

CHAPTER 5: INLAND WATERS

KEY POINTS

- The National Rivercare Programme will provide \$24.5 million in 1998-1999 to support activities contributing to improved natural resource management and environmental outcomes outside the Murray-Darling Basin including programs such as Waterwatch and the National River Health Programme.
- The Commonwealth will provide \$38.4 million under the Murray-Darling 2001 programme in 1998–99 to accelerate on-ground action addressing high priority water quality and river health issues in the Murray-Darling Basin.
- The National River Health Programme is central to the Commonwealth's efforts to progress implementation of the environmental aspects of the COAG Water Reform framework. Totalling \$13.6 million to the year 2000-01, the programme will allocate a significant portion of these funds towards environmental flow management.
- The Natural Heritage Trust partnership agreements signed by the Commonwealth and States set a framework for the delivery of the National Wetlands Programme and provides for, among other things, a national framework of complementary wetland policies, management planning for significant wetlands, a nationally consistent approach to monitoring, and a national wetland inventory.

ALLOCATION OF WATER USE

It is essential to balance consumptive demands of water with the environmental needs of our waterways to ensure the health of our rivers and the industries that depend upon them. Both surface water and groundwater require appropriate flows to maintain their health and productivity, thus providing water of reasonable quality for homes, farms and industries, as well as ecosystems that are water-dependent. Over-allocation of water leads to environmental degradation such as salinity, blue-green algae outbreaks, deteriorating water quality and decline in the abundance and density of animals and plants that live in or around water courses.

COAG Water Reform Framework

A comprehensive strategic framework for the efficient and sustainable reform of the Australian water industry was endorsed by the Council of Australian Governments (COAG) in February 1994. A major focus of these reforms is the formal determination of allocations and entitlements to water, including the allocation of water for the environment. In particular, State and Territory governments have agreed that environmental allocations will be determined using the best scientific information available and, in cases where river systems are over-allocated or deemed to be stressed,

arrangements for the allocation of water for the environment will be instituted and substantial progress made by 1998.

State and Territory governments are working towards the full implementation of the COAG reforms by 2001. Implementing the water reform agenda is an explicit condition of State and Territory eligibility for receiving competition payments under the National Competition Policy. Each government's progress in meeting its commitments will be assessed by the National Competition Council in the context of delivering the second tranche of competition payments. These assessments are due by July 1999.

Table 5.1: Inland Waters — Programme and Tax Expenditure Estimates

Description	1997–98 \$m	1998–99 \$m	1999–00 \$m	2000–01 \$m	2001–02 \$m
PROGRAMME AND TAX EXPENDITURE ESTIMATES					
National River Health					
National Rivercare Programme (a)	12.4	24.5	31.9	27.9	—
Rivercare Programme (b)	6.3	17.8	24.5	20.6	—
National River Health Programme (c)	3.0	3.3	3.6	3.5	—
Fisheries Action Programme — inland waters (d)	0.8	0.8	1.1	1.1	—
Tasmanian Regional Environment Remediation Programme	3.5	3.5	—	—	—
Murray-Darling Basin					
Murray-Darling 2001	29.5	38.4	43.6	47.7	—
Wetlands					
National Wetlands Programme	2.9	3.7	2.9	2.5	—
Assessing and Monitoring					
National Land and Water Audit (e)					
Waterwatch Australia (f)	2.4	2.6	2.6	2.7	—
CSIRO (total) (g)	10.3	11.6	11.8	na	na
Nutrient and pollution transport	3.2	3.3	3.4	na	na
Surface water management	2.0	2.1	2.1	na	na
Groundwater management	1.0	1.0	1.0	na	na
Land and water contamination	2.8	2.8	2.9	na	na
Waste utilisation	1.2	1.3	1.3	na	na
Urban water systems	—	1.1	1.1	—	—
CRC for Catchment Hydrology	2.3	2.0	—	—	—
CRC for Freshwater Ecology	2.2	2.2	2.0	—	—
CRC for Water Quality and Treatment	2.3	2.3	2.3	2.3	2.3
Bureau of Meteorology (h)	0.9	0.9	0.9	0.8	0.8
Environmental Research Institute of the Supervising Scientist	na	na	na	na	na
International Development Cooperation					
International water supply and sanitation	34.0	na	na	na	na

— denotes nil; na denotes not available

- (a) Formerly referred to as the National Rivercare Initiative. These figures are the total funding for the National Rivercare Programme, comprising four programmes presented separately in this table: the Rivercare Programme, the Fisheries Action Programme, the National River Health Programme, and Waterwatch Australia.
- (b) This is the Department of Primary Industries and Energy (DPIE) administered elements of the National Rivercare Programme, excluding the Fisheries Action Programme.
- (c) Administered by Environment Australia. The programme also received funding of \$100,000 in 1996–97, so the total programme funding is \$13.6 million.
- (d) Administered by DPIE. See Chapter 8 for the marine component of the programme.
- (e) See Chapter 4.
- (f) Administered by Environment Australia.
- (g) This is the total of the figures against indented descriptions below.
- (h) Estimate of appropriation-based Bureau of Meteorology expenditure attributable to hydrological monitoring, services and research in support of environmental objectives.

Central to the Commonwealth's activities to progress implementation of the environmental aspects of the Water Reform framework, is the National River Health Programme (see Box 5.1). The most extensive investment in this programme is targeted towards environmental flow management, with \$7.6 million to be invested towards this sub-programme over the next three years.

RIVER HEALTH

European settlement has had a profound effect on many of our water resources. Many of Australia's waters and water dependent ecosystems are presently suffering extensive damage, with growing economic and environmental costs to the nation. Water is an integral part of the environment, yet it is seriously threatened by nutrient enrichment and algal blooms, salinisation, disruptions to hydrological processes, increased sediment loads, pesticide and heavy metal contamination, loss of aquatic biodiversity, and invasion by foreign plant and animal species.

Rivercare

The National Rivercare Programme aims to ensure progress towards the sustainable management, rehabilitation and conservation of rivers outside the Murray-Darling Basin and to improve the health of these rivers. The programme will involve community groups, resource managers, industry and government agencies and will:

- increase community awareness and understanding of river issues and promoting linkages to facilitate community involvement;
- promote the integration of riverine action plans with land and vegetation issues;
- assist in the development of responses to critical barriers and impediments to improved river health, particularly within catchment or regional contexts;
- assist and stimulate investment in activities which address national, State and regional strategies and priorities for improved river outcomes; and
- assist in providing high quality data and decision support systems which will support investment and decisions in relation to environmental water provisions.

The programme also incorporates the National River Health Programme, Waterwatch Australia, and the inland waters component of the Fisheries Action Programme (see Chapter 8).

In 1997–98, the first full year of funding for the National Rivercare Programme, there was a strong response from the community with a range of quality projects proposed. The Commonwealth provided \$6.3 million for projects, including:

- on-ground actions by community groups to improve water quality in local rivers;
- large, integrated projects involving a range of stakeholders, including community groups, local shires and agencies, to improve river management with biodiversity and sustainable production benefits;

- projects focusing on improving stormwater management as part of the water cycle; and
- activities focusing on developing water course management and environmental flow plans for catchments.

BOX 5.1: THE NATIONAL RIVER HEALTH PROGRAMME

To ensure an adequate knowledge base to protect and repair aquatic systems, the National River Health Programme continues to 2000–01 and will total \$13.6 million. The programme has two components: the Environmental Flows Management sub-programme and the First National Assessment of River Health.

The programme's objectives are to:

- provide a sound information base to establish environmental flows;
- undertake a comprehensive assessment of the health of Australia's inland waters;
- consolidate and apply techniques for improving the health of inland waters, particularly those identified as stressed; and
- develop community, industry and management expertise in sustainable water resources management and raise awareness of environmental health issues and needs of our rivers.

Groundwater

The Australian Geological Survey Organisation is continuing to undertake research to provide further information on groundwater resource sustainability, and groundwater quality and vulnerability.

The Great Artesian Basin Consultative Council, comprising representatives from the community, industry, conservation groups, traditional landholders and government agencies was established in 1997 to coordinate policy and water resource management of the Basin. The Commonwealth is a member of the Council and is actively supporting the Council's current activities towards the development of a strategic management plan for the sustainable management of the groundwater resources of the Basin.

Design of Hydrological Structures

The Bureau of Meteorology is responsible for the provision of advice to government authorities, standards association groups, engineers and others on a wide range of hydrometeorological problems related to the assessment, planning, development and operational aspects of water resource management.

In 1997–98, the Bureau allocated resources of about \$500,000 with a major focus on the assessment of initial rainfall loss for dam spillway design. During 1998–99, it plans to

develop and apply a probable maximum precipitation methodology for the west coast of Tasmania.

Tasmanian Regional Environment Remediation Programme

The Commonwealth is providing \$3.5 million in 1998–99 to the Tasmanian Regional Environmental Remediation Programme, known as Riverworks Tasmania, to improve water quality and amenity in key rivers within Tasmania by reducing and removing sources of pollution. This programme, now part of the Natural Heritage Trust, is jointly managed by the Supervising Scientist Group of Environment Australia and the Tasmanian Department of Environment and Land Management and comprises two parts: the Derwent, Huon and Tamar regions; and the West Coast.

Nine projects totalling \$835,000 were approved for the Derwent and Tamar valley systems in 1997. A further ten projects totalling \$1.38 million for these regions was approved in February 1998. The West Coast programme, which will include innovative technology to manage acid drainage from the Mount Lyell mine site, commenced in 1997–98.

Funding for Capital Works at Orielton Lagoon, Tasmania

The Commonwealth contributed over \$700,000 in 1997–98 towards the second phase of remediation works at Orielton Lagoon, a small embayment east of Hobart. The State and local governments are also providing funds.

The first phase of remediation works, to improve flushing, has been completed. The second phase involves the diversion of sewage, which presently discharges into Orielton Lagoon, for irrigating orchards and cut-flower farms.

Tamar River Environs Project

The Commonwealth has provided \$1.7 million, of a total project cost of \$3.7 million, towards the Tamar River Environs Project in Tasmania. The primary objective of the project is to provide for the sustainable development of the Tamar River and its surrounds, and involves a range of environmental and infrastructure improvements including: boardwalks, jetty construction and repair, wetlands and foreshore environmental enhancement, viewing platforms, foreshore developments, and general upgrading of public access and environmental quality in and along the Tamar River.

MURRAY-DARLING BASIN

Murray-Darling 2001

The Commonwealth provided \$29.5 million for Murray-Darling 2001 in 1997–98 to accelerate on-ground action within catchment plans to address high priority water quality and river health issues in the Murray-Darling Basin (MDB).

Funding priorities were developed through the MDB Commission's Basin Sustainability Programme (BSP) which aims to promote and coordinate effective planning and management of the water, land and other environmental resources of the Basin. Within

the BSP framework, participating State governments in the MDB Initiative developed three year rolling plans for natural resource management priorities and activities for their part of the Basin.

Within these agreed frameworks, and consistent with Murray-Darling 2001 core priorities, funding has been targeted to those projects which are part of a catchment strategy or a local action plan and considered to contribute to achieving an integrated solution to catchment-based natural resource and agricultural productivity issues.

A funding allocation approach has been developed for Murray-Darling 2001 where 85 per cent of programme funds are notionally allocated to the MDB States through an agreed formula and the remaining 15 per cent is contestable across the States on the basis of project merit. This two-tiered approach is providing support for priorities established by the States within the BSP framework but also provides a mechanism for identifying and addressing Basin-wide priorities.

Consistent with the importance of irrigated agriculture in the Basin, approximately 50 per cent of funds under the Murray-Darling 2001 arrangements have been directed to activities in irrigation areas which address water-related issues and sustainable practices through community-based land and water management plans.

WETLANDS

Policy Initiatives

The Commonwealth has been progressing a range of initiatives under the National Wetlands Programme (NWP) which implement the Commonwealth Wetlands Policy and support Australia's obligations under the Ramsar Convention on Wetlands and the bilateral migratory bird agreements with Japan and China. The Programme aims to promote the conservation, repair and wise use of wetlands across Australia.

The Natural Heritage Trust partnership agreements signed between the Commonwealth and respective States and Territories set the framework for the delivery of the National Wetlands Programme and provides for:

- a national framework of complementary wetland policies;
- management plans for all Australian Ramsar sites, and increasingly, for East Asian Australasian Flyway Shorebird Reserve Network sites and other nationally important wetlands;
- a nationally consistent approach to monitoring of these wetlands;
- a national wetland inventory;
- nomination of additional sites under the Ramsar Convention and to the East Asian Australasian Flyway Shorebird Reserve Network;
- support for community wetlands projects; and

- development of a sound technical and scientific basis for wetland conservation and management.

The Commonwealth will provide \$3.7 million to the National Wetlands Programme in 1998–99. The programme, under the Natural Heritage Trust, encourages States and Territories to prepare wetland policies and strategies where these are not already in place to develop a national approach to the ‘wise use’ of wetlands. In 1997–98 the programme supported the development of wetland policies in South Australia and Tasmania and assisted the implementation of the New South Wales Wetlands Management Policy through activities under the State’s Wetland Action Plan.

In 1997–98, the Commonwealth provided over \$200,000 to support Queensland, Victoria, Western Australia and South Australia to develop management arrangements for wetlands recognised as nationally and internationally important.

A priority of the programme is the development of a comprehensive national wetland inventory by the year 2000. A total of \$300,000 was allocated in 1997–98 to a number of States and Territories to assist them to conduct surveys to identify important wetlands or to update their respective chapters of the second edition of *A Directory of Important Wetlands in Australia*. This information will be included in a third edition scheduled for release in 1999.

Another priority of the Programme is to identify new sites for listing under the Ramsar Convention and for addition to the East Asian Australasian Shorebird Reserve Network. Funding of almost \$100,000 has been provided to Western Australia and Victoria to support nominations of new Ramsar and Shorebird Reserve Network sites, and more than \$100,000 provided to Queensland and the Northern Territory for surveys to identify sites suitable for inclusion in the Network.

The National Wetlands Research and Development Programme, a component of the National Wetlands Programme, supports the conservation, rehabilitation, restoration and long-term sustainable management of wetlands by government and private sectors through targeted research and development. A number of projects are underway with findings and management recommendations becoming available during 1998–99.

Through the 1997–98 round of funding from the Trust’s ‘One-Stop-Shop’, the Commonwealth has allocated over \$1.4 million to 57 wetlands projects. Nearly half of these are community-based projects to carry out on-ground works to rehabilitate and manage wetlands and to support awareness raising of wetland conservation issues.

International Cooperation

International actions include the provision of training opportunities for countries in the Oceania region, promotion of the Ramsar Convention amongst Oceania countries, support of Australia’s role under the Japan-Australia the China-Australia Migratory Birds Agreements, and contributing to a multilateral approach to conservation of migratory waterbirds through the East Asian Australasian Shorebird Reserve Network. The network aims to promote a cooperative approach and training opportunities for on-ground wetland managers at sites which are important stopover points for migratory

waterbirds. It is hoped that this cooperative multilateral arrangement will eventually lead to formal multilateral agreements between countries in the flyway.

Australia's overseas aid programme is playing an important role in the sustainable use and conservation of wetlands in the Asia Pacific region, including supporting bilateral projects such as the Western Province Coastal Zone Management Planning Project in Papua New Guinea. This project provides assistance to the 590,000 hectare Tonda Wildlife Management Area, which is listed as a site of international significance under the Ramsar Convention. Australia is also supporting the Mekong River Commission (see Box 5.2).

BOX 5.2: THE MEKONG RIVER COMMISSION

Australia's aid programme supports the work of the Mekong River Commission (MRC), a river basin authority with responsibility for improving water resources management of the Mekong River. The Mekong is Asia's largest freshwater wetland ecosystem. AusAID's Strategic Liaison Project is a series of activities designed to enable the MRC to learn from the experiences of the Murray-Darling Basin Commission.

The project will fund specific activities assisting in the development of strategic direction, developing the MRC's capacity to make effective use of modelling, water management workshops, and community participation. The three year \$900,000 project is due to finish in June 1999.

ASSESSING AND MONITORING

To achieve the sustainable management of our water resources, managers need to know the extent and condition of the resource, changes the resource is undergoing, and the factors driving these changes (such as land use practices, pollution, and water diversions). As the knowledge base develops and our understanding of the inter-relationships with land use practices grows, so does our ability to ensure that these resources are maintained and enhanced.

National Land and Water Resources Audit

Assessing the state and trends in the condition of Australia's water resources will be a major focus of the National Land and Water Resources Audit, an initiative under the Natural Heritage Trust (see Chapter 4). The Audit will, as an integral part of its activities, investigate issues of water allocation and quality, for both surface water and groundwater resources, and their relationship with catchment health and land management practices.

Water allocation and use will be among the first broad theme areas to be commenced under the Audit, with the process of data collection anticipated to begin by mid to late 1998.

The First National Assessment of River Health

Under the First National Assessment of River Health, approximately 1,500 river sites were assessed across Australia in 1997 using the Australian River Assessment Scheme (AUSRIVAS) monitoring system. It is expected that a nationwide assessment of around 6,000 sites will be completed by the year 2000. The results of the assessment will then be consolidated in a comprehensive public 'state of the river' report, dataset and national maps of river condition. They will be incorporated in the next state of the environment report and linked with the National Land and Water Audit.

National River Health Programme also provided \$500,000 in 1997–98 to develop a comprehensive toolbox of assessment techniques to expand the usefulness and rigour of AUSRIVAS.

Waterwatch Australia

Waterwatch Australia is a Commonwealth programme which operates in every State and Territory. It coordinates and supports the monitoring of our waterways by schools and community groups, aiming to promote community action to address water quality and aquatic biodiversity issues and to achieve healthy waterways.

The programme assists the community to establish water quality and aquatic biodiversity monitoring networks which collect meaningful information which is shared with catchment managers and other sectors of the community. This is assisted by the appointment of regional coordinators who feed the information collected into local and catchment management planning processes, so that all data is interpreted in the context of the whole catchment.

Most recently, Waterwatch Australia has developed national monitoring guidelines and protocols and data management tools to ensure consistency in the collection and interpretation of data across the 4,000 Australian sites where Waterwatch groups are operating.

The Commonwealth provided \$2.4 million in 1997–98 for Waterwatch Australia projects through the Natural Heritage Trust One-Stop-Shop. Most of these projects are community-based, regional coordination projects which provide support and training to community Waterwatch networks.

In 1998–99, approximately \$2.6 million will be provided to community projects through the One-Stop-Shop. Many of these projects will be a continuation of those funded in 1997–98.

CSIRO

The CSIRO's water research supports the Government's investment in sustainable natural resource management and is closely linked with its research on land degradation (see Chapter 4). Allocations in 1998–99 include:

- \$3.3 million to improve understanding and management of pollution of waterways by nutrients, pollutants and sediments;

- \$3.1 million for building tools for understanding surface and groundwater resources and their management;
- \$2.8 million for understanding and modelling land and water contamination processes; and
- \$1.3 million for identifying new approaches to urban water system technologies, design and management.

In addition, the CSIRO has commenced a new project aiming to stimulate a radical re-consideration of the way that urban water systems are designed, equipped and managed. The technologies and approaches envisaged in future sustainable water systems will have environmental benefits. The CSIRO will commit \$2.2 million to this work for the years 1998–99 and 1999–2000.

Cooperative Research Centres

In 1997–98, the CRC for Catchment Hydrology invested \$2.3 million towards improving our understanding of catchment hydrology and its application to water management issues, concentrating particularly on salinity problems, water yield, waterway management, control of sediments and nutrients, and flood estimation and forecasting. The CRC for Freshwater Ecology provided \$2.2 million towards research on ecological sustainability and management of Australian temperate region surface waters. The CRC for Water Quality and Treatment provided of \$2.3 million towards assisting the Australian water industry to deliver quality drinking water to consumers.

The CRC for Catchment Hydrology developed methods to identify the source of nutrients and sediments reaching water supply reservoirs. As a result of this work, recently trialed on the Tarago Reservoir in Gippsland, guidelines have been developed for the placement of stream buffer strips to reduce nutrient flow into water supply reservoirs and, as a consequence, improve water quality.

Environmental Research Institute of the Supervising Scientist

The Environmental Research Institute of the Supervising Scientist conducted a scientific research and assessment on tropical freshwater and estuarine ecosystems of northern Australia. The research has resulted in protocols for assessing wetlands to be proposed for use by the Ramsar Convention. Linked with the wetlands research programme a coastal monitoring node for the Alligator Rivers Region has also been established.

In cooperation with traditional landowners, a programme to assess the ecological status of key wetlands on Aboriginal lands has commenced. This programme is providing information to assist traditional owners to develop management plans within the context of ecologically sustainable development. A report on the processes used to develop this programme with traditional owners was submitted to the IUCN as part of an international project to develop guidelines for involving local communities in wetland management. Local community wetland monitoring initiatives have commenced with Landcare and other local groups. Assistance and advice on natural fish kills and floodplain monitoring has been provided to Parks Australia North.

Technique and database development for wetland inventory and monitoring has been undertaken and draft protocols for a national wetland inventory proposed. Remote sensing and geographic information systems are being used to assess hydrology and vegetation and to provide an information base for early warning and predictive monitoring of adverse change, including variations due to global change.

Wetland monitoring techniques have been further advanced with completion of Quality Assurance/Quality Control reports for the National River Health Programme. Further, the process of ecological risk assessment has been significantly advanced with protocols being developed for the Ramsar Convention. Risks associated with the use of herbicides to combat proliferation of the weed *Mimosa* have been assessed, the effects of chemical speciation on water quality guidelines for metals determined, and rapid methods for the toxicological assessment of waste waters are under development.

Revision of the Australia Water Quality Guidelines for Fresh and Marine Waters for the ANZECC has continued. A first draft of the new guidelines has been reviewed by the ANZECC/ARMCANZ contact group and further revision is underway prior to release of the draft guidelines for public comment.

Advice on wetland monitoring, inventory and/or assessment has been provided to a number of organisations, including the ANZECC Wetlands and Migratory Waterbirds Taskforce, the Mekong River Commission programme in Cambodia, the Porgera mine in PNG, the International Geosphere Biosphere Programme, the Indonesian authorities in East Java, and the Macquarie River Catchment Committee. Wetland training initiatives have continued at an informal level with local Aboriginal groups and formally with the Northern Territory University external Masters degree programme.

Hydrometeorology

In cooperation with State and Territory water agencies, the Bureau of Meteorology has recently established a network of benchmark stream flow gauging stations and associated climate stations. Data from the network will be monitored and analysed to determine changes or trends associated with climate variability or future climate change. It is also proposed to develop rainfall-runoff models for these catchments to provide estimates of the impact of future rainfall patterns under various climate change scenarios.

INTERNATIONAL DEVELOPMENT COOPERATION

Access to a clean and reliable source of freshwater is vital in the promotion of sustainable development. Millions of people in developing countries die from contaminated water each year, and many more are made sick. As well as these health impacts, it is a lack of water, not land, that is the major constraint on these countries' agricultural production. For these reasons water supply is an important element of Australia's official development assistance (ODA).

It is estimated that in 1997–98, Australia spent over \$34 million ODA in the water supply and sanitation sector, mostly in the Asia-Pacific region. This is predominantly spent on a number of major aid projects that focus on improving water supply, including the \$10 million North Mindano Water and Sanitation project in the Philippines and the

\$22.5 million Flores project in Indonesia. Spending on improving water resources policy and administrative management forms around 10 per cent of this sector's support.

BOX 5.3: INCORPORATING A GENDER AND ENVIRONMENT PERSPECTIVE: WATER SUPPLY AND SANITATION

An example of how AusAID recognises the important role of women in natural resource management, such as water management in developing countries, is demonstrated by a \$22.5 million Water Supply and Sanitation Project in Flores, Indonesia.

In Flores, women and children are the major water collectors and users. Women are also the major carers for children and the sick. Several steps have been taken to incorporate a gender perspective into the Flores water project including the employment of a full-time, local gender and development adviser responsible for ensuring the project is sensitive to gender issues. Through separate training and discussion groups, women are encouraged to input into decision-making, and their specific needs are identified and respected. Gender awareness workshops are held at the district level for project staff and community members.

All projects take into account environmental factors, such as catchment management, and social factors including the involvement of local communities, in particular, women (see Box 5.3).