipping channels of the Great Barrier Reef region.

WATER EFFICIENCY — The Australian Government's mandatory national Water Efficiency Labelling and Standards Scheme requires a range of water-using appliances or products to carry an efficiency label. The first range of products to be labelled under the scheme on a voluntary basis (taps, toilets, dishwashing machines, washing machines, urinals, showers and flow controllers) are now being supplied for sale with the new water efficiency label affixed to them.

HAZARDOUS WASTE — The Australian Government ensures that hazardous wastes are exported from or imported into Australia in accordance with our international obligations. Key obligations arise under the Basel Convention on the control of transboundary movements of hazardous wastes and their disposal, which is given effect by the *Hazardous Waste (Regulation of Imports and Exports) Act 1989*.

REDUCTION OF PLASTIC BAGS — Plastic bag use has significantly decreased since the Australian Government backed the Australian Retailers Association Code of Practice for the Management of Plastic Bags in 2003. It is estimated that plastic bag use has fallen from 6 billion in 2002 to 4.4 billion in 2005. Following the expiration of the Code of Practice at the end of 2005, the Government is working on strategies to further reduce the environmental impacts of plastic bags.

INDUSTRY PARTNERSHIPS — The Australian Government is working with a range of industries to minimise waste and improve environmental performance in specific sectors, notably packaging, plastic bags, tyres, and electrical and electronic products (in particular, televisions and computers).

POLLUTION INFORMATION — The National Pollutant Inventory provides Australians with free access to information via an internet database on the types and amounts of pollutants being emitted in their community, and the possible health and environmental effects of these emissions. The National Pollutant Inventory aims to protect the atmosphere and improve the sustainability of human settlements by providing information to improve environmental planning and management practices.



AIR POLLUTION — The Australian Government is continuing to target the two main contributors to urban air pollution—motor vehicles (through vehicle emissions and fuel standards) and wood heaters (through the review of product standards and improved compliance checks). The Government is also working with states and territories on a major review of national air quality standards and will give attention to indoor air issues through management strategies to improve the quality of indoor air in non-industrial settings.

OIL RECYCLING — The Product Stewardship for Oil Programme, enacted in 2000, has been an outstanding success, with Australia now recycling more than 80 per cent of recoverable lubricant oil. A network of more than 800 local government collection facilities has been established across the nation. The coming year will see a concerted effort to extend this programme to remote Australia and in particular, to its Indigenous communities.

URANIUM MINES — In conjunction with the Northern Territory Government and other stakeholders, the Australian Government is working to protect the environment and people of the Alligator Rivers Region from the impacts of uranium mining, through a combination of scientific research, monitoring, audit and assessment. Over the next four years, the Australian Government will rehabilitate a range of 1950s and 1960s abandoned uranium mine sites and associated uranium tailings in the Kakadu National Park, to provide for a long-term containment solution for uranium mine waste for this region.

CHEMICALS — The Australian Government has regulatory systems in place for the assessment and management of risks — including environmental risks — associated with the introduction of new chemicals, pesticides, veterinary medicines and genetically modified organisms. In conjunction with the states and territories, the Australian Government is developing a national environmental risk management framework to ensure that regulatory decisions about the environmental risks of industrial, agricultural and veterinary chemicals are given consistent and systematic effect.

OZONE PROTECTION AND CLIMATE CHANGE — Australia remains ahead of schedule under the Montreal Protocol in phasing out ozone depleting substances, with the consumption of hydrochlorofluorocarbons to be phased out by 2015, five years ahead of the Montreal Protocol requirement. This early phase out will reduce hydrochlorofluorocarbon consumption by around 5,000 ozone depletion potential tonnes (over 60 per cent) in the phase out period. The Australian Government is progressively introducing regulatory measures to reduce emissions of ozone depleting substances and their synthetic greenhouse gas replacements across all industry sectors, including: refrigeration and air-conditioning; fire protection; fumigation foam blowing; and aerosols.

WILDLIFE PROTECTION — Invasive species can have devastating impacts on our native flora and fauna. The Australian Government will continue its commitment to stronger border protection by regulating the import and export of wildlife and wildlife products in accordance with Australia's obligations under international conventions and legislative obligations.

OZONE DEPLETING SUBSTANCES

The introduction of national regulations on the use of ozone depleting substances and their synthetic greenhouse gas replacements will cut Australia's greenhouse gas emissions in 2010 by the equivalent of nearly six million tonnes of carbon dioxide — one per cent of 1990 levels. In close consultation with industry, regulations have been developed and implemented for the fire protection and refrigeration and air conditioning industries as well as fumigators using methyl bromide. These regulations provide significant environmental protection by improving skills and establishing national standards for the handling of these substances which includes a ban on avoidable emissions. The benefits flow through to industry with the establishment of long-term certainty, employment and business mobility through a single set of consistent standards that apply right across Australia and increase consumer confidence in the professionalism of the industry.

See: www.deh.gov.au/industry; www.deh.gov.au/atmosphere; and www.npi.gov.au.

Antarctica

Antarctica influences the global climate because of its immense size and low temperatures. Together with the Southern Ocean, the region directly influences Australia's climate, weather and marine industries.

Australia has been a key player in the Antarctic Treaty since it came into force in 1961 and takes a lead role in the Antarctic Treaty System. This allows the Australian Government to be an effective advocate for protecting the Antarctic environment, undertaking research, and preserving the Antarctic for peaceful use.

The Australian Government's Antarctic programme has a number of elements which will be supported by the Government's new \$46.3 million Antarctic Airlink. These elements are:

ANTARCTIC TREATY SYSTEM — Through the Antarctic Treaty System, the Australian Government is pursuing an improved international management framework for tourism and other non-government activities in Antarctica.

INTERNATIONAL ENGAGEMENT — The Australian Government is working with the parties of the Madrid Protocol to put in place measures to ensure adequate responses to environmental emergencies in Antarctica following the adoption in 2005 of a limited liability regime for damage to the Antarctic environment. Australia is working with other countries within the Committee on Environmental Protection to develop State of the Antarctic environmental reports, assess environment impact evaluations, and promote Antarctic protected areas, including Marine Protected Areas.

PROTECT FISHERIES — Australia has worked within the Commission for the Conservation of Antarctic Marine Living Resources to fully operationalise the Centralised Vessel Monitoring System to combat illegal fishing and to strengthen other measures to combat illegal, unregulated and unreported fishing in the commission area. Domestically, Australia has continued fisheries enforcement actions in the Heard Island and McDonald Islands exclusive economic zone (five illegal fishing vessels have been apprehended in the past five years).

SEABIRDS — Under the Agreement on the Conservation of Albatrosses and Petrels, the Australian Government is continuing to work to reduce the impacts of longline fishing on albatrosses and petrels, to tackle emergency situations where a particular species of albatross or petrel is in rapid decline.



WHALING — The Australian Government continues to pursue the goal of a global ban on commercial whaling and an end to so-called ‘scientific’ whaling, to maintain the Southern Ocean Sanctuary, and to promote the South Pacific Whale Sanctuary proposal. Australia and other countries are working together to encourage coordination of cetacean conservation measures at a regional level.

RESEARCH — The Australian Government is providing logistic and financial support for the four key research programmes of the Antarctic Science Strategy 2004–09 (ice, oceans, atmosphere and climate; southern ocean ecosystems; adaptation to environmental change; and impacts of human activities in Antarctica).

HUMAN IMPACTS IN ANTARCTICA — The Australian Government will ensure that its Antarctic stations minimise their impact on the environment by continuing to investigate the best ways to remediate old waste dumps and by continuing to investigate energy conservation options. The Australian Government will also make sure the Antarctic Environmental Management System continues to meet the ISO 14001 standard.

SCIENTIFIC RESEARCH

The Baseline Research on Oceanography, Krill and the Environment (BROKE — West) has surveyed over a million square kilometres of the waters off the SW Indian Ocean sector of Antarctica (Commission for the Conservation of Antarctic Marine Living Resources Division 58.45.2). The primary aims of the survey were to determine the krill biomass in the area, which will be used to set a catch limit on the krill fishery in this area, and to undertake a comprehensive oceanographic survey. The survey also studied all aspects of the physical and biological environment so that an overview of the ecosystem of this region could be developed. All planned sampling was carried out and the voyage has exceeded expectations in the amount and quality of data that have been collected. During the survey, researchers found temperature and salinity changes in some areas of the Southern Ocean, as well as an extensive krill population — the main food source for whales, seals and seabirds. The completion of this survey is the culmination of ten years of intensive effort in the waters of the Australian Antarctic Territory by the Australian programme.

See: www.aad.gov.au.

Meteorology

The Bureau of Meteorology (the Bureau) contributes to Australia’s social, economic, cultural and environmental goals by providing essential weather, climate, hydrological and oceanographic services and by undertaking supporting research, including into environment-related issues such as global climate change, ozone depletion and air quality. The Bureau will spend \$10 million on environment-focused project activities in 2006–07, including:

THE BLUELINK OCEAN FORECASTING SYSTEM — Jointly developed by the Bureau, CSIRO and the Royal Australian Navy, this system will generate routine analyses and forecasts of the marine environment, providing information on ocean currents and changes in the ocean that affect maritime and defence operations, coastal management, the marine environment and regional and global climate. The total investment by all partners is expected to be around \$5 million in 2006–07. Operational implementation is scheduled for early 2007.

E-WATER COOPERATIVE RESEARCH CENTRE — The Bureau's participation in the \$40.25 million "eWater" Cooperative Research Centre helps to strengthen its links with the water industry in areas such as radar rainfall applications and the use of numerical weather modelling products for improved water management. The Bureau will contribute to three research projects, initially looking at the use of radar rainfall forecasts in flood modelling, the inclusion of some of the longer-term climate influences and climate change on stochastic data generation models and the assimilation of remotely sensed soil moisture into numerical weather models.

AIR QUALITY PREDICTION SYSTEM — Based on the Bureau's model developed for the Sydney Olympics, an operational air quality prediction system has been implemented in Sydney and Melbourne. In collaboration with CSIRO, an extension of the system to the Adelaide airshed is nearing completion. Discussions are currently under way with relevant federal and state agencies in regard to the establishment of a national air quality database in the Bureau.

BUSHFIRE COOPERATIVE RESEARCH CENTRE — The Bureau continues to contribute to the Bushfire Cooperative Research Centre through the conduct of meteorological research and the provision of operational support. Advances have already been made in the determination of the climatology of fire danger and the forecasting of wind changes, which are of vital importance during fire-fighting operations.

WATER AVAILABILITY AND NATIONAL MONITORING PROJECTS — The Bureau, through its National Climate Centre is working with the Bureau of Rural Sciences and CSIRO on the *Australian Water Availability* project, which aims to improve processes and procedures for evaluating water availability throughout the nation for primary production purposes. The National Climate Centre is also working with the Bureau of Rural Sciences and other state agencies on a related demonstration prototype for a National Agricultural Monitoring System. The National Agricultural Monitoring System will provide a consistent and continuous flow of information on climate conditions and agricultural production statistics for assessing applications and renewals for support under the exceptional circumstances process.

NATIONAL TIDAL CENTRE — The National Tidal Centre collects, monitors and publicly provides sea level data from selected locations around Australia and, with AusAID funding, in the South West Pacific. The data are used in deriving trends in absolute sea level, producing national tide predictions and tide streams, and monitoring the effects of climate change on ocean levels. The Centre will also take an integral role in the monitoring of sea levels as part of the new Australian Tsunami Warning System being developed by the Bureau, Geoscience Australia and Emergency Management Australia.

See: www.bom.gov.au



Other government portfolios

Activities that other Australian Government agencies undertake range from the day-to-day implementation of environmental management systems to science, research and industry partnerships.

NATIONAL WATER INITIATIVE

Water is a national priority issue and the Australian Government is committed to achieving environmentally sustainable water resource management. The National Water Initiative is a comprehensive strategy driven by the Australian Government to improve water management across the country. Australia's highly variable and often scarce water resources are crucial for our economic, social and environmental wellbeing and it is important that we improve the productivity and efficiency of our water use, while maintaining healthy river and groundwater systems.

Australian Government Water Fund

The \$2 billion Australian Government Water Fund investment in smart water infrastructure and technologies, improved knowledge and water management, and better practices in the stewardship of Australia's water resources.

The three main components of the Australian Government Water Fund are: Water Smart Australia; Raising National Water Standards; and the Community Water Grants programme. The National Water Commission, an independent statutory agency created in the Prime Minister's Portfolio, administers the first two programmes. The Department of the Environment and Heritage and the Department of Agriculture, Fisheries and Forestry administer the Community Water Grants programme.

Water Smart Australia will provide \$1.6 billion over five years from 2005–06 to accelerate the development and uptake of smart technologies and practices in water use across Australia. Through competitive grants, the Australian Government will continue to directly support projects that implement technologies and practices that improve water use and management. On World Water Day, 22 March 2006, the Prime Minister announced that the Government had already committed to supporting 28 water conservation projects across Australia involving initiatives worth over \$1 billion with contributions from the Australian Government's Water Fund of \$392 million. Projects are demonstrating innovative approaches to water recycling and reuse, demonstrating water use efficiency techniques, integrated water resource planning and smart metering technology.

The Raising National Water Standards Programme will invest \$200 million over five years from 2005–06 in activities to improve Australia's national capacity to measure, monitor and manage its water resources. An investment strategy that outlines key areas for support under the programme has been agreed by the Prime Minister. Funding under the Raising National Water Standards Programme is already underway to complete a national baseline assessment of water resources which is a requirement of the National Water Initiative.

The Community Water Grants programme will invest \$200 million over five years from 2005–06 to make a real difference in the way communities use our water resources through practical on-ground projects to save and protect water resources. Round one was announced in March 2006, with 1750 projects in place which will aim to: save 18,063 million litres through water efficiencies and reuse; rehabilitate 15,261 hectares of land for water quality improvement; and fence 1,826 kilometres of land to protect waterways.

AUSTRALIAN GOVERNMENT'S COMMUNITY WATER GRANTS

Facing a local water crisis, Nimmitabel in NSW used their \$45,000 grant to secure a water supply that will meet domestic needs without carting water from the nearby town of Cooma. By treating and reusing water, installing water tanks to public buildings and subsidising water efficient toilets and shower heads, the Nimmitabel community will reduce their water consumption by 24 per cent and save more than 4,120,000 litres of water per year.

The City of Bunbury in Western Australia is on the way to solving the problem of when is the best time to water their local parks and ovals. They are using their grant of \$50,000 to install a weather station that communicates with the irrigation system at five local parks and ovals. The station adjusts irrigation times and settings according to the weather, saving over 50,000,000 litres of water each year, by watering more efficiently.

See: www.pmc.gov.au/nwi/; www.nrm.gov.au/water-fund; www.nwc.gov.au/; and www.mdbc.gov.au/

NATIONAL ACTION PLAN FOR SALINITY AND WATER QUALITY

The National Action Plan for Salinity and Water Quality aims to halt the spread of dryland salinity and improve water quality. During 2005–06 the integrated regional delivery of the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust (administered jointly by the Department of Agriculture, Fisheries and Forestry and the Department of the Environment and Heritage) has achieved significant progress. All 21 National Action Plan for Salinity and Water Quality regions now have regional plans that have been accredited by the Australian and state governments. Investment under the plan has accelerated and total expenditure to 31 December 2005 has exceeded \$352 million.

FOREST MANAGEMENT

The Australian Government continues to advance the sustainable use and management of Australia's forest resources. The Department of the Environment and Heritage and the Department of Agriculture, Fisheries and Forestry, in conjunction with the Tasmanian government will direct over \$250 million towards the Tasmanian Community Forest Agreement to strengthen the Tasmanian forest industry and environment.

PESTS AND WEEDS

The Australian Government continues its commitment towards the National Weeds Strategy for the eradication of Australia's most threatening and invasive weeds. Weeds do significant damage to the environment, agricultural industries, and to the nation's biodiversity. Management and control of weeds and associated production losses cost the agricultural industry around \$4 billion each year. The Australian Government has committed \$44.4 million through the Defeating the Weed Menace programme — from the Natural Heritage Trust — to target the nation's most threatening weeds through research, biological control, and community awareness and action. The most effective weed strategy is prevention and early detection, and a priority list of Australia's worst weeds is planned to be in place by 2007–08.

The new Emergency Plant Pest Response Deed between governments and industry, which came into force on 26 October 2005, will encourage early reporting of suspected plant pests, including exotic pests, increasing the chance of early detection and enabling a swifter response to incursions. These arrangements include the identification of exotic pest threats, contingency plans and emergency response



arrangements to eradicate plant pests which, if established, could have a significant negative impact on native flora and fauna and the environment.

ENVIRONMENTAL MANAGEMENT SYSTEMS

The Australian Government has allocated over \$31 million of Natural Heritage Trust funding to test the potential for and encourage the adoption of voluntary on-farm environmental management and environmental assurance systems. The Environmental Management System Incentives Programme, Environmental Management System National Pilots Programme and the Pathways to Industry Environmental Management System Programme are helping primary producers to secure a sustainable, profitable and competitive future through improved natural resource management and better recognition of farmers' environmental credentials.

The Department of Defence's \$44.6 million projected contribution to environment-related activities in 2006–07 will support and promote the Environmental Management System. Works will include: water and energy management; pest and weed control; and, natural resource efficiency initiatives and projects.

MARKET BASED INSTRUMENTS PILOT PROGRAMME

The Australian Government has committed up to \$5 million (over two rounds) to the National Market Based Instruments Pilot Programme, funded under the National Action Plan for Salinity and Water Quality. This programme is the first time that states, territories and the Australian Government have worked together to examine market-based solutions to natural resource management issues. Results from the first round of the programme indicate that market based instruments, such as competitive tenders, can be a cost effective way of providing incentives to farmers to help address a wide range of environmental problems including water quality, biodiversity decline and salinity. Round two of the programme will commence in mid-2006.

FISHERIES

The Australian Government and the Australian Fisheries Management Authority (the Authority) will continue to fight illegal fishing and make sure our Commonwealth fisheries are ecologically sustainable. The \$220 million Securing Our Fishing Future Package is the largest structural adjustment package offered to the Australian fishing industry. The structural adjustment package is designed to help secure Commonwealth fish stocks and a profitable future for the fishing industry. The Government's Securing Australia's Fishing Future Package comprises: a range of new fishing management measures to address over-fishing and reduce impacts on the broader marine environment; implementation of new marine protected areas in the South-east Marine Park Region; and, the \$220 million structural adjustment package to help ease the introduction of these measures and to provide a one-off opportunity to allow operators to exit the industry.

NATIONAL LANDCARE PROGRAMME

The National Landcare Programme seeks to increase the profitability, competitiveness and sustainability of Australian primary industries through improved management of natural resources. The primary mechanism used to achieve these aims is the provision of support to the landcare movement for on-ground projects. The landcare movement is a voluntary community group movement which aims to improve natural resource management. There are around 4,000 groups operating nationally involving 40 per cent of Australian farmers.

HEALTHY SOILS

The Australian Government will involve farmers and community groups in demonstrating the benefits of better management practices for soil health (\$5 million over four years from the Natural Heritage Trust).

INDIGENOUS AUSTRALIANS

The Australian Government is committed to ensuring the full participation of Aboriginal and Torres Strait Islander communities in ecologically sustainable development. This commitment is being made through programmes that provide for the identification, protection, preservation, and management of cultural property and areas of significance to Indigenous Australians.

For example, the Indigenous Land Corporation assists Indigenous Australians to acquire land and manage Indigenous-held land in a sustainable way to provide cultural, social, economic or environmental benefits for themselves and future generations. The Department of Families, Community Services and Indigenous Affairs also delivers large-scale capital projects covering housing and related infrastructure, to improve environmental living conditions for Indigenous Australian communities, primarily in rural and remote locations.

INTERNATIONAL

The Department of Foreign Affairs and Trade leads Australia's international engagement on a range of environmental issues and contributes diplomatic policy development and negotiating support to Australia's international work on a range of other environment issues. In 2006–07, AusAID will provide an estimated \$316 million for activities that address environmental problems in developing countries (around 13 per cent of overall AusAID expenditure).

Future assistance will focus on priority areas including engagement on Asia-Pacific environmental issues in international fora. Australia will also support the work of multilateral agencies through activities such as the Global Environment Facility. The facility supports projects in developing countries in areas such as: biodiversity, water and land resource management, the ozone layer, and persistent organic pollutants. Australian assistance also contributes to the Montreal Protocol Multilateral Fund to support initiatives that repair the ozone layer, and the United Nations Environment Programme to support sustainable development.

RESOURCE AND HERITAGE PROTECTION

The Australian Customs Service's civil surveillance and response services at sea and land borders help the Department of the Environment and Heritage to combat the illegal export and import of wildlife. There will be a continuation of surveillance and enforcement capability of Australia's Southern Oceans to protect Australian sovereignty and environmental values in Australia's exclusive economic zone at Heard and McDonald Islands, and a continued operation of a sustainable Australian fishing industry.

The Department of Defence will work towards sustainable environmental management of the Defence estate through the ongoing implementation of its Defence Heritage Strategy and the ongoing development of Heritage Management Plans for Defence sites.

COMMUNITY INCENTIVES

The Australian Government provides incentives to encourage and support environmental sustainability in the community, including a requirement for Australian Government agencies to develop and implement environmental management systems across their activities, to encourage continuous improvement in the environmental performance of these agencies, and decrease resource and energy use.



A range of environmental taxation concessions and incentives are implemented by the Australian Taxation Office, such as: capital gains tax concessions for conservation covenants; deductions for expenditure on environmental impact statements, water conservation, and donations to registered environmental organisations; a tax offset facility for soil conservation; and, a levy on lubricating oils to fund recycling and reuse of these products.

INDUSTRY

Industry plays a vital role in achieving sustainable development. By working together with industry, both domestically and in international fora, the Australian Government coordinates its environmental agenda with the requirements of Australian industry.

The Department of Industry, Tourism and Resources has a continuing commitment of \$100 million over seven years, through the Renewable Energy Development Initiative. This initiative provides grants to firms for the development and commercialisation of new products, processes and services in the renewable energy sector, with strong commercial as well as emissions reduction potential.

The Energy Efficiency Opportunities Assessment programme has funding of \$16.9 million over five years to encourage the identification and uptake of commercial energy efficiency opportunities among Australia's largest business energy users. Approximately 250 users account for 60 per cent of all business energy end use. Commencing in July 2006, large energy-using businesses in Australia will be required to undertake an energy efficiency opportunities assessment every five years and report publicly on the outcomes and their responses. The realisation of these energy efficiency opportunities will significantly improve economic productivity while reducing greenhouse emissions.

GREENHOUSE

The Australian Government has committed funding of \$100 million over five years to the Asia-Pacific Partnership on Clean Development and Climate. The Partnership will explore ways to develop, deploy and transfer cleaner, more efficient technologies to address climate change, air pollution, energy security and sustainable development in an integrated manner.

Addressing human-induced climate change is a major issue for this century. The Department of Industry, Tourism and Resources will invest \$10 million (\$5 million in 2006–07 and \$5 million 2009–10) as a contribution towards the construction of a new gas fired turbine generator at the Queensland Alumina Limited facility in Gladstone. This has the potential to reduce greenhouse gas emissions by at least 2.5 million tonnes of carbon dioxide emissions.

Currently, electricity generation contributes over 35 per cent of Australia's greenhouse gas emissions. The CSIRO will provide science and develop technologies to assist in the significant reduction of Australia's greenhouse gas emissions.

The Department of Transport and Regional Services is developing guidelines to encourage the owners and operators of high-emitting heavy diesel vehicles to reduce exhaust emissions of particulates, smoke and smog-forming pollutants, through adoption of reasonable maintenance standards.

SCIENCE, RESEARCH AND ECONOMIC ANALYSIS

New knowledge, skills and technologies underpin sound environmental policy and on-ground solutions. Significant initiatives include:

- Continued analysis by the Australian Bureau of Agriculture and Resource Economics of potential economic and environmental impacts of policies on climate change, water resource management, and fisheries.
- Investment by the CSIRO of \$280 million in continuing research on climate change, ecosystems, biodiversity and sustainable natural resource management, including improving the health of Australian rivers, estuaries and coastal environments. The Urban and Industrial Water programme will create the science platform for management of the Total Water Cycle of Australia's urban and industrial environments. The diverse benefits of forest landscapes will be measurably protected and enhanced through effective risk management under the Forest Protection programme.
- Australia's contribution of \$3 million from 2005–06 to 2007–08 to membership of the Commission for the Conservation of Southern Blue-fin Tuna and to the Commission's scientific research programme. These funds will assist the Commission in ensuring the conservation and optimum utilisation of Southern Blue-fin Tuna.
- The National Land and Water Resources Audit is a National Heritage Trust funded programme (\$7.5 million from 2006–07 to 2007–08) designed to coordinate natural resource information across Australia. It evaluates the extent and condition of natural resources such as soils, land use, wetlands and coastal areas.
- Land and Water Australia is a national organisation funded under the Natural Heritage Trust, dedicated solely to investing in and managing research and development to underpin sustainable resource use and management. \$6.8 million will be invested in projects in 2006–07.
- Geoscience Australia's critical role in producing first-class geoscientific information and knowledge in relation to environmental topics such as coastal and marine environment research mapping (\$19 million from 2005–06 to 2009–10) which assists in Regional Marine Planning, establishment of Marine Protected Areas and the management of the Australian Marine Jurisdiction.
- Continued investment by the Australian Research Council for research relevant to ecologically sustainable development and environmental development.

WHALE RESEARCH

Whale research at the Australian Antarctic Division has continued to focus on the development and



application of powerful, non-lethal approaches to better understand the role of whales in their ecosystem. Substantial progress has been achieved in three methodological categories:

Molecular techniques:

- Techniques have been successfully developed and applied to study the diet of whales from the remnant prey DNA found in whale faeces.
- New techniques are being developed to attempt to determine the age of whales from molecules in their chromosomes.

Novel technology:

- Sophisticated acoustic recorders have been developed and deployed that record whale sounds and can be used to assess whale presence and relative abundance.
- Micro-electronics and bio-compatible materials are being used to further develop satellite monitored location tags that can track whale movements over large scales.

Mathematical, statistical and computer modelling:

- Improved statistical models to determine the abundance and trends of whale populations measured from large scale ship surveys are being developed.
- New approaches to developing Southern Ocean ecosystem models, with a focus on whales, are being further developed.
- Powerful computer-based quantitative models are being developed to visualise, explore and analyse animal tracking data, such as that derived from whales, and integrate these data with other information from the Southern Ocean.

Further information on the environment-related programmes of various Australian Government portfolios can be found at their respective web sites which can be accessed through www.directory.gov.au.

Table A1.1: Environment activities — programme and tax budget estimates

Note: This table includes estimated budgets for programmes in a wide variety of government departments and agencies outside the Environment