



Department of the Environment and Heritage

Mr Ian Dundas
 Secretary
 House of Representatives Standing Committee
 on Agriculture, Fisheries and Forestry
 Parliament House
 CANBERRA ACT 2600

Secretary: *[Signature]*

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- 1 MAY 2003

HOUSE OF REPRESENTATIVES
 STANDING COMMITTEE ON
 AGRICULTURE, FISHERIES
 AND FORESTRY

Dear Mr Dundas

**Submission to Inquiry into the Provision of Future Water Supplies for
 Australia's Rural Industries and Communities**

I have pleasure in forwarding a submission from Environment Australia (including the Australian Greenhouse Office) to the House of Representatives Inquiry into the Provision of Future Water Supplies for Australia's Rural Industries and Communities.

Key issues in Environment Australia's submission include current water use, climate change and climate variability, the Council of Australian Governments Water Reform Framework, the Murray-Darling Basin Initiative, the *Environment Protection and Biodiversity Conservation Act 1999*, and Commonwealth funding programs that relate to water.

Officers of the Department are available to further contribute to the Inquiry if requested. Please do not hesitate to contact Mr Theo Hooy, Acting Assistant Secretary, Water Branch, on 6274 2223.

Yours sincerely

[Signature of Alison Russell-French]

Alison Russell-French
 Acting First Assistant Secretary
 Marine & Water Division

30 April 2003

Enc





Department of the Environment and Heritage

House of Representatives Standing Committee on Agriculture, Fisheries and Forestry
**INQUIRY INTO THE PROVISION OF FUTURE WATER SUPPLIES
FOR AUSTRALIA'S RURAL INDUSTRIES AND COMMUNITIES**

Submission by Environment Australia
(including the Australian Greenhouse Office)

April 2003

Executive Summary

The conservation and sustainable management of our surface and ground water resources is one of the key natural resource issues facing Australia today. The health of our surface and groundwater systems continues to deteriorate due to increasing pressures to extract water for human use¹. The *Snapshot* assessment of river condition in the Murray-Darling Basin dramatically illustrates the extent to which the rivers of the Murray-Darling Basin have been modified. It estimates that over 95 per cent of the river length assessed in the Murray-Darling Basin has an environmental condition that is degraded². Few river systems, such as the Paroo River, remain unregulated in Australia. The need to strike an appropriate balance between the competing demands being made on rivers, streams, wetlands and groundwater systems is an urgent one.

Environment Australia, in partnership with other agencies such as Agriculture, Fisheries, Forestry – Australia, takes a lead role in the development and implementation of the Commonwealth's major policy and program initiatives that aim to improve water resource management and ensure the long-term viability of important aquatic ecosystems. Environment Australia is also responsible for administration of the *Environment Protection and Biodiversity Conservation Act 1999*. The legislation provides a national framework for environment protection through a focus on protecting matters of national environmental significance, including wetlands of international importance (Ramsar wetlands), listed migratory species and listed threatened species and ecological communities.

In particular, Environment Australia participates in and contributes to the development and implementation of national water resource policy, including the Council of

¹ Australian State of the Environment Committee (2001), *Australia State of the Environment, 2001*, Independent Report to the Commonwealth Minister for the Environment and Heritage, CSIRO Publishing on behalf of the Department of the Environment and Heritage, Canberra.

² MDBC (2001), *Snapshot of the Murray-Darling Basin River Condition*, Report to the Murray-Darling Basin Commission by Cooperative Research Centre for Freshwater Ecology and CSIRO Division of Land & Water, Murray-Darling Basin Commission, Canberra.

Australian Governments Water Reform Framework, the National Principles for the Provision of Water for Ecosystems and the National Water Quality Management Strategy.

The CoAG Water Reform Framework establishes the need for formal allocation of water for the environment, and is guiding governments in moving towards more sustainable water allocation regimes. It introduces an element of greater consistency across jurisdictions that is vital to the sustainable management of large cross-border river systems and shared groundwater resources, and to facilitating trade to enable water to move to its highest value end use. Its twinned economic and environmental focus delivers a nexus between the need to protect the long-term ecological viability of aquatic ecosystems, and the need to provide water for urban and rural communities for consumptive use, including clearly specified water access rights. As such, it is the foundation on which current and future water resource management must rest.

The complexity of the issues challenges all involved and is starkly manifest in the present situation in the Murray-Darling Basin and the debate about returning more water to the environment.

Australia is already experiencing climate change, and it is appearing more pronounced in the southwest and southeast regions of the continent. It is anticipated that the impacts of climate change will become more severe over the whole continent in the next few decades. It is expected that, for much of Australia, inflows of water into managed streams and reserves will decrease concurrent with increased evaporative demands. Water resources are already under pressure, and climate change will exacerbate the challenge of supply and management of water resources for Australia's rural industries and communities.

It is essential that processes of water allocation take climate variability and climate change into account to avoid over-estimation of sustainable yields of water from catchments and over-allocation of entitlements over the long term. There is a strong need to improve water accounting methodologies, both at the macro (catchment) and micro (farm) scales to monitor, evaluate, and better manage water resources. Attention should focus on eliminating water losses that cannot be recaptured, and on maximizing economic, environmental, and social benefit per unit of available water.

Changes in water supply and catchment hydrology will have profound impact throughout all rural and urban landscapes, affecting the environment, agricultural productivity, infrastructure, and communities. There needs to be greater focus on initiatives such as institutional reforms, incentives, and scientific and technical developments to address the decreases in water availability that are due to climate change and climate variability.

The development of policies relating to the provision of future water supplies for Australia's rural industries and communities should not be based solely or predominantly on historical records and paradigms. Climate change, and the increase in climate variability that accompanies climate change, must be taken into account in the development of policies, especially where these policies may relate to the competing demands for the allocation of water between agricultural, environmental, and urban uses. Major gaps in knowledge of climate science and the impacts of climate change remain, and this will increasingly restrict our capacity to develop effective response measures.

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1 Introduction

Freshwater ecosystems provide economic and environmental services crucial to all life and well-being in Australia, both now and in the future. Water, delivered at appropriate times and of suitable quality and quantity is vital to the ecological health of aquatic, riparian and terrestrial ecosystems. It is also vital to our towns and cities, and is an essential resource that underpins much of Australia's economic development.

Australia is the driest inhabited continent with over 80% of its land having an average rainfall of less than 600 mm/year. Rainfall also varies considerably from year to year, between seasons and across Australia. The key findings of *Australia: State of the Environment 1996* highlighted that Australia's inland waters are under increasing pressure from over-extraction, pollution, algal blooms, catchment modification, habitat destruction and flow regulation³. Since 1996, the pressures on many inland waters have increased, with a substantial increase in water extraction, continued clearing of catchments and riparian vegetation, increases in the area of land affected by dryland salinity and increases in pesticide use⁴.

2 Water Use in Australia

Water extraction has increased substantially over the last 15 years. About 26% of surface water management areas are close to or have exceeded sustainable extraction limits⁵. Total water use in Australia for 1996/97 was 24 100 ggalitres (GL), an increase of 65% from 1985^{6 7}. Seventy-nine per cent (19 100 GL) of water was extracted from surface waters, while 21% (5 000 GL) was extracted from groundwaters. Seventy-five per cent of water extracted is used for irrigation, with irrigation water use increasing by 76% between 1985 and 1996/97⁸.

2.1 Surface water resources

The average volume of run-off from Australia's catchments is 391 661 GL/year⁹. Only 32% of total run-off can feasibly be diverted for human use and typically consists of baseflows and low to moderate flows that are also important for the health of inland aquatic ecosystems. Based on the sustainable yields determined for 15 river systems in

³ State of the Environment Advisory Council (1996), *Australia: State of the Environment 1996*, Independent Report to the Commonwealth Minister for the Environment and Heritage, CSIRO Publishing on behalf of the Department of the Environment and Heritage, Canberra.

⁴ SOE (2001).

⁵ SOE (2001).

⁶ NLWRA (2001), *Australian Water Resources Assessment 2000*, National Land & Water Resources Audit, Commonwealth of Australia, Canberra.

⁷ AWRC (1987), *1985 Review of Australia's water resources and water use*, Australian Water Resources Council, Department of Primary Industries and Energy, Australian Government Publishing Service, Canberra.

⁸ State of the Environment Report, 2001.

⁹ NLWRA, 2001a.

Australia, on average 20% of Australia's total run-off can be sustainably diverted for human uses ¹⁰.

With the current level of resource development, 7% nationally of the average annual run-off is able to be captured. However, intensive development of river systems in the Murray-Darling Basin for irrigation and in the coastal river systems near major urban centers for potable and industrial water, has resulted in water extractions exceeding sustainable yields ¹¹.

2.2 Groundwater resources

Due partially to the cap on surface water extractions in the Murray-Darling Basin and the scarcity of surface water resources in other areas, groundwater use across Australia has increased by 90% between 1985 and 1996/97 to approximately 5 000 GL/year¹². Nationally, 33% of groundwater extracted is for urban/industrial use, 48% is used for irrigation and 19% is for stock watering and rural use.

The total volume of groundwater that can be sustainably extracted from groundwater resources is currently estimated at 25 735 GL/year (including water with <5000 mg/L total dissolved solids). However, many undeveloped groundwater resources are located in extremely remote areas of the continent. In many areas of rural and regional Australia, groundwater is the only viable and secure source of water for a range of agricultural, industrial and domestic uses. Many plants and animals also rely to varying extents on groundwater for survival. Given the importance of groundwater resources to the economic, social and environmental well being of much of inland Australia, Governments at all levels and rural communities are working together to ensure these resources are sustainably managed.

3 Impacts of Climate Change and Climate Variability on Water Resources and Water Resource Management

Australia has a wide range of climate regimes, experiencing large year-to-year variations in rainfall with droughts and floods being common occurrences.

According to the Bureau of Meteorology, widespread dry conditions during 2002 resulted in one of Australia's driest years on record. Even outside of the rainfall deficient areas, the past ten months have mainly been drier than average with very few regions experiencing average or above average totals. Preliminary results suggest that for Australia as a whole, 2002 was the fourth driest since 1900. The total annual rainfall averaged over Australia for 2002 was 339mm, well below the long-term average of

¹⁰ State of the Environment Report, 2001.

¹¹ State of the Environment Report, 2001.

¹² NLWRA, 2001b.

472mm¹³. These dry conditions were accompanied by very warm conditions with the all-Australian average maximum temperature the highest on record.

Australia's climate has been changing throughout the 20th century. According to the Bureau of Meteorology Australia's records show that mean annual temperature has increased by 0.9°C since 1910, with the decades at the end of the century the hottest ever recorded. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) has produced climate change projections for the Australian region using global climate model simulations. The latest projections of climate change (see www.dar.csiro.au/publications/projections2001.pdf) are for 2030 and 2070 relative to the average climate of 1990. The range in projections reflects the uncertainty in the amount of emissions and uncertainty in the climate system response to increased greenhouse gases.

Since 1910, the percentage area of Australia experiencing extreme wetness increased slightly and the area reporting extreme dryness has decreased, consistent with a slight rise in annual mean rainfall over much of the continent. However, drying has occurred over southeastern Queensland and also southwestern Australia since the mid-1960s. The latter trend has been of particular concern and climate change and natural climate variability are both likely to be contributing factors (IOCI 2002)¹⁴. Most of the century-scale increase over eastern Australia occurred in the first half of the century and trends since the early 1950s mostly show decreases.

Overall, CSIRO projections include:

- Most of Australia may warm 0.4 to 2.0°C by 2030 and 1 to 6 °C by 2070.
- Annual rainfall will generally decrease in the south and east (mainly winter/spring). Some inland and eastern coastal areas may experience wetter summers. Extreme rainfall and tropical cyclones could become more frequent.
- Potential evaporation increases annually and for all seasons ranging from 0% to 8% per degree of global warming over most of Australia, and up to 12% over Australia's eastern highlands and Tasmania. These increases tend to be higher where there is a corresponding decrease in rainfall.
- Average decreases in annual water balance (the difference between potential evaporation and rainfall) range from about 40 to 120 mm per degree of global warming. This represents reductions in the amount of available water across Australia from 15 to 160 mm by 2030 and 40 to 500 mm by 2070.

Changes to water resources are a major concern across most, if not all of Australia. Water supply and hydrological systems are likely to become increasingly vulnerable to climate change due to projected drying trends over much of the continent. Decreases in stream flow appear likely for southern Australia due to reductions in rainfall and increased

¹³ Bureau of Meteorology (2003), *Annual Climate Summary 2002*, Bureau of Meteorology, Melbourne, 14pp.

¹⁴ IOCI (2002), *Climate variability and change in south west Western Australia*, Indian Ocean Climate Initiative Panel, Western Australia Department of Environment, Water and Catchment Protection, Perth, 34pp.

evaporation. Stream flow in northern Australia may increase if summer rainfall increases. The IPCC Third Assessment Report (2001) has estimated that changes in stream flow in the east-central Murray-Darling Basin will range from 0 to -20% in 2030 and +5 to -45% in 2070¹⁵.

These reductions would increase pressure on already stressed riverine ecosystems resulting in reduced water quality (eutrophication, increased pollutant concentration, increased salinity etc.) and reduced water quantity. Regions already affected by reductions in rainfall and streamflow, mainly due to natural climate variability, would be placed under even more stress by further declines in rainfall as a consequence of global warming.

Dam storage may also be reduced. Modelling of the Macquarie River catchment in the Murray-Darling Basin indicates decreases in streamflow— as a result of climate change—into the Burrendong Dam the main storage in the catchment¹⁶. Evaporation is expected to increase, exacerbating existing transmission loss problems. Risk assessment of the simulated change in storage suggests that the most likely outcomes in flow are from about 0 to -15% in 2030 and 0 to -35% in 2070.

It is clear that water resources are already under pressure and climate change will further exacerbate water resource problems. In order to avoid over-estimation of water resource systems' sustainable yields and over-allocation of water entitlements, it is essential that water allocation regimes take climate change into account. There is a strong need to improve water accounting methodologies, at both paddock and catchment scales, to monitor, evaluate, and better manage water use. Attention should be focused on eliminating water losses that cannot be recaptured, and on maximising economic or environmental benefit per unit of available water.

Changes in water supply and catchment hydrology will have impacts throughout all rural landscapes, affecting the environment, agriculture, infrastructure, rural communities and people's livelihoods. Initiatives such as institutional reforms, incentive schemes, public awareness campaigns, and scientific and technical developments need to take on greater importance to reflect projected decreases in water availability as a result of climate change.

The trends within climate change are irreversible, and this will induce increasing pressure on Australia's water resources. Across most of Australia, the inflow of water into the managed streams and reserves will decrease concurrent with increased evaporative potentials in each of the catchment, storage, transfer, and utilisation phases.

The development of policies relating to the provision of future water supplies for Australia's rural industries and communities should not be based solely or predominantly

¹⁵ IPCC (2001), *Climate Change 2001: Third Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press.

¹⁶ Australian Greenhouse Office (1998), *Climate Change Scenarios and Managing the Scarce Water Resources of the Macquarie River*. Report to the Australian Greenhouse Office by Hassall and Associates, NSW Department of Land and Water Conservation, NSW National Parks and Wildlife Service, and CSIRO Division of Atmospheric Research.

on historical records and paradigms. Climate change, and the increase in climate variability that accompanies climate change, must be taken into account in the development of policies, especially where these policies may relate to the competing demands for the allocation of water between agricultural, environmental, and urban uses.

Research into climate change projections and the impact of climate change on water resources has only received minimal funding in Australia over the past decade or so. The Australian Greenhouse Office commissioned a review during 2002 of Australian Greenhouse Science Program. This review outlined achievements in climate science to date, but flagged major research gaps that are of high priority to Australia including the science to underpin understanding of climate change impacts, and the detection and attribution of climate change. It also noted that funding for the program had in real terms declined considerably over the past decade.

Current climate change models provide a reasonable understanding of the directions of climate change and, in broad terms, some understanding of the possible impacts of climate change on Australia's water resources. Additional precision in climate models at regional levels across Australia, however, would greatly strengthen our capacity to develop the required policies for the supply and management of water resources for Australia's rural industries and communities.

4 The Commonwealth Government's Role in Water Resource Management

The Commonwealth influences natural resource management through funding programs such as the Natural Heritage Trust and National Action Plan for Salinity and Water Quality. These programs are discussed in detail in Section 12 of this submission.

4.1 Environment Australia's role in water resource management

Environment Australia seeks to facilitate the conservation and sustainable management of freshwater resources by progressing the development and implementation of water-related environment policy. Key areas of interest include the provision of water for ecosystems, recognition of environmental requirements in water allocation and planning processes and best practice in the management of environmental flows.

Activities include support for the implementation of the Council of Australian Governments (CoAG) Water Reform Framework, and collaboration with State, Territory and Commonwealth agencies through the Natural Resource Management Ministerial Council, which provides strategic impetus for water reform beyond the current framework, and promotes best practice collaboration at the national level between State and Commonwealth water management and environmental agencies. The Commonwealth Ministers for Agriculture, Fisheries and Forestry, and for the Environment and Heritage sit on the Natural Resource Management Ministerial Council and the Murray-Darling Basin Ministerial Council.

During 2002, Commonwealth and State jurisdictions have focused on opportunities and impediments to better define and implement water property rights regimes (including water trading markets and where appropriate the responsibilities of water users), and how they are addressing uncertainties. Through this process, viable options are being identified that will enable jurisdictions to better manage the burden of the transition to full implementation of the CoAG water reforms, including through the establishment of efficient and more readily accessible water markets.

In April 2002, CoAG commissioned work from jurisdictions to report on opportunities and impediments to better define and implement water property rights regimes. The Chief Executive Officers Group on Water (CEOGW), comprising CEOs of several State and Commonwealth departments, including Environment Australia, and a representative of the Water Services Association of Australia, has developed a draft report containing draft national principles and guidelines concerning water entitlement certainty and adjustment assistance.

Environment Australia has contributed to the development of a Commonwealth paper outlining principles for achieving sustainable water management, informed by consultation with key stakeholder groups.

Environment Australia also administers the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), which provides protection for matters of national environmental significance, including wetlands of international importance (Ramsar wetlands), listed migratory species and listed threatened species and ecological communities. The EPBC Act is discussed in further detail in section 11 of this submission.

Through the development of Eco-efficiency Agreements with industry associations, Environment Australia is also working with businesses to develop more sustainable practices, enabling them to produce more goods and services with fewer natural resources, such as water, while producing less waste and pollution.

5 Council of Australian Governments (CoAG)

In an effort to halt the widespread degradation of our natural resources and to minimise unsustainable use of our water resources, the Council of Australian Governments (CoAG), in 1994, agreed to implement "a strategic framework to achieve an efficient and sustainable water industry". This Framework aims to establish integrated and consistent approaches to water resource management throughout Australia.

Key environmental water issues identified in the Water Reform Framework include:

- Allocation of water for the environment;
- Ecological sustainability of new developments;
- Institutional reform;
- The incorporation of environmental costs in water pricing;

- Ecologically sustainable water trading;
- Protection of groundwater; and
- Implementation of the National Water Quality Management Strategy

A key triumph of the Water Reform Framework has been the fact that through it, the needs of the environment are genuinely becoming recognised in water use decisions. This is partly due to the Framework being linked to the National Competition Policy (NCP). Under this policy, payments are made available for States and Territories that successfully implement a range of important reforms. That is, NCP payments are linked with progress on industry reforms and this has been a catalyst for beneficial change in the water industry.

The timeframes for implementation of the Framework were initially set at five to seven years, with full implementation attained by 2001. However, this timetable was optimistic as it underestimated the reform task. Consequently, some deadlines were extended. In particular, the timetable for environmental water allocations was extended to 2001 for stressed rivers and 2005 for all river systems and groundwater. The National Competition Council's 2002 assessment report indicated that jurisdictions are introducing the reforms at different rates and in some different ways. Volume Two of the assessment report, which examines the progress achieved by each State and Territory and the Murray Darling Basin Commission in water reform, can be found on the National Competition Council's website:

<http://www.ncc.gov.au>

Although implementation of reforms at the institutional level has varied amongst jurisdictions, the achievements so far should not be underestimated. The first step toward implementation is now almost complete, with the introduction of institutional and legislative changes laying the groundwork for reform. While the time and complexity involved in such legislative change has sometimes been underestimated, the implementation of appropriate legislation provides an important pathway for maintaining the momentum of reform. In addition, changes such as the commercialisation of irrigation areas and the progress to date in establishing more clearly defined water entitlements and trading arrangements are already leading to improvements in water use efficiency.

The Commonwealth is currently focusing its efforts on addressing issues that have arisen in the transition to sustainable allocation and use of water resources under the CoAG Water Reform Framework. Specifically, the Commonwealth is working with stakeholders to ensure that States address barriers to trade, provide minimum standards of certainty and security in relation tenure and duration of water access rights, and provide financial assistance to water users whose entitlements are reduced in the public interest.

6 Relevant Ministerial Councils

6.1 Natural Resource Management Ministerial Council

The Natural Resource Management Ministerial Council was established following agreement of the Prime Minister, Premiers and Chief Ministers on 8 June 2001 to develop a coordinated approach to issues affecting the sustainability of Australia's land and water resources. The NRM Ministerial Council is continuing the work of ANZECC and ARMCANZ in relation to progressing the CoAG Water Reform Framework. The Commonwealth Minister for the Environment, the Hon Dr David Kemp MP, and the Commonwealth Minister for Agriculture, Fisheries and Forestry, the Hon Warren Truss MP, jointly chair the NRM Ministerial Council, and all decisions are jointly made. The NRM Ministerial Council also oversees the implementation of the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust.

6.2 Murray-Darling Basin Ministerial Council

The main functions of the Murray-Darling Basin Ministerial Council are:

- To generally consider and determine major policy issues of common interest to the Contracting Governments concerning effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin; and
- To develop, consider and where appropriate, to authorize measures for the equitable, efficient and sustainable use of such water, land and other environmental resources.

Being a political forum, the Ministerial Council has the power to make decisions for the Basin as a whole. Resolutions of the Council require a unanimous vote. This means that decisions taken by the Council represent a consensus of governmental opinion and policy across the Basin.

6.3 Lake Eyre Basin Ministerial Forum

The primary role of the Lake Eyre Basin Ministerial Forum is to oversee the implementation of the Lake Eyre Basin Intergovernmental Agreement, which provides for the sustainable management of water and related natural resources associated with the major cross-border river systems within the Basin to protect dependent environmental, social and cultural values.

The Ministerial Forum is developing a range of policies and strategies in consultation with the Basin community covering: river flows; water quality; water and related natural resources; existing entitlements and significant water related developments; and research and monitoring requirements.

7 National Principles for the Provision of Water for Ecosystems

The CoAG Water Reform Framework recommended the introduction of comprehensive systems of water allocations, including the determination of clearly specified water entitlements, the provision of water for the environment and water trading arrangements. The CoAG Framework provided a clear, general direction for the further development and implementation of water resource allocation and management policies. The Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) and the Australian and New Zealand Environment and Conservation Council (ANZECC) were tasked with overseeing this work. In attempting to define these policies, it was recognized that direction was required on how the issue of water for the environment should be dealt with in water allocation decisions. Specifically, there was a need for national policy on questions such as:

1. The definition of environment in this context;
2. The aim of providing water for the environment;
3. Methods of providing water for the environment; and
4. Management of environmental water provisions.

The *National Principles for the Provision of Water for Ecosystems (1996)* were developed and published to provide policy direction on these issues. The National Principles are:

Basic premise of principles

- Principle 1: River regulation and/or consumptive use should be recognized as potentially impacting on ecological values

Determining environmental water provisions

- Principle 2: Provision of water for ecosystems should be on the basis of the best scientific information available on the water regimes necessary to sustain the ecological values of water dependent ecosystems.

Provision of water for ecosystems

- Principle 3: Environmental water provisions should be legally recognized.
- Principle 4: In systems where there are existing users, provision of water for ecosystems should go as far as possible to meet the water regime necessary to sustain the ecological values of aquatic ecosystems whilst recognizing the existing rights of other water users.
- Principle 5: Where environmental water requirements cannot be met due to existing uses, action (including reallocation) should be taken to meet environmental needs.
- Principle 6: Further allocation of water for any use should only be on the basis that natural ecological processes and biodiversity are sustained (i.e. ecological values are sustained).

Management of environmental water allocations

- Principle 7: Accountabilities in all aspects of management of environmental water provisions should be transparent and clearly defined.
- Principle 8: Environmental water provisions should be responsive to monitoring and improvements in understanding of environmental water requirements.

Other uses

- Principle 9: All water uses should be managed in a manner which recognizes ecological values.
- Principle 10: Appropriate demand management and water pricing strategies should be used to assist in sustaining ecological values of water resources.

Further research

- Principle 11: Strategic and applied research to improve understanding of environmental water requirements is essential.

Community involvement

- Principle 12: All relevant environmental, social and economic stakeholders will be involved in water allocation planning and decision-making on environmental water provisions.

8 National Water Quality Management Strategy

The National Water Quality Management Strategy (NWQMS) was introduced by the Commonwealth, State and Territory Governments in 1992 as a response to growing community concern about the condition of the nation's water bodies and the need to manage them in an environmentally sustainable way. In 1994, the NWQMS was included in the COAG Water Reform Framework. The Strategy has three major elements:

- Policies – the main policy objective of the NWQMS is “to achieve sustainable use of the nation's water resources by protecting and enhancing their quality while maintaining economic and social development”.
- Process – the process for water quality management involves the community working with government to set and achieve local environmental values and water quality objectives for water bodies and to develop management plans for catchments, aquifers, estuarine areas, coastal waters of other water bodies. Management of water resources is mainly a State and Territory responsibility and implementation of the NWQMS will involve the Strategy guidelines, State and Territory water policies and community preferences.
- Guidelines – the national guidelines developed under the NWQMS cover issues across the whole of the water cycle – ambient and drinking water quality, monitoring, groundwater, rural land uses and water quality, stormwater, sewerage

systems and effluent management for specific industries. The aim of the guidelines is to help the community, catchment managers, environment protection agencies and water authorities protect water quality including developing local action plans for water quality management. A total of 19 guideline documents have been released and two more are being prepared.

One of the guideline documents is specific to rural land uses, *09. Rural Land uses and Water Quality: A Resource Document*. This document provides background information on a number of the principal issues which affect water quality in rural environments.

It has been written in recognition that there is a range of land uses that can impact on water quality but which are not addressed in the other NWQMS guideline documents. The document discusses a range of degradation issues but makes no judgment on the extent or scale of these issues. It also discusses the causes of water degradation in rural environments, how these causes impact on water quality, and then identifies some of the Best Management Practices (BMPs) that can be adopted to minimise and/or prevent degradation. The BMPs discussed in this document can also have broader improved sustainability outcomes for other natural resources, including land and related vegetation. A copy of this Guideline is included at Attachment A.

9 Intergovernmental Agreements Related to Water Resource Management

9.1 Murray-Darling Basin Agreement

The Murray-Darling Basin Agreement was initially signed by the governments of the Commonwealth, New South Wales, Victoria and South Australia in 1987, and revised in 1992. Queensland became a signatory in 1996, and the Australian Capital Territory was added in 1998. The Agreement replaced the River Murray Waters Agreement which had been in place since 1915.

The purpose of the Agreement is to promote and co-ordinate effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin.

Three key elements are specified in the Agreement:

- The Murray-Darling Basin Ministerial Council
- The Murray-Darling Basin Commission – the executive arm of the Ministerial Council which advises the Council and carries out its decisions
- The Community Advisory Committee – which provides the Ministerial Council with advice and provides a two-way communication channel between the Council and the community.

The Agreement was recognition of the fact that no one government was able to deal with the Basin's emerging natural resource management problems. The involvement of the community is recognition of the fact that the task is not one that governments could fulfill

on their own. The Murray-Darling Basin *Initiative* is the partnership between the governments and the community, which has been established to give effect to the Agreement.

9.2 Lake Eyre Basin Inter-governmental Agreement

The Commonwealth, Queensland and South Australian Governments signed the Lake Eyre Basin Inter-governmental Agreement in October 2000. The Agreement provides for the sustainable management of the water and related natural resources of the major cross-border river systems within the Basin, to protect and maintain the ecological health of in-stream and floodplain ecosystems, and the viability of dependent economic and cultural values.

The Agreement established the Lake Eyre Basin Ministerial Forum and a Community Advisory Committee to the Ministerial Forum.

10 Murray-Darling Basin Initiative – Key Activities

10.1 Murray-Darling Basin Cap

Water has been diverted from the waterways of the Murray-Darling Basin in increasing quantities since the 1950s. This has caused significant changes to the river flow regime, particularly to the lower reaches of the River Murray where flows have been reduced so much that median annual flows from the Basin to the sea are just 26% of those that would have occurred naturally.

In response to such changes and their consequences, the Murray-Darling Basin Ministerial Council at its June 1995 meeting introduced a 'Cap' on water diversions from the river system. This was seen as an essential first step in establishing management systems to achieve healthy rivers and sustainable consumptive uses. In other words, the Council determined that a balance needed to be struck between the significant economic and social benefits that have been obtained from the development of the Basin's water resources, and the instream uses of water in the rivers.

There are two primary objectives behind the decision to implement the Cap:

- To maintain and, where appropriate, improve existing flow regimes in the waterways of the Murray-Darling Basin to protect and enhance the riverine environment; and
- To achieve sustainable consumptive use by developing and managing Basin water resources to meet ecological, commercial and social needs.

In August 2000 an independent review of the operation of the Cap was released. It reported that the Cap had been an essential first step in providing for the environmental sustainability of the river system of the Basin. Without the Cap, there would have been an

increased risk that environmental degradation of the river system would have been worse. The report also considered that there is compelling evidence that the Cap has already given rise to significant community and social benefits to the Basin community and that the net benefit will increase over time.

The Cap has provided a mechanism for restraining growth in diversions while enabling economic development to proceed. The Cap has provided the stimulus for codifying and improving property rights and entitlements to water, thereby facilitating water trading, which has encouraged water to go to its highest value use. The Cap has also helped alleviate tensions over resource distribution and environmental degradation between irrigator groups and between urban and rural Australians. In addition, the Cap has helped to protect Adelaide's water supply, by deferring the date at which it would have become necessary to treat this water for salinity.

There is evidence that, in the absence of the Cap, the erosion of security of supply for irrigators and other users would have been significant. The Cap has guaranteed security of supply at the valley level, and has provided a more certain climate for long-term investment and development, particularly in high value agriculture and value adding processes.

The implementation of the Cap requires an integrated reporting framework that requires significant improvements to the way that diversions are monitored and reported. To facilitate this, Water Audit Monitoring Reports are prepared on an annual basis. In addition, an Independent Audit Group (IAG) reviews progress on implementation of the Cap in State jurisdictions on an annual basis. The IAG also considers ways to resolve equity issues in water use.

10.2 The Living Murray Initiative

In March 2001 the Murray-Darling Basin Ministerial Council agreed to a vision and set of objectives for the River Murray. The vision is "*...a healthy River Murray system, sustaining communities and preserving unique values.*"

In April 2002 the Council:

- Agreed to hold a community-wide consultation process about environmental flows, this began in July 2002;
- Directed that a comprehensive study be done on the costs and benefits to the environment and the community of returning water to the environment;
- Recognized a need to spend \$150 million on modifying dams, weirs and locks and other measures, to make best use of all the water currently available to the environment; and
- Recognized the importance of establishing water trading arrangements for the efficient allocation of the scarce water resources of the Basin and that the effectiveness of these arrangements will depend on clear definition of access rights to water.

The Ministerial Council recognizes both the complexity of the environmental flows issues and the need for certainty in the communities relying on irrigated agriculture. Its strong desire is to manage the resources of the River Murray and its tributaries to improve the environment, while enhancing the social and economic benefits obtained from water use.

To aid discussion on how much water should be recovered, the Ministerial Council selected three reference points. These are not actual options, but are intended to give all sectors of the community an idea of the costs and benefits involved in transferring various annual volumes of water from current uses (such as irrigation or water losses) to the environment of the River Murray. No decision has yet been made on whether water will be recovered nor how much.

The three reference points are:

- 350 gigalitres a year;
- 750 gigalitres a year; and
- 1 500 gigalitres a year.

The Murray-Darling Basin Commission has appointed a Scientific Reference Panel (SRP) to provide independent expert scientific advice on the potential ecological benefits associated with the three reference points. The ecological assessments will be undertaken on a reach by reach basis, and will also allow for a system-wide evaluation. These assessments will make particular reference to the 'icon sites' identified by the Ministerial Council in April 2002, including the Murray Mouth, Coorong, Chowilla, Gunbower/Perricoota, Barmah-Millewa and also Murray cod populations.

This process is being facilitated by the formation of eight Regional Evaluation Groups along the River Murray and two of its major tributaries, the Goulburn and Murrumbidgee Rivers. The members of these Groups will contribute to this process through their scientific expertise and extensive local knowledge of these river reaches.

A Socio-Economic Reference Panel has been established to provide advice on the options for quantitative assessment of socio-economic impacts of any environmental flows and to advise on the development and conduct of commissioned work. The Panel was established in mid 2002 and since that time has commissioned a series of studies on the socio-economic impact of the three environmental flow reference points. These studies include an analysis of broad Basin-wide impacts as well as a focus on regional impacts, to the extent that these models can capture those. Reports of these analyses will be provided for discussion and feedback as part of the overall communication strategy of the *Living Murray* project.

The Ministerial Council received the first feedback on the community engagement process at its November 2002 meeting. Based on this feedback, Council has decided to

broaden the community engagement strategy and to accelerate planned discussions on options for water recovery, including where any environmental water will be sourced.

The Ministerial Council has directed the Commission to bring recommendations, based on the results of the environmental, economic and social analyses of the three reference points, and on the outcomes of the community feedback, to Council for consideration at its meeting in October 2003.

11 Commonwealth Legislation That May Affect Water Resource Management

The EPBC Act came into force on 16 July 2000. The legislation provides a national framework for environment protection through a focus on protecting matters of national environmental significance and on the conservation of Australia's biodiversity.

Under the assessment and approval provisions of the EPBC Act, actions that are likely to have a significant impact on a matter of national environmental significance are designated as 'controlled actions'. Controlled actions are subject to a rigorous assessment and approval process. An action includes a project, development, undertaking, activity or series of activities.

The Act currently identifies six matters of national environmental significance:

- World Heritage properties
- Ramsar wetlands of international significance
- Listed threatened species and ecological communities
- Listed migratory species
- Commonwealth marine areas
- Nuclear actions (including uranium mining)

Many water resource developments are referred under the EPBC Act including proposals to construct and operate dams and to undertake activities relating to irrigation projects for individual properties or a regional area. In those cases where proposed actions are determined to be likely to have a significant impact on a matter protected under the EPBC Act they will require environmental assessment and approval under the Act. The matters of national environmental significance that are most likely to be relevant for water resource management activities are wetlands of international importance, listed threatened species and ecological communities and listed migratory species.

11.1 Ramsar wetlands

The Convention on Wetlands, signed in Ramsar, Iran in 1971 (commonly known as the Ramsar Convention) is an intergovernmental treaty dedicated to the conservation and “wise use” of wetlands. The Convention’s mission is *‘the conservation and wise use of wetlands by national action and international cooperation as a means to achieving sustainable development throughout the world’*.

The Convention encourages the designation to the List of Wetlands of International Importance sites containing representative, rare or unique wetland types, or that are important for conserving biological diversity. Listed sites (Ramsar sites) need to be managed to ensure their special ecological values are maintained or improved.

Australia was one of the first countries to become a Contracting Party to the Convention. Australia currently has 63 Wetlands of International Importance which cover a total of approximately 7.3 million hectares (Figure 1 and Table 1). Australia seeks to protect these wetlands through a range of activities including the EPBC Act, development and implementation of site management plans and community education and awareness programs.

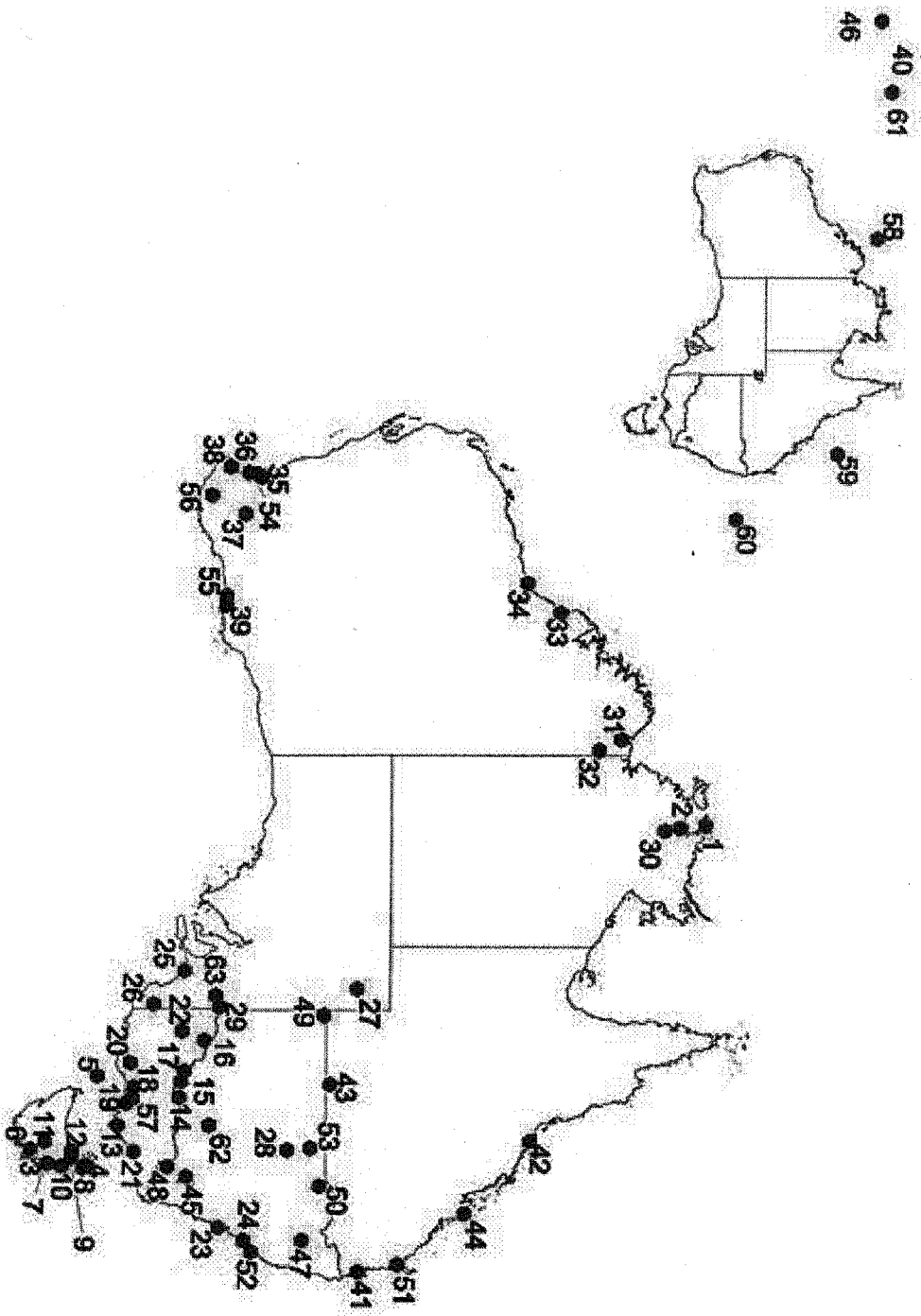


Figure 1: Map showing Australia's Ramsar sites

Table 1: Names and areas of Australia's Ramsar sites, as shown in Figure 1.

Site name	Area (In hectares)	Site Name	Area (In hectares)
1. Cobourg Peninsula Aboriginal Land & Wildlife Sanctuary	220,700	33. Roebuck Bay	55,000
2. Kakadu National Park Stage I (including wetlands components of Stage III)	683,000	34. Eighty-mile Beach	25,00
3. Moulting Lagoon Game Reserve TAS	4,496	35. Forrestdale and Thomsons Lakes	754
4. Logan Lagoon Conservation Area	2,172	36. Peel-Yalgorup System	26,530
5. Lavinia Nature Reserve	6,904	37. Lake Toolibin	493
6. Pitt Water and Orielton Lagoon	3,289	38. Vasse-Wonnerup System	1,115
7. Apsley Marshes	865	39. Lake Warden System	2,300
8. East Coast Cape Barren Island Lagoons	4,480	40. Hosnie's Springs (Christmas Island)	0.3
9. Flood Plain Lower Ringarooma River	3,407	41. Moreton Bay	113,314
10. Jocks Lagoon	19	42. Bowling Green Bay	35,500
11. Interlaken Lakeside Reserve (Lake Crescent)	519	43. Currawinya Lakes	151,300
12. Little Waterhouse Lake	56	44. Shoalwater and Corio Bays	239,100
13. Comer Inlet	67,186	45. Ginini Flats Subalpine Bog Complex	343
14. Barmah Forest	28,515	46. Pulu Keeling National Park (North Keeling Island)	122
15. Gunbower Forest	19,931	47. Little Llangothlin Nature Reserve	258
16. Hattah-Kulkyne Lakes	955	48. Blue Lake	320
17. Kerang Wetlands	9,419	49. Lake Pinaroo (Fort Grey Basin)	800
18. Port Phillip Bay (Western Shoreline) and	22,897	50. Gwydir Wetlands	823

Bellarine Peninsula			
19. Western Port	59,297	51. Great Sandy Strait	93,160
20. Western District Lakes	32,898	52. Myall Lakes	44,612
21. Gippsland Lakes	60,015	53. Narran Lake Nature Reserve	5,531
22. Lake Albacutya	5,731	54. Becher Point Wetlands	677
23. Towra Point Nature Reserve	387	55. Lake Gore	4,017
24. Hunter Estuary Wetlands	2,971	56. Muir-Byenup System	10,831
25. Coorong & Lakes Alexandrina and Albert	140,500	57. Edithvale-Seafood Wetlands	261
26. Bool and Hacks Lagoon	3,200	58. Ashmore Reef National Nature Reserve	58,300
27. Coongie Lakes	1,980,000	59. Coral Sea Reserves (Coringa-Herald and Lihou Reefs and Cays)	1,729,200
28. The Macquarie Marshes	18,726	60. Elizabeth and Middleton Reefs Marine National Nature Reserve	188,000
29. 'Riverland'	30,600	61. The Dales, Christmas Island	57
30. Kakadu National Park Stage II	692,940	62. Fivebough and Tuckerbil Swamps	689
31. Ord River Floodplain	141,453	63. Banrock Station Wetland Complex	1,375
32. Lakes Argyle and Kununurra	150,000	Total Area	7,287,110.3 ha

11.2 Threatened Species and Ecological Communities

Three hundred and sixty four fauna, 1 242 flora and 28 ecological communities were listed as threatened under the EPBC Act at the time of writing this submission.

While only a fraction of these species are aquatic, many other species can be affected by water resource developments. Under the EPBC Act, a person must not take an action that has, will have or is likely to have a significant impact on a listed threatened species and ecological communities without approval from the Commonwealth Environment Minister.

11.3 World Heritage Properties

There are 14 properties on the World Heritage List (Figure 2). A person must not take an action that has, will have, or is likely to have, a significant impact on the world heritage values of a declared World Heritage property, without approval from the Commonwealth Environment Minister. The world heritage values of a property are "the natural heritage and cultural heritage contained in the property".

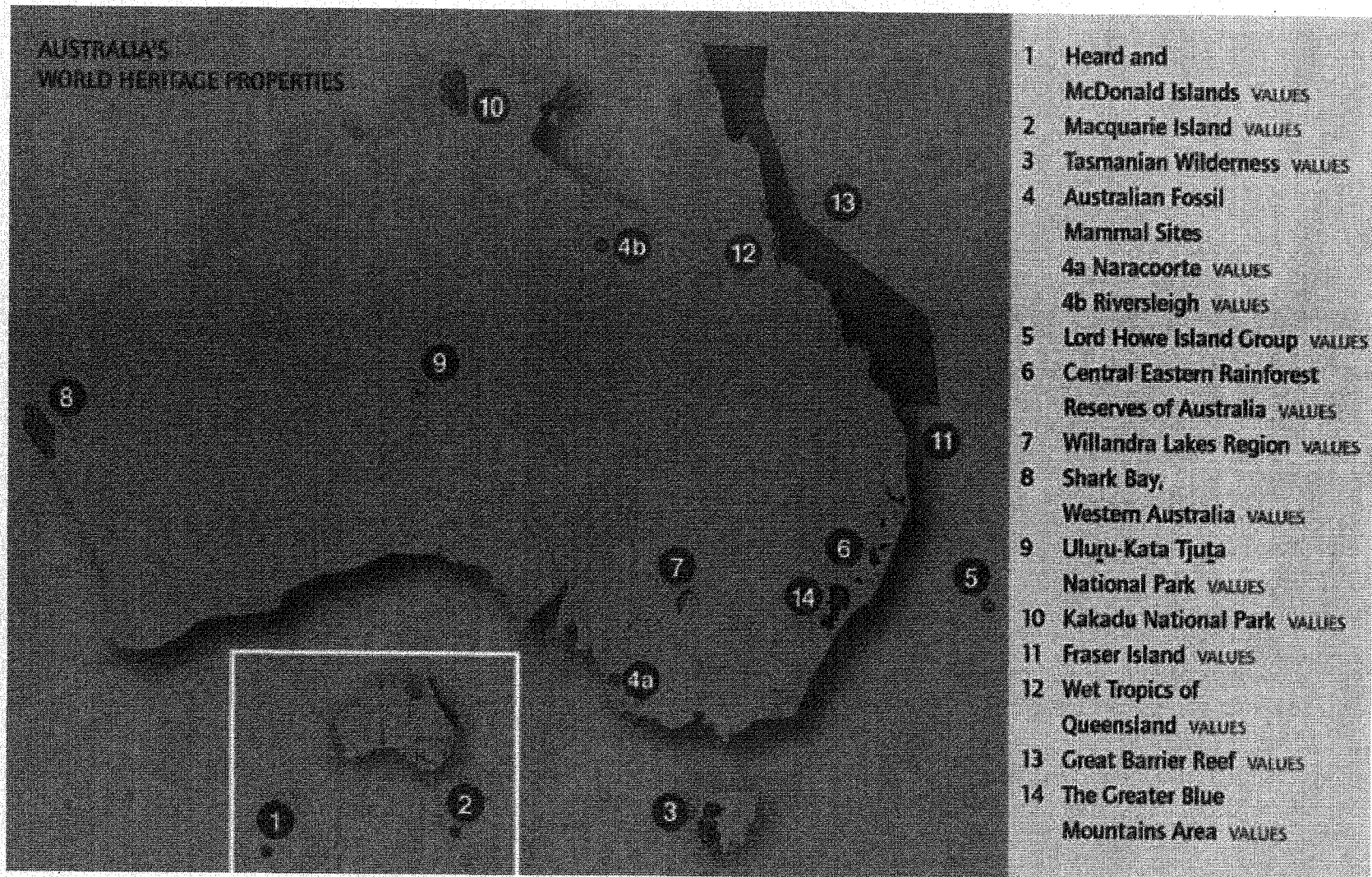


Figure 2: Australia's World Heritage Properties, as listed under the EPBC Act.

12 Commonwealth Funding Programs

12.1 Natural Heritage Trust

The Natural Heritage Trust (NHT) represents the biggest financial commitment to environmental action by any Commonwealth Government in Australia's history. The NHT is jointly administered by Environment Australia and Agriculture, Fisheries and Forestry, Australia. The first phase of the NHT (1996/97 – 2001/02) consisted of 23 programs, a number of which were aimed at improving Australia's inland aquatic resources. Several of these were administered by Environment Australia including:

- National River Health Program – funded research into environmental flows (The Environmental Flows Initiative), undertook a comprehensive assessment of the health of inland waters and identified stressed rivers (Australia-wide Assessment of River Health).
- National Wetlands Program – promoted the conservation, repair and wise use of wetlands and the conservation of migratory waterbirds across Australia.
- Waterwatch Australia – a national community water monitoring program that encourages all Australians to become involved and active in the protection and management of their waterways and catchments.

Other programs with an emphasis on improving the management of water resources were administered by Agriculture, Fisheries, Forestry – Australia, including:

- Murray-Darling 2001 – aimed to reduce or, where possible, reverse the rate of natural resource degradation in the Murray-Darling Basin through an integrated catchment management approach.
- National Rivercare Program – aimed to improve the health of Australia's river systems and waterways, focusing on inland rivers outside the Murray-Darling Basin.

In May 2001 the Commonwealth Government announced a \$1 billion, 5 year extension of the NHT. As part of the Trust Extension, the 23 Trust programs funded during the first phase have been consolidated into four programs:

- Landcare – will invest in activities that contribute to reversing land degradation and promoting sustainable agriculture.
- Bushcare – will invest in activities that contribute to conserving and restoring habitat for the native flora and fauna which underpin the health of the landscape.
- Rivercare – will invest in activities that contribute to improved water quality and environmental conditions in river systems and wetlands.
- Coastcare – will invest in activities that contribute to protecting coastal catchments, ecosystems and the marine environment.

NHT funds will be delivered at three levels:

- National investments – will cover national priorities, addressing activities that have a national or broad-scale.
- Regional investments – will be the principal delivery mechanism for the Trust. Investment will be made on the basis of an accredited, integrated natural resource management plan and investment strategy/proposal developed by the region.
- Australian Government Envirofund – will provide small amounts of funding to address local natural resource management issues. This component is aimed in particular at groups that have had little or no previous experience with the Trust. In recognition of the effects of the current drought across rural and regional Australia, the Commonwealth Government is making available a further \$10 million from the extension of the Natural Heritage Trust for a special round of funding from the Australian Government Envirofund.

Bilateral agreements further detail the implementation arrangements for each State and Territory. To date, bilateral agreements have been signed between the Commonwealth and the ACT, Victoria and Western Australia. A bilateral agreement has been signed by the Northern Territory Chief Minister and is with Commonwealth Ministers for consideration, while discussions are continuing between the Commonwealth and New South Wales, Queensland, South Australia and Tasmania on bilateral agreements for those jurisdictions.

12.2 National Action Plan for Salinity and Water Quality

Australia has critical salinity and water quality problems demanding urgent attention. The Prime Minister's National Action Plan for Salinity and Water Quality (the National Action Plan) highlights that:

- One third of Australian rivers are in extremely poor condition - within 20 years Adelaide's drinking water will fail World Health Organisation salinity standards in 2 days out of 5.
- At least 2.5 million hectares (5% of cultivated land) is currently affected by dryland salinity, and this could rise to 12 million hectares (22%) at the current rate of increase.
- Land and water degradation, excluding weeds and pests, is estimated to cost up to \$3.5 billion per year. In addition, dryland salinity has adversely affected biodiversity, with CSIRO estimating a resultant reduction in bird species of 50% in agricultural areas.
- Infrastructure (buildings, roads, etc) is being severely damaged in many rural urban centers¹⁷.

¹⁷ Commonwealth of Australia (2000), *A National Action Plan for Salinity and Water Quality in Australia*, Canberra.

Although these problems are severe, they can be overcome. The Prime Minister, Premiers and Chief Ministers endorsed the National Action Plan at the Council of Australian Governments on 3 November 2000. It involves a funding package of \$1.4 billion from the Commonwealth, States and Territories. The significant funding allocation is over a seven-year period and complements the Commonwealth's existing \$2.7 billion Natural Heritage Trust.

The National Action Plan complements and builds on the achievements of the NHT and recent initiatives proposed by State/Territory Governments (in particular Western Australia, New South Wales, Victoria and South Australia), as well as the work program of the Murray Darling Basin Ministerial Council. It focuses on integrated approaches to improve the future management of salinity and water quality. In particular it:

- provides the basis for a national approach to salinity and water quality solutions by engaging the Commonwealth, States, Territories and community;
- provides a total package with catchment/region funding accompanied by State and Territory action to establish property rights and protect environmental quality;
- requires accountability for the use of public funds through accreditation of plans and stringent requirements for monitoring, reporting and decision making at the Ministerial and community levels; and
- shifts the focus to proactive outcome driven community plans with performance monitoring and supported by a better regulatory environment, application of scientific knowledge and expertise for community benefit and more efficient use of limited funds.

The National Action Plan is jointly implemented at the Commonwealth level by Environment Australia and AFFA. Agreements between governments have been established in an overarching Intergovernmental Agreement, which sets out the framework for implementing the National Action Plan and also includes confirmation of State/Territory commitments to the CoAG water reforms. An example of such a commitment is the agreement by jurisdictions to cap extractive use of water from all surface and groundwater systems that are over-allocated or approaching full allocation. The National Action Plan requires that all catchment/regional plans include an agreed timetable and strategy to implement these caps. Bilateral agreements further detail the implementation arrangements for each State and Territory.

Implementation of the National Action Plan is strongly dependent on regional communities understanding and taking responsibility for the causes and solutions to natural resource management issues. The goal of the National Action Plan is to motivate and enable regional communities to use coordinated and targeted action to:

- prevent, stabilise and reverse trends in salinity, particularly dryland salinity, affecting the sustainability of production, the conservation of biological diversity and the viability of our infrastructure, and
- improve water quality and secure reliable allocations for human uses, industry and the environment.

As a result of Landcare and the Natural Heritage Trust (NHT), the community is more informed and involved and has demonstrated a capacity to plan and focus community resources to help address these problems. To date, over \$130 million of joint Commonwealth-State funding has been agreed to commence on-ground priority actions to avoid creating or address existing salinity and water quality problems.

While a number of key strategies that underpin the National Action Plan have been progressed and key policy tools have been agreed nationally, it is important that plans are accredited soon and that investment strategies follow soon after. This is because it is only once NRM plans are accredited, and the governments are in a position to consider investment plans that large-scale investments to address salinity and water quality issues facing a particular region can be implemented.

13 Attachments

Attachment A NWQMS Guideline 09: Rural Land Uses and Water Quality –
A community resource document.

ADDITIONAL INFORMATION HELD BY THE SECRETARIAT

ATTACHMENT TO SUBMISSION No. 150

Attachment A NWQMS Guideline 09: Rural Land Uses and Water Quality -
A community resource document.