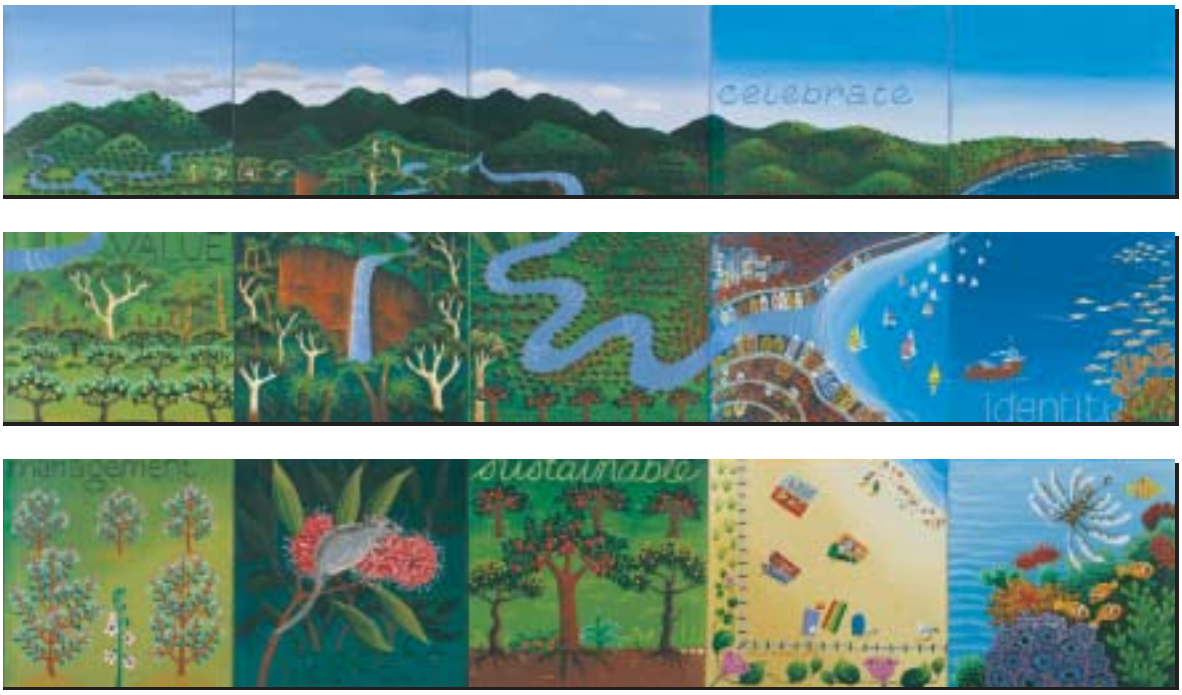
Land & Water
AUSTRALIA
research • development • innovation

LAND & WATER AUSTRALIA

Annual Report

2001–02

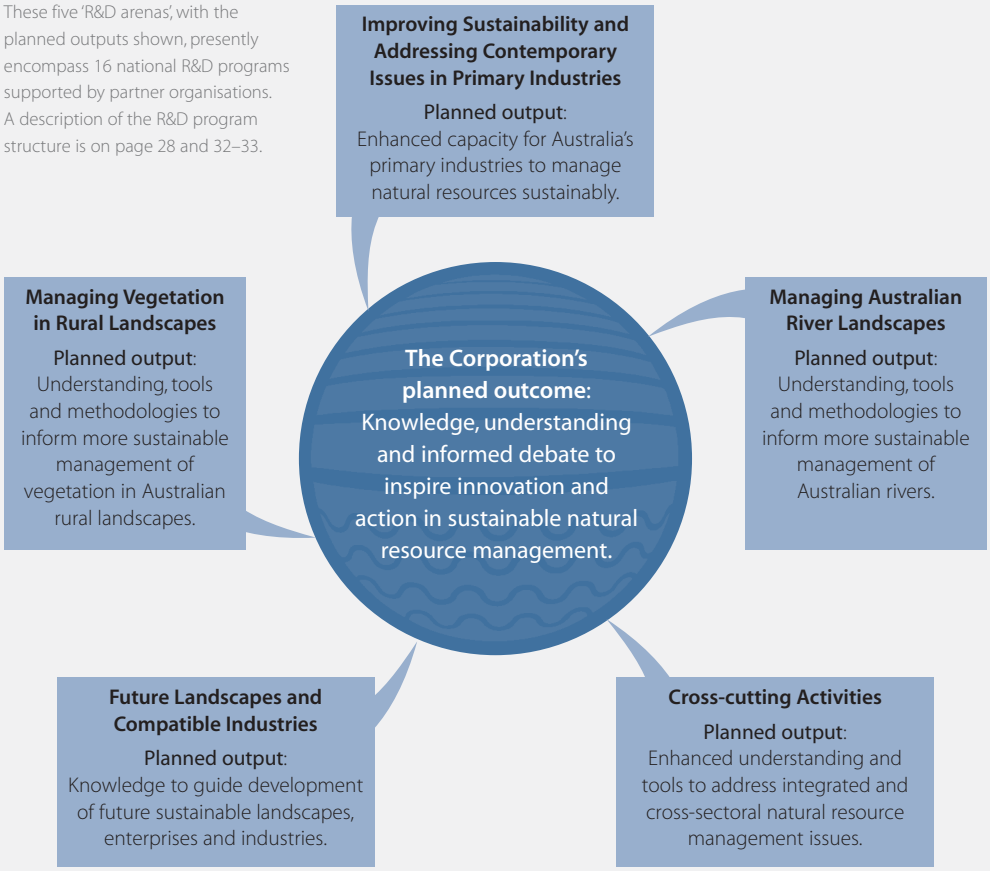


Land & Water Australia

Since 1990, Land & Water Australia (formerly known by its legal title, the Land and Water Resources Research and Development Corporation) has invested in research and development for the productive and sustainable management of Australia's land, water and vegetation resources.

This year, Land & Water Australia directed its Commonwealth Government appropriation of almost $12 million to generate almost $30 million in R&D investments. Such investments underpin the sustainability of irrigation, dryland cropping and grazing industries, whose production is worth $25 billion per year. Of even greater value are the natural resources on which these industries and the whole nation depend. Land & Water Australia seeks to invest in high-quality science to improve the knowledge base for managing these resources sustainably.

These five 'R&D arenas', with the planned outputs shown, presently encompass 16 national R&D programs supported by partner organisations. A description of the R&D program structure is on page 28 and 32–33.



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Land & Water Australia

25 September 2002

Senator the Hon. Judith Troeth
Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry
Parliament House
CANBERRA ACT 2600

Dear Senator Troeth,

Land & Water Australia Annual Report 2001–02

In accordance with section 28 of the *Primary Industries and Energy Research and Development Act 1989* (PIERD Act), I have pleasure in presenting to you the annual report of Land & Water Australia for 2001–02. The report has been prepared in accordance with the PIERD Act, the *Commonwealth Authorities and Companies Act 1997* and the Commonwealth Authorities and Companies (Report of Operations) Orders 2002.

Yours sincerely,

Roberta Brazil
Chairperson

Cover theme: the Australian landscapes mural

An exquisite and thought-provoking mural by artist Annie Franklin, signifying the many relationships Australians have with the continent's diverse environments

Land & Water Australia Annual Report, 2001–02

The legislated title of Land & Water Australia is
Land and Water Resources Research and Development Corporation

An electronic version is at http://www.lwa.gov.au/annualreports

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LAND & WATER AUSTRALIA

Annual Report 2001–02

Land & Water Australia's mission is to provide national leadership in generating knowledge, informing debate and inspiring innovation and action in sustainable natural resource management.

The legislated title of Land & Water Australia is Land and Water Resources Research and Development Corporation

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Introduction

From the Chair ...

I am delighted to introduce this annual report, which covers my first year in the role of Chairperson of Land & Water Australia. It is a privilege to have been asked to take on this role in a domain of great importance to the country.

The task of investing in research and development on behalf of the taxpayer in the national interest is one of great responsibility. We need to anticipate the sorts of knowledge that the Australian community will require in the future, ideally some years in advance of that need being widely perceived. For example, previous Boards of Land & Water Australia (then LWRRDC) foresaw the need for a national research program on dryland salinity ten years ago. We now have a $1.4 billion National Action Plan for Salinity and Water Quality, and salinity strategies in all states, based to a very significant degree on the knowledge and understanding generated through that investment.

We have a modest appropriation and a huge mandate. Getting the investment mix right is a balancing act. On the one hand is speculative research on issues that are on or over the horizon (the 2010s equivalent of salinity), for which there is limited current demand. On the other is more applied research that is designed to fill immediate knowledge gaps — for which there are pressing demands and audiences hungry for information.

Obviously it is much easier to find co-investors on the latter types of issues, and adoption of R&D outputs should be more assured for them. Ultimately, however, Australians and the natural resources on which they depend will be best served if Land & Water Australia takes a long-term view across its whole R&D portfolio.

It is a particular pleasure to be involved with Land & Water Australia, an organisation that is distinctly different from, and yet has many similarities with, the Cotton Research and Development Corporation of which I have also been a director for several years. This experience across two of the R&D Corporations — one commodity-based and one working across all commodities — has given me a great deal of respect for Australia's rural R&D corporation model.

Each of these corporations targets and manages its investments very strategically, and works closely with its stakeholders. However, they operate, organise and present themselves quite differently, as the 'RDC model' under the PIERD Act allows. As the model has evolved, several variations in corporate structure have emerged, but the central features remain: R&D investments managed corporately by independent boards; combining industry and government funding; and actively engaging industry to keep research well-grounded and to enhance its adoption.

Performance

The staff of the Corporation have performed extremely well over the past year, the first of the new R&D plan. The Corporation has made significant progress on industry partnerships, has made big strides in enhancing the communication effort, and has scoped and developed new investment opportunities that look very promising over the next few years. The Board is looking to a period of consolidation this year, as new R&D programs in irrigation and climate variability are established, and as the communication effort starts to bear fruit.

Governance

Land & Water Australia takes its corporate governance responsibilities very seriously. In 2001 the Corporation ran a corporate governance workshop for the Board and the management team, focusing on directors' and officers' responsibilities under the PIERD and CAC Acts. The Board also commissioned an external review of its own performance in early 2002. This comprehensive review gave the Board, and its relationship with management, a clean bill of health from a corporate governance perspective. We were also very pleased to assist AFFA in its own review of corporate governance in portfolio agencies, which again confirmed that the systems and processes that successive Boards have established provide a very sound corporate governance framework. We are making a concerted effort this year to ensure that all Board sub-committees are conscious of their responsibilities and are able to adhere to the same high standards as the Board proper.

Four directors completed their terms on 30 June: Jason Alexandra, Leith Boully, Stuart Bunn and Sheila Donaldson. They have each made fine contributions to the Corporation and to natural resource management more generally. I want to thank them warmly on behalf of the Corporation and to wish them well in the future.

As four directors depart, so we welcome John Childs, Peter Cullen, Tim Fisher and David Pannell, all of whom have already made a significant contribution to improved natural resource management. I am also delighted to welcome back three continuing directors: Mike Logan; the Deputy Chair, Warwick Watkins; and the Government Director, Charles Willcocks — on whom we will rely for their corporate memory and sure guidance, particularly in financial management and accountability.

Finally, I would like to congratulate our Executive Director, Andrew Campbell, and his staff for their great work during 2001–02. Our people are our greatest asset. We value their contributions highly.

I am looking forward to another great year of challenges in 2002–03.

Roberta Brazil
Chairperson


www.lwa.gov.au

Highlights of 2001–02

A web-based Land & Water Australia **innovations database**, which is accessible through www.lwa.gov.au, has been set up to allow internal and external interrogation of the Corporation's best innovations. For instance, partial rootzone drying has been listed in the top 100 Australian innovations of the 20th century. This technology generates considerable water savings over a range of crops, with negligible impact on yield and a positive impact on fruit quality. The Grape and Wine R&D Corporation, Land & Water Australia and Horticulture Australia have jointly invested in this CSIRO research.

The first systematic **stakeholder survey** indicated Land & Water Australia is seen as leading Australian thinking on sustainable natural resource management. For example, previous Boards of Land & Water Australia (then LWRRDC) foresaw the need for a national research program on dryland salinity ten years ago. We now have a $1.4 billion National Action Plan for Salinity and Water Quality, and salinity strategies in all states, based to a very significant degree on the knowledge and understanding generated through the Corporation's and other partners' $20 million investment and about $50 million of in-kind support through the National Dryland Salinity Program.

An interactive website is the key development of the National Land and Water Resources Audit, which is arguably the single biggest advance in the information base for natural resource management in Australia.

The **National Land and Water Resources Audit** represents arguably the single biggest advance in the information base for natural resource management in Australia. Established in 1997 as a program of the Natural Heritage Trust, the Audit completed its first phase this year. Its many reports and an interactive website (www.environment.gov.au/atlas) provide Australia-wide assessments of land, water and vegetation resources. The six assessments released during 2001–02 covered vegetation, rangelands, agriculture, people in natural resource management, catchments, rivers and estuaries, and data and information. They provide a solid basis for improved decision-making on land and water management, and improved allocation of public and private resources to high-priority issues.

The National Dryland Salinity Program (NDSP), with the assistance of AFFA, developed a database of tools for assessing **salinity management** options for use by catchment groups across Australia, and in particular groups developing catchment strategy proposals for funding under the National Action Plan for Salinity and Water Quality. The NDSP now embraces every state government, and its industry partnerships extend over the vast majority of land either affected by salinity or contributing to it.

Glenn Conroy photo

At the launch of the Land, Water & Wool R&D Program in August 2001 were the minister for Agriculture, Fisheries and Forestry – Australia, the Hon. Warren Truss MP (right); the CEO of Australian Wool Innovation, Col Dorber; and Executive Director of Land & Water Australia, Andrew Campbell (left).

In August 2001, Minister Truss launched a $20 million five-year Land, Water & Wool program funded by Australian Wool Innovation and managed by Land & Water Australia. Building on a decade of Land & Water Australia research, Land, Water & Wool focuses on designing sustainable and productive **management solutions for the wool industry**.

The **Climate Variability** in Agriculture Program (CVAP) has made significant contributions to development and delivery of seasonal forecasts, and their application in agriculture. A survey of Australian farmers for *Agriculture, Advancing Australia* showed a 37% level of adoption of seasonal forecasts, with more than 50% adoption by sugar cane farmers in north-eastern Australia. This has been achieved in a little over a decade since seasonal climate outlooks became generally available. CVAP has launched a new prospectus, with strong industry support through the National Farmers' Federation, seeking investment in the next phase of research.

A joint CVAP–Sugar Research and Development Corporation project, with broad industry support, demonstrated potential savings of tens of millions from using **climate forecasts in the sugar industry**. During the unseasonably wet year of 1998, researchers found growers and millers could have changed decisions about planting and milling had they better understood climate signals, potentially saving the industry millions of dollars in lost income.

2001–02 was the inaugural year for the Corporation's **Community Fellowships**, with $50,000 from a philanthropic trust that provided nine people with the opportunity to share their experiences with others working in natural resource management. The fellowships were such a success that the sponsor doubled funding for 2002–03 to $100,000. The call for 2002–03 was advertised in May 2002, attracting well over 100 applications.

Fellowships for sharing community knowledge

The inaugural Land & Water Australia's Community Fellowships, funded by a Philanthropic Trust, enabled nine people with extraordinary stories to share their insights and experiences on the land with a wider audience.

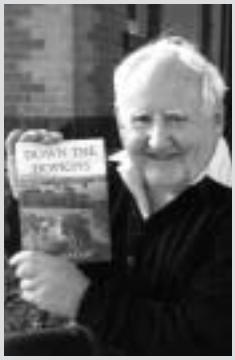
Kate Andrews: Integrated catchment management in the Lake Eyre Basin

For more than four years Kate worked in one of the most isolated parts of Australia with graziers, farmers, tourism operators, government and conservationists to try to reach agreement on how to better manage the vast Lake Eyre Basin. It wasn't easy bringing such a disparate group of individuals together. "Over the last decade, communities and stakeholders of the Lake Eyre Basin moved from fear and antagonism to working together" writes Kate. What began as a huge challenge resulted in setting up the Lake Eyre Basin Coordinating Group and developing a Basin-wide strategy culminating in Heads of Agreement between the South Australian, Queensland and Commonwealth Governments. Kate says the community asked for the story to be written so other groups could learn from the experience — to overcome conflict, face diversity, respect local knowledge, and to turn talk and planning into action.

The fellowship helped Kate to capture her experiences and to distil the insights that will be valuable for landcare and catchment groups throughout Australia and beyond.

Christine Jones, Darryl Cluff, Colin Seis, Bruce Maynard, Greg Martin: Farming without farming

Christine, Darryl, Colin, Bruce and Greg want to redefine our attitude to land management — to get Australians to think about farming in new ways. Each has a story to tell: about regenerating soil, increasing biodiversity or raising profits. They believe in a new era, not simply planting and waiting for the results, but managing land for a range of living things. They are a diverse group. Darryl, Colin and Bruce run mixed farms, Greg works for the company Earth Sanctuaries, and Christine specialises in native grass and grasslands. Their pooled talents and experiences (captured in a book written by Christine) offer challenging insights to future land managers.



Bob McKenzie: A walk down the Hopkins

In the spring of 2000, Bob McKenzie walked the length of Victoria's longest river — the Hopkins. The 300 km stretch, from Skeleton Hills near Ararat to Warrnambool, took five weeks and began just after Bob's 74th birthday. The trek began in remnant native scrub and progressed through towns and farms, past billabongs, waterfalls, cliff-tops and thick scrub, to eroded banks, open pastures and finally to Logan's Beach. Bob wrote notes along the way about the people he met, the landcare groups he joined. He also kept a daily record of water quality measurements, and always his thoughts and experiences. There were challenges — the constant rain during one of the wettest springs on record — and the fences: electric, barbed wire and odd mixtures of the two!

Bob's aim was to do something for the community, and the fellowship helped Bob to present a series of talks and seminars across regional Victoria and beyond, based on his book *Down the Hopkins*.

Lawry Pitman: A virtual farming experience

Lawry Pitman is a farmer from Corrigin in Western Australia. Lawry served his community for many years at national, state and local levels — on industry, government and community committees covering topics as diverse as land management, farm safety and commodity management. Now he's using all his experience and knowledge, and his own property, to showcase sustainability. Lawry says he wants "to prove that we are sustainable by attempting to measure and monitor all aspects of sustainability — economic, social and ecological. Benchmarks are being set with the help of Western Australian agencies and R&D corporations. Progress or deterioration will be communicated to the community through whatever means is required".

Lawry used his fellowship to produce a CD-ROM describing the annual cycle, benefits and costs of sustainable farm practice on a real-life, working property.

John Weatherstone: Looking back, moving forward — renaissance at Lyndfield

John has achieved so much in terms of land management that his farm, Lyndfield Park, was chosen as the site to launch the Australian Conservation Foundation and National Farmers' Federation joint natural resource management campaign. The success didn't come overnight. John started working on Lyndfield Park, originally a fine wool merino stud, in 1959, clearing trees and improving pastures. But by the early 70s he noticed some unhealthy changes. Tree dieback, erosion and salinity were emerging; the fertilisers weren't having the same effect, there was no stock shelter, and weeds, pests and diseases were increasing. John was following expert advice and couldn't work out what was going wrong. The drought of 1982–83 caused a huge re-think. Now there are an extra 70,000 trees; minimum tillage and direct drilling have replaced intensive cultivation; stocking rates are flexible; erosion is stabilised; perennial pastures replace some annuals; and the farm earns more money from native vegetation than cropping or livestock.

John used his fellowship to produce a booklet telling the story of Lyndfield Park for other land managers.

The National Program for Irrigation R&D (NPIRD) concluded nine years of successful irrigation research and innovation, funded by Land & Water Australia, industry bodies, CSIRO and state government agencies from around Australia. For example, groundbreaking research has developed Ecological Risk Assessment methodology for catchments and regions to assess the ecological risk associated with irrigation and to guide decision-making about irrigation development. NPIRD produced the framework used for benchmarking the performance of rural water supply authorities — which has been taken up internationally by the International Committee on Irrigation and Drainage and is at present being trialled in six countries. NPIRD work also underpinned major new state-based programs aimed at improving irrigation Water Use Efficiency in New South Wales and Queensland. A new program, the National Program for **Sustainable Irrigation** started on 1 July 2002, with an even stronger emphasis on natural resource management.

A **groundwater vulnerability** assessment tool is now available to groundwater managers and planning agencies to minimise risks of groundwater contamination by pesticides and other chemicals. A comprehensive manual for groundwater practitioners, which will bring together what we know about groundwater in fractured rock, will be completed by early 2003.

An independent review found that the National **Riparian Lands** R&D Program is setting a world-class standard in its science and communication activities. For example, new technical guidelines provide the most recent scientific findings on riparian processes and their implications for management and restoration efforts. The updated website, www.rivers.gov.au, provides state of the art access to information, with an interactive catchment for people to explore the science underpinning recommended practices for river and riparian management.

The National Rivers Consortium has developed training and education activities at tertiary and vocational levels to increase the **capacity and skills of river managers**.

The National River Contaminants Program is providing underpinning science for the National Action Plan for Salinity and Water Quality and the Murray-Darling Basin Commission Integrated Catchment Management Policy on the **impact of contaminants** on ecosystem processes at the national and catchment scales. For example, a salt sensitivity database, linked to the National Dryland Salinity Program, provides knowledge about the impacts of salinity on a wide range of biota in ecosystems where salinity is the dominant cause of stress.

Agroforestry has the potential to improve agricultural productivity, diversify and increase farm income, conserve land, maintain biodiversity and contribute to the national timber supply. The Joint Venture Agroforestry Program, supported by the Rural Industries R&D Corporation, Land & Water Australia and the Forests and Wood Products R&D Corporation, produced the first in the Agroforestry Guideline Series, *Trees, Water and Salt*.

Given the importance of the Murray-Darling Basin to both agriculture and biodiversity conservation in Australia, the new partnership with the Murray-Darling Basin Commission in the **Native Vegetation** R&D Program is a key development. This has enabled the expansion of research to assist government agencies, community groups and landholders to better manage and conserve native vegetation in rural landscapes. For example, the MDBC, the Native Vegetation R&D Program, the Riparian Lands R&D Program and the Joint Venture Agroforestry Program have worked together to integrate information from these different programs to provide a much-needed guide to **managing riparian zones** for different objectives. The magazine *Thinking Bush* highlighted some of the recently completed and current research being funded through the Native Vegetation R&D Program.

The Social and Institutional Research Program (SIRP) recognises that knowledge of **social and institutional factors** is a key to achieving further improvement in the use and management of Australia's land, water and vegetation resources. SIRP produced and widely-distributed a range of communication products including included a booklet 'People and Policy' that provides an integrated overview of completed SIRP research, project fact sheets and a CD-ROM comprising research reports.

Workshops for postgraduate students funded by Land & Water Australia are held each year to help the students develop networks and advance their professional development.

At the launch of the Ord-Bonaparte Program on 6 September 2001 in Mirima National Park, Kununurra were Mr Rex Edmondson, Independent Chair of the Governing Board of the Program; Senator Robert Hill, then Commonwealth Minister for Environment and Heritage; and Dr Judy Edwards, Western Australian Minister for Environment and Heritage and Minister for Water Resources.

The first round of projects in the **Ord–Bonaparte Program** (OBP) commenced. The OBP is a major integrated natural resource management R&D program seeking to underpin ecologically sustainable development in the East Kimberley region of north-western Australia. The OBP is designed to inform how development can proceed in northern Australia without repeating the mistakes that have proved so costly in the Murray-Darling Basin and elsewhere in southern Australia. The OBP has enormous potential as an example of how an **integrated approach to R&D at the regional scale** can inform the sustainable development of a region extraordinarily rich in natural resources.

Land & Water Australia coordinated a scoping project with the major broadacre rural industry research organisations (Australian Wool Innovation, Grains Research & Development Corporation and Meat and Livestock Australia) to establish a **whole farm systems research initiative** focused on the wheat-sheep belt. The Sustainable Grain & Grazing Systems Program, to commence in 2002–03, will address the fundamental environmental challenges while developing more profitable and stable business enterprises on the 66,000 properties that pay levies to two or more of the above R&D Corporations. Research will investigate crop, pasture, livestock and environmental interactions, and their economic and social implications, at the paddock, farm and catchment levels.

Land & Water Australia has built on its ISO 9000 **quality management** certification, achieved in 1996, through to AS/NZS ISO 9001:2000 achieved in 2001. These achievements indicate the Corporation's commitment to continual improvement and the highest level of client service and accountability.

Annie Franklin, artistic designer of the Australian landscapes mural used by Land & Water Australia, and her artwork at the Corporation's reception area in Canberra. The mural signifies the many relationships that Australians have with the diverse and unique environments across the country. Researching how to best manage our country's natural resources and live in the landscape is at the heart of Land & Water Australia's activities.


www.lwa.gov.au

Report of operations

Part 1: The directors' review of operations and future prospects

Part 2, describing operational and financial results, starts on page 27.

Part 3, describing corporate governance matters, starts on page 101.

Part 4, describing other corporate management matters, starts on page 117.

Certificate concerning the report of operations

The directors of the Land and Water Resources Research and Development Corporation* are responsible, under section 9 of the CAC Act, for preparation of the following report of operations in accordance with the CAC Orders.

This report of operations is made in accordance with a resolution of the directors at their meeting of 11 September 2002.

The date of the report is 25 September 2002.

Roberta Brazil
Chairperson

* Land and Water Resources Research and Development Corporation is the legislated title of Land & Water Australia

The directors' review of operations and future prospects

David Coward photo

Left to right, standing: Charles Willcocks, Andrew Campbell, Mike Logan, John Childs, David Pannell.
Seated: Peter Cullen, Warwick Watkins, Roberta Brazil, Tim Fisher.

A challenging operating environment

Natural resource management has never been higher on the political and public policy agenda in Australia. The National Action Plan for Salinity and Water Quality was precipitated by a meeting of the Prime Minister and all Premiers and Chief Ministers, at which salinity and water quality issues were at the top of the agenda. This would have been unthinkable even five years ago.

Priorities have changed. Having salinity and water quality issues at the top of the agenda of a Prime Minister / Premiers meeting would have been unthinkable even five years ago

Industry is also placing natural resource management issues much higher on its agenda. One reason is a greater awareness of the impact of our resource-using industries on the sustainability of the natural resource base. Another is that industries recognise that, in the long term, access to market and licence to operate will be increasingly influenced by the extent to which they have adopted sustainable practices.

The 'market' for the outputs of Land & Water Australia research investments has never been more receptive.

The National Land and Water Resources Audit has released a range of reports during recent months (discussed on pages 86–91). Collectively they represent a landmark in natural resource management in Australia. It is arguably the single biggest advance in the knowledge base for natural resource management in Australia's history. Data from the Audit provides the best available information about the status and condition of Australia's natural resources, and it does so in a way that should enable public and private investment to be targeted much better in future than it is at present. Land & Water Australia's association with the Audit is very important in enhancing the capacity to target and manage research and development investments towards the most pressing information needs in Australia.

The National Land and Water Resources Audit is arguably the single biggest advance in the knowledge base for natural resource management in Australia's history

Land & Water Australia must work in partnership with other investors to enhance the leverage on its funding base. There are significant investors in natural resource management R&D. At the Commonwealth level alone, there are 22 Cooperative Research Centres that overlap with the Land & Water Australia portfolio. All 14 rural R&D corporations are required to make sustainable natural resource management a high priority. In addition, two divisions of CSIRO, the Bureau of Rural Sciences, ABARE and a range of smaller Commonwealth research agencies also operate in the same domain as Land & Water Australia. At the state and local government levels, there are even more partners. Many invaluable outputs are produced through these partnerships.

Despite a stronger knowledge base and wider awareness within the broader community on natural resource management issues, for many of these issues there remains a very acute need for more profitable and practical solutions that can be applied at a landscape scale. Land & Water Australia is keen to work in partnership with industry to develop such profitable and practical solutions.

Increasingly, it is being recognised that land, water and vegetation management issues operate at scales greater than the individual paddock, property or even district. This means that in order to bring about changes to land use and management practices on the necessary scales, one needs to operate across property boundaries and to influence large numbers of landholders. This is an inherently social and political process, shaped by government and industry policies and other institutional arrangements. These social and institutional dimensions of natural resource management are increasingly well-recognised. A notable example is the intensifying debate around water property rights.

Land & Water Australia has been a significant investor in social and institutional research for natural resource management for more than five years. There is intense demand for the outputs of Land & Water Australia research in this area. This provides Land & Water Australia not only with significant opportunities but also risks in exceeding our limited capacity.

The strategic outlook

2001–02 was the first year in which Land & Water Australia operated under its new Strategic R&D Plan. The year saw very important work in establishing the strategic directions set out in the plan. Among them were:

- increasing the revenue base of the Corporation in order to have greater impact;
- developing a more integrated portfolio of research and development, in particular at a landscape scale;
- placing far greater emphasis on enhancing adoption of research outputs; and
- working more in partnership with the major resource-using industries, in particular through their R&D corporations.

We have made significant strides on all these fronts. Nevertheless, much remains to be done.

Risks

The biggest overall risk for Land & Water Australia, as we look forward to 2002–03, is that of being spread too thinly. Land & Water Australia has an extremely broad mandate — the sustainability of land, water and vegetation resources across the Australian continent. It is critical that our investments are focused on the most important issues in such a way as to produce maximum impact.

A further risk for the Corporation is inherent in our emphasis on working in partnership with other investors. Such partnerships are critical to increase the leverage on Land & Water Australia's funds. However, such partnerships also involve significant transaction costs for the Corporation and an inevitable dilution of priorities. That is because collaborative efforts generally involve some compromise in order to concentrate on areas of mutual interest and benefit. As Land & Water Australia has more and more of its effort invested in large-scale partnerships with industry, the risk to the Corporation of such partnerships failing becomes greater. Our expertise in maintaining and servicing such relationships is our best insurance against this risk.

Opportunities and challenges

The National Action Plan for Salinity and Water Quality and Phase 2 of the Natural Heritage Trust represent huge opportunities for Land & Water Australia. These major public funding initiatives, delivered through regional arrangements, create a very significant market for the outputs of Land & Water Australia's research and development investments. We are working with some catchment organisations on pilot projects to help us to identify the best means of engagement at the catchment and regional level. This engagement is likely to lead to increasing use of synthesis products across R&D projects, programs and R&D arenas, and also to our exploring in more depth the nature of social learning at a regional scale.

Our industry partnerships represent a great opportunity and a great challenge. We already have very significant partnerships with the wool industry; we are developing a major partnership initiative with the wool, grains and meat industries; we are engaging in a major collaborative irrigation program, targeting all industries that have significant irrigation; and we are in the process of involving as many rural industries as possible in our new program on managing climate variability. This is a comprehensive array of industry partnerships, but further opportunities remain to work with industry.

Our industry partnerships represent a great opportunity and a great challenge

There are major opportunities for Land & Water Australia to be recognised as the Commonwealth's pre-eminent investor, broker and purchaser of natural resource management R&D. However, Land & Water Australia's appropriation — based on the best figures we have available — represents about 5% of total Australian funding for natural resource management R&D, and about 16% of the external funding for which research providers are competing in this field. Land & Water Australia's task, as a relatively small investor, is to differentiate its unique contribution.

A perennial challenge for Land & Water Australia is to achieve better adoption of research outputs. We need a comprehensive and subtle grasp of the demand from particular audiences for certain types of information presented in different forms. We are working very hard in our communication efforts to improve the 'demand pull' for our research outputs, as opposed to starting from the 'supply push' perspective of simply disseminating the outputs of every project in the same way.

The second challenge in our quest to improve adoption is to measure and evaluate the impact of our research outputs. It can be as expensive to measure adoption as it is to do the research in the first place. Nevertheless, we intend to allocate more resources to tracking the longer-term impacts of our research investment.

Strategic directions and priorities

The strategic directions for the Corporation are well articulated in our Strategic R&D Plan for 2001–06. The priority for 2002–03 is to consolidate these strategic directions. We need to make sure that our industry partnerships add value for all involved. We need to capitalise on our enhanced communication capacity and translate better products and services into improved adoption on the ground.

An area of the Land & Water Australia research portfolio to which we are looking for an increase in momentum is the Futures Arena. This R&D arena will see some of our most challenging and 'left field, blue sky' research. We need to ensure that the arena, while providing space and encouragement for imaginative, far-sighted and lateral research activities, also remains connected to the rest of the R&D portfolio. A particular challenge is to ensure that the perspectives and insights generated in our Futures Arena are stimulating all our programs and other arenas.

The Strategic R&D Plan for 2001–06 places great emphasis on developing a more integrated approach to research investment and to the management of our R&D portfolio. This priority will be a particular challenge for the next two to three years as we attempt to operate increasingly at the level of the whole portfolio.

People often attempt to depict an integration challenge by drawing diagrams of boxes with arrows between them. Typically, the boxes are funded with real dollars and resources allocated to them, while the arrows are 'virtual'. The Board has recently allocated a significant investment to 'fund the arrows'. We have a major challenge over coming years to ensure that investing explicitly in integration activities generates results that are of practical use for end-users on the ground. We will evaluate this effort very carefully.

A further significant priority over coming years is to enhance the systems, both hard and soft, that the Corporation uses to target, manage and communicate its investment portfolio. This is not a trivial challenge. The Board is confident that it has arrangements in place that will see the Corporation achieve its potential to be recognised as the leading research broker and manager in the natural resource management field.

The Corporation has potential to be recognised as the leading research broker and manager in the natural resource management field

Land & Water Australia sits at the intersection of two major sectors of the economy: the primary industries and the environment industries (the latter being a loose umbrella term for all those industries that specialise in developing more sustainable approaches to the use and management of natural resources). The former is well-known, generating $33 billion in turnover — about 20% of Australia's export income. The environment industries, however, are less well-known. In fact, they are not even represented as a separate category in the statistics on the Australian economy.

The environment industries are among the most exciting, fast-growing, profitable and innovative sectors of the economy

Nevertheless, the environment industries are among the most exciting, fast-growing, profitable and innovative sectors of the economy. This is a critical development. Typically, environment issues and natural resource management issues are characterised as 'problems'. These problems, it is said, 'need to be fixed' at great 'cost' usually for the long-suffering taxpayer. Thus, environment issues are often characterised as something to be tackled when resources permit — not as a core business, and certainly not as a major area of potential profit. Land & Water Australia is in a fortunate position of being able to contribute research investments that underpin Australia's transition to an economy in which the environment is not seen as a 'problem', but rather as a macro-economic opportunity — a potential source of huge competitive and comparative advantage for Australia.

The directors' broad assessment of the Corporation's performance, 2001–02

In relation to nominated outputs

The following assessment is against the outputs nominated in figure 2 on page 5 of the 2001–02 annual operational plan.

Outputs (by R&D arena)

Improving Sustainability and Addressing Contemporary Issues in Primary Industries

Enhanced capacity for Australia's primary industries to manage natural resources sustainably.

Managing Australian River Landscapes

Understanding, tools and methodologies to inform more sustainable management of Australian rivers.

Managing Vegetation in Rural Landscapes

Understanding, tools and methodologies to inform more sustainable management of vegetation in Australian rural landscapes.

Future Landscapes and Compatible Industries

Knowledge to guide development of future sustainable landscapes, enterprises and industries.

Cross-cutting Activities

Enhanced understanding and tools to address integrated and cross-sectoral natural resource management issues.

Performance measures	Assessment
Evidence that screening template is utilised in developing R&D program plans and project-level investments.	During the year, the Board approved a new portfolio investment strategy to guide the decision-making process for investing in R&D. It includes detailed scanning and scoring of new and emerging issues. The Corporation also developed an enhanced framework for designing and implementing new program investments.
Less than 5% of Land & Water Australia projects fail to meet their objectives and milestones without acceptable reasons.	The target was achieved. During 2001–02, 12 out of 356 projects (3%) failed to meet contractual R&D objectives at the specified date in the agreement (2000–01, 3%). A further 11 projects, while achieving their R&D objectives, had overdue financial statements. Eight projects were terminated during the year for poor compliance. The R&D objectives were achieved for all projects that had submitted final reports during the period. Using its upgraded project management system, the Corporation continues to tighten its practices on tardy reporting, including withholding payments and initiating automated follow-ups.

Performance measures	Assessment
Research results from Land & Water Australia projects targeted to meet client needs.	All research projects are required to indicate their target audience and key messages; and to ensure that in delivering their outputs that both of these are kept in mind. Over the last year work has been undertaken to ensure that communication products are directed to our target audience through the use of sophisticated distribution and tracking methods.
Communication and adoption strategies developed and being implemented for all R&D programs receiving Land & Water Australia funds.	All programs are incorporating communication strategies that clearly identify target audiences and ensure that research outputs are developed with them in mind — not 'retrofitted' at the end of the project or program.

In relation to the Corporation's planned outcome

The following assessments, under headings nominated in figure 1 on page 6 of the 2001–02 annual operational plan, demonstrate the overall effectiveness in achieving Land & Water Australia's planned outcome.

Effectiveness in relation to leadership

To be, and be seen to be, at the forefront of Australian thinking on sustainable natural resource management.

Performance measures	Assessment
Stakeholder feedback through surveys. The extent to which R&D funded by Land & Water Australia puts issues on the national agenda.	Over all, Land & Water Australia is meeting expectations. A stakeholder survey concluded that the Corporation has invested in the areas identified by key stakeholders as highest priority. Stakeholders perceive that the Corporation is informing debate on natural resource management issues. Work funded by the Corporation has shaped a number of issues on the national agenda, such as dryland salinity, sustainable agricultural systems and redesigning agriculture for Australian landscapes.

Effectiveness in relation to influence

To maximise the impact of the Corporation's investments, at on-ground policy and institutional levels in improving the sustainability of natural resource management.

Performance measures	Assessment
Adoption of Land & Water Australia-funded R&D, measured through analyses and surveys of adoption rates. The ratio of total R&D effort in Land & Water Australia's programs to the core Land & Water Australia investment.	Over all, Land & Water Australia is meeting expectations. Of the eight major in-market innovations reviewed as part of the portfolio return on investment, more than half of the benefits have been realised, indicating that adoption rates are strong for these innovations. Adoption of R&D has been strong in a number of programs. For instance, the recent review of the climate program concluded that 40% of farmers are utilising seasonal climate forecasting in their decision-making. The stakeholder survey results suggest that the Corporation is generating significant benefits for users, and that investment in R&D has influenced on-ground management and policy. Over the period 1990 to 2000, Land & Water Australia achieved an overall leverage of 200% (including 40% cash and 160% in-kind), meaning that for every dollar invested by the Corporation, other parties invested forty cents in cash and $1.60 in non-cash contributions. In addition, Land & Water Australia has influenced the investments of a number of rural R&D corporations in areas such as agroforestry, pesticides, water use efficiency, sustainable grazing and dryland salinity.

Effectiveness in relation to relevance

To ensure that the Corporation targets investment to where it can make a real difference, by meeting critical natural resource policy and management needs.

Performance measures	Assessment
The degree of alignment of Land & Water Australia-funded R&D effort with issues identified by key stakeholders and natural resource management experts as critical national priorities. Stakeholder feedback through surveys.	Land & Water Australia is exceeding expectations in directing its investments to key national priorities. Stakeholder survey data suggest that over all, Land & Water Australia investments aligned well with the issues identified by key stakeholders (100% for high priority issues, 64% for medium priority and 82% for low priority issues). This appears to reflect the level of stakeholder consultation undertaken in the development of R&D programs.

Effectiveness in relation to return on investment

To maximise the return on public funding invested through the Corporation.

Performance measures	Assessment
The average benefit-cost ratio across the R&D and communication effort funded by the Corporation, with a target average of at least 10 to 1.	During the year LWA developed a framework for measuring portfolio return on investment. The methodology is based on measuring return on investment for high-impact innovations that are in-market (or there is clear evidence of adoption). It assumes that a majority of benefits are attributed to a small number of high-impact innovations. There remains a big challenge to identify the environmental and social benefits (principally non-market) across the portfolio.
	Initial results suggest that the Corporation has made a significant return on investment across the portfolio. Considerable potential still exists to capitalise more on the substantial body of knowledge being created to lift return on investment in future cycles. There is a need to establish clear adoption pathways for potential in-market innovations.

Effectiveness in relation to accountability

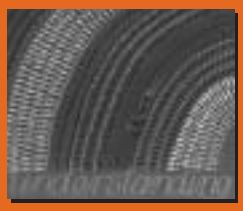
To meet all statutory obligations and accountability requirements in a comprehensive, timely and transparent manner.

Performance measures	Assessment
Independent and internal audit reports; feedback from AFFA and ANAO; timeliness of compliance.	Land & Water Australia has effectively complied with statutory accountability requirements. This is demonstrated through the following: Rigorous compliance checklists revealing no instances of major non-compliance with statutes. All recommendations from internal and external audits have been implemented. The end-of-year accounts were audited by the ANAO with no significant concerns. The ANAO performance audit on contract administration identified minor areas of non-compliance and significant areas where the Corporation is demonstrating better practice. The external review of Board performance and AFFA's corporate governance questionnaire gave the Corporation a 'clean bill of health' on corporate governance. Land & Water Australia has continued to maintain certification to quality management standard AS/NZS ISO 9001:9002.


www.lwa.gov.au

Report of operations

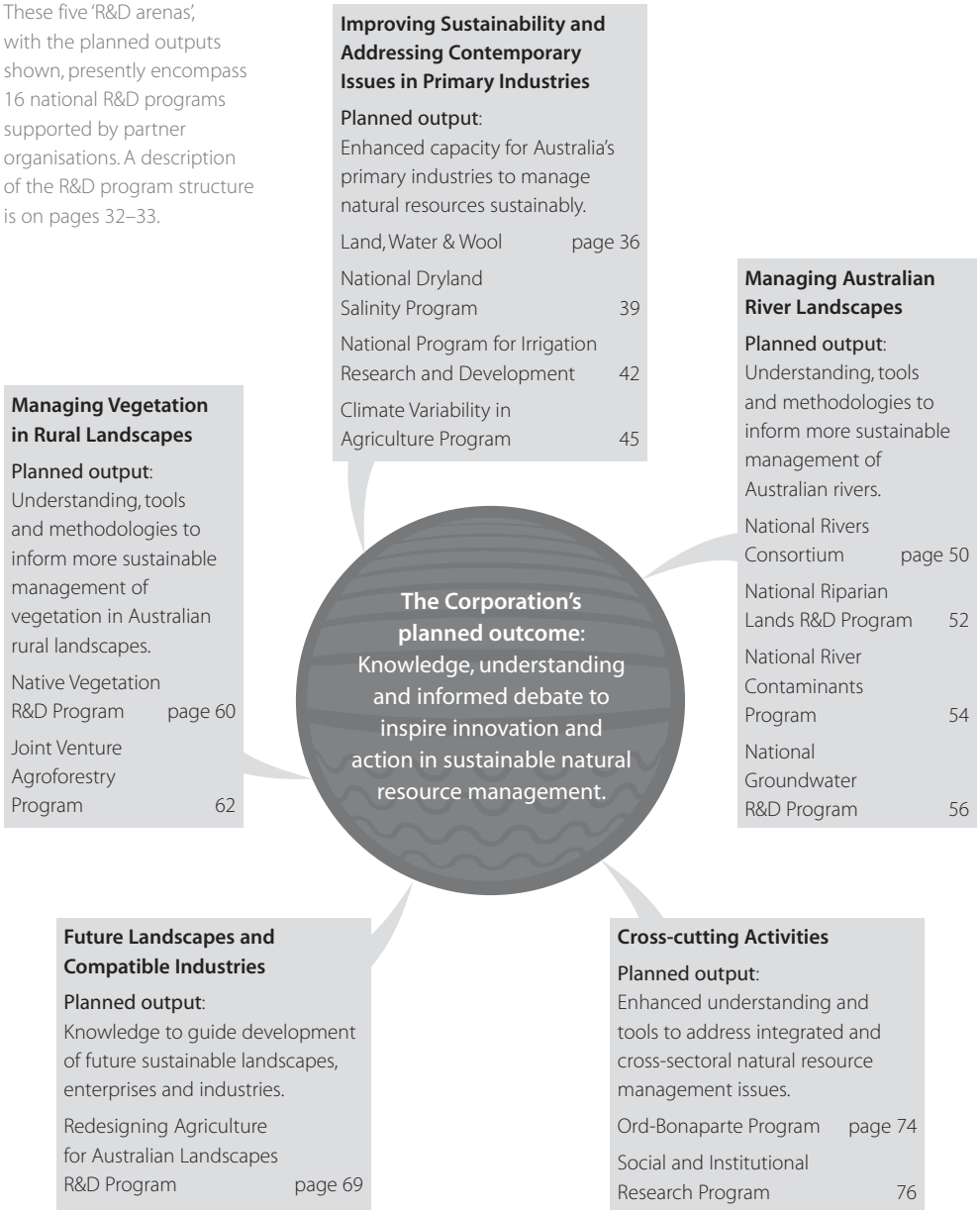
Part 2: The Corporation's operational and financial results



Part 3, describing corporate governance matters, starts on page 101.

Part 4, describing other corporate management matters, starts on page 117.

These five 'R&D arenas', with the planned outputs shown, presently encompass 16 national R&D programs supported by partner organisations. A description of the R&D program structure is on pages 32–33.



In addition:

- R&D conducted in response to a general call is on page 81.
- Details of the National Land and Water Resources Audit are on pages 85–91.

Details of the publicly available databases on which LWA-funded R&D is described are at page 106.

The Corporation's operations

Land & Water Australia's mission is to provide national leadership in generating knowledge, informing debate and inspiring innovation and action in sustainable natural resource management.

The main funding that the Corporation receives to achieve its mission is an appropriation from the Commonwealth Government of almost $12 million each year. Additional funds are sourced from external partnerships within collaborative programs and other activities. Land & Water Australia also derives income from sources such as investments, royalties and sales of products, information and services.

As detailed in the audited financial accounts, the Corporation has maintained a low surplus of accrued funds of $2.4 million at 30 June 2002 (2000–01 amount: $2.1 million). The Corporation maintains a small prudential reserve to cover contingencies in its R&D portfolio. All surplus funds are invested on deposit in Commonwealth-approved banks. During the course of the reporting year, the Corporation ensured that it met its debts and obligations as they fell due.

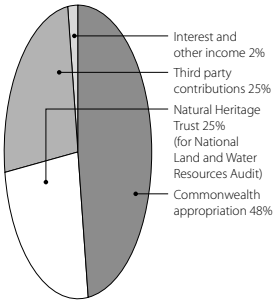
Land & Water Australia's corporate objectives, strategies and performance indicators, as set out in the 2001–02 AFFA portfolio budget statement and the Corporation's 2001–02 annual operational plan, are summarised on pages 22–25. These indicators were substantially revised in the 2001–06 Strategic R&D Plan, and subsequently in the 2002–03 annual operational plan and portfolio budget statement; next year's annual report will address them.

The Corporation's R&D activities are variously in keeping with, among other things, Commonwealth Government priorities for rural research, the Natural Heritage Trust and the Prime Minister's National Action Plan for Salinity and Water Quality (page 162), and the *Environment Protection and Biodiversity Conservation Act 1999* (page 33).

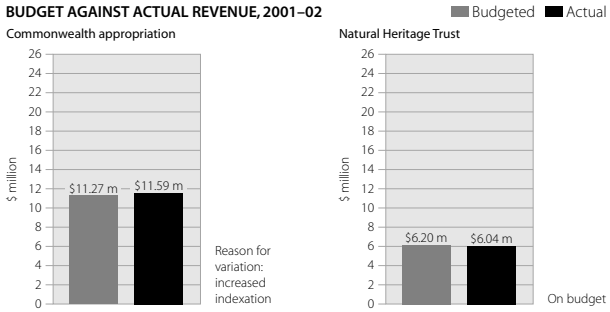
The Corporation has developed a comprehensive, robust and consistent evaluation and monitoring strategy. The strategy enables performance and impacts to be tracked at corporate, program, project and systems levels. At a corporate level, the focus has been on the five corporate objectives (leadership, influence, relevance, return on investment and accountability) and their linkage to the 'quadruple bottom line' (economic, environmental, social and accountability benefits). The 'public good' nature of Land & Water Australia's business and its role in encouraging sustainable natural resource management makes the evaluation task difficult. Environmental and social outcomes in particular are difficult to measure and even more difficult to attribute to particular research investments. Although the Corporation has developed innovative methods and approaches to this challenge, they are still in their early phases of application.

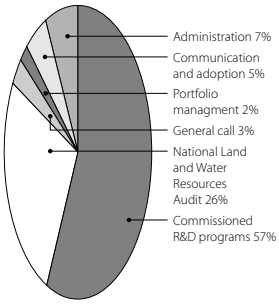
The core business of the Corporation is the establishment of national research programs. These programs, supported by partner organisations and linking with those organisations' programs, aim to bring together resource managers and researchers to jointly identify priorities and to ensure that research findings are adopted and implemented. Development of these programs and their efficient management was core business for Land & Water Australia in 2001–02. The programs are aggregated into five key output 'R&D arenas'.

Summary of budget and actual revenue and expenditure, 2001–02

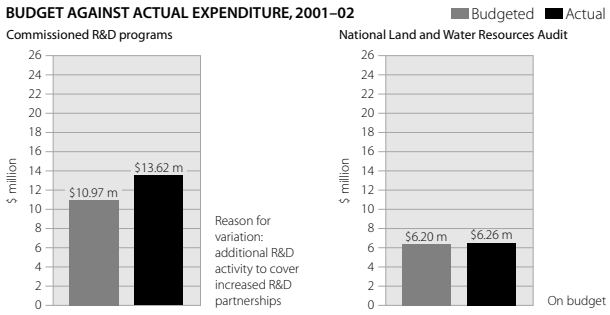


BUDGET AGAINST ACTUAL REVENUE, 2001–02

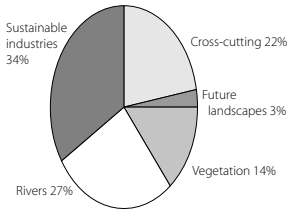




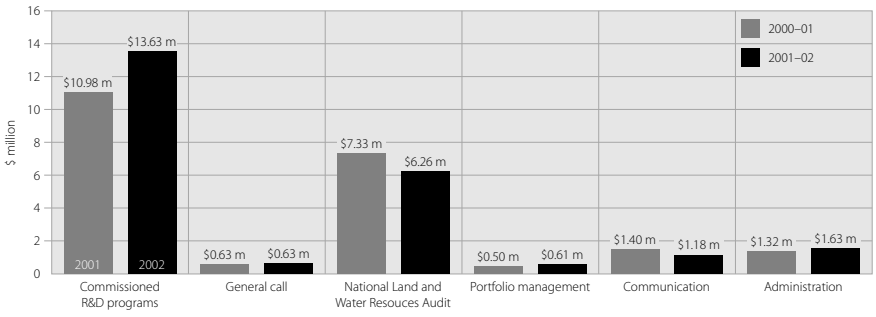
BUDGET AGAINST ACTUAL EXPENDITURE, 2001–02



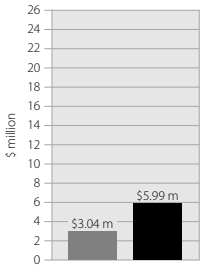
Expenditure across R&D arenas



COMPARISON BETWEEN 2000–01 AND 2001–02 EXPENDITURE

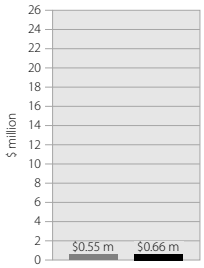


Third party contributions



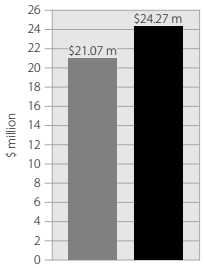
Reason for variation: additional revenue sourced (third party contributions disclosed in accrual terms.) (In 2001–02, LWA received $5.0 million in cash.)

Interest and other income

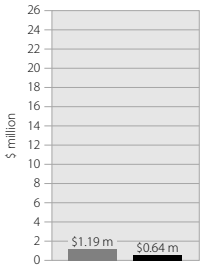


Reason for variation: additional return of R&D funds

Total income

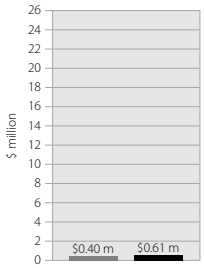


General call



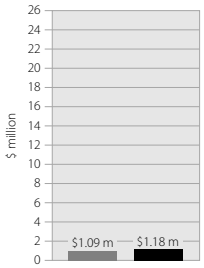
Reason for variation: projects transferred to commissioned R&D programs

Portfolio management



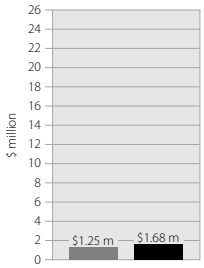
Reason for variation: set-up cost of framework for portfolio investment, knowledge management and evaulation

Communication and adoption



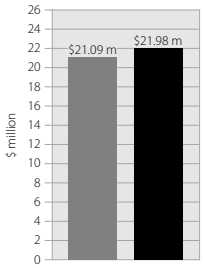
On budget

Administration

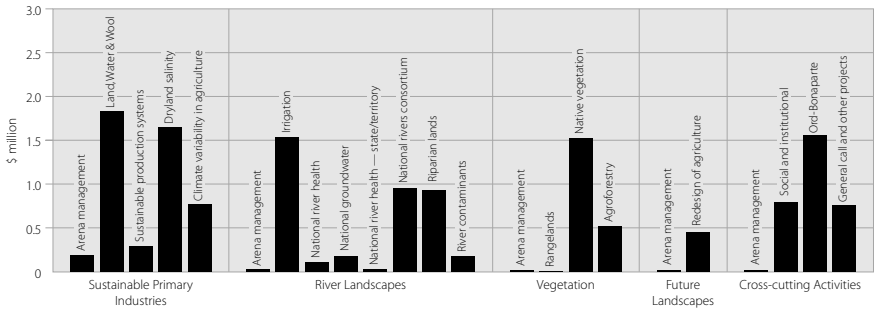


Reason for variation: additional management activity due to higher level of funds under management

Total expenditure



EXPENDITURE ON R&D PROGRAMS, 2001–02



The R&D programs

The planned outcome

Land & Water Australia, as a Commonwealth statutory authority, operates within a strategic framework based on outcomes and outputs.[1]

The Corporation's planned outcome, which is the end-point to which all its efforts are directed, is:

> Knowledge, understanding and informed debate to inspire innovation and action in sustainable natural resource management.

R&D arenas

In pursuit of that outcome, LWA's R&D programs — of which there are currently 16, though over time that number will change — are organised into five R&D arenas, which have the following planned outputs:

1. *Improving Sustainability and Addressing Contemporary Issues in Primary Industries*. Enhanced capacity for Australia's primary industries to manage natural resources sustainably.
2. *Managing Australian River Landscapes*. Understanding, tools and methodologies to inform more sustainable management of Australian rivers.
3. *Managing Vegetation in Rural Landscapes*. Understanding, tools and methodologies to inform more sustainable management of vegetation in Australian rural landscapes.
4. *Future Landscapes and Compatible Industries*. Knowledge to guide development of future landscapes, enterprises and industries.
5. *Cross-cutting Activities*. Enhanced understanding and tools to address integrated and cross-sectoral natural resource management issues.

Integrating themes

Interwoven across the five R&D arenas, the Strategic R&D Plan for 2001–2006 outlines four *integrating themes* to address a perennial challenge for most natural resource management agencies — that of integration across:

- issues and programs,
- different scales of activity,
- different jurisdictions,
- ecological, economic and social factors, and
- the knowledge spectrum — from knowledge generation to its transformation and utilisation.

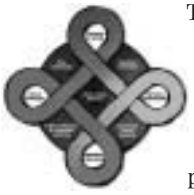
1 Outcomes are the results, impacts or consequences of actions by the Corporation in the wider Australian community and environment. Outputs are the goods and services that the Corporation produces for external organisations or individuals.

The Strategic R&D plan encourages programs, and existing and new partners, to support integrated projects in key areas. Important policy developments (such as the National Action Plan) will often generate such priorities, particularly where these issues cross sectoral and/or research program boundaries and require a coordinated response. Accordingly, this financial year LWA employed a concept of *integrating themes* to provide a new and practical approach to achieving coordination, synthesis and synergy between projects, programs and arenas.

The integrating themes cover four key drivers of natural resource management. They concern key elements of the relationship between human societies and the world around us, however we may categorise it: environment, landscapes, countryside, natural resources, natural capital or whatever. They encompass:

- perceiving and valuing our environment,
- learning and understanding our landscapes,
- living in and managing our natural resources, and
- organising and governing at a societal level.

Much R&D in natural resource management to date has concentrated on gaining a better understanding of the system and how it works — for example, about the nature of degradation processes and how they affect factors such as soil productivity and water quality. Research has also extended into management issues, attempting to develop better ways of managing natural resources more sustainably. However, relatively little work has been done on the influence of human perceptions and values on the way resources are managed — nor has much research work been done on the institutional dimensions of natural resource management. Accordingly, in 2001 the Board approved an integration framework and allocated $1.2 million to it over the next four years to ensure that resources are available for working in a genuinely integrated way across program boundaries.



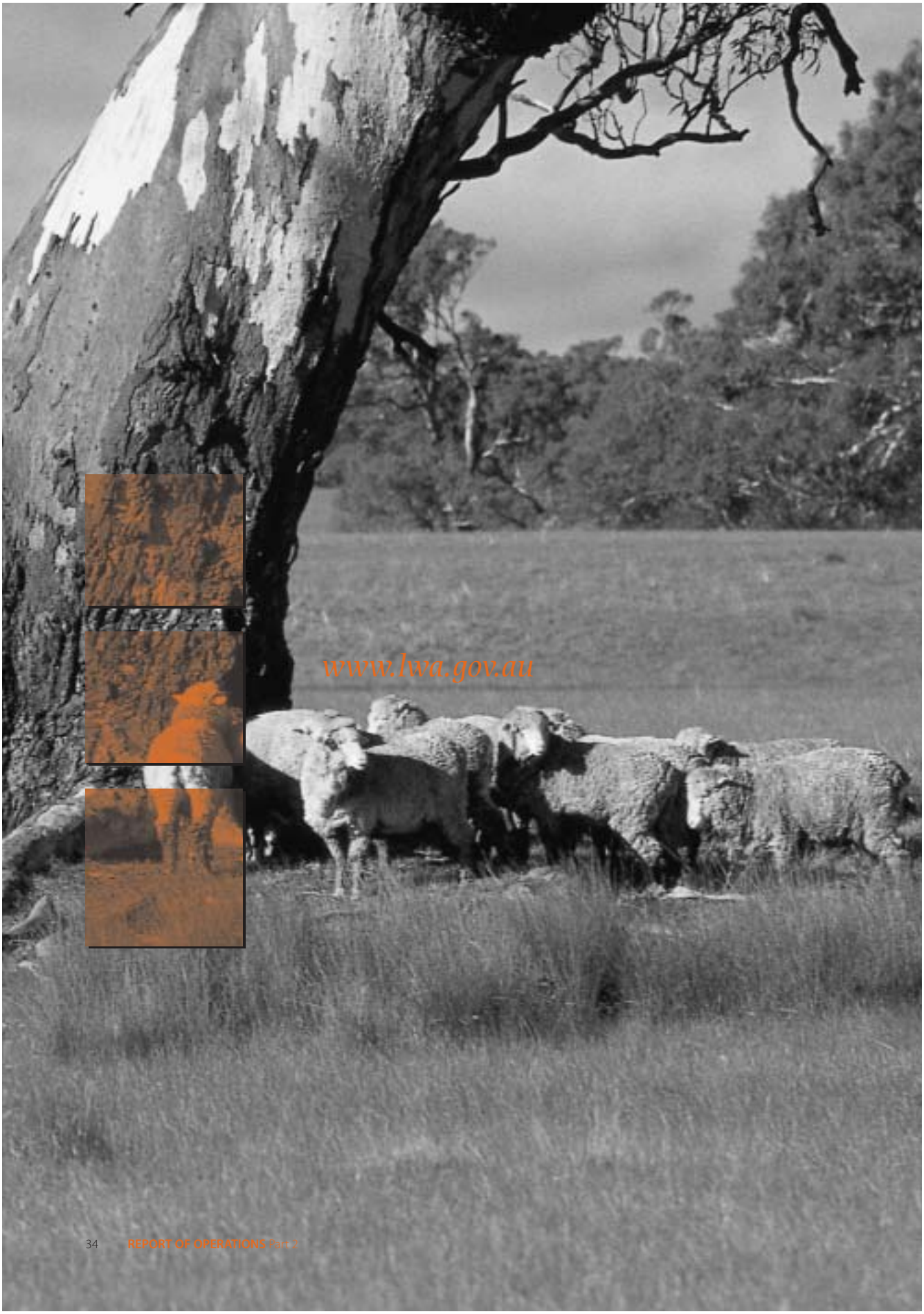
This diagram (also on the back cover) shows the five strategic R&D arenas and the four integrating themes.

In compliance with the Commonwealth Government's outcome-output model, reporting is centred on the R&D arenas, and below them the R&D programs, rather than on integrating themes.

Complying with the EPBC Act

Land & Water Australia requires that sustainability of the natural resource base is the over-riding objective when researchers and others are designing R&D projects and programs. Project contracts have specific clauses requiring providers to minimise environmental impacts. A significant number of projects across the R&D portfolio actively progress the intent of the *Environment Protection and Biodiversity Conservation Act 1999* by enhancing understanding of Australia's unique biodiversity, developing measures to limit or reverse threatening processes, and informing management of biodiversity and its habitat.

Government rural policy frameworks of particular significance to Land & Water Australia are detailed in appendix 1 (page 162).



R&D ARENA

Improving Sustainability and Addressing Contemporary Issues in Primary Industries

R&D programs in this arena

The planned output for investment in this arena is:

Enhanced capacity for Australia's primary industries to manage natural resources sustainably.

The productivity and ecological integrity of the resource base that underpins primary industries is Land & Water Australia's core business. More than 60% of the Australian continent is managed by farming and grazing industries. The Corporation works in partnership with primary industries, mainly through the commodity R&D corporations, to find ways to ensure that natural resources are used sustainably while supporting profitable farming systems. Such partnerships ensure that R&D is relevant to and 'owned by' industry, and takes advantage of existing industry-based delivery mechanisms for promoting R&D outputs.

Work in this arena focuses on research that addresses the fundamental causes of unsustainability in addition to managing their symptoms. Land & Water Australia investment is generally directed to public benefit objectives, but at a farm level it is often difficult to separate private and public interests. Best outcomes are most likely to occur when these interests converge, which calls for good understanding of the on-farm drivers for change. Through this arena, LWA is developing practical tools that resource managers can use to improve sustainability within their businesses and industries.

Land, Water & Wool

Land, Water & Wool is a major natural resource management initiative for the Australian wool industry based on a partnership between Australian Wool Innovation Limited and Land & Water Australia. It is an exciting program to advance one of Australia's most important agricultural commodities.

Land, Water & Wool was launched in August 2001 by the Federal Minister for Agriculture, Fisheries and Forestry, the Hon. Warren Truss, MP. The first ten months of Land, Water & Wool has been strongly focused on consultation with wool producers and the establishment of a number of on-ground research projects.

The program builds on ten years of Land & Water Australia research into natural resource management issues and focuses on designing sustainable and productive management solutions for the wool industry. There is a strong emphasis throughout the program on bringing together the win-wins in profitable production and sustainable natural resource management.

Land, Water & Wool finds win-win solutions in profitable production and sustainable natural resource management for wool producers

Expected outcomes

- A wool industry identified and respected as taking a proactive approach to natural resource management.
- Measurable change in wool producer natural resource management priorities and practices.
- Increased wool producer awareness of the importance of natural resource management.
- More than 2000 wool producers applying natural resource management innovations (covering salinity, waterway and native vegetation management, pastoral land use, biodiversity and climate forecasts).
- A conservative estimate of $58 million in improved productivity to wool producers and $46 million in enhanced environmental benefits (at an overall benefit-cost ratio of 5.5:1).
- Additional benefits — more difficult to quantify — such as reduced regulation, potential market premiums and market access, improved access to capital, increased community support and increased producer pride.

Planned outputs

- Natural Resource Management toolkits for wool producers based on research and practical producer experience.
- Incentive packages to assist wool producers to meet likely future natural resource management targets.
- Comprehensive database of natural resource management factors at the farm level.
- Identification of future wool production system needs, policy options and research priorities.
- A series of events and activities for producers to extend results.

Objectives

The objectives of Land, Water & Wool are:

1. To identify key natural resource management issues from producers' perspectives and understand their perceptions, needs, priorities and practices.
2. To increase wool producers' awareness and motivation to tackle natural resource management issues.
3. To provide wool producers with the knowledge and practical tools to address key natural resource management issues including productive and profitable solutions to the management of:
   - saline and potentially saline lands,
   - rivers, streams and watering points,
   - native grasslands and grazing systems,
   - on-farm biodiversity,
   - climatic variability and risk, and
   - long-term scenarios for future wool production systems.
4. To increase the capacity of wool producers to apply natural resource management innovations within their commercial enterprise.
5. To position the wool industry to reduce its environmental impact and to use environmental performance as a strategic marketing asset it if so chooses.

Partners

In addition to the over-arching partnership between Australian Wool Innovation Limited and Land & Water Australia, in its first year Land, Water & Wool attracted new investors at the sub-program and project level. At the sub-program level, Meat and Livestock Australia have invested $1.5 million over five years into the Sustainable Grazing on Saline Land sub-program.

At the project level, co-investors with LWA include the CRC for Plant-Based Solutions to Dryland Salinity; the Department of Agriculture Western Australia; the University of Tasmania; the Department of Primary Industries, Water and Environment, Tasmania; the University of New England; and the Department of Natural Resources and Environment, Victoria. New co-investors are expected to join as Land, Water & Wool completes its roll-out of sub-programs.

Strategies

By working with wool producers across the country, Land, Water & Wool will identify and paddock-test the practical tools and approaches in natural resource management which:

- make more productive use of saline land;
- improve river health and water quality;
- support production while conserving native vegetation and biodiversity;
- make more effective use of climate forecasting in grazing management;
- manage pastoral land for production and sustainability; and
- consider future wool and land management options.

Land, Water & Wool projects are strongly associated with wool producers who have contributed to identifying research questions and are interested in monitoring and participating in the research project.

Land, Water &Wool is also identifying and building relationships with existing wool producer networks such as Bestwool 2010 in Victoria and Bestprac in the pastoral zone. The Salinity sub-program is also facilitating development of a network of wool producers to share experience and ideas in dealing with salinity. Land, Water & Wool will use these networks (and others as they come on board) to share the new ideas, information and management strategies among wool producers generated by the program over the next five years. Land, Water & Wool will also encourage wool producers to engage and give feedback to the program on tools, ideas and products that come from the program.

The major delivery mechanism for Land, Water & Wool will be a natural resource management toolkit for wool producers. The toolkit will evolve over the life of Land, Water & Wool and will be shaped by wool producers' needs in natural resource management. The 'first cut' of the toolkit, which started during 2001–02, will be released late in 2002.

Achievements during the year

The Native Vegetation and Biodiversity, and Rivers sub-programs established an integrated on-ground research project in Tasmania bringing together producers' sustainable grazing management needs with biodiversity conservation and riparian management.

The Native Vegetation and Biodiversity sub-program established two projects in NSW and Victoria combining production and conservation of native vegetation and biodiversity.

The Sustainable Grazing on Saline Land sub-program established a leading research site in Western Australia and is developing a new producer network to combine the technical knowledge of scientists with the practical know-how of leading wool producers.

Workshops to gain support from state-based agencies and leading producers for the Climate and Pastoral sub-programs were successfully held with strong advice gained on design and delivery of both sub-programs.

The Pastoral Sub-program was re-designed to achieve stronger producer engagement following a targeted consultation in the pastoral zone. Producers commended the program for travelling to them and seeking their advice.

Future directions and opportunities

The key challenge over the next 12 months for Land, Water & Wool will be to secure strong wool producer support, participation and ownership in the program. Insights about producers' perceptions, needs and priorities in production and natural resource management, gained from the Producer Survey (due for completion August 2002) will be used to improve delivery and design of the program to meet producers' needs.

Further information: www.lwa.gov.au (click on R&D Arenas, then — on the new page — click Sustainable primary industries)

List of projects: page 178.

National Dryland Salinity Program

Objectives

The National Dryland Salinity Program (NDSP) is Australia's leading knowledge broker of research, development and extension efforts to combat the risk of dryland salinity to our land and water resources. The NDSP will research, develop and extend practical approaches to effectively manage dryland salinity across Australia.

Partners

Partners with LWA were as follows:

National	
CSIRO	Agriculture, Fisheries and Forestry – Australia
Murray-Darling Basin Commission	
State governments	
New South Wales	Victoria
South Australia	Western Australia
Queensland	Tasmania
Industry	
Grains R&D Corporation	Meat and Livestock Australia
Rural Industries R&D Corporation	

Strategies

In previous years, the NDSP has demonstrated that dryland salinity is not just an agricultural issue. Its diverse impact touches on many aspects of Australians' lives through declining water quality, loss of environmental assets, reduced income and increased stress, and damage to rural and urban infrastructure. The strategies of the NDSP are similarly diverse — covering research, development and communication extension activities and targeting many sectors of the population affected by salinity.

By working closely with Australia's leading scientists, the NDSP has further explored the nature of salinisation processes and the likely extent and impacts it poses for the future. With this knowledge, management strategies appropriate to the context can be developed.

Achievements during the year

The NDSP achieved much in 2001–02.

The most important contribution of the NDSP during the past decade has been the enormous contribution to public awareness made by the program's national network of communication coordinators. The state communication coordinators in Queensland, Victoria, New South Wales and South Australia were all involved with local NAP communication planning. Together with the Western Australian communication coordinator, the network had significant presence at 40 national, state and local conferences, workshops and other forums. It was responsible for publishing four editions of the *Focus on Salt* newsletter, two editions of *SALT* magazine and about 400 newspaper articles dealing with dryland salinity.

Distribution of *SALT* magazine increased in 2001–02 from 45,000 to 65,000 copies, largely to meet the demand of the grain industry. A readership survey of the magazine showed the total proportion of farmers who had recalled seeing *SALT* magazine had increased to 54% in 2001–02 from 47% the previous year. Of those recalling seeing *SALT*, 73% rated it very or fairly useful.

At the catchment community level, the program employed participative processes to develop comprehensive regional information about salinity, its costs and options for management for catchments across the Murray-Darling Basin.

The NDSP website (www.ndsp.gov.au) continued to grow in 2001–02, achieving the status of Australia's most used site in the field of natural resource management. There were indications of a high level of return users. During the year, the site was upgraded to enable users to gain access to some of the larger decision support system products on-line.

The NDSP website was Australia's most used site in the field of natural resource management

With the assistance of AFFA, the NDSP has developed a database of tools for assessing salinity management options. The database will be made available to catchment groups across Australia, and in particular will help those groups developing catchment strategy proposals for funding under the National Action Plan for Salinity and Water Quality (NAP, described on page 164).

Also with AFFA assistance, the program has developed a guidebook comparing different desalinisation techniques for use across a wide range of circumstances. This work follows previous NDSP projects dealing with the productive use of saline resources. The guidebook will be particularly useful to rural towns and businesses, including farming businesses, that require easier and cheaper access to fresh water.

During the past year, the program worked with farmers to reduce recharge into watertables. Much of this work was based in Western Australia and South Australia, employing participative research methods to investigate the use of deep-rooted perennial vegetation, such as lucerne, in farming systems that to date have been dominated by leaky annual crop-based vegetation.

Likewise, the program worked closely with shire and other engineers to develop a decision support system for engineers to use in designing works appropriate to landscape condition, and to reduce rather than add to environmental problems. Local government has been an important target audience for the program during the year.

Another decision support system that helps local governments to assess their salinity risks and management options was updated and distributed to about 450 councils across Australia.

Reflecting the program's relevance to both industry and government, the NDSP increased its partnership in 2001–02 to include the Government of Tasmania and Meat and Livestock Australia. The NDSP now embraces every state government, and its industry partnerships extend over the vast majority of land either affected by salinity or contributing to it.

The NDSP now embraces every state government, and its industry partnerships extend over the vast majority of land either affected by salinity or contributing to it

Future directions and opportunities

The final year (2002–03) of the second phase of the NDSP, will be an important year for completing research activities and translating them into useful communication products for the program's diverse stakeholders. The program's partners will be making a concerted effort to extract all the useful information emanating from the program over the life of the current and previous phases. This will include adapting existing products to suit the needs of the program's new partners and the needs of those working closely with the NAP.

In addition to a concerted communication effort, the NDSP will also be engaged in evaluation, reflection and planning. In particular, the program will assess the new environment in which it operates — an environment in which Australians view the problem of salinity in an entirely different light from when the NDSP started.

Challenges remain in dealing adequately with salinity in a cost-effective way, and a nationally coordinated research effort is still required to capture the synergies of enthusiastic researchers and community members. Opportunities abound in the area of biodiversity and the wider environment, commercial industry imperatives, extensive grazing, regional planning and support and knowledge exchange.

These opportunities will be assessed for their potential to establish a challenging new program in 2003–04.

Further information: www.ndsp.gov.au

List of projects: page 179.

National Program for Irrigation Research and Development

The National Program for Irrigation Research and Development (NPIRD) was established in 1992 and has operated in three distinct three-year phases since then. 2001–02 marks its final year.

Objectives

In the third phase of NPIRD (1999 to 2002), a total of $4.2 million in partnership funding was invested in research and development projects focusing on the following five objectives:

1. *Water use efficiency*: Clarify the terms, measurements and methods of interpreting and reporting data to help to establish water use efficiency as a national endeavour.
2. *Inter-relationships between irrigation and wider catchment processes*: Identify risks and enhance catchment sustainability.
3. *Water services*: Identify costs, benefits and implications of restructuring water policies and services.
4. *Adoption of innovations*: Improve networks and uptake of participatory processes.
5. *Best-practice guidelines*: Consolidate benchmarking across systems and inform towards on-farm monitoring.

Partners

There were 14 partners in NPIRD, all of which contribute funding (Land & Water Australia matches investment from the other partners on a one-to-one basis). Partners with LWA were as follows:

CSIRO Land and Water	Ord Irrigation Cooperative
Grape and Wine R&D Corporation	NSW Department of Land and Water Conservation
Horticulture Australia Ltd	NSW State Water
Queensland Department of Natural Resources	Southern Rural Water Authority
Goulburn-Murray Water	Wimmera Mallee Water Authority
NSW Irrigators	Agriculture WA
Sunraysia Rural Water Authority	South-West Irrigation
WA Water and Rivers Commission	

Partial rootzone drying technology was rated among the top 100 innovations of the 20th Century in a review conducted by the Powerhouse Museum and the Australian Academy of Technological Sciences and Engineering

Nine years of R&D achievement

The end of June 2002 marked the completion of the third and final phase of NPIRD and nine years of successful irrigation research and innovation, funded by the Commonwealth Government through LWA and CSIRO Land and Water, industry bodies and state government agencies around Australia. During this time almost 100 projects were funded, a number of which produced research of national and international reputation.

Partial rootzone drying technology was developed with support from NPIRD, the Grape and Wine R&D Corporation and Horticulture Australia Ltd. This technology, which delivers major benefits in saving water and enhancing yields, was rated among the top 100 innovations of the 20th Century in a review conducted by the Powerhouse Museum (Sydney) and the Australian Academy of Technological Sciences and Engineering.

The framework used for benchmarking the performance of rural water supply authorities has been taken up internationally by the International Committee on Irrigation and Drainage and is at present being trialled in six countries. Further, NPIRD work has underpinned major new state-based programs to improve irrigation water use efficiency in New South Wales and Queensland.

Achievements during the year

A substantial achievement for 2001–02 was the development of the Ecological Risk Assessment project. A common methodology was developed and three regional case studies implemented, allowing research to begin into a generic method for catchments and regions to assess the ecological risk associated with irrigation systems.

This ground-breaking work has required four research projects consisting of one in each of the three case study catchments of the Goulburn–Broken, Ord and Fitzroy plus another, which is a research linkage project. The aim of this fourth project is to develop experimental design and technical rigour; to ensure optimal exchange of ideas and knowledge across the case study areas; and to use the knowledge to develop a framework for future catchment application. The projects will generate a rigorous assessment process that catchments can use to identify the ecological risks of irrigation, guiding decision-making about irrigation development and enhancing the sustainability of irrigation.

Other achievements during the year included:

- scoping of socio-economic issues affecting positive change in irrigation communities,
- developing kits to help irrigators to make decisions about short-term and long-term optimum water entitlement for their farms, and

- a national consensus workshop to achieve a national standard for irrigated crop water balance and evapo-transpiration methodologies.
- Investigating the practicalities and potential for controlling evaporation losses from on-farm storages.
- Gaining acceptance of a water use efficiency framework.
- Identifying best management practices for sub-surface drainage design and management.
- Identifying water balance benchmarks.
- Improving knowledge about sustainable management of the Burdekin Delta groundwater systems.
- Improving irrigation water use in northern Australia by accounting for contributions to crop water requirements from freshwater, shallow watertables.

Future directions and opportunities

Partnerships between some 30 irrigation industry stakeholders are currently being negotiated

A new program, the National Program for Sustainable Irrigation, started on 1 July 2002 to build on the successes of NPIRD, but with a strong re-orientation towards emerging natural resource management issues.

The new program will provide R&D for issues of national importance, including salinity, water quality, COAG water reform including water savings, socio-economic viability of regional communities and the ecological footprint of irrigation.

The scope, size, partnerships and potential for impact of the new program are substantially expanded beyond those of NPIRD. Theme areas are:

- Enhancing the sustainability of irrigation.
- Exploring future visions and values.
- Informing public policy development.

Increased industry support for the new program will be crucial to success. Partnerships between some 30 irrigation industry stakeholders are currently being negotiated with governments, irrigator groups, commodity and other research organisations, and water authorities. Such a substantial institutional partnership arrangement is a unique and valuable opportunity to greatly increase the rate of change. Through sharing and adapting knowledge, it is expected that there will be a substantial leap forward in enhancing the sustainability of irrigation in Australia.

Further information: www.npird.gov.au (covers the National Program for Sustainable Irrigation that supersedes NPIRD).

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Climate Variability in Agriculture Program

The most recent phase of the Climate Variability in Agriculture Program (CVAP) began in 1997 and ended in June 2002.

Objectives

The Climate Variability in Agriculture Program aimed to develop products for improved management of the major opportunities and risks arising from climate variability. The program worked with farmers and natural resource managers to develop and implement profitable and sustainable management strategies using improved climate information — in particular rainfall outlooks for the season ahead.

Phase 1 of the program was funded as part of the 1994 National Drought Policy initiative of the Commonwealth Government. The current phase is funded through AFFA as part of *Agriculture, Advancing Australia*. The strategic framework included a farm sector dealing self-reliantly with risk and with a capacity to manage its natural resources sustainably.

Partners

Five R&D corporations complemented AFFA's lead role in funding CVAP. Their involvement in planning and management has been a major feature and strength of CVAP. Decision support tools could thus be readily developed in partnership with specific industries as well as more generic tools of value in a wide range of industries and regions.

Partners with Land & Water Australia as the co-leading agency were as follows:

Major funding partner	
Agriculture, Fisheries and Forestry – Australia	
Funding partners	
Rural Industries R&D Corporation	Sugar R&D Corporation
Grains R&D Corporation	Dairy R&D Corporation
Management Committee	
National Farmers' Federation	

Strategies

The program is a relatively new focus for research. The major challenge is to integrate new knowledge of climate variability into existing approaches to managing climate-related risks. Collaborative projects and generic tools are the two most effective ways for CVAP to contribute as a national program.

In the most recent phase, about $1 million annually has been invested in 25 projects. The coverage includes applications in new regions and industries, contributions to policy development, and advancing climate science of value in applications in agriculture.

CVAP's implementation strategy included building on a unique national opportunity to foster more effective collaborative approaches within the agricultural sector, and between agriculture and researchers in meteorology and oceanography.

Four objectives defined the research strategies. The first developed improved seasonal forecasts through statistical approaches, climate models, and through directly forecasting production indices — for example crop yields or pasture growth. The second was developing better-adapted farming systems. The remaining two objectives concentrated on regional and industry applications, including communication and marketing aspects.

Achievements during the year

The role of seasonal climate forecasts in underpinning decisions on farm and natural resource management is central to the program. A survey of Australian farmers for *Agriculture, Advancing Australia* showed a 37% level of adoption of seasonal forecasts. This level has been achieved in a little over a decade since seasonal climate outlooks became generally available. The survey question was on whether or not farmers took seasonal climate forecasts into account in farm decisions. CVAP has made significant contributions to development and delivery of the forecasts, and in applications in agriculture.

CVAP has contributed to the increased understanding and credibility of seasonal climate forecasts through its wide range of applications projects and through communication of the practical value of forecasts. National farm journals have regularly run features on climate aspects featuring CVAP research and products.

The *Agriculture, Advancing Australia* survey results show 63% of farmers still need to take forecasts into account in their farm management decisions. However, in some regions and industries, opportunities to do so are limited. There are gains to be made in climate forecasting skills at critical decision times such as crop planting.

A comprehensive review of CVAP by independent consultants during 2001 concluded that an extension of the program with an emphasis on adoption was warranted (For the full review, see www.cvap.gov.au).

Future directions and opportunities

Experience is showing that better interpreted information at a local level is the important trigger for many farmers. The previous phases of the program have now provided the generic tools to facilitate this.

The current phase aims to provide better interpreted local information that will trigger many farmers to take up the technology

The CVAP review confirmed that a broadening of the program is now the most effective means to achieve wider adoption. In addition to a greater focus on applied research to show value in specific industries and regions, the review gives high priority to application in water resources and natural resource management.

The Prospectus for a new phase of CVAP was launched in May 2002, with strong industry support through the National Farmers' Federation. The rural R&D Corporations and AFFA are the major potential partners in a new phase.

The next phase of the program will have a broader focus and a greater concentration on increasing adoption in a wider range of industries and in applications in natural resource management.

Consultation with stakeholders as part of the review process in 2001 set a framework for the new phase, including a broader scope to specifically include fisheries and forestry industries, and natural resource management.

Further information: www.cvap.gov.au

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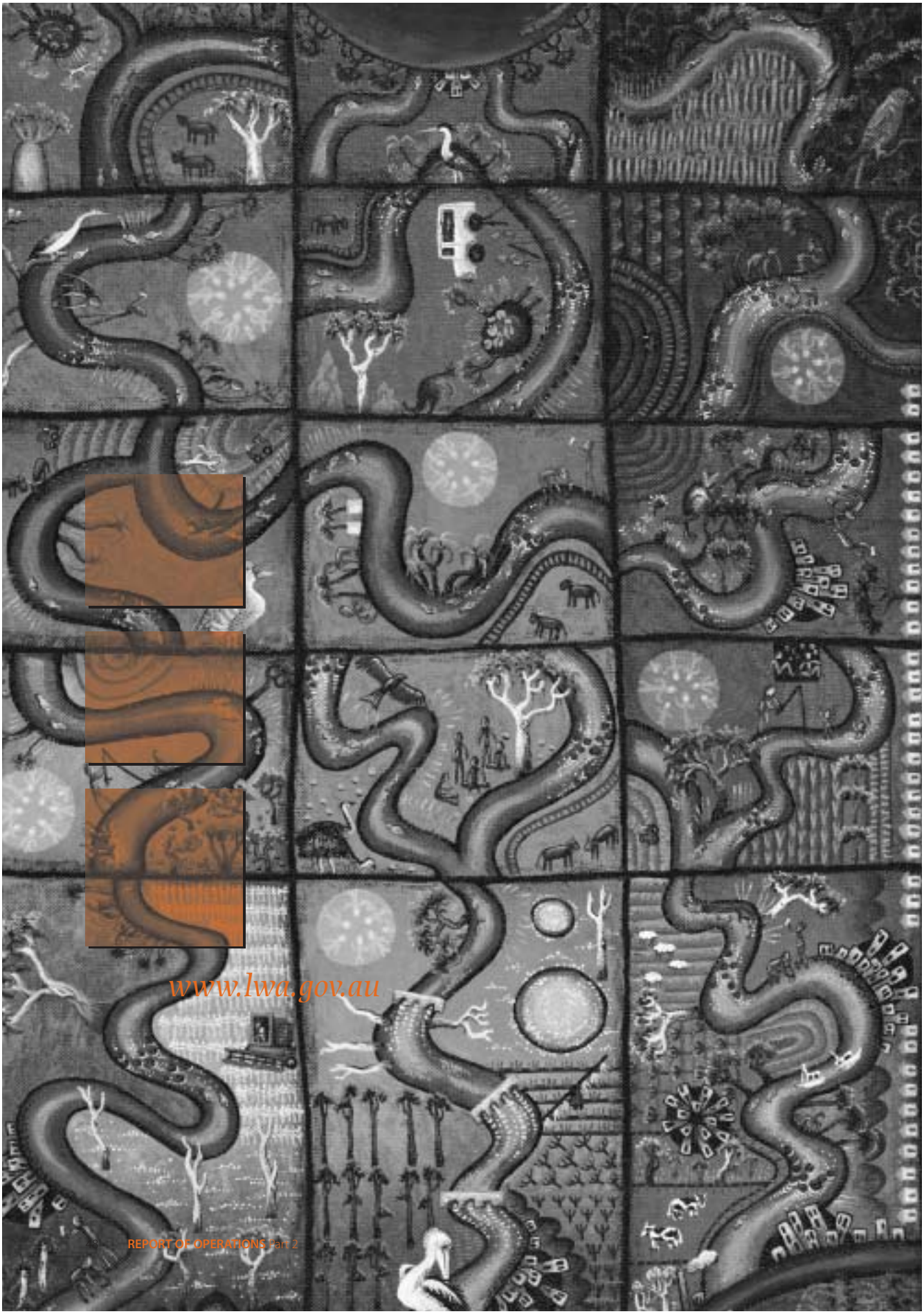

www.lwa.gov.au

R&D ARENA

Managing Australian River Landscapes

R&D programs in this arena

The planned output for LWA's investment in this arena is:

Understanding, tools and methodologies to inform more sustainable management of Australian rivers.

Water resources are crucially important to Australia. Appropriate management of these resources is a national priority. The relative scarcity of water and the high demands placed on existing supplies by agricultural and other users have placed river systems and associated landscapes, floodplains, wetlands, estuaries and coastal waters under great pressure. Australian rivers are quite different from those elsewhere in the world as a result of the highly variable climate combined with a highly erodible, flat and ancient landmass. Many of the degradation processes associated with agriculture result from fundamental changes to catchment hydrology. There can be long lag times in the full manifestation of problems. The most threatened elements of biodiversity are often concentrated in riparian zones. Dealing successfully with river landscapes thus has the potential to generate a systemic impact extending well beyond the rivers themselves.

The need for a whole system approach to river management — from source to sea — is becoming clear. However, with few exceptions, there are no institutional models providing such coverage. Work through this arena is underpinning improved policies and institutional arrangements for river management and protection, and adoption of sustainable management practices in the field.

The Land & Water Australia programs within the Rivers Arena during the year included the National Rivers Consortium, the Riparian Lands Program, the National River Contaminants Program, and the National Groundwater Program.

National Rivers Consortium

Objectives

The National Rivers Consortium is a strategic collaboration between policy makers, river managers and scientists. The Consortium is aiming to:

- assemble the full range of skills, expertise and capacity of major organisations involved in river restoration and protection in Australia;
- connect the various types of activities (policy, science, practical management); and
- speed up progress to achieve community goals for river condition and management.

The National Rivers Consortium aims to achieve continual improvement in the management of Australia's rivers.

Partners

Partners with LWA as the managing agency are as follows:

CSIRO Land and Water	Murray-Darling Basin Commission
WA Water and Rivers Commission	NSW Department of Land and Water Conservation

Strategies

Making an impact on the continuing degradation of Australia's rivers requires substantial financial resources and a coordinated and focused national effort. A major challenge of the Consortium is to ensure effective collaboration with key R&D providers, national and state agencies and catchment authorities.

The Consortium is working to secure resources to undertake an effective program of activities, and has focused its activities on the following priorities for project funding:

- protecting rivers with retained natural values,
- restoring degraded rivers,
- training river managers,
- turning research into practical river management solutions, and
- undertaking regional and catchment demonstration projects.

Achievements during the year

Activities and achievements completed during the year include:

- developing training and education activities at tertiary and vocational levels to increase the capacity and skills of river managers;
- launching a regional, catchment-based, best-practice research and demonstration project in the Torbay catchment of WA, and developing a complementary large-scale demonstration project in the Murrumbidgee region;
- supporting a number of national workshops, in particular the successful Rivers Forum March 2002;
- completing a major review of the national legislative and regulatory bases for river management activities;
- developing and promoting best-practice river restoration, rehabilitation and management techniques;
- conducting outreach activities, including a new web site for all NRC and related information on river protection, restoration and management; and
- disseminating high-quality fact sheets and technical guidelines.

Future directions and opportunities

There is increasing support for the Consortium across Australia, and growing confidence that it can meet the needs of river managers. Catchment and river management authorities in particular are becoming strong supporters.

The National Rivers Consortium Board has agreed to expand membership to include all the states, and possibly territories, as opportunities allow. In the coming year it is expected that South Australia will become a partner member of the Consortium through its combined Catchment and Water Management Boards.

From 2002–03, the National Program for Sustainable Irrigation will be managed within the Rivers Arena, and the National Groundwater Program will end.

Further information: www.rivers.gov.au

List of projects: page 184.

National Riparian Lands R&D Program

Objective

The program's objective is to assist communities to implement, monitor and evaluate practices for ecologically sound, effective and economic management of riparian lands.

Partners

Co-investor and research provider partners, with Land & Water Australia as the lead agency, are as follows:

CRC for Catchment Hydrology	University of Western Australia
CSIRO Land and Water	Charles Sturt University
Centre for Catchment and In-Stream Research, Griffith University	James Cook University

At the project level, co-investors are as follows:

Dairy R&D Corporation	Australian Wool Innovation
Gipps Dairy	Sugar R&D Corporation

All states and territories are on the Program Advisory Committee.

Strategies

The program invests in research according to key riparian management issues, identified through an extensive consultation process involving landholders, government agencies, research institutions and community-based organisations. The issues are:

- development of a conceptual model showing riparian zone interactions,
- influence of riparian management on flood hazards at a catchment scale,
- stabilising streambanks and trapping sediments and nutrients,
- improving water quality and aquatic ecosystem health,
- reintroducing and maintaining large woody debris,
- preventing or reducing pollution caused by nitrogen and associated carbon sources,
- valuing riparian ecosystem services to improve decision-making,
- determining appropriate riparian width for different management objectives,
- management of domestic stock and feral animals,
- development of simple but effective techniques for monitoring and evaluating riparian management and vegetation condition, and
- overcoming constraints to implementation of sound riparian management.

These 11 riparian management issues are being investigated using a mix of research, demonstration and knowledge exchange approaches. Full details of the work to be undertaken in each of these areas may be found on the website (www.rivers.gov.au) under the 'activities' heading.

The program is now in its second phase, following an independent review that found Phase One was setting a world-class standard in its science and communication activities. The program has a strong practical focus that has been translated into an investment strategy for research according to key riparian management issues. A multi-disciplinary approach is essential so that findings can be accessed and used by river managers 'on the ground'. The program has a strong focus on knowledge exchange and its creative use of communication vehicles to reach different target audiences.

Achievements during the year

The program is taking the lead in translating complex science into innovative, relevant and useful products for people to apply on-farm and in-the-river. Achievements over the past year include the LWA Rivers Forum, which bought together more than 200 people involved in river and riparian management — including local councils, landowners, industry representatives, government agencies, catchment management organisations and research providers. Speakers at the Forum were drawn from outside the rivers community to obtain different perspectives on how to raise awareness about the need to protect and restore our riverine environments and motivate people to act. In the 'Researchers on a Riverbank' segment, participants were able to talk directly to researchers about what was happening in their rivers and how they could better manage these areas to achieve environmental and economic goals.

Other achievements included:

- publication of an updated River and Riparian Management Fact Sheet series covering key riparian and river issues encountered by people on their farms;
- new technical guidelines containing the most recent scientific findings on riparian processes and outlines for adaptation of management strategies to capitalise on the functions performed by riverine environments — for example, filtering, bank protection, wildlife habitat.
- an updated website, which provides state-of-the-art access to information with an interactive 'catchment' by which people can explore the science underpinning recommended practices for river and riparian management.

The National Riparian Lands R&D Program is now working with several industry groups to develop research projects and outputs that meet the demand for river and riparian information to be practical, relevant and tailored to meet a particular industry's needs. Current projects are as follows:

- A guideline for 'Managing Riparian Lands in the Sugar Industry' (Sugar R&D Corporation and LWA).
- Gippsland Dairy Riparian Project (GippsDairy, Dairy Research & Development Corporation, West Gippsland Catchment Management Authority).
- The Land, Water & Wool program — Rivers sub-program (Australian Wool Innovation Pty Ltd and Land & Water Australia).
- A guideline for 'Managing Riparian Lands in the Cotton Industry' guideline (Cotton R&D Corporation and LWA).

Full details of all these projects can be found on the website.

Future directions and opportunities

As the consumer push for clean, green environmental credentials grows, the program is being approached by different commodity groups to provide information, guidelines and demonstration sites to show how economic and environmental outcomes can be achieved on-farm. This work is providing the basis on which environmental management systems can be provided for commodity-specific best management practice guidelines and manuals.

Working with industries, the Riparian Lands R&D Program is breaking new ground as an investor in river and riparian science

Working with industry ensures that the research undertaken by the program is relevant and able to be practically applied. The industry projects provide the opportunity to make river and riparian science an integral part of whole-of-system farm plans, and represent a new direction for the program. By working with industries, the program continues to break new ground and to remain at the forefront as an investor in river and riparian science.

Further information: www.rivers.gov.au

List of projects: page 185.

National River Contaminants Program

Objectives

The National River Contaminants Program aims to contribute to healthy river systems by reducing the ecological impact of river contaminants. It provides practical technical information to directly support river management at the national and catchment scales, and fills information gaps to improve our understanding of the impact of contaminants on ecosystem processes. The program aims to add value to important natural resource management initiatives, including the National Action Plan for Salinity and Water Quality and the Murray-Darling Basin Commission's Integrated Catchment Management Program.

Partner

LWA's partner in this program is the Murray-Darling Basin Commission.

Strategies

The National River Contaminants Program has a strong scientific base. It invests in research directed towards the following priorities:

- A whole-of-ecosystem approach that focuses on the combined impacts of major riverine contaminants: nutrients, sediments and salts and their role in ecosystem processes.
- Scientific input to end-of-catchment target-setting frameworks currently being established at national, state, basin and local scales.
- Practical support for operational decisions regarding the management of river contaminants.

Achievements during the year

2001–02 was an establishment year for the program. It saw the development and publication of the program plan and a national call for research proposals consistent with that plan. Seventy-five high quality applications were received, seeking more than $23 million in funding. Thirteen of these proposals, seeking approximately $4.5 million, were invited to submit second-round applications. Projects will be selected and contracted in the first quarter of 2002–03.

Communications activities have been integrated within the Rivers Arena. One edition of *RipRap* magazine focused on river contaminants, and several high quality fact sheets and technical guidelines were produced. A database detailing the sensitivity to salinity of a wide range of aquatic species was completed by Monash University and Victoria University.

Future directions and opportunities

Science from the National River Contaminants Program will contribute important information to regional and catchment strategies

The National River Contaminants Program potentially covers a broad range of river contaminant issues such as salinity, nutrients and algae, soil erosion and pesticides. A major challenge for the program is to invest strategically while:

- adopting a holistic, long-term, ecosystem-focused approach;
- providing basic knowledge and supporting R&D about the ecological effects of salinity in ecosystems where salinity is the dominant cause of stress, with links to the National Dryland Salinity Program;
- turning existing knowledge for nutrients and sediments into management tools and policy changes; and
- developing partnerships and effective collaboration with key R&D providers, national and state agencies and catchment authorities to achieve critical funding mass for large-scale ecosystem studies.

Science from this program will be an important input into the various regional and catchment strategies being prepared for the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust. Land & Water Australia has a major opportunity and challenge to ensure that those who could benefit from the outputs of this program do so.

Further information: www.lwa.gov.au (then click the R&D Arenas button and, on the page that appears, click on 'rivers' in the text).

List of projects: page 185.

National Groundwater R&D Program

Objectives

The National Groundwater R&D Program aimed to provide management and policy information and tools to assist in the sustainable use of groundwater resources and the protection of groundwater quality.

Partners

Partners with LWA as the lead agency are as follows:

NSW Department of Land and Water Conservation	Queensland Department of Natural Resources
Western Australian Water and Rivers Commission	National Groundwater Management Committee under the Standing Committee on Agriculture and Resource Management

Strategies

The program started with an extensive national review of R&D needs. Then a management committee, comprising experts from the key state managing agencies, set priorities for:

- groundwater-dependent ecosystems,
- sustainable groundwater use in complex aquifers, and
- tools to prevent groundwater contamination.

Achievements during the year

The program has highlighted the importance of the formerly unknown dependence of many ecosystems on groundwater in Australia. All jurisdictions and groundwater management agencies now have policies for protecting these ecosystems. Vegetation complexes that rely on groundwater for their survival are now better protected, as are underground stygofauna that represent a significant addition to Australia's biodiversity inventory.

Helped by the National Groundwater R&D Program, all jurisdictions and groundwater management agencies now have policies for protecting ecosystems influenced by groundwater

Australians now have a more complete understanding of the complex fractured rock aquifers that cover significant areas of the continent. New techniques and models have been developed and transferred to management agencies to assist in water quantity assessments and understanding of salinisation processes.

Due to the interest in this work, it was decided to commission a comprehensive manual for groundwater practitioners. To be completed by early 2003, this manual will bring together what we know about groundwater in fractured rock.

A groundwater vulnerability assessment tool is now available to groundwater managers and planning agencies to minimise risks of groundwater contamination by pesticides and other chemicals.

Future directions and opportunities

The five-year program will conclude in 2002–03. In future groundwater research will be conducted within the context of other Land & Water Australia programs.

Further information: www.lwa.gov.au (then click the R&D Arenas button and, on the page that appears, click on 'rivers' in the text).

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www.lwa.gov.au

R&D ARENA

Managing Vegetation in Rural Landscapes

R&D programs in this arena

The planned output from investment in this arena is:

> *Understanding, tools and methodologies to inform more sustainable management of vegetation in Australian rural landscapes.*

Vegetation performs an essential role in all aspects of the environment. Almost all organisms are in some way dependent on it for survival. Although some ecosystem functions can be supported by exotic forms of vegetation such as introduced crops, pastures and plantations, many others cannot. Many of the functions performed by native vegetation are poorly understood and are under-valued. Native vegetation resources are under great pressure in many rural landscapes.

Vegetation management has a major role to play in preventing rising watertables and dryland salinity in those parts of Australia that have not yet been extensively cleared, and in the restoration of hydrological balance in landscapes that have been extensively cleared. Depletion, degradation and fragmentation of Australia's native vegetation cover is the most important single cause of dryland salinity, the single biggest driver of loss of biodiversity, and among the largest contributors to net greenhouse gas emissions.

This arena encompasses vegetation management in rural landscapes in total — not just native vegetation. The programs in this arena include the Native Vegetation R&D Program and the Joint Venture Agroforestry Program, managed by the Rural Industries R&D Corporation.

The key strategies employed through this arena include:

- research to determine the functional values and ecosystem services provided by native vegetation over different scales;
- development and active promotion of practical guidelines, tools and methodologies to improve vegetation management at a landscape scale; and
- development of better tools and processes to measure, monitor and report on the condition of native vegetation, consistent with the National Vegetation Information System.

Native Vegetation R&D Program

Objectives

This program aims to assist government agencies, community groups and landholders to better manage and conserve native vegetation and its associated biodiversity in rural landscapes.

Partners

Partners with LWA are as follows:

CSIRO Sustainable Ecosystems	Murray-Darling Basin Commission
CSIRO Plant Industry	

The program commenced its second five-year phase of research in July 2000, and is funding research projects under three key themes. A broad range of stakeholders identified these themes as significant issues associated with the management of native vegetation and its associated biodiversity in rural Australia.

All states and territories, Greening Australia, RIRDC and Environment Australia are represented on the Program Advisory Committee.

Strategies

The program, which started its second five-year phase of research in July 2000, is funding research projects under three key themes identified by a broad range of stakeholders as significant issues related to management of native vegetation and its associated biodiversity in rural Australia:

- methods to assess native vegetation status, viability and thresholds for significant change;
- testing different landscape design principles and methods for biodiversity conservation; and
- incorporating native vegetation management into agricultural production systems.

The Native Vegetation and Biodiversity sub-program of the Land, Water & Wool Program is building on almost a decade of research undertaken in the Native Vegetation R&D Program. A key component of the sub-program is four regional projects that will be examining options that are both profitable and that help to protect, sustain and improve native vegetation across different regions in Australia. By working closely with commodity groups such as Australian Wool Innovation, the chances of incorporating native vegetation management into agricultural production systems will be much higher.

A national framework for landscape classification is also being developed (in a PhD project supported by the program) as a tool to improve communication about native vegetation and its management. This study is also addressing the critical issue of stakeholder values.

Achievements during the year

Communication of results at both the project and program level is a major focus of the program, as explained in the website listed below.

Fact sheets on each of the current projects are available on the website and in hard copy. In July 2002 a magazine called *Thinking Bush* highlighted some of the research being funded through the program. Initial feedback has been extremely positive.

An integration highlight was the production of a publication on managing riparian lands for multiple uses. This draws on the work funded by the Native Vegetation R&D program, the Riparian Lands R&D Program, the Joint Venture Agroforestry Program and the MDBC. Integration of the material from these different programs will provide a much-needed guide to managing riparian zones for different objectives.

Like the riparian program, the Native Vegetation R&D Program is working increasingly with commodity R&D corporations (including wool, cotton, meat and grains), illustrating an increasing understanding within industry of the need to integrate production and conservation objectives on private land.

The Native Vegetation R&D Program is seeing increasing understanding within industry of the need to integrate production and conservation objectives on private land

Future directions and opportunities

Interest in the management of native vegetation and biodiversity is increasing in rural Australia, as evidenced by the number of policies and programs that focus on this issue. The Native Vegetation R&D Program is the leading broker for research in this area, and is attracting a growing number of approaches to utilise the knowledge that has been generated in both policy and practice.

A review of the effectiveness of other LWA research programs that promote the integration of native vegetation into agriculture production systems will start in late 2002.

A workshop on the 'focal species approach' is being organised for late 2003. There is much debate in the scientific community about the assumptions underlying this approach, which is being widely adopted as a management tool. The workshop will provide an opportunity to explore the strengths and weaknesses of the approach.

A mid-term review of the program in early 2003 will examine the likely contribution of completed and current projects to the improved management of native vegetation, actual and potential benefits, and the program's administrative and communication performance.

Further information: www.lwa.gov.au/nativevegetation

List of projects: page 191.

Joint Venture Agroforestry Program

Objectives

Agroforestry has the potential to improve agricultural productivity, diversify and increase farm income, conserve land, maintain biodiversity and contribute to the national timber supply. Given appropriate research, development and extension, agroforestry could become a widespread, profitable and sustainable system of land use.

The 'multiple benefit' nature of agroforestry makes it ideal for collaboration between R&D partners with varying priorities. Development of a joint approach ensures that outcomes from agroforestry R&D investment are balanced by focusing resources on a set of priorities agreed by all partners.

Partners

The program was established in 1993 with three partners: RIRDC, Land & Water Australia (then LWRRDC), and the Forest and Wood Products Research and Development Corporation.

Funding is also provided for some activities by the:

Murray-Darling Basin Commission	Agriculture, Fisheries and Forestry – Australia
Grains R&D Corporation	Australian Greenhouse Office

A major contribution of $4 million, received in February 1998 from the Natural Heritage Trust through the Farm Forestry Program, ends in 2002.

Strategies

The Joint Venture Agroforestry Program is involved in:

- initiating, coordinating and communicating agroforestry R&D;
- assisting in the removal of policy and institutional impediments;
- assisting in the development of new tree-based industries; and
- designing large-scale commercial agroforestry systems in lower rainfall areas to address environmental issues.

The program recognises that future commercial agroforestry investments, particularly in the medium to low rainfall regions, are subject to considerably more risk than other commercial land use enterprises that have proven production systems and more transparent commodity markets. R&D intervention can help to reduce this risk by quantifying land, water, biodiversity and social responses to agroforestry systems and developing new products from trees in low to medium rainfall areas.

The program has managed Bioenergy Australia (previously called the Biomass Taskforce) since 1998. This taskforce fosters and facilitates the development of biomass for energy, liquid fuels and chemical feedstocks. Membership continues to grow; now there are about 50 paying members. The sustainable development of a biomass industry in Australia is an important new area of R&D within the program.

Achievements during the year

Some of the key outputs of the Joint Venture Agroforestry program during 2001–02 included the following:

- Two complementary reports into Environmental Services: 'Emerging Markets for Environmental Services — Implications and Opportunities for Resource Management in Australia' and 'Making Farm Forestry Pay: Markets for Ecosystem Services'. These were combined and distilled into a *Research Update* publication.
- A key report into investment titled 'Environmental and Commercial Outcomes through Agroforestry'.
- The first in the *Agroforestry Guideline* series 'Trees, Water and Salt', launched at a high-profile event in March 2002.
- An evaluation of pulpwood quality for 13 agroforestry species.
- The Carbon Farmer report, manual and software, which allow farmers and advisers to evaluate whether it is worth engaging in carbon farming.
- A feasibility study investigated the potential for integrated mallee processing for carbon products, eucalyptus oil and electricity. A pilot plant based on this system is currently being established in Narrogin, WA, with government and private investment. This could potentially underpin a successful new industry based on woody perennials.
- A workshop on the potential of the wattleseed industry in March 2002.
- A report on measurement and integration of fauna biodiversity into agroforestry systems in Queensland.
- A bibliography of silvicultural research trials in Australia.

Future directions and opportunities

Since the current five-year plan runs to 2004, it will be updated within the next year. It is likely that the major focus and opportunities will continue to lie in establishing new industries in the low rainfall areas of Australia.

Distilling clear design guidelines for agroforestry will continue — land managers need reliable, simple information on designing agroforestry systems for multiple benefits

The current direction of distilling clear design guidelines for agroforestry is likely to continue into the future because there is a pressing need to provide reliable yet simple information to land managers on designing agroforestry systems for multiple benefits. Two more books in the Agroforestry Design Guidelines series are to follow the first book, *Trees, Water and Salt* — in late 2002 *Trees for Shelter* and in 2004 *Trees for Biodiversity*. Also planned are a series of manuals on other topics: establishing trials, setting up silvicultural trials, site selection for farm forestry, mixed species plantations for cabinet timber wood, and irrigated eucalypts.

Developing new and more sustainable industries requires pioneering research on several fronts. Continued effort will be made in investigating policy and investment options to build on work completed this year. Research will continue into new farming systems based on short rotation and coppicing trees, as well as industries such as bio-energy. Major opportunities exist in the field of bio-based products from woody perennials in low rainfall areas. This includes investigating the potential of a range of unique Australian flora and perhaps unique associations with microflora that can be used in new processing technologies and products (for example, preservatives, adhesives and fine chemicals). The relative priority that will be given to this type of research will be discussed in more detail during the next five-year planning cycle.

Further information: www.rirdc.gov.au (under 'Our programs', click on 'Agroforestry and Farm Forestry').

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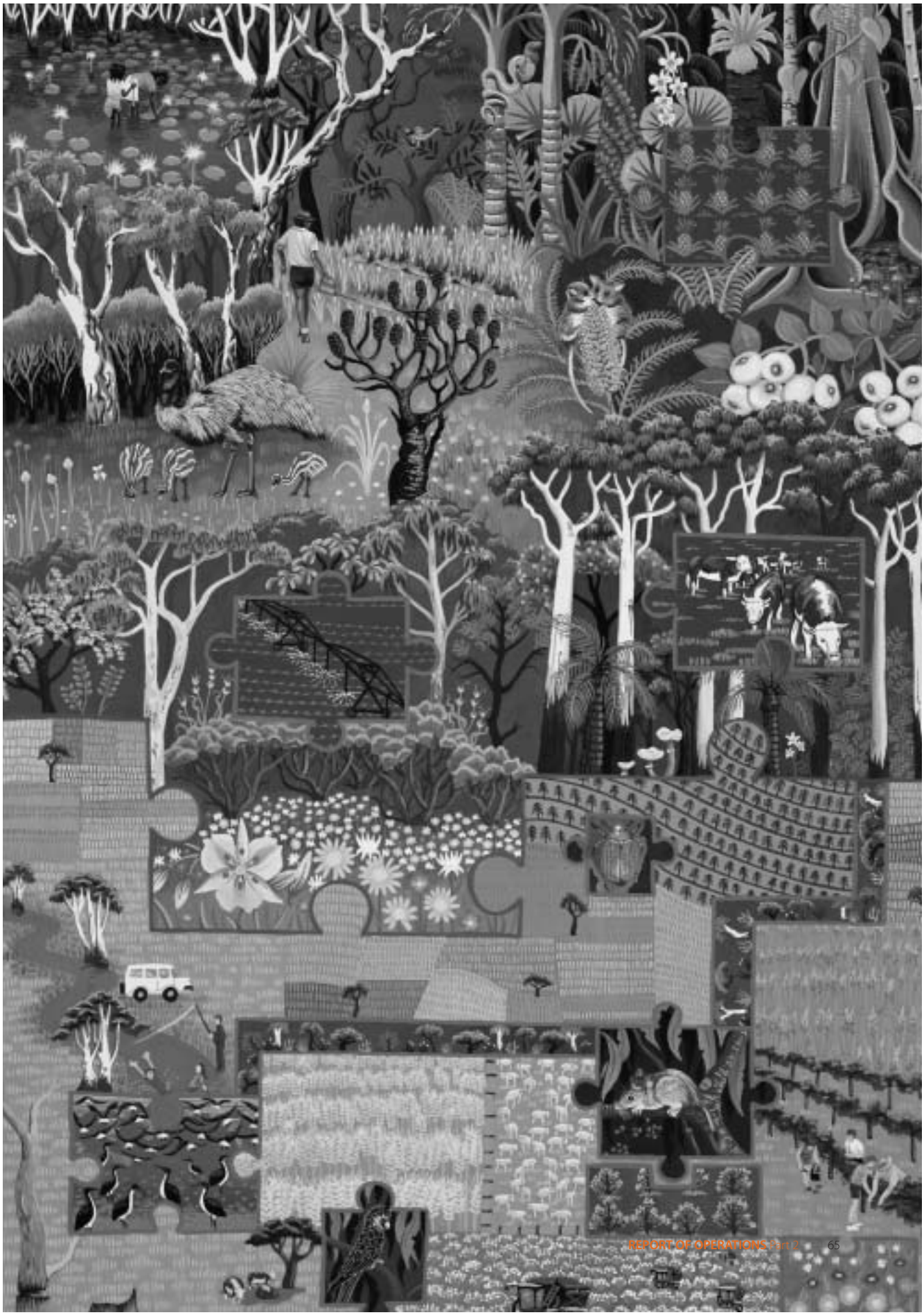


www.lwa.gov.au
Ian Prosser photo

R&D ARENA

Future Landscapes and Compatible Industries

R&D program in this arena

The planned output from investment in this arena is:

Knowledge to guide development of future sustainable landscapes, enterprises and industries.

This arena is distinguished from other work in Land & Water Australia in the following ways:

- *Time*. Thinking will be characterised by longer time frames: probably 10 to 100 years.
- *Breadth*. Attention is on all systemic drivers and uncertainties, not only natural resource management drivers.
- *Landscape*. All landscape attributes are explored — not just rural or agricultural landscapes.
- *Paradigms*. Alternative futures and quantum jumps are explored rather than incremental change.
- *Orientation*. The future, rather than the past, will be invigorating the present.

The world is changing more rapidly than ever before. Relationships are becoming more dynamic, and in this environment efforts to predict and control the future must rely on smart intelligence-gathering and active risk management. Fundamental science and technology break-throughs and radically new ideas for utilising natural resources will provide opportunities for achieving sustainable future landscapes. Taking an exploratory long-term perspective in this environment provides Land & Water Australia with an appropriate context within which better R&D decisions can be taken today.

New approaches, tools, techniques and businesses are emerging to understand, explore and visualise the future. The Futures Arena will bring this thinking into LWA to guide other programs.

This arena, probably more than any other, will contribute directly LWA's role of being at the forefront of Australian thinking on natural resource management and in informing debate in the community.

Arena objective

This arena aims to revitalise Australian landscapes, enterprises and industries through practical and profitable alternatives to unsustainable landscape practices.

The ability to fulfil this aim requires a deep understanding of the dynamic interaction of both the natural system and the interaction of human beings with it.

Arena strategies

An initial plan for the Futures Arena, approved by the Board in 2002, incorporates six core strategies:

- exploring and designing sustainable landscapes and compatible industries for the future;
- innovating future sustainable agriculture;
- comprehending new and emerging issues and concepts;
- stimulating and influencing LWA's R&D portfolio and external stakeholders;
- constructing the futures knowledge base and resources; and
- communicating and educating.

Planned outputs

The arena will provide knowledge to guide development of future sustainable landscapes, enterprises and industries. Specific outputs will include:

- well-articulated future scenarios providing the context for natural resource management R&D;
- understanding of global to local drivers of change;
- interpretations of current trends expressed in landscape evolution;
- visions of alternative future sustainable landscapes;
- innovations for sustainable rural production systems;
- funding for future farming systems;
- rapid knowledge of emerging issues and concepts;
- futures tools, skills and knowledge embedded in the organisation; and
- a forward-looking LWA portfolio.

Future directions and opportunities

By taking an long-term perspective, the new Future Landscapes and Compatible Industries Arena will give Land & Water Australia a context for better R&D decisions today

This arena is in an active stage of development with all six strategies progressing in parallel. One of the most significant activities will be a major scenario-planning exercise, starting in September 2002, that will broaden the thinking of LWA and key stakeholders about future possibilities and hence priorities for R&D funding. The arena will also be working on R&D priorities for new sustainable farming systems, scanning and analysing new and emerging issues, communicating and stimulating futures thinking and activity across the Corporation's portfolio, and taking an active role in internal and external education. The arena will also be developing a partnership project addressing deep drainage issues in the northern Murray-Darling Basin.

Further information: www.lwa.gov.au (then click the R&D Arenas button and, on the page that appears, click on 'future landscapes' in the text).

List of projects: page 192.

Redesigning Agriculture for Australian Landscapes R&D Program

Objectives

This now-completed program aimed to design novel agricultural systems to ensure economic production and ecosystem and landscape function by matching these systems to the unique biophysical characteristics of the Australian environment.

The program arose from increasing evidence that most current agricultural production systems in Australia are not likely to be ecologically sustainable in the long term. In particular, current crop and pasture plants and production systems are not able to make full use of available rainfall and soil moisture; consequently, they leak water and nutrients.

This phenomenon contrasts to the native systems that were able to use a much greater proportion of available rainfall. The additional water leaking from agricultural systems is largely responsible for moving salt and nutrients around the landscape, giving rise to dryland salinity and soil acidification. There is a clear need to develop new agricultural systems that match the unique characteristics of the Australian landscape and 'mimic' their functioning.

Partners

CSIRO was the co-lead agency with LWA.

Strategies

Four priorities were developed for the program's research:

- Understand, by comparison, the key biophysical processes affecting leakage of water and nutrients in cropping, grazing and natural systems.
- Benchmark criteria for redesigning agricultural systems in Australian landscapes.
- Develop a toolbox of redesign options to modify current agricultural systems (or to develop new agricultural systems) for Australian landscapes.
- Facilitate implementation of redesign options in priority Australian landscapes by exploring the socio-economic, institutional, policy, marketing and technological requirements and implications of each option.

Achievements during the year

The program made substantial progress in understanding water and nutrient leakage in agricultural and native systems, and identified broad principles for redesigning agricultural systems.

The research has highlighted the challenges involved in designing new farming systems and the further challenges involved in integrating these farming systems in the landscapes within which the farming systems operate. New ways of thinking are emerging about the future of Australia's landscapes and a small but healthy degree of farmer innovation has been identified. In addition, a significant increase in the number of initiatives exploring farming system and landscape redesign issues has occurred over the life of the program.

During the year the program explored concepts of landscape redesign in a project to develop new ways of thinking about Australia's landscapes and how we might actively 'redesign' those landscapes to achieve a range of economic, environmental and social outcomes. A consultancy was also let to develop an investment vehicle for private funding of new sustainable agricultural systems (Fund for Future Farming Systems). The program has also undertaken a review of farmer-initiated innovative farmer systems to identify the innovations occurring at the farm scale across the country.

Work also progressed with the synthesis or R&D outputs, communication planning and identification of new R&D priorities. A technical review of the program has been completed and a second review to evaluate the program's leadership, influence, relevance, return-on-investment and accountability is in progress.

Future directions and opportunities

The program was formally completed in June 2002; two on-going experimental projects were absorbed into the Futures Arena. In the near future, effort will focus on actively communicating the program's outputs, reviewing the implications of the Fund for Future Farming Systems consultancy, and developing the potential for future research within the broader context of future landscapes and compatible industries.

Further information: www.lwa.gov.au (then click the R&D Arenas button and, on the page that appears, click on 'future landscapes' in the text).

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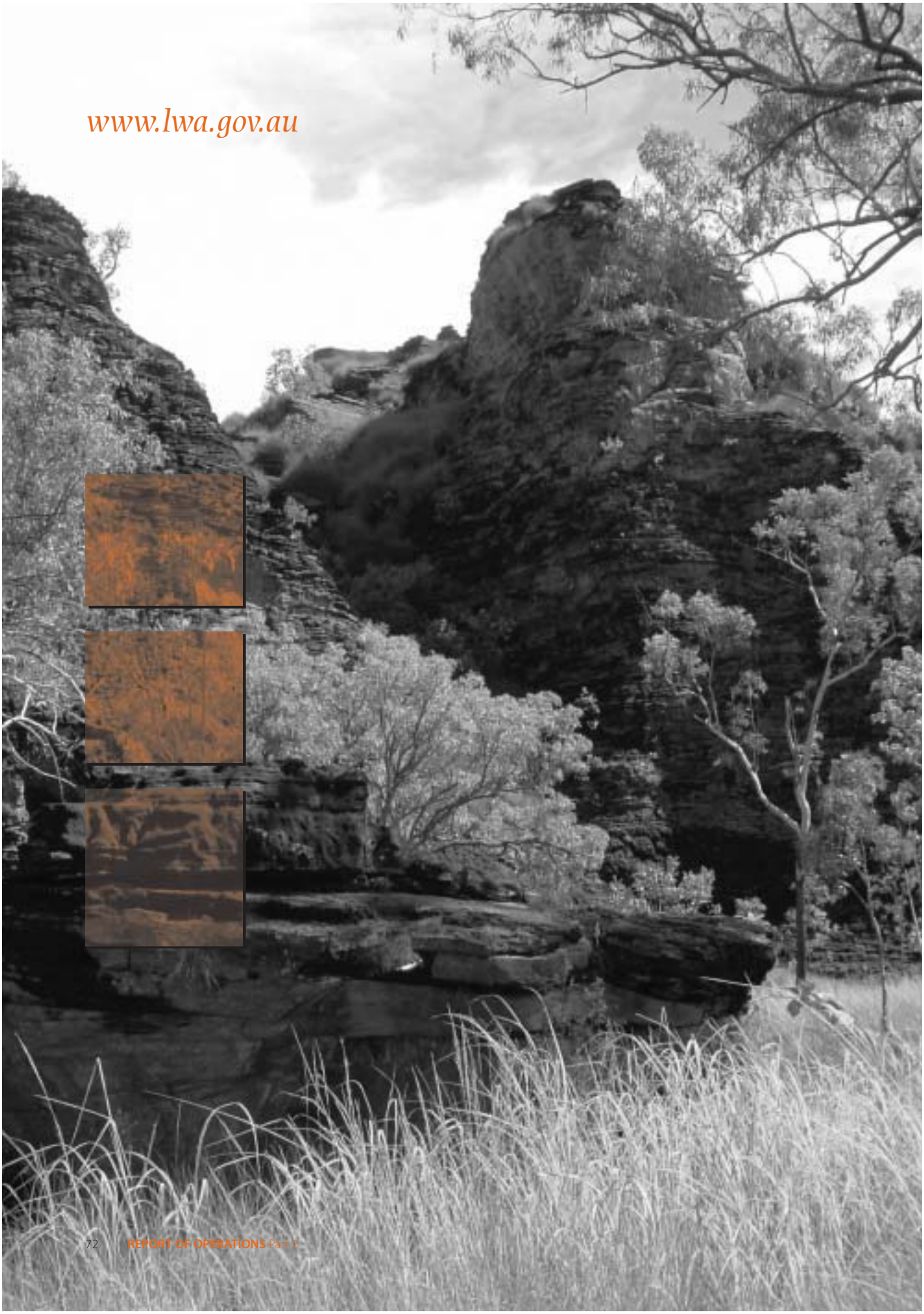
www.lwa.gov.au



R&D ARENA

Cross-cutting Activities

R&D programs in this arena

The planned output from investment in this arena is:

Understanding, tools and methodologies to guide development of integrated approaches to natural resource management at regional and policy levels.

Ord-Bonaparte Program

Objectives

The Ord-Bonaparte Program is a major integrated natural resource management R&D program seeking to underpin ecologically sustainable development in the East Kimberley region of north-western Australia.

The program is innovative in its scope and its integrated approach to natural resource management at a regional scale. The study region takes in the whole of the Ord and Keep Rivers catchments, extending out into the Joseph Bonaparte Gulf. The program is committed to effective community participation and capacity building, and integrates biophysical, social and economic research.

The program is expected to reveal how development can proceed in northern Australia without repeating the mistakes that have proved so costly in the Murray-Darling Basin and elsewhere in southern Australia. It aims to build on existing activities and, in partnership with regional stakeholders, to develop effective tools, methods, processes and strategies to underpin policy, planning and management for the sustainable use of natural resources at catchment and regional levels. Its outcomes will apply at catchment and regional levels in the East Kimberley and across northern Australia.

Partners

The program is a joint-venture partnership between Commonwealth, state and local government agencies and organisations. Signatories to the Collaborative Research Agreement, in addition to LWA, are:

CSIRO	Kimberley Land Council
WA Waters and Rivers Commission	Shire of Wyndham and East Kimberley
WA Department of Agriculture	Australian Institute of Marine Science
Agriculture Fisheries and Forestry – Australia	Centre for Resource and Environmental Studies, ANU
WA Department of Conservation and Land Management	Cooperative Research Centre for Tropical Savannas
WA Department of Mineral and Petroleum Resources	

The program is managed by a Governing Board comprising an independent chair; representatives of the five major funding partners and five local community representatives that represent the broad spectrum of local stakeholders within the study region. Key community organisations also collaborating in the development and implementation of the program include the Halls Creek-East Kimberley Land Conservation District Committee and Ord Land and Water.

Strategies

A five-year R&D plan was developed in 2000 with the participation of a wide range of agencies and stakeholders. The R&D plan sets out strategies and activities under five sub-programs:

- Regional Resource Futures.
- Rangeland Systems.
- Water Resources Planning and Management.
- Coastal, Estuarine and Marine Resources.
- Aboriginal Management and Planning for Country.

Achievements during the year

Scoping work completed in 2001 led to key research projects to be completed in June 2003, including:

- Development of an integration framework.
- Characterisation of rangeland resources.
- Best utilisation of water resources for the Ord River Irrigation Area.
- The response of the Lower Ord River and Estuary to management of catchment flows and sediment and nutrient loads.
- Plants and animals of Kija, Jaru country: Aboriginal knowledge conservation and ethno-biological research in the upper Ord catchment.
- Data access and information, GIS and cultural mapping with Kija and Jaru people in the upper Ord catchment.
- Capacity building and two-way learning for Miriuwung-Gajerrong and Balangarra people in the lower Ord catchment.

The program's communication strategy aims to build commitment and involvement by stakeholders and to develop useful information packages. Communication outputs have included information sheets, community workshops discussing interim research results, collaborative projects with community organisations, and a communication workshop.

Future directions and opportunities

To date there has been little investment of R&D in the Kimberley region. Baseline knowledge is generally poor, and although some high-quality, project-specific R&D has occurred, research in the region generally lacks a whole-of-system perspective.

The program will add value to existing R&D activities in the region and fill major gaps in data and knowledge. The region represents a diverse range of ecosystems and land-use interactions, and is a potential model for evaluating the impacts of future development elsewhere in northern Australia.

The Kimberley region, with its diverse range of ecosystems and land-use interactions, is a model for evaluating impacts of future development in northern Australia

The program will make significant contributions towards:

- a substantial increase in fundamental and baseline knowledge to support improved resource management strategies;
- synthesis and integration of biophysical and socio-economic research;
- innovative ways of ensuring R&D delivery to stakeholders and clients;
- innovative and flexible decision support tools, underpinning sustainable natural resource policy, planning and management; and
- ecologically sustainable development of multiple resources in the region, with lessons transferable to other regions in northern Australia.

The program has enormous potential as an example of how an integrated approach to R&D at the regional scale can underpin the sustainable development of a region that is extraordinarily rich in natural resources. The extent to which the program can achieve its ambitious goals will depend on investment to enable more of the original R&D plan to be implemented.

Further information: www.lwa.gov.au (then click the R&D Arenas button and, on the page that appears, click on 'cross-cutting activities' in the text).

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Social and Institutional Research Program

The Social and Institutional Research Program fills a nationally recognised need for the social sciences to contribute more to understanding natural resource management problems and solutions and to create new and better procedures for producing knowledge. Since natural resource management problems are complex and require different perspectives to understand them, the program has a broad mandate to encompass social, economic, legal, institutional and policy-related disciplines.

The program helps to ensure that biophysical R&D funded by Land & Water Australia and its partners takes into account social and institutional factors. The program also has a special relationship with the Integrating Themes of the R&D matrix (page 32). Its goal is continual improvement in natural resource management through enhanced knowledge of:

- how people value and perceive natural resources;
- how they learn about and understand natural resource management;
- how people live in and manage natural resources; and
- how processes and governance influences natural resource management.

Accordingly, the program's objectives are to:

- build the knowledge base of the social and institutional factors that impact on natural resource management;
- produce social and institutional R&D services and products that facilitate changed practice; and
- develop Australian R&D capacity in the social and institutional dimensions of natural resource management.

Partners

The Social and Institutional Research Program is funded by LWA; it does not have other funding partners at the program level. Some of its projects have partnership funding from within and outside LWA. For several of its projects, the research providers (including universities and CSIRO) have provided cash or in-kind contributions.

The program operates in a highly collaborative manner with other organisations, including the Murray-Darling Basin Commission, the Bureau of Rural Sciences and other rural R&D corporations. It does this by exchanging research results, consulting in the design of projects and participating in joint steering committees.

Through the program, Land & Water Australia is a partner in a cooperative venture that is being coordinated by the Rural Industries R&D Corporation — 'Capacity building for innovation in rural industries'. The aim is to share and build on the knowledge base and experience of governments, agribusiness, extension/education and training institutions, farmers, R&D organisations and industry organisations.

Other partners include the following:

Agriculture, Fisheries and Forestry – Australia	Grape and Wine R&D Corporation
Sugar R&D Corporation	Murray-Darling Basin Commission
Grains R&D Corporation	Dairy R&D Corporation
Meat and Livestock Australia	

Strategies

The program's strategies are to:

- adopt a national leadership role to assist in ensuring that the social and institutional R&D undertaken in Australia addresses priority areas and issues;
- produce social and institutional R&D products and services that facilitate the adoption of solutions by target audiences;
- work with associated stakeholders to collaborate in R&D that addresses the social and institutional dimensions of natural resource management; and
- communicate the results of R&D to target audiences through a clear communication strategy.

Achievements during the year

Major highlights of the year included the publication and distribution throughout Australia of a number of communication products on the program's R&D; development of a communication strategy and an agency engagement strategy for the program; completion of seven research projects; and initiation of a mid-term review of the program.

Communication products published and distributed widely during the year included a booklet, *People and Policy*, which provides an integrated overview of completed research; 12 project fact sheets; and a CD-ROM containing research reports. These products seek to improve access, readability, timeliness and relevance of research results to end-users.

A strategy for engaging Commonwealth agencies that use the program's research was developed and will be implemented in the coming year. As a trial for this strategy, a *Research meets Policy* forum was held to review the latest research on water rights and structural adjustment.

R&D projects completed during the year included:

- analysis of the drivers of and constraints to producers adopting sustainable practices derived from research;
- a software package for integrated catchment management;
- analysis of the transferability of successful organisational and program models across natural resource jurisdictions and regions;
- evaluation of producer-initiated and managed R&D;
- an insight model for natural resource and rural adjustment policies at the catchment scale;
- oral history of the experiences and reflections of social scientists involved with the integration of social science research in several natural resource management agencies from 1980 to 2000; and
- analysis of rural adjustment via water markets.

The program is managing an additional five postgraduate awards on behalf of Land & Water Australia, bringing to 12 the completed or continuing awards within the program's portfolio. These awards are making a significant contribution to Australia's future capacity in social and institutional research and to present natural resource management.

The independent mid-term review, which involved extensive consultations with stakeholders, found that the program:

- has helped to raise the awareness of social and institutional issues among policy makers;
- is conducting R&D that is helping to address important natural resource management issues; and
- is a sound and efficiently managed program.

Future directions and opportunities

The Social and Institutional Research Program will add value to research and the communication of results through social and institutional perspectives

In the coming year, the Social and Institutional Research Program will be strengthened to ensure that potential users are involved in the selection and design of projects to ensure that they have a strong interest in project outcomes. The program will also implement its agency engagement strategy with briefings on research for senior management of Commonwealth departments and policy-specific briefings and other forums for operating staff. Similar activities will be put in place to strengthen relationships with state government agencies and catchment or regional groups.

The program will build stronger links with other LWA programs, particularly to add value to research and to the communication of results through social and institutional perspectives. The program will also continue to build collaborative partnerships with other organisations that invest in social and institutional research.

Further information: www.lwa.gov.au (then click the R&D Arenas button and, on the page that appears, click on 'cross-cutting activities' in the text).

List of projects: page 193.


www.lwa.gov.au

General Call

Objectives

The majority of Land & Water Australia's R&D investment is through commissioned research programs. Although the commissioning process provides substantial benefit in achieving desired outcomes, the Corporation accepts that it is also a process that locks longer-term investment into tightly defined priorities. To ensure that LWA can respond to emerging issues, and to provide an opportunity for researchers to propose new or untried approaches to understanding and managing land, water or vegetation resources, an annual General Call is also used.

A General Call ensures that Land & Water Australia can respond to emerging issues and that researchers can propose new or untried approaches to land, water or vegetation issues

In 2001–02, LWA called for projects to start 1 July 2003. The key research priorities for this General Call included:

- highly innovative research on new and emerging issues in natural resource management;
- research issues emanating from the National Land and Water Resources Audit;
- implications of climate change for natural resource management; and
- management of biodiversity in agricultural landscapes.

Although the General Call elicits projects that may otherwise be overlooked in a process dominated by commissioned programs, one-off focused projects resulting from the General Call are at risk of being isolated from a broader context that would help facilitate adoption of results. For this reason, LWA expects all projects, including General Call projects, to have a substantial consultation and communication component and preferably to have third-party support from agencies with interest in the project outcomes.

Partners

Most General Call projects include third-party support from a wide range of agencies and groups. Some projects, especially those testing novel concepts, are funded solely by LWA.

Achievements during the year

Projects selected from the 2001–02 General Call were as follows.

Project Title	Principal Investigator	Arena/Theme
Molecular environmental diagnostics for sustainable land management	Dr Steve Rogers, CSIRO	Sustainable industries
Innovative techniques for managing multiple threats to high-value aquatic systems	Dr Paul Boon, VUT Dr Paul Bailey, Monash University	Rivers
Using the 2001 census round to monitor structural change in agriculture	Dr Neil Barr, DNRE Victoria	Cross cutting
Creating inspiration — how visual and performing arts shape environmental behaviour	Dr Nick Reid, University of New England	Communications

This year, more time and effort was taken to ensure a high-quality process for administering the General Call process and building improved relationships with the R&D community. In addition, more attention is now being given to identifying important new issues for the R&D community to target. This is resulting in an enhanced and more valuable contribution to Land & Water Australia's R&D portfolio.

All projects selected under the General Call have a communication component to ensure the best chance of having the research results adopted.

Future directions and opportunities

The General Call will remain an important part of the Corporation's investment strategies. Preliminary assessment of past General Call projects has demonstrated particularly high performance in returns on investment. This return will be further enhanced by the continuing improvement in the Corporation's strategic analyses and environmental scanning capabilities.

Further information: www.lwa.gov.au (then click the R&D Arenas button and, on the page that appears, click on 'cross-cutting activities' in the text).

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Ian Rutherfurd photo

www.lwa.gov.au

National Land and Water Resources Audit

Objectives

The National Land and Water Resources Audit is a program of the Natural Heritage Trust. It was established in 1997 to provide Australia-wide assessments of land, water and vegetation resources to facilitate improved decision-making on land and water management by:

- providing a clear understanding of the status of, and changes in, the nation's land (including vegetation) and water resources and implications for their sustainable use;
- providing an interpretation of the costs and benefits (economic, environmental and social) of land and water resource change and any remedial actions;
- developing a national information system of compatible and readily accessible land and water data;
- producing national land and water (surface and groundwater) assessments as integrated components of the Audit;
- ensuring integration with, and collaboration between, other relevant initiatives; and
- providing a framework for monitoring Australia's land and water resources in an on-going and structured way.

The Audit is co-located within the LWA office. Co-location promotes interaction between the Audit and the programs of the Corporation. Through a business arrangement, LWA provides administrative support to the Audit Management Unit.

Partners

Working across a range of natural resources issues, the Audit developed an unprecedented number of partnerships, including the following:

Commonwealth, state and territory agencies	universities
CSIRO	landcare and catchment management committees
natural resource management CRCs: Freshwater Ecology Catchment Hydrology Coastal Zone Estuary and Waterway Management Tropical Savannas industry	

These partnerships bring a breadth of competencies and skills to the Audit's activities and ensure that Audit outcomes are practical and relevant.

Achievements during the year

In 2001–02 the Audit released most of its assessments; unveiled models for future natural resource management and data collection and collation; and instigated the adoption of key policy initiatives.

Assessments

The six assessments released during the last financial year covered native vegetation; agriculture; Australians and natural resource management; catchments, rivers and estuaries; rangelands; and data and information management.

Outputs from the National Land and Water Resources Audit are arguably the single biggest advance in the information base for natural resource management in Australia

1. *Australian Native Vegetation Assessment 2001* provides the most up to date picture of the nature and extent of native vegetation. This assessment revealed the following:

- Australia is dominated by a few plant genera across the broad range of structural vegetation types.
- Hummock grasslands cover 23% of Australia followed by the eucalypt woodlands with 17% extent; acacia forests, woodlands and shrublands with 17% extent; chenopod/samphire shrublands, other shrubs and forblands at 10%; and tussock grasslands another 7% of the continent.
- About 32% of Australia's native vegetation in the intensively used areas (primarily the agricultural and urban zones) have been cleared or substantially modified.
- Twenty-five of Australia's 245 river basins and 42 of 354 sub-regions have less than 30% remaining native vegetation.

Australian Native Vegetation Assessment 2001 also introduces a new and Australia-wide agreed method to map and monitor changes in Australia's vegetation type and extent. The National Vegetation Information System describes 20 major vegetation types based on a combination of floristic (species) and structural characteristics. These are being used to improve vegetation management across all state and Commonwealth jurisdictions.

Much remains to be done, but the framework provided by the National Vegetation Information System provides natural resource managers with the basis for investing in further data collection activities.

2. *Australian Agriculture Assessment 2001* assessed key factors related to natural resource sustainability, focusing on soil and nutrient management on and off the farm.

Among other facts, it revealed:

- a doubling in the productive capacity of agricultural landscapes;
- a 5% increase in continental net primary productivity through nutrient inputs;
- an increase of 13% in mineral nitrogen stores and 8% in mineral phosphorus stores; and
- major increases in use of nitrogenous fertiliser.

Key challenges facing Australia's land managers are defined across the landscape as follows:

- *Soil acidification*: 50 million and 23 million hectares respectively of Australia's agricultural zone are experiencing impacts from soil acidity in surface and subsoil layers.
- *Water-borne soil erosion*: in some areas erosion far exceeds (up to 50 times) rates of soil development. This includes hillslope or sheet and rill erosion, gully and riverbank erosion increasing sediment delivery to streams, rivers, estuaries and near-shore marine zones. About 90% of suspended sediment loads reaching marine and estuarine environments are derived from 20% of agricultural catchments, particularly in coastal regions of Queensland and New South Wales. This work has already been applied to set water quality targets for the Great Barrier Reef catchments.
- *Nutrient loads to Australian rivers and estuaries*: nearly 19,000 tonnes of total phosphorus and 141,000 tonnes of total nitrogen are exported to Australia's coast each year from key agricultural catchments. This nutrient load in rivers and estuaries will increase the incidence of algal blooms over the long term. It is an issue best addressed by practices to reduce soil erosion and dissolved nutrient losses off-farm.

Australian Agriculture Assessment 2001 also demonstrated how best management practice is an evolving part of agriculture. Australian industries are committed to developing and adopting innovative farming methods. A good example is the widespread adoption of minimum tillage, reduced rotations and green trash blanketing in the sugar industry.

3. *Australians and Natural Resource Management 2002* provides insight into the social and economic dimensions of natural resource management. It focuses on people — those who manage and depend on land and water resources and their capacity, motivation and opportunities to implement changes that bring about improved social, economic and environmental outcomes consistent with sustainability objectives.

The report reveals that 60% of the Australian continent is used for agriculture. This contributes 2.7% to Australia's annual gross domestic product, but the contribution is far from even:

- 80% of the profits come from less than 1% of the area used;
- 50% of the profits come from irrigated agriculture; and
- 10% of farms produce between 40% and 50% of gross agricultural income.

60% of the Australian continent is used for agriculture ...
80% of the profits come from less than 1% of the area

Australian farmers have a positive and pragmatic attitude towards environmental issues. Sustainable resource management practices are more likely to be adopted if they provide economic and other advantages, involve low risk and are simple to manage.

Australians and Natural Resource Management 2002 combines information from previous Audit assessments to provide estimates of the costs of resource use for agriculture. For example, yield gaps[2] were calculated for acidity and salinity and were compared to the inherent factor of sodicity.[3]

- *Dryland salinity*: the yield gap for all agriculture is about $200 million for 2000, increasing to $300 million by 2020, representing less than 3% of profits from agriculture.
- *Soil acidification*: for 2000, the value of yield gaps is estimated at $1.5 billion, representing 24% of profits from agriculture.
- *Sodicity*: impacts from this inherent soil attribute for 2000 are estimated at $1 billion, representing 18% of profits from agriculture.

The report also provides information on other costs associated with land degradation, such as physical damage to local infrastructure and costs of water treatment arising from dryland salinity and soil erosion. Soil erosion is costing as much as or more than dryland salinity to public assets and activities.

Australian Catchment, River and Estuary Assessment 2002 is Australia's first comprehensive assessment of catchments, rivers and estuaries. The assessment is based on an understanding of the processes that drive these systems and provides a benchmark of natural resource condition.

Key findings for rivers include:

- one-third of the assessed river length has impaired aquatic biota;
- more than 85% of the assessed river reaches are classified as significantly modified in terms of environmental features;
- more than 80% of the reaches are affected by catchment disturbance;
- more than half of the river reaches have modified habitat, mainly linked to changes in sediment loads that can also alter channel shape; and
- nutrients (mainly phosphorus) and suspended sediment loads are higher than natural loads in more than 90% of reaches, with 33% classified as substantially modified.

Of Australia's 979 estuaries and coastal waterways assessed:

- 50% are in near-pristine condition;
- 22% are in largely unmodified condition;
- 19% are in modified condition; and
- 9% are in extensively modified condition.

2 Yield gaps are the difference between profits with and without soil health problems.

3 Sodicity, which affects nearly a third of all soils in Australia, develops through a process in which sodium ions build up in preference to other soil cations (particularly calcium) on the exchange complex of the soil. Increases in soil pH and deceases in calcium and magnesium usually accompany this process.

Most importantly, this assessment provides information on which regional and local groups can target their protective management and remedial works.

This assessment provides information on which regional and local groups can target their protective management and remedial works

The Audit also released the companion report on terrestrial biodiversity: *Landscape Health in Australia*. This is a precursor to the detailed assessment being completed in the later part of 2002 on terrestrial biodiversity.

4. The *Landscape Health in Australia* report assessed the relative impacts of land use at a continental scale using Australia's 354 IBRA sub-regions. The key findings include:

- In 57 sub-regions, less than 30% of the original extent of native vegetation remains.
- In 88 sub-regions, connectivity between native vegetation remnants has broken down.
- 175 sub-regions have less than 2% of their area in conservation reserves; 33 of these have less than 30% of native vegetation remaining. 91 sub-regions have more than 10% of their area in conservation reserves.

Landscape Health in Australia also rated continental landscape stress over six stress classes using a number of attributes such as extent and connectivity of native vegetation, weeds, feral animals and dryland salinity.

Representatives of the two highest stress classes have little natural habitat remaining and that which does remain is under increasing stress from a variety of threatening processes. Landscape-scale responses are required in these sub-regions to prevent further decline and to maximise the protection of remaining sub-regional biodiversity. This is likely to be expensive.

At the other end of the scale, many sub-regions are in comparatively good condition. Highest priority should be given to protecting and managing these sub-regions as the investment is likely to be much more cost-effective that attempting to rehabilitate grossly disturbed sub-regions.

5. *Australia's rangelands — tracking changes* addressed the fact that with more than 75% of Australia broadly defined as rangelands, it is essential that the natural resource condition and opportunities for investment in Australia's rangelands are understood. This area covers a diverse group of comparatively undisturbed ecosystems — tropical savannas, woodlands, shrublands and grasslands.

The Audit was asked to define the elements of a comprehensive monitoring and reporting program to provide regular Australia-wide reports and enable people to make better land use and management decisions. The result, the Australian Collaborative Rangeland Information System, was launched during the year. The report, based on the partnerships that have been developed among Australia's rangelands managers, defines the components and methods for the monitoring system and presents examples of monitoring products at national and regional scales. Investment by the Commonwealth to further foster these partnerships and undertake assessment of Australia's rangelands has been approved as an additional element to the continuation of the Audit.

6. *Australian Natural Resources Information 2002* describes the progress made by the Audit and its state, territory, Commonwealth and industry partners in addressing the current and future scenario for natural resource information, including data collection, collation and management. It reveals the following:

- The Australian Natural Resources Atlas and Data Library Community provides community access to one of the world's most comprehensive natural resource information systems. The Atlas and Data Library present results of Audit assessments and integrated views of data and information.
- New Australia-wide data about land use, soils, salinity, estuaries, water and native vegetation resources have been developed through the Audit partnerships.
- A landmark agreement developed between the Audit and the Australian and New Zealand Land Information Council supported by the Commonwealth and all states and territories has significantly streamlined public access to data required for natural resource assessments and management.

History suggests that the systems, data and partnerships developed by the National Land and Water Resources Audit will not be maintained. A plan has been prepared so that the investment is not lost

It is expensive to collect, collate and standardise information. History suggests there is a danger that the systems, data and partnerships that have been developed over the past four years will not be maintained. *Australian Natural Resources Information 2002* provides a plan to help ensure that this investment is not lost.

The report discusses the development of Australia-wide natural resource information and demonstrates the benefits of a coordinated and integrated approach to develop information products to support natural resource managers. It also highlights areas where management of investment in information must be improved.

Recommendations in this report cover:

- building fundamental datasets;
- providing community access to natural resources information;
- ensuring maximum return on Australia's investment in data collection; and
- the role of regular assessments, providing a basis to track progress and re-align investments.

The Australian Natural Resources Atlas

Central to the National Land and Water Resources Audit's activities is the Australian Natural Resource Atlas (www.environment.gov.au/atlas). It provides access to all Audit assessments and a conduit to the Audit's partners and their data and information resources.

The Atlas is both innovative and easy to use, and:

- provides ready access to information about the status and trends in Australia's natural resources;
- links and integrates information by geography and topics — Atlas users can navigate through the Audit's information by selecting a topic (for example, surface water quantity) and geography (for example, a surface water drainage basin);
- provides a dynamic query and mapping facility, enabling users to prepare customised publication-quality reports and maps;
- links up with information services available from other sources, ensuring that users have easy access to the most up-to-date information; and
- allows users to visually compare and query environmental, social and economic map data.

Future directions

2001–02 was the final year for Audit 1. 2002–03 sees the following key activities:

- release of the Audit's final report;
- release of the Terrestrial Biodiversity Assessment;
- coordination of Australia-wide data collection and assessment activities with funds additional to Audit core funding approved so far for water, soil, rangelands, social, dryland salinity and native vegetation; and
- transition arrangements to Audit 2, including appointment of new staff, variations to governance arrangements and development of a strategic plan for Audit 2.

Further information: www.environment.gov.au/atlas

List of projects: page 196.
Publications: page 165.

www.lwa.gov.au

Corporate outputs

Portfolio management

Objectives

Portfolio management aims, through systematic inquiry, to increase the value and application of knowledge to sustainable natural resource management.

Portfolio management activities operate across LWA's entire portfolio and involve elements of organisational change and operational planning. Core activities include strategic planning, science leadership, integration and evaluation — all guided by a knowledge management perspective.

Portfolio management helps to address the challenges of dealing with multi-dimensional problems, of integrating across disciplines and issues, and delivering R&D outputs in more effective ways. Land & Water Australia has managed a 12-year investment in more than 1300 projects in a highly integrated and collaborative way, and continues to do so in conjunction with current programs. The Corporation's challenges have significant and sometimes complex ramifications.

Achievements

Land & Water Australia has greatly increased its investment in planning, integration, management, evaluation and delivery of R&D. A major step has been the building of a 'knowledge management culture' in which both explicit knowledge and tacit knowledge (that is, knowledge within people) are formally recognised. Training in knowledge management processes having been completed at all levels, LWA is now implementing knowledge management initiatives — a stimulating process that is providing a framework for other portfolio management activities.

Land & Water Australia has greatly increased its investment planning, integration, management, evaluation and delivery of R&D

The following portfolio management improvements occurred during the year:

- *Strategic planning*. An advanced investment planning framework has been approved by the Board. The framework enhances the Corporation's capacity in environmental scanning, recognition of new and emerging issues, investment decision analysis, scoping processes and program planning. The first full application of the new framework will be in 2002–03.
- *Science leadership*. Global drivers and their implications for natural resource management in Australia have been analysed and an extensive list of Australian R&D issues has been compiled to help in priority-setting. Environmental water allocation has been recognised as a high priority for Australia; the science supporting it has been comprehensively analysed at global, national and regional levels across all disciplines. A web-based Land & Water Australia Innovations Database (www.infoscan.com.au/id/web/browse.htm) has been set up to allow ready access to the Corporation's best innovations.
- *Integration*. Land & Water Australia continues to highlight processes within and across its research programs for more effective integration of the knowledge required to address complex natural resource management issues. In addition to the incorporation of key principles in its investment planning framework, and the development of a number of synthesis knowledge products, work commenced on a framework to provide the Board with a basis for investing in further knowledge integration activities.
- *Evaluation*. Land & Water Australia has developed an advanced evaluation strategy and is in the process of enhancing and applying new tools for evaluation and portfolio analysis. The first comprehensive evaluation report assesses Corporation performance against its five corporate objectives of leadership, influence, relevance, return on investment and accountability. New portfolio-level analyses of return on investment have been trialled. A study was completed of sources of natural resource management funding and the Corporation's effectiveness in leveraging its own funds.

Future directions and opportunities

Land & Water Australia will continue to build on its growing expertise in portfolio management and, increasingly, will provide leadership in natural resource management on complex topics such as integration, knowledge management and evaluation of environmental benefits. The 2002–03 year will see the first application of LWA's advanced investment planning framework, including scanning, scoring, scoping and program planning phases. Evaluation instruments will be further enhanced and a more thorough analysis of returns on investment from 1990 to 2002 will be made at portfolio level. As LWA develops its new forward-looking science policy, the way in which the Corporation gains access to and deploys science to achieve its goals will be re-assessed. An important analysis of national science capacity across all disciplines relevant to natural resource management will also be conducted in the coming year.

List of projects: page 199.

Land & Water Australia will continue to build on its growing expertise in portfolio management, providing leadership in natural resource management on complex topics such as integration, knowledge management and evaluation of environmental benefits

Communication

Objectives

Land & Water Australia aims to set a new benchmark in Australian science communication by translating its R&D into integrated services and products that promote, inform and encourage the implementation of sustainable natural resource management practices.

During 2001–02, LWA completely overhauled its communication effort, starting with a fundamental redevelopment of communication systems and processes at the corporate level. This work is like the re-stumping, re-wiring and re-plumbing associated with renovating a house — invisible to the casual observer but fundamental for a good long-term result. The Corporation had to 'get back to basics' to understand its audiences better and to build databases, processes and tracking systems for improved communication products and activities. A new outsourced distribution and tracking facility was developed. The corporate communication team also took a stronger role in providing advice and support for communication activity at a program level.

Strategies

As the new communication systems emerged, the Board issued a new communication strategy for 2002–2006 that focuses on strategic relationships, broader delivery, branding and awareness-raising, education, and monitoring and evaluation. The strategy also sets out the resources and systems support required to underpin this effort to enhance adoption. In particular, over the last year Land & Water Australia has integrated a communication dimension into the Corporation's new knowledge management system.

Achievements

This year's overhaul of communication systems has laid the foundation for sustained improvement in communication effort.

During the year Land & Water Australia built a completely new interactive website (www.lwa.gov.au), described further overleaf. Further improvements are in train. The project listing will have a powerful search engine and links from each project to either a final report held on *Streamline*, LWA's established database, or a summary on ARRIP, the innovations database and research portfolio.

A list of Land & Water Australia communication products is in appendix 3 (page 166).

Product distribution, via CanPrint, is tracked via monthly reporting to LWA, from which a profile of target audiences and their needs is being built. A recent mail-out hugely increased demand for Land & Water Australia titles across the board.

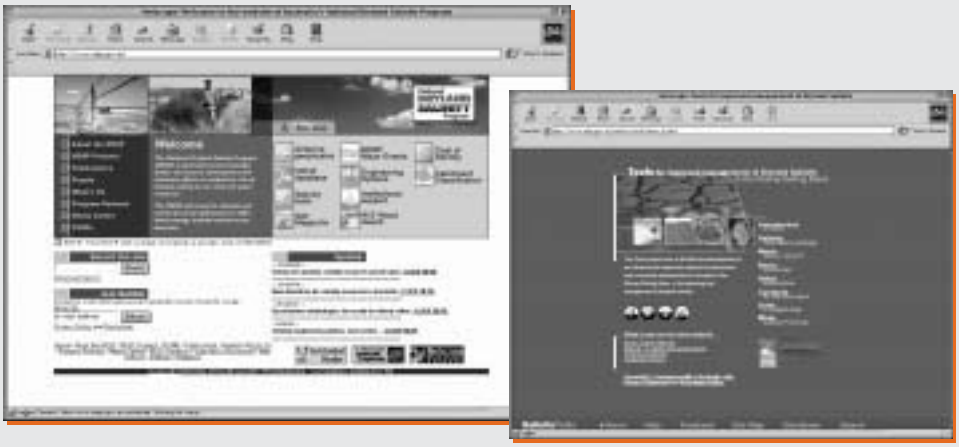
Science for Managing Australian Landscapes — tapping in to our portfolio

In 2001–02, Land & Water Australia completely overhauled its website and significantly revised the sites of several R&D programs. Work is continuing to make the sites as accessible, integrated and interactive as possible, so that people can find the type of information they want — in the form they want, quickly, easily and mostly free. We want to make it easy for anyone interested to gain access to the Land & Water Australia portfolio of about 1500 research projects — from a decade ago to the present day and into the future. We have two main tools. First, our website (**www.lwa.gov.au**) provides a comprehensive electronic shopfront for everything we do and everything we have produced.

Second, people who either cannot (or do not like to) look for information electronically can now order and receive hard copies (paper and/or CD-ROM) of Land & Water Australia products through our freecall telephone number — 1800 776 616. In addition, they can obtain a free photocopy of research project final reports by telephoning the Agriculture, Fisheries and Forestry – Australia library on 02 6272 4848 and quoting the project's reference number, such as AND1 (see page 176 for lists of R&D projects).

Here are just a few of many possible examples of how different people can use the Land & Water Australia website for different purposes:

- A farmer in a catchment affected by salinity who wants to know what he can do to manage his property can first go to the National Dryland Salinity program site.



→ **www.ndsp.gov.au/** then select Salinity Tools

→ **www.ndsp.gov.au/salinity/tools/home_fs.html** to go to a network of professional and community representatives to find out about local dryland salinity.

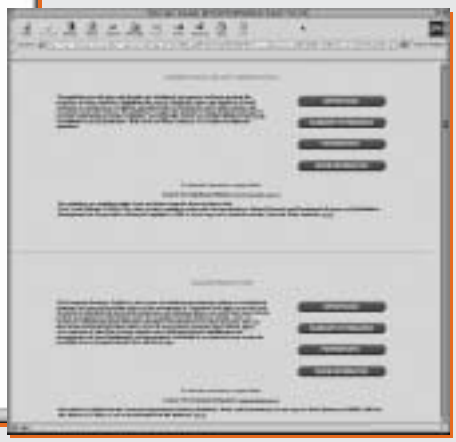
- The National Land and Water Resources Audit is arguably the single biggest advance in the information base for natural resource management in Australia. The Audit's interactive website, **www.environment.gov.au/atlas**, provides Australia-wide assessments of land, water and vegetation resources to improve decision-making on land and water management.

→ **www.nlwra.gov.au/atlas/**

Someone in the Armidale district of NSW, for example, can type 'Armidale' in the Place Name box and find all the Audit information on that district.

→ **www.audit.ea.gov.au/ANRA/navigator/search_result.cfm**

- And from the great many R&D innovations produced by Land & Water Australia over the past decade, www users can search the Innovations Database.



→ **www.infoscan.com.au/id/web/browse.htm** for technology discoveries in their area of interest; for instance, guidelines for promoting native vegetation protection

→ **www.infoscan.com.au/dbtw-wpd/exec/ …**

2001 was the inaugural year for LWA's Community Fellowships, which give non-scientists the opportunity to share their insights and experiences in natural resource management with a wider audience. The fellowships, funded by a philanthropic trust, have attracted great interest from the media and community groups.

Land & Water Australia is also investing in young students through an ongoing relationship with the National Youth Science Festival, run in conjunction with Rotary Australia. The festival enables more than 200 students in Year 11 to interact with leading science thinkers.

The Corporation is also a major sponsor of the AFFA Science and Innovation Awards for Young People.

Future directions and opportunities

The test for Land & Water Australia is to translate an improved communication infrastructure into enhanced adoption on-ground and at policy levels. This will depend on being close enough to key audiences to understand their needs and to deliver high-quality products and services developed from across LWA's R&D portfolio —not just at the project level — in ways that meet real needs in a useful timeframe. The balance of communication efforts is shifting from 'supply push' towards 'demand pull'. From the development work of the last two years will flow the capacity to identify the need for, then to deliver on, synthesis products and services drawn from a range of current and former projects across the portfolio.

... Our communication effort is shifting from 'supply push' towards 'demand pull'

A related challenge is to minimise the perennial difficulty of measuring and evaluating the adoption and impacts of research outputs. Tracking adoption, adaptation and dis-adoption[4] of an R&D output can be at least as expensive as generating the research output, so it is not possible to measure adoption routinely across the portfolio. LWA's next step is to select some strategic projects and follow them through over time.

The new website, and rapid developments in communication technologies more broadly, offer significant opportunities to disseminate information more efficiently than ever before. LWA is also thinking ahead to when ubiquitous high-speed broadband Internet services will provide widespread access and will give clients more choice and control over their communication with the Corporation. LWA is ready to play its part in the broader challenge to reinvent an extension system for sustainable resource management in the 21st century.

List of projects: page 199.
Publications: page 166.

4 Abandonment of a previously adopted R&D output after it has been found unsuitable for the adopter's purposes.

Business management

Objective

To run the business operations of the Corporation in an efficient and effective manner so that R&D funds are invested well, and to meet all statutory obligations and accountability requirements in a comprehensive, timely and transparent manner.

Strategies and achievements

Land & Water Australia further enhanced its systems approach to R&D investment and contract management during 2001–02.

The Corporation achieved certification to standard AS/NZS ISO 9001:2000 in July 2001 and maintained its commitment to continual improvement and the highest level of client service and accountability. (More information on quality management is at page 114.)

In line with the knowledge management strategy, the Corporation has established a mechanism to review the efficacy and effectiveness of current management systems, both in meeting user requirements and capitalising on changes in technology.

The Corporation maintained its commitment to continual improvement through certification to upgraded quality management standard AS/NZS ISO 9001:2000

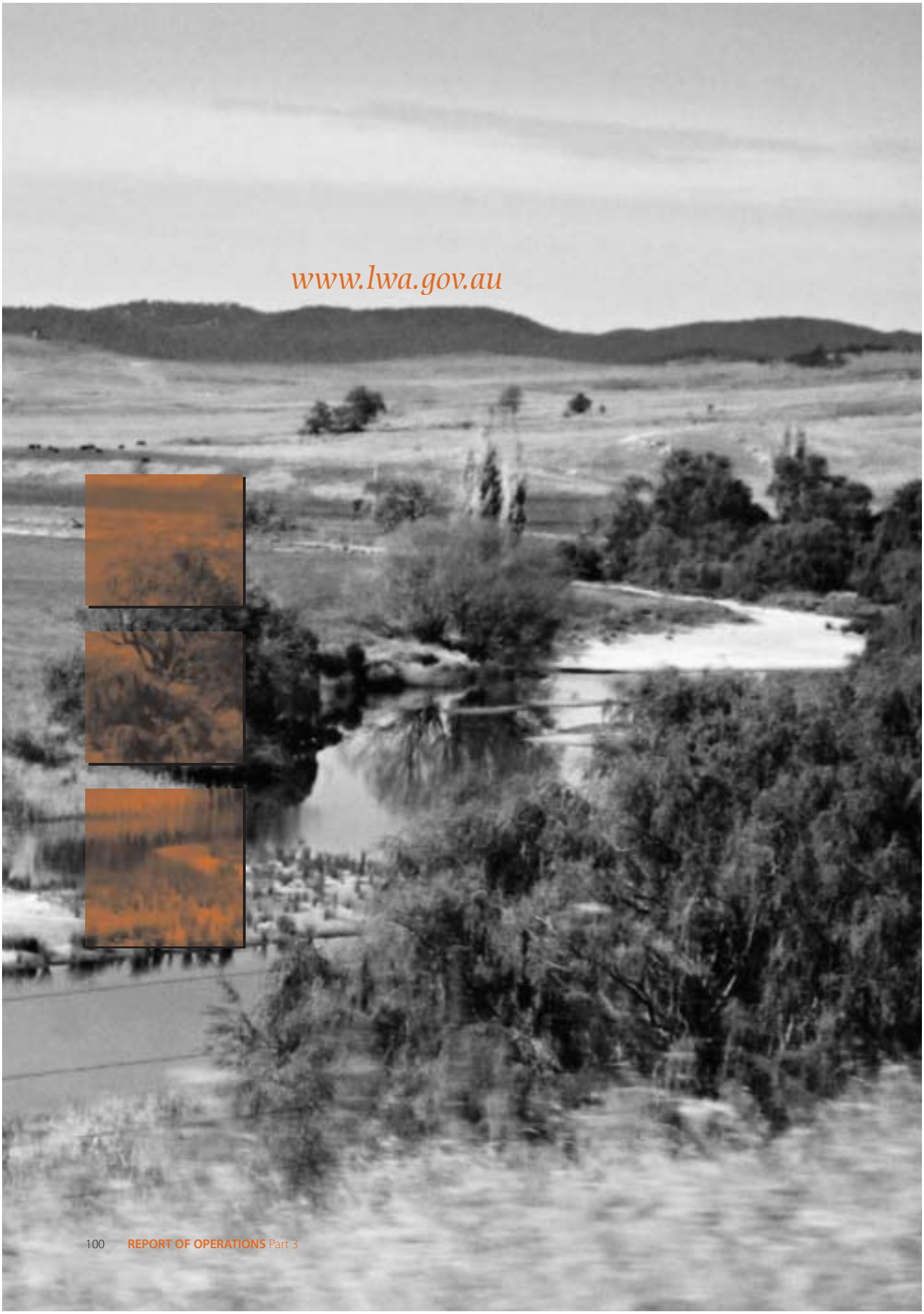
As detailed in appendix 4 on page 171, Land & Water Australia demonstrated high standards of accountability and corporate governance, to which a training program for directors and managers contributed. The external review of the Board, followed by a corporate governance review instigated by AFFA, concluded that LWA has an effective framework for continual improvement that meets the elements for better practice.

Administration expenditure for 2001–02 exceeded the budget target at year-end, mainly due to the higher level of funds under management. The Corporation's revenue exceeded budget by about $3 million, reflecting the increase in Land & Water Australia business and the need to support this increased activity by an increase in the administration budget.

Future directions and opportunities

Business management within Land & Water Australia will continue to maintain the highest standards of accountability and corporate governance as a high priority. Other key priorities for 2002–03 are to significantly improve financial forecasting and reporting systems; to enhance a number of the Corporation's information systems, including implementation of electronic contract management and enhanced portfolio analysis and reporting; and to establish commercialisation strategies for appropriate projects to enhance adoption.

List of projects: page 199.



www.lwa.gov.au

Report of operations

Part 3: Corporate governance

Part 4, describing other corporate management matters, starts on page 117.

This section describes the processes by which Land & Water Australia is directed and controlled in support of effective accountability for good performance outcomes.

Corporate status

Land & Water Australia is a rural research and development corporation within the Commonwealth Government's Agriculture, Fisheries and Forestry portfolio. It was established as the Land and Water Resources Research and Development Corporation on 3 July 1990 under the PIERD Act, which provides a foundation for its accountability to Parliament and to natural resource users and managers across Australia.

LWA also operates under the provisions of the CAC Act, which applies high standards of accountability while providing for the independence required by the Corporation's focus on national R&D programs.

The rural R&D corporations model on which Land & Water Australia is based

- The rural R&D Corporations (RDCs) are not research grant agencies; the PIERD Act requires them to treat R&D as an investment in economic, environmental and social benefits to their respective industries and to the people of Australia.
- The RDCs are empowered to intervene anywhere in the innovation process — not just in traditional research.
- RDCs are required to focus their activities around strategic R&D plans and annual operational plans that must be approved at ministerial level.
- RDCs are fully accountable to their major stakeholders and to the wider community.
- A tight focus on achieving outcomes leads RDCs to place emphasis on brokering active collaboration between researchers, and between researchers, resource managers and primary industry interests.
- RDCs apply significant resources to the challenging task of translating research outputs into practical outcomes.

Corporate governance principles

The Board is committed to the highest standards of corporate governance, in accordance with required statutes and principles. The Board provides strategic direction to the Corporation and oversees the implementation of Board decisions and directions by the Corporation's managers.

The Board relies on a range of measures to ensure that the Corporation is operating according to the accountability provisions of the CAC Act, including induction training and continuing training for directors; compliance checks and internal and external audits; a due-diligence check and code of conduct for directors; effective processes for disclosure and management of (or perceptions of) conflicts of interest; a risk identification and management framework; and effective systems for monitoring performance and ensuring that the Corporation can meet its debts and other obligations as they fall due. The Corporation has in place a framework for evaluating Board performance in accordance with corporate governance principles and the Board's charter.

The annual report includes a comprehensive summary of corporate governance matters, including a description of how strategic directions, policies and processes have been applied during the year. The Board continually reviews policies and processes concerning all major areas of Board operations. A number of Board committees (including Communication, Finance and Audit) and other committees of the Board, as deemed necessary from time to time, act on the Board's behalf.

Appropriate R&D program management committees are also established to oversee program design and management, ensuring that desired program outputs are being met and that partnership and Government funds are wisely spent.

Implementation of PIERD Act objects

The paramount authority for Land & Water Australia's activities is the legislative objects specified in section 3 of LWA's enabling legislation, the PIERD Act, which are essentially to fund and administer R&D with a view to carrying out:

- development of primary industries,
- sustainable use and sustainable management of natural resources,
- more effective use of the resources and skills of the community, and
- improved accountability for expenditure.

A tabular presentation in appendix 5 (page 174) lists the four objects and outlines the way in which the strategies described in the R&D plan address them.

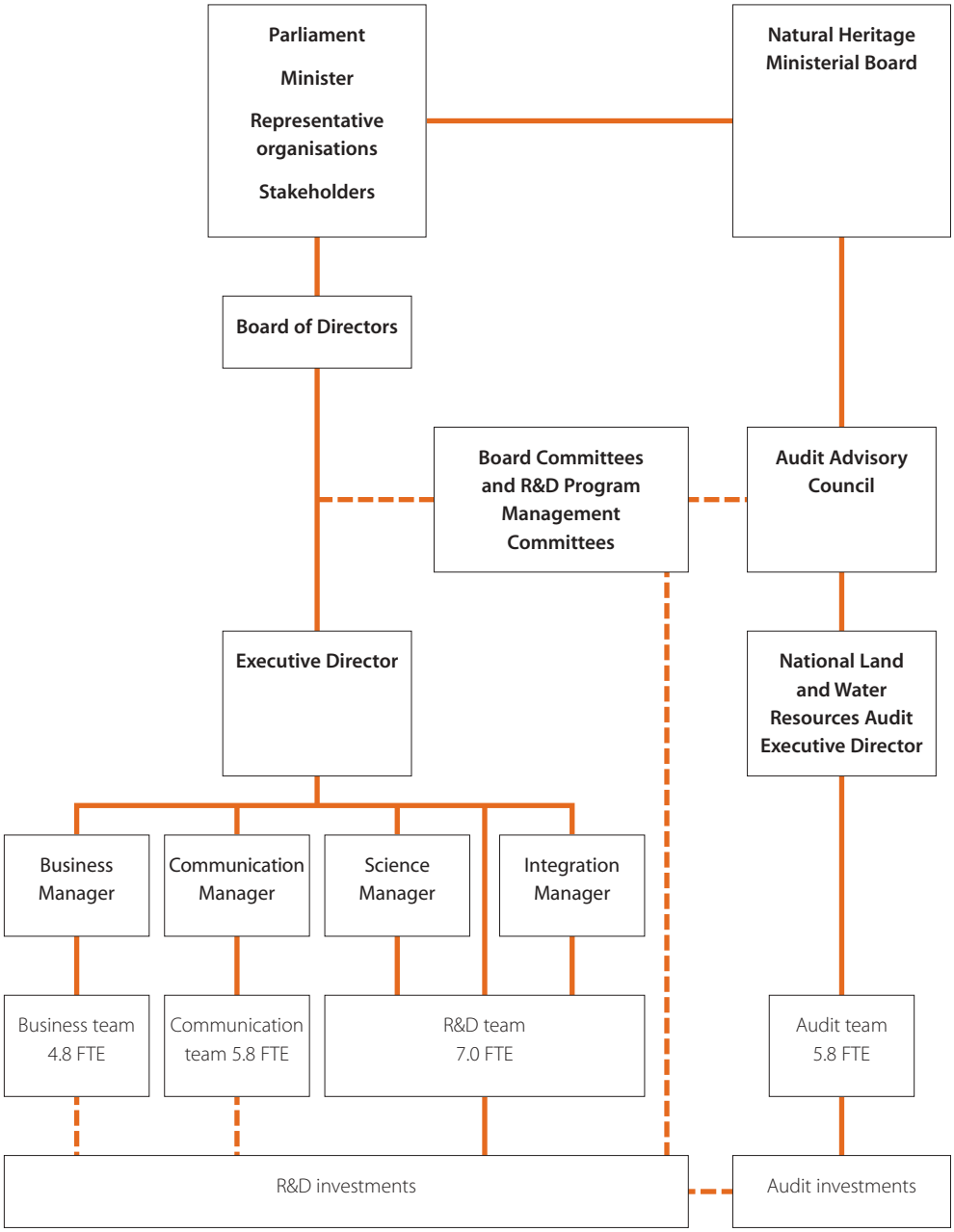
[The URL for the PIERD Act is: www.austlii.edu.au/au/legis/cth/consol_act/piaerada1989531/]

Functions and powers

The functions and powers of LWA are listed in appendix 5 (page 175).

Organisation

Land & Water Australia's organisation is as follows.



Notes:

FTE: Full-time equivalent staff

The R&D team also utilises 14 part-time coordinators.

Publicist (Audit team) works one day per week for Land & Water Australia.

Accountability to Parliament

The Corporation is accountable to the Minister for Agriculture, Fisheries and Forestry; to the Parliamentary Secretary to the Minister; and to the Minister for Forestry and Conservation — and, through them, to Parliament.

The Minister is empowered by the PIERD Act to:

- approve the Corporation's R&D plans, annual operational plans and variations to both of these plans, assessed against the objects set out in the Act;
- select and appoint the Chairperson and Government Director to the Board, and appoint the Presiding Member and other members to the Land and Water Resources R&D Corporation Selection Committee for Board positions;
- approve the nominees for membership on the Board; and
- transfer contracts, agreements and assets held in the name of the Commonwealth to the Corporation.

Under the CAC Act, the Minister must table the Corporation's annual report in Parliament.

The Minister is responsible for the Corporation's enabling legislation and in turn is answerable to Parliament. The Minister also has other discretionary powers (provided through section 143 of the CAC Act) to give written directions to the Corporation as to the performance of its functions and the exercise of its powers. The Corporation is also obliged to ensure compliance with any policies of the Commonwealth Government of which it is notified by the Minister under section 28 of the CAC Act.

Responsible Ministers

The Ministers responsible for Land & Water Australia are the Minister for Agriculture, Fisheries and Forestry; the Parliamentary Secretary to the Minister; and the Minister for Forestry and Conservation.

Throughout the year the Minister for Agriculture, Fisheries and Forestry was the Hon. Warren Truss, MP and the Parliamentary Secretary to the Minister was Senator the Hon. Judith Troeth. The Minister for Forestry and Conservation until November was the Hon. Wilson Tuckey, MP and from December was Senator the Hon. Ian Macdonald. All three Ministers exercise ministerial powers in their own right.

Compliance with Commonwealth Government statutes and policies

The Corporation's compliance with statutes and policies of the Commonwealth Government is detailed in appendix 4 (page 171).

Notifications of Government general policies and administrative matters by the Minister for Agriculture, Fisheries and Forestry, the Parliamentary Secretary or the Minster for Forestry and Conservation in previous years had continuing effect. No new notifications were issued by the Ministers during the financial year. Since the end of the financial year (on 21 August 2002), the Minister for Agriculture, Fisheries and Forestry issued a notification of the requirement that portfolio agencies adopt the Commonwealth Fraud Control Guidelines.

Important Commonwealth Government rural policy frameworks

Three policy frameworks are particularly significant to Land & Water Australia:

- Commonwealth Government priorities for rural research,
- the Commonwealth Government's Natural Heritage Trust, and
- the Prime Minister's National Action Plan for Salinity and Water Quality.

Although activities in relation to the frameworks are mentioned throughout this annual report, they are also addressed explicitly in appendix 1 (page 162).

Accountability to representative organisations

Land & Water Australia is accountable to two representative organisations, which represent the interests of key natural resource users and managers. The representative organisations are:

- the Australian Conservation Foundation, 340 Gore Street, Fitzroy VIC 3065, and
- the National Farmers' Federation, PO Box E10, Kingston ACT 2604.

Transparency of research project information

Details of all present LWA-funded projects are entered onto the publicly available online database, Australian Rural Research in Progress (ARRIP). Details such as project title, principal investigator, objectives, contact numbers and amounts of funding provided are provided in this database. Except for project objectives and funding, the details are presented in appendix 6 (page 176).

In addition, the publication is available as a searchable database at www.infoscan.com.au, which also hosts the Streamline, ARRIP and Australian Bibliography of Agriculture databases.

Abstracts of all final reports received by LWA are entered on to *Streamline*. *Streamline* can also be provided on CD-ROM. Further information on Streamline is available from Infoscan Pty Ltd, (tel: 02 6236 6267; fax: 02 6236 6440, e-mail: pamela@infoscan.com.au).

Stakeholders

Land & Water Australia sees its stakeholders as:

- the Commonwealth Government and other governments and their agencies that provide collaborative support within commissioned R&D programs;
- the two representative organisations;
- landholders, community groups and state and local government organisations involved in conservation and management of Australia's land, water and vegetation resources;
- consultants, advisers, research organisations and researchers who provide advice and direction and new knowledge on improved management of Australia's land, water and vegetation resources; and
- the general community, as owners and beneficiaries of natural resources and as taxpayers who fund the Corporation.

Further details on collaborating organisations within commissioned R&D programs are discussed in the summaries of the individual R&D programs (see page 28).

The Board

In accordance with section 16 of the PIERD Act, the Board comprises a Chairperson and a Government Director selected and appointed by the Minister, six non-executive directors nominated by an independent selection committee and appointed by the Minister, and an Executive Director appointed by the LWA Board. The most recent report of the selection committee is at appendix 7 (page 200).

The Chairperson and other directors (except for the Government Director and Executive Director) are appointed for a term not exceeding three years and are eligible for re-appointment. The Government Director holds office at the Minister's pleasure and the Executive Director holds office at the Board's pleasure.

Directors are selected to reflect a balance of expertise in appropriate areas specified in section 131 of the PIERD Act. They are not appointed as representatives of the organisations or sectors with which they are associated.

Directors can be contacted through the office of Land & Water Australia, GPO Box 2182, Canberra ACT 2601 or by e-mail (public@lwa.gov.au).

Directors' biographies

Note: Directors' memberships of Board committees are shown on page 114.

Continuing directors

David Coward photo

Ms Roberta Brazil

Chair (non-executive), 1 July 2001 to 30 June 2004

BA, LLB., LLM. (UQ), Grad. Dip. L.P. (QUT)

Roberta (Bobbie) Brazil is a former lawyer and a partner with her husband in large-scale mixed farming and pastoral businesses on Queensland's Darling Downs and in the Northern Territory. Bobbie brings to the Board an excellent understanding of catchment management and extensive experience on a range of natural resource management and other bodies. She currently chairs the Condamine Catchment Management Association and is a member of Queensland Great Artesian Ministerial Council.

Bobbie is the Queensland community representative on the Australian Landcare Council and a director of the Cotton Research and Development Corporation.

David Coward photo

Andrew Campbell

Executive Director, 1 July 2002 to 30 June 2005

MSc (Wageningen), B. ForSc (Hons) (Melb), Dip.For (Creswick)

Andrew Campbell has been Executive Director of the Corporation since March 2000. He has been involved at the cutting edge of natural resource management in Australia for 20 years. Previously a senior executive of Environment Australia from 1996, he was responsible for the Bushcare program funded through the Natural Heritage Trust. He was instrumental in the development of Landcare as Australia's first National Landcare Facilitator from 1989–92. He is a member of the European Society for Rural Sociology and the International Society for Ecological Economics.

In the mid-1980s Andrew managed the Potter Farmland Plan, a philanthropic initiative that sought to demonstrate, using real farms, how conservation and production can be complementary activities through a whole farm planning approach. Andrew's family has been farming in Western Victoria since the 1860s and he has been managing the family farm with the help of a neighbour since 1987.

David Coward photo

Mike Logan
Director (non-executive), re-appointed 1 July 2002 to 30 June 2005

B. Bus (Kuring-gai CAE)

Mike Logan is a cotton, cereal and beef producer from Narrabri, NSW. He is a Fellow of the Australian Institute of Company Directors and is an accredited ISO 14000 auditor.

He has been instrumental in introducing an Environmental Best Management Practice program into the cotton industry and is probably the first commercial farmer in Australia to achieve ISO 14001 certification of the environmental management system for his farm.

David Coward photo

Warwick Watkins
Deputy Chair (non-executive), re-appointed 1 July 2002 to 30 June 2005

AMP:ISMP (Harv.); B. Nat.Res. (UNE); Dip.Sci.Agr. (UNE); HDA (Hons)

Warwick Watkins is Director-General of the NSW Department of Information Technology and Management and is Surveyor General of New South Wales. He is also Chair of the Australian and New Zealand Land Information Council, Director of the Cooperative Research Centre for Smart Internet Technology, and a member of the Land and Water Resources Audit Advisory Council. Formerly Commissioner of Soil Conservation for NSW, he has particular skills and experience in natural resource management, land and spatial information and organisational management.

David Coward photo

Charles Willcocks: Government Director (non-executive)

B. Rural Science (Hons) (UNE), Diploma of Economic Development (University of Glasgow)

Charles Willcocks is the General Manager, Landcare and Regional Capacity Branch, Natural Resource Management Division, Department of Agriculture, Fisheries and Forestry – Australia.

Directors appointed from 1 July 2002

David Coward photo

John Childs:
Director (non-executive), appointed 1 July 2002 to 30 June 2005

B. Rural Science (UNE), Dip Ag Econ (UNE), M. Agric Sc (Melb)

John is a director of Queensland-based Bush Business Consulting Pty Ltd and a member of the Northern Territory Pastoral Land Board and the Australian Rangelands Society. He has a broad range of skills and experience in natural resource management, adult education and communications, with a special understanding of the situation in northern Australia through his role as Director of the Tropical Savannas Cooperative Research Centre. John also has significant experience working with Aboriginal communities and the sheep and cattle grazing industries.

David Coward photo

Peter Cullen:
Director (non-executive), appointed 1 July 2002 to 30 June 2005

B.Agr.Sc. (Melb), M.Agr.Sc. (Melb), Dip. Ed. (Melb)

Professor Peter Cullen recently retired as Chief Executive of the CRC for Freshwater Ecology and Professor of Resource and Environmental Science at the University of Canberra. He has worked for more than 30 years in the water quality and catchment management fields.

Peter is a director of Landcare Australia Limited and the Gungahlin Development Authority. He has served on many committees and boards, and has been an adviser to state and federal governments, including: Chair, ACT Natural Resources Management Committee; member, Natural Heritage Trust Advisory Committee; Chair, ACT State Assessment Panel, National Heritage Trust; member, Community Advisory Committee, Murray-Darling Ministerial Council; Scientific Adviser, Lake Eyre Catchment Management Coordinating Group; and Chair, Scientific Advisory Panel to the Lake Eyre Basin Ministerial Forum. He is a fellow of the Australian Academy of Technological Sciences and Engineering; a life member of the Australian Society of Limnology; and a member of the Ecology Institute, the American Water Resource Association, the Ecological Society of America, the Environmental Institute of Australia and the International Water Academy.

Peter was awarded the Prime Minister's Prize for Environmentalist of the Year in 2001 for his work on the National Action Plan for Salinity and Water Quality.

David Coward photo

David Pannell:
Director (non-executive),
appointed 1 July 2002 to 30 June 2005

B.Sc.Agric. (Hons) (UWA), B.Ec. (UWA), PhD (UWA)

David is Associate Professor in Agricultural and Resource Economics at the University of WA and leader of the Economic and Social Assessment Program of the CRC for Plant-Based Management of Dryland Salinity. He has expertise in resource economics, farmer adoption of land conservation practices, technology transfer, communication, policy evaluation, risk management and the economics of science. David has a broad understanding of Australia's rural industries and brings a multi-disciplinary approach to sustainability issues. He was a member of the WA Government's Salinity Taskforce in 2001, and is a past President of the Australian Agricultural and Resource Economics Society.

David Coward photo

Tim Fisher:
Director (non-executive),
appointed 1 July 2002 to 30 June 2005

BA (Monash)

Tim has spent the past 11 years with the Australian Conservation Foundation (ACF), most recently as coordinator of its Land and Water Ecosystems Program. He has a strong background in communications. Mr Fisher also has considerable experience working with farmers and farmer organisations at the local and national level on issues as diverse as catchment management, water resource planning and socio-economic assessments.

Directors whose appointments ended on 30 June 2002

David Coward photo

Jason Alexandra:
Director (non-executive), 1 July 1996 to 30 June 2002

Jason Alexandra has more than 20 years experience in natural resource management. He has commercial experience in agriculture, horticulture, forestry and consulting. As a policy analyst and researcher he has authored numerous publications on natural resource management, environmental management, agroforestry and water. He has been a member of both the Murray-Darling Basin Ministerial Council's Advisory Committee and the National Board of Greening Australia.

David Coward photo

Leith Boully:
Director (non-executive), 1 July 1996 to 30 June 2002

B. Rural Science (UNE); Postgraduate Diploma of Business Studies (UNE); CPAg; FAICD

Leith Boully has been a wool, beef cattle and cotton producer on the Lower Balonne floodplain near Dirranbandi in Queensland for 15 years. She has worked with community organisations on natural resource management issues since 1988.

Since 1999, as Chairman of the Murray-Darling Basin Ministerial Council's Advisory Committee (CAC), Leith has fostered the building of strong relationships between the CAC, agencies and governments. Leith Boully is also a Board member of the Australian Broadcasting Corporation and member of the Australian Landcare Council.

David Coward photo

Stuart Bunn:
Director (non-executive), 1 July 1999 to 30 June 2002

BSc Hons and PhD, both in Zoology at the University of Western Australia

Professor Stuart Bunn is Director of the Centre for Catchment and In-Stream Research in the Faculty of Environmental Sciences at Griffith University in Brisbane. His major research interests are in the ecology of river and wetland systems with a particular focus on aspects of ecosystem function. He now leads the Restoration Ecology Program within the Cooperative Research Centre for Freshwater Ecology and is a project leader within the Restoration Program of the CRC for Catchment Hydrology.

Stuart is currently Deputy Chair of the Scientific Expert Panel for the South-East Queensland Regional Water Quality Strategy and has previously served on several other state government advisory committees on water-related issues. He is also a member of the Scientific Committee for Water Research for the International Council of Science; member, Lake Eyre Basin Scientific Advisory Panel; and Deputy Chair, Scientific Advisory Group, Moreton Bay and Catchments Healthy Waterways Partnership.

Stuart is a member of the Australian Society for Limnology; Societas Internationalis Limnologiae; Ecological Society of Australia; North American Benthological Society; Royal Society of Queensland; and the American Society for Limnology and Oceanography.

David Coward photo

Sheila Donaldson:
Director (non-executive), 1 July 1999 to 30 June 2002

B. Rural Science (Hons) (UNE); CPAg

Since 1993, Sheila Donaldson has been consulting in natural resource management, especially in catchment planning for salinity management. She has developed integrated catchment proposals for whole valleys and catchment groups in the Namoi, Gwydir and Macquarie valleys in NSW, developed through community participation and ownership. She also has skills and experience in group facilitation and strategic planning.

Sheila has a background in mixed farming in Northern NSW. She has represented the rural community on natural resource management issues including the North West Catchment Management Committee (NSW), the Murray-Darling Basin Ministerial Council's Advisory Council and Australian Landcare Council. She is currently a director of the Tamworth Development Corporation; a director of Donaldson Planning & Management Services; and a member of the Advisory Committee for the CRC for Sustainable Cotton.

Committees of the Board

In 2001–02, committees to deal with the matters affecting the Board were:

- the Audit Committee, comprising three directors and the Business Manager, which monitors the financial systems, operations and accounts of the Corporation;
- the Finance Committee, comprising two directors, the Business Manager and the Executive Director, which considers financial matters affecting the Corporation; and
- the Communication Committee, comprising three directors, the Executive Director and the Communication Manager, which develops a communication strategy and oversees its longer-term implementation.

The Board has also set up other committees to assist in the management of specific R&D programs.

Board and committee membership and attendance

The numbers of Board meetings and Board committee meetings attended by directors during 2001–02 were as follows:

	Board meetings	Audit Committee meetings	Finance Committee meetings	Communication Committee meetings
No. of meetings held →	4	3	4	3
Roberta Brazil	4	3	n/a	2
Charles Willcocks	4	3	n/a	n/a
Jason Alexandra *	4	3	n/a	n/a
Leith Boully **	4	n/a	n/a	3
Warwick Watkins ***	4	n/a	3	n/a
Andrew Campbell	4	n/a	4	3
Sheila Donaldson	4	2	n/a	2
Mike Logan	3	n/a	3	n/a
Stuart Bunn	3	n/a	n/a	2

* Chair of Audit Committee.

** Chair of Communication Committee.

*** Chair of Finance Committee.

n/a not applicable

Directors' interests policy

In accordance with the CAC Act, the Board has in place a process to manage all direct and indirect conflicts of interest, including directors' formal declarations of their interests at each Board meeting which is documented in the minutes of the meeting. This policy extends to all committees of Land & Water Australia.

Quality management system

Land & Water Australia has built on its ISO 9000 quality management certification, achieved in 1996, through to AS/NZS ISO 9001:2000 achieved in July 2001. These achievements indicate the Corporation's commitment to continual improvement and the highest level of client service and accountability. The Corporation's total quality management commitment, therefore, underpins many factors that are critical to the highest standards of corporate governance.

The Corporation's quality management systems were last audited in August 2001 by SGS International Certification Services Pty Ltd.

Service charter

To promote a greater focus on its stakeholders, LWA has developed a service charter as part of its quality management system, certified to ISO 9001:2000 in July 2001. The principles of the service charter are that:

- the Corporation shall verify that the requirements of stakeholders are identified and satisfied in a competent and professional manner;
- Land & Water Australia products and processes shall be reviewed and aligned to reflect the needs of its stakeholders — this is achieved through close consultation and feedback with our key stakeholders; and
- any variances to stakeholder requirements shall be dealt with in a timely manner, in accordance with the quality system.

During the year, the Corporation demonstrated effective conformance to these principles through ongoing ISO certification and positive feedback from a stakeholder survey.

Risk management

Land & Water Australia's risk management policy is integrated into its quality management system and internal audit program. The policy seeks to protect the Corporation's public and commercial position and its employees, information and property. A risk register identifies each risk, describes its probability, likely severity and mitigation strategy, and records the status of the mitigation strategy.

The risk management policy also incorporates a fraud control framework in accordance with the Fraud Control Policy of the Commonwealth — Best Practice Guide for Fraud Control, which seeks to minimise the likelihood and impact of fraud. The policy is a standing item at each Board meeting and is reviewed regularly by the Board's Audit Committee to ensure that it remains relevant to the Corporation's business. Internal audits, an important component of the risk management framework, are managed by the Audit Committee

No incidence of fraud was detected during 2001–02.

Indemnities and insurance premiums for officers

The Corporation has comprehensive insurance cover with the Commonwealth insurer, Comcover, for its directors and officers. In accordance with the contract of insurance with Comcover, the Corporation is prohibited from disclosing details of insurance.

CSIRO Ecosystem Services photo

www.lwa.gov.au

Report of operations

Part 4: Other corporate management information

Location of the Corporation's major activities and facilities

Land & Water Australia's office is in Canberra. Location and contact details are on the reverse of the first page of this report.

David Coward photo

Land & Water Australia staff: Back row from left — Gill Whiting, Dianne Flett, Jenny Nitschke, Felicity Madin, Melanie King, Penny Cook, Christine Ellis, Warren Mortlock, Jennifer Bruce, Alana Burt, Glenn Conroy, Catherine Viljoen, Anwen Lovett. Front row from left — Sandy Lolicato, Nick Schofield, Andrew Campbell, Catherine Mobbs, Richard Price. Absent — Brian Prince, Paula Cooney, Fleur Flanery, Drusilla Patkin, Chris Louis, Kerri Price, Rebecca Barnes, Betsy Vucetic, Elizabeth Ann, Joanne Barbaro.

Staffing

LWA staff set up R&D programs and call for, assess, develop, implement, support and review R&D funding applications. Staff are employed on terms and conditions determined by the Corporation. During 2001–02, 23 full-time and five part-time staff were employed:

Executive Director	Andrew Campbell
Communication Manager	Christine Ellis
Business Manager	Sandy Lolicato
Manager, Land, Water & Wool	Anwen Lovett
Integration Manager	Catherine Mobbs
Manager, National Dryland Salinity Program	Richard Price
Science Manager	Nick Schofield
CEO, Ord-Bonaparte Program	Brian Prince
Executive Officer — R&D	Melanie King
Program Support Officer (OBP)	Paula Cooney
Communication Officer	Glenn Conroy
Communication Officer	Warren Mortlock
Knowledge Broker (part-time)	Dianne Flett
Communication Coordinator, Land, Water & Wool (part-time)	Fleur Flanery
Publicist (part-time)	Drusilla Patkin
Publication Officer, Communication Team	Jennifer Bruce
Program Officer, Communication Team	Chris Louis
Systems Controller	Kerri Price
Business Services Officer	Jenny Nitschke
Financial Controller (part-time)	Rebecca Barnes
Finance Officer	Betsy Vucetic
Business Support Officer	Alana Burt
Business Support Officer (Acting)	Elizabeth Ann
Finance Assistant (part-time)	Felicity Madin
Program Officer, Research and Development Team	Penny Cook
Program Officer, Research and Development Team	Gill Whiting
Program Officer, Research and Development Team	Catherine Viljoen
Program Officer, Research and Development Team	Joanne Barbaro

External, part-time consultant Program Coordinators were also contracted:

Climate Variability in Agriculture R&D Program	Barry White
National Groundwater R&D Program	Graham Allison
National Program for Sustainable Irrigation	Murray and Liz Chapman
Riparian Lands Program	Siwan Lovett
National Rivers Consortium	Phil Price, Brendan Edgar
National River Contaminants Program	Brendan Edgar
Native Vegetation R&D Program	Jann Williams
Primary Industries Arena	Peter Day
Redesigning Agriculture for Australian Landscapes	David Clarke
Social and Institutional Research Program	Ken Moore

Six full-time persons and one part-time person were employed as part of the National Land and Water Resources Audit Management Unit:

Executive Director	Colin Creighton
Technical Director	Warwick McDonald
Technical Manager, Data (to January 2002)	Stewart Noble
Technical Manager — Ecology	Jim Tait
Business Manager	Sylvia Graham
Information Specialist	Maria Cofinas
Project Manager	Rochelle Lawson
Publicist (part-time)	Drusilla Patkin

Remuneration policy

A recent independent review of Land & Water Australia's salary banding structure, by HBA Consulting, recommended that a remuneration system based on four broad salary bands be introduced. The review also included work value indicators, which are now used to evaluate the level of a position and its place in the appropriate band.

Staff development

Land & Water Australia is in the knowledge business. We invest in, broker and manage research and development. In the process we generate, transform, utilise and work with knowledge — some of it formal, but much of it tacit, informal, experiential and intangible. Although our portfolio of 1500 or so projects over the last decade represents a considerable asset, the talents, experience, skills and know-how of our staff represent probably our greatest knowledge asset. Accordingly, the Corporation places priority on recruiting, developing and retaining people of high quality, commensurate with the Corporation's national leadership role and very challenging mandate. The table below gives some indication of the formal qualifications of our staff, and importantly, of the high proportion of staff who are undertaking further study as part of their training and development plans.

At 30 June 2002, the academic status of staff members was as follows:

	PhD	Master's degree	Graduate diploma or certificate	Honours degree	Bachelor's degree	Diploma
Completed	2	3	7	5	15	4
In progress	2	2	4	_	4	_

Each staff member's performance management agreement incorporates a training and development plan in which areas for development and activities or training are nominated. A budget is set aside for training and development of staff.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Auditor-General's report

Australian National
Audit Office

INDEPENDENT AUDIT REPORT

To the Minister for Agriculture, Fisheries and Forestry

Scope

I have audited the financial statements of the Land and Water Resources Research and Development Corporation for the year ended 30 June 2002. The financial statements comprise:

- Statement by Directors;
- Statements of Financial Performance, Financial Position and Cash Flows;
- Schedules of Commitments and Contingencies; and
- Notes to and forming part of the Financial Statements.

The Directors of the Corporation are responsible for the preparation and presentation of the financial statements and the information they contain. I have conducted an independent audit of the financial statements in order to express an opinion on them to you.

The audit has been conducted in accordance with Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards, to provide reasonable assurance as to whether the financial statements are free of material misstatement. Audit procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial statements, and the evaluation of accounting policies and significant accounting estimates. These procedures have been undertaken to form an opinion as to whether, in all material respects, the financial statements are presented fairly in accordance with Accounting Standards and other mandatory professional reporting requirements in Australia and statutory requirements so as to present a view which is consistent with my understanding of the Corporation's financial position, its financial performance and its cash flows.

The audit opinion expressed in this report has been formed on the above basis.

GPO Box 707 CANBERRA ACT 2601
Centenary House 19 National Circuit
BARTON ACT
Phone (02) 6203 7300 Fax (02) 6203 7777

Audit Opinion

In my opinion the financial statements:

(i) have been prepared in accordance with Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997*; and

(ii) give a true and fair view, in accordance with applicable Accounting Standards and other mandatory professional reporting requirements in Australia and the Finance Minister's Orders, of the financial position of the Land and Water Resources Research and Development Corporation as at 30 June 2002, and its financial performance and cash flows for the year then ended.

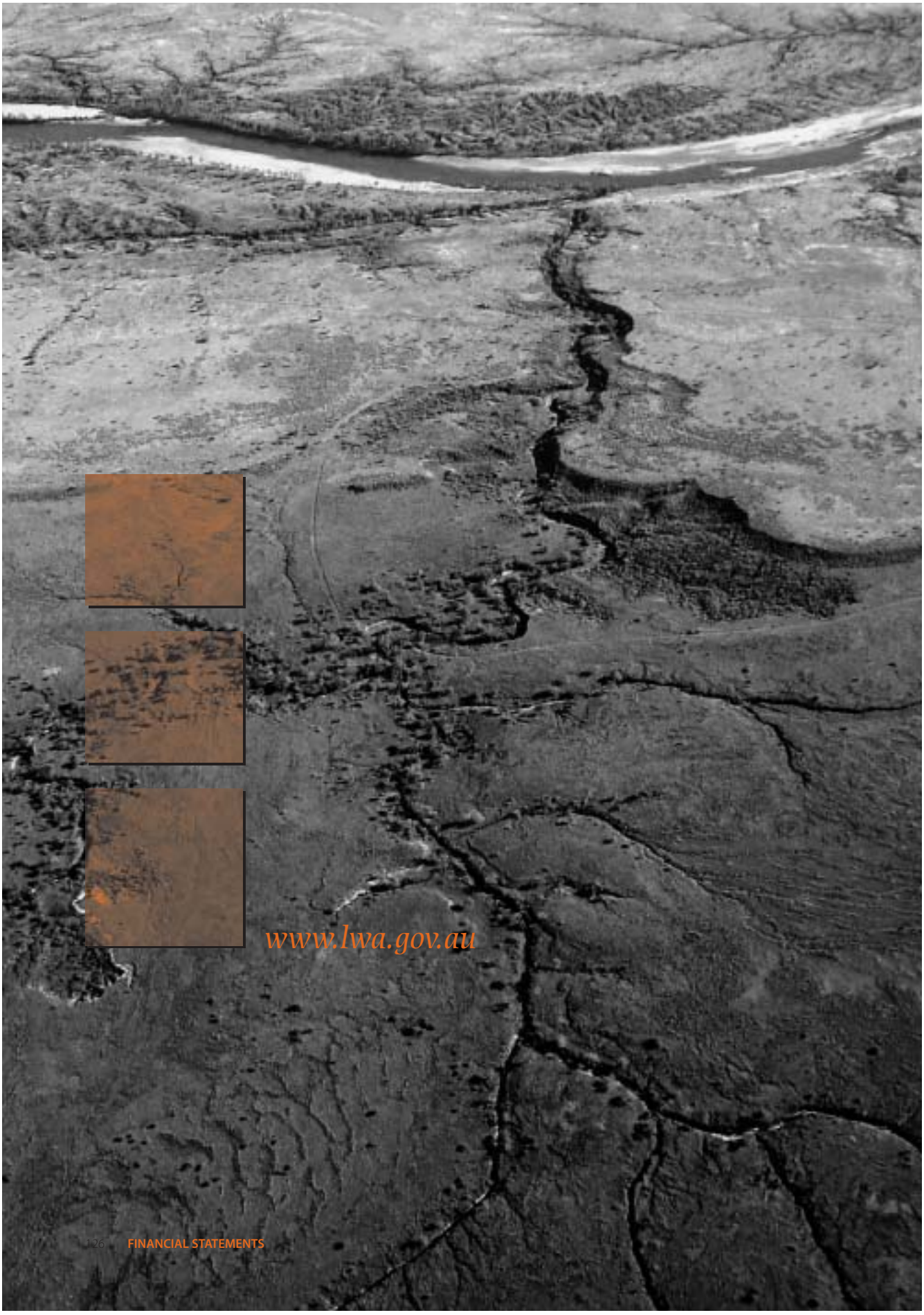
Australian National Audit Office

David McKean
Executive Director

Delegate of the Auditor General

Canberra

16 September 2002



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Financial statements

Statement by directors

In our opinion, the attached financial statements for the year ended 30 June 2002 give a true and fair view of the matters required by the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997*.

R Brazil
Chairperson
11 September 2002

A Campbell
Executive Director
11 September 2002

Statement of financial performance

for the year ended 30 June 2002

	Notes	2002 $	2001 $
Revenues from ordinary activities			
Revenue from Government	5A	**11,586,000**	11,314,000
Third party contributions utilised	4	**12,023,636**	10,560,145
Interest	5B	**291,302**	200,539
Proceeds from disposal of assets	5C	**432**	4,700
Other	5D	**364,183**	501,119
Total revenues from ordinary activities		**24,265,553**	22,580,503
Expenses from ordinary activities			
Employees	6A	**3,504,721**	2,975,306
Suppliers	6B	**3,419,830**	3,073,734
Research and development expenses	7	**16,734,571**	15,845,427
Depreciation and amortisation	6C	**272,683**	245,089
Write-down of assets	6D	**439**	6,542
Disposal of assets	5C	**187**	15,783
Total expenses from ordinary activities	8	**23,932,431**	22,161,882
Net operating surplus from ordinary activities		**333,122**	418,621
Net surplus		**333,122**	418,621
Net surplus attributable to the Commonwealth		**333,122**	418,621
Net credit to asset revaluation reserve	13	**115,254**	–
Total revenues, expenses and valuation adjustments attributable to the Commonwealth and recognised directly in equity		**115,254**	–
Total changes in equity other than those resulting from transactions with owners as owners		**448,376**	418,621

The above statement should be read with the accompanying notes

Statement of financial position

as at 30 June 2002

	Notes	2002 $	2001 $
ASSETS			
Financial assets			
Cash	9A	**5,324,526**	3,527,097
Receivables	9B	**2,395,981**	1,276,239
Investments	9C	**590,102**	561,618
Total financial assets		**8,310,609**	5,364,954
Non-financial assets			
Infrastructure, plant and equipment	10A,B	**447,565**	424,399
Intangibles	10C,B	**175,541**	238,451
Prepayments	10D	**4,200**	–
Total non-financial assets		**627,306**	662,850
Total assets		**8,937,915**	6,027,804
LIABILITIES			
Provisions			
Employees	11A	**769,833**	449,851
Total provisions		**769,833**	449,851
Payables			
Suppliers	12A	**204,150**	393,133
Research and development	12B	**5,406,014**	3,075,278
Total payables		**5,610,164**	3,468,411
Total liabilities		**6,379,997**	3,918,262
NET ASSETS		**2,557,917**	2,109,542
EQUITY			
Reserves	13	**115,254**	–
Accumulated surplus	13	**2,442,663**	2,109,542
Total equity		**2,557,917**	2,109,542
Current assets		**8,314,809**	5,364,954
Non-current assets		**623,106**	662,850
Current liabilities		**6,104,111**	3,742,747
Non-current liabilities		**275,886**	175,515

The above statement should be read with the accompanying notes

Statement of cash flows

for the year ended 30 June 2002

	Notes	2002 $	2001 $
OPERATING ACTIVITIES			
Cash received			
Sales of goods and services			
Non-government		**1,725,190**	826,661
Appropriations		**11,586,000**	11,314,000
Interest		**268,802**	200,539
Third party contributions		**10,897,356**	10,325,379
GST received from ATO		**520,919**	725,695
Total cash received		**24,998,267**	23,392,274
Cash used			
Employees		**(3,184,739)**	(2,898,503)
Suppliers		**(5,465,901)**	(4,343,305)
Research and development expenses		**(14,403,835)**	(15,224,308)
Total cash used		**(23,054,475)**	(22,466,110)
Net cash from operating activities	14	**1,943,791**	926,158
INVESTING ACTIVITIES			
Cash received			
Proceeds from sales of infrastructure, plant and equipment		**432**	4,700
Proceeds from maturity of investments		**–**	466,305
Total cash received		**432**	471,005
Cash used			
Purchase of infrastructure, plant and equipment and intangibles		**(118,310)**	(494,866)
Purchase of investments		**(28,484)**	–
Total cash used		**(146,794)**	(494,866)
Net cash from investing activities		**(146,362)**	(23,861)
Net increase in cash held		**1,797,429**	902,297
Cash at the beginning of the reporting period		**3,527,097**	2,624,802
Cash at the end of the reporting period		**5,324,526**	3,527,097

The above statement should be read with the accompanying notes

Schedule of commitments

as at 30 June 2002

	2002 $	2001 $
BY TYPE		
Other commitments		
Operating leases [1]	**720,246**	1,035,927
Other commitments [2]	**15,848,785**	19,257,457
Total other commitments	**16,569,031**	20,293,384
Commitments receivable	**(1,506,276)**	(1,844,853)
Net commitments	**15,062,755**	18,448,531
BY MATURITY		
All net commitments		
One year or less	**8,704,217**	12,010,986
From one to five years	**6,358,538**	6,437,545
Over five years	**–**	–
Net commitments	**15,062,755**	18,448,531
Operating lease commitments		
One year or less	**244,462**	237,098
From one to five years	**410,307**	704,654
Over five years	**–**	–
Net operating lease commitments	**654,769**	941,752

NB. Commitments are GST inclusive where relevant.

1. Operating lease is exclusively in relation to office accommodation for a fixed rental lease to March 2005.
2. As at 30 June 2002, 'Other commitments' comprise future commitments to research organisations and for jointly funded projects and programs managed by other funding agencies. Payment is dependent upon progress in each funded research project, annual ministerial approval of the annual operational plan and adequate annual appropriation of funds for the Corporation and funding partners.

The above schedule should be read with the accompanying notes

Schedule of contingencies

as at 30 June 2002

	2002 $	2001 $
Contingent losses		
Total contingent losses	–	–
Contingent gains		
Total contingent gains	–	–
Net contingencies	–	–

The above schedule should be read with the accompanying notes

Notes to and forming part of the financial statements

for the year ended 30 June 2002

Note 1: Summary of significant accounting policies

1.1 Basis of accounting

The Land and Water Resources Research and Development Corporation (the 'Corporation'), trading as Land & Water Australia, is required by Section 20 of the *Commonwealth Authorities and Companies Act 1997* to provide proper accounts and records of the transactions and affairs of the Corporation in accordance with accounting principles, generally applied in commercial practice.

The financial statements are required by clause 1(b) of Schedule 1 to the *Commonwealth Authorities and Companies Act 1997* and are a general purpose financial report.

The statements have been prepared in accordance with:

- Finance Minister's Orders (being the Commonwealth Authorities and Companies (Financial Statements 2001–2002) Orders);
- Australian Accounting Standards and Accounting Interpretations issued by the Australian Accounting Standards Board;
- other authoritative pronouncements of the Board; and
- Consensus Views of the Urgent Issues Group.

The statements have been prepared having regard to:

- the Explanatory Notes to Schedule 1 issued by the Department of Finance and Administration; and
- Finance Briefs issued by the Department of Finance and Administration.

The Statements of Financial Performance and Financial Position have been prepared on an accrual basis and are in accordance with historical cost convention, except for certain assets, which as noted, are at valuation. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position.

Assets and liabilities are recognised in the Statement of Financial Position when and only when it is probable that future economic benefits will flow and the amounts of the assets or liabilities can be reliably measured. Assets and liabilities arising under agreements equally proportionately unperformed are however not recognised unless required by an Accounting Standard. Liabilities and assets that are unrecognised are reported in the Schedule of Commitments and the Schedule of Contingencies.

Revenues and expenses are recognised in the Statement of Financial Performance when and only when the flow or consumption or loss of economic benefits has occurred and can be reliably measured.

1.2 Changes in accounting policy

The accounting policies used in the preparation of these financial statements are consistent with those used in 2000–01.

1.3 Reporting by outcomes

A comparison of budget and actual figures by outcome specified in the Appropriation Acts relevant to the Corporation is presented in Note 22. Any intra-government costs included in the figure 'net cost to budget outcomes' are eliminated in calculating the actual budget outcome for the government overall.

1.4 Revenue

The revenues described in this note are revenues relating to the core operating activities of the Corporation.

Interest revenue is recognised on a proportional basis taking into account the interest rates applicable to the financial assets.

Revenue from disposal of non-current assets is recognised when control of the asset has passed to the buyer.

Revenue from the rendering of a service is recognised by reference to the stage of completion of contracts or other agreements to provide services to other bodies. The stage of completion is determined according to the proportion that costs incurred to date bear to the estimated total costs of the transaction.

The Corporation receives revenue from third parties for the management of collaborative programs and projects.

Revenues from Government — output appropriations

The full amount of the appropriation for departmental outputs for the year is recognised as revenue.

Resources received free of charge

There were no resources received free of charge during 2001–02 (2000–01: nil).

1.5 Employee entitlements

Leave

The liability for employee entitlements includes provision for annual leave and long service leave. No provision has been made for sick leave as all sick leave is non-vesting and the average sick leave taken in future years by employees of the Corporation is estimated to be less than an annual entitlement for sick leave.

The liability for annual leave reflects the value of total annual leave entitlements of all employees at 30 June 2002 and is recognised at its nominal amount.

The non-current portion of the liability for long service leave is recognised and measured at the present value of the estimated future cash flows to be made in respect of all employees at 30 June 2002. In determining the present value of the liability, the Corporation has taken into account attrition rates and pay increases through promotion and inflation.

Separation and redundancy

Provision is made for separation and redundancy payments in circumstances where the Corporation has formally identified positions as excess to requirements and a reliable estimate of the amount of the payments can be determined.

No separation or redundancy payments were made during 2001–02.

Superannuation

Employees either contribute to the Commonwealth Superannuation and Public Sector Superannuation Schemes, or to another selected scheme in accordance with the Superannuation Guarantee levy. Employer contributions amounting to $281,081 (2000–2001: $246,568) for the Corporation in relation to these schemes have been expensed in these financial statements.

No liability for superannuation benefits is recognised as at 30 June as the employer contributions fully extinguish the accruing liability which is assumed by the Commonwealth.

Employer Productivity Superannuation Contributions totalled $39,559 (2000–01: $32,226) for the Corporation.

1.6 Leases

Operating lease payments are expensed on a basis which is representative of the pattern of benefits derived from the leased assets. The net present value of future net outlays in respect of surplus space under non-cancellable lease agreements is expensed in the period in which the space becomes surplus.

1.7 Research and development expenses

Research and development expenses are expensed as incurred. At 30 June 2002, there was no property income due from funded research and development projects other than those re-applied within some projects.

The Corporation has debited all items of expenditure against each individual R&D program account where a program management committee has been formed. These items include funding for research and development projects, scoping reviews, communications and other *ad hoc* management expenses related directly to the research (see Note 7).

The Corporation recognises research and development liabilities as follows.

Most research and development agreements require the grantee to perform services or provide facilities, or to meet eligibility criteria. In these cases, liabilities are recognised only to the extent that the services required have been performed or the performance eligibility criteria have been satisfied by the grantee. (Where research and development monies are paid in advance of performance or eligibility, a prepayment is recognised.)

There are no cases where grant agreements are made without conditions to be monitored.

1.8 Cash

Cash means notes and coins held and any deposits held at call with a bank or financial institution.

1.9 Financial instruments

Accounting policies in relation to financial instruments are stated at Note 20.

1.10 Acquisition of assets

Assets are recorded at cost on acquisition. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken.

1.11 Infrastructure, plant and equipment

Asset recognition threshold

Purchases of infrastructure, plant and equipment are recognised initially at cost in the Statement of Financial Position, except for purchases costing less than $1,000, which are expensed in the year of acquisition (other than where they form part of a group of similar items which are significant in total). Assets purchased from project funds and greater than the threshold of $5,000 may revert to the Corporation at the end of the project period. At 30 June 2002, no reversions took place. All sundry equipment transferred from the Commonwealth has been written off.

Revaluations

Infrastructure, plant and equipment are revalued progressively in accordance with the 'deprival' method of valuation in successive three-year cycles, so that no asset has a value greater than three years old.

In 2001–02 infrastructure, plant and equipment was revalued.

Assets acquired after the commencement of the revaluation are not captured by the revaluation then in progress.

Infrastructure, plant and equipment are measured at their depreciated replacement cost. Where assets are held which would not be replaced or are surplus to requirements, measurement is at net realisable value. At 30 June 2002, the Corporation had no assets in this situation.

All valuations are independent.

Recoverable amount test

Schedule 1 requires the application of the recoverable amount test to the Corporation's non-current assets in accordance with AAS10 *Recoverable Amount of Non-Current Assets*. The carrying amounts of these non-current assets have been reviewed to determine whether they are in excess of their recoverable amounts. In assessing recoverable amounts, the relevant cash flows have been discounted to their present value.

Depreciation and amortisation

Depreciable infrastructure, plant and equipment are written off to their estimated residual values over their estimated useful lives to the Corporation using, in all cases, the straight-line method of depreciation. Leasehold improvements are amortised on a straight-line basis over the lesser of the estimated useful life of the improvements or the unexpired period of the lease.

Depreciation / amortisation rates (useful lives) and methods are reviewed at each balance date and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate. Residual values are re-estimated for a change in prices only when assets are revalued.

Depreciation and amortisation rates applying to each class of depreciable asset are based on the following useful lives:

	2001–02	2000–01
Leasehold improvements	Lease term	Lease term
Plant and equipment	3–8 years	3–8 years

The aggregate amount of depreciation allocated for each class of asset during the reporting period is disclosed in Note 6C.

1.12 Intangibles

The Corporation's intangibles comprise externally acquired and internally developed software. The assets are carried at cost. The carrying amount of each non-current intangible asset is reviewed to determine whether it is in excess of the asset's recoverable amount. If an excess exists as at the reporting date, the asset is written down to its recoverable amount immediately. In assessing recoverable amounts, the relevant cash flows, including the expected cash inflows from future appropriations by the Parliament, have been discounted to their present value.

No write-down to recoverable amount has been made in 2001–02.

Intangible assets are amortised on a straight-line basis over their anticipated useful lives.

Useful lives are:

	2001–02	2000–01
Externally acquired software	3–4 years	3–4 years
Internally developed software	3–4 years	3–4 years

1.13 Taxation

The Corporation is liable to payroll tax, fringe benefits tax, stamp duty and goods and services tax. The Corporation is exempt from the payment of income tax under clause 46(1) of the *Primary Industries and Energy Research and Development Act 1989 (PIERD Act)*.

1.14 Insurance

The Corporation has insured risks through the Government's insurable risk managed fund, called 'Comcover'. Workers compensation is insured through Comcare Australia.

1.15 Comparative figures

Comparative figures have been adjusted to conform to changes in presentation in these financial statements where required.

Note 2: Economic dependency

The Corporation was established under the provisions of the PIERD Act and is controlled by the Commonwealth of Australia.

The Corporation is dependent on appropriations from the Parliament of the Commonwealth for its continued existence and ability to carry out its normal activities.

Note 3: Subsequent events

Since balance date, the Corporation is not aware of any events that have occurred which will affect the amounts disclosed in the financial statements.

Note 4: Third party contributions

Third party contributions were received for the following programs and projects in which the Corporation was a participant and managed the activity on behalf of other funding agencies:

ACTIVITY	Utilised 2002 $	Utilised 2001 $	Not yet utilised 2002 $	Not yet utilised 2001 $
Industries Arena coordination	**40,000**	0	0	0
Land, Water & Wool	**1,818,901**	0	**1,381,099**	0
Sustainable production systems	**222,479**	0	**77,521**	0
National Dryland Salinity R&D	**319,037**	414,323	**0**	49,453
Climate variability in agriculture	**500,849**	914,090	**0**	500,849
Sustainable management of military lands	**0**	29,192	**0**	0
Social and institutional R&D	**0**	25,000	**0**	0
Ord-Bonaparte program	**666,154**	885,000	**180,664**	0
NRHP — state / territory monitoring sub-program	**0**	17,698	**0**	0
National eutrophication management	**0**	123,586	**0**	52,489
Irrigation R&D	**858,686**	555,489	**111,841**	213,487
River Contaminants	**119,642**	0	**282,847**	0
National Rivers Consortium	**528,037**	303,723	**93,228**	203,460
Riparian lands	**110,000**	0	**0**	0
National remnant vegetation R&D	**630,735**	97,628	**71,637**	102,372
National Land and Water Resources Audit	**6,034,543**	7,194,416	**1,056,891**	1,090,915
Other research and development projects	**174,573**	0	**110,354**	0
Total	**12,023,636**	10,560,145	**3,366,082**	2,213,026

Of the third party contributions received, $12,023,636 has been recognised as income at balance date (2000–01: $10,560,145).

Note 5: Operating revenues

	2002 $	2001 $
Note 5A — Revenues from Government		
Appropriations for outputs	**11,586,000**	11,314,000
Total	**11,586,000**	11,314,000
Note 5B — Interest		
Deposits	**291,302**	200,539
Total	**291,302**	200,539
Note 5C — Net gain from sales of assets		
Infrastructure, plant and equipment:		
Proceeds from sale	**432**	4,700
Net book value at sale	**(187)**	(15,783)
Net gain / (loss)	**245**	(11,083)
Less: plant and equipment written off on disposal (Note 6D)	**(439)**	(6,542)
Net gain / (loss) on disposal of property, plant and equipment	**(194)**	(17,625)
Note 5D — Other revenues		
Return of R&D funds	**270,240**	275,834
Publication sales	**6,150**	11,808
Other sundry items	**87,793**	213,477
Total	**364,183**	501,119

Note 6: Operating expenses

	2002 $	2001 $
Note 6A — Employee expenses		
Remuneration (for services provided)	**3,496,390**	2,965,268
Other employee expenses	**8,331**	10,038
	3,504,721	2,975,306
The Corporation contributes to the Commonwealth Superannuation (CSS) and the Public Sector (PSS) Superannuation schemes, which provide retirement, death and disability benefits to employees. Contributions to the schemes are at rates calculated to cover existing and emerging obligations. Current contribution rates are 18.9% of salary (CSS) and 10.1% of salary (PSS). An additional average 3% is contributed as Employer Productivity Superannuation Contributions.		
Note 6B — Suppliers expenses		
Supply of goods and services	**3,143,862**	2,828,866
Operating lease rentals	**275,968**	244,868
	3,419,830	3,073,734
Note 6C — Depreciation and amortisation		
Depreciation of property, plant and equipment	**130,371**	104,331
Amortisation of leasehold improvements	**43,482**	64,345
Amortisation of computer software	**98,830**	76,413
	272,683	245,089
Note 6D — Write-down of assets		
Plant and equipment — write-off on disposal	**439**	6,542
	439	6,542

Note 7: Operating expenses — research and development expenses

	2002 $	2001 $
Non-profit institutions	**11,714,200**	11,348,907
Research and development expenses to commercial entities	**5,020,371**	4,496,520
Total	**16,734,571**	15,845,427

Note 8: Total operating expenses

Total operating expenses are classified by functional type as follows:

	2002 $	2001 $
Administration	**1,628,497**	1,321,335
Research and development funding [1]		
Arena activities	**13,620,630**	10,981,787
General call	**634,739**	633,808
National Land and Water Resources Audit	**6,254,606**	7,328,518
Portfolio management	**609,668**	–
Communication	**1,184,291**	1,400,854
Strategic planning and management	**–**	443,539
Review and evaluation	**–**	52,041
Total	**23,932,431**	22,161,882

1. R&D funding includes all expenses related to the implementation and development of an R&D program and related other costs.

Note 9: Financial assets

	2002 $	2001 $
Note 9A — Cash		
Cash at bank and on hand	**5,324,526**	3,527,097
	5,324,526	3,527,097
Balance of cash as at 30 June shown in the Statement of Cash Flows	**5,324,526**	3,527,097
Note 9B — Receivables		
Goods and services	**2,006,495**	880,215
Less: Provision for doubtful debts	**–**	–
	2,006,495	880,215
GST receivable	**366,985**	387,954
Other receivables	**22,501**	8,070
	2,395,981	1,276,239
Receivables (gross) which are aged as follows:		
Not overdue	**389,486**	778,319
Overdue by:		
Less than 30 days	**1,895,680**	486,060
30 to 60 days	**–**	1,740
60 to 90 days	**11,435**	0
More than 90 days	**99,380**	10,120
	2,006,495	497,920
	2,395,981	1,276,239
Note 9C — Investments		
Term deposit	**590,102**	561,618
	590,102	561,618
Investments are categorised as follows:		
Current	590,102	561,618
Non-current	–	–

Note 10: Non-financial assets

	2002 $	2001 $
Note 10A — Infrastructure, plant and equipment		
Office equipment — at cost	**17,245**	521,137
Office equipment — 2002–05 valuation	**257,995**	–
Accumulated depreciation	**(49)**	(255,542)
	275,191	265,595
Furniture and fittings — at cost	**–**	85,885
Furniture and fittings — at 2002–05 valuation	**51,774**	–
Accumulated depreciation	**–**	(47,163)
	51,774	38,722
Leasehold improvements — at cost	**–**	294,686
Leasehold improvements — at 2002–05 valuation	**120,600**	–
Accumulated depreciation	**–**	(174,605)
	120,600	120,081
Total infrastructure, plant and equipment	**447,565**	424,399
The revaluations were in accordance with the revaluation policy stated at Note 1.11 and were completed by an independent valuer (Australian Valuation Office).		
Note 10B — Intangibles		
Computer software:		
Externally acquired — at cost	**59,915**	46,106
Accumulated amortisation	**(42,356)**	(31,927)
	17,559	14,179
Internally developed — at cost	**308,117**	286,016
Accumulated amortisation	**(150,135)**	(61,744)
	157,982	224,272
Total	**175,541**	238,451

Note 10: Non-financial assets (cont.)

10C — Analysis of infrastructure, plant and equipment and intangibles

Table A — Reconciliation of the opening and closing balances of infrastructure, plant and equipment and intangibles

Item	Office equipment $	Furniture and fittings $	Lease improvements $	Computer software $	Total $
Gross value as at 1 July 2001	521,137	85,885	294,686	332,122	1,233,830
Additions: purchase of assets	71,402	9,730	1,260	35,910	118,302
Revaluations: write-ups / (write-downs)	(294,432)	(43,841)	(175,346)	0	(513,619)
Assets transferred in / (out)	0	0	0	0	0
Write-offs	(4,602)	0	0	0	(4,602)
Disposals	(18,265)	0	0	0	(18,265)
Gross value as at 30 June 2002	**275,240**	**51,774**	**120,600**	**368,032**	**815,646**
Accumulated depreciation / amortisation charge as at 1 July 2001	255,542	47,163	174,605	93,661	570,971
Disposals	(18,078)	–	–	–	(18,078)
Depreciation / amortisation charge for the year	122,488	7,883	43,482	98,830	272,683
Revaluations: write-ups / (write-downs)	(355,740)	(55,046)	(218,087)	0	(628,873)
Assets transferred in / (out)	0	0	0	0	0
Write-offs	(4,163)	0	0	0	(4,163)
Accumulated depreciation / amortisation charge as at 30 June 2002	**49**	**0**	**0**	**192,491**	**192,540**
Net book value as at 30 June 2002	**275,191**	**51,774**	**120,600**	**175,541**	**623,106**
Net book value as at 1 July 2001	265,595	38,722	120,081	238,461	662,859

Net revaluation increments / decrements in the table above comprises:

- for office equipment — a net revaluation increment of $61,308
- for furniture and fittings — a net revaluation increment of $11,205
- for leasehold improvements — a net revaluation increment of $42,741

Note 10: Non-financial assets (cont.)

10C — Analysis of infrastructure, plant and equipment and intangibles (cont.)

Table B — Assets at valuation

Item	Office equipment $	Furniture and fittings $	Lease improvements $	Computer software $	Total $
As at 30 June 2002					
Gross value	257,995	51,774	120,600	–	430,369
Accumulated depreciation / amortisation	–	–	–	–	–
Net book value	**257,995**	**51,774**	**120,600**	**–**	**430,369**
As at 30 June 2001					
Gross value	–	–	–	–	–
Accumulated depreciation / amortisation	–	–	–	–	–
Net book value	**–**	**–**	**–**	**–**	**–**

Note 10D — Prepayments

	2002 $	2001 $
Prepayments	**4,200**	–

Note 11: Provisions

Note 11A — Employee provisions

	2002 $	2001 $
Salaries and wages	**308,767**	139,065
Leave	**449,367**	291,687
Superannuation	**11,699**	19,099
Aggregate employee entitlement liability	**769,833**	449,851
Employee provisions are categorised as follows:		
Current	**493,947**	274,335
Non-current	**275,886**	175,516

Note 12: Payables

Note 12A — Supplier payables

	2002 $	2001 $
Trade creditors	**204,150**	393,133
	204,150	393,133

All supplier payables are current.

Note 12B — Research and development

	2002 $	2001 $
Non-profit institutions	**1,537,432**	612,252
Contributions not yet utilised (see Note 4)	**3,366,082**	2,213,026
Contributions in advance	**502,500**	250,000
	5,406,014	3,075,278

All research and development payables are current.

Note 13: Equity

Note 13A — Analysis of equity

Item	Accumulated results		Asset revaluation reserve		Total equity	
	2002 $	2001 $	**2002 $**	2001 $	**2002 $**	2001 $
Opening balance 1 July	2,109,541	1,690,920	–	–	**2,109,541**	1,690,920
Operating result	333,122	418,621	–	–	**333,122**	418,621
Net revaluation increment / (decrement)	–	–	115,254	–	**115,254**	–
Closing balance as at 30 June	**2,442,663**	2,109,541	**115,254**	–	**2,557,917**	2,109,541

Note 14: Cash flow reconciliation

Reconciliation of operating surplus to net cash provided by operating activities:

	2002 $	2001 $
Operating surplus	**333,122**	418,621
Depreciation and amortisation of infrastructure, plant and equipment	**173,853**	168,676
Amortisation of intangibles	**98,830**	76,413
Property, plant and equipment written off	**439**	6,542
(Gain) / loss on disposal of assets	**(245)**	11,092
Changes in assets and liabilities		
(Increase) / decrease in receivables	**(1,119,742)**	(530,896)
Increase / (decrease) in employee provisions	**319,982**	76,803
Increase / (decrease) in supplier payables	**(150,828)**	77,787
Increase / (decrease) in GST receivable	**(42,355)**	0
Increase / (decrease) in research and development expenses payable	**2,330,736**	621,120
Net cash from / (used by) operating activities	**1,943,791**	926,158

Note 15: Director remuneration

	2002	2001
The number of directors of the Corporation included in these figures are shown below in the relevant remuneration bands:		
$0 – $10,000	1	1
$10,001 – $20,000	–	–
$20,001 – $30,000	6	6
$30,001 – $40,000	1	1
$130,001 – $140,000	–	–
$160,001 – $170,000	–	1
$180,001 – $190,000	1	–
	9	9
	$	$
Aggregate amount of superannuation payments in connection with the retirement of directors	12,684	–
Other remuneration received or due and receivable by directors of the Corporation	332,225	369,592
Total remuneration received or due and receivable by directors of the Corporation:	344,909	369,592

The part-time directors of the Corporation received remuneration and allowances as determined by the Remuneration Tribunal. In accordance with the *PIERD Act*, the part-time directors are appointed by a Selection Committee. The Executive Director was the only full-time director of the Corporation.

Note 16: Related party disclosures

Directors of the Authority

The Directors of the Corporation during the year were:

Mrs R. Brazil	Chairperson
Mr J. Alexandra	Director
Mrs L. Boully	Director
Prof. S. Bunn	Director
Mr A. Campbell	Executive Director
Mrs S. Donaldson	Director
Mr M. Logan	Director
Mr W. Watkins	Director and Deputy Chair
Mr C. Willcocks	Government Director

The aggregate remuneration of directors is disclosed in Note 15.

Loans with directors and director-related entities

There were no loans made to directors or director-related entities.

Other transactions with directors or director-related entities

Research and development expenses were made to the following director-related entities. The directors involved took no part in the relevant decisions of the Board.

Mrs L. Boully	Chairman, CSIRO Biodiversity Sector Advisory Committee.
Prof. S. Bunn	Director, Centre for Catchment and In-Stream Research, Griffith University.
Mr A. Campbell	Member, CSIRO Land and Water Sector Advisory Committee.
Mrs S. Donaldson	Member, Advisory Committee, Centre for Resource and Environmental Studies, Australian National University.
Mr C. Willcocks	General Manager, Landcare and Regional Capacity, Natural Resource Management, Agriculture, Fisheries and Forestry – Australia.
	Member, Advisory Committee, Centre for Resource and Environmental Studies, Australian National University.
Mrs R. Brazil	Director, Cotton Research and Development Corporation.
	Chair, Land Use Studies Centre Advisory Committee, University of Southern Queensland.

The CSIRO Sector Advisory Committees perform a strategic and advisory role and are removed from direct research operations in particular from contractual arrangements with external funding bodies including Land & Water Australia. The Corporation provided research funding to the above agencies. These transactions occurred within the normal terms and conditions of research and development expenses.

	2002 $	2001 $
Research and development expenses made to director-related entities	**3,231,375**	3,694,556

These research and development expenses for the 2001–02 year were provided to director-related entities as follows:

Entity	2002 $	2001 $
Australian National University	**333,405**	266,267
CSIRO Land and Water and Biodiversity Sectors	**2,732,046**	3,253,511
Griffith University	**165,924**	123,892
University of Queensland	**–**	50,886
Total	**3,231,375**	3,694,556

The Corporation has also received contributions from director-related entities to jointly-funded projects with the Natural Heritage Trust, Agriculture, Fisheries and Forestry – Australia. These transactions occurred within the normal terms and conditions of research and development agreements.

Note 17: Remuneration of officers

The number of officers who received or were due to receive total remuneration of $100,000 or more:

	2002	2001
Between $100,001 – $110,000	–	2
Between $110,001 – $120,000	2	1
Between $120,001 – $130,000	1	2
Between $130,001 – $140,000	3*	1
Between $140,001 – $150,000	3	1
Between $190,001 – $200,000	1	1*
Between $240,001 – $250,000	–	1*
	10	8
	$	$
The aggregate amount of total remuneration of officers shown is:	1,385,988	1,165,493

The officer remuneration includes all officers concerned with or taking part in the management of the Corporation during 2001–02 except the Executive Director. Details in relation to the Executive Director have been incorporated in Note 15: Remuneration of Directors.

* At the direction of the National Land & Water Resources Audit Advisory Council, the officers of the Audit received a retention allowance in recognition of the requirement for specialist expertise to be retained at least until 30 June 2001 and 30 June 2002 (where applicable). These payments referred to a three-year period, however, the entire payment is reflected in this year's financial statements.

Note 18: Remuneration of auditors

	2002 $	2001 $
Remuneration to the Auditor-General for auditing the financial statements for the reporting period	14,500	14,500

In addition, the Auditor-General was contracted to perform additional audit services for the following programs:

- National Land and Water Resources Audit;
- Climate Variability Research and Development Program; and
- Land, Water & Wool.

Note 19: Average staffing levels

	2002	2001
The average staffing levels for the Corporation during the year were:	32	27

Note 20: Financial instruments

Note 20A — Terms, conditions and accounting policies

Financial instrument	Notes	Accounting policies and methods (including recognition criteria and measurement basis)	Nature of underlying instrument (including significant terms and conditions affecting the amount, timing and certainty of cash flows)
Financial assets		Financial assets are recognised when control over future economic benefits is established and the amount of the benefit can be reliably measured.	
Cash at bank	9A	The balance is recognised at the nominal amount. Interest is credited to revenue as it accrues. A negative balance arises when unpresented cheques exceed the current bank balance and this is disclosed as an overdraft.	Temporarily surplus funds, mainly from monthly drawdowns of appropriation, are placed in a cheque account with the Commonwealth Bank. Interest is earned on the daily balance at the prevailing daily rate for money on call and is paid at month end. CBA Bank Rating: AAA.
Cash on hand	9A	Petty cash held on premises.	
Deposits at call	9A	Deposits are recognised at their nominal amounts. Interest is credited to revenue as it accrues.	Temporarily surplus funds, mainly from monthly drawdowns of appropriation, are placed on deposit at call with the Commonwealth Bank and Bankers Trust. Interest is earned on the daily balance at the prevailing daily rate for money on call and is paid at month end. CBA Bank Rating: AAA. Bankers Trust Bank Rating: AAA.
Receivables for goods and services	9B	These receivables are recognised at the nominal amounts due less any provision for bad and doubtful debts. Provisions are made when collection of the debt is judged to be less rather than more likely.	Credit terms are net 7–14 days (2000–01: 7–14 days)
Term deposit	9C	The Term deposit is recognised at cost. Interest is accrued as it is earned.	Term deposit is with the Adelaide Bank, maturing in 2002–2003, and earns an effective rate of interest of 5.55%. Interest is payable on maturity. Adelaide Bank Rating A2.
Financial liabilities		Financial liabilities are recognised when a present obligation to another party is entered into and the amount of the liability can be reliably measured.	
Trade creditors	12	Creditors and accruals are recognised at their nominal amounts, being the amounts at which the liabilities will be settled. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).	Settlement is usually made net 14 days.
Research and development payables: non-profit institutions	12	The Corporation recognises a liability on the signing of grant agreements. The amount of the liability is for the total of all payments under the agreement, which are no longer at the Corporation's discretion. The part of the liability recognised in the Balance Sheet comprises payments, which are more rather than less likely to be made.	Grant payments are made in instalments according to the grantee meeting agreed milestones and subject to funds being appropriated annually by the Parliament. The Corporation does not necessarily appropriate the benefits of the research to itself and any benefit it receives will only coincidentally approximate in value the grant made.
Contributions not yet utilised and in advance	12	The Corporation brings income to account in the same period as expenditure is incurred; therefore any contributions not utilised are recorded as a liability.	There are agreements with third party contributors that contributions will be spent on R&D projects and other activities relating to specified programs. The Corporation is the administrator of the funds.

Note 20: Financial instruments (cont.)

Note 20B — Interest rate risk

Financial instrument	Notes	Floating interest rate		Fixed interest rate 1 year or less		Fixed interest rate 1 to 2 years		Non-interest bearing		Total		Weighted average effective interest rate	
		2002 $	2001 $	2002 $	2001 $	2002 $	2001 $	2002 $	2001 $	2002 $	2001 $	2002 %	2001 %
Financial assets (recognised)													
Cash at bank	9A	–	2,309,262	–	–	–	–	–	–	–	2,309,262	1.05	1.05
Cash on hand	9A	–	–	–	–	–	–	1,056	496	1,056	496	N/A	N/A
Deposits at call	9A	5,323,470	1,217,339	–	–	–	–	–	–	5,323,470	1,217,339	3.56	4.53
Receivables for goods and services	9B	–	–	–	–	–	–	2,395,981	1,276,239	2,395,981	1,276,239	N/A	N/A
Term deposit	9C	–	–	590,102	561,618	–	–	–	–	–	561,618	5.7	6.4
Total financial assets (recognised)		5,323,470	3,526,601	590,102	561,618	–	–	2,583,819	1,276,735	8,310,609	5,364,954		
Total assets										8,937,915	6,027,804		
Financial liabilities (recognised)													
Trade creditors	12A	–	–	–	–	–	–	204,150	393,133	204,150	393,133	N/A	N/A
Research and development payables: non-profit institutions	12B	–	–	–	–	–	–	1,537,432	612,252	1,537,432	612,252	N/A	N/A
Contributions not yet utilised and in advance	12B	–	–	–	–	–	–	3,868,582	2,463,026	3,868,582	2,463,026	N/A	N/A
Total financial liabilities (recognised)		–	–	–	–			5,610,164	3,468,411	5,610,164	3,468,411		
Total liabilities										6,379,997	3,918,265		

Note 20: Financial instruments (cont.)

Note 20C — Net fair values of financial assets and liabilities

Financial instrument	Note	2002		2001	
		Total carrying amount $	Aggregate net fair value $	Total carrying amount $	Aggregate net fair value $
Financial assets					
Cash at bank	9A	–	–	2,309,262	2,309,262
Cash on hand	9A	1,056	1,056	496	496
Deposits at call	9A	5,323,470	5,323,470	1,217,339	1,217,339
Receivables for goods and services	9B	2,395,981	2,395,981	1,276,239	1,276,239
Term deposit	9C	590,102	590,102	561,618	561,618
		8,310,609	8,310,609	5,364,954	5,364,954
Financial liabilities					
Trade creditors	12A	204,150	204,150	393,133	393,133
Research and development payables: non-profit institutions	12B	1,537,432	1,537,432	612,252	612,252
Contributions not yet utilised and in advance	12B	3,868,582	3,868,582	2,463,026	2,463,026
		5,610,164	5,610,164	3,468,411	3,468,411

Financial assets

The net fair values of cash, deposits on call, receivables for goods and services and term deposit approximate their carrying amounts.

Financial liabilities

The net fair values contributions not yet utilised and in advance, trade creditors and research and development payables are approximated by their carrying amounts.

Note 20D — Credit risk exposures

The Corporation's maximum exposures to credit risk at reporting date in relation to each class of recognised financial asset is the carrying amount of those assets as indicated in the Statement of Financial Position.

The Corporation has no significant exposures to any concentration of credit risk.

Note 21: Appropriations

The Corporation received the following appropriations during the year:

	2002 $	2001 $
Annual Appropriation Acts No 1 & 2	**11,586,000**	11,314,000

Note 22: Reporting of outcomes

Note 22A — Outcomes of the Corporation

The Corporation is structured to meet one outcome:

- Knowledge, understanding and informed debate to inspire innovation and action in sustainable natural resource management.

Five outputs are identified for this outcome. These include:

Output 1: Sustainable Primary Industries

Output 2: River Landscapes

Output 3: Vegetation

Output 4: Future Landscapes and Compatible Industries

Output 5: Cross-cutting Activities

Note 22B — Total cost / contribution of outcome

	Outcome		Total	
	Actual $	Budget $	Actual $	Budget $
Net cost of departmental outputs	11,252,878	11,292,000	11,252,878	11,292,000
Cost of outcome before extraordinary items	11,252,878	11,292,000	11,252,878	11,292,000
Extraordinary items	–	–	–	–
Net cost to budget outcome	11,252,878	11,292,000	11,252,878	11,292,000

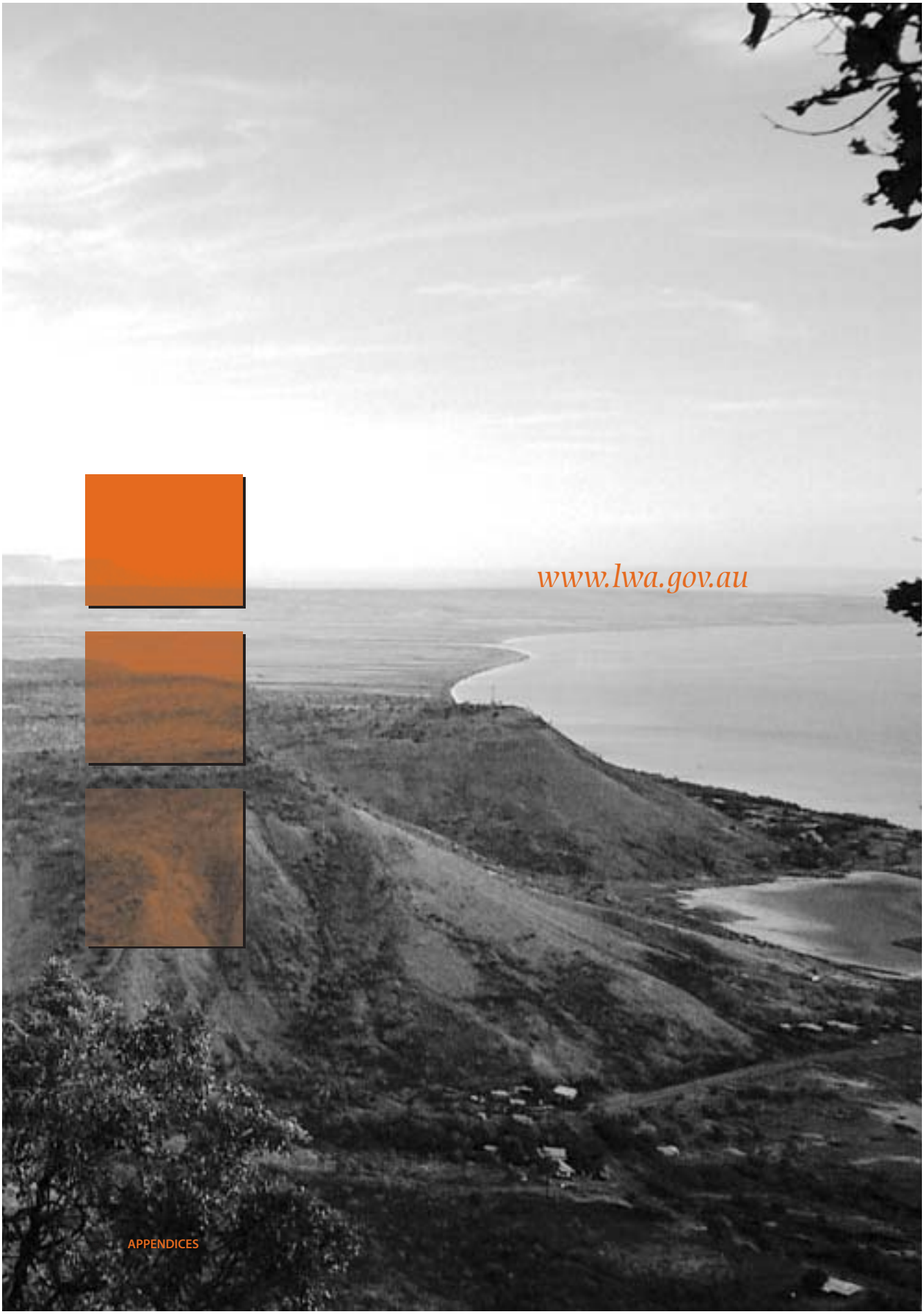
Note 22: Reporting of outcomes (cont.)

Note 22C — Major revenues and expenses by output group

	Output 1		Output 2		Output 3		Output 4		Output 5		Non-attributable		Total	
	2002 $	2001 $	2002 $	2001 $	2002 $	2001 $	2002 $	2001 $	2002 $	2001 $	2002 $	2001 $	2002 $	2001 $
Operating revenues														
Revenues from Government	1,497,984	–	1,340,088	–	1,144,562	–	231,341	–	1,976,268	–	5,395,757	11,314,000	11,586,000	11,314,000
Industry contributions	2,901,266	–	1,616,364	–	630,735	–	–	–	6,875,271	–	–	10,560,145	12,023,636	10,560,145
Other non-taxation revenues	115,326	–	175,268	–	18,622	–	–	–	240,483	–	106,218	706,358	655,917	706,358
Total operating revenues	4,514,576	–	3,131,720	–	1,793,919	–	231,341	–	9,092,022	–	5,501,975	22,580,503	24,265,553	22,580,503
Operating expenses														
Employees	351,404	–	184,419	–	59,717	–	331,266	–	1,006,354	–	1,571,561	2,975,306	3,504,721	2,975,306
Suppliers	458,676	–	435,377	–	133,830	–	13,021	–	1,103,311	–	1,275,615	3,073,734	3,419,830	3,073,734
Grants	2,846,898	–	3,357,446	–	2,110,899	–	402,457	–	6,818,967	–	1,197,904	15,845,427	16,734,571	15,845,427
Depreciation and amortisation	–	–	–	–	–	–	–	–	–	–	272,683	245,089	272,683	245,089
Write-down of assets	–	–	–	–	–	–	–	–	–	–	626	22,326	626	22,326
Total operating expenses	3,656,978	–	3,977,242	–	2,304,446	–	746,744	–	8,928,632	–	4,318,389	22,161,882	23,932,431	22,161,882

Note 22D — Major classes of departmental assets and liabilities by output group

	Output 1		Output 2		Output 3		Output 4		Output 5		Non-attributable		Total	
	2002 $	2001 $	2002 $	2001 $	2002 $	2001 $	2002 $	2001 $	2002 $	2001 $	2002 $	2001 $	2002 $	2001 $
Output specific authority assets														
Goods and services receivable	868,082	–	401,261	–	129,192	–	–	–	583,434	–	24,526	880,215	2,006,495	880,215
Total specific authority assets	868,082	–	401,261	–	129,192	–	–	–	583,434	–	24,526	880,215	2,006,495	880,215
Other authority assets														
Net GST receivable	–	–	–	–	–	–	–	–	–	–	366,985	387,954	366,985	387,954
Plant and equipment	–	–	–	–	–	–	–	–	–	–	465,124	438,578	465,124	438,578
Internally developed software	–	–	–	–	–	–	–	–	–	–	157,982	224,272	157,982	224,272
Cash at bank and on hand	–	–	–	–	–	–	–	–	–	–	5,324,526	3,527,097	5,324,526	3,527,097
Other receivables	–	–	–	–	–	–	–	–	–	–	22,501	8,070	22,501	8,070
Investments	–	–	–	–	–	–	–	–	–	–	590,102	561,618	590,102	561,618
Other	–	–	–	–	–	–	–	–	–	–	4,200	–	4,200	–
Total other authority assets	–	–	–	–	–	–	–	–	–	–	6,931,420	5,147,589	6,931,420	5,147,589
Output specific authority liabilities														
Research and development	1,809,730	–	924,647	–	336,719	–	–	–	2,294,612	–	40,307	3,075,278	5,406,015	3,075,278
Employees	77,188	–	40,509	–	13,117	–	72,765	–	221,052	–	345,203	–	769,833	–
Total specific authority liabilities	1,886,918	–	965,156	–	349,836	–	72,765	–	2,515,664	–	385,510	3,075,278	6,175,848	3,075,278
Other authority liabilities														
Employees	–	–	–	–	–	–	–	–	–	–	–	449,851	–	449,851
Suppliers	–	–	–	–	–	–	–	–	–	–	204,150	393,133	204,150	393,133
Total other authority liabilities	–	–	–	–	–	–	–	–	–	–	204,150	842,984	204,150	842,984



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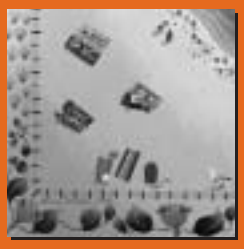
APPENDICES

Appendices



Appendix 1: Government rural policy frameworks of particular significance

Three policy frameworks are particularly significant to Land & Water Australia:

- Commonwealth Government priorities for rural research,
- the Natural Heritage Trust, and
- the Prime Minister's National Action Plan for Salinity and Water Quality.

Although activities in relation to the frameworks are mentioned throughout this annual report, they are addressed explicitly as follows.

Government priorities for rural research

The Commonwealth Government has indicated its ongoing financial commitment to R&D and recognition that the system of rural research and development corporations plays a critical role in 'taking science into the paddock'. In December 1999, the Minister wrote to all RDCs outlining the Government's priorities for rural research to increase the competitiveness of Australia's rural industries. Those priorities were re-affirmed in a letter of 11 May 2001. The Corporation's response against each of the seven priority areas is as follows.

Sustainable natural resource management

The Corporation's core business relates to protecting and enhancing the natural resource base that underpins rural Australia.

Whole-of-industry approach

The Corporation ensures a whole-of-industry approach in all its collaborative activities with RDCs, such as incorporating ecological sustainability into the PROGRAZE farming systems package and the natural resource management kits to be developed as part of the 'Land, Water & Wool' initiative.

Biotechnology

The Corporation will work with other R&D Corporations to review the potential impact of biotechnology on the natural resource base. A review of this issue is currently in progress. During 2002–03 the Board will determine the role that LWA should take.

Increase in trade and market access

Land & Water Australia programs, in association with the other RDCs' programs, are helping landholders to diversify and produce new and improved high-value products that satisfy the needs of both environmental sustainability and domestic and export markets, such as agroforestry products and productive use of saline lands.

Clean and green

The emergence of 'clean green' marketing, and the threat of non-tariff trade barriers being imposed on Australia's exports, make Land & Water Australia's research very important to winning and maintaining overseas markets and increasing farm productivity.

Food safety for consumers

Land & Water Australia has minimal direct R&D responsibility for food safety. However, the Corporation cooperates with the commodity-based R&D corporations (which have direct food safety responsibility) to ensure food is sustainably produced through effective management of natural resources.

Improving our human resources

Land & Water Australia has attracted philanthropic support for a new program of community fellowships to help members of the community with valuable experience in or insights into natural resource management to distil the lessons and share them with a much wider audience. The Corporation will continue to provide postgraduate scholarships in fields in which research capacity requires expansion. The Corporation helps researchers within its programs to upgrade their skills by providing joint support, with research organisations, for attendance at training workshops and courses. Land & Water Australia also provides annual travelling and visiting fellowships to boost Australia's research capacity in areas of identified need and to ensure that Australia remains at the cutting edge of natural resource management research world-wide.

Natural Heritage Trust

The Commonwealth Government's Natural Heritage Trust (NHT) has provided a substantial boost to the level of on-ground work in environmental management. Land & Water Australia has worked during the first phase of the NHT to establish good links between its R&D programs and those of the NHT. The aim is to make sure that research findings are available to on-ground managers in a readily accessible form, and that the information needs of those managers are being taken up and incorporated within R&D programs. Successful linkages with the Trust have been developed in a range of programs including the National Land and Water Resources Audit, National Dryland Salinity Program, National Rivers Consortium and the Riparian Lands R&D Program.

The National Dryland Salinity Program has supported the development of catchment strategies and subsequent Landcare projects across Australia. The major NHT management agencies, including AFFA and the MDBC, together with state agencies and industry R&D corporations, are vital participants in the second phase of the National Dryland Salinity Program. Their participation ensures that that there will be close linkages between R&D and on-ground works in this area of land and water degradation. LWA has also established linkages with the National Rivercare Initiative through implementing the First National Assessment of River Health. The Riparian Lands R&D Program has published a set of technical guidelines on riparian management and an Australian Manual and CD-ROM on Stream Rehabilitation. These guidelines are helping catchment and community groups to plan and implement works that will lead to improved management of rivers and waterways.

Land & Water Australia aims to continue to strengthen linkages with Natural Heritage Trust programs. The National Action Plan and the NHT are generating community demands for access to up-to-date information, decision support tools and scientific and technical expertise. Land & Water Australia is actively exploring opportunities with AFFA, EA and others to build stronger partnerships at national and regional levels. Potential areas for partnership include:

- investment to generate new knowledge to address emerging issues under the NHT, including the challenges posed by regional delivery, institutional change and integration;
- facilitating better information exchange and partnerships with regional and industry bodies; and
- improving policy–research linkages with policy makers.

Prime Minister's National Action Plan for Salinity and Water Quality

Under the National Action Plan for Salinity and Water Quality (NAP), there is an expectation that planning, implementation and monitoring of integrated natural resource management at the regional level will be underpinned by good science. The NAP provides opportunities for LWA to target its priorities, research activities and communication effort towards regions where significant partnership investment can be focused. In particular, the NDSP will need to complement and support the activities of the NAP, as will other industry, water and vegetation programs. Land & Water Australia is well-placed to broker collaborative R&D programs within NAP regions with other R&D investors, and in particular with the commodity RDCs. AFFA and EA have approached LWA to coordinate the scoping of a number of research and capacity issues in implementing the NAP — including mapping regional capacity, identifying regional planning skills and desalinisation technologies. As with the NHT, LWA will continue to investigate ways to forge stronger partnerships with AFFA, EA, state agencies and regional bodies to generate and exchange new knowledge and information.

Appendix 2: Publications of the National Land and Water Resources Audit

All National Land and Water Resources Audit reports or their executive summaries are available through the Audit website (www.environment.gov.au/atlas).

August 2001	*Annual Report of the National Land and Water Resources Audit 2000–01*
November 2001	*Landscape Health in Australia*
November 2001	*Landscape Health in Australia* (summary)
January 2002	*Australian Natural Resources Information 2002*
January 2002	*Australian Native Vegetation Assessment 2001*
February 2002	*Native Vegetation in Australia* (summary)
February 2002	*User guide – Australian Natural Resources Atlas and Data Library* (summary)
February 2002	*Australian Agriculture Assessment 2001*
February 2002	*Agriculture in Australia* (summary)
March 2002	*Australians and Natural Resource Management 2002*
May 2002	*Australian Catchment, River and Estuary Assessment 2002*
May 2002	*Catchments, Rivers and Estuaries in Australia* (summary)

Project Reports completed in 2001–02 are also available through the Atlas website.

Appendix 3: Land & Water Australia communication products

The following list identifies communication products produced during 2001–02 and details the product code, title, author/editor, book number (where applicable), price and whether the publication is available in print or as a downloadable PDF file.

Publications available in print may be obtained from Land & Water Australia's distributor, CanPrint, on freecall 1800 776 616 or by using the online order at the Corporation's website (www.lwa.gov.au/catalogue).

All publications available as PDF files may be downloaded from the 'Our Products' section of Land & Water Australia's website unless otherwise stated.

Reports

PR020277	*Sub-surface Drainage Design and Management Practices in Irrigated Areas of Australia (Irrigation Insights 2)*, E W Christen, J W Hornbuckle (eds), ISBN 095795820X, free, EC020293 electronic copy also (not available on www)
PR020275	*Land & Water Australia Annual Operational Plan 2002–03*, Land & Water Australia, ISBN 642760845, free, electronic copy only
PR020270	*Report of the Inland Rivers Workshop* — reprinted, R Webster and M Williams & Associates Pty Ltd, ISBN 642760624, free, print and electronic copy
PR020269	*River Restoration Framework* — reprinted, J D Koehn et al, ISBN 064276056X, free, print and electronic copy
PR020252	*Rivers Arena Strategic Plan 2001–2006*, Land & Water Australia, ISBN 0642760772, free, print and electronic copy
PR020251	*Managing Nutrients in Floodplain Wetlands and Shallow Lakes — River and Riparian Land Management Technical Guidelines Update No 2 May 2002*, P Bailey et al, ISBN 642760802, free, print copy only
PR020250	*The New National Program for Sustainable Irrigation — Prospectus*, L Chapman, ISBN 642760799, free, print and electronic copy
PR020228	*Managing Climate Variability: An Investment Prospectus 2002–2006*, Land & Water Australia, ISBN 642760764, free, print and electronic copy
PR020226	*National River Contaminants Program: Program Plan 2001/02–2004/05*, Land & Water Australia, ISBN 642760748, free, print and electronic copy
PR020210	*Guidelines for Protecting Australian Waterways*, J Bennett et al, ISBN 642760705, $28.00, print and free electronic copy
PR010158	*Land & Water Australia Annual Report 2000–01*, Land & Water Australia, ISSN 1037-6658, free, print and electronic copy
PR010157	*Managing Riparian Lands in the Sugar Industry: A guide to principles and practices*, S Lovett, P Price, ISBN 957931301, free, print only
PR010115	*Report of the Inland Rivers Workshop*, R Webster and M Williams & Associates Pty Ltd, ISBN 642760624, free, electronic copy only

PR010102	*Land & Water Australia R&D Strategic Plan 2001–2006*, Land & Water Australia, ISBN 0642760632, free, print and electronic copy
PK020217	*The Private and Social Values of Wetlands: an Overview*, JW Bennett and SM Whitten, ISBN 642760721, free, print and electronic copy
PK010162	*Natural Resource Management: People and Policy: Research projects commissioned by the Social and Institutional Research Program of Land & Water Australia*, Blackadder Communication and Naturally Resourceful, free, print and electronic copy
PK010097	*Regional Approaches to Rangeland Planning: Seeking Sustainability in the Western Division of New South Wales by Changing Laws, Policies and Administration*, N Abel and A Langston, ISBN 642760659, free, print and electronic copy
PK010096	*Regional Approaches to Rangeland Planning: Rangeways: Community-based Planning for Ecologically Sustainable Land Use in the North East Goldfields of Western Australian*, J Duffecy et al, ISBN 642760640, free, print and electronic copy
PK010095	*Regional Approaches to Rangeland Planning: Central Highlands Regional Resource Use Planning Project: a Planning and Learning Experience*, A Dale et al, ISBN 642760667, free, print and electronic copy

Fact sheets

PF020294	*Real or unreal water savings?*, NPIRD, free, electronic copy
PF020272	*Climate Variability in Agriculture R&D Program Factsheet Update G1*, CVAP, print only
PF020265	*Land, Water & Wool — Managing Native Vegetation & Biodiversity*, LWW, electronic copy
PF020253	*River and Riparian Management Fact Sheet 1 — Managing Riparian Land*, Rivers Arena, free, print and electronic copy
PF020254	*River and Riparian Management Fact Sheet 2 — Streambank Stability*, Rivers Arena, free, print and electronic copy
PF020255	*River and Riparian Management Fact Sheet 3 — Improving Water Quality*, Rivers Arena, free, print and electronic copy
PF020256	*River and Riparian Management Fact Sheet 4 — Maintaining In-stream Life*, Rivers Arena, free, print and electronic copy
PF020257	*River and Riparian Management Fact Sheet 5 — Riparian Habitat for Wildlife*, Rivers Arena, free, print and electronic copy
PF020258	*River and Riparian Management Sheet 6 — Managing Stock*, Rivers Arena, free, print and electronic copy
PF020259	*River and Riparian Management Fact Sheet 7 — Managing Woody Debris in Rivers*, Rivers Arena, free, print and electronic copy
PF020260	*River and Riparian Management Fact Sheet 8 — Inland Rivers and Floodplains*, Rivers Arena, free, print and electronic copy
PF020229	*Land, Water & Wool: Managing Climate Variability*, LWW, free, electronic copy
PF020227	*NPIRD UPDATE – (combined) No. 1 November 2001; No. 2 February 2002; No. 3 March 2003*, NPIRD, free, electronic copy at <www.npird.gov.au/news>
PF020224	*Land, Water & Wool: Managing Australia's Natural Resources*, LWW, free, electronic copy
PF020223	*Land, Water & Wool: Rivers*, LWW, free, electronic copy
PF020222	*Land, Water & Wool: Managing Native Vegetation & Biodiversity*, LWW, free, electronic copy

PF020221	*Land, Water & Wool: Sustainable Grazing from Saline Land*, LWW, free, electronic copy
PF020220	*Land, Water & Wool: Managing Pastoral Country*, LWW, free, electronic copy
PF020216	*Researching native vegetation — answers to a landscape puzzle*, W Mortlock, free, print and electronic copy
PF020214	*The Ecosystems Services Project Research CWE 27 of SIRP*, CSIRO Sustainable Ecosystems, free, electronic copy
PF020213	*Environmental research: from independent experts to post-modern process managers? Research Project no. ANU 18 of SIRP*, L van Kerkhoff, free, electronic copy
PF020212	*Insight-Systems modelling for catchment management Research CWE 18 of SIRP*, CSIRO Sustainable Ecosystems et al, free, electronic copy
PF020206	*Incorporating Biodiversity Monitoring into Rangeland Condition Assessment*, A Fisher, free, electronic copy
PF020205	*Landscape design principles for native vegetation management: addressing multiple scales*, N MacLeod, free, electronic copy
PF020204	*A National Framework for Landscape Classification*, S McIntyre
PF020203	*Stakeholder values, institutional change and formulating vegetation management policies*, J Sandall, free, electronic copy
PF020202	*Improved vegetation planning for rural landscapes*, S McIntyre et al, free, electronic copy
PF020200	*Vegetation restoration and landscape design for enhanced biodiversity conservation*, D Lindenmayer, free, electronic copy
PF020199	*Landscape level thresholds for conservation of biodiversity in rural environments*, D Bennett and J Radford
PF020198	*Testing approaches to landscape design in cropping lands*, D Freudenberger, free, electronic copy
PF020197	*Genetic and ecological viability of plant populations in remnant vegetation*, A Young, free, electronic copy
PF020196	*Biodiversity dynamics, habitat loss and disturbance in the NSW wheatbelt*, R Bradstock and M Bedward, free, electronic copy
PF020195	*Ecological thresholds for native vegetation management in southern Queensland*, A House, free, electronic copy
PF020190	*Aboriginal planning and management*, OBP, free, electronic copy
PF020189	*What future for the East Kimberley?*, OBP, free, electronic copy
PF020188	*Managing the East Kimberley rangelands*, OBP, free, electronic copy
PF020187	*Using water wisely in the Ord region*, OBP, free, electronic copy
PF020186	*Keeping the lower Ord River and Estuary in good health*, OBP, free, electronic copy
PF020185	*Ord Bonaparte Program: Supporting sustainable development in the East Kimberley*, OBP, free, electronic copy
PF010173	*Interdisciplinary Research in Natural Resource Management Research UMU14 of SIRP*, M Booth and F Frost, free, print and electronic copy
PF010172	*Evaluating Natural Resource Management: Policies and Programs Research USQ3 of SIRP*, C Zammit, free, print and electronic copy
PF010171	*Supporting Decisions: Understanding Natural Resource Management Assessment Techniques Research CLW24 of SIRP*, M Young and S Hajkowicz, free, print and electronic copy

PF010170	*The Potential for Private Sector Nature Conservation in Australia Research ADF5 of SIRP*, S Whitten, free, print and electronic copy
PF010169	*Using Environmental Law for Effective Regulation Research TPF1 of SIRP*, P Martin and M Verbeek, free, print and electronic copy
PF010168	*Social and Institutional Knowledge in Natural Resource Management Research UTA11 of SIRP*, J Davidson and E Stratford, free, print and electronic copy
PF010167	*Using Citizens' Juries for Making Decisions in Natural Resource Management ANU11 of SIRP*, R Blamey, free, print and electronic copy
PF010166	*Evaluating Integrated Catchment Management Research CTC7 of SIRP*, J Bellamy, free, print and electronic copy
PF010165	*Participation in Natural Resource Management: Research and Development SYN1 of SIRP*, T Gleeson, free, print and electronic copy
PF010164	*'It Can't Work Without People': Effective Relationships in Natural Resource Management CAG2 of SIRP*, O Kingma and N Beynon, free, print and electronic copy
PF010163	*Community Participation in Australian Natural Resource Management ANU21 of SIRP*, M Buchy, free, print and electronic copy
PB020234	*Land, Water & Wool — Managing Australia's Natural Resources*, LWW, free, electronic copy
PB020184	*Social and Institutional Research Program (Information Sheet)*, SIRP, free, electronic copy

Periodicals

PN020273	*Land, Water & Wool News June 2002*, LWW, free, electronic copy
PN020271	*Climag Magazine 6*, CVAP, ISSN 1441-7987, free, print and electronic copy
PN010114	*FOCUS on salt Newsletter 21*, NDSP, ISSN 1444-7703, free, print and electronic copy
PN020215	*FOCUS on salt Newsletter 22*, NDSP, ISSN 1444-7703, free, print and electronic copy
PN020267	*FOCUS on salt Newsletter 23*, NDSP, ISSN 1444-7703, free, print and electronic copy
PN020233	*Salt Magazine Issue 6*, NDSP, ISSN 1445-9442, free, print and electronic copy
PN010118	*RipRap Magazine 20*, S Lovett (ed), ISSN 1324-6941, free, print and electronic copy
PN020208	*RipRap Magazine 21*, S Lovett (ed), ISSN 1324-6941, free, print and electronic copy
PN020276	*RipRap Magazine 22*, S Lovett (ed), ISSN 1324-6941, free, print and electronic copy

Other publications and ephemera

PK020266	*The Mostly Free Publication Catalogue June 2002*, Land & Water Australia, free, print and electronic copy
PB010103	*Snapshot: Land & Water Australia R&D Strategic Plan*, Land & Water Australia, free, print and electronic copy
PB010101	*National Dryland Salinity Program — Investment Profile 1998–2003*, NDSP, free, print and electronic copy
IP020268	*River Landscapes Poster*, Rivers Program, free, print copy
IP010092	*Native Vegetation Poster*, Native Vegetation Program, free, print copy
EV010083	*Virtual Cotton*, LWRRDC, free, video available

ED010100	*Salinity credits: A paper at National Dryland Salinity Program Conference, Bendigo, November 2000*, A Gardner, free, electronic copy at www.ndsp.gov.au
ED010099	*Local government: a major player in the battle against salinity?: A paper at National Dryland Salinity Program conference, Bendigo, November 2000*, L Hicks, free, electronic copy at www.ndsp.gov.au
ED010098	*Integrated natural resources management in the Murray-Darling Basin, Australia: the dryland salinity lever: A paper at National Dryland Salinity Program conference, Bendigo, November 2000*, D Farrier, free, electronic copy at www.ndsp.gov.au
EC020232	*Land & Water Australia's Rivers Forum 2002: 20–21 March 2002 — Canberra*, Land & Water Australia, $10.00, CD-ROM available
EC020225	*Guidelines for Protecting Australian Waterways*, B Edgar (Ed), free, CD-ROM available
EC020207	*Natural Resources Management — people and policy: research from the Social and Institutional Research Program of Land & Water Australia*, Land & Water Australia, free, CD-ROM available
EC010104	*Sustainable Primary Industries Research Reports 2001*, Land & Water Australia, free, CD-ROM available
EC010091	*Rivers Research Reports 2001*, Land & Water Australia, free, CD-ROM available

Miscellaneous publications

Innovate Australia magazine (published by joint R&D Corporations — enquiries to Grains R&D Corporation for copies), free. ISSN 1442-6277. www.innovateaustralia.com.au

Australian Landcare (published by Rural Press — with sponsorship by Land & Water Australia and others). ISSN 1440-4397

A recent mail-out of this catalogue hugely increased demand for LWA titles across the board.

Appendix 4: Compliance with Commonwealth Government statutes and policies

The following table provides a summary of Land & Water Australia's compliance with specific statutes and government policies. A compliance index, showing the numbers of pages on which information is provided in response Commonwealth Government legislation and policies, is on page 216.

Statute/Government policy	Obligation	Compliance (see note 1)
PIERD Act	Various	Fully compliant — demonstrated through completed compliance checklist
PIERD Act section (1)(a)(iii)	Revision of the R&D plan and annual operational plan	No revisions during the year
PIERD Act section 28(1)(a)(v) to (viii)	Report if LWA applied for or commercially exploited a patent or was granted a licence under a patented invention, had interests in a company or in forming a company, undertook activities to form a company, or transacted significant acquisitions or disposals of real property	Nothing to report during the year
PIERD Act section 28(1)(a)(iv)	Details of LWA research projects	See page 176
PIERD Act section 143	Ministerial directions	No Minister has notified the Corporation of a Ministerial direction
CAC Act and Auditor-General Act 1997	Various	Fully compliant — demonstrated through completed compliance checklist reviewed by the Corporation's legal advisers and Audit Committee
CAC Act section 15	Significant events	Nil reported during period
Division 3 section 16 of the Commonwealth Authorities and Companies (Report of Operations) Orders 2002	Disclosure of insurance cover	The Corporation has comprehensive insurance cover with the Commonwealth insurer, Comcover, for its directors and officers. In accordance with the contract of insurance with Comcover, the Corporation is prohibited from disclosing details of insurance
Environment Protection and Biodiversity Conservation Act 1999		Compliant; see page 33
Freedom of Information Act 1982		See appendix 8 (page 204)
A New Tax System (Goods and Services) Act 1999		Compliant

Statute/Government policy	Obligation	Compliance (see note 1)
Occupational Health and Safety (Commonwealth Employment) Act 1991	Compliance with occupational health and safety policy	Compliant. During the year, a detailed workplace assessment was undertaken to ensure that each staff member has an effective work environment. There were no accidents and injuries during the year that resulted in significant leave by staff
Section 20 of the Political Broadcasts and Political Disclosures Act 1991	Amount of funds expended	$10,000 was expended towards the stakeholder marketing survey
Archives Act 1983		Compliant
Administrative Decisions (Judicial Review) Act 1977		No matters to report during the year
Parliamentary or administrative reviews		No judicial decisions or decisions of administrative tribunals during the reporting period that have had or may have a significant impact on the Corporation's operations.
		There were no reports from a Parliamentary committee or the Commonwealth Ombudsman regarding the operations of the Corporation
Equal Employment Opportunity Act 1987	The Corporation's terms and conditions of employment promote a work environment free from discrimination in employment matters, ensuring application of the principles of merit and equity. The Corporation also promotes the principles of industrial democracy and a participative work place	Compliant
Government priorities for rural research		See page 162
Payments made to representative organisations related to consultation		Nothing to report; see note 2
Energy efficiency statement		See note 3
Fraud control	Preparation of fraud risk assessments and fraud control plans	Compliant
Management of frequent flyer points	All frequent flyer points accumulated by directors and staff on LWA business must only be redeemed for the benefit of the Corporation	Compliant

Statute/Government policy	Obligation	Compliance (see note 1)
Commonwealth Disability Strategy		Compliant
Legislation/regulations affecting LWA business	LWA is required to comply with the Commonwealth Government's requirements for regulatory best practice arrangements when proposing new regulation or amending existing regulation which impacts on business	LWA has not been involved in any regulatory proposals during the reporting period

Notes:

1. Where 'compliant' appears in this column, details of the actions or policy that constitutes compliance are available on request from the Corporation (public@lwa.gov.au, facsimile 02 6257 3420 or telephone 02 6257 3379).
2. No expenditure is planned during 2002–03.
3. Land & Water Australia supports the Commonwealth Government's enhanced Energy Management Program and energy management guidelines. The guidelines call for improved energy efficiency in relation to vehicles, equipment and building design. The Corporation leases offices as part of a large office complex and does not own large, energy-consuming equipment or commercial vehicles. The Corporation commissioned an energy audit of its premises during the year to identify efficiency measures.

Appendix 5: The Corporation's legislative foundation

Enabling legislation

Land & Water Australia was established on 2 July 1991 under the *Primary Industries and Energy Research and Development Act 1989* (the PIERD Act).

Objects

This table lists the four objects in section 3 of the PIERD Act and outlines the way in which the strategies described in the R&D plan address them.

PIERD Act object	Link to LWA mission and objectives
(a) Increasing the economic, environmental or social benefits to members of primary industries and to the community in general by improving the production, processing, storage, transport or marketing of the products of primary industries	LWA has a planned output to enhance the capacity for Australia's primary industries to manage natural resources sustainably. LWA works with the primary industries (particularly through kindred R&D corporations) to find ways to ensure that natural resources are used sustainably while supporting profitable farming systems.
(b) Achieving the sustainable use and sustainable management of natural resources	This object constitutes LWA's core business; it is the basis for the Corporation's mission and objectives.
(c) Making more effective use of the resources and skills of the community in general and the scientific community in particular	To ensure that LWA meets its corporate objectives for relevance and influence, involvement of all key groups in the design, development and implementation of R&D programs and projects is encouraged.
	The communication strategy has an objective to equip present and future land managers, policy makers, educators and others with the knowledge and tools to expand their capabilities in achieving sustainable natural resource management.
	Through funding postgraduate scholarships and travelling and community fellowships in identified areas of deficiency, the Corporation enhances R&D capacity and makes more effective use of skills of the community.
(d) Improving accountability for expenditure on R&D activities in relation to primary industries.	The LWA key accountability objective, 'to meet all statutory obligations and accountability requirements in a comprehensive, timely and transparent manner', addresses this object.

[The URL for the PIERD Act is: www.austlii.edu.au/au/legis/cth/consol_act/piaerada1989531/]

Functions

The functions of Land & Water Australia, deriving from section 11 of the PIERD Act, are to:

- investigate and evaluate the requirements for research and development relevant to issues affecting the management of land, water and related vegetation resources and, on that basis, prepare a five-year R&D plan, review it annually and revise it if required;
- prepare an annual operational plan for each financial year;
- coordinate or fund the carrying out of R&D activities that are consistent with the annual operational plan;
- monitor, evaluate and report on natural resource management R&D activities that are coordinated or funded, wholly or partly, by the Corporation to the Parliament; the Minister and its representative organisations;
- facilitate the dissemination, adoption and commercialisation of the results of its research and development in relation to the activities in respect of which the Corporation was established; and
- such other functions as are conferred on the Corporation by the PIERD Act or any other Act.

Powers

Section 12 of the PIERD Act grants powers to Land & Water Australia to:

- enter into agreements for carrying out R&D activities;
- make applications for and deal with patents vested in the Corporation;
- charge for work or services rendered by the Corporation;
- accept gifts, grants and bequests, and act as a trustee of money or property vested in the Corporation;
- acquire, hold and dispose of real and personal property;
- join in the formation of a company; and
- do anything incidental to any of its powers.

Appendix 6: Current LWA R&D projects

R&D projects in which Land & Water Australia invested during 2001–02 are as follows, grouped by R&D arena and, below that, by program.

Contact details for the projects and researchers are available from Land & Water Australia (public@lwa.gov.au, facsimile 02 6257 3420 or telephone 02 6257 3379).

Fellowships and postgraduate scholarships

AND1	Bringing people together: integrated catchment management in the Lake Eyre Basin	Kate Andrews	Kate Andrews
DUV5	Relationship between landscape structure and biodiversity conservation	Dr Andrew Bennett	Deakin University
UOC19	Flow effects on cycling of carbon from lowland river macrophytes	Trish Bowen	University of Canberra
UMU12	Understanding the recruitment biology of vegetation communities on saline soils	Michelle Carey	Murdoch University
ANU32	Learning from US volunteer monitoring practices and protocols	Dr Anna Carr	Australian National University
ANU36	Federalism and natural resources management: water in the Murray-Darling Basin	Daniel Connell	Australian National University
GBR2	The role of knowledge and communities in catchment management adjacent to the Great Barrier Reef	Michelle Devlin	Great Barrier Reef Marine Park Authority
ANU14	Mekong region environmental governance	John Dore	Australian National University
UWA27	Community catchment groups, land use change and environmental management systems	Megan Farrelly	University of Western Australia
UOC18	Inland river floodplains: the role of sediment and nutrient exchanges	John Foster	University of Canberra
ANU35	Visual art as an agent for promotion of vegetation management	Jordy Hansson	Australian National University
ANU31	Improving deliberative forms of public participation for decision making on sustainability	Carolyn Hendriks	Australian National University
MQU10	Environmental justice: a transdisciplinary framework for stream rehabilitation and management	Mick Hillman	Macquarie University
UOC21	Hydraulic habitat of inland rivers: the role of large woody debris	Victor Hughes	University of Canberra
ANU37	Indigenous kinship with country: inter-cultural values of natural resource management	Diana James	Australian National University
UMU11	Making decisions for agricultural sustainability: scale as a critical influence	Susan Jennings	Murdoch University

Postgraduates — **enhancing R&D capacity** continued			
STI1	Farming without farming: the book	Christine Jones	Stipa Native Grasses Association
UWO5	Integrating carbon emissions trading with major Australian land management initiatives	David Jones	University of Wollongong
RMI11	South African study tour: effects of salinity on aquatic invertebrates	Ben Kefford	Royal Melbourne Institute of Technology
ANU33	Wheat/sheep landscapes: perceiving the past, present and future	George Main	Australian National University
UMU15	Planning for sustainable land use at the property level in the Australian rangelands	Donald Marshall	Murdoch University
BOB1	'Down the Hopkins' a walk along the Hopkins River	Robert McKenzie	Robert McKenzie
ANU12	Sustainable resource management: consumers' preferences or citizens' deliberations	Simon Niemeyer	Australian National University
PIT1	Valema Farms ... a virtual farming experience	Lawry Pitman	Lawry Pitman
UMU19	Determining transition thresholds between alternative ecological states in saline waterbodies	Lien Sim	Murdoch University
UAD17	Institutional change enabling kangaroo harvest to promote sustainable rangeland landscapes	Dana Thomsen	University of Adelaide
MQU7	Plant functional types: grazing, fire and global warming in rangelands	Peter Vesk	Macquarie University
WEA1	'Lyndfield Park' — looking back, moving forward	John Weatherstone	John Weatherstone
UFL1	Salt storage in the River Murray floodplain	Rebecca Whyatt	Flinders University

Improving Sustainability and Addressing Contemporary Issues in Primary Industries

RST2	Primary Industries and Future Landscapes Arenas Leader	Peter Day	Peter R. Day Resource Strategies Pty Ltd
CSU21	Integrating nature conservation and production agriculture: lessons for Australia based on an international tour	Dr David Goldney	Charles Sturt University
CLY2	Understanding deep drainage for better catchment planning in the northern Murray-Darling basin	Clive Lyle	Clive Lyle and Associates
QNR27	Agrochemical environmental risk management tool for landholders and extension bodies	Bruce Simpson	Queensland Department of Natural Resources and Mines

Land, Water & Wool

TPI2	Sustainable sheep grazing systems for riparian landscapes	Mike Askey-Doran	Tasmanian Department of Primary Industries, Water and the Environment
BLE1	Implementation plan and targeted regional consultations for pastoral sub-program	Don Blesing	Blesing Strategy
BDA1	Benefit : cost analysis of the sustainable wool production initiative.	Drew Collins	BDA Group
DAV39	Marrying biodiversity conservation and productivity in wool production landscapes	Jim Crosthwaite	Department of Natural Resources and Environment (Vic)
SPC3	Editing of 'Saltland Pastures in Australia — a practical guide'	Jo Curkpatrick	SPAN Communication
SIW3	Riparian lands R&D program coordinator — wool component	Dr Siwan Lovett	Lovett Clarke Consulting Pty Ltd
ACI5	Scope of the Future Woolscapes sub-program	Greg Martin	ACIL Consulting Pty Ltd
RPC1	Program coordination for the sustainable grounds for wool initiative	Dr Warren Mason	RPC Solutions
RPC2	Benchmarking — survey dataset and design	Dr Warren Mason	RPC Solutions
UWA28	Fence the demonstration site at Tammin, WA as part of the broader 'profitable and sustainable grazing of saline lands in Western Australia — site 1 project'	Dr David Masters	University of Western Australia
UME66	Red Barren Project	Dr Robert Norton	University of Melbourne
MDP1	Develop a business plan for AWIL to invest in applied natural resources R&D	Russell Pattinson	Miracle Dog Pty Ltd
MDP2	Program coordinator	Russell Pattinson	Miracle Dog Pty Ltd
OPT1	Preparation of a series of case studies from across southern Australia where producers have been implementing grazing systems onto saline land	John Powell	Optimal ICM

Improving Sustainability and Addressing Contemporary Issues in Primary Industries continued			
UNE43	Profitable, biodiverse, wool production systems for the northern tablelands of NSW	Assoc. Prof. Nick Reid	University of New England
DTE1	Best practice survey	Pam Watson	Down To Earth Research
WEB6	Scoping study: 'Sustainable Grounds for Wool' — an NDSP salinity management initiative for the wool industry	Adrian Webb	WEBBNET Land Resource Services Pty Ltd
AGE3	Climate and pastoral coordinator	Dr Barry White	AGEC Consulting
RMI10	Vegetation sub-program coordinator	Dr Jann Williams	Royal Melbourne Institute of Technology

National Dryland Salinity Program

UMU17	A simple computer program for dryland salinity management Australia wide (FLOWTUBE)	Dr Richard W. Bell	Murdoch University
SKP8	Assessment of the efficacy of engineering solutions for management of dryland salinity	Paul F Bolger	Sinclair Knight Merz
CLW28	Generation and delivery of salt and water to streams	Dr Hamish Cresswell	CSIRO Land and Water
SPC1	National Dryland Salinity Program Communication Coordinator — Victoria	Jo Curkpatrick	SPAN Communication
CLW27	Biogeochemical and physical processes in saline soils and potential reversibility	Dr Rob Fitzpatrick	CSIRO Land and Water
NDW30	National Dryland Salinity Program communication coordination — New South Wales	Lisa Gray	NSW Department of Land and Water Conservation
UMU16	Risk and restoration potential for remnant vegetation in salinising landscapes	Prof. Richard J Hobbs	Murdoch University
MDB7	Determining the costs of dryland salinity — Phase II	Richard Ivey	Murray-Darling Basin Commission
CLW29	Predicting the combined environmental impact of catchment management regimes on dryland salinity	Dr Lu Zhang	CSIRO Land and Water
CUR1	Provision of communication coordination services to NDSP	Kim Mitchell	Currie Communications
CUR2	NDSP national communication coordinator — 2001–2003	Kim Mitchell	Currie Communications
MUN1	National Dryland Salinity Program communication coordinator — South Australia	Dr Bruce Munday	Clear Connections
VCE17	Assessment of a system to predict the loss of aquatic biodiversity from changes in salinity	Phil Papas	Department of Natural Resources & Environment
GRD5	One million hectares for the future	Dr Bill Porter	Grains R&D Corporation
GRD6	Farming systems with lower recharge for WA	Dr Bill Porter	Grains R&D Corporation

Improving Sustainability and Addressing Contemporary Issues in Primary Industries continued			
ABC1	ABC series 'Silent Flood' — a production of four programs on the subject of dryland and freshwater salinity in Australia.	Richard Price – Land & Water Australia	Australian Broadcasting Corporation
GRI3	Linking agricultural environmental management systems with ecological processes and objectives at landscape and regional scales	Neil Urwin	Griffin nrm Pty Ltd
QNR25	National Dryland Salinity Program communication coordinator — Queensland	Mark Warnick	Queensland Department of Natural Resources and Mines
DAW32	National Dryland Salinity Program communication coordinator — Western Australia	Georgina Wilson	Department of Agriculture WA

National Program for Sustainable Irrigation (incorporating completed National Program for Irrigation R&D)

DAN14	Determining 'whole-of-system' water use efficiencies for NSW river valleys	Dr Nick Austin	NSW Agriculture
DAN15	An information package on water use efficiency	Dr Nick Austin	NSW Agriculture
CAG5	Socio-economic issues affecting positive change in irrigation communities, scoping study	Noel Beynon	Capital Ag
CLW32	Sustainable management of the Burdekin Delta groundwater systems	Dr Keith L Bristow	CSIRO Land and Water
CTC10	Guidelines for efficient and sustainable trickle irrigation systems	Dr Keith L Bristow	CSIRO Sustainable Ecosystems
DAW39	Developing the concept of satellite links in on-farm irrigation R&D for improved R&D integration across Australia	Geoff Calder	Department of Agriculture WA
CLW25	Development of a national electronic communications strategy and research skills database	Jeremy Cape	CSIRO Land and Water
NRE2	Develop a website to disseminate information about flow management	Alison Carmichael	Naturally Resourceful Pty Ltd
RUP1	NPIRD Program Coordinator	Murray and Liz Chapman	RuralPlan
CSU14	An evaluation of sub-surface irrigation configurations	Philip Charlesworth	Charles Sturt University
CLW20	Best management practices for sub-surface drainage design and management	Dr Evan Christen	CSIRO Land and Water
UNE39	Improving water quality from sub-surface drainage systems in irrigated agriculture	Dr Evan Christen	University of New England
NRE1	Communications coordinator	Anne Currey	Naturally Resourceful Pty Ltd
UCQ3	Ecological risk assessment associated with irrigation in the Fitzroy Basin — stage 2 (with emphasis on macroinvertebrates)	Dr Leo Duivenvoorden	Central Queensland University

Improving Sustainability and Addressing Contemporary Issues in Primary Industries continued			
GMW11	Ecological risk assessment associated with irrigation in the Goulburn Broken — stage 2	Pat Feehan	Goulburn-Murray Water
WTR1	www.npird.gov.au maintenance	Debra Ferguson	Wolf Tracks
QNR26	An evaluation of short-term weather forecasting and risk management to improve irrigation scheduling	Ian Gordon	Queensland Department of Natural Resources and Mines
QNR29	Investigation into the practicality of and potential for controlling evaporation losses from on-farm storages	Melva Hobson	Queensland Department of Natural Resources and Mines
CLW21	Rigorously determined water balance benchmarks for irrigated crops and pastures	Dr Elizabeth Humphreys	CSIRO Land and Water
MDB9	Development of guidelines for quantification and monitoring of seepage from earthen channels	Peter Jackson	Murray-Darling Basin Commission
DAN11	Improving water use efficiency by reducing groundwater recharge under summer pastures	Hayden Kingston	NSW Agriculture
CDH2	Improving the water use efficiency of horticultural crops	Dr Brian Loveys	CSIRO Plant Industry — Horticulture Unit
WRC12	Ecological risk assessment associated with irrigation in the Ord — phase 2, the impact of irrigation return on biodiversity in the Lower Ord River	Dr Mark Lund	WA Waters and Rivers Commission
CID1	Benchmarking irrigation service providers	John Mapson	Australian National Committee on Irrigation and Drainage
CID2	National Irrigation and Drainage Science and Engineering Conference	John Mapson	Australian National Committee on Irrigation and Drainage
CLW43	Australian CRC for Irrigation Resource Management	Prof. Wayne Meyer	CSIRO Land and Water
AQC1	Gaining acceptance of WUE framework, terms and definitions	Jim Purcell	Aquatech Consulting
CID3	Identify independent meter testing facilities, and develop irrigation meter selection installation, operation training modules and manual	Andrew Sinn	Australian National Committee on Irrigation and Drainage
RMG3	Managing water allocation risk — an irrigators toolkit stage 2	Charles Thompson	Rendell McGuckian Agric. & Management Consultants
CTC26	Improved irrigation scheduling for crops underlain by shallow, fresh watertables	Dr Peter Thorburn	CSIRO Sustainable Ecosystems
GRU25	Enhancement of the water market reform process: A socioeconomic analysis of guidelines and procedures for trading in mature water markets	Dr John Tisdell	Griffith University
MCS1	NPIRD Program Coordinator	Brett Tucker	Capital Consulting Partners Pty Ltd

Improving Sustainability and Addressing Contemporary Issues in Primary Industries continued			
DAV37	A review of genetic algorithm technology for irrigation water ordering systems	Dr QJ Wang	Department of Natural Resources and Environment (Vic)
BDA3	Economic evaluation of a proposed project	David Collins	BDA Group
RST3	Program Manager	Peter Day	Peter R. Day Resource Strategies Pty Ltd
CLL1	Scoping project	Clinton Lester	Clinton Lester & Associates
CWW28	Equity and other social implications in the allocation of groundwater for sustainable management	Blair Nancarrow	CSIRO Land and Water — Perth

Climate Variability in Agriculture Program

URS3	Defining researching opportunities for improved applications of seasonal forecasting in south-eastern Australia with particular reference to the southern NSW and Victorian grain regions	Dr Martin Andrew	URS Australia Pty Ltd
CTC16	From oceans to farms: integrated management of climate variability	Dr Andrew Ash	CSIRO Sustainable Ecosystems
QNR24	SILO II: extension, marketing and industry focussed product development	Alan Beswick	Queensland Department of Natural Resources and Mines
VCE14	Strategies to cope with climatic variability in the perennial pasture zone of south-eastern Australia	Stephen Clark	Department of Natural Resources & Environment
QPI43	CLIMARC — computerising the Australian climate archives	Nick Clarkson	Queensland Department of Primary Industries
QPI46	Undertake additional activities to the Streamflow project	Nick Clarkson	Queensland Department of Primary Industries
UQL20	Seasonal climate information and farmers' risk assessment and decision-making	Dr Lenard Dalgleish	University of Queensland
QNR9	Australian grassland and rangeland assessment by spatial simulation — 'Aussie GRASS'	Dr Beverley Henry	Queensland Department of Natural Resources and Mines
UWA21	Innovative workshops to improve understanding of price and climate variability	Dr Ross Kingwell	University of Western Australia
HAS5	Climate Variability in Agriculture R&D Program review	Dr David McClintock	Hassall and Associates Pty Ltd
QNR14	Can seasonal climate forecasting prevent degradation of Australia's grazing lands?	Dr Greg McKeon	Queensland Department of Natural Resources and Mines
QPI44	Can decadal variability (DCV) impact on cropping systems management	Dr Holger Meinke	Queensland Department of Primary Industries

Improving Sustainability and Addressing Contemporary Issues in Primary Industries continued			
COR5	Extended seasonal climate predictions using a dynamic climate model	Dr Gary Meyers	CSIRO Marine Research
CPA2	Climate Variability in Agriculture R&D Program — communication package	Tom Parkes	Capital Public Affairs Consultants
UWA23	The influence of north-west cloud bands on eastern Australian rainfall	Assoc. Prof. Charitha Pattiaratchi	University of Western Australia
CIC6	Climate variability prospectus and launch campaign	Tim Powell	Cox Inall Communications
BOM3	A century's perspective on climate variability and impacts on agriculture	Dr Scott Power	Bureau of Meteorology
BOM5	Effective implementation, adoption and utilisation of new climate model results	Dr Scott Power	Bureau of Meteorology
BOM6	SILO tailored to user's location and preferences for presentation	Dr Scott Power	Bureau of Meteorology
CWE23	Do government policy instruments support sustainable grazing on-farm?	Dr Mark Stafford-Smith	CSIRO Sustainable Ecosystems
AGE1	Program management for the Climate Variability in Agriculture Research and Development Program (Continued to AGE4 — Nov 2001)	Dr Barry White	AGEC Consulting
AGE2	CVAP communication coordination	Dr Barry White	AGEC Consulting
AGE4	Program management for the Climate Variability in Agriculture R&D Program (Brought over from AGE1 — Nov 2001)	Dr Barry White	AGEC Consulting
BOM4	Improved climate prediction during El Nino events	Dr William Wright	Bureau of Meteorology
HRM1	Improved management of climate variability on Australian grain farms	Peter Wylie	Horizon Rural Management

Managing Australian River Landscapes

National Rivers Consortium

WRC11	Torbay System — whole of catchment waterways restoration and management	Naomi Arrowsmith	Waters and Rivers Commission
EPN2	Environmental values of NSW rivers	Prof. Jeff Bennett	Environment Protection Authority, NSW
QEH3	Environmental planning and evaluation guidelines for rivers and floodplains	John Bennett	Queensland Department of Environment
UWA26	National training and education scoping study	Marcus Blacklow	University of Western Australia
CLW35	Analysis of water quality data sets for information on relationships between land uses and water quality	Dr Myriam Bormans	CSIRO Land and Water
UWO3	Process variability in river systems, south-east Australia: implications for river rehabilitation	Timothy Cohen	University of Wollongong
UWA22	Arid zone fish ecology: the importance of floodplain connections	Prof. Peter M Davies	University of Western Australia
UMU18	Alternative stable states: a potential paradigm for managing salinised ecosystems	Dr Jenny Davis	Murdoch University
EDG1	Program consultant	Brendan Edgar	Edgar & Partners
UTA9	The impact of introduced trout on aquatic ecosystems in Australia	William Elvey	University of Tasmania
UNS25	National framework for the management of Australian estuaries	Dr Wayne Erskine	University of New South Wales
UMO35	Distribution of fish larvae and identification of nursery habitats in floodplain rivers	Alison King	Monash University
UME63	Preparation of an Australian handbook of stream roughness coefficients	Dr Anthony Ladson	University of Melbourne
MMA2	Improving the legislative basis for river restoration and management in Australia	Mary Maher	Mary Maher & Associates
UOC16	Habitat heterogeniety and carbon dynamics in semi-arid floodplain river systems	Heather McGinness	University of Canberra
RMM3	www.rivers.gov.au re-design	Brenda Moon	The Reef Multimedia Pty Ltd
MJA1	Investment strategy for transmission losses	Mark Nayar	Marsden Jacob Associates
MCG3	Program coordinator	Dr Phil Price	Mackellar Consulting Group
CLW44	Catchment assessment techniques to help determine priorities in river restoration	Dr Ian Prosser	CSIRO Land and Water
DAN13	Hydrologic effects of floodgate management on coastal floodplain agriculture	Peter Slavich	NSW Agriculture

Managing Australian River Landscapes continued			
MJA2	Institutional arrangements for water authorities to drive water use efficiency	Matthew Toulmin	Marsden Jacob Associates
MWA1	Inland rivers workshop — Alice Springs	Michael Williams	Michael Williams & Associates Pty Ltd

National River Contaminants Program (incorporating completed National Eutrophication Management Program)

UMO39	Contaminants fact sheets and salt sensitivity database	Dr Paul Bailey	Monash University
UTV1	Contaminants fact sheets and salt sensitivity database	Assoc. Prof. Paul Boon	Victoria University of Technology
CWA18	NEMP coordinator	Dr Richard Davis	CSIRO Land and Water — Canberra
EDG2	National River Contaminants Program coordinator	Brendan Edgar	Edgar & Partners

National Riparian Lands R&D Program

BRC1	Gippsland dairy industry project — communications consultancy	Carol Bradshaw	Bradshaw Consulting
MQU9	Experimental reintroduction of large woody debris into rivers — geomorphic and habitat implications	Andrew Brooks	Macquarie University
GRU26	Flow-related responses of floodplain vegetation in arid, inland catchments	Assoc. Prof. Stuart Bunn	Griffith University
GRU27	In-stream ecological issues	Assoc. Prof. Stuart Bunn	Griffith University
UWA25	In-stream ecological issues	Prof. Peter M Davies	University of Western Australia
PLN1	Project consultancy — Yass region for Land, Water & Wool — rivers	Fleur Flanery	Placing Nature
SIW1	Program Coordinator	Dr Siwan Lovett	Lovett Clarke Consulting Pty Ltd
JCU16	Livestock management and the monitoring and evaluation of management practices in riparian ecosystems	George Lukacs	James Cook University
GBC1	Demonstration / evaluation of riparian management: Victoria — Goulburn-Broken region	Bill O'Kane	Goulburn-Broken Catchment Managment Authority
CSU22	Livestock management and the monitoring and evaluation of management practices in riparian ecosystems	Prof. Alistar Robertson	Charles Sturt University
CSU24	Gippsland riparian project	Prof. Alistar Robertson	Charles Sturt University

Managing Australian River Landscapes continued			
UME64	Riparian land management: concepts, floods and erosion	Dr Ian Rutherfurd	University of Melbourne
LSR1	Assessing community capacity through riparian restoration	Dr Don Thomson	Landscape & Social Research

National River Health Program

Phase 2 of the National River Health Program (NRHP) is now being managed by Environment Australia, without Land & Water Australia involvement. The following Phase 1 NRHP research projects are being managed by Land & Water Australia until their completion (expected by the end of 2002).

MDR13	Riverine and floodplain interactions during high flow	Dr Terry Hillman	Murray-Darling Freshwater Research Centre
UMO27	Impact of flow manipulation on the biota of a lowland river	Dr Paul Humphries	Monash University
UOC14	State/Territory monitoring — AUSRIVAS mapping and reference site screening module	Assoc. Prof. Richard Norris	University of Canberra
CLN1	Participatory rural appraisal and planning: innovative methods of working with Aboriginal land managers	Fiona J Walsh	Central Land Council

National Groundwater R&D Program

UNS27	Investigation of leakage pathways through thick smectite clay sequences in the Upper Namoi	Dr Ian Acworth	University of New South Wales
ALL1	Program coordinator	Dr Graham Allison	Allison Partners Pty Ltd
CLW40	A practical guide to regional groundwater investigations in fractured rock aquifers	Peter Cook	CSIRO Land and Water
CLW8	Guidelines for managing groundwater for vegetation health in saline areas	Dr Jim Cox	CSIRO Land and Water
CLW7	Biogeochemical processes induced by groundwater — surface water interactions	Dr Andrew Herczeg	CSIRO Land and Water
MAE1	Groundwater recharge and flow velocities in fractured rock aquifers	Andrew Love	Department of Primary Industries & Resources SA
QNR13	Investigation, assessment and management of groundwater supplies — Atherton Tableland basalts	Bruce R Pearce	Queensland Department of Natural Resources and Mines
UNE42	Causes of eucalypt tree decline in the Namoi Valley	Assoc. Prof. Nick Reid	University of New England
NDW28	Influence of fractures on groundwater flow in an urban saline catchment, Wagga Wagga	Michael Williams	NSW Department of Land and Water Conservation

Managing Vegetation in Rural Landscapes

Joint Venture Agroforestry R&D Program

CPF-2A	Silvicultural management of blackwood (*Acacia melanoxylon*) for growth, form and wood quality	Dr Chris Beadle	CRC for Sustainable Production Forestry
SAR-19A	Integrating agroforestry into low rainfall farming systems	John Bourne	SA Research and Development Institute
BDB-2A	Policy and investment options for achieving environmental and commercial outcomes	Barry Buffier	Barry D Buffier
WS012-06	Workshop on the potential of broadacre wattle seed production	Dr Peter Chudleigh	Agtrans Research
CSL-10A	Using windbreaks to protect soil, crops and livestock	Dr Helen Cleugh	CSIRO Land and Water
UJC-6A	Optimising nutrition for productivity and sustainability of farm forestry systems	Dr Bob Congdon	James Cook University, Tropical Plant Sciences, School of Biological Science
CSF-61A	Natural durability of Eucalyptus trees from farm forestry and low rainfall areas	Dr Laurie Cookson	CSIRO Forestry and Forest Products
SAR-38A	FloraSearch — Selection and development of multipurpose species for large-scale revegetation	Mark Ellis	South Australia Department for Water, Land and Biodiversity Conservation, Pasadena Natural Resource Centre
ANU-52A	Assessing the extent, ecological condition, wood and other tangible and intangible forest values	Dr John Field	ANU School of Resource, Environment and Society
ANU-55A	Identification of pest-resistant Eucalyptus globulus	Dr William Foley	ANU Botany and Zoology
ANU-56A	The potential of bioactive constituents of Eucalyptus foliage as non-wood products from plantations	Dr William Foley	ANU Botany and Zoology
BCL-1A	Landcare loan fund project development	Dougal Gilmour	Broken Catchment Landcare Network Inc.
CSF-60A	'Best bet' products from agroforestry biomass	Dr Jamie Hague	CSIRO Forestry and Forest Products
CSL-18A	Banded agricultural systems for reduced recharge, reduced runoff and greater productivity — a scoping study	Dr Peter Hairsine	CSIRO Land and Water
CAL-6A	Phase farming with trees — field validation and extension	Dr Richard Harper	NSW Department of Conservation and Land Management
CSF-62A	Tree improvement for low rainfall farm forestry	Dr Chris Harwood	CSIRO Forestry and Forest Products
TFG-1A	Farmwood Australia market development	Ross Henderson	TFGA Farmwood

Managing Vegetation in Rural Landscapes continued			
UMU-31A	Trees and biodiversity: an Australian guide to increasing the benefits of farm trees to native biota	Prof. Richard Hobbs	Murdoch University, School of Environmental Science
ANU-35A	Inorganic-bonded wood-composites manufactured from mallee eucalypt and melaleuca species	Dr Ryde James	ANU School of Resource, Environment and Society
ANU-45A	ANU farm forestry market report	Dr Ryde James	ANU School of Resource, Environment and Society
UWA-63A	Profitability of medium to low rainfall agroforestry in the southern Australian cropping zone	Dr Ted Lefroy	University of Western Australia
UWA-64A	Integrate, segregate or rotate trees with crops?	Dr Ted Lefroy	University of Western Australia
WTC-1A	Substitution of farm grown pine for native jarrah in silicon smelters	Craig Leishman	Western Timber Cooperative Ltd, Bridgetown WA
DAQ-222A	The silvicultural basis for farm forestry in Australia — a national, collaborative review	Dr Rosemary Lott	Queensland Department of Primary Industries
CAL-7A	Acacia search	Bruce Maslin	NSW Department of Conservation and Land Management
UMU-19A	Salt tolerant trees with high pulp quality	Assoc. Prof. Jen McComb	Murdoch University, Head of Plant Science, School of Biological Sciences and Biotechnology
CSF-59A	Technologies for managing native forest on farms	Dr Bob McCormack	CSIRO Forestry and Forest Products
KDI-24A	The workboot series — the story of agroforestry in Australia	Catriona Nicholls	Kondinin Group
QDN-4A	A whole-farm and regional agroforestry decision making system	Phillip Norman	Queensland Department of Natural Resources and Mines
UA-55A	An electronic atlas of Australian biomass energy resources	Dr Ian Nuberg	University of Adelaide, Department of Agronomy and Farming Systems, Roseworthy Campus
RDC1	RIRDC / Land & Water Australia joint venture agroforestry program	Dr Deborah O'Connell	Rural Industries R&D Corporation
OIL-4A	Silviculture and water use of short rotation coppicing tree crops (combined with AFT99-08)	Prof. John Pate	Oil Mallee Company of WA
ANU-49A	Marketing successfully: effective strategies for marketing farm forestry products	Dr Digby Race	ANU School of Resource, Environment and Society

Managing Vegetation in Rural Landscapes continued			
UM-44A	Continuation and expansion of the Australian Master Treegrower R&D Program	Rowan Reid	University of Melbourne, Farm Forestry and Agroforestry, School of Resource Management
UM-56A	Australian Master TreeGrower Program — funding gap proposal	Rowan Reid	University of Melbourne, Farm Forestry and Agroforestry, School of Resource Management
UWA-68A	Farm forestry and landscape architecture	Grant Revell	University of Western Australia, School of Architecture and Fine Arts
MS012-18	Integration series — riparian zone guidelines	Lisa Robins	Robins Consulting, Canberra
SFN-1A	Wood and fibre properties of dryland conifers	Doug Rowell	State Forests NSW, Tumut
SSC-3A	Bioenergy Australia (Biomass Taskforce) — renewed contract	Dr Stephen Schuck	Stephen Schuck and Associates
SSC-4A	Participation in IEA Bioenergy 'short rotation crops for bioenergy systems'	Dr Stephen Schuck	Stephen Schuck and Associates
ANU-39A	Assessment of gain from breeding blue mallee	Dr Michael Slee	ANU School of Resource, Environment and Society
CSI-8A	Biomass fuel characterisation study	Wesley Stein	CSIRO Energy Technology
CSI-9A	Characterisation of woody biomass for energy purposes	Wesley Stein	CSIRO Energy Technology
QDN-3A	Estimating the productivity of forestry systems in south-east Queensland	Randal Storey	Queensland Department of Natural Resources and Mines
EPL-1A	Biomass energy production alternatives in Australia: status, costs and future opportunities	Colin Stucley	Enecon Pty Ltd
EPL-2A	Biomass for alcohol fuels — status of technology and cost / benefit analysis	Colin Stucley	Enecon Pty Ltd
DAW-93A	Characterisation of tree root morphology in alley systems	Rob Sudmeyer	Department of Agriculture, WA Esperance
DAW-101A	Hydrological impacts and productivity interactions of integrated oil-mallee farming systems	Dr Peter Taylor	Department of Agriculture, WA
CIE-12A	Emerging markets for environmental services — implications and opportunities for resource management	Dr Martin van Bueren	Centre for International Economics
CSL-9A	A manual for irrigated eucalypts, incorporating salinity impacts	Dr Glen Walker	CSIRO Land and Water

Managing Vegetation in Rural Landscapes continued			
CSW-35A	Building regional Australia's capacity to initiate markets for ecosystem services	Stuart Whitten	CSIRO Sustainable Ecosystems
CSC-1A	Development of a microbial library that utilises eucalyptus oil constituents as carbon source	Dr Michael Zachariou	CSIRO Molecular Science

Native Vegetation R&D Program

DUV6	Landscape thresholds for conservation of biodiversity in rural environments	Dr Andrew Bennett	Deakin University
NNP2	Biodiversity dynamics, habitat loss and disturbance in the NSW wheatbelt	Dr Ross Bradstock	NSW National Parks and Wildlife Service
DAV40	Managing landscapes to meet public biodiversity goals and farm business goals	Jim Crosthwaite	Department of Natural Resources and Environment (Vic)
TRC1	Incorporating biodiversity monitoring into rangeland condition assessment	Alaric Fisher	Tropical Savannas Management Cooperative Research Centre
CSE9	Testing approaches to landscape design in cropping lands	Dr David Freudenberger	CSIRO Sustainable Ecosystems
DEP11	A landscape approach to determine the ecological value of scattered trees	Michael Hodder	Department of Environment and Heritage
QNR28	Ecological thresholds for native vegetation management in southern Queensland	Dr Alan House	Queensland Department of Natural Resources and Mines
ANU34	Vegetation restoration and landscape design for enhanced biodiversity conservation	Dr David Lindenmayer	Australian National University
CSE7	Landscape design principles for native vegetation management: addressing multiple scales	Neil MacLeod	CSIRO Sustainable Ecosystems
CTC9	Applying management principles in variegated landscapes: identifying production: conservation trade-offs	Neil MacLeod	CSIRO Sustainable Ecosystems
CSE8	A national framework for landscape classification	Dr Sue McIntyre	CSIRO Sustainable Ecosystems
CTC27	Improved vegetation planning for rural landscapes	Dr Sue McIntyre	CSIRO Sustainable Ecosystems
UNE41	Stakeholder values, institutional change and formulating vegetation management policies	Mean Sandall	University of New England
RMI8	Program coordinator	Dr Jann Williams	Royal Melbourne Institute of Technology
CPI10	Genetic and ecological viability of plant populations in remnant vegetation	Dr Andrew Young	CSIRO Plant Industry

Future Landscapes and Compatible Industries

RST2	Future Landscapes and Primary Industries Arenas Leader	Peter Day	Peter R. Day Resource Strategies Pty Ltd

Redesigning Agriculture for Australian Landscapes R&D Program

UOC20	Mapping regional metabolism: an essential decision support tool for NRM	Dr Janis Birkeland	University of Canberra
UME65	Community exploration of changing landscape values	Assoc. Prof. Ian Bishop	University of Melbourne
CDS21	Water and nitrogen balances in the Australian wet tropics: a search for sustainable design principles	Dr Keith L Bristow	CSIRO Land and Water
LMS1	Documenting the concepts of the 'ecosystems farm management' approach	David Chambers	Land Management Society Inc.
SPV1	RAAL program coordinator	David Clarke	EFECT Pty Ltd
GRI2	Future landscapes scoping study	Dr Kate Duggan	Griffin nrm Pty Ltd
CPI7	Innovative soil and water management for sustainable agriculture in the Mediterranean climatic zone — WA	Dr Ian R P Fillery	CSIRO Plant Industry
CSE5	Transition to a biofuel economy in Australia	Barney Foran	CSIRO Sustainable Ecosystems
SYN3	Redesigning Agriculture for Australian Landscapes R&D Program review	Tony Gleeson	Synapse Agric. & Resource Consulting
CLW36	Conceptual framework for landscape redesign	Dr Stefan Hajkowicz	CSIRO Land and Water
ALB1	Fund for Future Farming Systems scoping study	John Harry	Allens Business Solutions Pty Ltd
CPI9	Linkage of Grazplan pasture/animal models to APSIM crop/soil models and the SWIM water balance	Dr Andrew Moore	CSIRO Plant Industry
UWA18	Water and nitrogen economies of native plant communities and comparison with agricultural systems in WA	Prof. John S. Pate	University of Western Australia
CRS1	Review of farmer initiated innovative farming systems	Ian Perkins	LPM Creative Rural Solutions
CDS20	Manipulating water and nutrient uptake to minimise leaching	Dr Chris Smith	CSIRO Land and Water

Cross-cutting Arena

Ord-Bonaparte Program

CSE6	OBP Program Evaluation	Jennifer Bellamy	CSIRO Sustainable Ecosystems
CSE3	Regional resource futures for the East Kimberley (Component C — tools)	Dr Romy Greiner	CSIRO Sustainable Ecosystems
DAW34	Characterisation and assessment of rangeland resources	Dr Paul Novelly	Department of Agriculture WA
KLC2	Planning for country	Kylie Pursche	Kimberley Land Council
CLW37	Needs analysis for project on maintaining healthy waterways in the Lower Ord, Keep and estuaries	Dr Christian Roth	CSIRO Land and Water
CLW38	Needs analysis for best utilisation of water resources for the Ord irrigation area	Dr Christian Roth	CSIRO Land and Water
CLW41	Best utilisation of water resources for the Ord irrigation area	Dr Ramsis Salama	CSIRO Land and Water
CDM8	The Ord-Bonaparte Resource Information System: a community resource for regional development	Dr Kerry Taylor	CSIRO Mathematical and Information Sciences
CMR2	Scoping study to establish a baseline for physical, biological, cultural, institutional and economic values of the estuarine, coastal and marine resources in the Ord-Bonaparte	Dr John Volkman	CSIRO Marine Research

Social and Institutional Research Program

RPM2	Evaluation of producer initiated and managed R&D	Dr Jennifer Andrew	Resource Policy and Management Consultants
ACG1	Social and Institutional Research Program mid-term review	Dr John Bell	The Allen Consulting Group
BLA1	SIRP reports communication	Jesse Blackadder	Blackadder Communication
UNE35	Ecological and social functions influencing governance of natural resources	Dr David Brunckhorst	University of New England
UNE40	Creating a contemporary common property resource management institution	Dr David Brunckhorst	University of New England
BRR19	Review and analysis of the drivers of and constraints to producer adoption of sustainable practices derived from research	Prof. John Cary	Bureau of Rural Sciences
CWE27	Assessing ecosystem goods and services	Dr Steven Cork	CSIRO Sustainable Ecosystems
CWA20	Development of an Integrated Catchment Management Software (ICMS) package	Susan Cuddy	CSIRO Land and Water — Canberra
CSU23	Assessing and managing burnout in Landcare members, leaders and coordinators	Dr Allan Curtis	Charles Sturt University

Cross-cutting Arena continued			
ANU24	Implications for Australian natural resource management of international experiences in institutional change and reform arising from sustainable development	Dr Steve Dovers	Australian National University
HAS6	Research meets policy — SIRP Commonwealth briefings	Peter Franklin	Hassall and Associates Pty Ltd
CWE18	Spatio-temporal effectiveness of natural resource and rural adjustment policies	Dr Russell Gorddard	CSIRO Sustainable Ecosystems
ANU22	Social and institutional implications of landscape and land use change	Dr David Lindenmayer	Australian National University
MMA3	Analysis of transferability of successful organisational and program models across natural resource jurisdictions and regions	Mary Maher	Mary Maher & Associates
USA3	Sustainability with profitability: rural adjustment via water markets	Prof. Jennifer McKay	University of South Australia
UWO4	The effectiveness of the integration of water and land use planning	Carla Mooney	University of Wollongong
BOR1	National coordination of the Social and Institutional Research Program	Kenneth Moore	Boorara Management and Consulting
CSE4	Integrating cross —jurisdictional planning and assessment for sustainable regions	Tiffany Morrison	CSIRO Sustainable Ecosystems
ING1	Where's Wally? — Reflections on integration of social science in NRM organisations 1980–2000	Dr Alice Roughley	Integrations
ANU18	Environmental science: from independent experts to post-modern process managers	Lorrae Van Kerkhoff	Australian National University
SWR1	Integrating themes coordinator	Su Wild River	Su Wild River

General Call

UNE36	Meeting the need for function-based assessments of soil biological health	Dr Keith J Hutchinson	University of New England
CLW30	Pesticide impact rating index: validation and adoption	Dr Rai Kookana	CSIRO Land and Water
CLW10	Mid-infrared spectroscopy for rapid prediction of soil physical properties	Richard Merry	CSIRO Land and Water
UNE37	National audit of changes in farmers' environmental attitudes since 1991	Ian Reeve	University of New England
CLW31	Soil Biota: its function in sustainable soil management	Dr Steve Rogers	CSIRO Land and Water
CTC17	Improved integrated resource use planning in the Australian sugar industry	Dr Daniel Walker	CSIRO Sustainable Ecosystems

National Land and Water Resources Audit

QPI45	Implementation of the Australian Collaborative Rangelands Information System — Queensland	Eric Anderson	Queensland Department of Primary Industries
PWA3	Implementation of the Australian Collaborative Rangelands Information System — Northern Territory	Rod Applegate	NT Department of Infrastructure, Planning and Environment
BRR6	Coordination of land-use mapping of KIAs	Dr Michele Barson	Bureau of Rural Sciences
DAW27	Land-use and vegetation mapping: Western Australia	Greg Beeston	Department of Agriculture WA
BRR17	Provision of data management services to the Audit	Dr Steve Blake	Bureau of Rural Sciences
RPM3	Indigenous information needs in Australia's rangelands	Roland Breckwoldt	Resource Policy and Management Consultants
NNP1	Sub-regional biodiversity synopsis reporting and conservation strategy options case studies	Mike Cavanagh	NSW National Parks and Wildlife Service
AGT8	Monitoring and Evaluation of the National Land and Water Resources Audit	Dr Peter Chudleigh	Agtrans Research
BRR10	Catchment water balance and land use impacts.	Jane Coram	Bureau of Rural Sciences
BRR15	Evaluation framework for dryland salinity	Jane Coram	Bureau of Rural Sciences
DET8	Development of Vegetation Theme information products	Bruce Cummings	Environment Australia
BRR13	Access, audit and compilation of digital vegetation extent and condition data	Dr Stuart Davey	Bureau of Rural Sciences
DRD4	National Dairy Land and Water Audit: sustaining our natural resources	Peter Day	Dairy R&D Corporation
DAW30	Soil acidity and acidification	Perry Dolling	Department of Agriculture WA
NDW31	Implementation of the Australian Collaborative Rangelands Information System — New South Wales	Daryl Green	NSW Department of Land and Water Conservation
CLW18	Assessment of river condition	Dr Graham Harris	CSIRO Land and Water
QNR18	Intensity of land use	Dr Beverley Henry	Queensland Department of Natural Resources and Mines
CSE11	Analysis of flora data and Australia-wide biodiversity analysis	Dr Craig James	CSIRO Sustainable Ecosystems
THA2	Provision of communication services to Audit (print products)	Robin Jean	Themeda
EAR3	Provision of communication services to Audit electronic information products, display and presentation material, sub-program coordination)	Dr Dave Johnson	Beatentrack Group
EAR5	Web reporting system	Dr Dave Johnson	Beatentrack Group

National Land and Water Resources Audit continued			
M4K1	Australian Collaborative Rangelands Information System Coordinator	Maria Kraatz	M4K Environmental Consulting
DAS20	Implementation of the Australian Collaborative Rangelands Information System — South Australia	Brendan Lay	Department of Primary Industries, SA
EPAQ1	Sub-regional biodiversity synopsis reporting and conservation strategy options case studies	Andrea Leverington	Environmental Protection Agency
EPAQ2	Terrestrial biodiversity database integration and analysis	Andrea Leverington	Environmental Protection Agency
MAT1	Specification for the development of vegetation profiles for the NVIS	Dr Libby Mattiske	Mattiske Consulting
CLW34	Monitoring the condition and trend of land resources in Australia	Dr Neil McKenzie	CSIRO Land and Water
CCM6	Sub-regional biodiversity synopsis reporting and conservation strategy options case studies	Norm McKenzie	Department of Conservation and Land Management, WA
GMO1	Landscape health assessment	Gethin Morgan	Gethin Morgan
DAW35	Implementation of the Australian Collaborative Rangelands Information System — Western Australia	Dr Paul Novelly	Department of Agriculture WA
DET9	Provision of information management services to the Audit	Kate Ord	Environment Australia
DAV38	Sub-regional biodiversity synopsis reporting and conservation strategy options case studies	David Parkes	Department of Natural Resources and Environment (Vic)
TPI1	Sub-regional biodiversity synopsis reporting and conservation strategy options case studies	David Peters	Tasmanian Department of Primary Industries, Water & the Environment
CLW42	Communication and adoption of the Audit sediment and nutrient budgets	Dr Ian Prosser	CSIRO Land and Water
RAD1	Audit Draft Final Report	Dr John Radcliffe	Dr John Radcliffe
CIE6	Capacity for change: coordination and reporting	Dr George Reeves	Centre for International Economics
CLW13	Soil nutrient status	Dr Doug Reuter	CSIRO Land and Water
RAS1	Reporting for Theme 5 — Agricultural Productivity and Sustainability	Dr Doug Reuter	Reuter & Associates
DEP10	Sub-regional biodiversity synopsis reporting and conservation strategy options case studies	Tony Robinson	Department of Environment and Heritage
PSA3	Audit Biodiversity Assessment Theme Coordination	Dr Paul Sattler	Paul Sattler
DAV35	Signposts for Australian agriculture — synthesis and integration	Victor Sposito	Department of Natural Resources and Environment (Vic)

National Land and Water Resources Audit continued			
CLW15	Estuarine health assessment	Lynne Turner	CSIRO Land and Water
BRR12	Land use change, productivity and enterprise diversification	Dr James Walcott	Bureau of Rural Sciences
SKT1	Benchmarking current rural industry practices, productivity, environmental impact and assessing the capacity to implement change	Bob Walker	Sinclair Knight Merz Pty Ltd, Toowoomba
CLW26	An initial assessment of catchment condition	Dr J. Walker	CSIRO Land and Water
SKL1	Development of the Australian Natural Resources Atlas and Data Library — version 2.0	Noel Ward	Sinclair Knight Merz (LANDINFO)
RMI9	Analysis, compilation and draft final reporting for the Audit Biodiversity Theme	Dr Jann Williams	Royal Melbourne Institute of Technology
PWN1	Sub-regional biodiversity synopsis reporting and conservation strategy options case studies	Dr John Woinarski	RTM Parks and Wildlife Commission NT
CLW14	Valuing the resource base and costs of degradation	Mike Young	CSIRO Land and Water

Corporate outputs

Portfolio Management

IBM1	Knowledge mapping and strategy development	Shawn Callahan	IBM Australia
AGT9	Development of a portfolio investment proposal for Land & Water Australia. (see also project DIA1)	Dr Peter Chudleigh	Agtrans Research
BDA2	Return on Investment (ROI) evaluation consultancy	Drew Collins	BDA Group
BRR21	Identifying regional planning skill needs for integrated natural resource management	Dr Allan Curtis	Bureau of Rural Sciences
DIA1	Development of a portfolio investment proposal for Land & Water Australia.(see also project AGT9)	Dr Diana Day	Diana Day
INF8	Land & Water Australia innovations database stage 2 development (see also INF7)	Brenda Gerrie	Infoscan Pty Ltd
BRR20	A method to map regional capacity to adopt more sustainable natural resources management practices	Dr Gerald Haberkorn	Bureau of Rural Sciences
CWA28	Estimation of the scale of management solutions required in natural resource management: continental scale	Dr Neil McKenzie	CSIRO Land and Water — Canberra
URS4	Economic assessment of desalination technologies in National Action Plan priority regions	Geoff Moyle	URS Australia Pty Ltd
AQU8	EcoPlan transfer	Laslo Nagy	Atech Group Pty Ltd
CIE8	Assessing the influence and leverage of Land & Water Australia funds	Dr George Reeves	Centre for International Economics

Communication Management

PFF1	Case study series: essential elements — Australian stories	Gregg Borschmann	Peoples Forest Foundation
INF7	Development of a web-based innovations database prototype (see also INF8)	Brenda Gerrie	Infoscan Pty Ltd
INF9	Streamline 2002	Brenda Gerrie	Infoscan Pty Ltd
INF6	Streamline Database 1998–2001	Pam Handyside	Infoscan Pty Ltd
BRR22	2002 AFFA Science and Innovation Awards for Young People	Dr Peter O'Brien	Bureau of Rural Sciences
RFB1	Sponsorship of the 2001 River Symposium	Trevor Reddacliff	Riverfestival Brisbane Pty Ltd

Business Management

CQS3	Internal quality auditing	Murray Feddersen	CQS Australia
CQS8	Further development and enhancement of the quality management system	Murray Feddersen	CQS Australia
AQU7	Commercialisation consultancy	Laslo Nagy	Atech Group Pty Ltd

Appendix 7: Report of the committee to select directors

LAND & WATER AUSTRALIA
SELECTION COMMITTEE

Ms Carolyn Tanner
c/o University of Sydney
Faculty of Agriculture, Food and Natural Resources
NSW 2006 Australia
c.tanner@agec.usyd.edu.au
Tel: 02 9351 2573

Senator the Hon. Judith Troeth
Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry
Parliament House
CANBERRA ACT 2600

Dear Senator

I am pleased to submit the annual report of the Land and Water Australia Selection Committee which you established in December 2001, pursuant to section 141(1) of the *Primary Industries and Energy Research and Development Act 1989*.

Now that the work of the Selection Committee has been completed, I hereby formally abolish it pursuant to section 129 of the Act.

Yours sincerely

Carolyn Tanner
Presiding Member
Land & Water Australia Selection Committee
6 August 2002

LAND & WATER AUSTRALIA
SELECTION COMMITTEE

LAND & WATER AUSTRALIA SELECTION COMMITTEE ANNUAL REPORT

Establishment of the Selection Committee

The Land & Water Australia (LWA) Selection Committee was established under the *Primary Industries and Energy Research and Development Act 1989* (PIERD Act) for the purpose of nominating to the Minister persons for appointment as Directors of the LWA Board.

The Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry, appointed Ms Carolyn Tanner, Associate Dean of the Faculty of Agriculture, Food and Natural Resources at the University of Sydney, as the Presiding Member of the LWA Selection Committee for a three-year period commencing 23 July 2001.

The Representative Organisations of LWA, the Australian Conservation Foundation and the National Farmers' Federation, nominated Mr Michael Krockenberger, Mr Angas Hopkins, Mr Ralph Leutton and Mr Wayne Cornish for appointment to the LWA Selection Committee.

The Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry appointed Messrs. Krockenberger, Hopkins, Leutton and Cornish to the LWA Selection Committee on 22 February 2002. Further details concerning the Selection Committee members are given in Attachment A.

The Selection Process

Advertisements were placed in the national and rural press and on the Internet from 18 January 2002, with a nominal closing date for applications of 22 February 2002. As part of the process, the AFFA Balance Database was consulted, and as a result a number of individuals were sent letters drawing their attention to the advertisement. The Presiding Member also advised a number of suitable persons of the call for applications. The Selection Committee received a total of 281 applications and interviewed 15 applicants on 6–7 May 2002.

At the completion of the interviews, the Selection Committee drew up a list of preferred applicants. In accordance with section 131 of the PIERD Act, six persons were selected for nomination for appointment in the Committee's report to the Parliamentary Secretary, dated 31 May 2002. In considering the nominations submitted by the Selection Committee, the Parliamentary Secretary invoked her powers under section 134 of the PIERD Act and sought further nominations.

Appointments by the Parliamentary Secretary to the Minister

The persons appointed to the LWA Board by the Parliamentary Secretary to the Minister are Mr Warwick Watkins, Mr Michael Logan, Dr David Pannell, Mr Tim Fisher, Mr John Childs and Professor Peter Cullen.

The Selection Committee is unanimously of the view that the six persons appointed to the LWA Board by the Parliamentary Secretary collectively possess a balance of expertise in the areas listed in subsection 131(1) of the PIERD Act, that is, commodity production, processing and marketing; management and conservation of natural resources; science, technology and technology transfer; environmental and ecological matters; administration of research and development; economics; finance and business management; and sociology.

Costs

The operations of the Selection Committee entailed costs of $54,184.45. A summary of these costs is set out in Attachment B.

ATTACHMENT A

Members of the LWA Selection Committee

Presiding Member:

MS CAROLYN TANNER

Ms Tanner is Senior Lecturer in Agricultural Economics and Associate Dean of the Faculty of Agriculture, Food and Natural Resources at the University of Sydney. She is currently a member of the Quarantine and Exports Advisory Council, and in 1998 she chaired the National Competition Policy Review of the *Imported Food Control Act 1992*.

Members:

MR MICHAEL KROCKENBERGER
Mr Krockenberger is Strategies Director for the Australian Conservation Foundation.

MR ANGAS HOPKINS
Mr Hopkins is Principal Research Scientist at the Western Australian Department of Conservation and Land Management.

MR RALPH LEUTTON
Mr Leutton is Program Manager of Cotton Australia Ltd.

MR WAYNE CORNISH
Mr Cornish is Vice President of the National Farmers' Federation and chairs the NFF Environment Committee.

ATTACHMENT B

Expenses of the LWA Board Selection Committee

Expenditure for the year ended 30 June 2002

	$
Airfares and travel	21,372.86
Advertising	13,140.68
Secretariat	12,244.20
Sitting fees	6,750.00
Freight	74.16
Other	602.55
Total	**54,184.45**
Total (including GST)	**59,602.92**

Appendix 8: Freedom of information statement

As a Commonwealth statutory authority, the Corporation is subject to the *Freedom of Information Act 1982*.

Categories of documents

Documents relating to research and development activities funded by the Corporation are held at the office in Canberra, including the following.

Category	Nature	Customarily made available	Not customarily made available*
Planning documents including R&D plan, annual operational plan and annual report	Files		✔
Annual report	Files		✔
	Publications	✔	
Applications and agreements	Files and forms		✔
Financial and project administration	Files and electronic data		✔
	Publications	✔	
Information relating to the commercialisation of R&D	Files		✔
R&D plan	Files		✔
	Publications	✔	
R&D reports and occasional papers	Files		✔
	Publications	✔	
Staff administration and personnel	Files		✔

* For privacy or commercial-in-confidence reasons

Freedom of information statistics

Freedom of information requests received:	Nil
Internal review received:	Nil
Administrative Appeals Tribunal appeals:	Nil

Facilities and procedures for Freedom of Information access

Members of the public can examine documents at the Corporation's office in Canberra by contacting the Business Manager on (02) 6257 3379. Office hours are Monday to Friday between 8.30 am and 5.00 pm. Access to the documents incurs a fee as prescribed under the Freedom of Information Act.

This statement is correct to 30 June 2002.

Appendix 9: Program Management Committees membership

Membership is as at 30 June 2002.

Placement of committees in R&D programs reflects the 2002–03 committee structure.

* denotes Chair of the committee in 2001–02.

A list of abbreviations is on pages 212–213.

Improving Sustainability and Addressing Contemporary Issues in Primary Industries

Program	Name	Organisation
Land, Water & Wool (Sustainable Wool Advisory Group)	M. Arthur	AWI producer nominee
	A. Campbell	LWA
	W. Crozier *	AWI producer nominee
	P. Day	LWA consultant
	T. Dunbabin	LWA producer nominee
	L. Hogan	AWI manager
	M. Lloyd	LWA producer nominee
	A. Lovett	LWA
	W. Merriman	AWI producer nominee
National Dryland Salinity	S. Butters	Vic DNRE
	P. Cole	PIRSA
	I. Cox	Bank of Melbourne
	S. Donaldson	LWA
	K. Goss *	MDBC
	G. Latta	GRDC
	M. Lee	AFFA
	B. Nulsen	WA Agriculture
	G. Pinkard	Tas DPIWE
	M. Poole	CSIRO
	R. Price	LWA
	B. Vandersee	Qld DNRM
	R. Williams	NSW DLWC

Program	Name	Organisation
Climate Variability in Agriculture	A. Cousins	AFFA
	B. Fargher	NFF
	M. Kelly	AFFA
	M. Logan *	LWA
	S. Lolicato	LWA
	S. Nelson	GRDC
	J. O'Connor	DRDC
	R. Troedson	SRDC
	G. Wilson	RIRDC
Sustainable Grain and Grazing Systems (Scoping Phase)	J. Harvey	GRDC
	K. McCann	AWI
	R. Price *	LWA
	B. Russell	MLA

Managing Australian River Landscapes

Program	Name	Organisation
National Rivers Consortium	D. Blackmore	MDBC
	L. Boully *	LWA
	A. Campbell	LWA
	G. Fishburn	NSW DLWC
	D. McFarlane	WA WRC
	J. Williams	CSIRO Land and Water
National Riparian Lands (Management Committee)	S. Donaldson *	LWA
	C. Ellis	LWA
National Riparian Lands (Advisory Group)	J. Amprimo	Qld DNRM
	R. Applegate	NT DIPE
	M. Askey-Doran	Tas DPIWE
	R. Denham	NSW DLWC
	S. Donaldson *	LWA
	J. Doolan	Vic DNRE
	C. Ellis	LWA
	L. Hunt	AFFA
	V. Klemm	WA WRC
	J. Lovett	Environment ACT
	N. Power	SA DWLBC

Program	Name	Organisation
Sustainable Irrigation	M. Logan *	LWA
	A. McCrea	WA WRC
	W. Meyer	CSIRO Land and Water
	S. Mills	Goulburn-Murray Reg Mgt Board
	G. Nielson	Qld irrigator
	N. Schofield	LWA
	R. Wells	Sunraysia Regional Mgt Board
	R. Williams	NSW DLWC
	G. Wright	NSW irrigator
	D. Yule	Qld DNRM
National River Contaminants	G. Bickford	MDBC
	A. Campbell *	LWA
National Groundwater R&D	B. Harris	SA DME
	N. Schofield *	LWA
	H. Ventriss	WA WRC
	J. Verhoeven	NSW DLWC

Managing Vegetation in Rural Landscapes

Program	Name	Organisation
Native Vegetation R&D	S. Bunn *	LWA
	J. Burdon	CSIRO Plant Industry
	A. Kearns	CSIRO Sustainable Ecosystems
	S. Keyworth	MDBC
	N. Schofield	LWA
Joint Venture Agroforestry (managed by RIRDC)	J. Alexandra	LWA
	M. Baldwin	AFFA
	S. Barlow	University of Melbourne
	A. Boutland	WA
	A. Campbell *	LWA
	R. Clark	RIRDC
	P. Core	RIRDC
	S. Davis	MDBC
	G. Kile	FWPRDC
	W. Ragg	AFG
	R. Stanton	PTAA

Future Landscapes and Compatible Industries

Program	Name	Organisation
Redesigning Agriculture for Australian Landscapes R&D	J. Alexandra *	LWA
	N. Schofield	LWA
	R. Stirzaker	CSIRO Land and Water
	J. Williams	CSIRO Land and Water

Cross-cutting Activities

Program	Name	Organisation
Ord-Bonaparte	J. Butters	Community rep; no organisational affiliation
	A. Campbell	LWA
	R. Dalton	AFFA
	B. Dwyer	Community rep; no organisational affiliation
	R. Edmondson *	Independent; no organisational affiliation
	J. Gooding	Community rep; no organisational affiliation
	D. Hartley	Agriculture WA
	A. McEwen	Community rep; no organisational affiliation
	M. Middap	Community rep; no organisational affiliation
	C. Mobbs	LWA
	S. Morton	CSIRO Sustainable Ecosystems
	S. Worley	WA WRC
Social and Institutional Research	J. Gordon	CIE
	C. Mobbs	LWA
	C. Willcocks *	LWA

Other

Program	Name	Organisation
General Call, Scholarships and Fellowships	D. Clarke	EFECT Pty Ltd
	C. Ellis	LWA
	N. Schofield *	LWA
	R. Shaw	CRC for Coastal Zone, Estuary and Waterway Management
National Land and Water Resources Audit	C. Creighton	NLWRA
	R. Green *	Independent; no organisational affiliation
	S. Hunter	EA
	J. Radcliffe	CSIRO
	P. Sutherland	Standing Committee representative
	W. Watkins	ANZLIC, LWA
	R. Wickes	Standing Committee representative
	J. Womersley	Standing Committee representative
	B. Wonder	AFFA

List of abbreviations

AFFA	Department of Agriculture, Fisheries and Forestry – Australia
AFG	Australian Forest Growers
ANAO	Australian National Audit Office
ANU	Australian National University
ANZLIC	Australia New Zealand Land Information Council
ARRIP	Australian Rural Research in Progress
Audit	National Land and Water Resources Audit
CAC Act	*Commonwealth Authorities and Companies Act 1997*
CIE	Centre for International Economics
COAG	Council of Australian Governments
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVAP	Climate Variability in Agriculture R&D Program
DIPE	Department of Infrastructure, Planning and Environment (NT)
DLWC	Department of Land and Water Conservation (NSW)
DME	Department of Mines and Energy (SA)
DNRM	Department of Natural Resources and Mines (Queensland)
DRDC	Dairy Research and Development Corporation
DWLBC	Department of Water, Land and Biodiversity Conservation (SA)
EA	Environment Australia
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESD	ecologically sustainable development
FWPRDC	Forest and Wood Products R&D Corporation
GIS	geographic information systems
GRDC	Grains Research and Development Corporation
ISO	International Standards Organization
JVAP	Joint Venture Agroforestry R&D Program

LWA	Land & Water Australia (legislated title: Land and Water Resources Research and Development Corporation)
MDBC	Murray-Darling Basin Commission
MLA	Meat and Livestock Australia
NAP	National Action Plan for Salinity and Water Quality
NDSP	National Dryland Salinity Program
NFF	National Farmers' Federation
NHT	Natural Heritage Trust
NLWRA	National Land and Water Resources Audit
NPIRD	National Program for Irrigation R&D
NPSI	National Program for Sustainable Irrigation
NRC	National Rivers Consortium
NRHP	National River Health Program
NSW DLWC	New South Wales Department of Land and Water Conservation
NT DIPE	Northern Territory Department of Infrastructure, Planning and Environment
PIERD Act	*Primary Industries and Energy Research & Development Act 1989*
PIRSA	Primary Industry and Resources South Australia
PTAA	Plantation Timber Association of Australia
Qld DNRM	Queensland Department of Natural Resources and Mines
R&D	Research and development
RDC	Research and Development Corporation
RIRDC	Rural Industries Research and Development Corporation
SA DME	South Australian Department of Mines and Energy
SA DWLBC	South Australian Department of Water, Land and Biodiversity Conservation
SIRP	Social and Institutional Research Program
SRDC	Sugar Research and Development Corporation
Tas DPIWE	Tasmanian Department of Primary Industries, Water and Environment
Vic DNRE	Victorian Department of Natural Resources and Environment
WRC	Water and Rivers Commission (WA)
www	World Wide Web

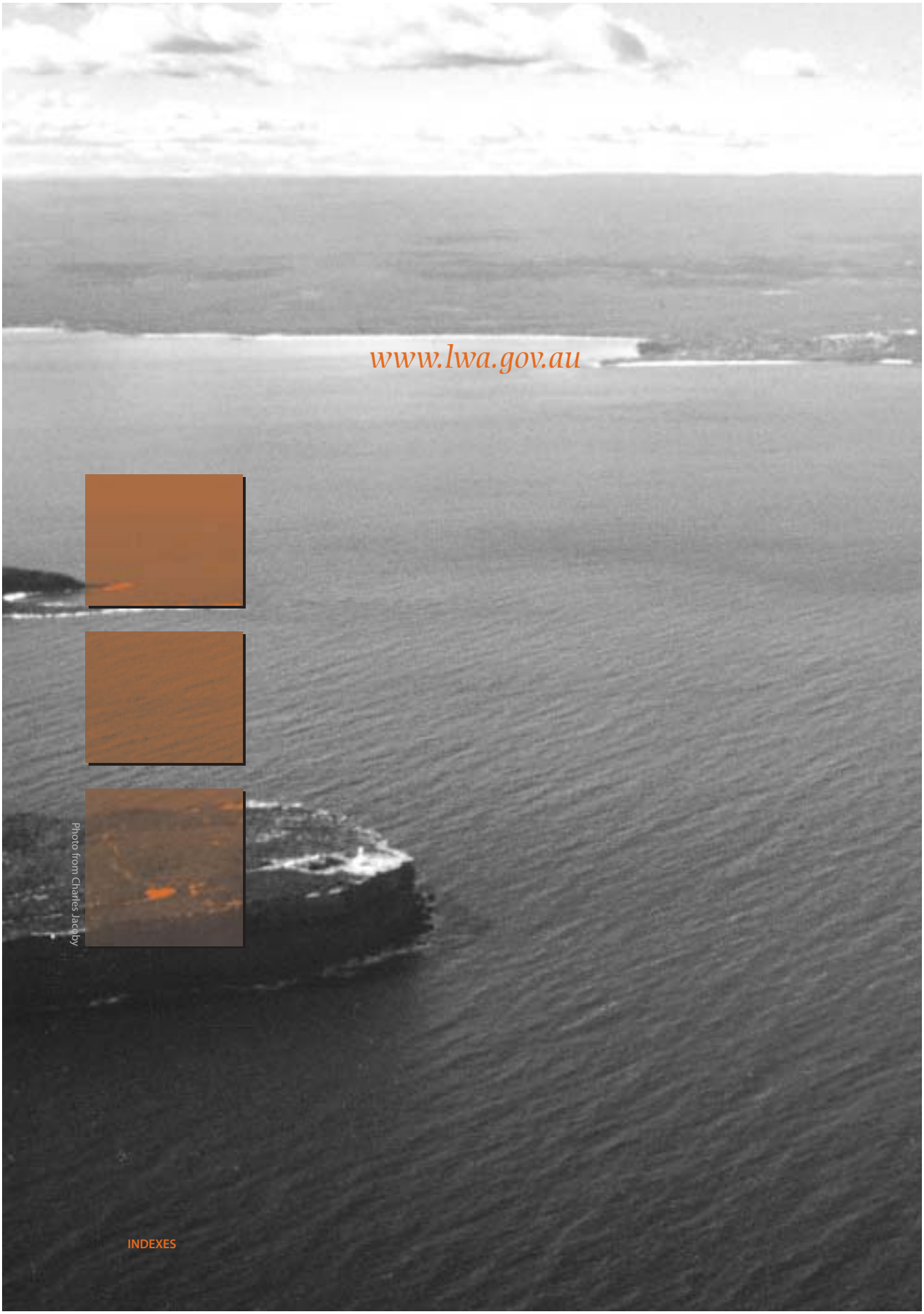


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Photo from Charles Jacoby

INDEXES

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Compliance index

This index shows the numbers for pages on which information is provided in response Commonwealth Government legislation and policies. A table providing a summary of LWA's compliance with specific statutes and government policies is at appendix 4 on page 171.

When this annual report has not addressed a compliance subject (usually because no activity occurred under that heading during the year), the subject entry is followed by '—' rather than by a page number.

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Our new electronic window

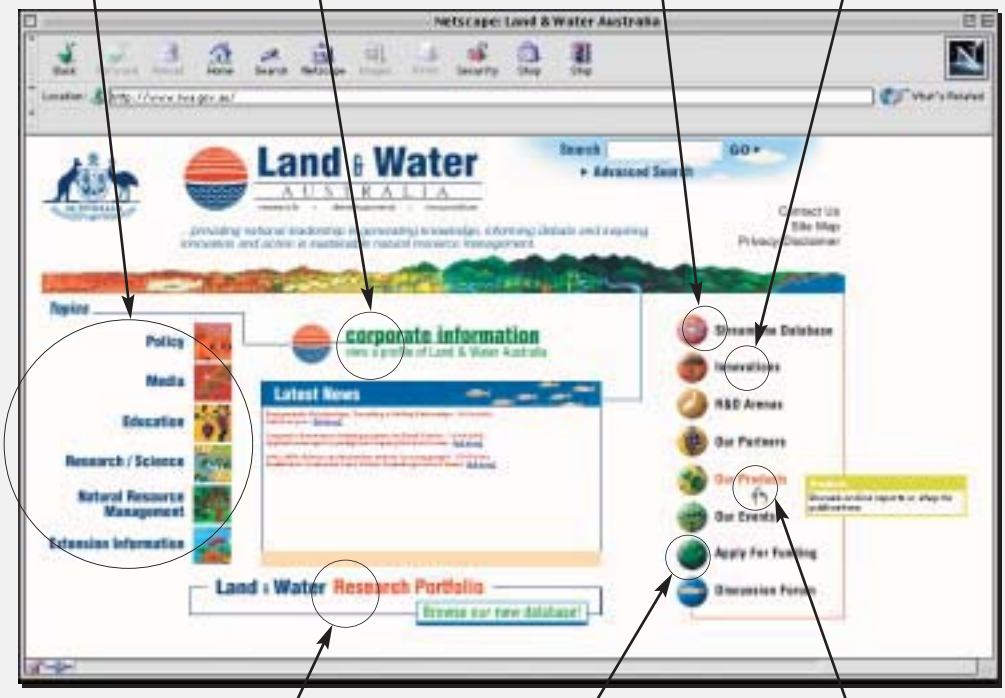
During the year, Land & Water Australia significantly increased its capacity to provide information to Australians. A new Internet home page (www.lwa.gov.au) has opened up a gateway to many valuable sources of information, including the following.

Targeted R&D information for users, such as policy, media, natural resource management etc.

A database of bibliographic information on natural resource management topics.

Corporate information about Land & Water Australia and its activities

An innovations database encompassing more than a decade of R&D achievements



Details of Land & Water Australia's R&D portfolio

Information on applying for funding

A link to order Land & Water Australia communication products (also accessible via freecall 1800 776 616)

More information: pages 95–97.

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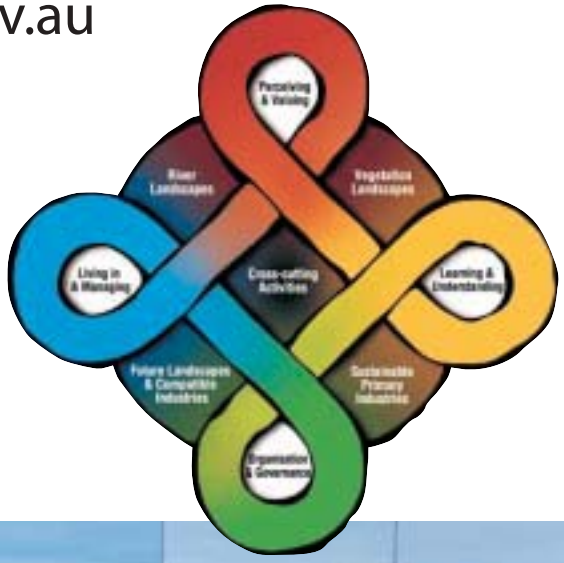

Land & Water Australia (legislated title: Land and Water Resources Research and Development Corporation) is a statutory authority of the Commonwealth Government's Department of Agriculture, Fisheries and Forestry – Australia