Murray–Darling Basin Authority Annual Report 2010–11

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Australian Government

MURRAY–DARLING BASIN AUTHORITY

Office of the Chief Executive

TRIM Ref: D11/31130

The Hon. Tony Burke
Minister for Sustainability, Environment, Water,
Population and Communities
Parliament House
CANBERRA ACT 2600

Dear Minister

It is my pleasure to present the annual report of the Murray–Darling Basin Authority (MDBA) for the year ended 30 June 2011.

This report has been prepared in accordance with the requirements for annual reports prepared by the Joint Committee of Public Accounts and Audit under s. 63 of the *Public Service Act 1999*.

In accordance with the *Commonwealth Fraud Control Guidelines 2011*, I certify that MDBA has prepared fraud risk assessments and fraud control plans, and has in place appropriate fraud prevention, detection, investigation, reporting and data collection procedures and processes that meet MDBA's specific needs. I certify also that I have taken all reasonable measures to minimise the incidence of fraud in the MDBA and to investigate and recover the proceeds of fraud against the MDBA.

The report notes that significant progress has been made in preparing the proposed Basin Plan, due for completion in late 2011.

Under ss. 214(1) of the *Water Act 2007*, the Chief Executive must, as soon as practicable, prepare and give to the Minister and to each other member of the Murray–Darling Ministerial Council, a report on MDBA operations during that year. This annual report must include contents listed under ss. 214(2) of the Water Act.

Subsection 214(3) of the Water Act requires you as Minister to table this annual report in each House of Parliament within 15 sitting days of that House after the day on which you receive the report.

Yours sincerely

Rhondda Dickson
Chief Executive

17 / 11 /2011

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Highlights for 2010–11

The widespread flooding of October 2010 to May 2011 significantly affected numerous Murray–Darling Basin Authority program activities, including capital works. Despite the impact of natural events, MDBA's financial position remains sound.

Basin Plan Division

- Continued preparation of draft Basin Plan for release later in 2011, with delivery of a Basin Plan to government now scheduled for 2012.
- Launched the online Basin Plan Knowledge and Information Directory.
- Published the *Guide to the proposed Basin Plan* and a number of other publications.
- Developed the proposed evaluation, monitoring and compliance program, the water quality and salinity management plan and the environmental watering plan.
- Researched further the environmentally sustainable level of take.
- Completed a detailed risk assessment into the continued availability of Basin water resources.
- Commissioned a series of social and economic studies of the implications of the Basin Plan.
- Undertook widespread consultation and received extensive feedback on the Guide, including an intensive program of community information sessions held in towns across the Basin.
- Used feedback on the Guide to improve community consultation and engagement strategies and to further develop the draft Basin Plan.

Natural Resource Management Division

- Completed the acid sulfate soils risk assessment project, sampling for the second Sustainable Rivers Audit and the Strategic Programs Review.
- Significant progress in meeting the water recovery goals of The Living Murray program.
- Delivered over 270 GL of environmental water — part of which resulted in one of the best bird-breeding events in Barmah Forest in 50 years.
- Completed 1,350 mapping requests and delivered 500 cartographic products for MDBA projects, and created MDBA Basin Map, a web-mapping and information delivery system.

- Continued work on the Sea-to-Hume fishway program and on managing alien fish species, and developed the Native Fish Strategy Action Plan 2011–21.
- Completed a 30-year dataset of River Murray phytoplankton and macroinvertebrate monitoring.
- Investigated potential impacts of floods in mobilising salts from floodplains — peak salinity at Morgan, South Australia remained below 800 EC (electrical conductivity units).
- Monitored and reported the 2010–11 River Murray blackwater event.
- With New South Wales, Victoria and South Australia, implemented actions that targeted specific flow rates in the River Murray and its tributaries and helped dilute blackwater as it returned to the river from the floodplains.
- All contracting state governments (New South Wales, Victoria and South Australia) have remained in net credit on the salinity registers.
- Basin-wide, the cumulative Cap diversions since 1997–98 were about 5% below the cumulative Cap targets.

River Murray Division

- Managed successfully minor and moderate floods through Hume Reservoir and Yarrawonga Weir on multiple occasions, after many years of below-average inflows.
- Coordinated environmental flows through the Barmah–Millewa Forest.
- Forecasted the timing and magnitude of flood peaks and recessions at downstream sites to assist with management of construction works.
- Continued to codify rules and practices used to operate the River Murray, developed options to alleviate Barmah Choke channel capacity issues, and provided much input into the preparation of new schedules to the Murray–Darling Basin Agreement.
- Operated the modified navigable pass structures installed at several locks in real flood conditions for the first time; all reports have been very positive.
- Continued construction of the Hume Dam spillway dam improvement works, which are nearing completion.
- Continued environmental works and measures projects interrupted by the 2010–11 floods following sufficient rescission of floodwaters.
- Commenced construction at Koondrook–Perricoota Forest, the largest environmental works and measures project, to water more than 16,000 ha, including 40 km of levee banks.
- Diverted approximately 324,000 tonnes of salt from the River Murray by interception schemes.
- Continued production of a range of modelling software and applications.

Corporate Services Division

- Effectively operated internal senior management committees.
- Received the 'Highly commended — small to medium agency' award in the 2010 Comcover awards for excellence in enterprise risk management.
- Established the Information Stewards Team to manage MDBA's information assets and an associated internal wiki.
- Implemented the Strategic Workforce Plan, which included developing leadership and coaching programs.
- Negotiated a new enterprise agreement.
- Expanded our graduate recruitment program and commenced our first cadetship program and our involvement in all entry-level Australian Public Service pathways programs.
- Implemented a workplace diversity program that includes an Indigenous employment strategy and the MDBA Disability Action Plan.
- Further refined key policies, guidance and business processes, incorporating recent amendments to the *Financial Management and Accountability Act 1997* (Cwlth) and its associated regulations.
- Undertook a strategic review of jointly funded Natural Resource Management and River Murray programs to determine and recommend improvements to governance and operational requirements.
- Created the Computational Resource Environment — a high-speed, powerful environment for undertaking sophisticated modelling activities.
- Published 30 publications and was awarded a silver Australasian Reporting Award for the *Murray–Darling Basin Authority annual report 2009–10.*

Chief Executive's review

MDBA Chief Executive,
Rhondda Dickson

Coming into the role of Chief Executive in June 2011, I saw the end of what had been a very busy and challenging water year for the Murray–Darling Basin Authority (MDBA).

In 2010–11, widespread flooding in the Murray–Darling Basin well and truly broke the millennium drought (c. 1997 to c. 2009) that had gripped much of the eastern states of Australia for the previous decade. While floodwaters replenished dams and rivers and revitalised wetlands and floodplains, they also caused significant damage to property and assets, and adversely affected the progress of new and ongoing MDBA construction work. Among the delayed or suspended MDBA construction projects were navigable pass upgrades and/or fishways at locks 2, 4, 11 and 15 along the River Murray and the Chowilla Environmental Works and Measures Program project, which is unlikely to resume before January 2012, a 15-month delay.

The floods mobilised salt from the floodplains, with about 2,500,000 tonnes of salt estimated to have passed Morgan in South Australia in 2010–11, compared with about 210,000 tonnes the previous year. River Murray salt interception schemes diverted approximately 324,000 tonnes of salt from the River Murray and helped limit the flood-induced salt mobilisation.

River Murray at the mouth of Barmah Lake, November 2010

We made significant progress in the development of the draft Basin Plan. On 8 October 2010, the *Guide to the proposed Basin Plan* was published and made available for public scrutiny and discussion. Authority members participated in engagement activities to support the Guide's release, with former Chair Michael Taylor attending many of the 33 community information sessions organised across the Basin by MDBA staff. Authority members also met with representatives of Basin state governments about their formal feedback on the Guide.

The Guide generated considerable public feedback. As a result, MDBA reviewed and widened our engagement and consultation activities, and addressed shortcomings in the Guide identified by Basin stakeholders, through further analysis and by commissioning new work. The release of the draft Basin Plan has been delayed until late 2011 to enable a more thorough consideration of matters raised by jurisdictions and the community.

It was also a year of comings and goings. In May 2011, Rob Freeman retired as Chief Executive of MDBA. During his time as Chief Executive, Rob helped the Murray–Darling Basin Commission and its staff transition into the Murray–Darling Basin Authority, and helped to create a strong organisation well placed to deal with the current and future challenges facing the Murray–Darling Basin.

Michael Taylor, the Chair of the Murray–Darling Basin Authority, resigned in December 2010 and Dr Diana Day, an Authority member, resigned in February 2011. Both Michael and Diana played important roles as formative members of the Authority. We welcomed the Hon Craig Knowles as the new Chair of the Authority. Bringing a wealth of experience from his time as a minister in the New South Wales Government from 1995 to 2005, Craig hit the ground running, undertaking a series of tours across the Basin, meeting with many stakeholders and starting an ongoing dialogue with Basin communities on water management and reform.

The Murray–Darling Basin Ministerial Council met twice during 2010–11. Its achievements included approving additions to the register of water recovered for the environment under The Living Murray program and approving the Schedule for Water Sharing and the Schedule to Account for South Australia's Storage Right. The Ministerial Council endorsed MDBA's work on Indigenous cultural values associated with rivers and wetlands, and proposed a framework to incorporate them into state water plans. The Ministerial Council also recommended deferring the date of enforcement for sustainable diversion limits under the Basin Plan to 2019; MDBA took up this recommendation.

The Ministerial Council also supported MDBA by approving our corporate plan for 2011–12 to 2014–15 and approving a final report on our funding strategy beyond 2010–11.

For more information about the Authority, Ministerial Council and related committees, please refer to Appendix A (p. 256).

Delivering water

The MDBA's River Murray Division is responsible for equitably managing, operating and sustaining River Murray assets to deliver states' shares of water and environmental outcomes in the river system.

The floods dramatically reversed our role from ensuring that water was available for essential water requirements to managing minor and moderate floods through Hume Reservoir and Yarrawonga Weir on a number of occasions, and forecasting the timing and size of flood peaks and recessions at sites downstream of these structures.

The MDBA's River Operations targeted a range of environmental outcomes, including delivery of environmental water, management of blackwater and weir-pool drawdowns. The flooding caused the first overbank watering of Barmah–Millewa Forest since 2005, and our release of 410 GL of environmental water — to prolong the duration of flooding in the forest by extending the recession of high flows rather than exaggerating the peak flows — resulted in one of the largest bird-breeding events there in 50 years.

Despite its many benefits, the flooding caused widespread and significant damage to property and also delayed new and ongoing work scheduled to be carried out by the Environmental Works and Measures Program. More information about this program and the issues it faced because of the floods is in Chapter 3, 'Delivering water efficiently and equitably' (p. 123).

Water being released from Lake Mulwala through Yarrawonga Weir, March 2011

Until the floods arrived, Basin storage had been well below average for a number of years. Throughout 2010–11, total Basin government storage increased from 32% to 81% of capacity. Total MDBA active storage on 30 June 2011 was 7,056 GL, more than 3,771 GL higher than the previous year and over 1,500 GL above the long-term average for this time of year.

At Hume Reservoir, releases to meet downstream diversion requirements were low because of high inflows from downstream tributaries and rainfall across the irrigation areas. Low demand coupled with high inflows resulted in the reservoir spilling in October, November and December 2010 and again in February 2011.

The total annual flow across the South Australian border, including additional dilution flow and unregulated flow, was about 15,100 GL, the highest since 1975–76. The Lower Lakes returned to their full supply level of 0.75 m Australian height datum (for an explanation of AHD, please see the glossary included with this report) during October 2010. The first releases of water through the barrages from the Lower Lakes since 2006 began in September 2010. More than 11,000 GL of water is estimated to have been released to the Southern Ocean during 2010–11, resulting in the opening of the Murray Mouth and enabling salt export to the sea and improving fish passage. A further benefit was that dredging to keep the mouth open was no longer necessary and the dredging contract was terminated.

Capping water diversions

The MDBA manages the implementation of the Cap on water diversions for each river valley in the Murray–Darling Basin. The Cap was established in 1995 by the Murray–Darling Basin Ministerial Council to limit the growth in diversions from the Basin's rivers. This was seen as an essential first step in establishing management systems to achieve healthy rivers and sustainable consumptive uses.

Under the Basin Plan, the Cap will be replaced by sustainable diversion limits (SDLs) for surface water and groundwater.

The MDBA is responsible for a Cap compliance audit by the Independent Audit Group, and for preparing and publishing an annual water audit monitoring report using information provided by the Basin states. The Cap audit for 2009–10 was conducted in September 2010, before the floods, with the Independent Audit Group's report finding that diversions were within acceptable bounds in all Basin valleys where a Cap applies; this included the combined Barwon–Darling – Lower Darling valley that had a Cap breach continuation in 2009–10.

The Independent Audit Group's report on the annual Cap audit for 2009–10 was published and distributed in January 2011. The *Water audit monitoring report 2009–10,* which updates the Independent Audit Group's figures, was published and distributed in May 2011.

The report also found that diversions from rivers in the Basin in 2009–10 were the fourth lowest since 1983–84 because of the ongoing millennium drought and the possible onset of climate change.

Although part of the Cap, floodplain harvesting and some other diversions (e.g. farm dams) are not currently accounted for because we lack reliable methods to monitor them. However, MDBA has developed a way to estimate floodplain harvesting and other diversions using remote sensing derived from satellite imagery analysis, geographical information system techniques and some on-ground weather data measurements. Although this method needs further development for use in routine Cap compliance monitoring, its use means we will be able to provide reasonable and cost-effective estimates of floodplain harvesting and other currently unmonitored diversions.

Trading water

Interstate water trade in the southern-connected Murray–Darling Basin in 2010–11 differed markedly from water trading that took place during the millennium drought, when large volumes of water were traded.

Compared to the drought years, volumes of water traded in 2010–11 were significantly lower than those traded in previous years — 200 GL compared to 490 GL in 2009–10 and 593 GL in 2008–09. Wetter conditions throughout the second half of 2010–11 allowed most water entitlements to reach 100% allocation, which meant that net trades from New South Wales (100 GL), Victoria (45 GL) and South Australia (55 GL) were much lower.

During the year, and following advice from the Australian Competition and Consumer Commission, draft Basin Plan water trading rules were published in the *Guide to the proposed Basin Plan: technical background* (Part I, Vol. 2). The MDBA then consulted with Basin states on further refining these rules.

Once the draft Basin Plan becomes law, its water trading rules will create consistent water trading rules for all Basin water resources. These rules will enable tradeable water access rights to reach their most valued use, and will create efficient and effective water trading regimes by removing barriers to trade, specifying the terms and processes for trading water, and providing market information.

Draft Basin Plan

On 8 October 2010, MDBA published the *Guide to the proposed Basin Plan*. Volume 1 in this suite of publications outlined the basis of the draft Basin Plan; the technical detail was set out in parts I, II and III of Volume 2 of the Guide.

One of the key elements of the draft Basin Plan is the setting of new limits — sustainable diversion limits, or SDLs — on the amount of water used in the Basin. While feedback provided after the release of the Guide indicated a high level of acceptance of the need to ensure sustainable water use in the Basin, stakeholder views differed markedly on the amount of additional surface water needed for the environment and where this water should come from. In response, MDBA has been incorporating this feedback into the development of sustainable diversion limits and policy proposals for the implementation of the Basin Plan.

The MDBA's initial work in 2009 and early 2010 to determine a new balance for the Basin was based on the approach of identifying water needs as a subset of key environmental assets and key ecological functions sites in the Basin (known as hydrologic indicator sites). The water needs at these sites are considered a reasonable approximation of the environmental water requirements of the broader Basin environment.

Determining the environmental water requirements through this method is an iterative process involving assessment of the environmental water demands of different environmental objectives and targets at each site and the interaction between sites. In mid-2010, as the Guide was being finalised, modelling to estimate water needs based on the hydrologic indicator sites approach (based on assets and functions) was still underway. The method was described in the Guide, but a simpler estimation of environmental requirements based on an end-of system-flow analysis (also described in the Guide) was used to derive the proposed SDL numbers in the Guide — the range of 3,000 to 4,000 GL additional water requirements proposed in the Guide.

Since the Guide, MDBA has continued the work commenced before the Guide's publication to model water requirements based on the hydrologic indicator sites approach, and this method will be the one used to inform the proposed SDLs in the draft Basin Plan.

Sustainable diversion limits will be enforced through state water resource plans. In line with the Murray–Darling Basin Ministerial Council request, MDBA will propose aligning the SDL enforcement dates to 2019 across all Basin states. This is a significant change from the staggered enforcement set out originally in the Guide, and will ensure that all Basin communities have sufficient time to adjust to the new limits.

The public concern generated by the Guide led to the establishment of the House of Representatives Standing Committee on Regional Australia inquiry into the impact of the Murray–Darling Basin Plan in regional Australia (the Windsor inquiry). The inquiry report, *Of drought and flooding rains*, was released in June 2011; in it the committee criticised MDBA's consultation and engagement with Basin communities and stakeholders during the Guide's production and made a number of recommendations.

In the months following the Guide's release, MDBA sought feedback on the planning and policy framework described in the Guide. We provided extensive opportunities for feedback. Over 20,000 people attended our community information sessions and many others contributed by telephone, email and post.

The public concern generated by the Guide led to the establishment of the House of Representatives Standing Committee on Regional Australia inquiry into the impact of the Murray–Darling Basin Plan on regional Australia (the Windsor inquiry).

The public feedback, both informal and formal, has helped MDBA improve our engagement and communication with Basin stakeholders, and has opened up opportunities for them to participate in the draft plan's development.

To help people understand the science underpinning the Guide, MDBA launched an online searchable catalogue — the Basin Plan Knowledge and Information Directory. Available on our website, <www.mdba.gov.au>, BPKID makes it easier for people to access information used in assembling the draft Basin Plan. Currently the directory has over 1,500 entries, but it is continually being updated as new information becomes available, including information discovered through regular dialogue with Murray–Darling Basin stakeholders.

Basin communities also expressed concerns about the potential social and economic impacts of the draft Basin Plan. Recognising these concerns, MDBA commissioned seven further studies to inform understanding of the social and economic impacts of the Basin Plan. These studies included a major review, led by Environment and Behaviour Consultants and released in July 2011, of the Guide's impact on Basin communities. The MDBA also commissioned further and improved economic modelling of the impacts of the draft Basin Plan, a study to assess the cost and benefits of the plan, and a study of the impacts of drought on communities in the lower Murray region. A major new project assessing in detail the multiple benefits of the draft Basin Plan is currently underway.

Community information session held in Narrandera, New South Wales on 9 November 2010

Over 700 people attended this meeting, which provided stakeholders with information about the draft Basin Plan as well as allowing them to ask questions and receive answers on specific issues. Tea and coffee were supplied by the Narrandera Lions Club.

The MDBA has analysed and considered the findings of a large number of social and economic studies undertaken by other agencies and experts. The outcomes of MDBA's economic modelling have been considered together with the outcomes of hydrologic modelling to inform the finalisation of the draft Basin Plan, including the proposed SDLs.

In response to concerns about the adequacy of the draft Basin Plan in recognising cultural flows, MDBA also established the National Cultural Flows Planning and Research Committee. The initial role of the five-member committee is to develop a detailed cultural flows research proposal, which it will then oversee.

The Living Murray

The MDBA's Natural Resource Management Division administers The Living Murray (TLM) program, which aims to restore the River Murray System to a healthy working state.

The initiative specifically aims to improve environmental outcomes at six icon sites chosen for their high ecological and cultural value to Aboriginal people and other communities. The six icon sites are Barmah–Millewa Forest; Gunbower–Koondrook–Perricoota Forest; Hattah Lakes; Chowilla Floodplain and Lindsay–Wallpolla Islands; the Lower Lakes, Coorong and Murray Mouth; and the River Murray Channel.

The millennium drought exacerbated the ongoing decline of the River Murray's ecological balance, and for a number of years we concentrated on recovering water for TLM. The drought-breaking floods of 2010–11 changed this focus to delivering water and continuing construction of water management structures along the length of the river. Inflows over summer 2010–11 were the highest on record, which increased the volume of water allocations in The Living Murray water portfolio, making a wide range of watering options available and increasing opportunities for significant environmental benefits.

Throughout 2010–11, TLM continued to monitor the condition of fish, birds and vegetation at the icon sites, enabling us to provide consistent reports on the health of the sites and continue working on long-term ecological objectives for these sites.

Significant progress continues to be made in meeting TLM's water recovery goals, with 18 water recovery measures completed or implemented and a total of 479 GL long-term Cap equivalent on the environmental water register.

Our monitoring projects at icon sites and in the River Murray System found that widespread flooding in late 2010 and early 2011 has been good news for the environment, enabling species to recover from the effects of the drought.

In 2010–11, we began a series of intervention monitoring projects to help us understand links between TLM management intervention — such as environmental watering — and ecological responses. Information from these projects will enable us to refine and improve future watering and management action, maximising TLM environmental benefits. Intervention monitoring projects include monitoring the freshwater turtle population in Barmah–Millewa Forest to provide a scientific framework for their culturally led management, and a series of projects at the Chowilla icon site to provide information about risks associated with the operation of the Chowilla Environmental Regulator and to assess progress towards achieving ecological objectives for the site. Throughout 2010–11, TLM continued to monitor the condition of fish, birds and vegetation at the icon sites, enabling us to provide consistent reports on the health of the sites and continue working on long-term ecological objectives for these sites.

Intermediate egrets (*Egretta intermedia*) at their nest at Picnic Point, Barmah–Millewa Forest, 17 December 2010

The intermediate egret (also known as the median egret or the yellow-billed egret) is similar to the great egret, but is smaller and has a more rounded head; its neck is about the same length as its body.

Blackwater in the River Murray

The high spring and summer inflows of 2010–11 combined with carefully planned environmental water delivered during the gaps between flood peaks to maintain river levels have been critically important for many species recovering from the recent drought in the Murray–Darling Basin. However, these unprecedented inflows were large enough to cause a simultaneous blackwater event in the River Murray and in the Goulburn–Broken, Edward–Wakool, Murrumbidgee and Loddon rivers.

Blackwater events are natural phenomena that occur when floodwaters flush organic matter (e.g. leaves) from floodplains into the river system — the tannins and other compounds released during the breakdown of this organic material discolour the river water. While such events have positive environmental impacts because they put nutrients back into river systems that promote the growth of many aquatic organisms, river water can become very low in dissolved oxygen, which may harm aquatic plants and animals.

To counter this risk during the 2010–11 blackwater event, MDBA and New South Wales, Victorian and South Australian agencies implemented actions that targeted specific flow rates (at times using environmental water) in the River Murray and its tributaries, which helped dilute blackwater as it returned to the river from the floodplains. Privately owned Murray Irrigation Limited infrastructure was used to divert highly oxygenated water around the Barmah–Millewa Forest into the Edward–Wakool system where it provided localised refuge areas with higher dissolved oxygen levels.

The MDBA also coordinated the monitoring and reporting of this blackwater event, with preliminary findings indicating that overall benefits of the flooding to the river ecosystem will outweigh adverse effects such as fish kills.

Checking river health

The MDBA monitors the long-term ecological health of the Murray–Darling Basin's 23 river valleys through the Sustainable Rivers Audit. The program uses indicators from five environmental themes — fish, macroinvertebrates, hydrology, vegetation and physical form.

An independent panel of eminent ecologists prepares its assessment every three years — its first report, the *Sustainable Rivers Audit-SRA report 1: A report on the ecological health of rivers in the Murray–Darling Basin 2004–2007,* was published in 2008. During 2010–11, significant work was undertaken for the analysis and preparation of the next report. Complexity of the analysis has now required postponing delivery of this report until late 2011.

Acid sulfate soil material is likely to still be present in many of these wetlands and the underlying causes of acid sulfate soil formation in the first place have not changed, which means that the ongoing acid sulfate soil risk will continue to exist.

During 2010–11, MDBA also continued its long-term data collection for fish and macroinvertebrates. Conditions of the recent wet/floods phase were captured and are likely to continue in 2011–12 sampling. This will be reported in the next three-yearly report, due in 2014.

During the year we completed the acid sulfate soils risk assessment project, which has substantially increased our knowledge of where acid sulfate soils occur throughout the Basin and the hazards and risks associated with these soil materials. Over 19,000 Basin wetlands were assessed, including 14 listed under the Convention on Wetlands of International Importance (the Ramsar Convention). The project summary report, *Acid sulfate soils in the Murray–Darling Basin*, was released by the Murray–Darling Basin Ministerial Council in May 2011. Among other things, it found that wetlands affected by acid sulfate soils are more widespread than initially understood and that their development is linked to changes in hydrology, particularly where high water levels are maintained in ephemeral systems for unnaturally long times, which reduces the frequency of drying and flushing phases.

While many of the affected wetlands were re-flooded during the extensive floods of 2010–11, the impacts on water quality through re-flooding of acid sulfate soils were diluted by the size of the floods. Acid sulfate soil material is likely to still be present in many of these wetlands and the underlying causes of acid sulfate soil formation in the first place have not changed, which means that the ongoing acid sulfate soil risk will continue to exist.

Identifying risks to water resources

Throughout 2010–11, we made a substantial effort to improve our understanding of risks to the condition and availability of the Murray–Darling Basin's water resources and the biodiversity and communities that depend on them.

While human activities (such as interception activities) affect the availability and condition of water, other major risks include the effects of climate change, changes to land use and limitations in the state of the knowledge that forms the basis of estimates about Basin water resources. Our risk analysis activities throughout 2010–11 included 24 research projects assessing current and potential risks to Basin water resources; these projects received funding from the Basin states.

We also carried out 12 projects focusing on climate change (e.g. climate patterns and causal processes, and atmospheric and land surface dynamics) and, with the assistance of an expert panel, identified another 12 projects targeted at other priority risks to natural resources in the Murray–Darling Basin (e.g. climate change and variability, adaptive management capacity and impacts on water quality in the Basin arising from climate change).

Understanding drought and climate change

Our understanding of Australia's climate variability and the effects of possible climate change is critical to determining how we should use Basin water resources in the future. The ending of the millennium drought and the onset of widespread flooding throughout the Basin has temporarily distracted community attention from the predictions of increased drought from climate change. However, MDBA has continued to focus on the effects of climate change and how to deal with them because of the significance of the future risk to Basin water resources.

We are preparing an adaptive management framework for the draft Basin Plan that will allow us to identify and manage the impact of climate change on Basin communities and the environment. The purchase of entitlements for environmental watering under the Australian Government's 'bridging-the-gap' commitment means that the environment will have access to water under lower inflow conditions without affecting consumptive water user entitlements. Changes in water availability because of climate change will be shared by consumptive users and the environment through standard water allocation processes, consistent with the National Water Initiative agreement.

Fishway on the southern bank of Torrumbarry Weir, River Murray, March 2011

Helping native fish

During 2010–11, MDBA continued its work on the Sea-to-Hume fishway program, which is re-establishing opportunities for fish migrations to over 2,000 km of the River Murray by installing fishways. This program allows fish passage for the majority of species in a migrating fish community rather than for only one or two species of economic or social significance.

During the year we continued work on how to manage alien fish species in the Basin, to determine how their proliferation might affect native fish species, particularly if the effects of climate change are fed into the equation.

We began developing the Native Fish Strategy Action Plan for 2011–21 in late 2010, which identifies high-priority activities for the next 10 years.

We also funded a collaborative project to interview and collect information from members of the Basin's Indigenous communities, recreational fishers and commercial fishers across the Basin — people who hold a wealth of knowledge about the local, historical and cultural changes to native fish communities in the Basin. We hope to tap into their collective knowledge to better understand how fish relate to the riverine environment and how changes to these environments have affected the status of native fisheries.

Other MDBA activity during the year included Native Fish Awareness Week, held in November 2010. We used a Basin-wide approach, with every jurisdiction hosting activities ranging from tree-planting to fishing competitions, and from school-based education days to book launches.

Historic Hampden Bridge over the Murrumbidgee River, Wagga Wagga, New South Wales, 25 March 2011

Continuously improving performance

During 2010–11, we continued to look for opportunities to improve and streamline our internal operating arrangements and performance. This resulted in ongoing revision of internal policies and procedures to improve how we do business across corporate areas such as finance, human resources, governance and records management.

We also focused on strengthening our workplace, which saw us implement our first Strategic Workforce Plan and our Workforce Diversity Program, as well as negotiate a new enterprise agreement.

The MDBA's strength in corporate governance was recognised during 2010–11 when we received two awards — the 'Highly commended — small to medium agency' award in the 2010 Comcover awards for excellence in enterprise risk management, and a silver Australasian Reporting Award for our 2009–10 annual report.

As well as these awards, an independent occupational health and safety audit showed our very high compliance with occupational health and safety requirements.

Looking forward to 2011–12

The coming year will again be a busy one for MDBA. The draft Basin Plan will be released late in 2011 and will be followed by a 20-week consultation period. During this time, we will try to reach as many Basin stakeholders as possible so that we can to explain what is proposed in the draft plan and hear community ideas and views. We will then incorporate this feedback on the draft Basin Plan into a revised plan that will be presented to the Murray–Darling Basin Ministerial Council for consideration, and then to the Commonwealth Minister for Water (the Minister for Sustainability, Environment, Water, Population and Communities) for adoption before it is eventually tabled in the Australian Parliament.

With wet catchments and full dams, we will once again be monitoring inflows into the catchments and preparing to respond to possible flooding.

Since becoming Chief Executive, I have become aware of the very broad scope of MDBA's business and have been impressed by many of its achievements over the past year. I am certain that in the coming year MDBA will build on its successes of the past year by once again meeting the challenges of managing the Murray–Darling Basin's water resources in the national interest.

Rhondda Dickson
Chief Executive
Murray–Darling Basin Authority

Chief Finance Officer's report

The extraordinary flooding events throughout the year significantly affected the Murray–Darling Basin Authority's financial results for 2010–11 by curtailing numerous MDBA program activities, including capital works, throughout the Murray–Darling Basin.

Other sections of this annual report cover the repercussions of the flooding on specific programs, but its overall impact was to constrain MDBA expenditure during the year, with some expenditures previously budgeted for being deferred into the Forward Estimates.

Dichotomies in accounting for MDBA's financial performance

The MDBA's general purpose financial report is included in the management and accountability section (p. 161) of this annual report.

Importantly, the financial report sets out MDBA objectives together with its economic dependency on the Australian Government's policy and parliamentary appropriations for the administration of the agency and its functions (e.g. production of the draft Basin Plan).

The report also covers MDBA's ongoing funding arrangement from the Australian Government and the jurisdictions of New South Wales, Victoria, South Australia, Queensland and the Australian Capital Territory to deliver functions required under the Murray–Darling Basin Agreement.

The MDBA also has a leading role as the manager of key infrastructure assets throughout the Basin. These assets comprise $2.1 billion in River Murray Operations assets (e.g. Hume and Dartmouth dams and the locks and weirs on the River Murray) and $480 million in water entitlements managed under The Living Murray program.

Although these assets are critically important and are integral to securing our water supplies and supporting healthy rivers, they do not form part of MDBA's general purpose financial report. Because of this, they are reported separately in special purpose financial reports, to reflect the underlying unincorporated joint ventures that own and control these assets. These special purpose financial reports are not included in this report, but are also audited annually by the Auditor-General, Australian National Audit Office.

In turn, the asset values reported in the special purpose financial reports provide the formal basis for the Australian Government and participating jurisdictions to calculate their respective shares in the underlying assets and to report them in their respective balance sheets (i.e. their interest in the joint ventures).

While MDBA does not control these infrastructure assets in a legal or accounting sense, under the *Water Act 2007* (Cwlth), it has key responsibilities in strategically managing these assets and in working in close partnership with jurisdictional constructing authorities and their agents in carrying out construction works, major repairs and planned maintenance. Given this management role, the related operating expenses of these assets are largely excluded from MDBA's general purpose financial report.

Funding

The MDBA is able to draw down (to the extent of its appropriation) from the Murray–Darling Basin Special Account, an appropriation mechanism established under s. 209 of the Water Act that provides a way to set aside and record amounts used to undertake MDBA activities and projects. These funds are held in the Minister of Finance's Official Public Account and do not form part of MDBA's official bank account as reported in its general purpose financial report.

However, the Special Account is integral to understanding MDBA's financial performance, where operating deficits have progressively and purposefully been met from funds through this account, which held $219.6 million at 30 June 2011. More information about the use of the Special Account in managing MDBA's equity is in Figure 1.

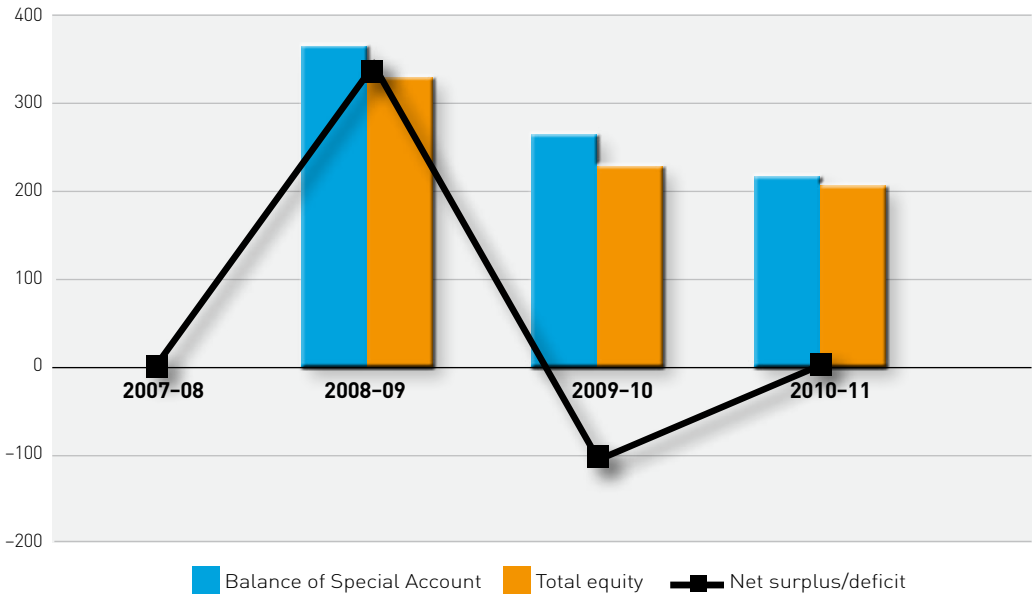


Figure 1 Special Account, balance and total equity, 2007–08 to 2010–11

Financial results

Despite the impact of natural events during the year, MDBA's financial position remains sound, with its total equity at 30 June 2011 equalling $182.6 million. See Figure 1 for more information about MDBA's equity.

The 2010–11 and 2009–10 deficits reflect planned expenses to complete Environmental Works and Measures Program projects for which funding was transferred from the Murray–Darling Basin Commission within the framework of MDBA's current funding from the Special Account.

Figure 2 maps MDBA's operating results against government revenues. In MDBA's first financial reporting period, government revenues included other revenue of $441.50 million, which represented a transfer of Murray–Darling Basin Commission funds into the Special Account balance.

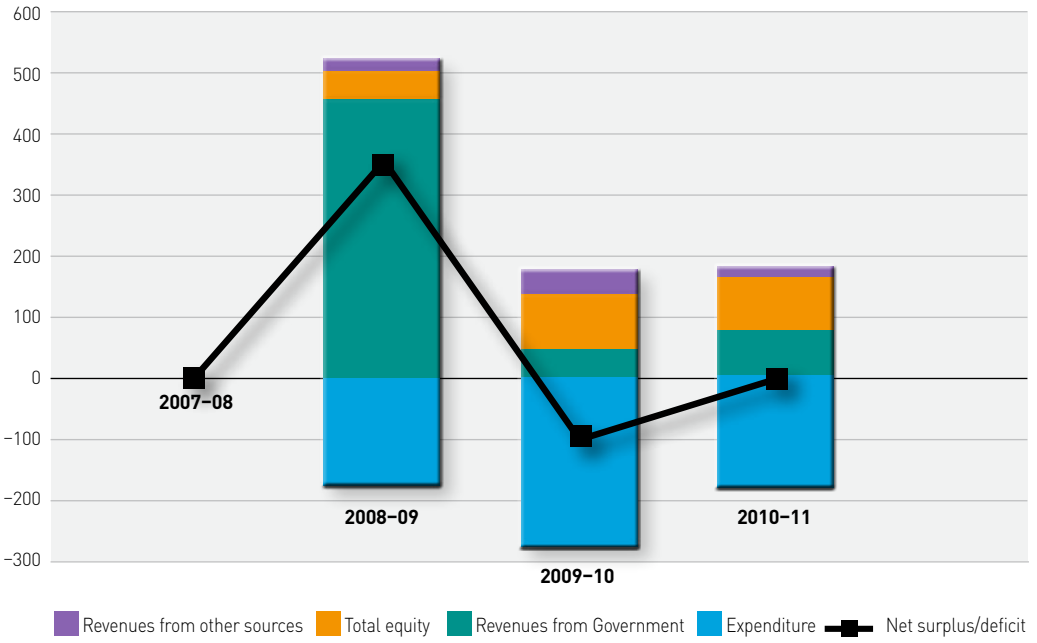


Figure 2 MDBA operating results mapped against government revenues, 2007–08 to 2010–11

Internal controls

The MDBA has a robust internal control framework that is supported by the work of an Audit Committee (with an independent chair) and the performance of a comprehensive internal audit program. Internal audit priorities are reviewed at least annually and deal with relevant key considerations such as risk management rankings and requests from management for specific reviews.

During 2010–11, the internal control framework was further strengthened by work on the new Chief Executive's Instructions that came into operation on 1 July 2011. In addition, MDBA conducts ongoing Certificate of Compliance quarterly surveys, supported by analysis of potential and actual breaches.

The Auditor-General issued an unqualified audit opinion for MDBA's 2010–11 financial statements, which has consistently been the case since MDBA was established in 2008. As part of the audit process, the Auditor-General advised that MDBA has appropriate financial controls in place and that these operated effectively and reliably during the year.

Meeting different accountabilities

The MDBA has a relatively intricate governance model in place, one characterised by multiple-tiered accountabilities extending beyond meeting MDBA obligations under the *Financial Management and Accountability Act 1997* (Cwlth) and other legislative and regulatory requirements.

As indicated, MDBA implements some programs or aspects of programs directly while others are implemented through state government agencies that manage the Basin in partnership with Australian Government agencies.

A schematic depiction of MDBA's governance structure is provided in Appendix A (see p. 256). The overlaying tiers of accountability and reporting, linked with key bodies such as the Murray–Darling Basin Ministerial Council and the Basin Officials Committee, impose clearly defined requirements on MDBA's budgetary and financial management framework. These requirements must be satisfied to ensure MDBA conducts its business consistent with its statutory objectives. This is a multifaceted issue given how MDBA operates; while MDBA's corporate plan 2009–13 provides primary conduit planning and budgeting, these requirements are linked to many different internal processes.

During 2010–11, key changes in MDBA program-related expenses and revenues were reflected by:

- an increase in revenue contributions from jurisdictions of 14%, to $95.5 million
- an increase in revenue from government of 48%, to $75.7 million
- a decrease in suppliers' expenses of 26%, to $181 million
- an increase in employee benefits expenses of 8%, to $34.1 million.

Challenges ahead

Once the draft Basin Plan comes into operation, MDBA business activities will significantly change as we move to implementing the Basin Plan, which may affect the shape and composition of our future funding model.

To respond to these changes, MDBA will need to develop a flexible financial strategy aligned with broader MDBA corporate plan developments. Investing in areas such as natural resource management and integrating Basin activities and programs will not only deliver challenges, but will also provide significant opportunities for us to pursue our goals in an innovative and collaborative way in close partnership with the Basin state jurisdictions.

George Knezevic
Chief Finance Officer
Murray–Darling Basin Authority

The Murray–Darling Basin

The Murray–Darling Basin extends through substantial areas of four states — Queensland, New South Wales, Victoria and South Australia — and the entire Australian Capital Territory.

The Basin is the catchment for the Murray and Darling rivers and their many tributaries. It has 23 river valleys and covers over 1 million km^2, or 14%, of the Australian mainland; it is our most important agricultural area, producing over one-third of Australia's food supply, and is home to more than 2 million people (see Figure 3).

The Basin contains Australia's most iconic river system and has a long history of management and development, and its health and that of its dependent ecosystems is integral to the future wellbeing of Australia — its people and its unique flora and fauna.

From the start of European settlement of the Basin, our use of the Basin's resources has focused on securing water for human consumption and agricultural use, with little understanding of the needs of the environment. Over time, overallocation of water to 'consumptive uses' (primarily irrigated agriculture), exacerbated by drought, decreasing inflows and increasing salinity, has caused the environmental health of the Basin and its dependent ecosystems to decline, as indicated by findings of the Sustainable Rivers Audit in its report on river health throughout the Basin's 23 catchments.[1]

Fauna and flora species that once thrived in the Basin are now listed as rare and protected under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth). At least 35 bird species and 16 mammals that live in the Basin are endangered, and Murray cod (*Maccullochella peelii*), Australia's largest freshwater fish species, which was once widespread, is in severe decline, as are many other native fish species. During the millennium drought iconic species such as river red gums (*Eucalyptus camaldulensis*) became severely stressed, with populations significantly declining in some parts of the Basin.

1 See *The Sustainable Rivers Audit-SRA report 1: A report on the ecological health of rivers in the Murray–Darling Basin 2004–2007*, at <www.mdba.gov.au/sustainable-rivers-audit>.

Figure 3 The Murray–Darling Basin

Murray–Darling Basin Authority

The Murray–Darling Basin Authority (MDBA) is part of the Sustainability, Environment, Water, Population and Communities portfolio, and reports to its minister, the Hon Tony Burke.

We are an Australian Government agency, and we operate under the federal *Public Service Act 1999* and the *Financial Management and Accountability Act 1997*. The MDBA replaced the Murray–Darling Basin Commission in September 2008, assuming the commission's role and functions.

As the sole agency responsible for planning the integrated management of the water resources of the Murray–Darling Basin (see Figure 3), MDBA is an integral element of the Australian Government's Water for the Future program, which has four priorities:

- tackling climate change
- supporting healthy rivers
- using water wisely
- securing our water supplies.

Our vision is to build a sustainable future for the Basin and to get right the balance between critical human water needs, water for agriculture and environmental water for the Basin's water-dependent ecosystems.

The MDBA was established under s. 172 of the *Water Act 2007* (Cwlth). Under this Act, our key functions include:

- preparing the Basin Plan for adoption by the Minister for Sustainability, Environment, Water, Population and Communities (the Commonwealth Minister for Water), including setting sustainable limits on water that can be taken from surface-water and groundwater systems across the Murray–Darling Basin
- advising the minister on the accreditation of state water resource plans
- developing a water rights information service that facilitates water trading across the Basin
- managing water sharing between the states
- constructing and operating River Murray assets such as dams and weirs
- managing all aspects of Basin water resources, including water, organisms and other components and ecosystems that contribute to the physical state and environmental value of the Basin's water resources
- measuring and monitoring water resources in the Basin
- gathering information and undertaking research
- engaging the community in the management of the Basin's resources.

Departmental structure

The MDBA consists of the Chief Executive and MDBA staff. Information about our governance structure, including the six-member Murray–Darling Basin Authority (the Authority) and the Murray–Darling Basin Ministerial Council, is in Appendix A (see p. 256).

The MDBA implements some aspects of its programs itself, while others are implemented through agencies of the state governments who, with the Australian Government, are partners in managing the Basin.

During most of 2010–11, MDBA's structure was based around our key program areas — a structure consisting of five divisions, headed by executive directors who reported to the Chief Executive (see Figure 4 and 'Executive Team', below):

- Basin Plan Division
- River Murray Division
- Natural Resource Management Division
- Engagement, Secretariat and Communications Division
- Corporate Services Division.

However, during the year we began to review our structure to ensure that our resources and responsibilities were appropriately distributed to deliver our priorities.

As an interim step, and following the retirement of an executive director, the number of divisions was collapsed from five to four. The Engagement, Secretariat and Communications Division functions were redistributed among the other divisions:

- Secretariat functions supporting the Authority, Ministerial Council and other high-level committees were transferred to the Corporate Services Division
- Engagement and Communications functions were transferred to the Basin Plan Division.

Key historic programs are also changing. For instance, water recovery for The Living Murray program was largely completed in 2009–10 and our focus is now on using this water to improve the health of icon sites and building infrastructure to efficiently deliver water to them.

To streamline and better align infrastructure works programs, the Environmental Works and Measures Program now sits with the River Murray Division. This realignment will deliver increased efficiency and effectiveness in the related programs over the corporate plan years.

We plan to implement a revised longer-term organisation structure in the first half of 2011–12. Our current organisation appears in Figure 4, below.

Figure 4 MDBA organisational chart

Staffing snapshot

As at 30 June 2011, MDBA had 314 employees, 262 of whom were ongoing and 52, non-ongoing (see 'Staffing profile', p. 183).

Executive Team

Rhondda Dickson, Chief Executive

Dr Rhondda Dickson is an experienced leader in natural resource management policy and has over 20 years' experience working with states and territories in the development and implementation of national polices. Rhondda has been closely involved in the development of the National Action Plan for Water Quality and Salinity, national forest policy and national approaches to vegetation management.

In her most recent position as Deputy Secretary of the Department of Agriculture, Fisheries and Forestry, Rhondda had responsibility for primary industries policies within the agriculture portfolio, including rural adjustment, drought assistance policy, natural resource management, fisheries and forestry.

As a senior executive with the Department of Prime Minister and Cabinet, Rhondda was involved in policy coordination and decisions on water (including for the Murray–Darling Basin), primary industries, the environment, climate change and energy, industry, infrastructure and science.

She has also worked across the full scope of practical natural resource management within the federal Department of Agriculture, Fisheries and Forestry, the Department of Environment, the former Department of Primary Industries and Energy, and CSIRO.

Fraser MacLeod, Executive Director Basin Plan

Dr Fraser MacLeod is Executive Director Basin Plan. He joined MDBA in 2009 from the South Australian Department for Water, Land and Biodiversity Conservation. Fraser has over 15 years' experience in European agricultural and environmental policy, integrated rural development, research and information management and, more recently, in integrated natural resource management in Australia.

In his role as Executive Director Basin Plan, Fraser leads a range of programs that contribute to developing a new plan for the management of the water resources in the Murray–Darling Basin.

Jody Swirepik, Executive Director Natural Resource Management

Jody Swirepik is the Executive Director Natural Resource Management Division, MDBA. Jody's formal qualifications are in applied science and focus on water management and freshwater aquatic ecology, with an honours (First) on aquatic plants and a masters degree focusing on the impact of carp (*Cyprinus carpio*).

Jody began work at the Murray–Darling Basin Commission (MDBA's predecessor) in 2001, developing the Sustainable Rivers Audit. She then worked on The Living Murray program for a number of years, receiving a Public Service Medal for her work in this area.

Before 2001, Jody worked for seven years for the New South Wales Environment Protection Authority, implementing the 1994 Council on Australian Governments' water reforms and developing the early environmental flows rules for inland New South Wales.

Liz Dann, Executive Director Special Projects (Basin Plan)

Liz Dann has been on secondment to MDBA from the Queensland Department of Environment and Resource Management since April 2010 to provide additional executive input into the development of the draft Basin Plan. Liz brings more than 20 years' experience in natural resource management policy reforms to MDBA, and is appreciating the opportunity to be part of the team developing one of the most complex and important reform projects in natural resource management ever undertaken in Australia.

Liz's secondment is due to finish in August 2011.

David Dreverman, Executive Director River Murray

David Dreverman is the Executive Director River Murray, MDBA. David joined the Murray–Darling Basin Commission in 2000 as Manager Assets and was appointed General Manager River Murray Water in 2003. David transferred to MDBA in late 2008, when it subsumed the functions of the commission.

David has worked in the consulting engineering industry with SMEC, the Hydro-Electric Commission of Tasmania and Australian Power & Water. For more than 35 years he has been involved with large dam and hydropower projects, both in Australia and overseas and, more recently, in the management of the River Murray System.

Frank Nicholas, Executive Director Corporate Services

Mr Frank Nicholas joined MDBA as Executive Director Corporate Services in September 2008. Frank is responsible for leading the Corporate Services Division, which provides financial, human resource, legal, information technology, governance, planning, office services, records management, parliamentary and secretariat advice and support to MDBA.

Outcomes and performance reporting

The MDBA began operations on 8 September 2008 and so we do not have five years' worth of performance reporting and other statistical information.

We receive government funding under the Portfolio Budget Statements and manage our performance using a single outcome, the achievement of which is split between the Basin Plan, Natural Resource Management and River Murray divisions, each of which reports against specific elements of this overarching outcome. These divisions are supported by the Corporate Services Division and the engagement, secretariat and communications functions that were redistributed among the other divisions during the year.

Expenditure

In 2010–11, MDBA incurred departmental expenditure of $218.7 million.

Our funding is derived from:

- Australian Government Appropriations for MDBA functions as described under s. 172 of the Water Act, interest equivalency on funds credited to the Special Account and the Australian Government's contribution to the delivery of functions agreed under Schedule 1 of the Water Act (the Murray–Darling Basin Agreement 2008)
- jurisdictional contributions from the Basin states to fund the delivery of functions agreed to under the Murray–Darling Basin Agreement 2008
- other revenue, including sale of assets, property revenues, hydro-generation and recovery of salinity mitigation and operation costs.

More information about our expenditure can be found in the Chief Finance Officer's report for 2010–11 (p. 20) and in Part 4, 'Financial statements' (p. 209).

Aspirations

The MDBA is seeking to establish a workplace that captures our passion for and commitment to our vision of sustainably managing the Basin's water resources into the future.

We aspire to be a fair, capable, inspirational and tolerant workplace, within which we support and value our people and their skills and diversity. To support these goals, we adhere to the Australian Public Service Values and Code of Conduct.

More information about our vision, strategies, outcome and programs is available in the *Murray–Darling Basin Authority corporate plan 2010–11 to 2013–14* (as amended by Murray–Darling Basin Ministerial Council 4).

Portfolio outcome and performance reporting

Under the 2010–11 Portfolio Budget Statements, the Murray–Darling Basin Authority (MDBA) had one outcome:

> The equitable and sustainable use of the Murray–Darling Basin by governments and the community including through development and implementation of a Basin Plan, operation of the River Murray System, shared natural resource management programs, research, information and advice.

Performance of this outcome is shared between three divisions — Basin Plan Division, Natural Resource Management Division and River Murray Division, all of which are required to satisfy specific program objectives — with the support of the engagement, secretariat and communications functions and the Corporate Services Division.

Progress against outcome deliverables and key performance indicators

Basin Plan Division

Program objective **To develop a Basin Plan so that:** **Water in the Murray–Darling Basin is adaptively managed so that the Basin's ecosystems have the resilience, and its people have the capacity, to adapt to future challenges including climate change**	
Deliverables	**Comments**
1. Establish the planning and policy framework to support the preparation and operation of the Basin Plan, including environmental watering, water quality and salinity management plans.	Continued refinement of the draft Basin Plan during 2010–11 included more work on determining the Basin's environmental watering requirements and refining the proposed sustainable diversion limits, the environmental watering plan and the water quality and salinity management plan.

Continued/...

Basin Plan Division

Program objective

To develop a Basin Plan so that:
Water in the Murray–Darling Basin is adaptively managed so that the Basin's ecosystems have the resilience, and its people have the capacity, to adapt to future challenges including climate change

Deliverables	Comments
2. Identify the hydrological, ecological and socioeconomic information inputs to support the preparation, implementation and operation of the Basin Plan.	The MDBA has made significant progress in identifying these inputs. Feedback received on the *Guide to the proposed Basin Plan*, available at <www.mdba.gov.au>, has been invaluable in informing our research into these matters, and is greatly supporting our preparation of the plan and determining what is necessary for its successful implementation and operation. Seven socioeconomic projects that analyse the likely effects of the draft Basin Plan have been completed and reported on. Another four projects, including one that considers the effects of the proposed plan on local communities and its potential benefits were commissioned and are currently underway. The MDBA, in conjunction with the Department of Sustainability, Environment, Water, Population and Communities, has created a comprehensive water-dependent ecosystem database to support improved understanding of environmental assets and their water requirements and to assist in prioritising environmental water use in the Murray–Darling Basin. The MDBA is revisiting proposals outlined in the Guide and re-examining issues such as the environmentally sustainable level of take, better integration of the Basin Plan with other measures, the role of environmental works and measures and our approach to engaging with the community and other stakeholders.
3. Develop a Basin-wide information strategy to integrate existing data holdings and information systems, including a new water rights information service to facilitate water trading across the Basin.	The MDBA: • has established the Information Stewards Team, which coordinates and implements information management activities and is currently developing a Murray–Darling Basin information service • is implementing the information strategy, including the development of information management policies (e.g. metadata) and the implementation of the whole-of-government data licensing approach (AusGOAL) framework • is developing strategic alliances with key information holders (e.g. Geoscience Australia and the Bureau of Meteorology), using collaborative heads of agreements • is working with the Bureau of Meteorology to deliver the Murray–Darling Basin subaccount of the National Water Account 2010 • is scoping a Murray–Darling Basin water rights information service, including its integration with the National Water Market System.

Continued/...

Basin Plan Division

Program objective

To develop a Basin Plan so that:
Water in the Murray–Darling Basin is adaptively managed so that the Basin's ecosystems have the resilience, and its people have the capacity, to adapt to future challenges including climate change

Deliverables	Comments
4. Establish the requirements for accreditation and adoption of water resource plans for water resource areas.	Currently being developed as part of the draft Basin Plan and being readied for the release of the legislative instrument (see deliverable 5.)
5. A legislative and descriptive Basin Plan.	Significant progress has been made in the development of the draft Basin Plan, which will be released in late 2011.
6. Stakeholder engagement and consultation management process.	Following the Guide's release, MDBA: • tracked and collated feedback on the Guide and published an overview of this feedback • conducted community information sessions about the Guide • established a 1 800 hotline number to help people find more information about the Guide and MDBA community events • conducted a technical briefing for scientific and key stakeholder groups on the proposals outlined in the Guide. Drawing on feedback on the Guide and an independent evaluation of our engagement strategy, MDBA is developing a multifaceted engagement strategy for the release of the draft Basin Plan in November 2011. MDBA Indigenous engagement activities included: • continued support of the effective participation of Aboriginal people in the development of the draft Basin Plan • assisted the Murray Lower Darling Rivers Indigenous Nations and the Northern Murray–Darling Basin Aboriginal Nations to contribute to the draft plan and provide an Aboriginal perspective on natural resource management and cultural issues within the Basin • supported the River Country Spirit Ceremony • supported the National Cultural Flows Planning and Research Committee in developing a research project to identify and quantify cultural flows in the Basin and inform water resource plans nationally • initiated two use-and-occupancy mapping projects with traditional owner groups, to help Aboriginal people document the many ways in which they use the land and water.

Basin Plan key performance indicators

Key performance indicators	Comments	Performance
1. Basin Plan developed consistent with the requirements of the *Water Act 2007*.	Significant progress continues to be made in developing the draft Basin Plan. It is anticipated that the draft plan will be released in late 2011.	**Progress continuing**
2. Key information to support the draft Basin Plan identified and published.	Launched the Basin Plan Knowledge and Information Directory. Further developed the environmentally sustainable level of take and sustainable diversion limits incorporating feedback on the Guide. Commissioned socioeconomic studies to fill gaps in the evidence base.	**Progress continuing**
3. Evaluation, Monitoring and Compliance Program established.	Undertook consultation with other Australian Government agencies and the Basin states. Work has begun on further refining the provisions of the draft Basin Plan to provide for adaptive management into the future.	**Progress continuing**
4. Water security for all users of Basin water resources improved.	Critical human water needs agreed between governments, including new schedules to the Murray–Darling Basin Agreement.	**Progress continuing**

Note: key performance indicator 4 for the Basin Plan Division was based on the *Murray–Darling Basin Authority corporate plan 2009–10 to 2012–13*; the other key performance indicators are from the Portfolio Budget Statements.

Natural Resource Management Division

Program objective

To develop and implement programs for the protection, enhancement and sustainable use of the Basin's shared water and other natural resources

Deliverables	Comments
1. Continued implementation of The Living Murray First Step Decision along with revision and, where required, production of associated plans, reports and strategies.	At June 2011, 479 GL long-term Cap equivalent of water was listed on The Living Murray Environmental Water Register; 271 GL of water from The Living Murray regulated entitlements were delivered and the ecological responses were monitored consistent with the annual TLM watering plan. The *Living Murray annual implementation report 2009–10* and the *Audit of The Living Murray implementation 2009–10* were published in one document in May 2011. The Living Murray Committee endorsed revised drafts of the icon site plans in June 2011. The Basin Officials Committee agreed to a work plan to address multi-site watering accounting issues in March 2011.
2. Continued implementation of Basin-wide river health monitoring and assessment, along with the delivery of river health assessment reports and development of data management and quality assurance systems.	The Sustainable Rivers Audit continued to assess the condition and health of the Murray–Darling Basin's 23 river valleys. An audited report on river health is being prepared for Murray–Darling Basin Ministerial Council Meeting 6, which is scheduled for 4 November 2011.
3. Continued implementation and management of the Cap along with publication of Cap compliance audit reports and accreditation models.	All the deliverables were achieved. Deliverables included the: • audit of the Cap • publication of the Independent Audit Group report • maintenance of the Cap Register • preparation and publication of the *Water audit monitoring report 2009–10* • improvement of monitoring of diversions and returns. There was some under-expenditure because a key project was not approved.

Continued/...

Natural Resource Management Division

Program objective

To develop and implement programs for the protection, enhancement and sustainable use of the Basin's shared water and other natural resources

Deliverables	Comments
4. Implementation of the Basin Salinity Management Strategy and Schedule B obligations, including rolling reviews of accountable actions, assessment of new proposals and refinement of Basin Salinity Management Strategy models and salinity registers.	The Basin Salinity Management Strategy provides MDBA and contracting governments with clear responsibilities, with mandatory elements incorporated into Schedule B of the Murray–Darling Basin Agreement. Under Schedule B requirements, the *Basin Salinity Management Strategy 2009–10 annual implementation report* was provided to the Murray–Darling Basin Ministerial Council and published in May 2011. The report includes all rolling reviews completed, assessment of new proposals, details of new and updated salinity assessment models and salinity registers. The report also highlighted the achievement of simulated Basin salinity target of 800 EC for 95% of the time at Morgan, South Australia. The implementation of the Basin Salinity Management Strategy was independently audited and the outcomes of the audit, including recommendations, were reported to MDBA and provided to the Ministerial Council in May 2011.
5. Continued implementation of the Sea-to-Hume fishway program along with refinement of the communications strategy, native fish sustainability research and adaptive management strategies.	Fishway construction and monitoring activities continue to be undertaken, with only four locations remaining to have fishways completed. The construction program is expected to be completed in 2012. Several research projects were undertaken, including further investigations into management of alien fish species, as well as research on fish passage priorities in the Darling River and the role of managed flows on fish communities.

Natural Resource Management key performance indicators

Key performance indicators	Comments	Performance
1. New arrangements identified for The Living Murray.	Based on agreement with The Living Murray Committee, the business plan review has been delayed pending the review of The Living Murray intergovernmental agreements. High-level policy issues will be developed and logged, and any deviations from the existing business plan will be notified to partner governments.	**Progress continuing**
2. Up-to-date salinity registers agreed by Basin states.	Salinity registers are a salinity-based accounting system with salinity credits and debits assigned to the contracting governments of New South Wales, Victoria and South Australia (the governments of Queensland and the Australian Capital Territory do not have accountable actions in the registers). The MDBA recoded all joint and state accountable actions in the registers, which were independently audited and endorsed by MDBA before being noted by the Murray–Darling Basin Ministerial Council in May 2011 and publicly released. The contracting governments remained in net credit in the salinity registers, as required under Schedule B of the Murray–Darling Basin Agreement.	**Achieved**
3. Breaches of the Cap are reported to the Murray–Darling Basin Ministerial Council.	No breaches occurred during 2010–11. This was reported to the Ministerial Council.	**Achieved**
4. Sustainable Rivers Audit Basin-wide report delivered on time.	Report is delayed and is expected to be submitted to Ministerial Council in November 2011.	**Progress continuing**
5. Program review of Murray–Darling Basin Agreement functions undertaken, and new program agreed by partner governments that will effectively manage Basin-scale Natural Resource Management programs into the future.	Review completed. Ministerial Council agreed with the findings of the review, which was undertaken by independent consultants and assessed current joint investments and recommended future activities.	**Achieved**

River Murray Division

Program objective

To equitably manage, operate and sustain the River Murray assets to deliver states' shares of water and environmental outcomes in the River Murray System

Deliverables	Comments
1. Continued implementation of water assets maintenance program for water storage, delivery and navigation.	In spite of floods, the assets have been maintained at the standard set by MDBA. Good progress has also been made in implementing the dam improvement program at Hume.
2. Salt interception schemes operational and maintained to achieve agreed River Murray salinity targets and continued construction of in-plan salt interception schemes.	During 2010–11, the Loxton and Pyramid salt interception schemes were formally commissioned by the Basin Officials Committee. The Upper Darling scheme is close to completion and Murtho has progressed significantly.
3. Agreed water shares delivered to states in accordance with the Murray–Darling Basin Agreement along with continued day-to-day operation of the River Murray System in accordance with objectives and outcomes set by the Basin Officials Committee.	Despite the dramatic turnaround from drought to protracted high flows, water delivery objectives and outcomes were met.
4. The Murray Mouth kept open and connectivity to the Coorong maintained through operation of the Murray Mouth dredging program.	After eight years of dredging the Murray Mouth to allow water to flow from the Murray to the Southern Ocean, dredging has ceased because of sustained high flows.
5. Commencement of major construction of works and measures to support delivery of environmental water to the icon sites.	While the floods forced the shutdown of construction at Chowilla and delays at other sites, the Environmental Works and Measures Program works at Gunbower Forest and Lindsay Island progressed to detailed design, while the detailed design for Hattah Lakes was completed.

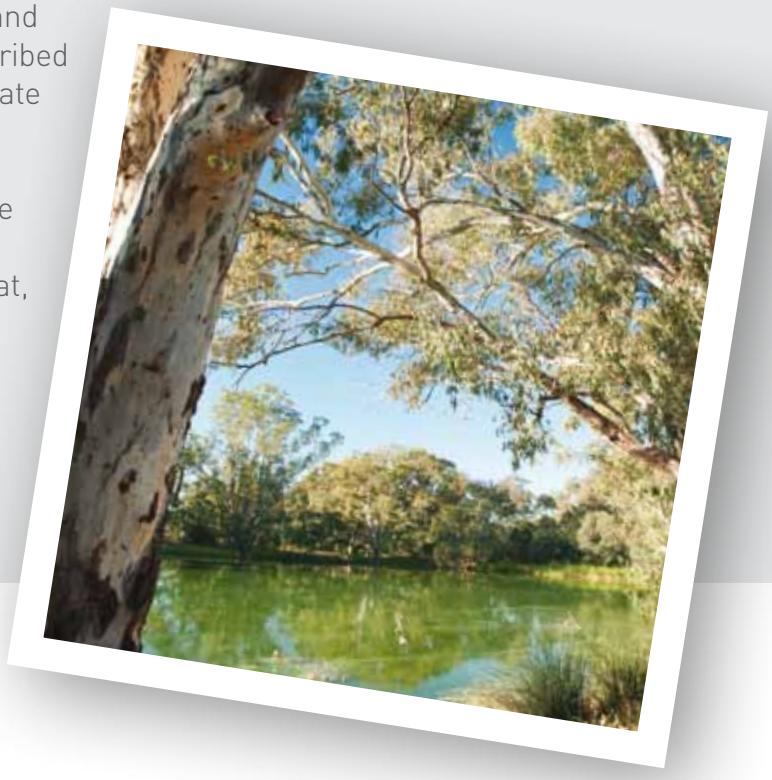
River Murray key performance indicators

Key performance indicators	Comments	Performance
1. Planned and routine asset maintenance and improvement works undertaken each year according to schedule.	In spite of floods, the weirs were operated safely and navigation on the river was maintained. All water orders were delivered as and when needed.	**Achieved**
2. Physical asset base is improved to achieve contemporary best practice standards.	Asset improvement advanced significantly at Hume Dam. Work on completing the navigable pass upgrades (three out of 11 still under construction) was delayed because of floods.	**Progress continuing**
3. Salinity interception schemes operated and maintained to meet agreed operating rules.	Salinity interception scheme operation and maintenance are progressing well with reductions in power requirements because of smart operations and a start on the major refurbishment of Mildura–Merbein salinity interception scheme.	**Achieved**
4. State water shares delivered and accounted for transparently each year.	Achieved.	**Achieved**
5. Diurnal tidal ratio targets achieved at Murray Mouth.	Achieved up until cessation of dredging on 5 December 2010 when sustained high flows through the Murray Mouth made dredging unnecessary.	**Achieved**
6. Program review of Murray–Darling Basin Agreement functions undertaken to determine the most efficient and effective delivery mechanism for the functions.	Review completed. The Ministerial Council agreed with the findings of the review, which was undertaken by independent consultants and assessed current joint investments and recommended future activities.	**Achieved**

REPORT ON PERFORMANCE

REPORT ON PERFORMANCE

Each of the following three chapters describes MDBA's achievement of Outcome 1 objectives during 2010–11 by the Basin Plan, Natural Resource Management and River Murray divisions. The achievement of these objectives is also discussed using objectives and deliverables described in MDBA's corporate plan 2009–13, supported by MDBA's Corporate Services Division and the secretariat, engagement and communications functions that were transferred to other divisions during the year.



Developing the Basin Plan

CHAPTER: 1

Chapter 1 and its main subsections also relate to the Basin Plan Division section of the *Murray–Darling Basin Authority corporate plan 2009–10 to 2012–13.*

Under the 2010–11 Portfolio Budget Statements, the Basin Plan Division has the following program objective:

To develop a Basin Plan so that:

Water in the Murray–Darling Basin is adaptively managed so that the Basin's ecosystems have the resilience, and its people have the capacity, to adapt to future challenges including climate change.

Cormorants nesting in a river red gum, Steamer Plain, Barmah–Millewa Forest, 23 February 2011

Overview

Under the *Water Act 2007* (Cwlth), the Murray–Darling Basin Authority is required to prepare and implement a Basin Plan for the integrated and sustainable management of Murray–Darling Basin water resources. In keeping with this requirement, MDBA continued to develop the draft Basin Plan in 2010–11, working to a timetable that will enable us to deliver the draft Basin Plan to government in 2011. The draft plan is being developed to work alongside other measures to support the delivery of a healthy working Murray–Darling Basin.

A significant step in developing the draft Basin Plan was the publication of the *Guide to the proposed Basin Plan* on 8 October 2010. The Guide presented and described a range of policy options being considered by MDBA for inclusion in the draft Basin Plan. Its release generated a strong public response, both from Basin communities and other stakeholders.

On 12 October 2010, MDBA began seeking community feedback on the planning and policy framework described in the Guide. We held community information sessions in towns across the Basin, along with other activities designed to provide information, respond to questions from the public and receive feedback.

This feedback identified the need for MDBA to revisit proposals outlined in the Guide and examine some central issues, including the environmentally sustainable level of take, how the Basin Plan might be better integrated with other measures, the role that environmental works and measures might play and MDBA's approach to engaging with the community and other stakeholders.

Taking this feedback onboard, MDBA continued to refine the draft Basin Plan throughout the past year for public release late in 2011. This included additional work for determining the environmental water requirements of the Basin and refining the proposed sustainable diversion limits, the environmental watering plan and the water quality and salinity management plan.

The MDBA also continued to build the evidence base underpinning the draft Basin Plan using community and state government feedback, and refining the hydrologic modelling of the environmental water requirements. We also commissioned significant bodies of work to inform this process, including detailed social and economic analysis relating to Basin communities.

The Basin Plan

Main activities

During 2010–11, the Murray–Darling Basin Authority:

- Released the *Guide to the proposed Basin Plan* in October 2010.
- Consulted with more than 20,000 people at meetings, workshops and forums with Basin communities, interest groups and jurisdictions following the Guide's release.

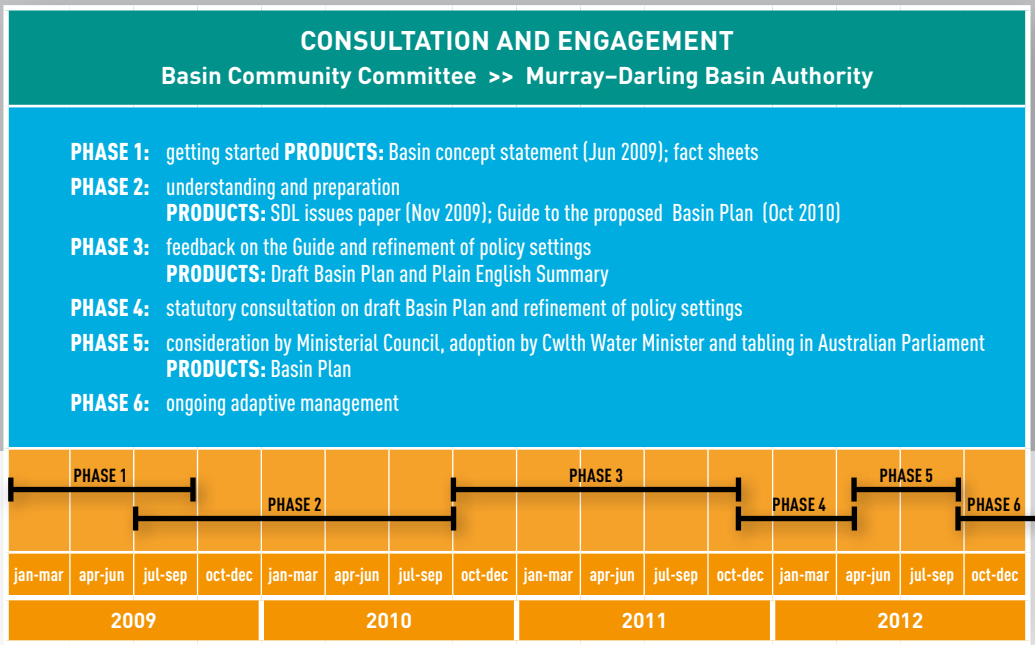


Figure 1.1 Phases and time line for development of the Basin Plan

- Used the invaluable and substantial feedback generated by the Guide to further develop the Basin Plan and as a result:
  - developed further the detailed hydrologic indicator site approach and used the new evidence provided in feedback to inform our deliberations about the proposed environmentally sustainable level of take, including groundwater and surface-water hydrologic modelling
  - commissioned further studies to enable us to understand more about the social and economic circumstances of people living in the Basin and the potential implications of the draft Basin Plan
  - launched the Basin Plan Knowledge and Information Directory, a searchable catalogue, to access more than 1,500 data, modelling and information resources used in the development of the Basin Plan.
- Took into account findings of the report of the House of Representatives Standing Committee on Regional Australia inquiry into the impact of the Murray–Darling Basin Plan in regional Australia (the Windsor inquiry).
- Took onboard the request of the Murray–Darling Basin Ministerial Council (communiqué of 27 May 2011) and aligned the commencement dates for the enforcement of the sustainable diversion limits in all Basin states to 2019. This change has enabled MDBA to develop a proposed seven-year transition strategy for implementation of the Basin Plan after its approval in 2012.

Developing a robust evidence base

Background

The *Water Act 2007* requires MDBA to develop the draft Basin Plan using the best available scientific knowledge and socioeconomic analysis. This information includes data, modelling and scientific knowledge in the areas of hydrology, ecology and socioeconomics. Assembling this comprehensive picture of the Basin and the current state of its water resources has played an important part in developing the draft Basin Plan.

During 2010, a comprehensive interpretation of the available knowledge was assembled in volume 2 (parts I, II and III) of the *Guide to the proposed Basin Plan* and published in hard copy and online. In addition, the Basin Plan Knowledge and Information Directory (BPKID), a searchable directory, was made available on MDBA's website, <www.mdba.gov.au>, to make it easier for people to access all information used in assembling the draft Basin Plan.

Main activities

- Identification and publication of key information to support the draft Basin Plan, both through the Guide and on BPKID.
- Identification of information to support implementation of the evaluation, monitoring and compliance program, including the integration of sources and information.

Evidence base for the draft Basin Plan

In developing the Guide, we used the best available scientific information and socioeconomic knowledge. By revealing the scientific evidence underpinning the Guide, MDBA ensured it was available to Murray–Darling Basin communities for their consideration. To do this, we used a range of tools, such as making an information catalogue of the evidence base available online and conducting meetings with Basin stakeholders, including members of Basin communities and representatives of peak bodies and Basin jurisdictions.

The MDBA used hydrology information and knowledge derived from data collected over a long period. Sourced from MDBA and from jurisdictional databases and the Bureau of Meteorology, all data are of an equivalent standard, suitability and state of completeness.

Ecological science has relatively less readily available long-term information representing the wet-dry environment of the Murray–Darling Basin. In addition to formal scientific literature, ecological evidence was accessed through MDBA's collaborative network, including scientists, federal and Basin state government agencies and various non–government organisations. The ecological evidence collected by the Basin states differs widely, because it was usually collected for different purposes and to different standards.

The socioeconomic data and information available for use in the Guide were the least well-developed, both spatially and temporally. Broadscale information about the economic value of industries was difficult to readily translate at a local scale. Similarly, historical economic and social information collected at temporal intervals did not always readily align with the Murray–Darling Basin's wet-dry environment.

Following the release of the Guide, MDBA received significant and valuable feedback from all Basin communities and governments. Much of the feedback recognised the limitations of the available information, identified explicit information gaps and indicated a willingness to support the capture of new knowledge.

In response to this feedback, we commissioned new projects, particularly of a socioeconomic nature, to synthesise available information and to build on and complement previous socioeconomic work. These projects include economic modelling to assess the economic impacts of the Basin Plan, further analysis of the plan's impact on Basin communities and studies of community vulnerability and adaptive capacity. These projects are helping to build MDBA's understanding of local and community implications of the Basin Plan and of the plan's benefits and costs.

We have also refined our hydrologic indicator site method and river modelling approach that we commenced in 2009–10 to explicitly link the recovered environmental water to the environmental water requirements of key assets and functions, and to take a number of physical and operational constraints affecting river management into account.

We have also put in place other arrangements to manage information more effectively within our organisation. As part of our information strategy, MDBA created the Information Stewards Team in 2010–11 to coordinate and facilitate ready use of the information we hold.

Advancing information sharing

Basin Plan Knowledge and Information Directory

During 2010–11, a searchable catalogue — the Basin Plan Knowledge and Information Directory (BPKID) — was made available on MDBA's website to make it easier for people to access all information used in assembling the draft Basin Plan. In response to

feedback on the Guide, for example, MDBA drew on a wide range of social and economic analyses undertaken by other agencies and experts to inform the policy positions being developed for the draft plan. As these new projects are completed, the information they contain is progressively being made available through BPKID to ensure it is available to all stakeholders.

This directory either directs inquiries to the source of the specific information (e.g. a website or a public library) or provides information as a download from MDBA's website. Currently BPKID has over 1,500 entries, but is continually being updated as new information becomes available, including information discovered through regular dialogue with Murray–Darling Basin stakeholders.

Collaborating on collecting water information

The MDBA is collaborating with a range of agencies to ensure we access the water information necessary for reporting. In the Water Act, the meaning of 'water information' is broad and collecting this information is a significant undertaking for the Bureau of Meteorology. By developing collaborative arrangements with state governments, the Bureau of Meteorology and other information providers (including those in state jurisdictions), MDBA expects to be able to access all appropriate data and information when reporting on the Basin and its resources.

A further example of our commitment to collaborative information access is the joint MDBA – Geoscience Australia Collaborative Head of Agreement, which will allow geospatial data and information to be shared efficiently and simply. Approaches such as these will be particularly important for implementing the draft Basin Plan's monitoring and evaluation plan.

Water accounting

Development of a National Water Account by the Bureau of Meteorology has seen water accounting become an important tool for providing and reporting information on water use in Australia. In 2010–11, MDBA helped prepare the Murray–Darling Basin's 2009–10 subaccounts for publication as part of the National Water Account 2010.

The MDBA also compiled a six-monthly environmental water recovery report that accounted for held environmental water recovered since 2004 in the Basin.

It is envisaged that water accounting will be an important tool in the future implementation of the Basin Plan, because it provides a transparent mechanism for identifying, measuring, recording and reporting water-related information in a consistent and structured manner for water users and decision-makers alike. This use of water accounting for Basin water resources will be implemented in collaboration with the Bureau of Meteorology and other federal and state agencies.

An integrated approach to information assets and holdings

Over 2010–11, MDBA initiated internal coordination arrangements to improve information management in the agency. These arrangements included the creation of an internal Information Stewards Team, whose five members — drawn from MDBA business areas — support an integrated approach to information holdings.

As part of this role, the Information Stewards Team is developing proposals for future information services that may include a Murray–Darling Basin water rights information service for registrable water rights (Water Act s. 103). The approach MDBA adopts will be closely linked to the strategy of collaborating with the Bureau of Meteorology and other providers in sharing water information and data.

Social and economic analysis

Background

The *Water Act 2007* aims to promote the use and integrated management of Basin water resources in a way that optimises economic, social and environmental outcomes; the Act also stipulates that these aims be provided for in the draft Basin Plan. Under the Act, in developing the Basin Plan, MDBA is also required to act on the basis of the best available scientific knowledge and social and economic analysis. The MDBA's social and economic work has informed our development of the draft Basin Plan in line with these requirements.

Main activities

During 2010–11, MDBA:

- commissioned a major new study to assess the community impacts of the *Guide to the proposed Basin Plan* and undertook further analysis of local and community impacts
- further refined and improved our economic modelling of the impacts of the Basin Plan
- commissioned new work to assess the social and economic benefits of the Basin Plan, and to compare these benefits with the social and economic costs
- continued engaging with Australian Government and Basin state government officials and with academics and community leaders on the approach and progress of the social and economic analysis program.

Following the release of the Guide, many Basin communities expressed concerns about the potential social and economic impacts. The MDBA commissioned several further studies in response to these concerns, to add to the considerable evidence base already established. This included commissioning a major study, led by Environment and Behaviour Consultants (EBC), released in July 2011, to assess the potential impact of the Guide's proposals on Basin communities. The MDBA has also worked to improve economic modelling of the impacts of the Basin Plan, commissioned a study to assess the costs and benefits of the Basin Plan, and commissioned a study of the impacts of drought on communities in the lower Murray region. A major new project is currently underway to assess in detail the multiple benefits of the draft Basin Plan.

The main focus of the EBC report, *Community impacts of the Guide to the proposed Murray–Darling Basin Plan*, was on the local, small-scale human issues and costs of the plan over the transitional short term. For the purpose of the project, 48 distinct 'social catchments' were identified to better reflect the areas in which social and economic interactions occur at the local community level. Over 330 meetings took place across the Basin and nearly 700 people were interviewed.

In each social catchment, meetings took place with farmers from the full range of irrigation sectors; businesses that directly service the agriculture sector (e.g. rice mills and fruit packers); businesses that do not directly service the agriculture sector (e.g. real estate agents and small business owners); and government and non–government community service providers (e.g. councils, rural financial counsellors and Centrelink). The report identified towns at risk from changes to water availability as proposed in the Guide, options and opportunities to mitigate the impacts of the Basin Plan, and issues around previous engagement and consultation strategies.

A number of refinements are continuing to be made to the economic modelling, including improvements to the baseline, the inclusion of the Australian Government's Water for the Future programs, improved consideration of water supply variability and a revised methodology for converting water diversions to irrigation use. The Australian Bureau of Agricultural and Resource Economics, University of Queensland and the Monash Centre for Policy Studies are undertaking this program of analysis.

A case study by Dr Jonathan Sobels has assessed the social impacts of 'life with less water' on the communities of the Lower Lakes region of South Australia. It found that communities experience considerable stress when they have to adjust to changing circumstances, but that they often reinvent themselves. According to the study, individuals, families and businesses respond in a variety of ways — and often quite innovatively — according to their own set of circumstances and opportunities. The report highlights the role of community engagement and communication of government plans in supporting people through this process.

To understand the relative merits of different sustainable diversion limit options, MDBA commissioned a study by the Centre for International Economics in August 2010. The results of the study indicate that it is extremely challenging to place an accurate economic value on the potential environmental benefits, especially as a significant proportion of the value of the benefits of the draft Basin Plan is likely to extend from non-use and non-monetary values. This presents difficulties for placing a monetary value on ecological responses to water recovery in order to compare them with the costs of foregone agricultural production. Nevertheless, the study found that overall it is likely that the social and economic benefits of the Basin Plan will be considerably greater than the costs.

A consistent message from community feedback on the Guide was the call for better articulation of the benefits of the Basin Plan. In response, MDBA has commissioned a major new project by CSIRO Water for a Healthy Country, which is aiming to describe and quantify the environmental, social and economic benefits of enhanced environmental flows prescribed under the draft Basin Plan. The project is applying integrative approaches to the evaluation of the benefits of increased environmental flows by linking hydrologic changes resulting from the proposed sustainable diversion limit scenarios to ecological, ecosystem service, economic and social benefits.

The overarching message from these studies confirms the findings of previous work undertaken by MDBA — while the macroeconomic impacts at the whole-of-Basin level will be modest, short-term and transitional impacts could be more substantial for many small, and even some moderate-sized, irrigation-dependent towns and communities, particularly where they are geographically isolated.

However, while the broad location, nature and extent of impacts can be identified, even using the best available data and analysis, the exact scale and location of effects remain difficult to determine with any level of precision. This is because there are many factors that will influence how the impacts will be felt and residual complexities about precisely how the draft Basin Plan will be implemented. For example, this includes the question of the mix between the use of irrigation infrastructure and buybacks to acquire water in different regions and the extent to which buybacks target high or lower security water entitlements. How environmental watering plans are implemented will also have an important effect.

It is important to note that the manner in which these and other policy and management tools are used and coordinated presents substantial opportunities to reduce and mitigate the potential effects of the Basin Plan.

Developing the new arrangements

Background

Under the *Water Act 2007*, MDBA is responsible for developing a Basin Plan that will support the delivery of a healthy working Murray–Darling Basin through providing for the integrated management of the Basin water resources in the national interest.

The plan is being developed based on the best available science and social and economic information. Developing the plan is a complex process and extensive feedback from stakeholders has been sought to ensure development of a draft plan that will support the future health and viability of the Murray–Darling river system and the communities and environments it sustains.

The Water Act sets out the steps MDBA must follow in preparing the draft Basin Plan. These steps include a minimum of 16 weeks' public consultation on the draft Basin Plan and consideration of it by the Murray–Darling Basin Ministerial Council. After consideration by the Ministerial Council, the draft will be provided to the Minister for Sustainability, Environment, Water, Population and Communities for adoption and then to the Australian Parliament before it becomes law. When made, the Basin Plan will operate alongside federal, state and local management initiatives such as water purchasing, infrastructure measures and local projects.

Under s. 22 of the Water Act, mandatory elements of the Basin Plan include:

- setting an environmentally sustainable level of take (sustainable diversion limits, or SDLs) for limiting the amount of surface water and groundwater to be taken from Basin water resources
- a water quality and salinity management plan that will include objectives and targets for water quality and salinity
- an environmental watering plan to ensure the effective management of environmental water
- water trade and transfer rules
- water resource plan areas and accreditation requirements
- a program for monitoring and evaluating the effectiveness of the plan's environmental, social and economic outcomes.

Main activities

In 2010–11, MDBA:

- continued engaging with Basin communities and other stakeholders about the science underpinning the draft Basin Plan
- continued to determine environmental water requirements and proposed SDLs
- completed an assessment of risks to Basin water resources and developed strategies for managing those risks
- refined policy positions of the draft Basin Plan, taking onboard public and state government feedback
- in consultation with Basin states, developed proposed amendments, including a new schedule, for the Murray–Darling Basin Agreement for:
  - new water-sharing arrangements
  - accounting and operational rules to minimise the risk of being unable to deliver critical human water needs during extremely dry conditions.

Determining the Basin's environmental water requirements

The extensive hydrologic and environmental assessments undertaken to determine the environmental water requirements of the Basin are principally described in Part II, Volume 2 of the *Guide to the proposed Basin Plan*.

Throughout late 2010 and early 2011, MDBA met with communities and stakeholders across the Murray–Darling Basin to discuss the science underpinning this work. These conversations with communities, stakeholders and MDBA staff provided MDBA with valuable feedback on the science and methods used to inform the environmental water requirements, and provided direction for further work to inform the draft Basin Plan — the next step in the process.

Using the feedback it received from Basin communities and stakeholders, MDBA refined its approach to determining environmental water requirements and SDLs by:

- greater use of detailed hydrologic modelling to assess the capacity of reductions in current diversions to meet the identified environmental water requirements for assets and functions
- further analysis and review of the science underpinning some assessments
- alignment of the modelling approach to the commitment of the Australian Government to bridge the gap by purchasing entitlements from willing sellers
- further analysis of the extent to which river operational constraints may limit the achievement of some flow targets
- greater consideration of the benefits and contributions that may be provided by environmental works and measures.

This work began in the first half of 2011 and will be used to inform policy proposals in the draft Basin Plan, which is planned for release late in 2011.

Groundwater SDLs have been set by considering the risks that groundwater take poses to groundwater-dependent ecosystems, the ability of aquifers to function into the future and groundwater quality. Sustainable diversion limits have been set using the best available knowledge, with input provided from the Basin states through technical and jurisdictional expert panels. The extensive feedback received on the Guide was also carefully considered, in particular taking into account existing initiatives to reduce groundwater use across the Basin.

Providing for critical human water needs

During 2010–11, MDBA worked towards finalising the provisions for critical human water needs in the draft Basin Plan.

The proposed provisions state the volumes of water required for meeting critical human water needs for communities dependent on the River Murray System. They also set water quality and salinity triggers requiring an emergency response. The draft Basin Plan also establishes a conveyance reserve to minimise the risk of being unable to deliver water to meet critical human needs in extremely dry conditions.

Determining the environmentally sustainable level of take

Background

The *Water Act 2007* requires that the draft Basin Plan provide for limits on the quantity of water that may be taken from the Murray–Darling Basin. These limits are known as sustainable diversion limits, and they must reflect a balance between providing for all uses of the Basin's water resources — that is, they must optimise social and economic outcomes for Basin regions while not compromising key assets and ecosystem services provided by the environment. To work out SDLs, MDBA was required to determine how much alteration would push the ecological integrity of ecosystems to a point where they could not recover. In other words, we had to quantify how much water the Basin environment actually needed.

The science around specific environmental flow needs is emerging, as is the scientific community's concept of ecosystem functions or services. Within the Basin, hydrology and ecology varies significantly from north to south and from east to west, and flows, ecological processes and ecosystem health vary over time in response to the Basin's highly variable climate. Consequently, MDBA could not draw on a wide body of well-tested data to inform

Narrandera wetlands landscape, Old Brewery Road, Narrandera, New South Wales, 25 March 2011

These wetlands were created by reclaiming the land on which the old sewerage works had operated.

decisions of exactly how much water each particular 'type' of ecosystem needed — at least, not Basin-wide and across timescales, and certainly not collected using the same criteria at the same scale. Furthermore, we had no widely accepted definition or list of the functions provided by each Basin ecosystem, nor did an agreed-upon typology of riverine and floodplain ecosystems exist.

The MDBA had to devise how to classify an agreed set of environmental assets and functions, as required under the Water Act, which it then had to test as much as possible in the time available. To enable us to do so, we coopted and adapted existing state water agency and MDBA hydrologic models.

A number of policy factors influenced the process:

- the mandate only concerned water resources, which meant that ecosystems and their functions that could not be supported by increased flow (i.e. primarily in the riparian zone) were out of scope
- we had to consider management constraints on delivering water — for example, the siting of towns, available infrastructure, providing for critical human needs and the ability to influence the timing of flows
- the availability of quality data — hydrologic information represented the most consistently and widely collected, well-understood data available over a long timescale and Basin-wide.

Taking the above factors into account, our methodology to determine an environmentally sustainable level of take (ESLT) included:

- an extensive literature review, not only to understand what data was available, but also to define the terms 'ecosystem services', 'productive base' and 'ecosystem functions'
- development of criteria against which nominated 'high value' sites in the Basin that were representative of various ecosystem types and/or providing key ecosystem functions could be selected (acknowledging the limitation that ecosystem functions potentially provided by a suite of sites may not be identified)
- development of overarching objectives specific to the management of environmental outcomes for the Basin, including to protect and restore water-dependent ecosystems and their ecosystem functions, and ensuring that those ecosystems are resilient to risks and threats
- focusing on benefits that would accrue through flow restoration, given constraints on water resources and water-dependent ecosystems
- adopting a number of principles (within the mandate, data, time and management constraints) focusing on:
  - sites most significantly affected by reduced flows
  - sites where the flow regime is a predominant influence on ecology
  - sites where quality data was available (primarily large wetlands and floodplains towards the end of rivers, which are often of high conservation value)
  - sites where the greatest benefit from restored flow would accrue.

Cumulatively, because the largest volumes of water diverted for agricultural use are from the lower end of the Basin's major rivers where large, high-conservation wetlands often occur, this process supported an assumption that providing increased flows at the lower end of the system would support many upstream ecosystems as well, given the further assumption that many flow regimes are interconnected.

Outline of the hydrologic indicator site approach

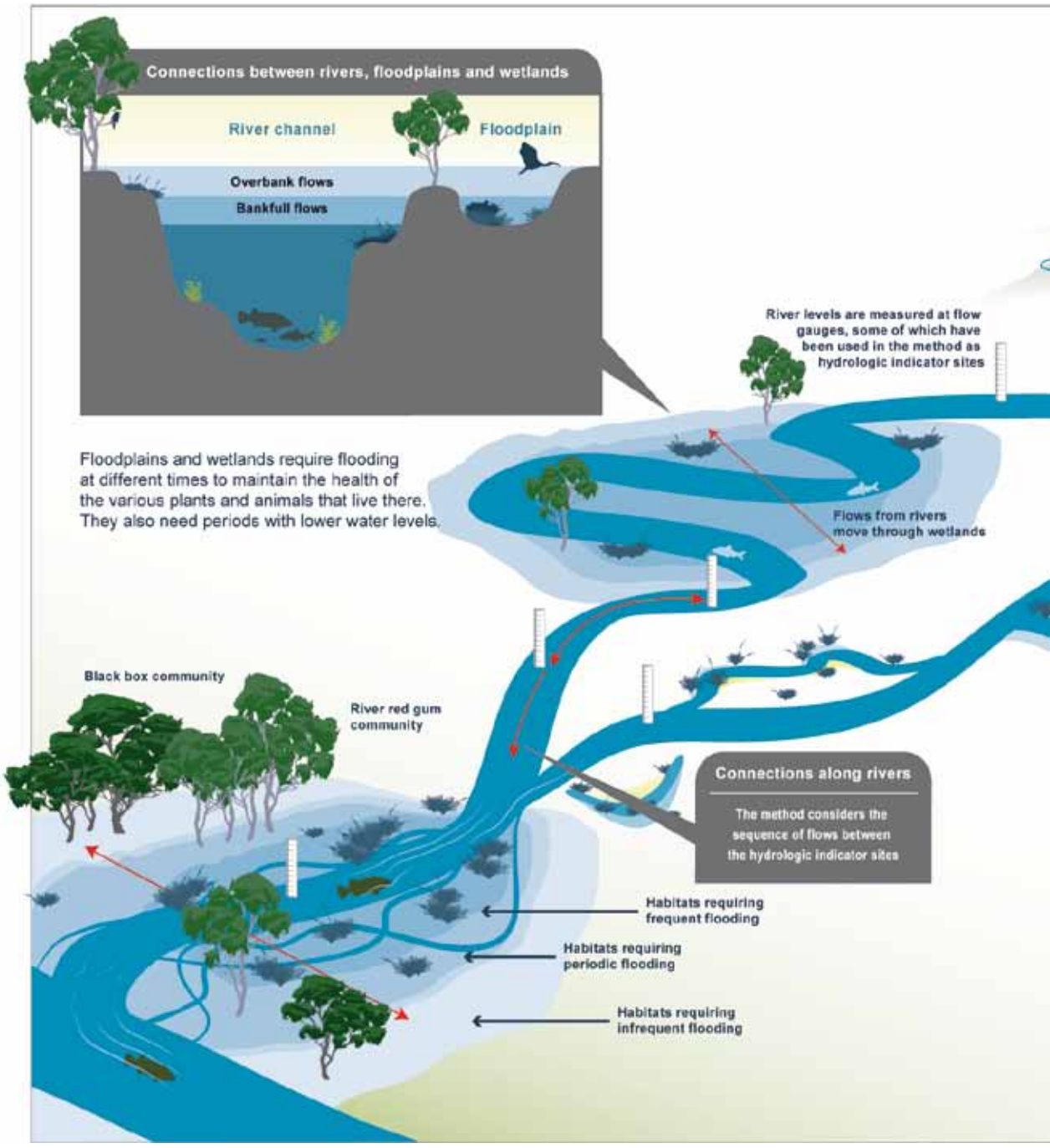
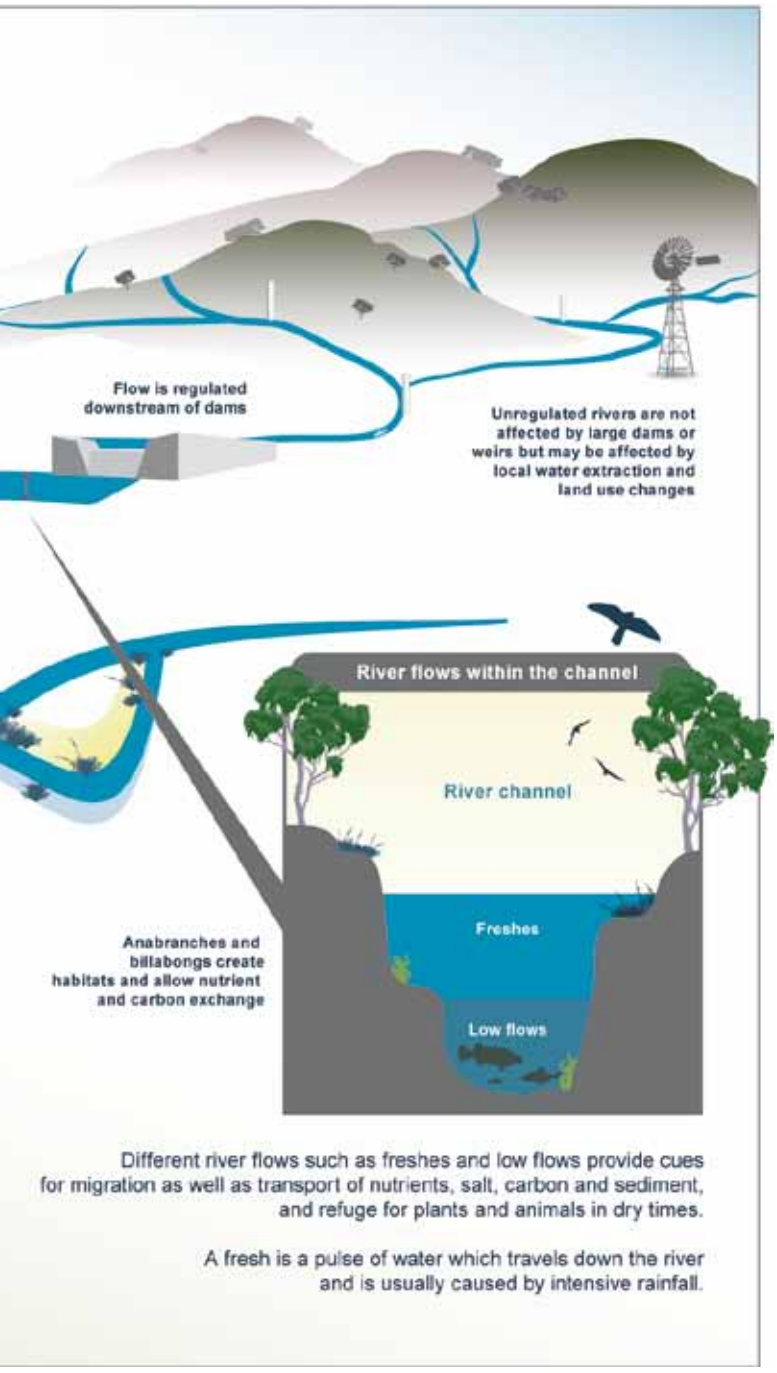


Figure 1.2 Illustrating the connections between Basin ecosystems



Different river flows such as freshes and low flows provide cues for migration as well as transport of nutrients, salt, carbon and sediment, and refuge for plants and animals in dry times.

A fresh is a pulse of water which travels down the river and is usually caused by intensive rainfall.

The rivers in the Murray–Darling Basin are more than just paths for water — they provide connections to floodplains and wetlands; they transport nutrients, carbon, salt and sediments; and they create habitats for native plants and animals. Because river flows vary over days, seasons and years, the habitats and ecosystems that rivers support vary, with some needing water periodically and some needing water all the time. The plants and animals that depend on these systems have adapted and evolved to the different river levels and seasonal conditions. The health of these water-dependent ecosystems is related to the timing and amount of river flows, as well as the duration between wet and dry times.

Figure 1.2 shows how flows vary within a catchment, both within the river itself and between the river and the floodplain and wetlands.

As shown in Figure 1.2, different habitats need different periods of inundation — for example, river red gum communities need more frequent inundation than black box communities, which is why river red gums are often found closer to the river than black box gums.

In determining environmental water requirements for the Basin Plan, MDBA has chosen a number of locations within rivers, floodplains and wetlands across the Basin. At these locations, known as hydrologic indicator sites, environmental water requirements have been determined by assessing the needs of the local ecology, as well as the water needed to provide the many functions that are necessary for healthy ecosystems both locally and downstream.

In working out these environmental water requirements and establishing a long-term average sustainable diversion limit (SDL) across the Basin, MDBA has taken account of the infrastructure that exists in the rivers, such as dams and weirs, as well as the risk of flooding to towns and properties along the river.

While the proposed SDLs are necessarily expressed as long-term averages, it is important to recognise that the annual SDL target will incorporate climatic variation and that environmental requirements will also vary according to the season and across sites and habitats.

For 112 hydrologic indicator sites — including 19 key indicator assets — across the Basin (and representative of known changes in flow regime), specific ecologically significant parts and patterns in the flow regime were targeted (low flows, fresh flows, bankfull and overbank events). All these criteria have ecologically important longitudinal effects — for example, variation in river flows confined within a river channel (low flows and fresh flows) are very important to the fish, aquatic plants and macroinvertebrates that live in the channels, but have a limited influence on the water needs of a floodplain or wetland complex.

A multiple lines-of-evidence approach was then used (ecological, hydrologic and social assessments informed by an extensive array of previous studies, new research and management plans) to assess the flow needs of the sites. In addition, modelling using 114 years of flow data was undertaken of the environmental water requirements of each flow component for each indicator site (for current and without-development flow scenarios). Changes in the frequency, duration and magnitude of low flows, fresh flows, bankfull and overbank events were analysed, and a picture was built of how flow components have altered because of the introduction of dams, weirs, locks and water extraction.

Potential SDL options were assessed using these models, to determine the potential environmental outcomes under these options and to inform policy settings within the draft Basin Plan. Based on feedback from a specially convened science forum that reviewed how the hydrologic indicator site method was applied when determining SDLs for the Basin, in June 2011 MDBA invited CSIRO to lead a review that will access a broader range of information than could be supplied to the forum. The review, due to be completed at the end of October 2011, will draw on expertise in the ecological and hydrologic sciences from within and outside CSIRO, including a subset of the scientists involved in the forum.

Once the CSIRO-led review has been undertaken, its findings will be made available during the consultation period on the draft Basin Plan, and MDBA will ensure that relevant forums are established so that the review and methods can be considered by the broader science community and other interested parties.

Transitioning to the new arrangements

Background

The *Water Act 2007* requires MDBA to prepare a draft Basin Plan to provide for the integrated management of the Murray–Darling Basin's water resources in a way that promotes the objects of the Act, including the management and use of those resources in a way that optimises economic, social and environmental outcomes.

Main activities

- The Australian Government confirmed in August 2010 that it would bridge the gap between baseline diversion limits and sustainable diversion limits (SDLs) through water recovery measures.
- The MDBA has agreed to the Murray–Darling Basin Ministerial Council request to defer the enforcement of sustainable diversion limits until 2019.

The House of Representatives Standing Committee on Regional Australia inquiry into the impact of the Murray–Darling Basin Plan on regional Australia (the Windsor inquiry) made a number of recommendations currently being considered by MDBA.

The committee found that most people throughout the Basin believe we need to change the way we use the Basin's water resources and that some water needs to be returned to the Basin to sustain both the Basin environment and the communities that depend on it. Basin stakeholders generally believed that a Basin plan is an appropriate way to achieve this, but were concerned about the plan proposed in the *Guide to the proposed Basin Plan*.

The committee concluded that alternatives existed to the proposals outlined in the Guide and these alternatives would help to achieve a better balance between the productive use of the Basin's water and water needed to sustain the Basin's environment, enabling Basin communities to be confident about their social and economic futures. The committee noted that water savings, for example, could be made through environmental works and measures and on-farm efficiency works, but that Basin communities and other stakeholders (including Basin state and local governments and their agencies) needed to be consulted about, engaged with and able to contribute to the development of any draft Basin plan.

The MDBA received extensive community feedback that was consistent with the findings of the Windsor inquiry. One of the key messages from this feedback was that communities needed more time to adjust to the changes required in the draft Basin Plan. In response to these concerns, the Murray–Darling Basin Ministerial Council requested at its meeting on 27 May 2011 that the transition to SDLs be extended over the next seven years to enable Basin communities and industries sufficient time to adjust. As a result, SDL compliance commencement dates in all Basin states will be 2019.

This seven-year period will facilitate adjustment by allowing time to recover water for the environment and time to develop and implement new water resource plans. The transition period will also give MDBA the opportunity to progress scientific understanding of the environmental requirements of key assets and functions, and to engage with communities to develop locally relevant and innovative solutions to deliver the SDLs and, if the evidence warrants, to amend the Basin Plan before SDLs come into force.

As the Basin Plan is implemented, it will be critical to incorporate new knowledge from ongoing research and to make future changes to the plan based on this knowledge and the experiences gained as we progressively move to a more sustainable and healthy Basin. This adaptive management approach will be principally underpinned by the monitoring and evaluation program in the Basin Plan, the work undertaken to improve scientific knowledge and the input from local communities and water managers. With input from and the support of engaged Basin communities, the monitoring and evaluation program will report on the condition of and trends in the environment as various water management plans are rolled out.

In addition to implementing adaptive management strategies, the seven-year transition period will also allow MDBA to address recommendations of the Windsor inquiry's report. The report highlighted a number of factors currently limiting environmental restoration and water delivery in the Basin, and recommended MDBA work with Basin states to remove these where appropriate.

Implementing the new arrangements

Background

Under the *Water Act 2007,* the draft Basin Plan is required to have specific elements to facilitate implementation of the new water management arrangements. These mandatory elements include:

- water resource plans to be developed by Basin states that will support water resource management in all areas of the Murray–Darling Basin
- an environmental watering plan that will ensure the best use of water for the environment
- a water quality and salinity management plan that will protect water quality in the Basin's water resources
- consistent water trading rules to govern trade and transfer of tradeable water rights within the Basin.

Main activities

During 2010–11, MDBA:

- Continued to refine the accreditation requirements that a water resource plan will need to meet to be accredited under the draft Basin Plan. Water resource plans will be the main mechanism for implementing the Basin Plan.
- Progressed development of the environmental watering plan, the water quality and salinity management plan, and the water trading and transfer rules to be included in the draft Basin Plan.

Water resource plans

The draft Basin Plan will mainly be implemented through water resource plans to be developed by Basin states. To be accredited, these water resources plans will need to meet the accreditation requirements set out in the Basin Plan. The MDBA will consider each plan before providing it to the Commonwealth Minister for Water (the Minister for Sustainability, Environment, Water, Population and Communities) for accreditation.

Developing water resource plan accreditation requirements

During 2010–11, MDBA prepared draft water resource plan accreditation requirements for inclusion in the draft Basin Plan.

Establishing water resource plan requirements has required an integrated approach to the management of surface water, groundwater and environmental water in the draft Basin Plan. Over the past year, MDBA increased the level of consultation with state and federal agencies and received feedback on the accreditation requirement proposals.

This feedback has contributed to an improved policy framework for water resource planning, resulting in simplified and streamlined accreditation criteria that will be included in the draft Basin Plan. Water resource plan requirements are now designed to be practical and feasible and to promote confidence that they are fit for purpose.

Future management of water resource plans

Generally, the Water Act separates state plans into those made before and those made after the Act was written. Transitional plans are plans nominated in Schedule 4 of the Act and made before 25 January 2007. Interim plans are plans made after 25 January 2007 (and before the Basin Plan comes into effect). These plans will eventually be replaced by water resource plans consistent with the Basin Plan, developed as part of legislative requirements.

During the year, MDBA worked with Basin states on developing water resource plans, particularly those that will become interim water resource plans.

In consultation with relevant agencies, MDBA expects to begin developing guidelines in 2011–12 that will help decision-makers as water resource plan accreditation requirements are translated into Basin Plan water resource plans.

MDBA TEAM SNAPSHOT

Groundwater Planning Team

As part of its work on the draft Basin Plan, MDBA's Groundwater Planning Team has established the first-ever framework for groundwater management throughout the entire Murray–Darling Basin.

Our work brings together extensive work done over many years by the Basin states. It establishes a common approach to baseline arrangements for assessing further changes to groundwater management and identifies changes proposed as necessary to move groundwater management to a sustainable footing. In particular, the establishment of a common approach to the groundwater management baseline is of major significance, given that no equivalent arrangement (such as the Cap on water diversions in 1995) has applied for surface water in the Basin.

Groundwater Planning Team members have worked extensively with, and been aided by the significant contribution of, Basin state officials to develop and apply MDBA policies on groundwater. These policies have also been significantly improved through the feedback from groundwater users and other interested stakeholders.

Our work has involved estimating groundwater recharge right across the Basin, the use of state-developed groundwater models for areas of particularly intensive groundwater use and consideration of issues that may be relevant to groundwater in the future.

Environmental watering plan

Section 28 of the Water Act requires that an environmental watering plan be included in the draft Basin Plan. The environmental watering plan will set out ecological objectives and targets to measure progress, and will include principles and methods to guide planning for and use of environmental water. In combination, the components of the environmental watering plan will help prioritise and coordinate environmental watering to achieve Basin-scale environmental outcomes in a changing environment.

Among other things, the environmental watering plan must specify an environmental management framework for planned and held water along with methods to identify environmental assets and ecosystem functions that need environmental watering. The plan will also apply principles and methods to determine the priorities for applying environmental water, which will enable us to make the best use of water available to the environment.

Rather than prescribe a strict watering or flow regime, the environmental watering plan will provide a framework for the adaptive management of watering activities, which will allow us to use advances in knowledge and to deal with year-to-year climate variation.

The environmental watering plan will build on both a long history of water resource management in the Murray–Darling Basin and the solid body of expertise in managing environmental water developed over recent years. The plan will also build on the experience of local communities, working groups and committees set up to support environmental watering, and Australian Government and state government agencies.

Once the Basin Plan is adopted, Basin states will be required to develop long-term strategic environmental watering plans consistent with the environmental watering plan. From this annual water planning, we will be able to determine annual watering priorities for each water resource plan area, which will inform a Basin-scale environmental watering prioritisation process. Using advice from an environmental watering advisory committee, which MDBA will establish and chair, we will be able to coordinate Basin-scale priorities using the principles outlined in the environmental watering plan.

The prioritisation process will actively consider the forecast water availability and the management outcomes being sought, with MDBA using this information to publish a yearly statement of environmental watering priorities.

Water quality and salinity management plan

Under ss. 22(1) and 25 of the Water Act, the proposed water quality and salinity management plan is a mandatory component of the draft Basin Plan.

The Water Act requires the water quality and salinity management plan to identify key causes of water quality degradation in the Murray–Darling Basin, and to include water quality and salinity objectives and targets for the Basin's water resources.

The proposed water quality objectives and the targets for water quality characteristics of most concern in the Murray–Darling Basin — salinity, suspended matter, nutrients, dissolved oxygen, toxins (caused by blue-green algae, or cyanobacteria, and pesticides), pH and water temperature — were published in the Guide to the proposed Basin Plan (Part I, Vol. 2). Following discussions with stakeholders and consideration of additional scientific information, a number of the proposed water quality targets were further reviewed.

Murrumbidgee River, just above the Tuggeranong Creek confluence, May 2011

At the Basin level, adopting the objectives and targets of the water quality and salinity management plan and the management framework will lead to new water quality reporting obligations for infrastructure managers. Infrastructure operators (including MDBA) will need to report to MDBA when certain water quality targets are exceeded as a result of flow management decisions. Relevant targets are the salinity operating target, dissolved oxygen target (because of the risk of blackwater events and consequent fish kills) and algal toxins target (because of the risks to recreational water users).

At the catchment level, new water quality management plans are proposed to support the water resource plans. These plans will outline measures and actions proposed to address key water quality risks in particular catchments or water resource plan areas. Implementing these actions or measures over time will lead to the water quality objectives being achieved.

A number of models for water quality management have been investigated, including the Coastal Catchments Initiative, a framework used for coastal catchments in Australia. Adopting the plan's objectives and targets will lead to new water quality management obligations at the Basin level (for infrastructure managers) and, at the catchment level, to water quality management actions as a component of water resource plans.

Basin-wide water trading rules

Water trading policies are currently set independently by Basin states, which means water trading rules vary between jurisdictions. Rules are currently found in state legislation and in the policies and procedures of irrigation infrastructure operators; they are administered by state governments or infrastructure operators. To ensure consistent treatment of interstate water trades in the southern-connected Basin, MDBA coordinates interstate water trade under Schedule D of the Murray–Darling Basin Agreement.

Under the draft Basin Plan, water trading rules will create consistent water trading rules for all Basin water resources. Water trading rules will apply to parties wishing to buy or sell water within the Basin. All buyers, sellers and administrators of water (including Basin states and irrigation infrastructure operators) will be required to comply with the new rules, which will ensure that Basin water markets function consistently and transparently.

It is intended that Basin Plan water trading rules will enable tradeable water access rights to reach their most valued use. The water trading rules will create efficient and effective water trading regimes by removing barriers to trade, specifying the terms and processes for trading water and providing market information.

During its preparation of the draft Basin Plan water trading rules, MDBA took into account advice provided by the Australian Competition and Consumer Commission in its *Water trading rules: final advice* (March 2010). The ACCC had earlier released issue, position and draft advice papers on the rules; the resulting stakeholder submissions and other information collected by the ACCC were then used to inform the ACCC's final advice.

Interstate water trade in the southern-connected Murray–Darling Basin, 2010–11

The southern-connected Murray–Darling Basin is arguably the largest and most mature water market in Australia, with water trading bringing significant benefits to the region. The importance of trade has been highlighted over the past three years, during which the highest volumes were traded in seasons of low water availability.

During 2010–11, volumes of interstate water allocation trade in the southern-connected Murray–Darling were not as high as in previous years — trades of around 200 GL took place, much lower than the 490 GL in 2009–10 and 593 GL in 2008–09.

This reduction in interstate water allocation trades coincides with the much wetter conditions that occurred in the second half of 2010–11, when the majority of water entitlements reached 100% allocation. The net trade out of New South Wales was 100 GL, while Victoria and South Australia had net trades of 45 GL and 55 GL, respectively.

The application of consistent and transparent Basin-wide water trading rules under the draft Basin Plan will provide opportunities for water users to use water markets throughout the Basin.

Inlet regulator valves, Tombullen Storage, near Euroley, New South Wales, March 2011

Tracking success

Background

The *Water Act 2007* sets out a new role for the Australian Government in water resource regulation, compliance and enforcement, operating in parallel with state and territory legislation. The MDBA will be the enforcement agency in relation to compliance with the Basin Plan. Along with state and territory enforcement agencies, MDBA will also have enforcement powers relating to water resource plans. In particular, the Water Act requires the Basin Plan to include a method for assessing compliance with the sustainable diversion limits.

Providing for adaptive management is a key consideration in developing and implementing the Basin Plan. Adaptive management involves building a sound base of information and experience as well as establishing a transparent framework to learn, adapt and review over time. As part of an adaptive management approach, the Basin Plan will include a program to monitor and evaluate its own effectiveness. This program will set out the principles to be applied and the framework to be used for monitoring and evaluation — including the requirements for reporting by the Australian Government and Basin state governments — and will set out a process to review the environmental watering plan and water quality and salinity management plan targets.

Main activities

- Progressed development of a proposed compliance and enforcement framework.
- Progressed development of a proposed monitoring, evaluation and reporting program to assess the effectiveness of the Basin Plan over time and to enable adaptive management.

Compliance

In 2010–11, MDBA liaised with other Australian Government agencies and with the Basin states on the diversion limit compliance method and the overall compliance and enforcement framework.

As a result, a refined diversion limit compliance method has been developed for inclusion in the draft Basin Plan. The MDBA's work in liaising with other Australian Government agencies and with the Basin states also enabled us to clarify to key stakeholders how MDBA will fulfil its regulatory role.

Work also began in the past year on scoping components of MDBA's regulatory role once the draft Basin Plan comes into operation. Issues scoped include identifying MDBA's compliance and enforcement options for regulating the Basin Plan and discussing the role of these options in giving effect to the Basin Plan with key stakeholders.

In addition, MDBA has been identifying key milestones to transition from the Cap on water diversions to the sustainable diversion limit model and how water resource plans can bring these requirements into effect. This work encompasses methods for determining compliance with the rules contained in water resource plans, assessing assumptions embedded in river system models and determining the annual reporting Basin states would be required to carry out.

Monitoring and evaluation

Throughout 2010–11, MDBA continued to develop the monitoring and evaluation program for the draft Basin Plan. Using the Australian Government's Monitoring, Evaluation, Reporting and Improvement Framework, the program identified the immediate, intermediate and longer-term outcomes of the Basin Plan and arrangements to track progress towards these outcomes.

Based on feedback on the draft monitoring and evaluation program outlined in the *Guide to the proposed Basin Plan* (Part I, Vol. 2) refinements were made to streamline and enhance integration of program elements and reporting. The MDBA liaised closely with the Australian Government and with Basin state governments about these refinements and also identified ways to improve alignment between the program and existing federal and state monitoring and evaluation activities and reporting.

The proposed monitoring and evaluation program builds on existing programs such as the Sustainable Rivers Audit, The Living Murray environmental monitoring program and a range of existing state-based programs as well as activities by Australian Government agencies (e.g. the Bureau of Meteorology).

In addition to finalising the monitoring and evaluation program for the draft Basin Plan, MDBA also began planning development of the technical and operational arrangements needed to implement the program once the Basin Plan comes into operation.

Engaging with stakeholders

Background

Stakeholder engagement is a major focus of the Murray–Darling Basin Authority across all its programs. The *Water Act 2007* specifies requirements for engaging stakeholders during the development of the draft Basin Plan — MDBA must consult with the Basin states, the Basin Community Committee and the Basin Officials Committee, as well as undertaking other consultation as appropriate. Appendix A (p. 256) contains more information about these committees.

Main activities

- Developed a process that tracked and collated over 3,000 pieces of feedback on the *Guide to the proposed Basin Plan.*
- Published an overview of feedback on the Guide.
- Implemented a round of community information sessions to discuss the Guide; feedback from these sessions was published daily on MDBA's website.
- Continued to support the effective participation of Aboriginal people whose traditional lands lie within the Basin in the development of the draft Basin Plan.
- Supported the National Cultural Flows Planning and Research Committee in developing a research project to identify and quantify cultural flows in the Basin.

Engagement on developing the draft Basin Plan

The MDBA continued to develop strong relationships with key stakeholders during 2010–11. Our Community and Environment Team carried out extensive engagement activities before the Guide was published, including attending conferences and running information stands at agriculture field days and industry events. These activities enabled MDBA staff to inform stakeholders about the process of developing the draft Basin Plan while giving them the opportunity to discuss issues relevant to the Guide with us.

Staff and executive members of MDBA attended more than 250 meetings, workshops and conferences to discuss draft Basin Plan development and wider MDBA business with community and environment stakeholders. These activities gave stakeholders many opportunities to participate in developing the draft plan, and increased MDBA's understanding of the range of views across the community.

Following his appointment, the new Authority Chair, Craig Knowles, dedicated a lot of time to meeting with individuals, Basin communities and governments to talk about our approach to the draft Basin Plan.

To get a better understanding of the communities and issues across the Basin, Craig visited over 30 regional towns to meet with as many concerned people as possible. Basin Community Committee and local community members were instrumental in arranging these meetings, which took place in a variety of formats — at kitchen tables, in paddocks and even on a few locally organised bus tours.

> *Without adequate consultation and an appropriate length of time to truly consider the social and economic impacts, this will further marginalise the communities in the Basin.*
>
> *Communities which have been heavily stressed by a decade of drought, fluctuating commodity prices and the global financial crisis have little tolerance left.*
>
> Quote from feedback on the Guide

> *It is to your credit that you took the time to release this Guide ... and encouraging the community to have input at the basement level. The respect shown by the Authority (at meetings) to the concerns of those communities and individuals who will be impacted and those that were interested was exemplary ...*
>
> Quote from feedback on the Guide

Being able to meet with people in their home towns gave us crucial insight and information to help guide the development of the draft plan.

Craig was accompanied on his tours by representatives from the Australian Conservation Foundation, National Irrigators Council, National Farmers Federation, the Department of Sustainability, Environment, Water, Population and Communities, and the Basin Community Committee.

The MDBA employed a consulting company to evaluate our implementation of the stakeholder engagement strategy. This evaluation took place in two parts, six months apart, and provided us with in-depth information to guide our future engagement with stakeholders. The review highlighted some areas where future engagement with our stakeholders could be improved. In particular the review identified that we need to improve our engagement with state agencies and encourage more trust in the process itself (i.e. how feedback received would feed into the development of the draft Basin Plan).

As well as the direct stakeholder feedback, the results of this review helped develop the engagement strategy for the draft Basin Plan — we have increased our engagement with state agencies significantly and we are further developing social media for use during the formal consultation period. We are designing future engagement events to give stakeholders more opportunities to present their views and discuss issues with the Authority and staff.

Indigenous engagement

During 2010–11, MDBA continued to support Indigenous Australians whose traditional lands lie within the Murray–Darling Basin to participate effectively in the development of the draft Basin Plan.

Two self-determining Indigenous organisations — the Murray Lower Darling Rivers Indigenous Nations (MLDRIN) and the Northern Murray–Darling Basin Aboriginal Nations (NBAN) — are contributing to the development of the draft Basin Plan and, more broadly, to providing an Aboriginal perspective on natural resource management and cultural issues in the Basin. The MDBA assisted MLDRIN to meet eight times in 2010–11, including five full delegate meetings and three working group meetings. The Northern Murray–Darling Basin Aboriginal Nations met seven times, including two full delegate meetings and five executive committee meetings. One joint MLDRIN – NBAN executive meeting and one joint MLDRIN – NBAN full delegate meeting were also held. Over 40 delegates from all over the Basin attended the joint MLDRIN – NBAN full delegate meeting in June 2011 at Old Parliament House, Canberra.

Our argument is that you can send an environmental flow down the river but it doesn't fulfil our cultural requirements. Need to look outside the square — this is our economy and social structure. They're trying to bundle us in with 'rural groups', 'school groups' etc. What I would like to say is that there is another community out there.

NBAN representative

I'm going to put it bluntly: Water is our life.

NBAN representative

During 2010–11, MDBA's Indigenous Engagement program again supported the River Country Spirit Ceremony. As with last year's ceremony, this was a successful event, giving MDBA staff the opportunity to engage with Aboriginal people in the Basin beyond MLDRIN and NBAN and to develop key contacts.

The MDBA is supporting the National Cultural Flows Planning and Research Committee, which consists of representatives from five Aboriginal organisations from across Australia, including MLDRIN and NBAN.

The committee's main objective is the development of a research project that will identify and quantify cultural flows in the Murray–Darling Basin and will inform water resource plans nationally. The committee has met four times since its establishment in March 2011.

Working with NBAN, MDBA has initiated two use-and-occupancy mapping projects with traditional owner groups. Widely implemented in Canada, use-and-occupancy mapping uses a rigorous, well-considered social science method and scientifically defensible technique to help Indigenous people document the many ways in which they use the land and water.

National Field Day, Orange, New South Wales

MDBA staff member Wade Whitelaw from the Stakeholder Engagement Team manning MDBA's stand at the National Agricultural Field Day held in Orange in October 2010. This event gave people an opportunity to discuss the *Guide to the proposed Basin Plan* and other issues with MDBA staff.

Feedback on the Guide

The Guide's publication on 8 October 2010 generated a strong public response from Basin communities and other stakeholders, partly because some people believed that the Guide was the actual draft Basin Plan.

The Guide provided an early opportunity to seek feedback from the community on a range of options being considered by MDBA for inclusion in the draft Basin Plan. The Guide included three proposed sustainable diversion limit (SDL) scenarios. The Guide's release enabled MDBA to carry out an intensive program of community engagement on the planning and policy framework described in the Guide.

We held community information sessions in towns across the Basin, along with other activities designed to provide information, respond to questions from the public and receive feedback. We held 33 community information sessions in 25 towns, and feedback provided by some of the 20,000 people who attended these sessions was summarised and published daily on our website, <www.mdba.gov.au>.

We established a 1 800 hotline number to help people find out more about the Guide and MDBA community events, and how to give feedback on the Guide. This hotline handled approximately 7,000 calls within a two-month period and provided an important service to our stakeholders.

Scientific and key stakeholder groups attended a technical briefing in Canberra on 22 and 23 November 2010. The briefing was attended by over 260 people and gave attendees the opportunity to further examine the contents of the Guide.

Many people submitted feedback on the Guide through our website, but we also received letters, emails and telephone calls. By the time the feedback period ended on 28 February 2011, we had received over 3,000 pieces of feedback. This feedback was tracked and collated and, where permission was given, published on our website.

We published an overview of this feedback on our website in May 2011. Feedback was given by a wide range of individuals and businesses, organisations and government agencies: some 44% of feedback came from outside the Murray–Darling Basin and around 41% came from within the Basin, while the source of the remaining 15% was unknown.

While most people agreed there should be a better balance between the productive use of Basin water resources and water needed to ensure environmental health, many in regional communities were particularly concerned about the scale of change in the proposed long-term average SDLs.

Other significant issues raised in feedback included the community engagement process and the large size and complexity of the Guide. The MDBA is considering this feedback as we develop our engagement strategy for the formal consultation on the draft Basin Plan.

While not all feedback on the Guide was negative, fears expressed by Basin communities generated considerable media coverage and commentary, and led to the establishment of the House of Representatives Standing Committee on Regional Australia inquiry into the impact of the Murray–Darling Basin Plan in regional Australia (the Windsor inquiry).

The standing committee tabled its report, *Of drought and flooding rains*, in the Australian Parliament on 2 June 2011. Criticisms of MDBA in the report principally revolved around consultation and engagement with Basin communities and stakeholders throughout the production of the Guide.

The committee made a number of recommendations that MDBA is now considering in the lead-up to the release of the draft Basin Plan, including commissioning a study to identify all regulations and agreements that inhibit the efficient management of water in the Murray–Darling Basin and, where appropriate, working with the states to remove these regulations; developing community engagement strategies tailored to each catchment community; and undertaking separate Basin community planning to give individual communities more opportunities to contribute to the development of the draft Basin Plan.

More information about the Windsor inquiry is in 'Transitioning to the new arrangements', on p. 62.

Protecting and enhancing water resources

CHAPTER: 2

Chapter 2 and its main subsections also relate to the Natural Resource Management Division section of the *Murray–Darling Basin Authority corporate plan 2009–10 to 2012–13*.

Under the 2010–11 Portfolio Budget Statements, the Natural Resource Management Division has the following program objective:

To develop and implement programs for the protection, enhancement and sustainable use of the Basin's shared water and other natural resources.

Construction of vertical slot fishway at Lock 2 (Waikerie), 2011

This image shows the vertical slot section passing under the outlet from the fish lock. The fishways have a dual lock/vertical slot capability to allow passage of the full-size class of fish, from 20 mm smelt (*Retropinna semoni*) to 1 m Murray cod (*Maccullochella peelii*).

Construction of the fishways at locks 2 and 4 had to cease when the work sites were inundated during the floods of 2010–11. While the delay to construction is frustrating, the floods provided fish with free passage because the weir was removed and floodwaters covered the floodplain at depths sufficient for fish to migrate upstream.

Overview

The Murray–Darling Basin Authority (MDBA) develops and implements strategies to protect and enhance the Murray–Darling Basin's shared water and other natural resources.

The MDBA's Natural Resource Management Division carries out these functions by undertaking the planning, development and management of the Basin's water, land and other natural resources. Operating on behalf of, and in collaboration with, Basin jurisdictions, the Natural Resource Management Division implemented key programs and policies as directed by the Murray–Darling Basin Ministerial Council, including The Living Murray program, a $1 billion river restoration program underpinned by intergovernmental agreements. Other significant programs for which the Natural Resource Management Division is responsible include:

- Cap on water diversions
- Native Fish Strategy
- Basin Salinity Management Strategy
- Sustainable Rivers Audit
- River Murray water quality monitoring
- interstate water trade and water accounting
- acid sulfate soils risk assessment
- South Eastern Australian Climate Initiative
- emergency measures, including recent works around the lakes at the lower end of the River Murray
- strategic review and future planning of natural resource programs.

The Natural Resource Management Division also plays a key role in supporting, funding and coordinating the collection, analysis and reporting of data and information to support development of natural resource management policies and programs. It does this through partnerships with key research organisations such as CSIRO and the Murray–Darling Freshwater Research Centre, as well as through delivery of programs such as the Sustainable Rivers Audit, which provides a long-term assessment of the health of the Basin's aquatic ecosystems. The division also contains a dedicated Natural Resource Information section that services MDBA spatial information and data requirements.

As well as delivering these core functions, the Natural Resource Management Division also supports development of the draft Basin Plan through the expertise of its staff in various program areas, from spatial data analysis to environmental water delivery and monitoring and evaluation.

Flooded Lachlan River near Condobolin, New South Wales, December 2010

Main activities

- Completed the acid sulfate soils risk assessment project — an assessment of the risk of acid sulfate soils at more than 19,000 waterways across the Murray–Darling Basin.
- Completed sampling for the second Sustainable Rivers Audit Basin-wide assessment of river health.
- Undertook the Strategic Programs Review, a comprehensive assessment of current investments in jointly funded natural resource management programs, and recommended future priorities in recognition of significant changes in the business environment.
- Made significant progress in meeting the water recovery goals of The Living Murray, with 18 water recovery measures completed or implemented and a total of 479 GL long-term Cap equivalent on the Environmental Water Register.
- Delivered phase 2 of a joint Department of Sustainability, Environment, Water, Population and Communities – MDBA comprehensive water-dependent ecosystem database.
- Continued construction work on and monitoring of the Sea-to-Hume fishway program. Only four more fishways are required to be built under this program.
- Developed the Native Fish Strategy Action Plan 2011–21 and continued work on managing alien fish species in the Basin, including research and knowledge exchange activities on gambusia (*Gambusia holbrooki*) and tilapia (*Oreochromis mossambicus*).
- Investigated the status and management of fish drought refuges in the Basin.
- Completed assessment of a 30-year dataset of phytoplankton and macroinvertebrate monitoring in the River Murray, and a 12-year dataset of the macroinvertebrate monitoring in the Mitta Mitta River, providing information about long-term trends in water quality and the impacts of development and river regulation.
- Coordinated weekly status discussions with jurisdictional partners and catchment management authorities on the blackwater event triggered by flooding in the River Murray (November 2010 to April 2011), to determine key lessons for the future, and provided updates on MDBA's website.
- Investigated potential impacts of floods in mobilising salts from River Murray floodplains. Findings include that floodplains located between locks 5 to 3 are likely to export highest salt loads to the river during flood recession periods and that at or below 5,000 ML/d flow, salinity at Morgan, South Australia may exceed 800 EC (95th percentile target). An EC is an electrical conductivity unit commonly used to indicate the salt concentration or the salinity of water (1 EC = 1 µS/cm).

The Living Murray river restoration program

Background

The Living Murray program is one of Australia's most significant river restoration programs, with funding of almost $1 billion.

The initiative is jointly funded by the Australian Government and the governments of New South Wales, Victoria, South Australia and the Australian Capital Territory; it is coordinated by the Murray–Darling Basin Authority (MDBA).

Over the long term, The Living Murray aims to contribute to the achievement of a healthy working River Murray System for the benefit of all Australians. The Living Murray program has made significant progress towards its original goal of achieving 500 GL of environmental water by recovering 479 GL (long-term average water availability per year) to improve the ecological health of the River Murray System.

The Living Murray aims to improve environmental outcomes at six icon sites — Barmah–Millewa Forest; Gunbower–Koondrook–Perricoota Forest; Hattah Lakes; Chowilla Floodplain and Lindsay–Wallpolla Islands; Lower Lakes, Coorong and Murray Mouth; and the River Murray Channel (see Figure 2.1 on p. 86 for the locations of the icon sites).

The icon sites were chosen for their high ecological value — most are listed as internationally significant wetlands under the Convention on Wetlands of International Importance (the Ramsar Convention) — and their high cultural value to Aboriginal people and other communities.

This year has seen a shift in the focus of The Living Murray from recovering water to delivering water and progressing construction of the water management structures along the length of the River Murray.

Significant flooding occurred this year along the entire River Murray and its tributaries, with inflows over summer the highest on record. The increased volume of water allocations in The Living Murray water portfolio meant that a wide range of watering options became available, increasing the opportunities for significant environmental benefits.

The Living Murray is made up of a number of programs that contribute to the improved environmental health of the icon sites. The following sections detail the progress of these programs. More information about the construction of water management structures at the icon sites can be found in chapter 3, 'Delivering water efficiently and equitably' (p. 123).

The Living Murray Water Recovery Program

Background

The Water Recovery Program coordinates actions to recover water for The Living Murray (TLM), including:

- infrastructure measures
- market-based measures
- regulatory measures.

The volume of water recovered is calculated as a long-term Cap equivalent volume, or LTCE (see boxed definitions).

All water recovery measures are subject to an independent review on completion. All final listings on the Environmental Water Register (see 'Water recovery registers' in boxed definitions) are approved by the Murray–Darling Basin Ministerial Council.

Definitions

Long-term Cap equivalent

The long-term Cap equivalent is a type of average. It takes into account the different characteristics and reliability of water entitlements in New South Wales, Victoria and South Australia. For instance, the recovery of a LTCE volume of 1.000 GL in the New South Wales Murray region requires purchase of either a 1.053 GL high security water access licence or a 1.237 GL general security water access licence. This measure of water recovery creates a common unit of measure, allowing equitable comparison of a broad range of water recovery measures.

Water recovery registers

Water recovery measures are approved and monitored using a system of three registers. The first stage of approval for a water recovery measure is the Developmental Register, the initial list of water recovery proposals deemed feasible as a water recovery measure under TLM.

The second stage of approval is the Eligible Measures Register, which lists water recovery measures either ready to be implemented or being implemented.

The third and final stage of approval for a water recovery measure is the Environmental Water Register, the point at which the water entitlement is made formally available for use under TLM.

Main activities

- Listed a total of 479 GL LTCE on the Environmental Water Register (as at 30 June 2011).
- Completed or implemented 18 water recovery measures for TLM.

Figure 2.1 Location of The Living Murray icon sites

As at 30 June 2011, water recovery measures have recovered 479 GL LTCE of water (see Table 2.1). It is expected that a further 7.1 GL LTCE of water will be recovered by measures still being implemented (see Table 2.2).

During 2010–11, MDBA completed its purchase of irrigation entitlements under The Living Murray water purchase project. The project received over 400 expressions of interest, with 18.646 GL LTCE of water entitlements being purchased from willing sellers in South Australia and Victoria.

The MDBA also completed work with the Ricegrowers Association of Australia in implementing the on-farm water efficiency round 2 project, under which funding was provided to irrigators to implement water savings at a farm-scale level in return for permanent water entitlements. The project has recovered 6.274 GL LTCE of water for TLM.

The MDBA also completed the purchase of entitlements under the sustainable soils and farms measure during 2010–11, which recovered 3.026 GL LTCE for TLM.

Table 2.1 Listings on the Environmental Water Register (at 30 June 2011)

Proponent	Measure	Volume recovered (GL LTCE)
Final listings		
Australian Government	Water through efficiency tender	0.176
New South Wales	Murray Irrigation Limited supplementary water access licence	17.800
New South Wales	Tandou Limited supplementary water access licence	9.300
New South Wales	Pipe-It	0.162
New South Wales	Wetlands water recovery — Stage 1	0.550
New South Wales	Market purchase measure	115.270
South Australia	Securing government-held water for environmental use	13.000
South Australia	Purchase from willing sellers	5.000
South Australia	Securing government water and purchase from willing sellers	17.000
Victoria	Goulburn–Murray Water recovery package	144.900
Victoria	Shepparton Irrigation Area modernisation project	29.300
MDBA	Pilot market purchase measure	13.285
MDBA	Ricegrowers Association on-farm water efficiency project: A1	1.186
MDBA	Ricegrowers Association on-farm water efficiency project: round 2	6.274
MDBA	The Living Murray water purchase project	18.646
MDBA	Sustainable soils and farms on-farm reconfiguration demonstration project	3.026
Interim listings		
New South Wales	Market purchase measure	113.688
New South Wales	Package B	56.000
Victoria	Lake Mokoan water recovery package	28.100
MDBA	Ricegrowers Association on-farm water efficiency project: round 2	5.836
MDBA	The Living Murray water purchase project	16.816
	Total	**479.0**

Table 2.2 Listings on the Eligible Measures Register (at 30 June 2011)

Proponent	Measure	Volume to be recovered (GL LTCE)
New South Wales	Package B	7.100
	Total	**7.1**

The Living Murray Environmental Delivery Program

Background

The Environmental Delivery Program is responsible for delivering water allocations from TLM water entitlements to the six icon sites to maximise ecological outcomes.

Main activities

- Substantial increase of allocated volume available to TLM because of improved inflows and the carryover from 2009–10.
- The Living Murray delivered a total of 271.176 GL of water from regulated entitlements to sites within the River Murray System, including 200 GL to the Barmah–Millewa Forest icon site. More unregulated water was also available to the River Murray, Lower Darling and Darling anabranch environments because of entitlements purchased by TLM.
- Successfully implemented a trial to prioritise environmental watering actions during the unregulated flows.

The high inflows to the Murray–Darling Basin throughout 2010–11, combined with the delivery of environmental water, have been critically important for many species recovering from the recent prolonged drought.

The carryover of 85 GL of allocations from 2009–10 was complemented by a substantial increase in allocations because of the high inflows. As a result, 402 GL of allocation became available to TLM in 2010–11.

Each year the Environmental Watering Group, which comprises representatives from TLM partner governments (the Australian Government and the governments of New South Wales, Victoria, South Australia and the Australian Capital Territory), develops a guide to its decision-making about the use of environmental water throughout the following year.

At the beginning of 2010–11, the outlook for inflows and allocations was low, with drought remaining in many areas of the southern Murray–Darling Basin. As a result, the Environmental Watering Group initially used management objectives for the 'dry' climate scenario to identify critical environmental water requirements for 2010–11. The dry climate objectives are to:

- maintain river functioning with reduced reproductive capacity
- maintain key functions of high priority wetlands
- manage within dry spell tolerances
- support connectivity within sites.

While allocations were initially low, the significant volume carried over from 2009–10 provided the Environmental Watering Group with its first opportunity to trial a larger watering action at multiple sites.

The high salinity levels and the risk of acidification at the Lower Lakes meant they were a high priority at the beginning of 2010–11. To maximise the environmental benefits, it was agreed to trial the delivery of environmental water through Barmah–Millewa Forest to the Lower Lakes. This trial encountered several complex operational and water accounting issues that meant environmental water could not be delivered in the manner initially planned. However, the action still produced very good environmental outcomes. The issues encountered are being addressed with the partner jurisdictions. Resolution of these issues will ultimately result in more effective environmental outcomes from the water available.

Higher inflows in spring 2010 significantly increased allocations and provided an alternative opportunity to deliver significant volumes of environmental water to Barmah–Millewa Forest and the Lower Lakes. A total of 410 GL of environmental water, comprising 200 GL of TLM water, 10 GL of environmental water from New South Wales and 200 GL from the Barmah–Millewa Forest Environmental Water Account, was released from Hume Reservoir. These releases were timed to maintain water levels in key bird-breeding areas during periods of lower flows and have resulted in one of the best bird-breeding events in Barmah Forest in 50 years.

High inflows throughout spring and summer resulted in a prolonged period of unregulated flow being announced for the River Murray and Lower Darling systems. For the first time TLM was able to trial the prioritisation of environmental watering actions during a River Murray unregulated flow event. The success of this trial indicates that the Environmental Watering Group's prioritising of environmental watering was beneficial during the early stages of the event when smaller volumes of River Murray unregulated flows were available. As larger amounts of unregulated water became available, this coordination was not required because most of the environmental watering sites were inundated by the higher flows. The prolonged floods meant that some of The Living Murray allocation initially committed for watering actions was either partially or fully met by the high inflows.

The Living Murray icon sites experienced either prolonged flooding or received good inflows during 2010–11, leading to significant improvements in their condition. Significant proportions of Barmah–Millewa Forest, Chowilla Floodplain and Gunbower–Koondrook Forest were inundated. At the Hattah Lakes icon site, most of the lakes were filled naturally, with water pumped to Lake Kramen for the first time since 1993. Water also flowed through the Hattah Lakes system into north Chalka Creek to the Murray for the first time since 1996, providing substantial environmental benefit to the floodplain and river. Water levels in the Lower Lakes rose well above the critical acidification levels and large volumes of water have been released through the barrages since September 2010, exporting salt to the Southern Ocean and improving fish passage.

Eleocharis spatheolata growing in wetland, Steamer Plain, Barmah–Millewa Forest, 23 February 2011

Little pied cormorants (*Microcarbo melanoleucos*) in their nest, War Plain, Barmah Forest, February 2011

During 2010–11, TLM revised icon site-specific environmental water management plans to incorporate over eight years of environmental watering experience, ecological monitoring, modelling and consultation outcomes. The environmental water management plans establish priorities for the use of TLM water within each icon site, describing icon site-specific ecological objectives and targets, watering regimes, water delivery arrangements and operation of water management structures. It is anticipated that most of the environmental water management plans will be available towards the end of 2011.

Plans for the Lower Lakes, Coorong and Murray Mouth icon site and the River Murray Channel will be reviewed during 2011–12.

MDBA TEAM SNAPSHOT

Environmental Delivery Team

As members of the Environmental Delivery Team, we are fortunate to have the opportunity to implement environmental watering throughout the River Murray System.

Working closely with our colleagues in state and other federal agencies, our role is to coordinate the effective environmental water planning and management of The Living Murray's six icon sites. This includes identifying water priorities on an annual basis, assisting with the logistics of delivering water to the sites and communicating the environmental outcomes and importance of the icon sites to the Australian public. We also serve a secretariat function for the Environmental Watering Group, an interjurisdictional committee that advises on the planning and management of environmental water under The Living Murray program. Our work requires us to work closely with the operators of the River Murray, including staff of MDBA River Operations.

Managing environmental water in an extremely variable climate provides many challenges. The team has coordinated the delivery of environmental water to critical refuge sites during very dry conditions. This has been followed by a period of record rainfall, in which environmental water was delivered in the gaps between flood peaks to ensure the continuation of bird-breeding events.

Each member of our team possesses a deep commitment to protecting and restoring the ecological health of these iconic sites, and we derive great satisfaction at being able to play an active role in the management of some of Australia's most important and internationally recognised wetlands.

The Living Murray Environmental Monitoring Program

Background

The Living Murray Environmental Monitoring Program assesses the environmental outcomes of The Living Murray (TLM) program by focusing on monitoring fish, bird and vegetation communities aligned with icon site ecological objectives. Environmental monitoring projects are in place at icon sites to provide both long-term ecological assessments and to document the shorter-term ecosystem benefits of environmental watering.

Highlight

- Throughout 2010–11, The Living Murray Environmental Monitoring Program continued to implement icon site condition, intervention and system-scale monitoring of fish, birds and vegetation communities.

A return to wetter conditions throughout the Murray–Darling Basin in 2010 led to widespread flooding that resulted in inundation of many floodplains and refilling of the Basin's water storages. The flooding of the River Murray floodplains delivered water to previously drought-stressed areas along the river systems. The Environmental Monitoring Program has coordinated a range of monitoring activities to ensure these outcomes are documented and reported, and the information is used to maximise the ecological benefits to the River Murray System and guide future watering activities.

Throughout 2010–11, the Environmental Monitoring Program continued to implement standardised condition monitoring of fish, waterbirds and vegetation, enabling consistent reporting on the condition or 'health' of the icon sites and progress towards long-term ecological objectives at all icon sites. Monitoring findings indicate that widespread flooding in late 2010 and early 2011 has resulted in positive ecological outcomes at icon sites and in the River Murray System. The monitoring information is summarised in the annual TLM implementation report, published each year.

The Environmental Monitoring Program coordinated a number of River Murray System-scale monitoring projects — for example, the fourth annual aerial survey of waterbird populations at icon sites, conducted in November 2010. This project was undertaken in conjunction with the Eastern Australian Waterbird Survey to enable survey results to be understood in the context of waterbird populations of the broader south-eastern Australian landscape. Initial results indicate that large numbers of waterbirds were observed in Barmah Forest.

In 2010–11, the Environmental Monitoring Program implemented a number of intervention monitoring projects to provide clear information about the links between TLM management

interventions such as environmental watering and ecological responses. The information gained from these monitoring projects will be used to refine and improve future watering and management actions to maximise the environmental benefits resulting from TLM. Among the intervention monitoring projects are:

- Quantifying the ecological benefits of an environmental release from Goolwa Barrage fishway, with reference to diadromous fish (fish that migrate between fresh and salt water). Interim results from the first two fish surveys, conducted in October and November 2010, indicate a greater number of fish were moving through the barrages than in the previous three years of sampling (i.e. from 2006 to 2009).
- Monitoring freshwater turtles in Barmah–Millewa Forest to assist cultural management. This project aims to provide a scientific framework for the culturally led management of turtle populations in Barmah–Millewa Forest. In 2010–11, the study increased efforts to transfer technical skills to the Yorta Yorta community, for whom the turtles have great cultural significance.
- Risk intervention monitoring projects at Chowilla to provide essential information on risks associated with the future operation of the Chowilla Environmental Regulator and to help assess progress towards achieving Chowilla icon site ecological objectives. In 2010, five projects were implemented at Chowilla:
  - surface-water quality monitoring
  - groundwater quality and level monitoring
  - soil salinity and moisture monitoring
  - salinity modelling
  - Murray cod (*Maccullochella peelii)* movement monitoring.

The widespread flooding of floodplains resulted in a blackwater event along the River Murray System and its tributaries. The Environmental Monitoring Program worked with the MDBA Water Quality Monitoring Program to coordinate the monitoring and reporting of this blackwater event.

Information derived from this monitoring was collated by the Murray–Darling Freshwater Research Centre and reported to the Australian Government, Basin state governments and the public. The information was used to assess whether blackwater was adversely affecting fish and other animals, to track its movement down the river system and to provide information about its impacts on floodplain forests, wetlands and adjoining rivers.

Preliminary findings from this monitoring indicate that despite some fish kills, overall the recent blackwater event had a minimal adverse effect on the river system and its dependent biota.

More information about The Living Murray Environmental Monitoring Program, the full suite of monitoring projects and recent monitoring reports are available on MDBA's website, <www.mdba.gov.au>.

Installing a fish trap at the Goolwa Barrage fishway entrance to monitor fish movements, December 2010

The traps are used as part of the River Murray Fishway Assessment Program, to assess the number and type of fish attempting to ascend the fishway and to demonstrate that the fishways are effective in allowing fish passage.

The Living Murray Communications and Consultation Program

Background

The Living Murray Communications and Consultation Program aims to:

- increase awareness and understanding of The Living Murray program
- promote the use of The Living Murray water portfolio to achieve environmental outcomes
- engage communities and provide opportunities for them to contribute their views.

Highlights

- Continued preparation of 'The Living Murray story', the story of one of Australia's largest river restoration programs.
- Participation in the Murray Meander — a one-week boating charity event that travelled from Mildura to Goolwa, South Australia. It involved 37 boats and 167 participants, traversed three icon sites and raised over $160,000 for charity.
- Display at Mildura Visitor Information Centre about The Living Murray and the nearby icon sites, Hattah Lakes and the Chowilla Floodplain and Lindsay–Wallpolla Islands.
- Continued engagement of local communities at sites where TLM water management structures are being built.

The Living Murray Communications and Consultation Team comprises four staff, who are located in New South Wales, Victoria and South Australia and at MDBA in Canberra. The team is responsible for developing and implementing The Living Murray communication and consultation strategy.

During 2010–11, state communication coordinators continued to meet with community groups and to conduct tours of the icon sites. The team also produced media releases and publications, including newsletters, factsheets and articles in magazines such as *Wetlands Australia* and *H_2O Thinking*.

The Living Murray publications were also distributed at relevant conferences, including the Australian Limnology Conference and the Floodplain Management Authorities Conference.

Construction of major water management structures is underway at a number of icon sites and extensive community consultation is occurring to ensure that the public is aware of the timing, scale and benefits of the works, and that any issues in their implementation can be resolved.

The Living Murray Communications and Consultation staff developing the strategy for 2011–12

Left to right: Jamie Hearn (Murray Catchment Management Authority, NSW), Jan Whittle (Department for Water, SA) and Lucy Alderton (Department of Sustainability and Environment, Vic).

The Living Murray Indigenous Partnerships Project

The Living Murray Indigenous Partnerships Project is a vital component of consultation and communication for The Living Murray (TLM) program.

The project aims to ensure that Indigenous community knowledge, values and perspectives are considered in the management plans for each of the six icon sites. The project employs Indigenous facilitators and Indigenous cultural heritage monitors who work with icon site managers to fulfil the program's objectives.

During 2010–11, traditional owners were engaged on TLM works and measures at each icon site to ensure that significant cultural sites are identified and protected.

Indigenous consultation on Mulcra Island works

Works at Mulcra Island are being built to increase the frequency of flooding to up to 800 ha of floodplains and wetlands. Ken Stewart, a TLM Indigenous facilitator who belongs to the Wamba Wamba nation, has been instrumental in engaging with Indigenous communities on issues relating to Mulcra Island:

> With Mulcra Island it's worked really well — the role that Indigenous people played in getting that infrastructure built and the partnerships they built with government agencies and contractors. That's the key thing: it's building relationships and partnerships.
>
> ... The good project managers did a lot of good work and got the trust of the Indigenous people and showed them that there's no nonsense.
>
> I always believe that if you tell people what's going on and put it on the table for them they're more sympathetic.
>
> If you keep them in the dark and don't give the information out, it's like anything — you're scared of the unknown. You need to put it on the table.
>
> The best thing is cross-cultural — getting the feedback from contractors who do a bit of work with Indigenous people coming back and saying, 'We're starting to understand why this land's important to people — the history'.

Ken Stewart of the Wamba Wamba nation, Indigenous facilitator, The Living Murray

Norman Moore (right), of the Barapa Barapa nation, showing Jamie Hearn (NSW TLM Communications and Consultation coordinator) a canoe tree in the Koondrook–Perricoota Forest, 2010–11

Community consultation at Koondrook–Perricoota Forest

Construction began in the Koondrook–Perricoota Forest (in New South Wales) in 2011. Consultation with community included opening a shop-front in Barham, which provides community members with the opportunity to discuss the works with TLM staff.

A joint Indigenous group was formed to monitor and provide advice on the impact of construction on cultural heritage at Koondrook–Perricoota. Indigenous Australian community members from both the Yorta Yorta and Barapa Barapa nations and representatives from the local Deniliquin and Moama Aboriginal land councils assessed the construction area for cultural sites such as habitat trees, scarred trees and artefacts. They continue to be involved in monitoring and recommending actions to protect the sites as construction proceeds.

Cap on water diversions

Background

The Murray–Darling Basin Authority manages the implementation of the Cap on water diversions for each river valley in the Basin as set out in Schedule E to the Murray–Darling Basin Agreement. The annual Cap target in each valley is calculated by a Cap model approved by MDBA.

The MDBA's responsibilities include organising the audit of compliance with the Cap by the Independent Audit Group and preparing and publishing an annual water audit monitoring report using information provided by the Basin states.

Highlights

- The Cap audit for 2009–10 (conducted and reported in 2010–11) found that diversions were within acceptable bounds in all valleys where a Cap applies.
- Basin-wide, the cumulative Cap diversions since 1997–98 were about 5% below the cumulative Cap targets.
- With the setting of the Condamine–Balonne Cap during 2010–11, capping in Queensland is now complete.
- Of the 20 Cap models requiring approval, 13 have been approved and four are being audited; of the remaining three Cap models, one has recently been submitted for audit and two are in advanced stages of preparation.
- The Cap has kept the aggregate level of water extractions in the Basin below the level of extraction in 1993–94 (see Figure 2.2).

Definition: the Cap

The Cap refers to a cap on diversions of surface water from the Murray–Darling Basin. It was established in 1995 to limit future increases in such diversions.

It is seen as an essential first step in establishing management systems to achieve healthy rivers and sustainable water use.

The annual Cap target varies from year to year, depending on inflow and rainfall.

Cap audit

The annual Cap audit for 2009–10 was conducted by the Independent Audit Group in September 2010, and the audit report was published and distributed in January 2011. The companion *Water audit monitoring report 2009–10*, which provides more comprehensive water use information and, where necessary, updates the figures of the Independent Audit Group, was published and distributed in May 2011.

The key findings of the Independent Audit Group Cap audit for 2009–10 were:

- Diversions of 5,518 GL from rivers in the Murray–Darling Basin were the fourth lowest since 1983–84, reflecting continuing drought conditions and the possible onset of climate change throughout most of the Basin.
- Diversions in all Cap valleys in New South Wales, Victoria, South Australia and Queensland where a Cap has been defined were within acceptable bounds for Cap management.
- The Cap proposal for Condamine–Balonne was assessed and the Cap was set; it will apply from 2010–11.
- The Cap proposal for the New South Wales Border Rivers region was assessed and will now be considered by the Murray–Darling Basin Ministerial Council.
- In the absence of a Cap model, the Australian Capital Territory Cap could not be audited. However, diversions were well below the territory's long-term Cap.

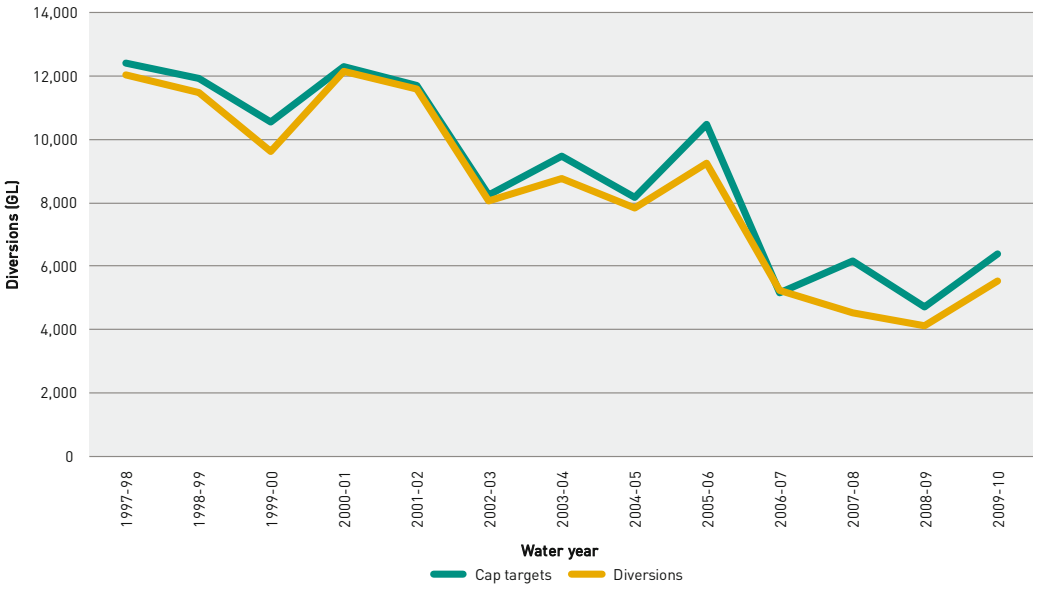


Figure 2.2 Annual diversions against annual Cap targets, 1997–98 to 2009–10

The overall decline in flow to the sea and the lowering of Cap targets and consequent reduction of diversions result from decreased inflows into rivers and decreased water availability as a consequence of drought.

Accreditation of Cap models

Of the 24 Cap valleys in the Basin, Caps have not been set in two valleys (NSW Border Rivers and Intersecting Streams) while two other valleys currently do not require a Cap model (Lower Murray swamps and country towns).

Of the remaining 20 Cap valleys, Cap models have been approved for 13, four are currently being audited and one more has been recently submitted for audit. The remaining two Cap models — for the Australian Capital Territory and metropolitan Adelaide — are in advanced stages of preparation.

Environmental water use and Cap adjustment

In 2008, the Ministerial Council adopted a protocol under Schedule E of the Murray–Darling Basin Agreement for adjusting Caps for environmental entitlements and use. Under this protocol, MDBA is required to report in its annual water audit monitoring report on:

- environmental entitlements created
- allocations for environmental use
- trade in environmental entitlements and allocations
- Cap adjustments for environmental use.

Since 2007–08, MDBA has also reported on environmental water in its annual water audit monitoring report. The *Water audit monitoring report 2009–10* highlights that in the Basin:

- total water available for environmental use was 492 GL
- total use of environmental allocations was 294 GL
- Cap adjustment for environmental use was 287 GL.

Methods to estimate floodplain harvesting and unaccounted diversions

Although they should be included in the Cap, floodplain harvesting and some other diversions (e.g. farm dams) are not currently accounted for under the Cap. These diversions are not monitored because of an absence of reliable monitoring methods.

Following completion of a trial project, MDBA developed a method for estimating floodplain harvesting using remote sensing. The project demonstrated that by using satellite imagery analysis, geographical information system techniques and some on-ground weather data measurements, reasonable estimates of floodplain harvesting could be made in a cost-effective manner. This method needs to be further developed for use in routine Cap compliance monitoring.

Managing salinity

Basin Salinity Management Strategy

Background

Salinity has been recognised as a significant problem in the Murray–Darling Basin for many decades. The MDBA manages the Basin Salinity Management Strategy 2001–15, which was agreed to by all Basin state governments and which accounts for in-river salinity impacts of new and past land and water management actions and decisions.

The targets for salinity and salt loads in the River Murray and major tributary valleys are set to achieve a Basin salinity target of less than 800 EC[1] for 95% of the time at Morgan, South Australia.

Main activities

- Peak salinity at Morgan, South Australia remained below 800 EC despite the mobilisation of significant salt load by the 2010–11 floods.
- Salt interception schemes prevented approximately 324,162 tonnes of salt entering the river system.
- All contracting governments (governments of New South Wales, Victoria and South Australia) have remained in net credit on the salinity registers.

Table 2.3 summarises salinity levels recorded at Morgan over four time intervals (1, 5, 10 and 25 years) to June 2011. Comparison of salinity levels for these intervals shows a long-term reduction of peak salinity, which reflects the combined effects of reduced salt mobilisation into the river because of the cumulative benefits of salinity mitigation works and measures (salt interception and improvements in land and water management) and the dry climatic conditions prevailing before 2010–11.

Table 2.3 Summary of salinity levels recorded at Morgan, South Australia

Time interval		Average	Median	95th percentile	Peak	Percentage of time >800 EC*
1 year	July 2010 – June 2011	303	332	412	461	0
5 years	July 2006 – June 2011	435	430	697	785	0
10 years	July 2001 – June 2011	446	432	693	785	0
25 years	July 1986 – June 2011	512	485	797	1,160	5

* Rounded to the nearest whole number.

1 EC is an electrical conductivity unit commonly used to indicate salt concentration or the salinity of water (1 EC = 1 µS/cm).

Salinity registers

Under the Basin Salinity Management Strategy, each entry on a salinity register is reviewed every five years. The review covers recent actions with significant salinity impacts as well as the salinity impacts from tributary valleys arising from major historical land and water use decisions. For example, actions such as new irrigation developments may generate a debit on the register because in some areas they may increase salt loads to the River Murray. By comparison, actions such as investing in infrastructure (e.g. salt interception schemes) or improving irrigation practices may generate a credit.

Each year the Basin states inform MDBA about activities that have significant salinity effects for that year. The MDBA calculates the salinity cost of these activities and updates the salinity registers for independent review by salinity auditors. In November 2010, the auditors confirmed that the contracting governments of New South Wales, Victoria and South Australia remained in net credit on the salinity register, Register A, and in the balance of registers A and B (see Table 2.4) as required by the strategy. The Australian Capital Territory and Queensland at present do not have any register entries.

The outcomes of the independent salinity audit were reported to the Murray–Darling Basin Ministerial Council and published by MDBA.

Table 2.4 Summary of the salinity registers

	$ million per year					
Actions	**NSW**	**Vic**	**SA**	**Qld**	**ACT**	**Commonwealth contribution (EC)**
Joint works and measures	2.638	2.638	0.767	0.0	0.0	32.1
State shared works and measures	0.191	0.191	0.0	0.0	0.0	0.0
State actions	2.652	2.190	2.209	tbd	tbd	2.6
Total Register A	5.481	5.019	2.976	tbd	tbd	34.7
Transfers to Register B	0.578	0.461	1.339	0.0	0.0	0.0
Total Register B*	0.404	–0.025	1.154	0.0	0.0	0.0
Balance — registers A and B	5.885	4.994	4.130	0.0	0.0	34.8

* Total Register B includes transfers from Register A.
Negative numbers indicate debit entries and positive numbers are credit entries.
tbd = to be determined.

Murray–Darling Basin Authority staff at an automated salinity monitoring station in the River Murray near Berri, South Australia, 2010–11

Salt inflows to the river increase during and after floods. These inflows can be determined by analysing continuous salinity data recorded from monitoring equipment on pontoons on the river.

Salt interception

Salt interception works are large-scale groundwater pumping and drainage projects that intercept saline water flows from an area of high in-river impact and dispose of them to an area of low in-river impact, generally by evaporation.

Under the Basin Salinity Management Strategy program, salinity credits equivalent to 61 EC will be delivered when all salt interception schemes are commissioned. One of the Basin Salinity Management Strategy's significant achievements during 2010–11 was the construction of the Murtho and Pike (South Australia) and Upper Darling (New South Wales) salt interception schemes. In 2010–11, the operation of salt interception schemes diverted approximately 324,162 tonnes of salt from the River Murray. Chapter 3 has a detailed performance report on salt interception activities during 2010–11 (see 'Salt interception schemes', p. 156).

Monitoring Basin health

Sustainable Rivers Audit

Background

The Sustainable Rivers Audit (SRA) provides a long-term assessment of the condition and health of the Murray–Darling Basin's 23 river valleys. Assessments for the upcoming audit will be based on indicators from five environmental themes — fish, macroinvertebrates, hydrology, vegetation and physical form.

Data collection is undertaken using scientific methods applied consistently across the Basin. An independent panel of scientists prepares the river health assessment every three years, with the next report due in late 2011. The audit provides theme indicator scores for each valley and for valley zones (montane, upland, slopes and lowland areas). Geomorphic zone boundaries are also used in the Darling, Lower Murray and Central Murray regions.

The data and experience gained from the SRA are informing the development of the draft Basin Plan's monitoring and evaluation framework.

Main activities

Data analysis and derivation of indicator scores for each of the five themes, including:

- a newly developed 'recruitment' indicator for fish and improved reference condition
- improved modelling and distribution dataset for macroinvertebrates reference condition
- near-riparian and floodplain spatial domains assessed for vegetation, for two indices — abundance and diversity, and quality and integrity.

An overall ecological health ranking for each of the 23 valleys will be done using the index for each of the five themes.

A preliminary trend analysis will be provided for the fish and macroinvertebrates themes.

The *Sustainable Rivers Audit-SRA report 1: A report on the ecological health of rivers in the Murray–Darling Basin 2004–2007* was published in 2008. Completion of the second SRA report has encountered delays because of the complexities of data analysis. The final report is now likely to be delivered to the Murray–Darling Basin Ministerial Council in November 2011. When approved, data reports related to SRA report 2 will be published on MDBA's website, <www.mdba.gov.au>.

River Murray Water Quality Monitoring Program

Background

The River Murray Water Quality Monitoring Program addresses the Murray–Darling Basin Authority's statutory responsibilities under Part VII of Schedule 1 to the *Water Act 2007*.

The long-term water quality monitoring program is made up of physical, chemical and biological components. The physical and chemical data monitors up to 23 parameters and has been collected from 35 sites in the River Murray since 1978. The biological component consists of monitoring the health of macroinvertebrate communities and phytoplankton at selected sites. This 30-year dataset provides a comprehensive overview of water quality and can help inform natural resource management decisions and provide a valuable context for investigations and research into the aquatic ecology of the Murray. Figure 2.3 shows the long-term monitoring sites used by the River Murray Water Quality Monitoring Program.

Main activities

- Multi-jurisdictional coordinated response to the 2010–11 blackwater event.
- Produced the *Phytoplankton data trend analysis 1980–2008* report.
- Produced the *Mitta Mitta River macroinvertebrate monitoring 1998–2009* report.
- Assessed 59 floodplain development proposals and provided advice.

Figure 2.3 Long-term monitoring sites: River Murray Water Quality Monitoring Program

River Murray blackwater event

Blackwater events are natural phenomena caused by the rapid breakdown of leaf litter on floodplains, which causes water discolouration that is sometimes accompanied by a decline of the dissolved oxygen levels within the water column.

The high spring and summer inflows during 2010–11 in the Murray–Darling Basin caused a simultaneous blackwater event in the River Murray and in the Goulburn–Broken, Edward–Wakool, Murrumbidgee and Loddon rivers. This event started around mid-November 2010 and ended mid-April 2011.

Although blackwater may cause significant short-term consequences, the impacts of recent wetter conditions are overwhelmingly positive for floodplain forests, wetlands and rivers.

More information about blackwater events can be found in the section on 'The Living Murray Environmental Monitoring Program' (see p. 92).

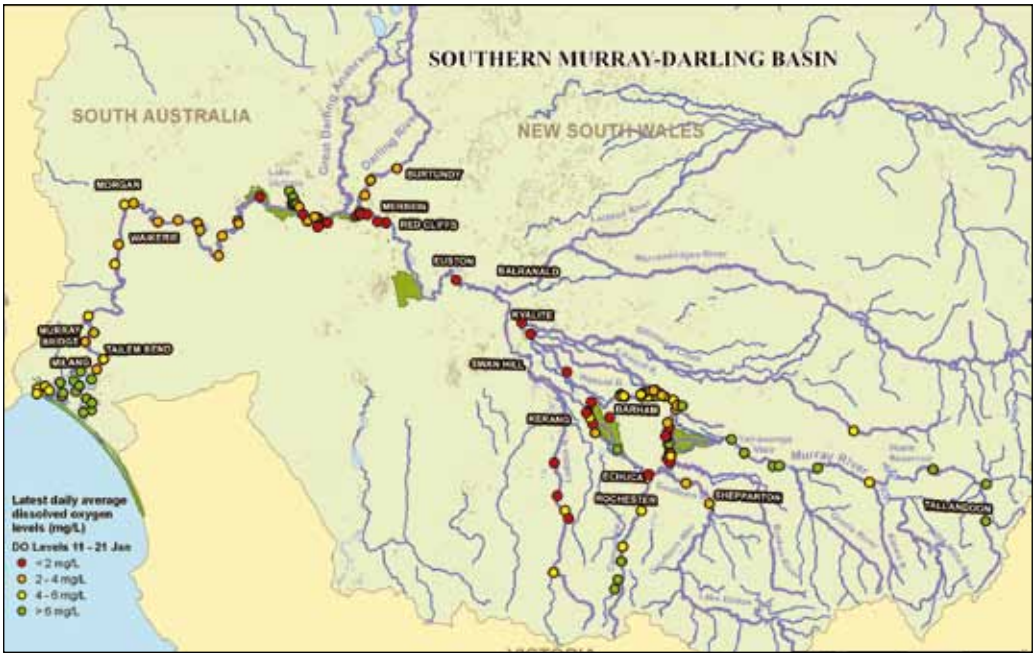


Figure 2. 4 Levels of dissolved oxygen (mg/L) in the River Murray and some tributaries, 11–21 January 2011

Management response

The River Murray Water Quality Monitoring Program coordinated the response to the 2010–11 blackwater event by organising weekly meetings of the Blackwater Monitoring Group, a multi-jurisdictional panel. The program coordinated data gathering as well as providing online maps and weekly blackwater bulletins.

Turbid water from the Darling River mixes with River Murray blackwater, 18 January 2011 (see also Figure 2.4, for levels of dissolved oxygen)

Blackwater events are naturally occurring phenomena in which water is discoloured by the release of tannins and other compounds during the breakdown of organic material such as leaves and other plant material that accumulates on floodplains. Blackwater can sometimes become very low in dissolved oxygen which can harm aquatic plants and animals.

Phytoplankton data trend analysis 1980–2008 report

The primary objective of this trend analysis is to understand the patterns of algal (cyanobacteria) blooms along the River Murray using the 28 years of available data.

The trend analysis also aims to give a greater understanding of the links between algal population dynamics and flow, water quality and climatic variability, including implications of the results for managing algal blooms.

Mitta Mitta macroinvertebrate monitoring 1998–2009 report

This project aims to review data collected during macroinvertebrate monitoring of the Mitta Mitta River between 1998 and 2009 and use it to indicate river health.

Floodplain management

The River Murray Water Quality Monitoring Program is also responsible for commenting on development applications for the River Murray floodplain and their possible impact on water quality and on the riparian and floodplain zones of the River Murray. Most development applications reviewed by the program during 2010–11 related to mooring and pontoons (41%), followed by pumps and infrastructure (19%). See Figure 2.5 for a breakdown of development applications by type.

The number and category of development applications received indicates that an increasing amount of urban development is occurring along the river.

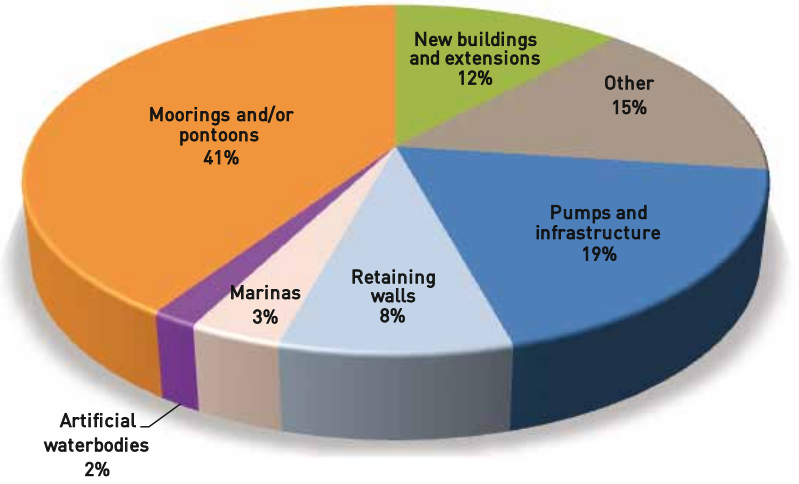


Figure 2.5 Breakdown of development applications by type

Note: the 'Other' segment includes high-level advice to councils, large infrastructure projects and unusual development applications.

A thick salt crust overlies acid sulfate soils in a Little Toolunka Flat complex wetland, lower River Murray, South Australia, 2010–11

Acid sulfate soils risk assessment project

Background

The record low inflows and river levels of recent years led to the drying of many permanent wetlands in the Murray–Darling Basin, resulting in the exposure of acid sulfate soils. The impacts of these soils had previously been an issue only at localised sites, but it became clear that acid sulfate soils may present a larger-scale issue in some parts of the Basin.

In March 2008, the Murray–Darling Basin Ministerial Council agreed to support an assessment of the spatial occurrence of, and risk posed by, acid sulfate soils at priority wetlands in the River Murray System, wetlands listed under the Convention on Wetlands of International Importance (the Ramsar Convention) and other key environmental sites in the Murray–Darling Basin.

A tiered assessment program was used, in which priority wetlands were screened through a desktop assessment stage, followed by a rapid on-ground appraisal, and then detailed on-ground assessment if results of previous stages indicated an increased likelihood of the occurrence of acid sulfate soils.

Main activities

- The Murray–Darling Basin acid sulfate soils risk assessment project substantially increased knowledge of the occurrence of acid sulfate soils throughout the Basin, and the hazards and risks associated with these materials. In all, over 19,000 wetlands received desktop assessment; 1,329 wetlands received rapid on-ground assessment; and nearly 200 wetlands and river reaches received detailed assessment, including 14 of the 16 Ramsar-listed wetlands in the Murray–Darling Basin.
- The summary project report, *Acid sulfate soils in the Murray–Darling Basin,* was approved by the Murray–Darling Basin Ministerial Council in May 2011. This report is supported by more than 50 reports produced throughout the project that document the following outcomes:
  - The distribution of affected wetlands shows the problem is not isolated to individual waterways, but affects whole sections of the lower River Murray in South Australia, the western part of the Edward–Wakool River system in New South Wales and clusters of wetlands in Victoria.
  - The hydrogeological processes that drive formation of acid sulfate soils are linked to the processes that drive salinity. As such, actions to reduce the likelihood for acid sulfate soils developing should be considered in conjunction with action to address long-term salinity.
  - Acid sulfate soils development is also linked to changes in hydrology — in particular, maintenance of high water levels in ephemeral systems for unnaturally long periods, leading to a lack of drying phases and a reduced frequency of large flushing floods over floodplains. The hydrological and hydrogeological context of affected wetlands needs to be taken into account when developing management actions.
  - Protocols and methods for both the rapid and detailed assessment of wetlands have been developed and refined, and now provide the basis for the broadscale assessment of inland acid sulfate soils throughout Australia.

Many of the affected wetlands were re-flooded during the extensive floods of 2010–11. The impacts on water quality through re-flooding of acid sulfate soils were diluted by the size of the floods. However, despite the floods, acid sulfate soil material is likely to still be present in many of the wetlands previously affected. Furthermore, the underlying conditions that caused the formation of acid sulfate soils in the first place have not changed. This means that the ongoing risk posed by acid sulfate soils is unlikely to have been mitigated and will need to be managed.

Murrumbidgee River, about 1 km beyond the Tuggeranong Creek confluence, May 2011

Wetland disconnection

Background

In response to critical water shortages in 2007–08, several wetlands in the Murray–Darling Basin were temporarily disconnected along the River Murray in New South Wales and South Australia. This disconnection was aimed at reducing evaporative losses under the Dry Inflow Contingency Planning Initiative to save water for community use. While several of the wetlands had previously received water to avoid environmental damage, all disconnected wetlands were reconnected through higher flows and the floods of 2010–11.

Main activities

- Refilling of Euston Lakes and final ecological monitoring completed. A significant finding was an increase in the diversity of native fish at three of the four wetlands and the re-establishment of a great cormorant (*Phalacrocorax carbo*) rookery on Dry Lake, not seen since the 1970s. These ecological responses are attributed to the reintroduction of a wetting and drying cycle at Euston Lakes and associated productivity pulses and the floods of 2010–11.
- Removal of temporary structures from some disconnected wetlands and re-opening of permanent structures in South Australia allowing disconnected wetlands to refill.

Managing the science and spatial information

Natural Resource Information

Background

The *Water Act 2007* requires the Murray–Darling Basin Authority (MDBA) to collect and share information used in delivering a range of river and natural resource management programs and projects and in preparing the draft Basin Plan. The Natural Resource Information section provides spatial science capability to support MDBA's delivery of authoritative information on the Murray–Darling Basin.

Main activities

- Delivered more than 1,350 mapping requests and 500 cartographic products for MDBA projects and more than 350 mapping requests from external customers.
- Developed and formalised partnerships with several federal and state agencies.
- Continued to improve MDBA's spatial information systems, products and online publication of spatial information.

Spatial information systems

The Natural Resource Information section provides technical advice on spatial information. It has established partnerships and networks with a broad range of federal and state government agencies, academic and research institutions, and industry and community organisations.

For example, MDBA is now a member of the Optical, Geospatial, Radar, Elevation Data and Services Panel, which, among other things, aims to create greater value in the procurement of remotely sensed imagery by Australian government agencies.

During 2010–11, the Natural Resource Information section presented scientific and technical publications at a number of national and international conferences and workshops, including the 'Managing drought through Earth observation' workshop (Sydney, April 2011). This workshop looked at approaches to drought and water management in Australasia, America, Europe and Africa. It explored the uses of the Global Earth Observation System of Systems, which uses sensors, communication systems, spatiotemporal data infrastructures and other components to observe the Earth.

Corporate spatial information management

To streamline the process of obtaining, storing and retrieving geospatial information from a wide array of sources, the Natural Resource Information section has been pursuing appropriate data-licensing agreements with many state and federal partner agencies.

During 2010–11, the Natural Resource Information section continued to maintain spatial data management storage of over 350 spatial data products, positioning MDBA as an authoritative information source and a leader in managing Basin-wide geographic information.

During 2010–11, the Natural Resource Information section continued to promote adoption of the whole-of-government data licensing approach (AusGOAL), which will lead to greater use of public-good spatial data by our stakeholders. The Natural Resource Information section also continued to implement nationally enterprise-endorsed quality assurance procedures, standards and data licensing for MDBA's substantial spatial data holdings.

Responding to risk

Risk Assessment Program

Background

In 2008, the Murray–Darling Basin Risks Strategy was developed by the Murray–Darling Basin Commission and Basin states with the objectives of both protecting the integrity of the water access entitlements system and achieving environmental objectives relating to the Basin's shared water resources. The strategy identified climate change, bushfire, afforestation and groundwater extraction, irrigation return flows and farm dams as the primary risk factors.

Under the *Water Act 2007*, the Murray–Darling Basin Authority (MDBA) must identify risks to the condition and continued availability of Basin water resources, including those arising from:

- taking and use of water (including through interception activities)
- effects of climate change
- changes to land use
- limitations on the state of knowledge on the basis of which estimates about matters relating to Basin water resources are made.

During 2010–11, MDBA directed substantial efforts towards developing greater understanding of the risks to the Basin's water resources and the biodiversity and communities that depend on them.

Main activities

- Finalised 24 targeted research projects to assess the impact of current and potential risks to water quantity and quality in the Basin.
- Convened a risks workshop with attendees from jurisdictions and agencies from across the Basin to present findings and discuss project outputs.

During 2010–11, the Risk Assessment Program continued risk analysis to inform natural resource management outcomes. This included completing 24 research projects, which received funding from Basin states, into diverse risks to water resources.

Twelve projects focused on climate change, targeting subjects such as climate patterns and causal processes, atmospheric and land surface dynamics, palaeoclimatic studies relevant to natural resource management in the Murray–Darling Basin, and the predicted impacts of climate change on the ecology of invasive weeds and pests.

A large number of these reviews formed the basis of peer-reviewed papers, many of which will be published in a special edition of the *Water Resources Research* journal.

The remaining 12 projects were targeted at other priority risks to natural resources in the Murray–Darling Basin; selected with the assistance of an expert panel, these projects included:

- capacity to adaptively manage under climate change and variability
- impacts on water quality in the Basin arising from climate change
- impacts on aquatic ecosystems in the Basin arising from climate change
- potential water quantity and quality impacts in the Basin from communities and industry responding to climate change
- synthesis of climate change-related projects
- risk of climate change impacts on salinity dynamics and mobilisation processes in the Basin
- afforestation risks to the Basin's water resources
- impacts of native forest management practices in silvicultural systems on catchment water yield in the Basin
- effects of climatic changes on plant physiological and catchment ecohydrological processes in the Basin's high-rainfall catchments
- distribution and ecological risk of reduced inorganic sulfur compounds in the Basin's river and creek channels
- a case study of risks to flows and floodplain ecosystems posed by structures on the Macquarie Floodplain.

The MDBA also convened a workshop to discuss each project's methods, results and outcomes. This workshop, which was attended by participants from federal and Basin state government agencies, featured presentations from project researchers.

The detailed reports and summaries of these projects are available on MDBA's website, <www.mdba.gov.au>.

Restoring native fish populations

Background

Native fish populations in the Basin have declined significantly over the past 150 years. As a response, the Native Fish Strategy was approved in 2003 by the Murray–Darling Basin Commission (now the Murray–Darling Basin Authority) as a 50-year plan to rehabilitate native fish populations. The strategy comprises projects involving:

- on-ground activities, management and monitoring
- researching reasons for low fish numbers and developing pragmatic solutions for arresting these declines
- investigating the particular role played by invasive species and developing techniques to manage their impacts on aquatic ecosystems
- strategic community engagement and participation to foster stewardship of aquatic systems.

Main activities

- Continued progress towards completion of the Sea-to-Hume fishway program, and monitored fishways before and after construction.
- Initiated development of the Native Fish Strategy Action Plan 2011–21.
- Completed studies on the impediments to fish migration in the Darling region of the Basin.
- Investigated fish responses to different water management regimes.
- Collected and shared 'fishy' stories from Indigenous communities, recreational fishers and commercial fishers across the Basin.
- Further exploration of the status and management of drought refuges across the Basin.
- Ongoing work to manage existing alien fish and highlighting lesser-known species such as gambusia (*Gambusia holbrooki*) and emerging threats such as tilapia (*Oreochromis mossambicus*).

The Sea-to-Hume fishway program

The world-class Sea-to-Hume fishway program is re-establishing opportunities for fish migrations to over 2,000 km of the River Murray by installing 15 new fishways.

The Sea-to-Hume fishway program is the first program anywhere in the world that allows fish passage for the majority of species in a migrating fish community rather than focusing on only one or two species of economic or social significance.

Monitoring shows that millions of native fish are using the new fishways, passing a large number (as many as 10,000 per day), with high diversity (13 species) and a wide range of sizes (from 31 mm to 1,040 mm in length).

The program has proved so successful that its fishway designs and the Fish Passage Taskforce model are now being adopted in areas outside the Murray–Darling Basin and internationally (e.g. along the Mekong River).

In 2010–11 all but four fishways in the program were completed; the uncompleted fishways are located at Lock 2 (Waikerie), Lock 4 (Bookpurnong), Lock 11 (Mildura) and Lock 15 (Euston).

All fishway installations are expected to be complete by June 2012.

Developing the Native Fish Strategy Action Plan 2011–21

The development of the Native Fish Strategy Action Plan 2011–21 began in late 2010. The plan identifies high-priority activities for native fish management in the Basin for the next 10 years. The MDBA Native Fish Advisory Panel and Basin jurisdictions have been involved in the development of the plan, which also incorporates recommendations made by independent reviews and provides a platform for broader investment.

Fish passage in the northern Basin

The Queensland Department of Employment, Economic Development and Innovation and NSW Industry and Investment, with MDBA funding, have investigated impediments to fish migration in rivers in the Darling region of the Basin.

The department identified 12 high-priority sites and developed concept designs and investment costs to fix the top five barriers to fish passage. The department's investigation has outlined works that could deliver substantial improvements in river health by reinstating fish passage over 2,000 km across the northern Basin.

Vertical slot fishway under construction at Lock 2 (Waikerie), 2011

The fishways are major structures with wall heights of up to 5 m; they require detailed engineering to ensure they meet the design life of 100 years as well as considerable scientific input to ensure the hydraulics are exactly right to allow fish to pass. Building a fishway typically takes a year, but construction at locks 2 and 4 had to cease when the work sites were inundated during the 2010–11 floods. While construction was delayed, the flood provided fish with free passage because the weir was removed and floodwaters covered the floodplain at depths sufficient for fish to migrate upstream.

Effectiveness of managed flows

Flow events are widely considered important for native fish populations; however, information about the effectiveness of managed environmental flows and natural events on native or exotic fish recruitment is patchy.[2] In late 2010, a team of scientists from the Arthur Rylah Institute and Murray–Darling Freshwater Research Centre was engaged to evaluate the response of fish and zooplankton communities to various water management regimes in the Barmah–Millewa Forest. Based on this project's findings, the team made recommendations to help water managers deliver environmental flows that better meet the needs of fish communities.

Protection of drought refuges for native fish

The record drought highlighted the lack of knowledge about the broadscale impact of drought on Basin freshwater fish populations.[3] Although drought refuges were known to be important, there was not significant information on the extent and location of all water bodies that act as refuges for fish. Researchers from the South Australian Research and Development Institute investigated the status and management of drought refuges across the Basin and developed methods to identify and protect key refuges. They identified key habitat types that serve as drought refuges and the threats to these areas, and specified key native fish species that need protection under drought response programs.

Fishy tales — collecting oral histories about fish in the Basin

Fishers hold a wealth of knowledge about the local, historical and cultural changes to native fish communities in the Basin. The long history of fishing within the Basin means that generations of people have spent substantial amounts of time on or near its rivers and waterways. The desire to experience the river and to catch fish has given people a refined understanding of how fish relate to the riverine environment, and consequently how changes to these environments have affected the status of native fisheries.

The MDBA funded a collaborative project to interview and collect information from Indigenous communities, recreational fishers and commercial fishers across the Basin. Some of Australia's most prominent ecological oral historians, fisheries agencies from each Basin state and regional natural resource management organisations were involved.

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2 McCarthy, B, Gawne, B, King, A, Meredith, S & Zampatti, B 2006, *Living Murray intervention monitoring assessment framework 2006–2007: Report to the Murray–Darling Basin Commission*, Murray–Darling Freshwater Research Centre and Arthur Rylah Institute for Environmental Research.

3 Lintermans, M & Cottingham, P 2007, *Fish out of water: lessons for managing native fish during drought*, final report of the Drought Expert Panel, Murray–Darling Basin Commission, Canberra.

The information collected from these people will help MDBA to understand the primary barriers to engaging fishers in supporting habitat protection and rehabilitation, and will be used in 2011–12 in communication activities.

Demonstrating a difference

Demonstration reaches are large-scale river reaches or wetlands where a number of management interventions are applied to showcase the cumulative benefits of river rehabilitation on native fish populations to communities and other interested parties.

A workshop to support the adaptive management process in the seven demonstration reaches operating throughout the Basin was held in Sydney in March 2011. Demonstration reach managers and other natural resource management staff received new information at the workshop about the establishment of new funding partnerships, consolidating community engagement, alien fish management, and monitoring and evaluation. The workshop established the need for an enduring knowledge management strategy as well as the need to facilitate regular communications across this network.

Native Fish Awareness Week

Native Fish Awareness Week ran from 12 to 25 November 2010, with 41 events and activities held across the Basin. This year's approach was 'Basin-wide', with every jurisdiction hosting activities ranging from tree-planting to fishing competitions, and from school-based education days to book launches.

Media activity promoting and supporting Native Fish Awareness Week was extensive, and included newspaper articles, radio broadcasts and television reports. Additional support for organising events was provided by a number of natural resource management groups and agencies in each jurisdiction.

Native Fish Strategy coordinators and members of the community stakeholder taskforce put in a phenomenal effort that directly involved over 1,800 Basin community members in activities to support native fish awareness.

Aliens in the Basin

Work continues to explore a range of controls for carp and other pest fish. The impacts of the small-bodied exotic fish, gambusia, were highlighted in a science and management forum, *Little fish, bigger problem*, held on 1 and 2 June 2011. Researchers from Australia, New Zealand and the United States of America gathered with managers and community members to understand the biology, ecology and management techniques for this destructive little fish.

Mozambique tilapia are an emerging threat to the Basin. Tilapia are internationally recognised as a major pest and have established populations in waterways just outside the Basin. The Queensland Department of Employment, Economic Development and Innovation examined the impacts that tilapia pose to the Basin and estimated the potential range this species could occupy. The department's work has shown that 50% of the Basin could be vulnerable and that only a 2 °C rise in temperature would mean that tilapia could survive throughout most of the Basin. Major impacts will be felt by native fish communities and aquatic ecosystems if tilapia invade the Basin.

Delivering water efficiently and equitably

CHAPTER: 3

Chapter 3 and its main subsections also relate to the River Murray Division section of the *Murray–Darling Basin Authority corporate plan 2009–10 to 2012–13*.

Under the 2010–11 Portfolio Budget Statements, the River Murray Division has the following program objective:

To equitably manage, operate and sustain the River Murray assets to deliver states' shares of water and environmental outcomes in the River Murray System.

Ginninderra Creek after rain, Umbagong Reserve, with rock groove area in foreground, 2011

Overview

La Niña conditions in the Pacific Ocean brought a dramatic increase in streamflows across the Murray–Darling Basin in 2010–11 after the prolonged drought of recent years. Total Basin government storage increased from 32% to 81% of capacity throughout the year following widespread, significant and sometimes very damaging flooding throughout the Basin.

Prolonged flooding, at relatively minor levels, was observed across the Central Murray Floodplain while flooding in South Australia, boosted by inflows from the Darling River, reached levels not seen since 1993. Extensive areas of floodplain and wetland systems were inundated with, in some cases, extraordinary environmental responses. However, prolonged and extensive blackwater events were also observed in the River Murray and its tributaries.

During the 2010–11 water year, an estimated volume of more than 11,000 GL flowed through the Murray Mouth, widening and deepening it considerably and resulting in significant improvements in salinity levels in Lake Alexandrina and the Coorong.

The Murray–Darling Basin Authority (MDBA) continued to support the eWater Cooperative Research Centre with development of River Manager and River Operator software. A prototype model of the upper River Murray has been constructed and will be thoroughly tested in 2011–12.

The prolonged high flows in the Murray adversely affected progress of MDBA construction works. Construction of navigable pass upgrades and/or fishways had to be suspended or slowed at locks 2, 4, 11 and 15. Construction of the Environmental Works and Measures Program at Chowilla has been suspended for nine months of the year and is unlikely to resume before January 2012 (a total delay of 15 months), while at Koondrook–Perricoota delays and slowing of works have occurred because of overbank flows and higher-than-usual localised rains. The rapid rise of the floods caused overtopping of the recently completed Environmental Works and Measures Program works at Mulcra Island, creating a washout around the ends of the structure, which will require remediation.

Environmental Works and Measures Program works at Gunbower Forest and Lindsay Island have progressed to detailed design, while the detailed designs for Hattah Lakes were completed.

The dam safety program at Hume Dam has advanced considerably. Construction work on the first project at the spillway southern junction to improve the filter and drainage capacity is close to completion. The detailed design and tender documents for the second project to construct a concrete buttress against the southern spillway training wall have been prepared and tenders for construction are due to close early August 2011. With the emphasis on these two projects, progress on the third project to upgrade the spillway capacity has been slowed. Options to meet the revised extreme floods have been considered and a schedule for confirming options, engaging stakeholders, detailed design and construction has been prepared.

Chowilla environmental regulator under construction, 2010–11

This image shows square piles being driven into the riverbed to support the regulator and sheet pile being driven in to stop seepage under the regulator. The regulator is being built in two halves to allow uninterrupted flow and fish passage in Chowilla Creek throughout the construction period.

Detailed design of the first stage of the dam safety upgrade at Dartmouth Dam commenced during the year. At Lake Victoria steps have been taken to reinvigorate the dam safety upgrade program with the aim of commencing construction works on the embankments in 2011–12.

The salt interception schemes have continued to improve their efficiency through smart use of power and better methods to maintain borehole capacity. The salt interception schemes diverted approximately 324,162 tonnes of salt from the River Murray in 2010–11. It is pleasing to see the start of a major refurbishment of the Mildura–Merbein salt interception scheme that will achieve not just recovery of the original design capacity, but also a significant additional capacity for the scheme.

Salt interception scheme construction has progressed well in spite of the impact of floods at Murtho and Upper Darling. The Upper Darling salt interception scheme is practically complete but commissioning has been delayed until 2011–12 because of the floods. The Loxton and Pyramid Creek salt interception schemes have been declared effective and their benefits entered onto the salinity registers.

Agreed water shares delivered to states

Background

The following key actions are undertaken to deliver agreed water shares in the River Murray System to the states, including in extreme conditions:

- regularly assess the water resources of the River Murray System to determine the volume of water available to each state
- operate structures under the control of the Murray–Darling Basin Authority (MDBA), and determine and review procedures for their efficient and effective operation
- establish, operate and maintain a system of continuous monitoring of the volumes of stored water, and of flows in the River Murray and from its tributaries
- liaise with state and federal authorities on matters related to the River Murray System to provide an up-to-date and comprehensive flow of information.

Main activities

- Successful management of minor and moderate floods through Hume Reservoir and Yarrawonga Weir on multiple occasions, after many years of below-average inflows.
- Coordination of environmental flows through Barmah–Millewa Forest.
- Forecasting of the timing and magnitude of flood peaks and recessions at downstream sites such as Euston, Mildura and the South Australian border to assist with management of construction works.
- Refilling of the Lower Lakes and the first releases through the barrages since 2006.

Increased water availability

Higher-than-average rainfall during 2010–11 has dramatically reversed the extreme dry conditions of recent years, with floods occurring multiple times along parts of the Murray, Barwon–Darling, Condamine, Murrumbidgee, Goulburn, Ovens, Campaspe, Loddon and many other rivers in the Murray–Darling Basin.

Inflows to the River Murray System and to Menindee Lakes were within the highest 10% of records (see Figure 3.1). In the southern Basin, River Murray System inflows (excluding Snowy River releases and Menindee inflows) totalled 17,500 GL during the year, which has an annual exceedance probability of 8%, compared with the long-term average of 9,230 GL. Total inflows to Menindee Lakes were about 5,800 GL, which has an annual exceedance probability of 10% and is almost three times higher than the long-term average of 1,998 GL.

System reserves have improved significantly in the past 12 months. Total MDBA active storage on 30 June 2011 was 7,056 GL, more than 3,771 GL higher than last year and over 1,500 GL above the long-term average for this time of year.

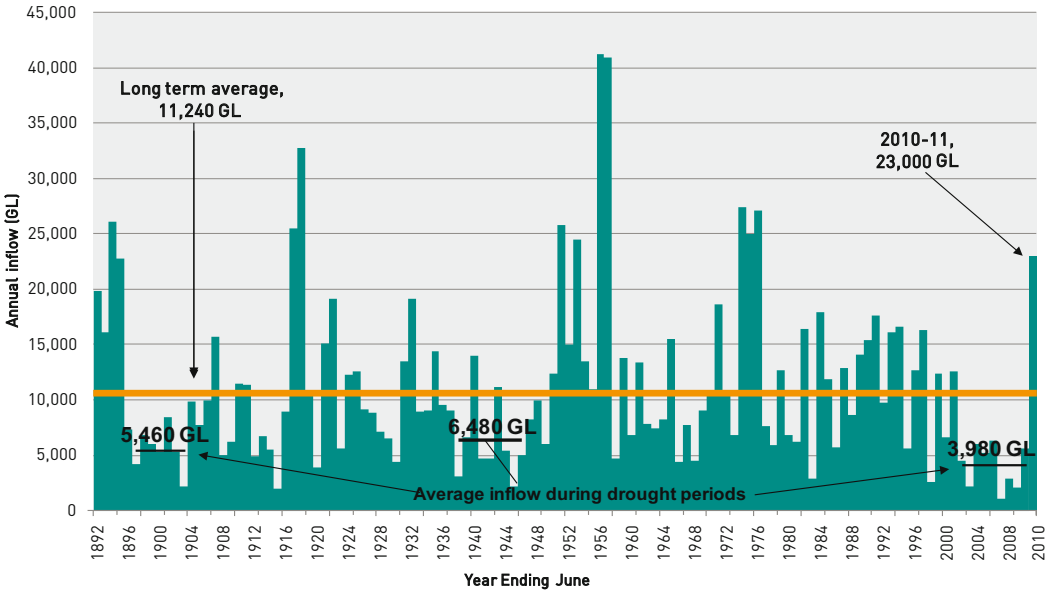


Figure 3.1 River Murray System annual inflows (including to Menindee Lakes) from July 1891 to June 2011

Rainfall and inflows

Rainfall across the entire Basin was very much above average during 2010–11. Parts of western Victoria, western New South Wales and southern Queensland received their highest rainfall on record. Significant rainfall events occurred in the upper Murray catchment in early September, mid-October and early December. In mid-to-late January, there were high rainfalls in the upper Darling catchment, western Victoria and western New South Wales. The above-average rainfall has generated a total inflow to the River Murray (including Menindee Lakes) of around 23,000 GL (8% annual exceedance probability).

Although the total inflow is within the range experienced over the past 118 years, the inflow pattern has been very unusual (see Figure 3.2). Inflows in the winter and spring (up to the end of November) were modest, with an annual exceedance probability of about 35%; however, the inflow over summer (December 2010 to February 2011) was about 6,700 GL, more than double the previous record inflow of 2,980 GL during the summer of 1992–93. The period from March to June was relatively dry, although the catchment remains primed for high inflows in the coming winter and spring.

Multiple flood events have also occurred in the catchments of the Darling River in the northern Basin. As a result, Menindee Lakes commenced prerelease and/or flood operations on 6 December 2010 under the day-to-day management of the New South Wales Government. The lakes were still surcharged at the end of June 2011. The releases have provided much needed water to floodplains along the Lower Darling and Great Darling Anabranch as well as to the River Murray in South Australia.

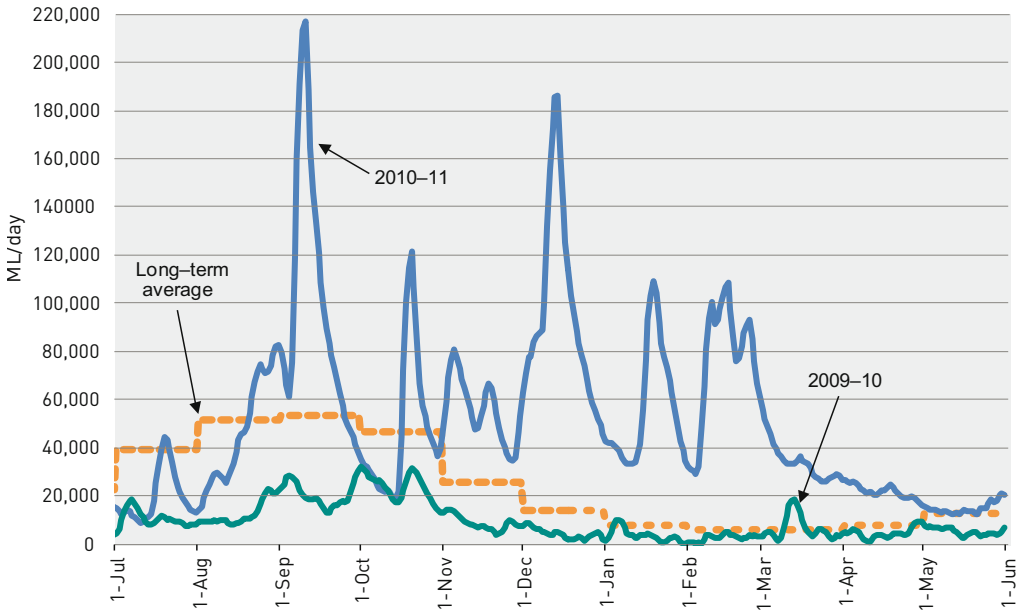


Figure 3.2 River Murray System daily inflows (excluding inflows to Menindee Lakes and the Snowy Mountains Scheme) — recent years and long-term averages

Active storage

System reserves improved significantly during 2010–11. Total MDBA active storage on 30 June 2011 was 7,056 GL (see Figure 3.3), including about 1,479 GL in Menindee Lakes. The active storage at the end of February 2011 was above the long-term average for the first time since November 2001. At 30 June 2011 about 320 GL of water was also available to the Murray for 2010–11 in inter-valley trade accounts in the Murrumbidgee and Goulburn valleys.

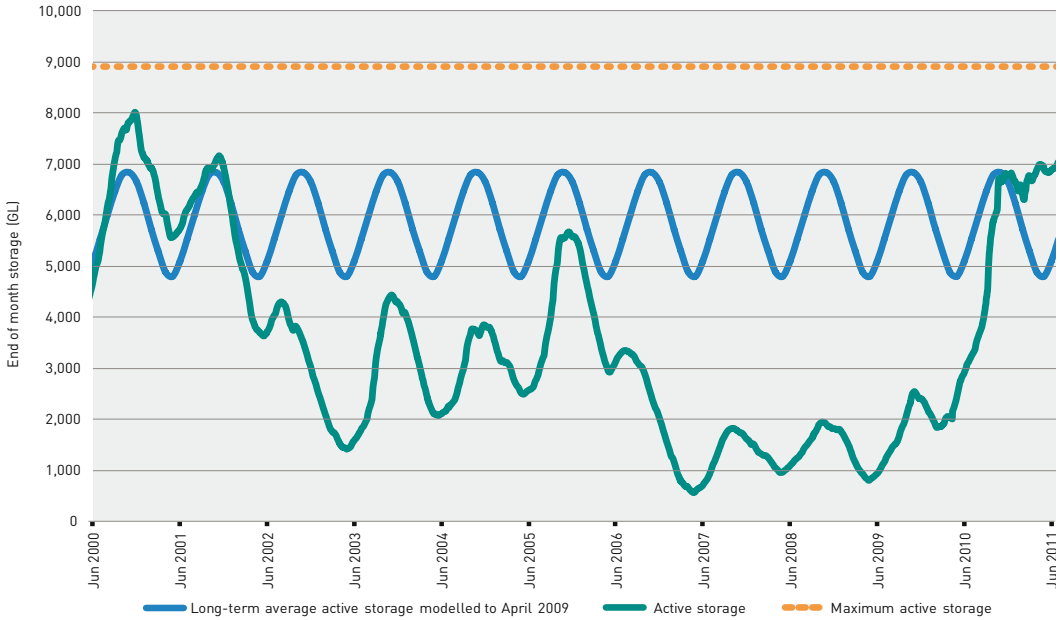


Figure 3.3 MDBA active storage, June 2000 to June 2011

Water shares for New South Wales and Victoria in MDBA storages at the beginning and end of 2010–11 are shown in Table 3.1.

Table 3.1 Water shares for New South Wales and Victoria, June 2010 and June 2011

	Storage at June 2010 (GL)[a]			Storage at June 2011 (GL)[a]		
Storage	**NSW**	**Vic**	**Total**	**NSW**	**Vic**	**Total**
Dartmouth Reservoir	546	636	1,182	1,151	1,269	2,420
Hume Reservoir	369	403	772	1,391	1,391	2,782
Lake Victoria	182	72	254	190	190	380
Menindee Lakes[b]	484	598	1,082	737	737	1,474
Total[c]	**1,581**	**1,709**	**3,290**	**3,469**	**3,587**	**7,056**

a Data relates to total storage.

b Menindee Lakes came under MDBA control in April 2010. This resource ceases to be available to MDBA when the volume in Menindee Lakes is less than 480 GL and NSW resumes control of the storage.

c Accounts are based on the best available data, which may contain some unverified operational data that could change in the future. Figures are rounded to the nearest GL.

Improving environmental outcomes

During 2010–11, MDBA River Operations targeted a range of environmental outcomes, including delivery of environmental water, management of blackwater, adjustments to flow rates to facilitate construction of environmental works, and weir pool drawdowns.

About 410 GL of environmental water was released from Hume Reservoir between late September 2010 and early February 2011. The releases were timed to maintain water levels in key colonial waterbird breeding areas and other wetlands in Barmah–Millewa Forest during periods of lower flows in between flood peaks. The target environmental flow rates also took into account the blackwater that had been draining from Barmah–Millewa Forest since mid-November 2010.

After many years without overbank flows, the extensive flooding that occurred throughout the River Murray System during 2010–11 resulted in large areas of the river system being affected by blackwater. Blackwater events occur naturally because the rapid breakdown of leaf litter on the forest floor causes water discolouration and, at times, low dissolved oxygen levels, which can adversely affect fish and other animals. Although the 2010–11 blackwater event caused some fish kills, overall it had a minimal adverse effect on the river system and its dependent biota. Blackwater events do have some positive impacts because they put nutrients that promote the growth of many aquatic organisms back into river systems. For more information about blackwater events, see 'River Murray Water Quality Monitoring Program' (p. 106).

New South Wales, Victorian and South Australian agencies and MDBA cooperatively implemented several actions aimed at diluting blackwater along sections of the River Murray System and its associated streams. The most effective actions were the targeting of specific flow rates (at times using environmental water) that assisted in diluting blackwater as it returned to the river from the floodplain, and the use of privately owned Murray Irrigation Limited infrastructure to divert highly oxygenated water around Barmah–Millewa Forest and into the Edward–Wakool system where it provided localised refuge areas with higher dissolved oxygen levels.

At Yarrawonga Weir (Lake Mulwala), the lake level was lowered during May 2011 to about 2.5 m to 3 m below full supply level. Lowering the lake was aimed at controlling the aquatic weed *Egeria densa*, which has recolonised in some shallower parts of the lake. It is planned to refill the lake in late July. A partial drawdown of the Torrumbarry Weir pool was undertaken during May and early June 2011 to help minimise bank erosion caused in part by holding the weir pool steady.

River Operations staff assisted with the construction of environmental works such as the construction of fishways and environmental regulators by adjusting flows, where feasible, and providing forecasts of the timing and magnitude of flood peaks and recessions.

Flooding of Barmah–Millewa Forest

Waterbird breeding in Barmah–Millewa Forest in response to this year's flooding has been extraordinary both for the number of species and the number of individual birds. The prolonged flooding has been critically important for many species rebounding from the recent prolonged drought, and has resulted in one of the largest bird-breeding events in the forest in 50 years.

The flooding this year was the first overbank watering of Barmah–Millewa Forest since 2005. Overbank flows began in August as a result of high inflows from the Ovens and Kiewa rivers. These flows were boosted significantly by floods in September, October and December 2010 and January 2011. The use of 410 GL of environmental water enabled flows to be maintained above channel capacity through the forest from August 2010 to April 2011.

The environmental water was sourced from Barmah–Millewa (200 GL), The Living Murray (200 GL) and the New South Wales adaptive environmental water (10 GL) accounts and entitlements. The environmental water was used to prolong the duration of flooding in the forest by extending the recession of high flows rather than exaggerating the peak flows. Management of forest watering was coordinated between MDBA and the responsible state agencies.

Eastern grey kangaroo (*Macropus giganteus*) in the flooded Barmah–Millewa Forest, September 2010

State water allocations and diversions

Water allocations in 2010–11 for the Murray Valley started quite low — by mid-August 2010, New South Wales had no general security allocation, while Victoria had a 70% high security allocation and a 23% allocation for high reliability water shares, and South Australia had a 34% allocation for high security water shares.

However, by mid-December 2010, these allocations had increased to:

- 100% general security allocation for New South Wales
- 97% high security allocation and 100% allocation for high reliability water shares in Victoria
- 67% allocation for high reliability water shares in South Australia.

On the Lower Darling, both general and high security water holders had 100% allocation for the entire 2010–11 year.

Paradoxically, while water allocations were the highest since 2006, actual water diversions were some of the lowest on record. The total amount of water diverted by the states was about 2,100 GL, compared with diversions ranging between 1,500 and 5,000 GL over the past 10 drought years (Figure 3.4). Unseasonal high rainfall in many irrigation areas from September 2010 to April 2011 combined with smaller areas of irrigated land because of the prolonged drought meant that very little irrigation was required to meet crop and pasture water requirements.

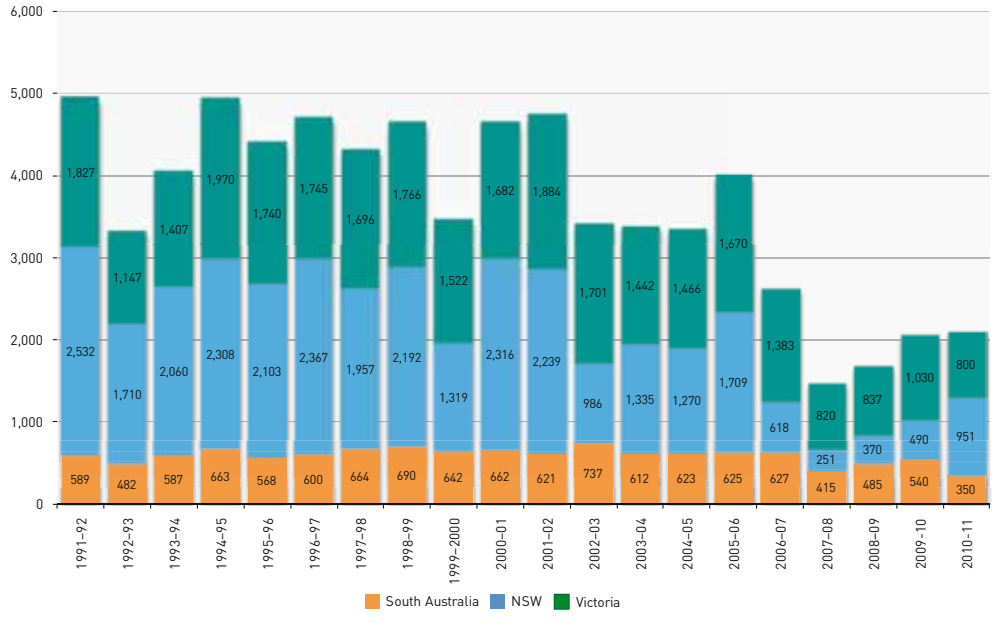


Figure 3.4 State diversions, 1991–92 to 2010–11: River Murray System

Note: diversions include the Lower Darling and any inter-valley trade received by a state.

The volume of private carryover water this year has increased markedly, to around 1,600 GL in New South Wales and 1,200 GL in Victoria; this is almost equal to the total capacity of Hume Reservoir and compares with about 1,200 GL for both New South Wales and Victoria last year.

Flow to South Australia

This year was the first since 2005–06 that South Australia has received its full entitlement. Additional dilution flow has been delivered to South Australia since 1 August 2010 as both the total volume of Hume and Dartmouth reservoirs exceeded 2,000 GL and the volume of Menindee Lakes exceeded the monthly trigger volumes. Additional dilution flow is likely to continue for some months into next year. Unregulated flow to South Australia began in September 2010 and is also likely to continue for a few more months.

The total annual flow across the South Australian border, including additional dilution flow and unregulated flow, is about 15,100 GL, the highest since 1975–76 (about 16,000 GL). The long-term median annual flow to South Australia is 4,760 GL.

The Murray component of the Snowy Mountains Scheme

Snowy Hydro Limited is obliged to release at a minimum the required annual release to the River Murray System over the course of the Snowy water year, which runs from 1 May to 30 April. The volume of the required annual release is determined by a calculation specified in the Snowy Water Licence. The terms of the licence allow for the volume of the required annual release to change throughout the course of the Snowy water year. Snowy Hydro Limited is free to release volumes in excess of the required release.

The 2010–11 required release was 422 GL on 1 May 2010, increasing throughout the year, with the final obligation being 1,278 GL. Included in the calculation of the 2010–11 required annual release was the repayment of 207 GL of irrigator borrows (from the 2004–05 and 2005–06 water years) and the repayment of the Mowamba Borrowings account that has existed since corporatisation of the Snowy Mountains Scheme in 2002. Snowy Hydro Limited released a total of 1,471 GL in 2010–11. The 193 GL in excess of the required annual release in 2010–11 will reduce the required release for 2011–12.

During the second half of 2010–11, MDBA joined discussions about amendments to the Snowy Water Licence that would speed the recovery of the Snowy scheme following drought and allow partner governments to hold callable water reserve in Snowy storage.

In June 2011, the NSW Office of Water invited the public to make written submissions on the proposed variations by 15 July 2011. When all issues raised in the submissions have been considered, the licence will be amended and published on the NSW Office of Water website.

River Murray Increased Flows is water to be used to improve environmental flows on the Murray. The RMIF is initially held in Snowy Hydro storages from where it is transferred to Hume Dam under certain conditions. As at 30 June 2011, no RMIF water was held in MDBA storages, while 160 GL of RMIF was held in Snowy Hydro Limited storage.

Operation of the River Murray System

River Murray System operations during 2010–11 were in marked contrast to recent years. While operations still aimed to maximise water availability, the frequent high inflows meant that operations were concentrated on passing the flows without magnifying the peak flow.

Upper Murray system

At the start of 2010–11, storage was low in both Dartmouth (1,254 GL, 32% of capacity) and Hume (804 GL, 26% of capacity) reservoirs. Updated capacity tables were implemented for these reservoirs on 1 October 2010. The updated tables ensure the best available information is being used to manage the storages.

The wet conditions have meant that demands downstream of Dartmouth Reservoir have been able to be met by downstream storages and tributaries. Accordingly, Dartmouth releases have been held at a minimum (200 ML/d), except for short periods during February, May and June 2011 when AGL Hydro used entitlement releases for power generation. As a result, storage in Dartmouth Reservoir increased from 32% to 65% capacity between July 2010 and June 2011.

At Hume Reservoir, regulated releases to meet downstream diversion requirements have been low because of high inflows from downstream tributaries and rainfall across the irrigation areas. These low demands coupled with high inflows over the year resulted in the Hume Reservoir spilling in October, November and December 2010 and again in February 2011. After that, the reservoir effectively spilled at low rates of flow for the remainder of the year.

In mid-October 2010, heavy rainfall, particularly in the Jingellic Creek catchment, resulted in a peak daily inflow to Hume Reservoir of 103 GL, one of the highest daily inflows on record. This rainfall resulted in the storage increasing by more than 250 GL in three days. During the December 2010 flood, Hume releases combined with inflows from the Kiewa River resulted in the flow at Doctors Point (near Albury–Wodonga) being above channel capacity (greater than 25,000 ML/d) for seven days. The maximum release from Hume Reservoir was 40,000 ML/d (from 11 to 13 December 2011), which when combined with Kiewa inflows resulted in a moderate flood level on the Albury gauge.

Environmental and irrigation releases in January 2011 resulted in Hume Reservoir being drawn down to 86% by early February 2011. However, further rain resulted in Hume Reservoir again filling and spilling in late February, creating the highest storage volume in Hume Reservoir at this time of year since the dam was completed in 1936. To assist with potential flood operations in the near future, from late February to the end of June 2011 the reservoir was operated to maintain about 200 GL airspace.

Hume Dam spilling, 31 October 2010

Mid-Murray

Flow rates downstream of Yarrawonga Weir have been well above the channel capacity of the River Murray through Barmah–Millewa Forest since late August 2010. Significant inflows from the Ovens and Kiewa rivers have required releases from Lake Mulwala to be managed using flood procedures. Two peak releases of just over 110,000 ML/d occurred downstream of Yarrawonga Weir (in September and December 2010) as a result of a combination of high unregulated inflows from the Kiewa and Ovens rivers and, in December, a spill from Hume Reservoir.

During 2010–11, the Barmah Choke was not a major constraint on operations. The rule preventing trade of allocations from above to below the choke has been relaxed since September 2007. The MDBA has been undertaking fortnightly reviews of the relaxation, with the result that it has continued uninterrupted.

Flooding along the Campaspe, Loddon and Avoca rivers in northern and western Victoria during January 2011 added to existing high flows along the lower mid-Murray. These high flows required removal of the weirs at Torrumbarry (for periods during September, December and January), Euston, Mildura and, combined with flood releases from Menindee Lakes, at Wentworth (from December to April). The peak flow past Euston was 74,000 ML/d on 25 January 2011, and at Wentworth, the peak flow was 92,000 ML/d on 6 February 2011.

Lake Victoria

At the end of June 2011, Lake Victoria was at 70% capacity. The lake was temporarily raised to 100% capacity (27.0 m Australian height datum) in mid-October 2010, and was then drawn down to 614 GL (26.48 m AHD, or 90%, by the end of October 2010). The lake was also temporarily filled to 650 GL (26.79 m AHD, or 96%, in mid-November 2010).

After this second peak, projected flood inflows permitted the lake level to be drawn down further, in accordance with the Lake Victoria Operating Strategy, to minimise the time spent at high lake levels. Refilling of the lake commenced in early June 2011.

Foreshore vegetation at Lake Victoria

Unusually high flows during 2010–11 provided MDBA staff with an opportunity to review the operation of Lake Victoria as required in the Lake Victoria Operating Strategy. Following advice from the Lake Victoria Scientific Review Panel, the lake was operated to provide favourable conditions for the vegetation growing on its foreshore.

The foreshore vegetation of Lake Victoria has been considerably modified by many decades of regulation, which has left large areas of the sandy lakeshore subject to dynamic geomorphic change. Recent work has established that adequate density and spatial arrangement of vegetation, in particular of spiny sedge (*Cyperus gymnocaulus*), can provide a stabilising function and limit erosion, which is important because Lake Victoria's shoreline contains Aboriginal cultural heritage material, including numerous burials of considerable antiquity.

Field inspections have revealed that the targeted operations have resulted in large-scale recruitment of spiny sedge, with many thousands of plants becoming established. Spiny sedge is a long-lived, rhizomatous perennial that effectively binds sand and accumulates leaf litter, and has the capacity to endure long periods of inundation and exposure once established.

With further targeted operations to capitalise on vegetation gains made in 2010–11, it is hoped this vegetation will provide an effective, self-sustaining biophysical tool that will give the foreshore resilience and enable the ongoing preservation of this culturally significant landform and mid-river storage.

Lake Victoria foreshore vegetation, showing spiny sedge, which stabilises and limits erosion, 2011

Menindee Lakes

Total inflows to Menindee Lakes between July 2010 and June 2011 were about 5,800 GL, an annual exceedance probability of 10%. The long-term average for this period is about 1,330 GL. These high inflows were caused by major rainfall events in various Darling River catchments during winter and spring in 2010, and in December 2010 and January 2011. As a result of these multiple events, the lakes have remained close to full or surcharged since September 2010.

The NSW Office of Water has overseen the daily flood operations at the lakes since 6 December 2010, consistent with past practice. The normal minimum release (200 ML/d in winter) was targeted from June to September. From October 2010, the daily release was increased to pass floodwater; by late February 2011, the release had reached as high as 34,000 ML/d. Gradual reductions were made in releases along the lower Darling River in April and May to minimise the potential for riverbank damage. At the end of June 2011, Menindee Lakes were storing 1,951 GL (113% capacity).

Lower Lakes and barrage operation in South Australia

The refilling of the Lower Lakes during spring 2010 was a highlight of 2010–11. The Lower Lakes returned to their full supply level of 0.75 m AHD during October 2010. Lake Albert had been reconnected to Lake Alexandrina when the Narrung Bund was partially removed in mid-September 2010. The Goolwa Channel was also reconnected to the rest of Lake Alexandrina after the partial removal of the Clayton embankment in late September 2010.

The first releases of water through the barrages from the Lower Lakes to the Southern Ocean since 2006 began in September 2010. It is estimated that in excess of 11,000 GL of water was released to the sea during 2010–11.

From January to June 2011, water releases through the barrages were managed to vary the level of the Lower Lakes between 0.65 and 0.85 m AHD through a number of cycles. This action facilitated mixing of water between the lakes to improve the salinity levels in Lake Albert. However, it has been difficult to implement large variations in water level in the Lower Lakes because of the high inflows and releases from the barrages being constrained by sand accumulation inside the Murray Mouth and by tidal influences.

Operations Review

The River Murray System Operations Review was established to assess existing river operations for the River Murray System against current and future requirements, including those provided in the Murray–Darling Basin Agreement.

This program works closely with river operators and jurisdictional managers to identify efficient and effective means to deliver states' shares of water and environmental outcomes for the River Murray System.

During 2010–11, Operations Review has:

- Supported documentation of a number of key subject areas within River Murray Operations requested by the Basin Officials Committee. A major part of this work has been summarising the process for water sharing in the River Murray System and collating the practices currently being used to operate the River Murray System. Work is now under way to establish the key decisions behind these practices.
- Supported the review of the Agreement Taskforce (established under the Basin Officials Committee) in defining areas of the agreement that require review as well as assisting in the codification of the operation of the River Murray System.
- Completed the 'individual options phase' of the Barmah Choke Study, which described, modelled and assessed individually a range of operational, policy and structural river management options to alleviate Barmah Choke channel capacity and shortfalls issues. The outcomes of the individual options phase are currently being used to inform the identification of integrated option packages for assessment as a part of the current 'options integration phase', which is expected to be completed by early 2012.

- Overseen preparation of draft River Murray System operating environmental guidelines. The environmental guidelines are being established to capture key environmental learning gained by operations and to test specific environmental actions proposed for operating the River Murray System.
- Provided substantial modelling work and consultation in the preparation of the final drafts of the new schedules to the Murray–Darling Basin Agreement — the Schedule to account for South Australia's storage right and the Schedule for water sharing. These new schedules were approved in May 2011 by the Murray–Darling Basin Ministerial Council and work has now begun on implementing them into the day-to-day operations and management of the River Murray System.

Water monitoring data for the River Murray

During 2010–11, MDBA continued to expand and improve its automated data acquisition system. A number of MDBA-funded water monitoring sites were damaged during the Victorian floods in January 2011, and these are being repaired or replaced.

This near real-time data is being used in real-time rainfall-runoff modelling for the Ovens River catchment. In 2011–12, MDBA will implement rainfall-runoff modelling for the upper Murray and Kiewa catchments.

Water resource modelling

The MDBA develops, operates and maintains river models and hydrographic data management systems for use in river management, water sharing and salinity management, and for other water resource issues and projects.

Major current projects include Basin Plan modelling, modelling for The Living Murray program, Operations Review modelling, managing the Cap on diversions and reporting on compliance, maintaining the Basin Salinity Management Strategy register and maintaining computer systems for the MDBA's River Operations section.

Throughout 2010–11, the Basin Plan Modelling Team continued to build a Basin-wide modelling capacity that will allow us to assess the effects of policy changes across the Basin. Development of this model has included the addition of environmental demands, which are used to support determination of the sustainable diversion limits required under the draft Basin Plan.

Operations Review work has included developing new schedules to the Murray–Darling Basin Agreement, modelling to assess water management policy options, running optimisation software to assess better ways to deliver additional dilution flows to South Australia, analysing the Lake Victoria Operating Strategy and providing expert support for the Barmah Choke Study.

Substantial model development has been associated with The Living Murray. Each of the six icon sites now has a detailed site model into which proposed construction projects have been written. The site-specific models can be used in real-time operational management of the river, which is being trialled using the Mulcra model. The model's potential application in accounting for water use is also being evaluated.

Support provided to river operations throughout the 2010–11 water year ranged from forecasting water availability under drought conditions to calculating prerelease targets to inform dam management during the wettest summer on record. The modelling team continues to provide modelling and analysis as part of MDBA liaison with Snowy Hydro Limited, and to support development of eWater Cooperative Research Centre's Source river model.

Managing assets

Background

River Murray Operations assets, principally those shown at Schedule A and Appendix 2 of Schedule B of the Murray–Darling Basin Agreement, are owned by the asset-controlling governments (the Australian Government and the governments of New South Wales, Victoria and South Australia). An asset agreement is in place between the four partner governments and the Murray–Darling Basin Authority (MDBA) regarding management of River Murray Operations assets.

For the most part MDBA carries out its roles and responsibilities under the asset agreement and the Murray–Darling Basin Agreement through the New South Wales, Victorian and South Australian state constructing authorities, including:

- State Water Corporation (State Water NSW) (the NSW Office of Water also undertakes significant works relating to salt interception schemes, river improvement, hydrometric and water quality monitoring, and the environment)
- Goulburn–Murray Water (Victoria)
- South Australian Minister for the River Murray, including the operating agents South Australian Water Corporation (SA Water) and the South Australian Department for Water.

The River Murray Division oversees the works associated with management of the assets. The Executive Director River Murray has particular delegations under the Murray–Darling Basin Agreement and the asset agreement. A strong relationship has developed between MDBA and the state constructing authorities, so that maintenance is proactive, decision-making is generally by consensus and issues are raised by constructing authorities at an early stage, which enables quick resolution.

Main activities

- Although work on the navigable pass upgrade and fishway construction at locks 5 and 6 was almost finished in 2009–10, and works at locks 2 and 4 made good starts in 2010–11, flooding in spring 2010 forced the contractor out of the river and work was suspended for the last eight months of the year. This has resulted in around $5 million in flood-related delay costs to the contract, substantially affecting project expenditure for 2010–11, and causing up to 12 months' delay in completing construction.
- The modified navigable pass structures installed at locks 1, 3, 7, 8, 9 and 10 over the past seven years were operated in real flood conditions for the first time this year. Removal and reinstatement of the navigable passes went smoothly, taking hours instead of days for each task and without any need for divers.
- Construction of the Hume Dam spillway southern junction dam improvement works made good progress during the year and is now nearing completion.
- Detailed design of the Hume Dam spillway southern training wall buttress stabilisation works and preparation of the tender documents for construction were completed, and tenders called for construction.
- With the construction of a new residence at Lake Victoria and additions made to one of the houses at Torrumbarry Weir and another at Lock 5, a decade-long program to bring housing stock up to an acceptable contemporary standard is nearing completion.

Assessment of asset management

Each year senior MDBA staff inspect all River Murray Operations assets, specifically to assess the operational performance of the assets. Assessment criteria include:

- condition of the assets
- operations and maintenance documentation
- occupational health and safety documentation and performance
- achievement of the works program set for the year
- expenditure against budget in meeting the program.

During 2010–11 locks and weirs were submerged for three to six months, more than 50% of the barrage gates were open for more than nine months, Torrumbarry Weir was fully open on two occasions, and three of the four major storages were in spill mode or at full supply level.

For operations and maintenance crews, this has been a dramatic turnaround compared to the previous decade. Many sites had made substantial efforts to get their assets back to a high standard following the navigable pass upgrades, fishway construction and lock

chamber refurbishment works only to have them inundated for an extended period. Once the waters receded, the result was dead grass for lawns, mud-covered concrete and fittings and, in many places, rust-affected assets.

The 2010–11 annual inspection of assets concentrated on how each site coped with the flood conditions and how they recovered over May and June 2011 after the flows receded.

Reconstruction of the navigable pass section of Euston Weir, showing use of cofferdam, May 2011

This photograph was taken after two of the four concrete half-height piers had been poured; the last two original steel trestles remain ready to be replaced. The steel cofferdam has been placed on the concrete base slab and pumped out to provide the contractor with a dry chamber for the next pier to be formed and poured. Work on the weir upgrade works and fishway construction resumed on 19 April 2011 when the flow dropped to 35,000 ML/d; on the day this photo was taken, the flow was around 22,000 ML/d. Works are currently scheduled for completion in mid-2012.

Senator Collings trophy winners, 2010–11

Top, left to right: David Dreverman, Scott Jenke, Greg Warren, Jim Rishworth, John Martin, Geoff Thompson, Rob Dowling, Max Beaumont, Brenton Erdmann, Daryl Jones, Roger Perry, Laurie Mill and Leo Pinnington. Bottom, left to right: Tony Morse, John Grima, Wade Stidiford and Neville Skipworth.

Senator Collings Trophy

In 2010–11, staff of the Lake Victoria Storage were presented with the Senator Collings Trophy for the best maintained asset in 2009–10.

This is the first time Lake Victoria Storage has been awarded the annual trophy, which is fitting recognition of the major efforts made on embankment topping and trimming, the inlet structure refurbishment, Scaddings Bridge upgrades, improvements around the depot and houses, and on the cultural heritage program.

The Lake Victoria team has worked extremely hard over the past three years to bring the asset to an award-winning standard. The team's pride and sense of achievement were clearly evident when they were presented with the award.

Major works on assets in 2010–11

Hume Dam

Three significant dam safety improvement projects are currently underway at Hume Dam.

The first of these progressed significantly with the installation of filter and drainage materials at the southern junction of the concrete spillway and the main earthfill embankment nearing completion.

This work involved drilling a series of overlapping holes next to the spillway southern junction and backfilling the holes with either filter sand or free-draining material as the drill casing was withdrawn. The first stage of the construction involved installing 300 mm-diameter filter columns. After this, 1,200 mm-diameter columns were installed, requiring the use of a much larger 160-tonne rig. Once the works are completed, more than 350 holes will have been drilled at depths of up to 42 m, and the total length of holes installed will be around 10,000 m.

During 2010–11, the detailed design for the second dam improvement project at Hume Dam (a concrete buttress to increase the stability of the spillway southern training wall) was completed. Funding for construction of the buttress was approved by the Murray–Darling Basin Ministerial Council. Construction works are expected to begin around November 2011 and may take up to two years to complete.

The third dam safety project is to assess and, if necessary, upgrade the flood-routing capacity at Hume Dam. Options for upgrading the spillway capacity have been considered, with a recommendation made to raise the main embankment parapet wall by about 0.3 m and carry out minor modifications to other embankments at Hume. This option will be developed further and with consideration of:

- Australian National Committee on Large Dams guidelines
- the current move by the New South Wales Dams Safety Committee (the New South Wales dams regulator) towards a more risk-based strategy
- a change in operating strategy for extreme rainfall events to further increase flood-routing capacity in addition to the recommended structural upgrade works
- the possible impact of the draft Basin Plan on future lake levels.

Dartmouth Dam

The annual dam safety inspection of Dartmouth Dam in May 2011 confirmed it is in good condition and performing as expected, although the need to increase spillway capacity to meet extreme floods was noted. The MDBA places a high priority on ensuring all its dam assets comply with Australian National Committee on Large Dams guidelines. In 2010–11, detailed design began on the first stage of the spillway capacity upgrade and refurbishment of the dam crest at Dartmouth Dam.

Aerial view of Hume Dam, 17 March 2011

This photograph shows construction works in progress at the spillway southern junction where the main embankment on the Victorian side meets the gravity dam spillway structure. The yellow Bauer BG40 drilling rig is installing overlapping 1,200 mm-diameter columns filled with either sand filter or drainage material. A smaller rig was used during the earlier part of this contract to install 300 mm-diameter sand filter columns. Drilling of production holes began in June 2010 and is scheduled for completion in August 2011.

Locks and weirs

The operation and maintenance of the locks and weirs were significantly affected by high flows from September 2010, which persisted to the end of May 2011.

Major projects affected included:

- Lock chamber refurbishments scheduled for two locks could not be carried out because of the high flows. However, work at Lock 2 (Waikerie) was completed (see photograph on p. 148).
- The navigable pass upgrade and the associated fishway construction at locks 2 and 4 were put on hold. Stand-downs at these sites began in October 2010; by January 2011, it had become necessary to suspend the construction contract until river levels had dropped sufficiently to enable the contractor to re-establish cofferdams with a reasonable expectation that low flows

would continue long enough to enable the works to be completed. Disruption of the schedule has caused significant additional cost; it is unlikely work will resume before October 2011 and it may take another year to complete the works.

- Fishway construction at Lock 11 was suspended and is not expected to resume before late spring 2011.
- Lock 15 works were on standby for fewer than three months, but its construction schedule will take longer than this to come back online because of flood clean-up, additional set-up time and preparation for possible further disruptions during winter and spring in 2011. These factors have resulted in additional costs for the project.

Barrages

A significant milestone was reached for the barrages deck replacement program in 2010–11. All the deck units and supporting beams of the Ewe Island Barrage were replaced with new, more stable and durable units that provide increased safety for operations. The deck replacement program will move on to the Tauwitchere Barrage in 2011–12.

It is expected it will take a further five to 10 years to complete the works, depending on the rate at which funds can be made available.

Lake Victoria

In 2007–08, the Lake Victoria Scientific Review Panel, comprising experts with skills in cultural heritage, aquatic ecology, geomorphology, hydrology and rangeland management, was convened. During 2010–11, the panel:

- provided advice to MDBA about lake operations
- continued to analyse 12 years of data collected from vegetation and shoreline monitoring programs
- assessed options for the redesign of the scientific monitoring program.

Furthermore, trials of the landscape function analysis monitoring developed by CSIRO and storm event monitoring were undertaken during the past year to augment current data. This was done to enable shoreline processes to be understood and to inform management actions. The cultural heritage record-keeping system is currently being updated, while the monitoring program is being redesigned to deliver targeted, preservation-focused management actions around the lake.

Over the past year, a number of initiatives were put in place to help us engage with the traditional owners of Lake Victoria, represented by the Barkindji Maraura Elders Council. One of these initiatives was assisting the council to become incorporated, which will enable it to better manage its affairs. Other initiatives included the design and initial implementation phases of two facilities: a 'keeping place' where artefacts and cultural records can be stored under proper curatorial conditions, and a camping ground on the lakeshore where the Barkindji Maraura Elders Council can quietly enjoy the lake.

Lock 2 (Waikerie) chamber dewatered during refurbishment, 2010–11

In this photograph, Lock 2's downstream gates are covered in a plastic tent to enable grit-blasting and repainting. The four large slots, on each side at the bottom of the chamber, house the valves connected to the filling conduits. These large valves are checked and are refurbished or replaced depending on their condition. Note the brown-coloured cofferdam just visible between the enclosed gates. Combined with a similar cofferdam upstream (behind the photographer), the river is kept out of the chamber to enable the works to continue in the dry.

Mitta Mitta River channel improvements

Works undertaken in 2010–11 included channel capacity maintenance works that primarily focused on proactive invasive willow control in the reaches of the Mitta Mitta River immediately below Dartmouth Dam. A number of 'emergency' blockages (fallen trees) were removed or realigned, several stock exclusion and willow control projects were completed, and all rehabilitation and revegetation sites from previous years were revisited for follow-up control of weed and willow regrowth.

A waterway action plan for the Mitta Mitta River was also completed. This plan identifies and allocates responsibilities for a river works program to achieve a balance between optimum river and riparian health and bulk water transfer objectives. The plan recommends a progressive five-year program, with only a minimal annual program of maintenance works required after this.

Hume to Yarrawonga reach

Hume to Yarrawonga River Murray Works Program

The erosion control works program for 2010–11 along the River Murray involved placing logs and rocks on riverbanks to restore 5 km of degraded river. Two engineered logjams were also constructed to control flows down developing anabranches (see images below and on the following page). Revegetation was a major part of the program, with 60,000 native plants established along 10 km of riverbank. Plants ranged from grasses and reeds to shrubs and trees. Willow management was also undertaken to remove several blockages in small anabranch stream beds.

Program monitoring continues to assess the effectiveness of the erosion control works. Monitoring and adaptive management allows improvements to be made to the design strategies developed by the New South Wales Office of Water's River Murray Works Unit for erosion control along the River Murray.

Murray Mouth sand-pumping

Benefits of the 2010–11 floods along the River Murray include the refilling of the Lower Lakes and the consequent flows through the Murray Mouth to the Southern Ocean. A combination of high flows (some estimated to be as high as 80,000 ML/d) passing through the mouth and the state of the Murray–Darling Basin storages resulted in a decision to cease sand-pumping and terminate the dredging contract.

A small engineered logjam on a River Murray anabranch known as Back Creek, near Howlong, Victoria

A large engineered logjam on a River Murray anabranch known as Common Creek, near Howlong, Victoria

The logjam is designed to reduce flows and velocities down the Common Creek anabranch to stop it developing further and to retain more of the flow within the main River Murray channel.

Between 2002 and 2010, just over 5 million tonnes of sand were pumped from inside the Murray Mouth to the shore of Encounter Bay at a cost of approximately $41 million. The ecological benefits to the Coorong are difficult to quantify, but there is no doubt that maintenance of the target diurnal tidal ratios helped maintain an estuarine environment within the Goolwa Channel below the Goolwa Barrage and in the northern part of the upper Coorong. This established a refuge area that was not super-saline, at temperatures that could sustain the fish, fauna and flora of the region.

The photographs on the following page show the state of the Murray Mouth while dredging was still in place (July 2010) compared with how it looked after the spring–summer rains had filled the Lower Lakes and flowed so strongly through the barrages and the mouth that dredging was discontinued (March 2011).

Aerial view of the Murray Mouth, with dredging to keep the mouth open, July 2010

Aerial view of the Murray Mouth after spring–summer rains had meant that dredging could be discontinued, March 2011

Environmental Works and Measures Program

Background

The Environmental Works and Measures Program aims to improve the health of the River Murray System through infrastructure that delivers and manages water for the six environmental icon sites of The Living Murray — Barmah–Millewa Forest; Gunbower–Koondrook–Perricoota Forest; Hattah Lakes; Chowilla Floodplain and Lindsay–Wallpolla Islands; Lower Lakes, the Coorong and Murray Mouth; and the River Murray Channel.

Infrastructure includes water-regulating structures, levee banks, water delivery channels, fishways and complementary works and measures.

Main activities

- Continued construction at the Chowilla and Mulcra Island floodplain inundation projects. These works were interrupted by the floods of October 2010 to May 2011.
- Began construction of the Koondrook–Perricoota floodplain inundation project with only minor delays caused by flooding.
- Progressed construction at locks 2, 4, 11 and 15, and at the Stevens Weir and Edward River offtake fishways. Flooding caused major delays to these works, and completion is now expected in 2011–12.
- Completed construction for locks 5 and 6 fishways, with some fish-lock technical issues to be resolved in 2011–12 when construction resumes after flooding recedes.
- Completed detailed designs for the Hattah Lakes works.
- Began detailed design for the Gunbower and Lindsay Island works.

The 2010–11 flooding provided welcome relief to stressed River Murray floodplains, inundating all icon sites and removing the time-critical nature of completing the works to allow watering of the sites. The downside of the flooding was that it caused major delays to the Environmental Works and Measures Program:

- work at Chowilla and at locks 2, 4, 11 and 15 fishways was suspended in mid-spring 2010; by autumn 2011 only the work at Lock 15 (Euston) was able to be resumed
- cultural heritage investigations for the Lindsay stage 1 works have been delayed by some six months because the sites were under water
- access issues delayed final cultural heritage inspections for Hattah Lakes works

- lower landscape works at Gunbower have been deferred until summer 2011–12 because flooding of the Loddon and Avoca rivers in 2010–11 meant that even when construction became possible, work crews were busy repairing damage to northern Victorian irrigation infrastructure.

The flooding has caused a number of contractual issues and increased costs for the program because standby and demobilisation costs had to be paid for these sites. The state constructing authorities have been diligent in managing costs and negotiating appropriate outcomes with the contractors.

Despite the challenges caused by the flooding, the Environmental Works and Measures Program made significant progress in 2010–11, including:

- Commenced construction at Koondrook–Perricoota Forest. This represents the start of the largest Environmental Works and Measures Program project, one that will be capable of watering more than 16,000 ha of forest. The project has a major cultural heritage component to minimise any adverse impact on cultural sites located on or near the works, including the clearing and stripping of land prior to construction of 40 km of levee banks. While construction of the works is scheduled to take six months, this timeframe may be interrupted by further flooding and wet weather.
- Completed the detailed design for the Hattah Lakes project and obtained most of the construction approvals. Expressions of interest have been sought from contractors, to select a short list of companies to be invited to tender for the work early in 2011–12. The works have an eight-month construction period and are scheduled to be largely completed in 2011–12.
- Completed concepts for the Gunbower works and resolved issues associated with fish passage. The detailed design process is progressing well and should be completed early in 2012, along with approvals and the tender documentation.
- Recommenced the detailed design and associated approval investigations for the Lindsay stage 1 work now that the floods have receded and appointed a consultant for the design of the Mullaroo offtake regulator and fishway upgrade. The need for cultural heritage and vegetation assessments, along with a sensible period for construction, means this work is unlikely to be completed until summer 2012–13.
- Developed an operating plan for the Mulcra Island environmental works. A joint effort by the Mallee Catchment Management Authority, Parks Victoria, SA Water and MDBA, this development has provided a good model for other sites to follow. Koondrook–Perricoota and Chowilla are also making good progress in developing their operating plans.

MDBA TEAM SNAPSHOT

Environmental Works and Measures Program Team

The Environmental Works and Measures Program Team coordinates a $287 million program that is building new works to ensure efficient use of environmental water across 35,000 ha of The Living Murray icon sites in the River Murray System.

We deliver the program through cooperative arrangements with natural resource departments, catchment management authorities, land management agencies and state constructing authorities across three states, and the Australian Government. Throughout the life of the program MDBA is also ensuring that we retain and make accessible the project knowledge it is generating.

A key part of our role is getting out to the sites and ensuring that MDBA develops networks with stakeholders and has a practical understanding of the works and challenges of the sites. We are responsible for ensuring that the designs and solutions developed will allow the efficient use of water to achieve the ecological outcomes under a wide range of flow and climate conditions.

Over the past year it has been great to see the floodplains respond to the floods, even though the floods have disrupted construction to the point where most sites were shut down. We have made significant efforts to minimise the impacts of the floods on the program. However, seeing the water flow over the land has helped us in preparing the operating plans for the icon sites because we now have a very real example of what will flow where, when, how deep and so on.

PS *Ruby*, first vessel to pass through the modified navigable pass at Lock 10 and Wentworth Weir, 9 December 2010

Improving river modelling

Background

The Murray–Darling Basin Authority (MDBA) strategy to improve water management and delivery tools includes creating:

- a daily model of the River Murray System
- a real-time model of the upper River Murray.

The work involves extensive collaboration with research organisations such as the eWater Cooperative Research Centre (CRC).

Main activities

- Continued development of design of Source, which will model catchment behaviour and river system planning, management and operations.
- Trialled Source in four Murray–Darling Basin catchments, to determine the robustness of the model and the software platform.
- Continued to support the eWater CRC with development of River Manager and River Operator software.
- Constructed a prototype model of the upper River Murray, which will be tested in 2011–12.

Definition: eWater Cooperative Research Centre

eWater CRC is a joint venture of 45 Australian water-cycle management, consulting and research organisations, which is supported by the Australian Government's Cooperative Research Centres Program.

eWater CRC builds water management tools for partners; it also markets those tools. The tools include decision software, guidelines, forecasting models and databases designed for use in operating river systems, managing catchments, developing monitoring programs and guiding investment in river and catchment restoration.

River operations and planning tools for the River Murray system

eWater CRC is developing Source, a next generation hydrologic modelling system that models catchment behaviour and river system planning, management and operations.

During 2010–11, the design of Source continued to progress as a result of additional funding from the Department of Sustainability, Environment, Water, Population and Communities and the National Water Commission. Substantial advances were made in the model's functionality, and significant hydrological and software testing was undertaken to determine the robustness of the model and the software platform. The Source model is being trialled in four catchments across the Murray–Darling Basin in application projects in partnership with the relevant jurisdictions.

The MDBA continues to contribute resources to support the design of Source, including how it describes physical and management functions, the undertaking of hydrological testing and a trial application model on the River Murray. Source is also currently being used by MDBA operations staff in parallel with the operations spreadsheets to undertake daily operations on the upper River Murray.

The MDBA also contributes to the model's development through membership of the eWater Ltd Board, a high-level steering committee, the user reference group and technical user groups.

Salt interception schemes

Background

Salt interception schemes are a significant component of the Basin Salinity Management Strategy. The schemes intercept saline groundwater and drainage inflows before they reach the River Murray or its tributaries, to achieve and maintain agreed salinity levels in the river; they are also operated to maximise environmental benefits to the Murray–Darling Basin.

The 18 current salt interception schemes (including five state-owned schemes) represent a significant achievement under the Basin Salinity Management Strategy 2001–2015. The locations of these salt interception schemes are shown in Figure 3.5 (see p. 158).

Main activities

- Diverted approximately 324,162 tonnes of salt from the River Murray in 2010–11 using salt interception schemes.
- Completed construction of the Upper Darling salt interception scheme in New South Wales.
- Commissioned the full Pyramid Creek salt interception scheme in northern Victoria.
- Commissioned the full Loxton salt interception scheme in South Australia.
- Completed construction of phase 1 of the Pike River salt interception scheme, funded by South Australia.
- Progressed construction of the Murtho salt interception scheme in South Australia.

Investigations

The focus for 2010–11 was on finalising a business case to rehabilitate and extend the existing Woolpunda salt interception scheme in the South Australian Riverland. This business case will complete the agreed salt interception investigations program.

Construction

Construction of the Upper Darling salt interception scheme near Bourke, New South Wales is now complete. However, because of flooding in the Darling River, the formal commissioning of this scheme will now take place early in 2011–12.

All construction components of the Loxton salt interception scheme in the South Australian Riverland were completed during the year, with the scheme declared effective in April 2011.

Following completion of a pumping optimisation program, the Pyramid Creek salt interception scheme in northern Victoria was declared effective in October 2010.

During 2010–11, the detailed design of the Pike River salt interception scheme was progressed and a phased approach to construction identified. In October 2010, a South Australian proposal to construct a limited package of works using funding made available through the National Action Plan for Salinity and Water Quality Program was supported by the Murray–Darling Basin Authority. Construction of the first phase of the Pike River salt interception scheme began early in 2011. With the exception of a small number of floodplain monitoring bores, work was completed by the end of 2010–11.

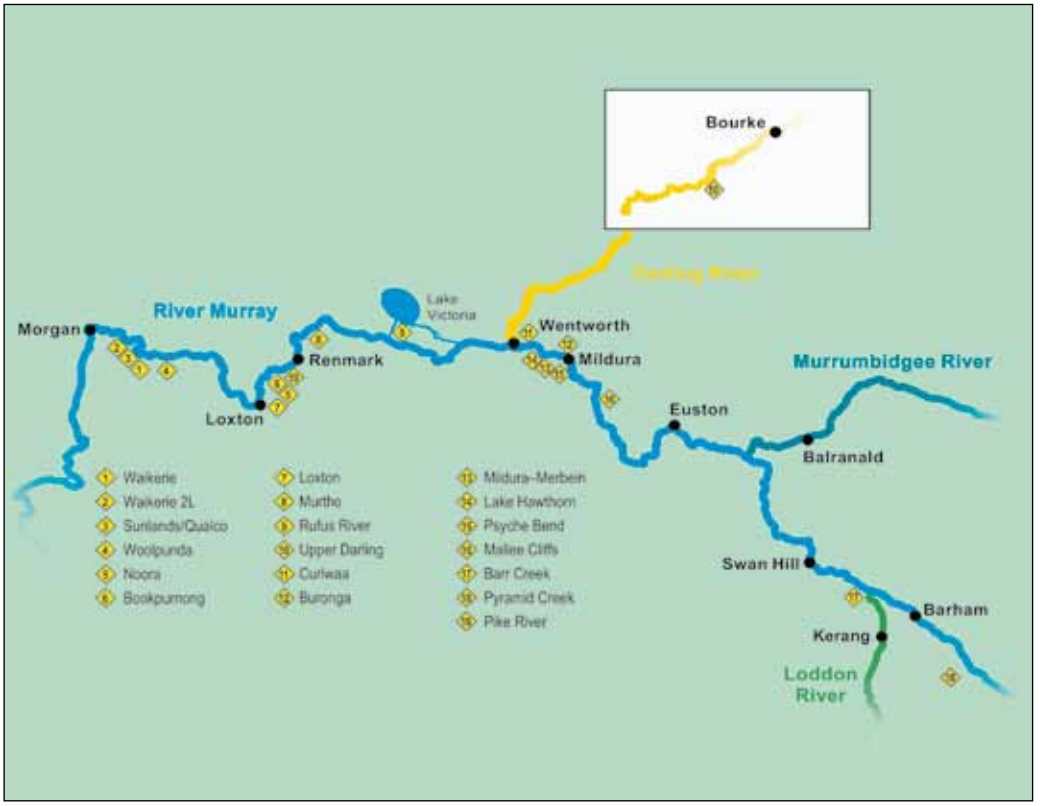


Figure 3.5 Salt interception schemes: Murray–Darling Basin, 2010–11

Note: Noora (icon no. 5) is a drainage basin scheme rather than a salt interception scheme; Pike River (icon no. 19), completed at the end of 2010–11, is the eighteenth salt interception scheme.

The floods in the River Murray during 2010–11 caused work on the construction of the Murtho salt interception scheme to slow. However, significant progress was still made on the construction of the scheme.

The contract for the mechanical and electrical design and fabrication of bore headworks, switchboards and the Disher Creek pump station has been let. Fabrication of components is underway.

Completion of the aquifer testing and analysis of the constructed borefield were also delayed because of the floods in the River Murray. It is now expected that this scheme will be close to completion by the end of 2011–12.

Operations and maintenance

During the past year, operation and maintenance of existing salt interception scheme assets continued to focus on minimising running costs, particularly the cost of energy for pumping. Careful monitoring means it has been possible to maintain target groundwater levels while scheduling pumping times to coincide with periods of lower power tariffs.

A number of production bores on the River Murray floodplain were shut down during 2010–11 because of floodwater inundation. Although most bores were restarted once floodwaters receded, considerable work has been required at Pyramid Creek to repair flood damage to a number of bores and their associated switchboards.

Table 3.2 shows the performance of the salt interception schemes over the past year.

Table 3.2 Performance of salt interception schemes, 2010–11

Salt interception scheme	Volume pumped (ML)	Salt load diverted (tonnes)	Average salinity (EC units)	Target achieved (percentage of time)	Power consumption (kilowatt hours) (Totals)
Pyramid Creek	488	6,590	38,980	100	189,600
Barr Creek	2,287	6,884	3,293	100	41,974
Mildura–Merbein	1,276	18,183	49,963	63	66,538
Mallee Cliffs	1,650	47,150	52,571	74	511,729
Buronga	2,390	60,540	43,830	90	444,314
Bookpurnong	595	14,513	38,265	95	252,188
Loxton	1,266	15,325	23,347	98	342,210
Woolpunda	3,825	74,916	31,800	98	3,524,931
Waikerie	3,179	69,928	35,300	95	1,381,652
Rufus River					
Line 1	71	581	14,149	100	5,412
Line 2	50	1,886	56,220	100	8,583
Line 3	50	2,441	70,444	100	13,252
Line 4	33	1,036	48,319	100	13,187
Minor pump station					
Major pump station	198	4,189	34,085	100	950
Subtotal for Rufus River	402	10,133			41,384
Totals across all schemes	**17,358**	**324,162**	**N/A**	**N/A**	**6,796,520**

MANAGEMENT AND ACCOUNTABILITY

Overview

The 2010–11 reporting period was another significant business year during which we continued to strengthen our corporate governance framework and our agency workplace culture.

During the year, some of our focus was on improving our corporate policies and procedures, reviewing our performance reporting, updating key risk management and business continuity plans, implementing our first Strategic Workforce Plan and Workforce Diversity Program and negotiating a new enterprise agreement.

Our performance across the corporate governance field was recognised during the year when:

- we received the 'Highly commended — small to medium agency' award in the 2010 Comcover awards for excellence in enterprise risk management
- an independent occupational health and safety audit showed our very high compliance with occupational health and safety requirements
- our 2009–10 annual report received a silver Australasian Reporting Award.

Our communications roles — including media, online initiatives, information provision and community and stakeholder engagement activities — increased dramatically throughout the year as we developed and released the *Guide to the proposed Basin Plan* and moved towards the release of the draft Basin Plan.

Main activities

- Effectively operated internal senior management committees.
- Continued oversight by the Information Management Committee of 23 projects in the Enterprise Information Strategy.
- Established the Information Stewards Team, to manage MDBA's information assets, and an associated internal wiki.
- Appointed new internal auditors, KPMG.

Senior management committees

Following the establishment of the Murray–Darling Basin Authority (MDBA) in 2008, a number of senior management committees were created to provide advice and assurance to the Chief Executive and to manage cross-cutting aspects of MDBA business. The senior management committees are described below.

Executive Committee

The MDBA's Executive Committee is chaired by the Chief Executive. Its membership comprises the executive directors of MDBA's four divisions (Basin Plan, Natural Resource Management, River Murray and Corporate Services), the Executive Director Special Projects and the chair of the Business Managers Committee.

The Executive Committee is the main forum in which MDBA governance requirements are discussed. The committee meets weekly and considers the strategic direction, risks and positioning, safeguarding and enabling necessary for MDBA to achieve its business outcomes.

During 2010–11, the committee considered corporate planning and budgets, financial performance, workforce metrics, workforce planning, development of the 2011–14 employee enterprise agreement, risk management framework, amendments to the *Water Act 2007* (Cwlth), internal communications strategy, web and social media, internal and external audit reports, the annual report, accommodation requirements, implementation of *Ahead of the game: Blueprint for reform of Australian Government administration initiatives*, and reports from business managers' meetings.

Business Managers Committee

The Business Managers Committee meets fortnightly to consider, plan and coordinate cross-divisional issues and communications to facilitate MDBA business. Its membership comprises all general managers and directors who report directly to the executive directors.

Standing items on the committee's agenda include a report from MDBA's People, Planning and Performance section, monthly financial reports, updates on internal communications and the progress of the draft Basin Plan.

Among the significant matters addressed by the committee during the past year were reviews of internal policies and procedures, a response to the all staff survey, and input into consideration of MDBA's future direction and the consequences for the organisation's structure.

Information Management Committee

The Information Management Committee was established as a subcommittee of the Executive Committee to provide advice on and strategic direction for the management of MDBA's information communication technology needs. The committee also discusses and endorses all projects with ICT components or impacts.

The committee is chaired by the Executive Director Basin Plan; its other members are the Chief Information Officer and two senior executive officers from business divisions with significant ICT interests. Membership is reviewed every two years; this happened in June 2011, when two senior executive member positions were changed over. Committee meetings are held every four to six weeks.

During 2010–11 the committee's main focus was its continuing oversight of a suite of 23 projects in the Enterprise Information Strategy and the establishment of the Information Stewards Team, which is responsible for managing MDBA's information assets arrangements and supporting an integrated approach to our information holdings.

INFORMATION STEWARDSHIP WIKI

During 2010–11, MDBA created the Information Stewardship Wiki, an internal wiki for all MDBA staff to share information about information — particularly, MDBA–relevant information.

The wiki pages are overseen by the Information Stewards Team, although the custodians of the wiki are MDBA staff.

This wiki is about harnessing the collective mind of MDBA staff to help define the information needs of the organisation, including the requirements for leadership and direction around information management processes and information quality.

Occupational Health and Safety Committee

The Occupational Health and Safety Committee is a subcommittee of the Executive Committee; established under the *Occupational Health and Safety Act 1991* (Cwlth), it meets quarterly to oversee OH&S matters across MDBA.

Until 20 June 2011 the committee was chaired by the General Manager Assets, River Murray Division. Since 20 June 2011 the committee chair has been the General Manager Basin Plan Development and Implementation, Basin Plan Division.

Other members of the committee include health and safety representatives from MDBA's two designated work groups, a representative from the Workplace Consultative Committee, the Director People, Planning and Performance, the Chief Fire Warden and the Occupational Health and Safety Coordinator.

The committee met four times in 2010–11 and considered a range of health and safety issues, including:

- policies, procedures and guidelines
- new work health and safety legislation and codes that will come into operation on 1 January 2012
- workplace inspections, and workplace incident and injury reports
- reports from first aid officers, fire wardens and harassment contact officers
- accommodation issues that have occupational health and safety implications
- promoting staff awareness of health and safety issues.

Workplace Consultative Committee

The Workplace Consultative Committee was established under clause 8 of the enterprise agreement to provide a forum for:

- staff consultation and input to decision making on matters affecting their employment
- provision of advice to the Executive Team on workplace issues
- oversight of the implementation of the enterprise agreement.

The committee is chaired by the Chief Executive. It comprises two management representatives; an elected employee representative from each of the four MDBA divisions; and an elected employee representative from the Association of Professional Engineers, Scientists and Managers, the Media, Entertainment and Arts Alliance and the Community and Public Sector Union.

The committee met four times during 2010–11 and reviewed:

- human resources policies, procedures and guidelines underpinning the enterprise agreement
- progress in implementing productivity measures under the enterprise agreement
- workforce planning
- ICT and protective security policies and guidelines
- Occupational Health and Safety Committee reports
- workforce statistical information.

Audit Committee

The Audit Committee reports to the Chief Executive. The committee has an independent chair, Mr Paul McGrath, while its membership comprises the Executive Director River Murray Division (as deputy chair), the executive directors of the Corporate Services and Natural Resource Management divisions and the General Manager Water Planning, Basin Plan Division.

The committee met four times in 2010–11, in September and December 2010 and in April and June 2011.

The committee provides independent assurance and assistance to the Chief Executive on the integrity of MDBA's financial data and processes; its risk, control and compliance framework; and its external accountability responsibilities. In particular, the committee ensures that MDBA:

- has a sound internal control framework that is supported by effective identification and business risk management procedures
- has an appropriate fraud control plan and procedures
- has appropriate disaster recovery and business continuity arrangements
- has reliable financial and management reporting systems
- clears its financial statements
- complies with applicable laws, regulations and government policies
- maintains an effective and efficient audit service.

In 2010–11, the committee considered MDBA's 2009–10 financial statements, the *Australian National Audit Office financial audit report* and the outcome of MDBA's 2009–10 Certificate of Compliance; it also monitored implementation of risk management, fraud control, business continuity and disaster recovery and internal audit work plans.

The committee also advised the Chief Executive about the appointment of a new internal auditor, KPMG. During 2010–11 the internal audit focused on a mix of performance and compliance audits.

The committee continued to monitor implementation of the internal and external audit report recommendations throughout the year.

The following sections on risk management, Comcover, fraud control, business continuity and ICT disaster recovery illustrate the wide range work carried out by the Audit Committee.

Risk management

Effective risk management is fundamental to good corporate governance and sound management practice; it is a key component of MDBA's planning and review systems. The Audit Committee monitors key risks and monitors the development of policies and procedures for risk management.

The MDBA Risk Management Plan 2010–11 was prepared in 2010 following a detailed organisational risk assessment that included a review by the executive of the organisation's risk appetite. The plan focuses on risks that affect the achievement of key corporate objectives and risks that affect most, if not all, MDBA functions and processes.

Former Chief Executive Rob Freeman (centre) with Lorraine Welling (far left) and Frank Nicholas (far right) with the Risk Management and Occupational Health and Safety Team of Donna Ironfield (second from left) and Laura Fulton (second from right), with their Comcover 2010 award

Each identified risk was assessed by consequence, likelihood and effectiveness of existing control measures. Additional risk mitigation activities aimed at reducing risks to acceptable levels were proposed where appropriate.

The risk management plan identified 22 enterprise risks: 2 of these were rated as high residual risks, 16 were rated as significant and 4 were rated as moderate. The Audit Committee considered the risk management plan and implementation of associated treatments in all its 2010–11 meetings, and will continue to monitor risk management in all future meetings.

In 2010–11, training in risk management, including fraud risk management and Australian Public Service values, was offered to MDBA employees and included in new staff inductions. The Performance Management and Development Scheme for all employees was also amended to include a compulsory section on governance training.

Comcover

The MDBA's insurable risks were identified as part of Comcover's insurance renewal process and will be reassessed annually. As a result, MDBA's 2010–11 Comcover premium was discounted by 7.2%.

Comcover assessed MDBA's overall risk performance as 'structured' in its maturity level, with a score of 7.6 out of 10 in its benchmarking study. The MDBA's greatest strengths were in accountability and responsibility, integration, and risk management policy and objectives.

The MDBA's Risk Management and Occupational Health and Safety Compliance Team received the 'Highly commended — small to medium agency' national award in the Comcover 2011 awards for excellence in enterprise risk management. The award recognised MDBA's efforts in developing and establishing enterprise-wide risk management practices for a new organisation.

The MDBA is covered by Comcare for risks associated with injury to employees.

Fraud control

Fraud control is an integral element of MDBA's governance framework. The MDBA has prepared fraud risk assessments and fraud control plans, and also has in place appropriate fraud prevention, detection, investigation, reporting and data collection procedures and processes that meet MDBA-specific needs and comply with the *Commonwealth fraud control guidelines*.

At each of its meetings throughout the past year, the Audit Committee monitored the implementation of MDBA's 2009–11 fraud risk assessment and fraud control plan and their associated treatments and actions. In addition, all employees with financial delegations are required to address their compliance with the fraud control guidelines during the quarterly Certificate of Compliance process and to report any known instances of fraud or potential fraud-related occurrences.

To strengthen understanding about fraud control, MDBA's fraud policy was included in the new online induction process for new staff. Targeted fraud awareness training was also undertaken during 2010–11; this training included informing staff about Australian Public Service values and the APS Code of Conduct.

Fraud investigations

One case of potential fraud was under investigation during 2010–11.

Future fraud risk assessment

During the past year, MDBA began work on the 2011–13 fraud risk assessment and on developing our fraud control plan, which will be in place in the first quarter of 2011–12.

We also started work on ensuring that MDBA complied with the new *Commonwealth fraud control guidelines* and the Australian National Audit Office's *Better practice guide on fraud control in Australian government entities*, both of which were published in March 2011.

Business continuity and information communication technology disaster recovery plans

In 2010–11, we began reviewing and updating our business continuity and information communication technology (ICT) disaster recovery plans following their testing in late 2010; this work involved incorporating requirements for a small new office lease.

The MDBA business continuity plan describes arrangements to ensure the continuity of MDBA key services after a significant, unexpected and disruptive incident (such as a fire). The plan also describes MDBA management structure; staff roles and responsibilities; activation criteria; procedures for continuing core business activities and managing recovery from emergencies, disasters and other disruptive events; and maintenance procedures.

The MDBA ICT disaster recovery plan provides recovery procedures to address the potential loss of critical ICT resources (e.g. hardware, data and voice network equipment, and critical business data and systems).

The Audit Committee reviews and monitors both plans.

Internal audit

Internal audit services during 2010–11 were provided by Ernst & Young until 1 January 2011. Following an open tender process and consideration by the Audit Committee, new internal auditors, KPMG, were appointed by the Chief Executive.

The Internal Audit Plan 2010–11 was developed after MDBA's strategic risks were considered and following discussions with senior managers. Internal audits finalised during the year covered:

- Basin Salinity Management Strategy performance audit
- Environmental Works and Measures Program performance audit
- contract management
- grants management
- ICT and protective security
- engagement strategy
- Indigenous engagement.

We also began an audit of MDBA records management during the year but this will not be finalised until early 2011–12.

The compliance audits found a strong and positive attitude to internal control, but identified actions needed to ensure improved compliance. A number of recommendations were made about the completed audits, but no serious control breaches were identified. The performance audits made a number of recommendations that will help better equip programs to meet future demands and changes to the operating environment.

At its quarterly meetings the Audit Committee continued to monitor implementation of report recommendations through status reports.

Certificate of Compliance

The MDBA online Certificate of Compliance system is a cornerstone of our wider corporate governance model. The system enables the Chief Executive to report on MDBA compliance with the Australian Government's financial management framework to the Minister for Sustainability, Environment, Water, Population and Communities (the Commonwealth Minister for Water) and the Minister for Finance and Deregulation by 15 October each year.

Compliance performance is assessed against the:

- *Financial Management and Accountability Act 1997*
- Financial Management and Accountability Regulations 1997
- Financial Management and Accountability (Finance Minister to Chief Executives) Delegation 2007 (No. 2) as amended from time to time
- Australian Government's foreign exchange risk management requirements
- legal and financial requirements for the management of special accounts
- the Commonwealth's financial management policies.

All staff holding financial delegations, including senior executives, are required to complete regular compliance assessments.

During the 2010–11 financial period, MDBA identified 71 items of non-compliance. Regardless of this, a review of compliance results indicated that the majority of matters did not entail significant risk.

Secretariat services

During 2010–11 the Secretariat Team provided quality secretariat support to more than 57 meetings of MDBA, the Murray–Darling Basin Ministerial Council, the Basin Officials Committee, the Basin Community Committee and various high-level committees and subcommittees.

This encompassed the provision of logistical, operational and technical support to ensure productive, well-governed meetings, and covered activities including input and quality control for the formation of agendas, meeting papers, minutes, decision registers and reports for each committee, timely dissemination of committee papers and responses to out-of-session requests.

The Secretariat also processed claims and entitlements for committee chairs and individual members and ensured each committee member was aware of their obligations and responsibilities under legislation and Commonwealth guidelines.

Appendix A (p. 256) provides a summary of the governance bodies' meetings and participation.

MDBA TEAM SNAPSHOT

Secretariat Team

As members of the Secretariat Team, we are proud to provide a high level of service and advice to all stakeholders within MDBA, state agencies and regional community committees.

Together we build and nurture strong relationships across this wide range of stakeholders, which enables us to coordinate agendas and provide logistical, operational and procedural support for the more than 57 meetings held each year for the Murray–Darling Basin Ministerial Council, six-member Murray–Darling Basin Authority, Basin Officials Committee, Basin Community Committee and other high-level committees.

Because of the nature of our work, we are given an overview of MDBA operations rather than being focused on one specialised area, and we're often at the forefront of important information and decisions. Each of us finds it rewarding to be involved in a project of the magnitude and significance of the draft Basin Plan, and to watch the planning process evolve at a high level while still being linked through our activities to on-ground matters and issues.

Our team shares a great camaraderie, and as individuals each of us appreciates our supportive working relationships with committed and professional staff.

External scrutiny

Auditor-General reports

In addition to the annual financial compliance audit, the Australian National Audit Office (ANAO) undertook a performance audit of MDBA relating to confidentiality-in-government contracts against the requirements of the Senate Order for Departmental and Agency Contracts (June 2001).

The MDBA also actively reviews all cross-agency reports issued by the Auditor-General, including any better-practice statements or guides. Where these reports are assessed as having relevance to MDBA operations, we evaluate our policies and/or procedures with a view to possibly implementing report recommendations.

The Audit Committee also oversees any implementation of these recommendations (see p. 165).

Commonwealth Ombudsman

The Commonwealth Ombudsman made no formal reports relating to MDBA during 2010–11.

Parliamentary committees

Three parliamentary inquiries held during 2010–11 related to the Murray–Darling Basin and MDBA's role and functions.

The House of Representatives Standing Committee on Regional Australia inquiry into the impact of the Murray–Darling Basin Plan in Regional Australia, which reported on 2 June 2011, inquired into the socioeconomic impact of MDBA's *Guide to the proposed Basin Plan* on regional communities.

In its report, the committee found that while the many people in regional communities acknowledged that some water should be returned to the environment, this needed to be achieved without the pain many believed would result from the proposed plan described in the Guide.

The Senate Legal and Constitutional Affairs References Committee inquiry into the provisions of the Water Act, which reported on 10 June 2011, considered the legislation with particular reference to the direction it provides for developing a Basin plan, including an equally weighted consideration of economic, social and environmental factors and the differences in legal interpretations of the Act.

The committee made 21 recommendations in its report that relate to the Murray–Darling Basin, the Guide itself, community engagement, water purchase and investment in infrastructure, and delivering the draft Basin Plan.

As it finalises the draft Basin Plan for release for consultation in mid-November 2011, MDBA is considering those report recommendation that fall within its remit.

The Senate Standing Committee on Rural Affairs and Transport References Committee inquiry into the management of the Murray–Darling Basin is underway and expected to report to parliament on 30 November 2011.

Judicial decisions and decisions of administrative tribunals

No judicial decisions or decisions of administrative tribunals relating to MDBA were made during 2010–11.

Privacy

The MDBA policy on privacy is available on the agency intranet, Billabong. We treat personal information in accordance with the *Privacy Act 1988* (Cwlth), including its information privacy principles.

During 2010–11, MDBA registered with the Office of the Australian Information Commissioner as a partner in Privacy Awareness Week 2011, which ran from 2 to 5 May 2011.

The slogan of this year's Privacy Awareness Week was 'It's all about you', and the week's theme was the need to educate people about protecting their own or other people's personal information for which they may be responsible as part of their job.

Legal services

The MDBA's legal services are provided primarily through an in-house legal team, although we also use legal services provided by a legal panel established by the Department of Sustainability, Environment, Water, Population and Communities.

During 2010–11 internal demand for legal services continued to be associated with preparing the draft Basin Plan. The legal panel of the Department of Sustainability, Environment, Water, Population and Communities helped us to satisfy that demand efficiently, while the Australian Government Solicitor was engaged to assist us with drafting services.

Important MDBA initiatives relating to legal services during 2010–11 included:

- contributing to development of possible amendments to the Water Act, the Murray–Darling Basin Agreement and aspects of the Water Regulations 2008 that relate to MDBA
- providing high-level legal services as part of developing the draft Basin Plan
- preparing schedules for water sharing and storage rights required by the Murray–Darling Basin Agreement
- reviewing MDBA contract and procurement templates
- assisting with implementation of Creative Commons licensing
- providing training to MDBA staff regarding legislative obligations and compliance requirements

- providing advice to all MDBA divisions about program delivery and legislative obligations
- continuing to implement business management systems for obtaining legal services from both internal and external legal service providers to ensure compliance with the *Legal Services Directions 2005*.

Freedom of information

During 2010–11, MDBA received 23 freedom of information requests.

The *Freedom of Information Act 1982* (Cwlth) gives individuals the right to view documents held by Australian Government ministers and agencies, with some exceptions. Section 8 of this Act requires MDBA to report on:

- our organisation and functions (for more information, see p. 27)
- the types of documents MDBA holds (see below)
- arrangements for outside participation (see below)
- MDBA freedom of information procedures, facilities and contact details (see 'How to lodge a freedom of information request').

In November 2010, the Information Commissioner announced a number of reforms that introduced fundamental changes to the way information held by government is managed and accessed by members of the public.

As part of these reforms, from 1 May 2011, all agencies must publish an information publication scheme (IPS) plan and a disclosure log on their websites. The MDBA has complied with both these requirements, and our information publication scheme plan and disclosure log are available on our website, <www.mdba.gov.au>.

The MDBA information publication scheme will show what information we propose to publish (referred to as the 'IPS information holdings'), how and for whom the information will be published, and how we will otherwise comply with IPS requirements (Freedom of Information Act s. 8(1)).

The MDBA disclosure log will summarise documents MDBA has released in response to a freedom of information request.

Documents we hold

The MDBA holds the following types of documents:

- representations to the Commonwealth Minister for Water on various aspects of government activity
- working files, including correspondence, analysis and advice
- internal administrative records, such as personnel files, staffing and financial records and office procedures

- submissions and comments from the public and stakeholders
- papers relating to new and amending legislation, drafting instructions and draft legislation
- briefing papers and submissions prepared for the Commonwealth Minister for Water
- documents relating to meetings and committees (such as agendas, minutes and reports)
- copies of questions asked in parliament, together with related replies
- tender documents
- government (including agency) policy statements, communiqués, guidelines and media releases
- contracts
- educational materials
- reports on research, water audits and MDBA activities.

How to lodge a freedom of information request

If you want to view one or more documents, you must send MDBA a request in writing — by mail, fax or email. You will need to provide an address in Australia to which we can send notices under the Freedom of Information Act, and you will also need to include:

- as much detail as possible about the document(s) you want to access
- a phone number in case we need to clarify your request.

If your request is approved, you will be provided either with a copy of the document(s) or the opportunity to inspect them at MDBA's Canberra office.

Address: Level 4, 51 Allara Street, Canberra, Australian Capital Territory

Please note that charges may apply.

More information

For more information, contact MDBA's Freedom of Information Coordinator in one of the following ways:

Mail: FOI Coordinator Murray–Darling Basin Authority GPO Box 1801 Canberra ACT 2601	Email: foi@mdba.gov.au Phone: (02) 6279 0670 Fax: 02) 6248 8053

Arrangements for outside participation

The MDBA consults with members of the public and bodies outside the Australian Government's administration when developing its policy and programs and administering legislation. As well as general public consultation, MDBA receives advice from various committees and other bodies.

Generally, people can participate by making oral or written representations to MDBA. Several formal arrangements under the Water Act provide for input from Basin states, other bodies and members of the public.

Following the release of the *Guide to the proposed Basin Plan*, MDBA received over 3,000 submissions from individuals, organisations and groups across the Basin and throughout Australia.

We received permission to publish approximately 800 of the feedback items, which are now available on MDBA's website, <www.mdba.gov.au>.

Directions under section 175 of the Water Act

No directions were given by the Commonwealth Minister for Water under s. 175 of the Water Act.

Advice to government

The MDBA advises the Commonwealth Minister for Water through briefings and uses the ministerial workflow system of the Department of Sustainability, Environment, Water, Population and Communities to ensure the minister receives timely advice. Table 4.1 sets out the volume of advice provided to the minister during 2010–11 compared to the previous year.

Table 4.1 Volume of ministerial advice, 2010–11

Type of advice	2009–10	2010–11
Ministerial correspondence	21	6
Briefs	87	34
Question time briefs	6	10
Senate Estimates questions on notice	27	45

Our people

Main activities

- Implemented the Strategic Workforce Plan, which included developing leadership and coaching programs.
- Developed the electronic Performance Management and Development Scheme (ePMDS).
- Delivered selection advisory committee training to 161 employees.
- Reduced recruitment turnaround times to an average of 45 days.
- Negotiated a new enterprise agreement.
- Expanded our graduate recruitment program, and began our first cadetship program and our involvement in all entry-level Australian Public Service pathways programs.
- Implemented a workplace diversity program that includes an Indigenous employment strategy and the MDBA Disability Action Plan.
- Complied to a high degree with occupational health and safety requirements, as demonstrated by an external OH&S audit.

Learning and development

The MDBA is committed to the continuous development of its employees.

Apart from providing ongoing refresher courses in a range of core Australian Public Service competencies (e.g. fraud awareness and occupational health and safety), we also fund training for public sector skills ranging from minute-taking to leading small teams, to developing or improving negotiation and facilitation skills.

The MDBA also supports employees who undertake tertiary studies — during 2010–11, 22 staff members undertook approved study, including three who were working on doctorates and two who were studying to become certified practising accountants.

During 2010–11 our strong focus on developing our staff was demonstrated in particular by three training and development programs: an internal seminar series, an employee coaching service and a leadership program for senior executive service (SES) and executive level (EL) 2 staff in the Basin Plan Division.

The Human Resources Team — left to right: Lisa Boljkovac, Anna McKinnon, Petra Downs, Scott Kneebone, Jess Weston, Sharyn Nelson (Assistant Director), Katiuscia Mojsovski, Lorraine Welling (Director)

Internal seminar series

Over 30 seminars were held during the year and were attended by around 8% of available staff on any one day. The seminars were designed to help MDBA achieve its business outcomes by supporting a unified direction and consistent approach to scientific and other matters related to the Murray–Darling Basin and its resources.

External seminar presenters came from Australian and international organisations involved in policy, environmental or technical subject matters aligned with MDBA's business, while MDBA presenters focused on program achievements, specialist knowledge, updates of corporate information and conference reports.

These seminars proved to be an excellent forum for teams and individuals to hear from external and internal professionals on a range of MDBA business issues, to learn new information, build networks across the organisation and discuss work outcomes. Topics covered in 2010–11 included:

- aerial surveys of The Living Murray icon sites, Eastern Australian Waterbird Survey and the national waterbird survey
- determination of water regimes to protect floodplains under hyper-drought conditions
- adaptive management of variable releases from Dartmouth Dam to enhance the environmental outcomes of river operations
- alpine stream ecology and the potential impact of climate change
- blue-green algal (cyanobacteria) blooms in the River Murray System.

Coaching program

The employee coaching program gives MDBA staff the opportunity to select an experienced coach to provide extra impetus and guidance to achieve specific development goals. Initially directed at SES staff and directors, the program was so well received that it has been expanded to include all employees. The MDBA has also established a coaching services panel, to increase the number of coaches available to our staff.

Leadership program

The leadership program consisted of a series of intensive workshops designed to hone the leadership skills of Basin Plan Division leaders in the lead-up to further consultation with the Basin states, industry and the public on the future of the Murray–Darling Basin.

Future directions in learning and development

The MDBA has several learning and development initiatives lined up for the 2011–12 financial year, including:

- a leadership development program for all our executive-level employees
- the possible establishment of a learning and development panel
- the creation of an MDBA skills map that will enable us to develop a more finely differentiated approach to employees' learning and development.

Performance management

The Performance Management and Development Scheme is a pivotal tool for MDBA in informing our workforce plans and training needs. During 2010–11 we redeveloped our paper-based PMDS; the new ePMDS, which will be implemented in 2011–12, will better integrate the PMDS with our workforce and training plans and will enable us to:

- meet our legislative requirements

- provide a direct link between an employee's role and the Portfolio Budget Statements using our corporate and business plans
- assist an employee's career development
- make salary progression equitable
- identify agency skills gaps
- better inform our workforce plans
- improve participation and adherence to the ePMDS through enhanced monitoring and reporting.

This increased capability will enable us to further improve our workforce productivity by strategically investing in our employees.

MDBA TEAM SNAPSHOT

Human Resources Team

Members of the Human Resources Team have had an exciting and challenging year in 2010–11. As a team, we are proud of the high level of service we provide to MDBA employees and executive. We are committed to providing strategic and operational human resource support in a professional manner, and we work closely with our managers and employees to resolve issues and to identify opportunities for innovative solutions.

Although MDBA is a small agency, its diverse workforce has a broad range of roles, responsibilities, experience and personalities. This means that every day we are faced with wideranging human resource challenges and demands.

Although relatively small, our team is cohesive and professional, but we are a dynamic group of individuals with diverse skills and experience. We support each other in carrying out responsibilities ranging from listening to staff discuss their issues to resolving personnel matters and implementing strategic policy outcomes.

Each of us enjoys working in MDBA, an agency that enables us, as human resource specialist staff, to have a more direct influence on the direction of human resource management.

Our workforce

Workforce planning

The MDBA's first Workforce Strategic Plan was approved by the Chief Executive in November 2010. Since then, our key focus has been on implementing the plan's strategic actions, which are directed at six priority areas — building a dynamic and flexible workforce with a 'one organisation' culture, strengthening leadership, widening and deepening our skill base, securing our workforce, improving how we manage change and reviewing our classification profile.

Over the past year, we:

- reviewed our recruitment strategy; as part of this, we developed an MDBA value proposition and applicant information kit and delivered selection advisory committee training to over 161 employees
- reviewed our capability framework and finalised work level standards for all classifications
- reviewed our learning and development program
- developed a workplace diversity program, an Indigenous employment strategy and a disability strategy and action plan
- developed a rewards and recognition program and a change management framework
- significantly redeveloped our Performance Management and Development Scheme for release in 2011–12
- expanded our graduate program from six graduates in 2010 to eight in 2011
- implemented our cadetship program.

Australia Day achievement awards

The MDBA recognises that building a culture that values its employees and recognises and rewards outstanding performance is critical in attracting and retaining the best people because it improves job satisfaction and increases staff motivation and productivity.

In 2010 we created a rewards and recognition program that enables us to recognise exceptional performance and achievement by staff on an individual or group basis. The program also helps to promote a culture where managers provide continual informal communication, feedback and recognition of employee performance. The Australia Day Achievement Awards are a key component of the program.

Seventeen nominations were received for the 2011 awards — nine individual nominations and eight team nominations. Individual recipients were Sarah Clark, Jim Donaldson and Ian Burns, all of whom are from the Basin Plan Division. Two teams received awards: River Murray Division's Environmental Works and Measures Program Team (Ben Dyer, Michael Jones, Paul Sureda, Heather Peachey and Jack Smart); and Corporate Services Division's Risk Management and Occupational Health and Safety Team (Laura Fulton and Donna Ironfield).

Determining senior executive service employee remuneration

The MDBA had 11 ongoing and one non-ongoing senior executive service employees at 30 June 2011. Rates of pay for SES employees are set by Chief Executive after consultation with the employee and in accordance with MDBA's SES remuneration policy.

Two SES employees who transitioned from the Murray–Darling Basin Commission are covered by individual employment contracts novated to MDBA. The remuneration package for all other SES employees is provided through a 24(1) Determination.

The salary package offered to an SES employee may include a vehicle allowance and a car-parking space.

Performance pay

Senior executive service and non-SES MDBA employees are not eligible for performance pay.

However, a non-SES employee at the top increment point in their salary range may be eligible for a one-off bonus as a result of a superior performance rating.

Individual non-senior executive service terms and conditions

Where appropriate, special terms and conditions of employment are currently provided to non-SES employees through:

- individual employment contracts (for six non-SES employees who transitioned from the Murray–Darling Basin Commission)
- individual flexibility agreements (for 10 non-SES employees).

Enterprise agreement

The current enterprise agreement, covering all non-SES employees, came into effect on 21 October 2009 and had a nominal expiry date of 30 June 2011.

An enterprise bargaining team comprising management representatives, seven nominated MDBA employee representatives and representatives from the Association of Professional Engineers, Scientists and Managers, the Community and Public Sector Union and the Media, Entertainment and Arts Alliance negotiated a new MDBA enterprise agreement in 2010–11. The new 2011–14 enterprise agreement was subsequently approved by Fair Work Australia on 17 August and came into effect on 24 August 2011.

The new agreement has been negotiated under the *Fair Work Act 2009* and the Australian Government Bargaining Framework that came into effect in January 2011.

Staffing profile

The tables on the following pages provide statistics on MDBA staffing in 2010–11.

Table 4.2 MDBA staff by employment agreement as at 30 June 2011

Category	Number of staff
Enterprise agreement	284
Non-SES individual flexibility agreements	10
Non-SES individual employment contracts	6
SES	
Individual s. 24(1) determinations	9
Individual employment contracts	3
Acting Chief Executive	1
Chief Executive	1
Total	**314**

Note: the Chair and the other four part-time members of the Authority are not included. The Chief Executive, Mr Rob Freeman, is on leave until 30 September 2011.

Table 4.3 Salary range for MDBA employees as at 30 June 2011

Classification	Salary range
Australian Public Service 1 (APS 1)	$39,636 – $43,137
APS 2	$45,641 – $49,670
APS 3	$52,493 – $57,028
APS 4	$58,625 – $63,688
APS 5	$65,824 – $72,444
APS 6	$74,793 – $82,318
Executive level 1 (EL 1)	$89,571 – $98,539
EL 2	$104,194 – $122,796
Senior executive service 1 (SES 1)	$144,244 – $193,314
SES 2	$204,755 – $242,112

Table 4.4 Salary range for MDBA employees (non-SES employees on individual flexibility arrangements and non-SES individual employment contracts) as at 30 June 2011

Classification	Salary range
Individual flexibility arrangements	
EL 1	$98,632 – $107,159
EL 2	$123,900 – $134,225
Non-SES individual employment contracts	
EL 2	$103,531 – $155,193

Table 4.5 MDBA staff by job classification and gender as at 30 June 2011

Classification	Gender	Subtotal	Total
APS 1	Female	3	3
	Male	0	
APS 2	Female	0	0
	Male	0	
APS 3	Female	7	11
	Male	4	
APS 4	Female	20	23
	Male	3	
APS 5	Female	34	46
	Male	12	
APS 6	Female	45	75
	Male	30	

Continued/...

Classification	Gender	Subtotal	Total
EL 1	Female Male	42 50	92
EL 2	Female Male	10 40	50
SES	Female Male	4 8	12
Acting Chief Executive	Female	1	1
Chief Executive	Male	1	1
Total			**314**

Note: the Chair and the other four part-time members of the Authority are not included.

Table 4.6 Age profile of MDBA staff as at 30 June 2011

Age	Ongoing	Non-ongoing	Total
Under 25 years	4	5	9
25–34 years	74	17	91
35–44 years	76	13	89
45–54 years	66	10	76
55–64 years	38	6	44
65 +	2	3	5
Total	**260**	**54**	**314**

Table 4.7 MDBA staff by equal employment opportunity group as at 30 June 2011

By group	Ongoing	Non-ongoing	Total	Percentage	Percentage of staff volunteering personal data
Female	129	37	166	53	100
Non–English speaking background	29	9	38	12	97
Indigenous Australians	1	0	1	0.34	96.60
People with a disability	5	1	6	2	95

Recruitment

The MDBA continued to focus on recruitment activity during 2010–11, with 138 positions advertised compared to 79 in 2009–10. Of the 138 recruitment processes, 108 were external and attracted 1,962 applications.

During 2010–11 we introduced a 'rolling recruitment' strategy designed to attract job candidates with technical knowledge and skills. This approach, where a merit selection assessment is carried out when an application is received rather than after waiting for a final comparative assessment, was used successfully when we identified a need for multiple recruitment activities within a constrained time limit.

In late 2010, we ran a bulk recruitment round for APS 5 and APS 6 officers. The recruitment round attracted over 90 applications and to date we have employed 10 people from the merit list.

We undertook a comprehensive recruitment and selection training program for selection advisory committee members. To date, 161 employees have attended the training; their feedback and evaluation of the program has been positive, and the program will continue during 2011–12.

We have refined online short-listing and application assessment processes, improving efficiency and enabling a shorter turnaround from closing date to offers of employment. In 2008–09, our average turnaround for MDBA recruitment processes (from date of advertising to offer accepted) was 90.25 days, compared to 61.75 days in 2010–11. Over the past 12 months, the process time has remained steady; however, during the past six months, the turnaround was reduced to 45 days, our target turnaround time.

We introduced an online induction program late in the year, which has received positive feedback. This program ensures that every new employee has a structured, blended induction that gives them clear and consistent information about MDBA and our workplace. The program can be partially completed before an employee's first day at MDBA, which enables new employees to very quickly become familiar with MDBA and our workplace. Employees work through the program at their own pace, while their understanding of their new workplace is interactively tested and confirmed at the end of each training module.

Graduate program

The MDBA graduate program began in 2009–10 when six graduates were recruited to the agency. Feedback from these graduates and their evaluation of the program demonstrated a high level of satisfaction.

Recognising how important the program was in increasing the diversity and talent depth of our workforce, in 2010–11 we expanded the program to eight graduates, who have a range of academic backgrounds and interests.

Graduates complete placements in three different MDBA areas and undertake a comprehensive development program — the Small Agencies Graduate Development Program — through the Australian Public Service Commission. This training is designed to equip graduates with the skills and knowledge they will need to make a meaningful contribution to MDBA and the APS. Graduates also participate in a mentoring program and receive additional training sourced from various professional bodies and training providers.

The 2012 graduate recruitment process was conducted in late June 2011 and attracted 294 applications. Following an extensive assessment and short-listing process, eight graduates will take up their new appointments in January 2012.

Cadet and trainee programs

One key action of our Workforce Strategic Plan 2010–14 was to develop and implement a cadetship program to strengthen our APS 1 to APS 4 classification profile.

The cadet program commenced during 2010–11, with advertising at local Australian Capital Territory universities attracting 11 candidates for two positions. Following assessment, two cadetships were offered and the cadets began work with MDBA in July 2011.

The MDBA is actively involved in all entry-level APS pathways programs and we are committed to recruiting two candidates each year from each pathways program. To date, we have not been successful in attracting suitable candidates.

Employee survey

An MDBA employee survey was undertaken in August 2010, in which we sought employee views about a wide range of workplace issues.

In response to the survey findings, we developed an action plan to address emerging issues such as internal communication, professional development, performance management, workplace consultation, business processes and change management.

Diversity

The MDBA is committed to embracing the principles of equity and diversity. In October 2010 we introduced a workplace diversity program and an Indigenous employment strategy.

The Workplace Diversity Program has three objectives:

- increasing awareness and acceptance of workplace diversity principles among our employees
- fostering diversity in MDBA and using the diverse skills, experiences and cultural backgrounds of our employees
- ensuring we have in place flexible workplace practices to allow employees to balance their work and personal lives.

Our Indigenous employment strategy outlines our commitment to Indigenous employees — particularly to their recruitment, capability development and career advancement — and to increasing the number of Indigenous employees in our workforce.

During 2010–11, MDBA participated in two centralised recruitment programs run by the Australian Public Service Commission — the Indigenous Graduate Program and Indigenous Cadetship Program — with a view to improving Indigenous Australian representation in MDBA. Unfortunately, no Indigenous graduates or cadets were recruited during the year, but we will continue to participate in these programs in 2011–12.

For the breakdown of Indigenous Australian staff numbers in MDBA, see Table 4.7, 'MDBA staff by equal employment opportunity group', on p. 185.

The MDBA works in partnership with 31 Indigenous nations throughout the Murray–Darling Basin. During 2011–12, we will build on our relationships with Indigenous nations and will further our successes and aspirations by developing a reconciliation action plan. We have already begun this process by asking representatives of the 31 Indigenous nations to participate in the steering group that will drive the content and implementation of the reconciliation action plan.

For more information about our partnerships with Indigenous peoples, please refer to Indigenous engagement (p. 75), which details our relationship with the Murray Lower Darling Rivers Indigenous Nations and the Northern Murray–Darling Basin Aboriginal Nations groups, and also to 'Access and equity', on p. 204.

Disability strategy

The MDBA has developed a disability strategy and action plan to identify strategies and implement measures to assist people with disability so they are able to access our programs, policies and information. Where possible and appropriate, we will focus on objectives established by the Management Advisory Committee report, *Employment of people with disability in the APS,* and will integrate Commonwealth Disability Strategy principles in our corporate processes.

Our Disability Action Plan outlines strategies that will give effect to five broad principles — equity, inclusion, participation, access and accountability. Using these principles will, for example, result in the inclusion of people with disability in consultations about new or revised policy or program proposals.

To date, outcomes of this strategy include ensuring that people with disability can access public information through different formats on MDBA's website and that documents, general information and policy information are available in formats suitable for their needs; recruitment information and application lodgement process are available in various formats; and assistive furniture is purchased to meet employees' specific requirements.

Our Disability Action Plan strategies are supported by performance measures to improve transparency and accountability.

Occupational health and safety

Executive commitment, OH&S structure and oversight

The MDBA acknowledges and recognises our obligations under the *Occupational Health and Safety Act 1991* (Cwlth) and related regulations, codes and standards. Responsibility for workplace health and safety is shared by all MDBA managers; under the Occupational Health and Safety Act, employees are also responsible for maintaining a safe and healthy workplace.

All parties to MDBA's enterprise agreement 2009–11 are committed to the safe operation of all equipment, safe working practices and a healthy work environment for all employees under applicable occupational health and safety obligations. Dispute settlement procedures are consistent with the enterprise agreement, subject to s. 24 of the Occupational Health and Safety Act.

Under the Occupational Health and Safety Act, we developed Health and Safety Management Arrangements (HSMAs) that set out how occupational health and safety is managed within MDBA. Following these arrangements is one way we can demonstrate our commitment to meeting our duty of care under the Act.

Approved in June 2010, the arrangements will be reviewed during 2011–12 to take into account proposed new work health and safety legislation and codes expected to come into effect on 1 January 2012.

In consultation with our employees, we have also developed occupational health and safety policies, procedures and guidelines. These are available on MDBA's intranet, Billabong, along with the HSMAs.

Responsibility for OH&S coordination, administration and policy and procedures lies with the People, Planning and Performance section in MDBA's Corporate Services Division. The Occupational Health and Safety Committee is a forum for employees to participate in the management of OH&S issues.

We manage OH&S risks using the Occupational Health and Safety Code of Practice 2008 along with *AS/NZ ISO 31000, Risk management—Principles and guidelines*. The MDBA risk management guidelines contain a section on OH&S hazard and risk management and specific provisions relating to our HSMAs.

An independent audit of MDBA's OH&S arrangements was finalised early in 2010–11. This audit examined our compliance with relevant legislation, regulations, the code of practice and relevant standards, and determined possible improvements we could make to these. We scored 95% in compliance and only two recommendations were made — specific training for managers and the inclusion of OH&S requirements in procurement — and these were implemented during the year.

The proposed work health and safety legislation and codes expected to be implemented on 1 January 2012 will have significant ramifications for MDBA, its executives and workers. Implementing these new requirements will be a significant focus for MDBA, particularly for the Occupational Health and Safety Committee, in 2011–12.

Effective communication and consultation

All MDBA managers are responsible for consulting and cooperating with employees on workplace health and safety.

Occupational health and safety awareness, training and communication are undertaken through:

- using email, intranet, posters, signage and other means as required
- including occupational health and safety in induction courses and as an optional item in compulsory training under the Performance Management and Development Scheme
- conducting information sessions for managers, supervisors, unions and employees
- having an established dispute resolution procedure under the enterprise agreement
- using appropriate forums, in particular the Occupational Health and Safety Committee, to consider occupational health and safety issues.

The Occupational Health and Safety Committee is consulted before new OH&S policies, guidelines or procedures are implemented or existing arrangements are changed. The committee may also consider workplace relations issues relating to OH&S, protective security, accommodation and amenities.

Initiatives ensuring the health, safety and welfare at work of employees and contractors

To actively promote the health, safety and welfare at work of employees and contractors, during 2010–11, MDBA:

- undertook comprehensive inspections of all its designated work group workplaces in conjunction with responsible managers
- offered influenza vaccinations to all employees
- developed safety posters for the workplace
- offered health checks to all employees
- provided information sessions on managing energy, stress and personal health
- provided guided relaxation classes to all employees
- developed and reviewed internal policies and procedures, to ensure currency and to address any new or emerging hazards
- offered workstation assessments to all employees

- provided a comprehensive OH&S induction to all new employees
- promoted the use of the Employee Assistance Program
- placed a high priority on early intervention, encouraging staff to report any symptoms early to prevent the development of chronic injury or illness
- reviewed and regularly updated OH&S information on the agency intranet accessible by all staff
- continued our commitment to recognising, respecting and valuing the importance of individual differences in the workplace, and fostering an inclusive work environment free from discrimination and harassment by establishing a network of specialist volunteer harassment contact officers
- supported paid training for harassment contact officers, first aid officers, health and safety representatives, emergency wardens and staff involved in OH&S and rehabilitation management.

Health and safety outcomes achieved as a result of initiatives

During 2010–11, almost all issues identified in MDBA workplace inspections were rectified. We took a proactive approach to OH&S and sought to ensure that workstation assessments were provided to employees when requested. Workplace inspections in both designated work groups and walk-arounds of new accommodation by trained health and safety representatives and occupational therapists provided comprehensive understanding and follow-up of existing and emerging OH&S issues. Eighty-three workstations were assessed and, where appropriate, equipment was provided to help reduce the incidence of illness, injury and costs, and to increase productivity.

All employees involved in OH&S-related activities received appropriate training, with general OH&S training provided and taken up by approximately 20% of our employees.

We also provided specific OH&S briefings to senior managers to ensure they are aware of their responsibilities and issues, including the new work health and safety legislation to be introduced in 2012.

An independent OH&S audit showed that MDBA's compliance with OH&S requirements is not only very high but is also well above the average OH&S compliance of Australian government agencies. This result reflects MDBA's comprehensive OH&S policy framework, training and staffing of safety-related positions and our proactive approach to OH&S.

Lost time caused by incident and injury not reported to Comcare was 10.5 staff days. Lost time caused by incident and injury reported to Comcare was four staff days; however, no incident reported to Comcare resulted in serious injury-lost time of a week or more. Two incidents reported to Comcare during the year equated to a rate of 6.6 incidents per 1,000 employees. Lost time because of rehabilitation cases was 91 staff days, or 42.9 weeks, per 1,000 full-time equivalent employees.

Comcare did not conduct any investigations or issue any notices to MDBA under the Occupational Health and Safety Act during 2010–11. Throughout the year, 24 internal reports on workplace hazards and incidents were made.

Comcare premiums

During 2010–11 MDBA had a total of seven claims with Comcare, with a total cost of $10,999. The average cost of claims was $1,571 and claim frequency was $389 per $1 million-payroll. In 2010–11, the Comcare premium was $304,367, the rate having declined to 1.02% from 1.04% in 2009–10.

Accident and dangerous occurrence statistics

Section 68 of the Occupational Health and Safety Act requires certain incidents to be notified to Comcare within specific timeframes. The following table details MDBA incidents notified in 2010–11.

Table 4.8 MDBA incidents notified to Comcare, 2010–11

Notice type	2010–11
Death	0
Serious personal injury	2
Dangerous occurrence	0
Incapacity >30 working days/shifts	0

Our planning and finances

Main activities

- Further refined key policies, guidance and business processes, incorporating recent amendments to the *Financial Management and Accountability Act 1997* (Cwlth) and its associated regulations.
- Continued enhancement of electronic reporting systems, including web-based Certificate of Compliance data collection and reporting to increase efficiencies in operations.
- Began a review of key conceptual frameworks (e.g. budgetary control) to further strengthen financial management and accountabilities.
- Undertook a strategic review of jointly funded Natural Resource Management and River Murray programs to determine and recommend improvements to governance and operational requirements.

Business planning

The Murray–Darling Basin Authority (MDBA) corporate plan is our official business planning document, which sets out our objectives, planned activities and budget for four financial years. The corporate plan is provided to the Minister for Sustainability, Environment, Water, Population and Communities each year, and comprises:

- details about MDBA functions described in s. 172 of the *Water Act 2007* (Cwlth) (including Basin Plan functions) approved by the Authority
- details on Murray–Darling Basin Agreement functions approved by the Murray–Darling Basin Ministerial Council.

The MDBA corporate plan and budget for the 2011–12 to 2014–15 financial years were approved by the Authority and Ministerial Council in May 2011.

During 2010–11, we undertook a strategic programs review, under the direction of the Basin Officials Committee, in which we comprehensively assessed current investments in jointly funded Natural Resource Management and River Murray programs and recommended future priorities.

The review also examined the operation of the joint program 'model' to assess and recommend improvements to governance, transparency, program efficiency and effectiveness and cost-sharing arrangements. In response to review recommendations, in 2011–12 we will clarify and set in place an agreed strategic direction consistent with the objectives and aspirations of joint funding partners and Basin Plan directions. This will both improve the operation of the joint programs and strengthen their capacity to deliver desired results by implementing agreed program management standards.

Performance reporting

Performance reporting during 2010–11 included:

- monthly financial reporting provided to MDBA Executive
- quarterly workforce statistics and project management reports provided to Executive, with monthly reports provided to business managers
- quarterly financial and non-financial performance against MDBA's corporate plan provided to the Basin Officials Committee
- quarterly reports provided to the Audit Committee on implementation of the risk management, fraud control, business continuity and disaster recovery plans, and internal and external audit reports.

During 2011–12, MDBA will modify its financial and non-financial performance reporting system to introduce improvements recommended by the Strategic Programs Review. These improvements include, but are not limited to:

- improving the design of performance measures so they are clearer in relation to strategic direction of the joint programs and the Basin Plan
- improving the design of performance reports so they provide more concise financial and performance outcomes, which will enhance decision making.

Project management framework

During 2010–11, staff mentoring and training supported the management of over 70 minor and major projects. During the year we mainly focused on implementing recommendations made following the 2009–10 post-implementation review of the project management framework. This saw the framework being enhanced by:

- improved categorisation and processes relating to projects, programs and jurisdictional project coordination
- renewed focus on basic project management skills training for project staff
- increasingly customised data capture, reporting and workflow capabilities according to project type, in line with executive requirements and user needs.

Financial management

We continued to enhance MDBA's reporting, monitoring and evaluation systems, as part of our commitment to driving improved information, management and efficiencies and maintaining a robust internal control framework.

During 2010–11, we focused on the comprehensive review and amendment of the Chief Executive's Instructions to incorporate amendments to the Financial Management and Accountability Act, financial regulations and the Minister for Finance and Deregulation's requirement for agencies to update their Chief Executive's Instructions by 1 July 2011.

To do so, we 'streamlined' the original Chief Executive's Instructions and removed the practical guides and procedures from the main body of the instructions, making them stand-alone documents. We also updated the instruments of delegations as part of this process.

The new structure will improve understanding among staff about financial management requirements and standards.

While adhering to the Department of Finance and Deregulation's financial framework, MDBA also sought, wherever possible, to implement better practice, having close regard to the various reporting and other announcements by the Australian National Audit Office.

Aside from ongoing investment in various business applications, our focus in 2011–12 will be on investing in our employees' skills to ensure our Executive, managers and other staff members continue to meet the stringent financial management requirements expected of them.

Financial performance

Revenues

The MDBA received $75.7 million in Appropriations from the Australian Government during 2010–11.

This sum included $38.2 million for Basin Plan functions and $18.3 million in contributions to the Murray–Darling Basin Agreement functions. Other revenues included $15.8 million in interest revenues from funds held in MDBA's Special Account (see also 'Funding', Chief Finance Officer's report, on p. 21).

A further appropriation of $3.3 million was received for continuation of the Hume Dam improvement program along with $10 million in additional funding from Basin jurisdictions going towards the total estimated cost for this project of $40 million.

Expenditures

The MDBA's total expenditure for 2010–11 was $218.7 million, including contributions to external parties for water recovery measures of $2.2 million ($72.4 million in 2009–10). The net cost of services, excluding revenue from government and share in joint venture operating results, was $117 million, while total expenses were $116.2 million below the approved budget. Table 4.9 outlines the main features of our financial performance in 2010–11.

Table 4.9 MDBA financial performance, 2010–11

Murray–Darling Basin Authority		2009–10 Actuals $'000	2010–11 Actuals $'000	2010–11 Variance $'000
Outcome 1	Revenue	174,911	175,755	844
	Expenses	280,813	218,656	(62,157)
	Surplus/(deficit)	(105,902)	(42,901)	63,001
Total departmental	Revenue	174,911	175,755	844
	Expenses	280,813	218,656	(62,157)
	Surplus/(deficit)	(105,902)	(42,901)	63,001

Financial position

The MDBA's net equity position reduced in 2010–11 by $42.9 million to $182.6 million.

This result was an outcome of the 2010–11 operating deficit of $42.9 million, which was funded from existing cash resources. The operating deficit and reduction in cash resources reflects planned activity to complete Environmental Works and Measures Program projects.

Assets and asset management

The MDBA's financial and non-financial assets at the end of 2010–11 were $221.2 million and $6.5 million, respectively. Financial assets consist of cash and cash equivalents, trade and other receivables. Non-financial assets consist of information communication technology infrastructure and office fit-out and equipment.

Liabilities

Liabilities administered directly by MDBA at the end of 2010–11 amounted to $45 million. Our liabilities mainly consist of amounts owing to suppliers and provisions for employee entitlements.

Total equity

The MDBA ended the year with total equity of $182.6 million (see Table 4.10), consisting mainly of cash resources, minor fixed assets offset by trade and employee liabilities.

Table 4.10 MDBA equity at end of 2010–11

Measurement	2009–10 $ million	2010–11 $ million
Assets	270,790	227,652
Liabilities	45,275	45,038
Total equity	225,515	182,614

Discretionary grant programs

The MDBA did not make any discretionary grants during 2010–11.

Managed assets: joint ventures

The MDBA is the appointed manager for the following classes of assets:

- River Murray Operations assets
- water entitlements under The Living Murray (TLM) program.

The assets are controlled through two unincorporated joint ventures, established to hold jurisdictional assets previously held by the Murray–Darling Basin Commission. The joint ventures were established through two agreements between the partner governments:

- the Asset Agreement for River Murray Operations Assets (RMO joint venture agreement)
- the Further Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray–Darling Basin — Control and Management of Living Murray Assets (LMI joint venture agreement).

At 30 June 2011 the RMO joint venture held net assets of $2.1 billion. The LMI joint venture held net assets of $480.1 million, comprising gross investment in water recovery measures of $653.5 million and an impairment loss of $173.4 million. Under the RMO joint venture agreement each jurisdiction controls its share of the River Murray Operations assets through their representatives on the Murray–Darling Basin Ministerial Council and the Basin Officials Committee. The jurisdictions acknowledge that MDBA manages RMO assets on their behalf.

Under the LMI joint venture agreement TLM assets are controlled jointly by TLM partner governments. These governments acknowledge that TLM assets are not under MDBA control but that we are responsible for managing these assets.

Procurement activities

Purchasing and procurement

The Murray–Darling Basin Authority conducts its procurement in accordance with the *Commonwealth procurement guidelines*.

We follow a devolved procurement framework that places responsibility for procurement with the appropriate financial delegate. To support these delegates, we have established Chief Executive's Instructions for procurement and provide ongoing training to financial delegates. Advice and assistance to line areas conducting procurement are provided by a central procurement and contracts unit that ensures we comply with relevant *Commonwealth procurement guidelines* instructions, policies and procedures. The unit also advises MDBA staff on probity and maintaining standard tender and contract templates.

Performance against core purchasing policies

The MDBA has complied with the mandatory procurement procedures of the *Commonwealth procurement guidelines* throughout 2010–11.

We advertise tender opportunities through the AusTender website, <www.tenders.gov.au>. Documentation, including a facility for tender submission, is also available on our website, <www.mdba.gov.au>.

Our procurement plan for 2011–12 was published on the AusTender site in June 2011 and will be updated as required throughout the coming year.

Reporting

All contracts with a value of $10,000 or more were reported on AusTender in 2010–11.

The MDBA met the requirements to report on the Senate Order on Government Agency Contracts for the calendar year 2010 and the financial year 2010–11.

All contracts with a value of $100,000 or more are listed on our website, at <www.mdba.gov.au/about/tenders>.

We satisfied the requirement to report to the Department of Finance and Deregulation on authorisations to spend public money under Regulation 10 of the Financial Management and Accountability Regulations 1997.

Consultancy services

The MDBA procures consultancy services in accordance with the *Commonwealth procurement guidelines* and the Chief Executive's Instructions. We select consultants using the value-for-money principle.

Expenditure on consultancies during 2010–11

During 2010–11, 71 new consultancy contracts were entered into, involving total actual expenditure of $6.6 million. In addition 39 ongoing consultancy contracts were active during the year, with a total actual expenditure of $3.2 million.

Details of contracts let by MDBA in 2010–11 to the value of $10,000 or more are available on AusTender or from MDBA as a PDF file.

The list of consultancy contracts let in 2010–11 to the value of $100,000 or more is at <www.mdba.gov.au/about/corporate_documents/contact-listings>.

If you cannot access this list, please contact MDBA and we will provide it to you in a suitable alternative format. You can contact us via our website, at <www.mdba.gov.au/contact>, or in the following ways:

Address: Level 4 51 Allara Street Canberra Australian Capital Territory	Mail: Murray–Darling Basin Authority GPO Box 1801 Canberra City ACT 2601	Phone: (02) 6279 0100 Fax: (02) 6248 8053

Information on expenditure on contracts and consultancies is also available on the AusTender website, <www.tenders.gov.au>.

Exempt contracts

During 2010–11, no standing offers or contracts in excess of $10,000 (GST inclusive) were exempted by the Chief Executive from publication on AusTender under the *Freedom of Information Act 1982* (Cwlth).

Access by the Auditor-General

The MDBA's consultancy agreements comply with Australian National Audit Office requirements. The standard long-form consultancy agreement allows for ANAO access; the short-form agreement does not include a specific provision allowing ANAO access, but does provide for an MDBA nominee to conduct audits of those contracts. Other agreements may include a requirement for ANAO access depending on the nature of the services.

Accommodation

The MDBA has two offices in Canberra — our main office at 51 Allara Street, Canberra and a new, smaller office at 40 Allara Street. The new office lease commenced in May 2011 following the expiry of a short-term lease on the ground floor of 51 Allara Street. The combined premises are now able to meet MDBA's longer-term accommodation needs.

Fit-out of the new premises was undertaken during May 2011 and 56 employees relocated to the new premises on the weekend of 11 and 12 June 2011.

Our information and communication resources

Main activities

- Created the Computational Resource Environment — a high-speed, powerful environment for undertaking sophisticated modelling activities.
- Continued standardising software to remove reliance on high-cost/low-use software platforms.
- Continued implementing the Enterprise Information Strategy, a three-year program to upgrade the Murray–Darling Basin Authority's information communication technology infrastructure and software to meet the increased requirements placed on MDBA by the *Water Act 2007* (Cwlth).

Information communication technology

During 2010–11, MDBA's Information and Communications Technology Team mainly focused on continued implementation of the Enterprise Information Strategy endorsed by the Information Management Committee and MDBA Executive in late 2009. The EIS goal is to establish MDBA as the authoritative information service for the Murray–Darling Basin.

The EIS is a three-year program, and in 2010–11 we entered its second year of implementation. The program's projects relate to all aspects of information and security technology, including automated workflows, enterprise-wide search capability, a standardised application development and content management platform, and the introduction of role-based desktop environments to better support the different needs of MDBA users. Our preparatory and planning work has positioned us well for major implementations in the first half of 2011–12.

In 2009–10 we comprehensively reviewed our information communication technology (ICT) governance and processes. Among other matters, this review recommended:

- consolidating ICT operations — this was progressed during 2010–11
- creating an information steward team to strategically develop MDBA information strategies (from a business perspective) — the team was formed late in 2010.

The hydrologic modelling project, originally hosted by CSIRO, was brought in-house in 2010–11. This required the development of the Computational Resource Environment, a high-speed, multi-threaded environment that performs modelling activities to support MDBA business.

We continued to focus on security in 2010–11, by making major improvements to our infrastructure to provide a secure environment, while allowing remote access to staff requiring it.

This increased capacity enabled us to comfortably handle an increase of more than 1,000% in traffic to and the number of downloads from our website.

Records management

During 2010–11, we started to use a new business classification scheme that determines how records are organised within the records management system and enables faster retrieval of documents to support business decisions.

The new scheme is expected to be completed early in 2011–12. We have also begun to prepare for an upgraded version of the TRIM records management software, which will be integrated with Microsoft's Sharepoint software to customise the TRIM user interface to make records management easier for all staff.

In 2010–11 we finalised a records disposal authority setting out requirements for keeping or destroying our core business records; this has been lodged with the National Archives of Australia for consideration and approval.

We also made significant progress in cataloguing legacy records created by the Murray–Darling Basin Commission. This catalogue will establish an electronic record of important documents created and/or held by the commission. This work will be completed early in 2011–12 and will enable us to provide an accurate record of all MDBA business.

Communicating with stakeholders and communities

Main activities

- Published 30 publications, including the *Guide to the proposed Basin Plan*, and was awarded a silver Australasian Reporting Award for the *Murray–Darling Basin Authority annual report 2009–10*.
- Developed a more proactive media strategy than existed before the recent creation of MDBA's Media Unit; the new unit issued 36 press releases in 2010–11.
- Renewed our existing education strategy to provide a suite of education-based products and programs that will serve all MDBA community stakeholders.

Communications and information delivery

Media

The past year was very busy for the newly created Media Unit. We developed and applied a more proactive media strategy, which meant we were better able to align the interests of the organisation with those of the media. Numerous briefings with journalists ensured that they had the most up-to-date and relevant information.

We issued 36 media releases during 2010–11, covering issues such as updates on blackwater events, communiqués from Murray–Darling Basin Ministerial Council meetings and forums, and River Murray operations.

Apart from handling normal media inquiries, media interest generally increased in the lead-up to the release of the *Guide to the proposed Basin Plan*. On the day of the Guide's release, we held a media lock-up that was attended by more than 50 journalists, who represented a range of media types and outlets; they were addressed by the (then) Authority Chair, Mike Taylor, and given copies of the Guide.

Continued interest has kept both the Guide and the draft Basin Plan high on the media's radar.

The media's key areas of interest over the past year were the:

- release of the Guide
- issues around the development of the draft Basin Plan

- resignation of Chair of the Murray–Darling Basin Authority, Mike Taylor
- appointment of the Hon Craig Knowles as new Chair of the Authority
- resignation of MDBA Chief Executive, Rob Freeman, and the appointment of Dr Rhondda Dickson as Acting Chief Executive
- Authority Chair's regional visits.

Much of our media coverage was provided by regional radio, followed by regional print media and television. Authority messages were successfully conveyed through key state-based rural newspapers such as *The Land*, *Stock Journal* and *The Weekly Times*. Online news services continued to grow in extent and influence.

The Media Unit also includes social media, and we have made a concerted effort to upgrade our social media activities, including developing Basin forums and increasing our Twitter and Facebook activity.

Website

The MDBA website, <www.mdba.gov.au>, is one of our key communication vehicles and its design was revamped during the year.

This revamp included commissioning the new Basin Plan Knowledge and Information Directory, which provides stakeholders with easy access to information used to inform development of the draft Basin Plan. The new design also allows us to promote up-to-date news and community engagement-based information on our home page and to provide more direct links from our home page to other documents and web pages, which simplifies navigation for users.

A new portal, at <www.thebasinplan.mdba.gov.au>, was also created to give stakeholders a one-stop web resource to access all draft Basin Plan resources and information. The portal was launched on the same day the Guide was published and received almost 10,000 visits in its first three weeks of operation.

In the middle of the 2010–11 reporting period, MDBA installed improved web statistics software to give a more accurate representation of the number of web visits (excluding visits from robot and search engine software). This software enables better analysis and evaluation of visitation patterns and site effectiveness, which in turn facilitate a more efficient improvement process.

The MDBA website received around 25,000 visits per month (adjusted figures), almost double the monthly average number of visits in 2009–10. Collectively, these visitors viewed about 76,000 pages per month (adjusted figures) — again, around twice the figure from the previous year. The increased use of MDBA's website by stakeholders is attributable to the increase in interest of the work of the agency, particularly around the time the Guide was released.

The most popular sections of MDBA's website continue to be those that provide regular updates of information or data, such as the live river data pages and the River Operations weekly report.

Publications

During 2010–11, MDBA published 29 publications, most of which were technical reports. Our publications included the *Guide to the proposed Basin Plan* (Volume 1 and Volume 2, parts I, II and III). A complete list of 2010–11 publications is included in Appendix F (see p. 274).

Our publications continued to be used throughout the year by key stakeholders as popular resources to support relevant education and awareness programs at schools, field days, meetings and conferences.

This year all MDBA publications were moved to a new single warehouse. This enabled us to streamline our publication ordering systems and has reduced warehousing and distribution costs by consolidating stock.

The MDBA's Publication Team continued to use measures to reduce the environmental footprint of our publications, including:

- the continued use of 100% or partially recycled stock for all print publications
- careful planning of print runs, which has significantly reduced excess stock
- publishing only in electronic format unless there are identified needs for print copies.

The quality of MDBA's annual report for 2009–10 was independently recognised when it received a silver Australasian Reporting Award.

Sponsorship and education

The MDBA is committed to engaging and providing educational material for the Australian community about the Basin's water resources and water-dependent ecosystems. As part of this commitment, during 2010–11 we developed a number of new educational resources, including maps, posters and brochures. Online activity sheets for primary school students remain a popular and efficient way to deliver education objectives. The activity sheets are available at <www.mdba.gov.au/services/education-resources>.

In 2010–11 we began to renew our existing education strategy to provide a suite of education-based products and programs that will serve all MDBA community stakeholders. We provided sponsorship funds and developed activities for the 'Kids Teaching Kids international river health conference', to be held in October 2011.

Native Fish Awareness Week was held in November 2010. We used a 'Basin-wide' approach, with every jurisdiction hosting activities ranging from tree-planting to fishing competitions, and from school-based education days to book launches.

Library

The MDBA introduced a new integrated library management system in July 2010, enabling us to index the 14,000 records held in our library. The upgrade provides enhanced content services for staff with a user-friendly interactive interface and the ability to catalogue electronic resources.

During 2010–11, the library processed 524 requests, a third of which came from external sources. Several new online databases were purchased, which has significantly increased staff access to online journal and reference resources.

A total of 1,845 new images were acquired during the year, while 3,840 images were fully indexed and added to MDBA's public Image Gallery; we now have more than 18,000 Basin-related images available online. During 2010–11, 112 individual image requests were received and 735 images were supplied. Ninety-five per cent of these requests were received from external sources, including the United States of America, the Netherlands, France, Germany and the People's Republic of China.

During the year, library staff also undertook quality assurance on the metadata for approximately 3,000 images acquired in 2003–04, to ensure it was accurate and would enable efficient and effective searching by users. These images formed the foundation of the Image Gallery when it was first developed more than three years ago.

Towards the end of 2010, we began to actively encourage MDBA staff to take photographs during their travels around the Basin, to help us document MDBA fieldwork activities. The MDBA's Science Communications Unit trained staff to use its newly acquired cameras, and in the following months 357 new images were added to our collection.

During 2010–11, we also began evaluating and digitising our collection of important historical documents, some of which date from the early 1900s. We also contracted out work on more than 2,000 historical images of infrastructure construction, some of which will be added to the Image Gallery.

Access and equity

The MDBA deals with culturally diverse groups, including Indigenous Australian peoples.

We fund the Murray Lower Darling Rivers Indigenous Nations and Northern Murray–Darling Basin Aboriginal Nations. We have a collaborative relationship with both MLDRIN and NBAN, and we fund a large proportion of their operational costs to help them engage with MDBA and other natural resource management agencies.

Both MLDRIN and NBAN are well positioned to provide strategic advice on their respective areas of the Murray–Darling Basin on how best to engage local Indigenous Australian communities in future Basin planning.

In October 2010, we introduced a workplace diversity program and an Indigenous employment strategy. More information about these initiatives is available under 'Diversity' (p. 187) and 'Indigenous engagement' (on p. 75).

Working with jurisdictions to develop the draft Basin Plan

The MDBA continued to work through the Basin Officials Committee (comprising senior officers from state and federal water agencies) as a primary means of intergovernmental consultation on the draft Basin Plan. More information about this committee is in Appendix A (p. 256) of this report.

The MDBA provided state agencies with individual briefings before the release of the Guide, and followed up with additional meetings during the draft Basin Plan consultation period.

In 2011, MDBA took steps to improve its working relationships with all jurisdictions. The Minister for Sustainability, Environment, Water, Population and Communities, the Hon Tony Burke, initiated regular ministerial forums to supplement the biannual Murray–Darling Basin Ministerial Council meetings and regular meetings between senior officials to provide a way to identify and address key issues more quickly. From February to June 2011, MDBA also held a series of multilateral and bilateral technical meetings and workshops on proposed approaches, and encouraged 'without prejudice' discussions ahead of formal positions being formed. The MDBA also provided jurisdictions with chapters of the draft Basin Plan as they became available for comment.

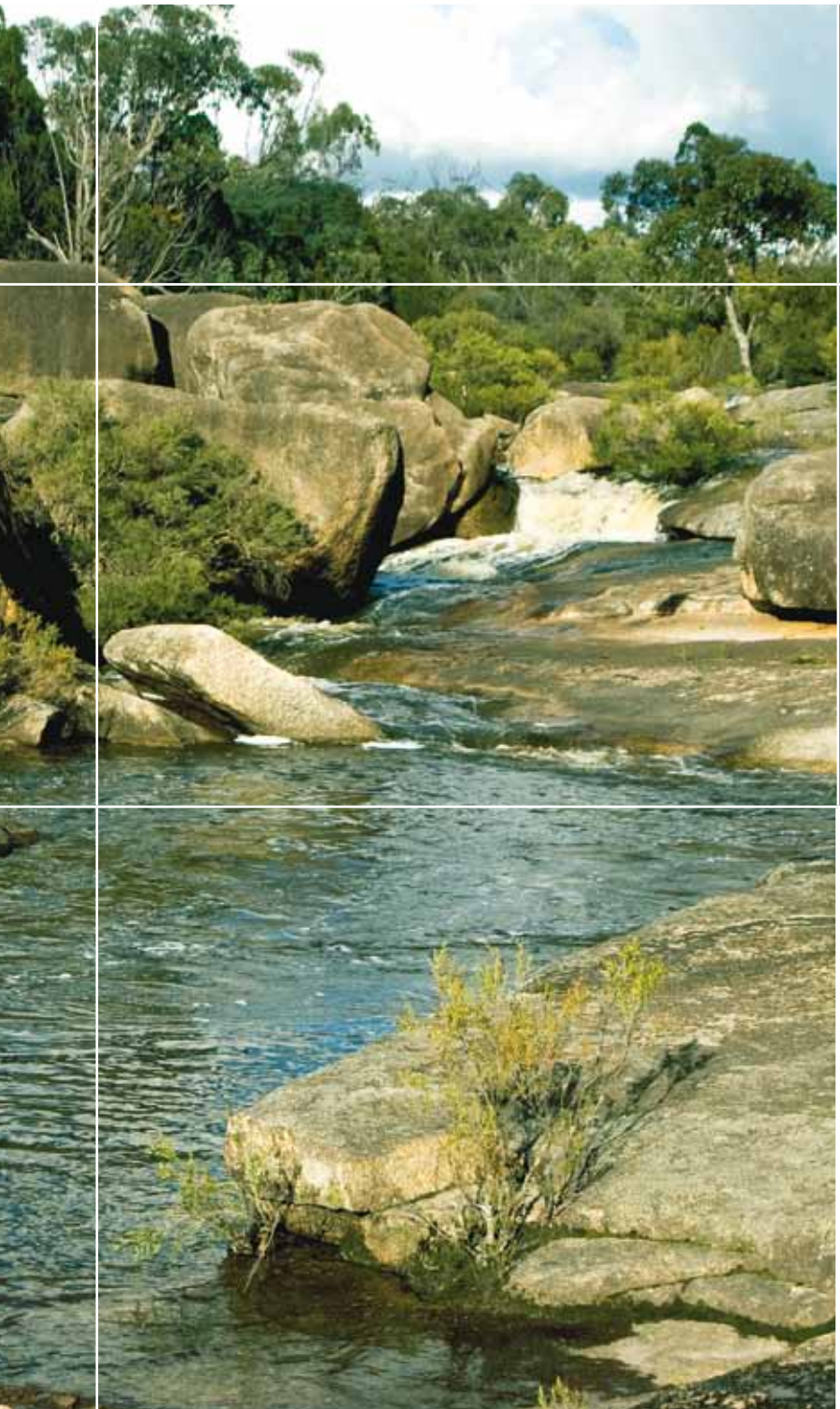
Following public consultation on the Guide, MDBA worked closely with the Department of Sustainability, Environment, Water, Population and Communities and the Department of Regional Australia, Regional Development and Local Government to ensure effective coordination and communication on the broader whole-of-government approach to water reform in the Basin.

In June 2011, MDBA convened the Basin Plan Working Group as a standing forum for conducting consultations with the states about the draft Basin Plan. The consultations provide a transparent process for states to present their concerns about the draft Basin Plan and for MDBA to respond to these concerns, either by proposing changes to address the concerns or providing reasons for not making changes.

The working group is chaired by MDBA and comprises representatives from all Basin states and the Department of Sustainability, Environment, Water, Population and Communities.

On 10 June, MDBA provided an initial version of the draft Basin Plan to the states for their comment, and the first meeting of the working group followed on 27 June 2011. Using states' comments as a basis for discussion, a work program was put together to enable detailed discussion on every chapter of the draft Basin Plan.

FINANCIAL STATEMENTS



Financial statements

Contents

MURRAY-DARLING BASIN AUTHORITY
STATEMENT BY THE CHIEF EXECUTIVE AND CHIEF FINANCE OFFICER

In our opinion, the attached financial statements for the year ended 30 June 2011 are based on properly maintained financial records and give a true and fair view of the matters required by the Finance Minister's Orders made under the *Financial Management and Accountability Act 1997,* as amended.

Rhondda Dickson
Chief Executive

26 Sep-11

George Knezevic
Chief Finance Officer

26 Sep-11

Australian National
Audit Office

INDEPENDENT AUDITOR'S REPORT

To the Minister for Sustainability, Environment, Water, Population and Communities

Report on the Financial Statements

I have audited the accompanying financial statements of the Murray-Darling Basin Authority for the year ended 30 June 2011, which comprise: a Statement by the Chief Executive and Chief Finance Officer; the Statement of Comprehensive Income; Balance Sheet; Statement of Changes in Equity; Cash Flow Statement; Schedule of Commitments; Schedule of Asset Additions; and Notes to and forming part of the Financial Statements including a Summary of Significant Accounting Policies.

Chief Executive's Responsibility for the Financial Statements

The Chief Executive of the Murray-Darling Basin Authority is responsible for the preparation of the financial statements that give a true and fair view in accordance with the Finance Minister's Orders made under the *Financial Management and Accountability Act 1997,* including the Australian Accounting Standards, and for such internal control as the Chief Executive determine is necessary to enable the preparation of the financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

My responsibility is to express an opinion on the financial statements based on my audit. I have conducted my audit in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards. These auditing standards require that I comply with relevant ethical requirements relating to audit engagements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Authority's preparation of the financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Authority's internal control. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of accounting estimates made by the Chief Executive, as well as evaluating the overall presentation of the financial statements.

GPO Box 707 CANBERRA ACT 2601
19 National Circuit BARTON ACT 2600
Phone (02) 6203 7300 Fax (02) 6203 7777

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Independence

In conducting my audit, I have followed the independence requirements of the Australian National Audit Office, which incorporate the requirements of the Australian accounting profession.

Opinion

In my opinion, the financial statements of the Murray-Darling Basin Authority:

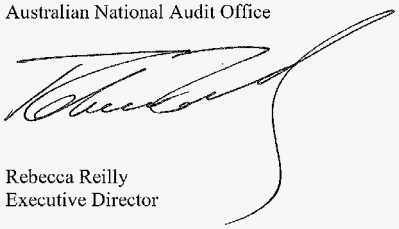
(a) have been prepared in accordance with the Finance Minister's Orders made under the *Financial Management and Accountability Act 1997,* including the Australian Accounting Standards; and

(b) give a true and fair view of the matters required by the Finance Minister's Orders including the Murray-Darling Basin Authority's financial position as at 30 June 2011 and of its financial performance and cash flows for the year then ended.

Report on Other Legal and Regulatory Requirements

Without modifying my audit opinion, I draw attention to Note 16 to the financial statements, which describes a risk of non-compliance with Section 83 of the Constitution. The Murray-Darling Basin Authority has recently become aware that there is an increased risk of non-compliance with Section 83 of the Constitution where payments are made from the special account in circumstances where payments do not accord with conditions included in the relevant legislation. The Murray-Darling Basin Authority will investigate these circumstances and any impact on its special account, seeking legal advice as appropriate.

Australian National Audit Office



Rebecca Reilly
Executive Director

Delegate of the Auditor-General

Canberra
27 September 2011

Murray-Darling Basin Authority
Statement Of Comprehensive Income
for the period ended 30 June 2011

	Notes	2011	2010
		$'000	$'000
EXPENSES			
Employee benefits	**3A**	**34,076**	31,578
Suppliers	**3B**	**181,213**	245,532
Depreciation and amortisation	**3C**	**1,741**	1,051
Finance costs	**3D**	**26**	-
Write-down and impairment of assets	**3E**	**-**	387
Total expenses		**217,056**	278,548
LESS:			
OWN-SOURCE INCOME			
Own-source revenue			
Contributions from jurisdictions	**4A**	**95,521**	83,699
Other	**4B**	**4,493**	40,068
Total own-source revenue		**100,014**	123,767
Gains			
Sale of assets	**4C**	**17**	20
Other	**4D**	**58**	58
Total gains		**75**	78
Total own-source income		**100,089**	123,845
Net cost of services		**(116,967)**	(154,703)
Revenue from Government	**4E**	**75,666**	51,066
Share of deficit in the Joint Ventures accounted for using the equity method	**3F**	**(1,600)**	(2,265)
Deficit attributable to the Australian Government		**(42,901)**	(105,902)
OTHER COMPREHENSIVE INCOME			
Changes in asset revaluation reserves		**-**	87
Total comprehensive loss attributable to the Australian Government		**(42,901)**	(105,815)

The above statement should be read in conjunction with the accompanying notes.

Murray-Darling Basin Authority
Balance Sheet
as at 30 June 2011

	Notes	2011	2010
		$'000	$'000
ASSETS			
Financial Assets			
Cash and cash equivalents	5A	**1,642**	3,321
Trade and other receivables	5B	**219,166**	261,597
Investment in the Joint Ventures using the equity method	5C	**377**	519
Total financial assets		**221,185**	265,437
Non-Financial Assets			
Property, plant & equipment	6A	**862**	885
Leasehold improvements	6B	**2,175**	1,395
Intangibles	6C	**2,077**	2,298
Other	6D	**1,210**	775
Lease assets	6E	**143**	-
Total non-financial assets		**6,467**	5,353
Total Assets		**227,652**	270,790
LIABILITIES			
Payables			
Suppliers	7A	**32,014**	36,867
Other	7B	**4,252**	930
Total payables		**36,266**	37,797
Non-interest bearing liability			
Lease incentive	8	**931**	886
Total non-interest bearing liability		**931**	886
Provisions			
Employee provisions	9A	**7,275**	6,592
Other	9B	**566**	-
Total provisions		**7,841**	6,592
Total Liabilities		**45,038**	45,275
Net Assets		**182,614**	225,515
EQUITY			
Parent Entity Interest			
Contributed equity		**(11,199)**	(11,199)
Reserves		**87**	87
Retained surplus		**193,726**	236,627
Total parent entity interest		**182,614**	225,515
Total Equity		**182,614**	225,515

The above statement should be read in conjunction with the accompanying notes.

Murray-Darling Basin Authority
Statement Of Changes In Equity
for the period ended 30 June 2011

	Retained Earnings		Asset Revaluation Reserves		Contributed Equity/Capital		Total Equity	
	2011	2010	**2011**	2010	**2011**	2010	**2011**	2010
	$'000	$'000	**$'000**	$'000	**$'000**	$'000	**$'000**	$'000
Opening balance								
Balance carried forward from previous period	**236,627**	342,529	**87**	-	**(11,199)**	(11,199)	**225,515**	331,330
Adjusted opening balance	**236,627**	342,529	**87**	-	**(11,199)**	(11,199)	**225,515**	331,330
Comprehensive income								
Other comprehensive income - Changes in asset revaluation reserves	**-**	-	**-**	87	**-**	-	**-**	87
Surplus (Deficit) for the period	**(42,901)**	(105,902)					**(42,901)**	(105,902)
Total comprehensive income	**(42,901)**	(105,902)	**-**	87	**-**	-	**(42,901)**	(105,815)
of which:								
Attributable to the Australian Government	**(42,901)**	(105,902)	**-**	87	**-**	-	**(42,901)**	(105,815)
Closing balance as at 30 June	**193,726**	236,627	**87**	87	**(11,199)**	(11,199)	**182,614**	225,515
Closing balance attributable to the Australian Government	**193,726**	236,627	**87**	87	**(11,199)**	(11,199)	**182,614**	225,515

The above statement should be read in conjunction with the accompanying notes.

Murray-Darling Basin Authority
Cash Flow Statement
for the period ended 30 June 2011

	Notes	2011	2010
		$'000	$'000
OPERATING ACTIVITIES			
Cash received			
Contributions from Jurisdictions		**95,599**	83,616
Appropriations / Drawdown from Special Account		**116,568**	162,463
Net GST received		**20,647**	15,738
Other cash received		**6,100**	31,486
Total cash received		**238,914**	**293,303**
Cash used			
Employees		**33,164**	29,166
Suppliers		**205,209**	267,648
Total cash used		**238,373**	296,814
Net cash from (used by) operating activities	**10**	**541**	(3,511)
INVESTING ACTIVITIES			
Cash received			
Proceeds from disposal of property, plant and equipment		**109**	38
Total cash received		**109**	38
Cash used			
Purchase of property, plant and equipment		**1,011**	150
Purchase of Computer Software		**816**	1,535
Leasehold improvements		**-**	136
Payments to Joint Ventures		**500**	-
Total cash used		**2,327**	1,821
Net cash from (used by) investing activities		**(2,218)**	(1,783)
Net increase (decrease) in cash held		**(1,679)**	(5,294)
Cash and cash equivalents at the beginning of the reporting period		**3,321**	8,615
Cash and cash equivalents at the end of reporting period	**5A**	**1,642**	3,321

The above statement should be read in conjunction with the accompanying notes.

Murray-Darling Basin Authority
Schedule of Commitments
as at 30 June 2011

	2011	2010
	$'000	$'000
BY TYPE		
Commitments receivable		
GST recoverable on commitments	**(2,309)**	(3,553)
Total commitments receivable	**(2,309)**	(3,553)
Commitments Payable		
Capital commitments		
Intangibles	**-**	221
Property, plant & equipment	**140**	95
Total capital commitments	**140**	316
Other commitments		
Operating leases	**13,917**	13,506
Other	**13,222**	26,938
Total other commitments	**27,139**	40,444
Net commitments by type	**24,970**	37,207
BY MATURITY		
Commitments Receivable		
One year or less	**(1,092)**	(2,249)
From one to five years	**(1,217)**	(1,154)
Over five years	**-**	(150)
Total commitments receivable	**(2,309)**	(3,553)
Commitments Payable		
Capital commitments		
One year or less	**140**	316
Total capital commitments	**140**	316
Operating leases commitments		
One year or less	**2,159**	1,851
From one to five years	**11,758**	10,005
Over five years	**-**	1,650
Total operating leases commitments	**13,917**	13,506
Other commitments		
One year or less	**11,479**	23,581
From one to five years	**1,743**	3,357
Total other commitments	**13,222**	26,938
Net commitments by maturity	**24,970**	37,207

Note:
1. Commitments were GST inclusive where relevant.
2. The nature of capital commitments are outstanding contractual payments related to furniture and fittings for 40 Allara Street.
3. The nature of other commitments are payments to suppliers.

Murray-Darling Basin Authority
Schedule of Commitments
as at 30 June 2011

The MDBA in its capacity as a lessee held the following:

Leases and licences for office accommodation

Canberra, ACT
Commencing on 1 January 2007 a 10 year and 3 months lease was initiated in respect of premises at 51 Allara Street. Lease payments are subject to fixed annual increases of 3.5% on review date (January each year), apart from 2012 when a market review will be undertaken.

Commencing on 1 May 2011 a 5 year and 11 months lease was initiated in respect of premises at 40 Allara Street. Lease payments are subject to fixed annual increases of 4% on review date (May each year).

Eastwood, SA
Commencing on 20 June 2011 a 12 month lease was initiated in respect of premises at 213 Greenhill Road.

Albury, NSW
Commencing on 1 September 2008 a 3 year licence was initiated in respect of premises at Charles Sturt University. Licence payments are fixed for the term of the lease.

Leases for 51 Allara Street and the Albury office were originally authorised by the Murray-Darling Basin Commission. The liability for the unexpended portion of the leases has transitioned on 15 December 2008 to the MDBA in accordance with the transition provisions of the *Water Act 2007* .

Operating leases and licences held by the MDBA are effectively non-cancellable.

Murray-Darling Basin Authority

Schedule of Asset Additions

for the period ended 30 June 2011

The following non-financial non-current assets were added in 2010-11:

	Land $'000	Buildings $'000	Investment Properties $'000	Heritage & cultural $'000	Other property, plant & equipment $'000	Intangibles $'000	Other $'000	Total $'000
Additions funded in the current year								
By purchase	-	-	-	-	1,011	816	-	1,827
Total funded additions funded in the current year	-	-	-	-	1,011	816	-	1,827
Additions recognised in 2010-11 - to be funded in futue years								
Make-good					540	-	-	540
Total future years/unfunded additions	-	-	-	-	540	-	-	540
Total additions	-	-	-	-	1,551	816	-	2,367

The following non-financial non-current assets were added in 2009-10:

	Land $'000	Buildings $'000	Investment Properties $'000	Heritage & cultural $'000	Other property, plant & equipment $'000	Intangibles $'000	Other $'000	Total $'000
Additions funded in the current year								
By purchase	-	-	-	-	286	1,535	-	1,821
Total funded additions funded in the current year	-	-	-	-	286	1,535	-	1,821
Additions recognised in 2009-10 - to be funded in futue years								
Make-good					-	-	-	-
Total future years/unfunded additions	-	-	-	-	-	-	-	-
Total additions	-	-	-	-	286	1,535	-	1,821

Murray-Darling Basin Authority

Notes to and forming part of the Financial Statements

for the period ended 30 June 2011

Murray-Darling Basin Authority
Notes to and forming part of the Financial Statements

Note 1: Summary of Significant Accounting Policies

1.1 Objective of Murray-Darling Basin Authority

The principal objective of the Murray–Darling Basin Authority (the Authority) is to manage the Basin's water resources in the national interest so that there may be an equitable and sustainable use of the Basin's resources.

In planning for the integrated management of water resources in the Basin, the Authority has overall responsibility for:

- preparing a Basin Plan for adoption by the Minister for Sustainability, Environment, Water, Population and Communities;
- implementing and enforcing the Basin Plan;
- advising the Minister on the accreditation of State water resource plans;
- developing a water rights information service which facilitates water trading across the Murray–Darling Basin;
- measuring and monitoring water resources in the Basin;
- gathering information and undertaking research; and
- educating and engaging the community in the management of the Basin's resources

The Authority delivers its functions under the Murray-Darling Basin Agreement in conjunction with and on behalf of Basin jurisdictions.

The continued existence of the Authority in its present form and with its present programs is dependent on:

- funding contributions from Basin jurisdictions towards meeting the cost of Murray-Darling Basin Agreement functions; and
- Government policy and on continuing funding by Parliament for the Authority's administration and programs relating to the Basin Plan and Murray-Darling Basin Agreement functions.

Reporting entity

The Authority was established under the *Water Act 2007* in March 2008 and is an Australian Government controlled entity as prescribed by Section 5 of the *Financial Management and Accountability Act 1997.*

The financial statements and accompanying notes include all controlled activities of the MDBA; the MDBA has no administered items. Notwithstanding, the Authority also has significant reporting and other management responsibilities in respect of two major unincorporated joint ventures:

- 'Asset Agreement for River Murray Operations Assets'; and
- 'Further Agreement on Addressing Water Over-allocation and Achieving Environmental Objectives in the Murray-Darling Basin – Control and Management of Living Murray Assets'.

These responsibilities entail working in close partnership with Basin jurisdictions, including the State Constructing Authorities (and agents thereof) in the efficient construction, operation, maintenance and required performance of any works, authorised under the Murray-Darling Basin Agreement.

The accounting for these assets, which are the subject of these individual Agreements do not form part of the Authority's general-purpose financial statements. In lieu, these intangible and infrastructure related assets are reported in separate special-purpose financial statements. The legal ownership and accounting control of these assets is vested with the joint venturers, which includes the Australian Government; but not the Authority.

Special-purpose financial statements relating to these assets are subject to annual audit by the Australian National Audit Office. In turn, the reported asset values provide the formal basis for the Australian Government and Basin jurisdictions to calculate and recognise their shares in the underlying assets in their respective balance sheets.

1.2 Basis of Preparation of the Financial Statements

The financial statements are general purpose financial statements and are required by section 49 of the *Financial Management and Accountability Act 1997.*

The financial statements and notes have been prepared in accordance with:

- Finance Minister's Orders (FMOs) for reporting periods ending on or after 1 July 2010; and
- Australian Accounting Standards and Interpretations issued by the Australian Accounting Standards Board (AASB) that apply for the reporting period.

The financial statements have been prepared on an accrual basis and in accordance with the historical cost convention, except for certain assets and liabilities at fair value. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position.

The financial statements are presented in Australian dollars and values are rounded to the nearest thousand dollars unless otherwise specified.

Unless an alternative treatment is specifically required by an accounting standard or the FMOs, assets and liabilities are recognised in the balance sheet when and only when it is probable that future economic benefits will flow to the entity or a future sacrifice of economic benefits will be required and the amounts of the assets or liabilities can be reliably measured. However, assets and liabilities arising under executor contracts are not recognised unless required by an accounting standard. Liabilities and assets that are unrecognised are reported in the schedule of commitments or the schedule of contingencies.

Unless alternative treatment is specifically required by an accounting standard, income and expenses are recognised in the Statement of Comprehensive Income when and only when the flow, consumption or loss of economic benefits has occurred and can be reliably measured.

The preparation of the financial statements requires:

- the use of certain accounting estimates and requires management to exercise its judgment in the process of applying the Authority's accounting policies. Any areas involving a higher degree of judgment, or where assumptions and estimates are significant to the financial statements, are outlined in the applicable notes;
- accounting policies are selected and applied in a manner which ensures that the resulting financial information satisfies the concepts of relevance and reliability, thereby ensuring that the substance of the underlying transactions or other events are reported; and,
- the accounting policies, hereunder, which have been applied in preparing the financial statements for the year ended 30 June 2011 and the comparative information presented.

1.3 Significant Accounting Judgements and Estimates

No accounting assumptions or estimates have been identified that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next reporting period.

1.4 Changes in Australian Accounting Standards

Adoption of New Australian Accounting Standard Requirements

No accounting standard has been adopted earlier than the application date as stated in the standard. All new standards, amendments to the standards and interpretations issued prior to signing of the statement by the Chief Executive and Chief Finance Officer were applied where applicable to the current reporting period.

Future Australian Accounting Standard Requirements

New/revised standards/interpretations/amending standards that were issued by the Australian Accounting Standards Board prior to sign-off date, and are applicable to future reporting period are not expected to have a financial impact the Authority.

1.5 Revenue

Revenue from Government

Amounts appropriated for the year (adjusted for any formal additions and reductions) are recognised as Revenue from Government when the Authority gains control of the appropriation, except for certain amounts that relate to activities that are reciprocal in nature, in which case revenue is recognised only when it has been earned. Appropriations receivable are recognised at their nominal amounts.

Amounts appropriated to the Authority will also include an interest equivalency amount that is derived from interest earned on the balance of funds in the Authority's Special Account held with the Minister of Finance. Amounts are recognised when the Authority gains control of the appropriations.

Resources Received Free of Charge

Resources received free of charge are recognised as revenue when, and only when, a fair value can be reliably determined and the services would have been purchased if they had not been donated. Use of those resources is recognised as an expense.

Resources received free of charge are recorded as either revenue or gains depending on their nature.

Contributions from Jurisdictions

The Authority receives contributions from jurisdictions based on an agreed Contributions Model (the Model). The Model, which has been carried forward from the Authority's predecessor agency, the Murray-Darling Basin Commission, is based on a number of different requirements including specific provisions under the Murray-Darling Basin Agreement. Historical funding commitments using 2006-07 as a base year are being maintained in real terms through to 2013-14, at which time the jurisdictions and the Australian Government have agreed that the Model will be subject to substantive review. Costs are indexed using a weighting of construction cost and consumer price indices.

Other Income

Revenue from sale of goods is recognised when:

- the risks and rewards of ownership have been transferred to the buyer;
- the entity retains no managerial involvement or effective control over the goods;
- the revenue and transaction costs incurred can be reliably measured; and
- it is probable that the economic benefits associated with the transaction will flow to the entity.

Revenue from rendering of services is recognised by reference to the stage of completion of contracts at the reporting date. The revenue is recognised when:

- the amount of revenue, stage of completion and transaction costs incurred can be reliably measured; and
- the probable economic benefits associated with the transaction will flow to the entity.

The stage of completion of contracts at the reporting date is determined by reference to the proportion that costs incurred to date bear to the estimated total costs of the transaction.

Receivables for goods and services, which have 30 day terms, are recognised at the nominal amounts due less any impairment allowance account. Collectability of debts is reviewed at end of the reporting period. Allowances are made when collectability of the debt is no longer probable.

Sale of Assets

Gains from disposal of non-current assets are recognised when control of the assets have passed to the buyer.

1.6 Expenses

Employee Benefits

Liabilities for 'short-term employee benefits' (as defined in *AASB 119 Employee Benefits*) and termination benefits due within twelve months of end of reporting period are measured at their nominal amounts.

The nominal amount is calculated with regard to the rates expected to be paid on settlement of the liability.

All other employee benefit liabilities are measured as the present value of the estimated future cash flows to be made in respect of services provided by employees up to the reporting date.

Leave

The liability for employee benefits 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 Authority is estimated to be less than the annual entitlement for sick leave.

The leave liabilities are calculated on the basis of employees' remuneration at the estimated salary rates that applied at the time the leave is taken, including the Authority's employer superannuation contribution rates to the extent that the leave is likely to be taken during service rather than paid out on termination.

The liability for long service leave has been determined by reference to the work of an actuary as at 30 June 2011. The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

Separation and Redundancy

Provision is made for separation and redundancy benefit payments if required. The Authority recognises a provision for termination when it has developed a detailed formal plan for the terminations and has informed those employees affected that it will carry out the terminations.

Superannuation

The Authority's staff are members of the Commonwealth Superannuation Scheme (CSS), the Public Sector Superannuation Scheme (PSS) or the PSS accumulation plan (PSSap).

The CSS and PSS are defined benefit schemes for the Australian Government. The PSSap is a defined contribution scheme.

The liability for defined benefits is recognised in the financial statements of the Australian Government and is settled by the Australian Government in due course. This liability is reported by the Department of Finance and Deregulation as an administered item.

The Authority makes employer contributions to the employees' superannuation scheme at rates determined by an actuary to be sufficient to meet the current cost to the Government of the superannuation entitlements of the Authority's employees. The Authority accounts for the contributions as if they were contributions to defined contribution plans.

The liability for superannuation recognised as at 30 June represents outstanding contributions for the final fortnight of the year.

The Authority also contributes to a number of complying funds to discharge the Authority's liability in regard to individual employees and the *Superannuation Guarantee (Administration) Act 1992* as well as to facilitate the salary sacrifice options of employees.

1.7 Leases

A distinction is made between finance leases and operating leases. Finance leases effectively transfer from the lessor to the lessee substantially all the risks and benefits incidental to ownership of leased non-current assets. An operating lease is a lease that is not a finance lease. In operating leases, the lessor effectively retains substantially all such risks and benefits.

Where an asset is acquired by means of a finance lease, the asset is capitalised at either the fair value of the lease property or, if lower, the present value of minimum lease payments at the beginning of the lease term and a liability recognised at the same time and for the same amount.

The discount rate used is the interest rate implicit in the lease. Leased assets are amortised over the period of the lease. Lease payments are allocated between the principal component and the interest expense.

Operating lease payments are expensed on a straight line basis which is representative of the pattern of benefits derived from the leased assets.

1.8 Borrowing costs

All borrowing costs are expensed as incurred.

1.9 Cash and Cash Equivalents

Cash and cash equivalents are recognised at their nominal amount and include:

- cash on hand;
- demand deposits in bank accounts with an original maturity of 3 months or less that is readily convertible to known amounts of cash and subject to insignificant risk of changes in value;
- cash held by outsiders; and
- cash in special accounts.

1.10 Financial Assets

The Authority classifies its financial assets as loans and receivables.

Financial assets are recognised and derecognised upon 'trade date'.

The Authority only has financial assets that fall into the loans and receivables category.

Effective interest method

The effective interest method is a method of calculating the amortised cost of a financial asset and of allocating interest income over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash receipts over the expected life of the financial asset, or, where appropriate, a shorter period.

Income is recognised on an effective interest rate basis except for financial assets 'at fair value through profit or loss'.

Loans and receivables

Trade receivables, loans and other receivables that have fixed or determinable payments that are not quoted in an active market are classified as 'loans and receivables'. Loans and receivables are measured at amortised cost using the effective interest method less impairment. Interest is recognised by applying the effective interest rate.

1.11 Jointly Controlled Entities

Cooperative Research Centres

The Authority participates in a number of joint ventures through its interests in Cooperative Research Centres (CRCs). While CRCs have the characteristics of joint ventures, they are not, in all cases, material to the Authority's activities and hence not specific disclosures have been made in accordance with the AASB 131 *Interests in Joint Ventures* .

A CRC is a research initiative of the Commonwealth Government established to pursue specific areas of research. One of the desired outcomes of a CRC is the creation of specific intellectual property with commercial value. There are usually a number of participants involved with CRCs, which also often have a significant research focus (e.g. Commonwealth Scientific and Industrial Research Organisation (CSIRO), universities and private sector bodies).

The funding of a CRC is usually coordinated through a central agent who is appointed generally from one of the joint venturers. Transactions between the CRCs and the Authority are accounted for in terms of general revenue and expenditure. The share of the operating loss in these joint ventures during 2011 is totalled $1.6 million (refer Note 3F).

In 2010-11, the Authority contributed both cash and in-kind support for the following CRCs:

- Invasive Animals

- eWater

Other joint ventures

In addition to CRCs the Authority has entered into another joint venture arrangement with the Murray-Darling Basin Freshwater Research Centre.

Interests in jointly controlled entities in which the Authority is a venturer (and so has joint control) are accounted for using the equity method.

1.12 Financial Liabilities

Financial liabilities are recognised and derecognised upon 'trade date'.

Other financial liabilities

Other financial liabilities, including borrowings, are initially measured at fair value, net of transaction costs.

These other financial liabilities are subsequently measured at amortised cost using the effective interest method, with interest expense recognised on an effective yield basis.

The effective interest method is a method of calculating the amortised cost of a financial liability and of allocating interest expense over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash payments through the expected life of the financial liability, or, where appropriate, a shorter period.

Supplier and other payables are recognised at amortised cost. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).

1.13 Contingent Liabilities and Contingent Assets

Contingent liabilities and contingent assets are not recognised in the balance sheet but are disclosed in the relevant notes. They may arise from uncertainty as to the existence of a liability or asset, or represent an existing liability or asset in respect of which settlement is not probable or the amount cannot be reliably measured. Contingent assets are reported when settlement is probable but not virtually certain and contingent liabilities are recognised when settlement is greater than remote.

1.14 Financial Guarantee Contracts

Financial guarantee contracts are accounted for in accordance with *AASB 139 Financial Instruments: Recognition and Measurement*. They are not treated as a contingent liability, as they are regarded as financial instruments outside the scope of *AASB 137 Provisions, Contingent Liabilities and Contingent Assets*.

1.15 Acquisition of Assets

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken. Financial assets are initially measured at their fair value plus transaction costs where appropriate.

Assets acquired at no cost, or for nominal consideration, are initially recognised as assets and revenues at their fair value at the date of acquisition, unless acquired as a consequence of restructuring of administrative arrangements. In the latter case, assets are initially recognised as contributions by owners at the amounts at which they were recognised in the transferor agency's accounts immediately prior to the restructuring.

1.16 Property, Plant and Equipment

Asset Recognition Threshold

Purchases of property, plant and equipment are recognised initially at cost in the balance sheet, except for purchases costing less than $2,000 in which case they are expensed in the year of acquisition (other than where they form part of a group of similar items which are significant in total).

The initial cost of an asset includes an estimate of the cost of dismantling and removing the item and restoring the site on which it is located. This is particularly relevant to 'make-good' provisions in property leases taken up by the Authority where there exists an obligation to restore the property to its original condition. These estimated costs are included in the value of the Authority's leasehold improvements with a corresponding provision for the 'make-good' recognised.

Revaluations

Fair value of leasehold improvements and equipment are measured at depreciated replacement cost and market selling price respectively.

Following initial recognition at cost, property plant and equipment are carried at fair value less subsequent accumulated depreciation and accumulated impairment losses. Valuations are conducted with sufficient frequency to ensure that the carrying amounts of assets do not differ materially from the assets' fair values as at the reporting date. The regularity of independent valuations depends upon the volatility of movements in market values for the relevant assets.

Revaluation adjustments are made on a class basis. Any revaluation increment is credited to equity under the heading of asset revaluation reserve except to the extent that it reverses a previous revaluation decrement of the same asset class that was previously recognised through operating result. Revaluation decrements for a class of assets are recognised directly through operating result except to the extent that they reverse a previous revaluation increment for that class.

Any accumulated depreciation as at the revaluation date is eliminated against the gross carrying amount of the asset and the asset restated to the revalue amount.

Depreciation

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

Depreciation rates (useful lives), residual values and methods are reviewed annually and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate.

Depreciation rates applying to each class of depreciable assets are based on the following useful lives.

	2011		2010	
	Years	**% - pa**	Years	% - pa
Motor Vehicles	**2-3**	**33%-57%**	2-3	33%-57%
Computers and IT equipment	**3-13**	**8%-33%**	3-13	8%-33%
Office Equipment	**2-13**	**8%-57%**	2-13	8%-57%
Furniture, Fixtures and Fittings	**3-20**	**5%-20%**	3-20	5%-20%
Leasehold Improvement	**6-10**	**11%-15%**	6-10	11%-15%
Software	**3**	**33%**	3	33%

Impairment

All assets were assessed for impairment at 30 June 2011. Where evidence of impairment exists, the asset's recoverable amount is estimated and an impairment adjustment made if the assets recoverable amount is less than its carrying value.

The recoverable amount of an asset is the higher of its fair value less costs to sell and its value in use. Value in use is the present value of the future cash flows expected to be derived from the asset. Where the future economic benefit of an asset is not primarily dependent on the asset's ability to generate future cash flows, and the asset would be replaced if the Authority were deprived of the asset, its value in use is taken to be its depreciated replacement cost.

1.17 Intangibles

An intangible asset is an identifiable non-monetary asset without physical substance.

The Authority's intangibles comprise internally developed software for internal use. These assets are carried at cost less accumulated amortisation and accumulated impairment losses.

The useful lives of intangible assets are assessed to be either finite or infinite. At this time, the Authority has intangible assets with finite lives only.

All software assets are assessed for indications of impairment at 30 June.

Following initial recognition, intangible assets are carried at cost less any accumulated amortisation and any accumulated impairment losses.

The acquisition of or internal development of software is capitalised only when the expenditure meets the definition criteria (identifiability, control and the existence of future economic benefits) and recognition criteria (probability of future economic benefits and cost can be reliably measured) and when the amount of expenditure is greater than or equal to $2000.

All research and development costs that do not meet the capitalisation criteria outlined in *AASB 138 Intangible Assets* are expensed.

1.18 Inventories

Inventories include goods and other property held either for sale or distribution at no or nominal cost in the ordinary course of business. It excludes depreciable assets.

Inventories held for distribution at no or nominal consideration, are measured at cost and adjusted when applicable for any loss of service potential. Inventories held for sale are measured at the lower of cost or their net realisable value.

The amount of any inventory write-down to net realisable value or inventory losses are recognised in the Statement of Comprehensive Income as an expense in the period the write-down or loss occurred. Any write-down reversals are also recognised in the Statement of Comprehensive Income.

1.19 Taxation

The entity is exempt from all forms of taxation except Fringe Benefits Tax (FBT) and the Goods and Services Tax (GST).

Revenue, expenses and assets are recognised net of GST:

- where the amount of GST incurred is not recoverable from the Australian Taxation Office; and
- for receivables and payables.

Note 2: Events after the Reporting Period

No events have occurred after reporting date that should be brought to account or noted in the 2011 financial statements.

Murray-Darling Basin Authority

Notes to and forming part of the Financial Statements

Note 3: Expenses

		2011		2010
		$'000		$'000
Note 3A:	**Employee Benefits**			
Wages and Salaries		**25,175**		23,189
Superannuation				
Defined contribution plans		**2,158**		2,216
Defined benefit plans		**2,280**		1,951
Leave and other entitlements		**2,901**		3,114
Other		**1,562**		1,108
Total employee benefits expense		**34,076**		31,578
Note 3B:	**Supplier**			
Goods and services				
Expenditure by State Constructing Authorities		**129,191**	*	102,825
Water Entitlements		**2,219**		72,360
Communication & IT Expenses		**1,790**		2,130
Water Licence Fee		**2,498**		2,121
Consultant and other services		**35,907**	**	56,342
Recruitment		**365**		433
Training and development		**804**		728
Provision of goods & services		**6,414**		6,899
Total goods and services		**179,188**		243,838
Goods and services are made up of:				
Provision of goods - external parties		**819**		907
Provision of goods - related entities		**62**		94
Rendering of services - external parties		**171,452**		230,334
Rendering of services - related entities		**6,855**		12,503
Total goods and services		**179,188**		243,838
Other Supplier Expenses				
Operating lease rentals - external parties:				
Minimum lease payments		**1,746**		1,431
Workers compensation expenses		**279**		263
Total other supplier expenses		**2,025**		1,694
Total supplier expenses		**181,213**		245,532
Note 3C:	**Depreciation and Amortisation**			
Depreciation				
Motor vehicle		**44**		59
Furniture, fittings and office equipment		**94**		88
Computers and IT equipment		**274**		196
Leasehold improvements		**292**		178
Total depreciation		**704**		521
Amortisation				
Computer software		**1,037**		530
Total amortisation		**1,037**		530
Total depreciation and amortisation		**1,741**		1,051
Note 3D:	**Finance Costs**			
Unwinding of discount - make-good provisions		**26**		-
		26		-
Note 3E:	**Write-down and Impairment of Assets**			
Asset write-downs and impairments from:				
Revaluation decrements - Plant & Equipment		**-**		141
Revaluation decrements - Leasehold Improvement		**-**		246
		-		387
Note 3F:	**Share of deficit in the Joint Ventures accounted for using the equity method**			
Share of deficit in the Joint Ventures accounted for using the equity method		**1,600**		2,265

* Includes $11.4 million in expenses incurred relating to unavoidable third party contractual commitments brought about by the extraordinary flooding conditions experienced during 2010-11 and not otherwise recoverable through the MDBA's existing insurance cover with Comcover.

** This includes expenses related to standard service contracts and other funding agreements.

Note 4: Income

	2011	2010
	$'000	$'000
Note 4A: Contributions from Jurisdictions		
Australian Government	**(78)**	83
New South Wales	**34,227**	29,721
Victoria	**32,437**	28,266
South Australia	**27,667**	24,388
Queensland	**986**	965
Australian Capital Territory	**282**	276
Total contributions from Jurisdictions	**95,521**	83,699
Note 4B: Other Income		
External parties:		
Hydropower generation	**857**	1,397
Salinity costs recovery	**2,410**	605
Legal fees recovery	**53**	80
Land and cottage rents	**707**	673
Contribution to Water Recovery Measures	**-**	9,487
Other	**466**	51
Total external parties	**4,493**	12,293
Related parties:		
Contribution to Water Recovery Measures	**-**	27,775
Total related parties	**-**	27,775
Total other income	**4,493**	40,068
Note 4C: Sale of Assets		
Motor Vehicles:		
Proceeds from disposal	**106**	38
Net book value of assets disposed	**(89)**	(18)
Net gain from sale of assets	**17**	20
Note 4D: Other		
Resources received free of charge	**55**	58
Proceeds from Sale of Assets Below Threshold	**3**	**-**
	58	58
Note 4E: Revenue from Government		
Appropriations - Departmental outputs	**75,666**	51,066
Total revenue from Government	**75,666**	51,066

Note 5: Financial Assets

	2011	2010
	$'000	$'000
Note 5A: Cash and Cash Equivalents		
Cash at bank	**1,642**	3,321
Total cash and cash equivalents	**1,642**	3,321
Note 5B: Trade and Other Receivables		
Goods and Services		
Goods and services - related entities	**74**	106
Goods and services - external parties	**1,346**	69
Total receivables for goods and services	**1,420**	175
Appropriations receivable:		
Special account - for existing programs	**215,120**	256,022
Total appropriations receivable	**215,120**	256,022
Other receivables:		
GST receivable from the Australian Taxation Office	**1,975**	4,912
Other debtors	**652**	488
Total other receivables	**2,627**	5,400
Total trade and other receivables (gross)	**219,166**	261,597
Receivables are expected to be recovered in:		
No more than 12 months	**219,166**	261,597
Total trade and other receivables (net)	**219,166**	261,597
Receivables are aged as follows:		
Not overdue	**219,106**	261,474
Overdue by:		
31 to 60 days	**17**	16
More than 90 days	**43**	107
Total receivables (gross)	**219,166**	261,597

No indicators of impairment allowance were found for trade and other receivables.

Murray-Darling Basin Authority

Notes to and forming part of the Financial Statements

Note 5: Non-Financial Assets Continued

Note 5C: Investment in the Joint Ventures using the equity method 2010-11

Joint Venture	**Equity held by MDBA %**	**Balance as at 30 June 2010 $'000**	**Contribution During the year $'000**	**Gain/(Loss) $'000**	**Balance as at 30 June 2011 $'000**
Ewater Co-operative Research Centre	**4.83%**	**-**	**500**	**(500)**	-
Invasive Native Animals Co-operative Research Centre	**21.02%**	**241**	**64**	**(113)**	**191**
Murray-Darling Freshwater Research Centre	**15.90%**	**278**	**893**	**(985)**	**186**
		519	**1,457**	**(1,599)**	**377**

Investment in the Joint Ventures using the equity method 2009-10

Joint Venture	Equity held by MDBA %	Balance as at 30 June 2009 $'000	Contribution During the year $'000	Gain/(Loss) $'000	Balance as at 30 June 2010 $'000
Ewater Co-operative Research Centre	4.83%	-	500	(500)	-
Invasive Native Animals Co-operative Research Centre	16.00%	367	750	(876)	241
Murray-Darling Freshwater Research Centre	19.80%	302	865	(889)	278
		669	2,115	(2,265)	519

Note 6: Non-Financial Assets

	2011	2010
	$'000	$'000
Note 6A: Property, plant & equipment		
Motor vehicles:		
- fair value	**50**	165
- accumulated depreciation	**(17)**	-
Total motor vehicles	**33**	165
Furniture, fittings and office equipment:		
- fair value	**369**	369
- accumulated depreciation	**(94)**	-
Total furniture, fittings and office equipment	**275**	369
Computers & IT equipment		
- fair value	**831**	354
- accumulated depreciation	**(277)**	(3)
Total computers & IT equipment	**554**	351
Total property, plant & equipment	**862**	885

In 2009-10 an independent valuation of all the assets was conducted by a valuer from the Australian Valuation Office as per valuation policy described in Note 1. In 2010-11, the assets were valued internally.

No indicators of impairment were found for plant and equipment.

Motor vehicles with a carrying amount of $33,000 are expected to be sold within the next 12 months; no other plant and equipment are expected to sold or disposed within the next 12 months.

Murray-Darling Basin Authority

Notes to and forming part of the Financial Statements

Note 6: Non-Financial Assets Continued

Table A **Reconciliation of the opening and closing balances of property, plant and equipment (2010-11)**

Item	Motor Vehicles	Furniture, Fittings & Office Equipment	Computer and IT Equipment	Total Plant & Equipment	Leasehold Improvements	Total
	$'000	$'000	$'000	$'000	$'000	$'000
As at 1 July 2010						
Gross book value	165	369	354	888	1,395	2,283
Accumulated depreciation and impairment	-	-	(3)	(3)	-	(3)
Net book value 1 July 2010	**165**	**369**	**351**	**885**	**1,395**	**2,280**
Additions	-	-	479	479	532	**1,011**
Make-good adjustments					540	**540**
Depreciation expense	(17)	(94)	(274)	(385)	(292)	**(677)**
Other disposals	(115)	-	(2)	(117)	-	**(117)**
Revaluations recognised in the operating result	-	-	-	-	-	**-**
Revaluations and impairments through equity	-	-	-	-	-	**-**
Net book value 30 June 2011	**33**	**275**	**554**	**862**	**2,175**	**3,037**
Net book value as of 30 June 2011 represented by:						
Gross book value	50	369	831	1,250	2,467	**3,717**
Accumulated depreciation	(17)	(94)	(277)	(388)	(292)	**(680)**
Net book value	**33**	**275**	**554**	**862**	**2,175**	**3,037**

Table B **Reconciliation of the opening and closing balances of property, plant and equipment (2009-10)**

Item	Motor Vehicles	Furniture, Fittings & Office Equipment	Computer and IT Equipment	Total Plant & Equipment	Leasehold Improvements	Total
	$'000	$'000	$'000	$'000	$'000	$'000
As at 1 July 2009						
Gross book value	189	542	565	1,296	1,758	**3,054**
Accumulated depreciation and impairment	(34)	(45)	(68)	(147)	(75)	**(222)**
Net book value 1 July 2009	**155**	**497**	**497**	**1,149**	**1,683**	**2,832**
Additions	-	19	130	149	137	**286**
Depreciation expense	(59)	(88)	(196)	(343)	(179)	**(522)**
Other disposals	(18)	-	(1)	(19)	-	**(19)**
Revaluations recognised in the operating result	-	(59)	(79)	(138)	(246)	**(384)**
Revaluations and impairments through equity	87	-	-	87	-	**87**
Net book value 30 June 2010	**165**	**369**	**351**	**885**	**1,395**	**2,280**
Net book value as of 30 June 2010 represented by:						
Gross book value	165	369	354	888	1,395	**2,283**
Accumulated depreciation	-	-	(3)	(3)	-	**(3)**
Net book value	**165**	**369**	**351**	**885**	**1,395**	**2,280**

Note 6: Non-Financial Assets Continued

	2011	2010
	$'000	$'000
Note 6B: Leasehold Improvements		
• Fair value	**2,467**	1,395
• Accumulated depreciation	**(292)**	-
Total leasehold improvements (non-current)	**2,175**	1,395

No indicators of impairment were found for leasehold improvements.

No leasehold improvements are expected to be sold or disposed of within the next 12 months.

Note 6C: Intangibles

Computer Software		
• Internally developed – in use	**1,439**	854
• Purchased	**2,362**	2,131
• Accumulated amortisation	**(1,724)**	(687)
Total intangibles	**2,077**	2,298

No indicators of impairment were found for intangible assets.

No intangibles are expected to be sold or disposed of within the next 12 months.

Note 6: Non-Financial Assets Continued

Table B: Reconciliation of the opening and closing balances of intangibles (2010-11)

Item	Computer Software Internally Developed	Computer Software Purchased	Total
	$'000	$'000	$'000
As at 1 July 2010			
Gross book value	854	2,131	2,985
Accumulated amortisation and impairment	(279)	(408)	(687)
Net book value 1 July 2010	**575**	**1,723**	**2,298**
Additions:			
Purchased	-	231	231
Internally developed	585	-	585
Amortisation	(147)	(890)	(1,037)
Net book value 30 June 2011	**1,013**	**1,064**	**2,077**
Net book value as of 30 June 2011 represented by:			
Gross book value	1,439	2,362	3,801
Accumulated amortisation and impairment	(426)	(1,298)	(1,724)
Net book value	**1,013**	**1,064**	**2,077**

Table B: Reconciliation of the opening and closing balances of intangibles (2009-10)

Item	Computer Software Internally Developed	Computer Software Purchased	Total
	$'000	$'000	$'000
As at 1 July 2009			
Gross book value	269	1,180	1,449
Accumulated amortisation and impairment	(132)	(25)	(157)
Net book value 1 July 2009	**137**	**1,155**	**1,292**
Additions:			
Purchased	-	950	950
Internally developed	585	-	585
Amortisation	(147)	(383)	(530)
Net book value 30 June 2010	**575**	**1,723**	**2,298**
Net book value as of 30 June 2010 represented by:			
Gross book value	854	2,131	2,985
Accumulated amortisation and impairment	(279)	(408)	(687)
Net book value	**575**	**1,723**	**2,298**

Note 6: Non-Financial Assets Continued

	2011 $'000	2010 $'000
Note 6D: Other Non-Financial Assets		
Payments to Joint Ventures in advance	**500**	-
Prepayments	**710**	775
Total other non-financial assets	**1,210**	775

All other non-financial assets are expected to be recovered in no more than 12 months.

No indicators of impairment were found for other non-financial assets.

Note 6E: Lease Assets		
Lease assets	**143**	-
Total lease assets	**143**	-

All other non-financial assets are expected to be recovered in no more than 12 months

No indicators of impairment were found for other non-financial assets.

Note 7: Payables

	2011	2010
	$'000	$'000
Note 7A: Suppliers		
Trade creditors and accruals	**31,889**	36,867
Operating lease rentals	**126**	-
Total supplier payables	**32,014**	36,867
Supplier payables expected to be settled within 12 months:		
Related entities	**1,038**	464
External parties	**30,871**	36,403
Total	**31,909**	36,867
Supplier payables expected to be greater than 12 months:		
External parties	**105**	-
Total	**105**	**-**
Total supplier payables	**32,014**	36,867

Settlement is usually made within 30 days.

Note 7B: Other		
Salaries and wages	**661**	455
Superannuation	**104**	89
Revenue received in advance - external entities	**3,487**	386
Total other payables	**4,252**	930

Other payables are expected to be settle within 12 months.

Note 8: Non-Interest Bearing Liabilities

	2011	2010
	$'000	$'000
Note 8: Lease incentive		
Lease incentive	**931**	886
Payable:		
No more than 12 months	**162**	131
More than 12 months	**769**	755
Total lease incentive	**931**	886

A lease fitout incentive, received on execution of the lease 51 Allara Street, is being amortised over the term of the lease. Similarly, a rent free priod incentive, received on execution of the lease on 40 Allara Street is being amortised over the term of the lease.

Note 9: Provisions

Note 9A: Employee Provisions		
Leave	**7,275**	6,592
Employee provisions are expected to be settled in:		
No more than 12 months	**1,700**	1,700
More than 12 months	**5,575**	4,892
Total employee provisions	**7,275**	6,592
Note 9B: Other Provisions		
Provision for restoration obligations		
Provision for make-good - 51 Allara st	460	-
Provision for make-good - 40 Allara st	106	-
	566	**-**
Other provisions are expected to be settled in:		
More than 12 months	**566**	-
Total other provisions	**566**	**-**

Murray-Darling Basin Authority

Notes to and forming part of the Financial Statements

Note 10: Cash Flow Reconciliation

	2011	2010
	$'000	$'000
Reconciliation of cash and cash equivalents as per Balance Sheet to Cash Flow Statement		
Cash and cash equivalents as per:		
Cash flow statement	**1,642**	3,321
Balance sheet	**1,642**	3,321
Difference	**-**	-
Reconciliation of net cost of services to net cash from operating activities:		
Net cost of services	**(116,967)**	(154,703)
Add revenue from Government	**75,666**	51,066
Less share of deficit in Joint Ventures	**(1,600)**	(2,265)
Adjustment for non-cash items		
Depreciation /amortisation	**1,741**	1,051
Write-down and impairment of assets	**-**	387
Gain on disposal of assets	**(17)**	(20)
Changes in assets / liabilities		
(Increase) / decrease in net receivables	**42,430**	109,965
(Increase) / decrease in other non-financial assets	**(618)**	(506)
(Increase) / decrease in share in Joint Ventures	**142**	150
Increase / (decrease) in supplier payables	**(4,853)**	(1,421)
Increase / (decrease) in revenue in advance	**3,322**	(9,339)
Increase / (decrease) in lease incentive	**45**	(132)
Increase / (decrease) in employee provisions	**683**	2,256
Increase / (decrease) in other provisions	**566**	-
Net cash from / (used by) operating activities	**540**	(3,511)

Note 11: Contingent Liabilities and Assets

Quantifiable Contingencies

Nil

Unquantifiable Contingencies

• In 2003, the Authority became a party to a Native Title Determination Application. It is not possible to estimate any liabilities arising out of this matter, which is currently subject to mediation.

• Under Section 239F of the *Water Act 2007* the liabilities of the Murray-Darling Basin Commission became liabilities of the Authority. This included any liability, duty or obligation, whether contingent or prospective, but does not include a liability, duty or obligation imposed by:
• an Act; or
• regulations or other subordinate legislation made under an ACT; or
• the *Murray-Darling Basin Act 1992* of New South Wales; or
• the *Murray-Darling Basin Act 1993* of Victoria; or
• the *Murray-Darling Basin Act 1996* of Queensland; or
• the *Murray-Darling Basin Act 1993* of South Australia; or
• the former MDB Agreement.

While the Authority has a management role in respect of the following agreements, there are no known quantifiable, or unquantifiable, contingencies evident at the reporting date:
• 'Asset Agreement for River Murray Operations Assets'
• 'Further Agreement on Addressing Water Over-allocation and Achieving Environmental Objectives in the Murray-Darling Basin – Control and

Murray-Darling Basin Authority

Notes to and forming part of the Financial Statements

Note 12: Senior Executive Remuneration

Note 12A: Senior Executive Remuneration Expense for the Reporting Period

	2011	2010
	$	$
Short-term employee benefits:		
Salary	**2,529,584**	2,030,058
Annual leave accrued	**185,644**	166,357
Performance bonuses	**-**	24,766
Motor Vehicle and Other Allowance	**224,432**	295,341
Total short-term employee benefits	**2,939,659**	2,516,523
Post-employment benefits:		
Superannuation	**329,479**	311,563
Total post-employment benefits	**329,479**	311,563
Other long-term benefits:		
Long-service leave	**85,855**	76,802
Total other long-term benefits	**85,855**	76,802
Termination benefits	**200,872**	-
Total	**3,555,865**	2,904,888

Notes:

1. Note 12A was prepared on an accrual basis (so the performance bonus expenses disclosed above differ from the cash 'Bonus paid' in Note 12B).

2. Note 12A excludes acting arrangements and part-year service where remuneration expensed for a senior executive was less than $150,000.

Murray-Darling Basin Authority

Notes to and forming part of the Financial Statements

Note 12B: Average Annual Remuneration Packages and Bonus Paid for Substantive Senior Executives as at the end of the Reporting Period

	as at 30 June 2011					as at 30 June 2010				
							Fixed elements			
Fixed Elements and Bonus Paid[1]	**Senior Executives**	**Salary**	**Allowances**	**Total**	**Bonus paid**	**Senior Executives**	**Salary**	**Allowances**	**Total**	**Bonus paid**
	No.	**$**	**$**	**$**	**$**	**No.**	**$**	**$**	**$**	**$**
Total remuneration (including part-time arrangements):										
less than $150,000	**-**	**-**	**-**	**-**	**-**	-	-	-	-	-
$150,000 to $179,999	**1**	**144,244**	**23,850**	**168,094**	**-**	2	151,931	22,500	174,431	1,885
$180,000 to $209,999	**7**	**175,080**	**20,219**	**195,300**	**-**	5	173,337	20,400	193,737	1,361
$210,000 to $239,999	**3**	**204,755**	**28,500**	**233,255**	**-**	2	191,213	25,500	216,713	7,097
$240,000 to $269,999	**1**	**242,112**	**20,724**	**262,836**	**-**	2	211,833	28,500	240,333	-
$270,000 to $299,999	**1**	**296,779**	**3,000**	**299,779**	**-**	1	243,130	49,430	292,560	-
Total	**13**					12				

Notes:

1. This table reports substantive senior executives who were employed by the entity at the end of the reporting period. Fixed elements were based on the employment agreement of each individual. Each row represents an average annualised figure (based on headcount) for the individuals in that remuneration package band (i.e. the 'Total' column).
2. Allowances: The fixed allowance relates to an allowance for motor vehicle, car parking and accommodation allowance.
3. Bonus paid: This represents average actual bonuses paid during the reporting period in that remuneration package band. The 'Bonus paid' was excluded from the 'Total' calculation, (for the purpose of determining remuneration package bands). The 'Bonus paid' within a particular band may vary between financial years due to various factors such as individuals commencing with or leaving the entity during the financial year.

Note 12B: Average Annual Remuneration Packages and Bonus Paid for Substantive Senior Executives as at the end of the Reporting Period continued

Variable Elements:

With the exception of performance bonuses, variable elements were not included in the 'Fixed Elements and Bonus Paid' table above. The following variable elements were available as part of senior executives' remuneration package:

(a) Bonuses:
- Performance bonuses were paid in financial year 2009-10 belonging to the former Murray-Darling Basin Commission. No performance bonuses have been paid after the inception of the MDBA.

(b) On average senior executives were entitled to the following leave entitlements:
- Annual Leave (AL): entitled to 20 days (2010: 20 days) each full year worked (pro-rata for part-time SES);
- Personal Leave (PL): entitled to 20 days (2010: 20 days) or part-time equivalent; and
- Long Service Leave (LSL): in accordance with Long Service Leave (Commonwealth Employees) Act 1976.

(c) Senior executives were members of one of the following superannuation funds:
- Australian Government Employee Superannuation Trust (AGEST): this fund is for senior executives who were employed for a defined period. Employer contributions were set at 9 per cent (2010: 9 per cent). More information on AGEST can be found at http://www.agest.com.au;
- Commonwealth Superannuation Scheme (CSS): this scheme is closed to new members, and employer contributions were averaged 28.3 per cent (2010: 24 per cent) (including productivity component). More information on CSS can be found at http://www.css.gov.au;
- Public Sector Superannuation Scheme (PSS): this scheme is closed to new members, current employer contributions were set at 15.4 per cent (2010: 15.4 per cent) (including productivity component). More information on PSS can be found at http://www.pss.gov.au;
- Public Sector Superannuation Accumulation Plan (PSSap): employer contributions were set at 15.4 percent (2010: 15.4 per cent), and the fund has been in operation since July 2005. More information on PSSap can be found at http://www.pssap.gov.au; and
- Other: there were some senior executives who had their own superannuation arrangements (e.g. self-managed superannuation funds). Their employer contributions were set at 15.4 per cent (2010: 15.4 per cent).

(d) Variable allowances:
- MDBA had no restriction payments during the financial year (2009-10: Nil); and
- Allowances available to senior executive include motor vehicle, carparking and accomodation allowance. Salary and allowances stated in the above table only represents base salary per individual determination and fixed allowances.

(e) Various salary sacrifice arrangements were available to senior executives including super, motor vehicle and expense payment fringe benefits.

Note 12C: Other Highly Paid Staff

During the reporting period, there were 4 employees (2010: 3 employees) whose salary plus performance bonus were $150,000 or more. These employees did not have a role as senior executive and are therefore not disclosed as senior executive in Note 12A and Note 12B.

Note 13: Remuneration of Auditors

	2011	2010
	$'000	$'000
Financial statement audit services were provided free of charge to the Authority.		
The fair value of the services provided was:		
Australian National Audit Office - MDBA 30 June	**55**	58
	55	58
Other Services provided by ANAO and paid by the Authority.		
Australian National Audit Office - Living Murray Initiative Joint Venture Special Purpose Financial Statements to 30 June	**18**	22
Australian National Audit Office - River Murray Operations Joint Venture Special Purpose Financial Statements to 30 June	**20**	24
	38	46

No other services were provided by the ANAO.

Murray-Darling Basin Authority

Notes to and forming part of the Financial Statements

Note 14: Financial Instruments

		2011	2010
		$'000	$'000
14A:	**Categories of Financial Instruments**		
Financial Assets			
Loans and receivables:			
Cash and cash equivalents		**1,642**	3,321
Trade and other receivables		**1,420**	175
Accrued debtors		**652**	488
Carrying amount of financial assets		**3,714**	3,984
Financial Liabilities			
At amortised cost:			
Trade creditors		**32,014**	36,867
Revenue received in advance		**3,487**	386
Carrying amount of financial liabilities		**35,501**	37,253

14B: Fair Value of Financial Instruments

All financial instruments are held at fair value.

Note 14: Financial Instruments Continued

14C: Credit Risk Exposure

Credit risk represents the loss that would be recognised if counterparties failed to perform as contracted. The maximum credit risk on financial assets of which the Authority recognised is exposed is the carrying amount net of any impairment loss as indicated in the balance sheet. Due to the nature of the majority of the Authority's receivables are from Government Agencies, such risk is considered by the Authority to be low. MDBA holds no collateral to mitigate against credit risk.

Credit quality of financial instruments not past due or individually determined as impaired

	Not past due nor impaired	Not past due nor impaired
	2011	2010
	$'000	$'000
Cash and cash equivalents	**1,642**	3,321
Trade and other receivables	**1,420**	175
Accrued debtors	**652**	488
Total	**3,714**	3,984

Murray-Darling Basin Authority

Notes to and forming part of the Financial Statements

14D: Liquidity Risk

Maturities for non-derivative financial liabilities 2011

	On demand	within 1 year	1 to 2 years	2 to 5 years	> 5 years	Total 2011
	$'000	$'000	$'000	$'000	$'000	$'000
Trade creditors	-	32,014	-	-	-	32,014
Revenue received in advance	-	3,487	-	-	-	3,487
Total	-	35,501	-	-	-	35,501

Maturities for non-derivative financial liabilities 2010

	On demand	within 1 year	1 to 2 years	2 to 5 years	> 5 years	Total 2011
	$'000	$'000	$'000	$'000	$'000	$'000
Trade creditors	-	36,867	-	-	-	36,867
Revenue received in advance	-	386	-	-	-	386
Total	-	37,253	-	-	-	37,253

MDBA's financial liabilities and revenue receivable in advance are payables.

MDBA is appropriated funding from the Australian Government and jurisdictions and the MDBA manages its budgeted funds to ensure it has adequate funds to meet payments as they fall due. In addition, the MDBA has policies in place to ensure timely payment are made when due and has no past experience of default. MDBA has no derivative financial liabilities in both the current and prior year.

14E: Market Risk

The Authority holds basic financial instruments that do not expose the Authority to certain market risks. The Authority is not exposed to 'Currency risk' or 'Other past due' financial risks.

The Authority does not have any interest bearing liabilities at the period end.

Murray-Darling Basin Authority

Notes to and forming part of the Financial Statements

Note 15: Appropriations

Table A: Annual Appropriations ('Recoverable GST exclusive')

	2011 Appropriations							Appropriation applied in 2011 (current and prior)	Variance
	Appropriation Act			*FMA Act*			Total appropriation		
	Annual Appropriation $'000	Appropriations reduced[(a)] $'000	AFM $'000	Section 30 $'000	Section 31 $'000	Section 32 $'000	$'000	$'000	$'000
DEPARTMENTAL									
Ordinary annual services	**75,666**	**-**	**-**	**-**	**-**	**-**	**75,666**	**75,666**	**-**
Other services									
Equity	-	-	-	-		-	-	-	-
Loans	-	-	-	-		-	-	-	-
Previous years' outputs	-	-	-	-		-	-	-	-
Total departmental	**75,666**	**-**	**-**	**-**	**-**	**-**	**75,666**	**75,666**	**-**

Notes:

(a) Appropriations reduced under Appropriation Acts (No.1,3,5) 2010-11: sections 10, 11, 12 and 15 and under Appropriation Acts (No.2,4,6) 2010-11: sections 12,13, 14 and 17. Departmental appropriations do not lapse at financial year-end. However, the responsible Minister may decide that part or all of a departmental appropriation is not required and request that the Finance Minister reduce that appropriation. The reduction in the appropriation is effected by the Finance Minister's determination and is disallowable by Parliament.

	2010 Appropriations							Appropriation applied in 2010 (current and prior years)	Variance
	Appropriation Act			*FMA Act*			Total appropriation		
	Annual Appropriation $'000	Appropriations reduced[(a)] $'000	AFM $'000	Section 30 $'000	Section 31 $'000	Section 32 $'000	$'000	$'000	$'000
DEPARTMENTAL									
Ordinary annual services	51,066	-	-	-	-	-	51,066	51,066	-
Other services									
Equity	-	-	-	-		-	-	-	-
Loans	-	-	-	-		-	-	-	-
Previous years' outputs	13,522	**-**	**-**	**-**		**-**	13,522	13,522	**-**
Total departmental	64,588	-	-	-	-	-	64,588	64,588	-

Notes:

(a) Appropriations reduced under Appropriation Acts (No.1,3,5) 2009-10: sections 10, 11, 12 and 15 and under Appropriation Acts (No.2,4,6) 2009-10: sections 12,13, 14 and 17. Departmental appropriations do not lapse at financial year-end. However, the responsible Minister may decide that part or all of a departmental appropriation is not required and request that the Finance Minister reduce that appropriation. The reduction in the appropriation is effected by the Finance Minister's determination and is disallowable by Parliament.

Murray-Darling Basin Authority

Notes to and forming part of the Financial Statements

Note 16: Special Account

Departmental - Murray-Darling Basin Special Account	**2011 $'000**	2010 $'000
Appropriation: *Financial Management and Accountability Act 1997 section 21* Establishing Instrument: *Water Act 2007 s 209*		
Purpose: i) in payment or discharge of the costs, expenses and other obligations incurred by the Authority in the performance of the Authority's functions; ii) in payment of any remuneration and allowances payable to any person under the *Water Act 2007* ; and iii) meeting the expenses of administering the Account.		
Balance brought forward from previous period	**264,437**	365,342
Appropriation Act:		
Appropriation Act (No. 1)	**49,053**	50,349
Appropriation Act (No. 2)	**-**	13,522
Appropriation Act (No. 3)	**26,613**	717
FMA Act:		
Contribution from Jurisdictions	**95,599**	83,616
Other receipts	**6,209**	31,524
Total increase	**177,474**	179,728
Available for payments	**441,911**	545,070
Payments made to employees	**33,164**	29,166
Payments made to suppliers	**189,147**	251,467
Total decrease	**222,311**	280,633
Balance carried to next period	**219,600**	264,437
Total balance carried to the next period	**219,600**	264,437

The Authority has recently become aware that there is a risk of non-compliance with Section 83 of the Constitution where payments are made from special accounts in circumstances where the payments do not accord with conditions included in the relevant legislation.

While the Authority is confident at this time that no such payments have been made, it has undertaken to investigate the circumstances surrounding all payments made from its Special Account, together with any impact on the balance of the Special Account, seeking legal advice as appropriate. It should be noted that the Authority has not received any Special Appropriations during 2010-11 or the previous financial year.

These steps will be performed during the 2011-12 financial year following further consultation with the Department of Finance and Deregulation and the Australian National Audit Office.

Note 17: Compensation and Debt Relief

Departmental

No 'Act of Grace' expenses were incurred during the reporting period (2009-10: Nil expenses).

No payments were made under s73 of the *Public Service Act 1999* during the reporting period.

No waivers of amounts owing to the Australian Government were made pursuant to subsection 34(1) of the *Financial Management and Accountability Act 1997* (2009-10: Nil waivers).

No payments were provided under the Compensation for Detriment caused by Defective Administration (CDDA) Scheme during the reporting period (2009-10: Nil payments).

No ex-gratia payments were provided for during the reporting period (2009-10: Nil payments).

No payments were provided in special circumstances relating to APS employment pursuant to section 73 of the *Public Service Act 1999* (PS Act) during the reporting period (2009-10: Nil payments).

Murray-Darling Basin Authority

Notes to and forming part of the Financial Statements

Note 18: Reporting of Outcome

Outcome:

The Authority has one outcome, being Outcome 1:

> 'Equitable and sustainable use of the Murray-Darling Basin by governments and the community including through development and implementation of a Basin Plan, operation of the River Murray system, shared natural resource management programs, research, information and advice'.

This outcome is in turn supported by four Program objectives:

- Trans-boundary Water Management Arrangements
- River and Ecosystem Health
- Knowledge into Action
- River Murray Operations Assets

Net cost of Reporting of Outcome Delivery

	Outcome 1		Total	
	2011 $'000	2010 $'000	**2011 $'000**	2010 $'000
Expense				
Departmental	**(217,056)**	(278,548)	**(217,056)**	(217,056)
Total	**(217,056)**	(278,548)	**(217,056)**	(217,056)
Income from non-government sector	**-**	-	**-**	-
Departmental	**-**	-	**-**	-
Other	**95,521**	83,699	**95,521**	83,699
Total Departmental	**95,521**	83,699	**95,521**	83,699
Total	**95,521**	83,699	**95,521**	83,699
Other own-source revenue	**-**	-	**-**	-
Departmental	**4,568**	40,146	**4,568**	40,146
Total	**4,568**	40,146	**4,568**	40,146
Net cost of outcome delivery	**(116,967)**	(154,703)	**(116,967)**	(154,703)

APPENDIXES

Appendix A

MDBA governance !

Governance of the Murray–Darling Basin Authority (MDBA) is carried out by:

- the Commonwealth Water Minister, currently the Minister for Sustainability, Environment, Water, Population and Communities, Senator the Hon Tony Burke MP
- the six-member Murray–Darling Basin Authority
- the Murray–Darling Basin Ministerial Council
- the Basin Officials Committee
- the Basin Community Committee.

More information about the Authority, Ministerial Council and the committees, their membership and their activities during 2010–11 is provided in this appendix, while the relationships between the bodies themselves are outlined in Figure A.1.

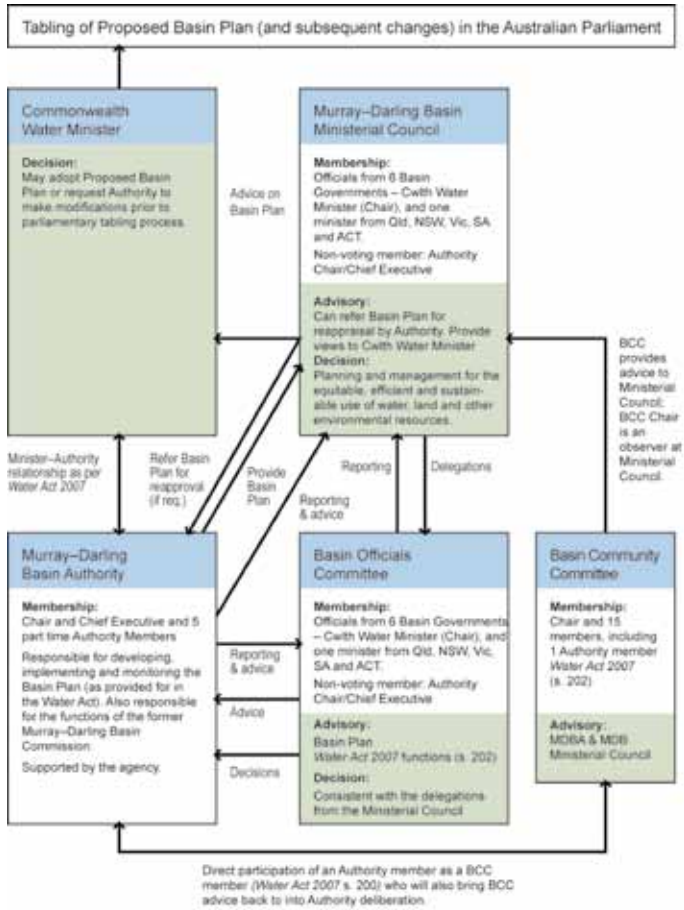


Figure A.1 MDBA governance structure and relationships

Murray–Darling Basin Authority

The MDBA is the statutory agency that manages the Murray–Darling Basin's water resources in the national interest. The agency is responsible for preparing and overseeing the Basin Plan, a legally enforceable management plan for the Basin.

In broad terms, MDBA's functions are:

- planning for the water resources of the Murray–Darling Basin through preparing the Basin Plan — including planning for critical human water needs
- collecting and disseminating information about the water resources of the Basin
- carrying out river operations, including managing assets
- carrying out natural resource management measures
- giving effect to agreed state water shares
- carrying out detailed technical obligations such as water trades and transfers, the current Cap on diversions and salinity measures.

More information about MDBA's role and structure can be found in Part 9, Division 2 of the *Water Act 2007* (Cwlth) and in this report at pp. 27–32.

The Authority

The MDBA is overseen by the Murray–Darling Basin Authority (the Authority), which consists of the Chief Executive, a chair and four other members (currently one position is vacant). Each Authority member is appointed by the Governor-General and must have a high level of expertise in one or more fields relevant to the activities of the agency itself — water resource management, hydrology, freshwater ecology, resource economics, irrigated agriculture, public sector management and financial management.

Authority members

At 30 June 2011, Authority members are:

Craig Knowles

The Hon Craig Knowles was appointed Chair of the Authority from 1 February 2011. As a member of the New South Wales Government from 1995 to 2005, he was Minister for Planning and Housing (1995–99); Minister for Health (1999–2003); Minister for Infrastructure, Planning and Natural Resources (2003 to August 2005); and Minister for Forests and Lands (2003 to January 2005).

Before entering parliament, Craig worked in property, land management, planning and valuation, in both the private sector (1978–86) and for New South Wales public sector agencies including the Macarthur Development Corporation, the Premier's Department, the Office of State Development and the Department of Business and Consumer Affairs (1986–90).

Dianne Davidson

Dianne Davidson has a strong management background in natural resources, particularly water and irrigated agriculture. She is a former member of the South Australian Premier's Climate Change Council and has served on the South Australian Murray–Darling Basin Natural Resource Management Board.

Rhondda Dickson

Dr Rhondda Dickson was the Acting Chief Executive and Authority member from 2 June to 30 September 2011, with formal appointment as Chief Executive taking effect from 1 October 2011. Rhondda is an experienced leader in natural resource management policy, most recently holding senior positions in the Department of Agriculture, Fisheries and Forestry and the Department of the Prime Minister and Cabinet.

David Green

David Green has been involved in water policy and water reform in Queensland since the mid-1990s. He is a former Queensland Water Commissioner and a former board member of the South East Queensland Water Grid Manager. David has extensive experience in water resource management and planning, economics, governance and water trading matters.

Barry Hart

Professor Barry Hart is an Emeritus Professor at Monash University and has over 35 years' experience in freshwater ecology and natural resource management. Barry also chairs a number of government scientific and strategic advisory committees, and is director of an environmental consulting company.

Farewells

During the year the Authority farewelled the following members:

- Michael Taylor AO, who resigned as Chair on 7 December 2010 with a date of effect of 31 January 2011
- Dr Diana Day, who resigned on 25 February 2011
- Rob Freeman, who commenced leave from the Authority on 2 June and resigns as Chief Executive and Authority member on 30 September 2011.

Meetings and outcomes

The Authority held 27 meetings during 2010–11. Significant outcomes for the year were:

- Production of the *Guide to the proposed Basin Plan* and its publication for public consultation on 8 October 2010. This major production effort involved reviewing scientific evidence, analysing stakeholder feedback and consultants' reports and determining policy.
- Participation in engagement activities to support the release of the Guide. The former Chair of the Authority and the Chief Executive attended many of the 33 community information sessions organised by Murray–Darling Basin Authority staff. These sessions were held in regional and metropolitan locations throughout the Murray–Darling Basin during November and December 2010. Other Authority members attended these sessions when possible and also participated in stakeholder-initiated events.
- Publication of feedback on the Guide, where authors permitted release.
- Organisation of bilateral meetings at which Authority members met with representatives of Basin state governments about their formal feedback on the Guide.
- Holding of meetings between the incoming Authority Chair, the Hon Craig Knowles, with regional leaders in more than 20 towns across the Basin to lay the foundations for future community engagement on the draft Basin Plan.
- Focus of effort on developing the draft Basin Plan, including:
  - Establishment on 30 March 2011 of a nine-member Proposed Basin Plan Testing Committee under the Water Act to test approaches and provide advice to the Authority ahead of finalising the draft Basin Plan. The committee operates in addition to and alongside existing consultative bodies, including the Basin Community Committee and Basin Officials Committee.
  - Establishment on 25 March 2011 of a seven-member Proposed Basin Plan Working Group to assist the Authority in the ongoing development of essential policy elements of the draft Basin Plan. This assistance does not replace the Authority's overall decision-making role in the preparation of the draft Basin Plan.

  - Organisation and holding of a two-day forum of selected scientists to consider the application of science to determining an 'environmentally sustainable level of take' in the development of the draft Basin Plan.
- Involvement of the Basin Officials Committee and the Basin Community Committee in an engagement and communications approach in the lead-up to and following the release of the draft Basin Plan in late 2011.
- Appearance of the Chair and Chief Executive before the House of Representatives Standing Committee on Regional Australia inquiry into the impact of the Murray–Darling Basin Plan in regional Australia (the Windsor inquiry).
- Appearance of the Chief Executive before the Senate Legal and Constitutional Affairs Committee inquiry into the provisions of the Water Act.
- Endorsement of MDBA's draft corporate plan for 2011–15 for submission to the Murray–Darling Basin Ministerial Council for approval.
- Receipt of the following reports from major social and economic consultancies:
  - *Modelling the socioeconomic implications of the introduction of sustainable diversion limits in the Murray–Darling Basin*, Centre for Policy Studies
  - *Benefits and costs of the draft Basin Plan, discussion and issues*, Centre for International Economics
  - *Community impacts of the Guide to the proposed Basin Plan*, EBC Consortium.
- Establishment of the Australian Cultural Flows Research Steering Committee to develop a detailed research proposal for the Cultural Flows Research Project.

Murray–Darling Basin Ministerial Council

The Murray–Darling Basin Ministerial Council is established by the Murray–Darling Basin Agreement, Schedule 1 to the Water Act.

The Ministerial Council considers and determines outcomes and objectives on major policy issues of common interests to governments on water and natural resource management in the Murray–Darling Basin. The council also approves MDBA's annual corporate plan and budget. It has policy and decision-making roles for matters such as state water shares, critical human water needs and the funding and delivery of natural resource management programs; it also has an advisory role in the preparation of the draft Basin Plan.

The council may give directions to the Basin Officials Committee concerning the committee's functions and powers under the Murray–Darling Basin Agreement, and can also seek the advice of the Basin Community Committee.

Membership of the Murray–Darling Basin Ministerial Council comprises the Commonwealth Water Minister (the Minister for Sustainability, Environment, Water, Population and Communities, the Hon Tony Burke), who chairs the council, and one minister from each of the Basin states, including the Australian Capital Territory.

Chair

Senator the Hon Penny Wong (Commonwealth) (to 12 September 2010)

Senator the Hon Tony Burke (Commonwealth) (from 26 October 2010)

Members

The Hon Phillip Costa (New South Wales) (to 26 March 2011)

The Hon Katrina Hodgkinson (New South Wales) (from 26 May 2011)

The Hon Tim Holding (Victoria) (to 16 December 2010)

The Hon Peter Walsh (Victoria) (from 17 December 2010)

The Hon Paul Caica (South Australia)

The Hon Stephen Robertson (Queensland) (to 21 February 2011)

The Hon Kate Jones (Queensland) (from 4 March 2011)

Mr Simon Corbell (Australian Capital Territory)

Meetings and outcomes

The Ministerial Council held two meetings during 2010–11 and achieved the following significant outcomes:

- approved MDBA's corporate plan for 2011–12 to 2014–15
- approved the final report on a strategy for MDBA funding beyond 2010–11
- approved additions to the register of water recovered for the environment under The Living Murray program
- released a report into the scale and extent of acid sulfate soils in the southern Basin
- endorsed MDBA's work in articulating Indigenous cultural values associated with rivers and wetlands, and proposed a framework for their incorporation into state water plans
- approved the Schedule for Water Sharing and the Schedule to Account for South Australia's Storage Right.

In regard to the draft Basin Plan, the Ministerial Council:

- agreed to support a new process for the Basin Plan that will increase the involvement of state governments and Basin communities
- encouraged MDBA to release the draft Basin Plan according to a timetable that allows it to take into account findings of the House of Representatives Committee inquiry chaired by Mr Tony Windsor MP
- called for the scientific basis and environmental benefits of the draft Basin Plan to be presented fully and clearly and in a way that allows for proper external analysis and scrutiny and community engagement
- requested that MDBA consider aligning the commencement dates in all states to 2019
- reiterated its view that the draft Basin Plan must be evidence-based and underpinned by the best available science
- agreed that each jurisdiction has a role in supporting local communities to contribute their experience, knowledge and innovative local practices.

Basin Officials Committee

The Basin Officials Committee is established by the Murray–Darling Basin Agreement, Schedule 1 to the Water Act.

The committee facilitates cooperation and coordination between the Australian Government, MDBA and the Basin states in managing the Basin's water resources.

The committee is responsible for providing advice to the Murray–Darling Basin Ministerial Council and for implementing policy and decisions of the council on matters such as state water shares and the funding and delivery of natural resource management programs.

The committee has high-level decision-making responsibilities for river operations, including setting objectives and outcomes to be achieved by the Authority in River Murray operations.

The committee has a role in advising the Authority about engaging the Basin states in the preparation of the draft Basin Plan.

Committee members are officials from the five Basin state governments and the Australian Government, and the committee is chaired by an Australian Government committee member. The Authority's Chair and Chief Executive are non-voting members of the committee.

Chair

Dr James Horne (to January 2011)

Mr David Parker (from 16 March 2011)

Members

Mr David Harriss (New South Wales)

Mr David Downie (Victoria, to 21 April 2011)

Mr Scott Ashby (South Australia)

Ms Debbie Best (Queensland)

Mr David Papps (Australian Capital Territory)

Meetings and outcomes

The Basin Officials Committee held six meetings during 2010–11 and achieved the following significant outcomes:

- completed stage 1 and commenced stage 2 of a review on the Murray–Darling Basin Agreement
- participated in a workshop and reviewed a final report on a strategy for MDBA funding beyond 2010–11 for approval by the Murray–Darling Basin Ministerial Council
- considered the Schedule for Water Sharing and the Schedule to Account for South Australia's Storage Right, and recommended them for approval by the Ministerial Council
- received a report from the Independent River Operations Review Group on the review of River Murray operations for 2010–11
- considered environmental water recovery reports for December 2009 and June 2010
- agreed to submit the draft MDBA corporate plan for 2011–12 to 2014–15 to Ministerial Council.

Basin Community Committee

The 16-member Basin Community Committee advises MDBA about the performance of its functions, including:

- engaging the community in the preparation of each draft of the draft Basin Plan
- community matters relating to the Basin water resources
- matters referred to the committee by the Authority.

The committee's role relates to water and other natural resources of the Murray–Darling Basin.

The committee advises the Murray–Darling Basin Ministerial Council on its functions under the Murray–Darling Basin Agreement, which may include matters such as delivery of natural resource management programs.

In performing these functions, the Basin Community Committee liaises with the wider Basin community, including by convening regional meetings with Basin stakeholders during the planning process for the draft Basin Plan and undertaking appropriate liaison activities to help provide advice to the Authority and the Ministerial Council.

Chair

Ms Joan Burns

Members

Ms Danielle Anderson
Ms Cheryl Buchanan
Ms Mary-Lou Gittins
Mr Henry Jones
Mr Jeff Parish OAM
Ms Kathryn Ridge
Dr Guy Roth
Mr Rory Treweeke
Dr Arlene Harriss-Buchan
Professor Ian Falconer AO
Mr Les Gordon
Ms Sarah Nicholas
Mr Russell Pell
Mr Matthew Rigney
Mr Dick Thompson

Meetings and outcomes

The Basin Community Committee held 11 meetings during 2010–11 and achieved the following significant outcomes:

- Provided draft Basin Plan development updates to committee members at meetings held in July, August, September and October 2010, in preparation for the release of the *Guide to the proposed Basin Plan*.
- Held two-day regional meetings (in November and December 2010, and in February, March and April 2011), during which committee members met with various stakeholder groups, including local community representatives, to hear about preferred engagement methods and water management issues. The second day of each meeting was set aside for Basin Community Committee discussions.

- Relayed stakeholder concerns heard by committee members at regional meetings to MDBA.
- Basin Community Committee Chair Ms Joan Burns accompanied the Hon Craig Knowles on part of his tour of the Basin during March and April 2011, during which they met with groups from across the Basin to discuss development of the draft Basin Plan and community engagement and information-sharing processes.
- Organised some of the local itineraries and programs for the Authority Chair for his visits to Basin centres, to ensure cross-sectional representation at community meetings.

The Basin Community Committee also advised the Authority on:

- *Delivering the Basin Plan: economic and social profiles and impact assessments in the Murray–Darling Basin*, a report by Marsden Jacobs Associates
- some social and economic catchment reports
- environmental water needs reports
- elements of the Guide and the draft Basin Plan:
  - critical human water needs
  - linking environmental watering plans to sustainable diversion limits
  - the Coorong, Lower Lakes and Murray Mouth end-of-system flows
- technical basis of the Guide
- engagement activities in general and during the public consultation phase on the draft Basin Plan
- issues raised by Basin communities
- local itineraries and invitation lists for the Authority Chair's regional tour
- engagement with Basin states and the Australian Government.

The committee developed recommendations for the Authority and the Murray–Darling Basin Ministerial Council that it called the 'Way forward', which provides advice on:

- developing a clear and widely accepted vision for managing the Basin's resources
- engaging with Basin states and the Australian Government
- following a progressive, interactive path to water resource management
- reconnecting with Basin communities
- cultural flows.

Appendix B

Agency resource statement and resources for outcome 1

Agency resource statement

Agency resource statements provide information about the various funding sources an agency may draw upon during the year.

The agency resource statement has been designed to allow reconciliation of the final usage of all resources in cash terms, by declaring the actual available appropriation for 2010–11 (including carried forward cash balances and further adjustments such as s. 32 transfers under the Commonwealth *Financial Management and Accountability Act 1997* and advances to the Finance Minister), and comparing this to the actual payments made.

Additionally, for departmental appropriations and special accounts, information about any remaining balance that will be carried over to the next financial year must also be reported.

Table B.1 MDBA agency resource statement, 2010–11

	Actual available Appropriations for 2010–11 $'000	Payments made in 2010–11 $'000	Balance remaining $'000
Ordinary annual services			
Departmental appropriation[1]	75,666	75,666	–
Total	**75,666**	**75,666**	**–**
Administered expenses			
Outcome	–	–	
Total	**–**	**–**	
Total ordinary annual services	75,666	75,666	
Other services*			
Administered expenses			
Specific payments to states, ACT, NT and local government			

Continued/....

	Actual available Appropriations for 2010–11 $'000	Payments made in 2010–11 $'000	Balance remaining $'000
Outcome	–	–	
Total	**–**	**–**	
New administered expenses			
Outcome	–	–	
Total	**–**	**–**	
Departmental non-operating			
Equity injections Previous years' outputs	–	–	
Total			
Administered non-operating			
Administered assets and liabilities	–	–	
Payments to CAC Act* bodies — non-operating			
Total			
Total other services			
Special appropriations			
Special appropriations limited by criteria/ entitlement			
Special appropriations limited by amount			
Total special appropriations			
Special accounts			
Opening balance	264,437		
Appropriations receipts	75,666		
Appropriation receipts — other agencies	–		
Non-appropriation receipts to Special Accounts[2]	101,808		
Payments made		222,311	
Closing balance			219,600
Total resourcing and payments	**517,577**	**297,977**	
Less appropriations drawn from annual or special appropriations above and credited to Special Account	(75,666)	(75,666)	
Total net resourcing and payments	**441,911**	**222,311**	**219,600**

Continued/....

Notes

* *Commonwealth Authorities and Companies Act 1997*

[1]	Includes:	
	Appropriation for Basin Plan activities	$38,240
	Commonwealth share of contribution to Murray–Darling Basin Agreement functions	$18,319
	Interest equivalency	$15,774
	Commonwealth share of contribution for restoration of Hume Dam southern training wall	$3,333
	Total	**$75, 666**
[2]	Includes:	
	Jurisdiction contribution to Murray–Darling Basin Agreement functions	$85, 599
	Jurisdiction contribution for restoration of Hume Dam southern training wall	$10,000
	Other miscellaneous receipts	$6,209
	Total	**$101,808**

Appendix C

MDBA collaboration with the international water sector

The Murray–Darling Basin Authority is viewed internationally as a leader in integrated water resources management. This is reflected in a growing interest in MDBA business, particularly around development of the draft Basin Plan.

During 2010–11 MDBA continued its involvement in two ongoing partnerships, the Australia–China Environmental Development Partnership and the Mekong River Commission.

The MDBA is one of five core Australian Government partners involved in the Australia–China Environmental Development Partnership, which is funded and administered by the Australian Government through AusAID. In the past financial year, MDBA contributed to the partnership by meeting with inbound delegations and participating in a high-level round table meeting of all Australia–China Environmental Development Partnership core partners.

The Mekong River Commission and MDBA have extended a successful collaboration that dates back to 1996 with the signing of a memorandum of understanding supported by AusAID and the International Centre for Excellence in Water Resources Management. This memorandum of understanding aims to continue the exchange of knowledge and information between the two agencies.

The MDBA also responded to requests for engagement by receiving delegations from countries including the People's Republic of China, Cambodia, Japan, Thailand, Vietnam, India and the Netherlands. Among other matters, these delegations were interested in the draft Basin Plan, water trade, community and Indigenous engagement, and water policy and governance.

Appendix D

Advertising and market research

This table of expenditure for 2010–11 is presented in accordance with the reporting requirements in s. 311A of the *Commonwealth Electoral Act 1918*. Expenditure was in the media advertising category only.

Media advertising		
Agency	**Purpose**	**Expenditure $**
Adcorp	Draft Basin Plan press campaign	46,653.00
Adcorp	Draft Basin Plan press campaign	630.32
Adcorp	Draft Basin Plan press campaign	767.26
Adcorp	Draft Basin Plan press campaign	902.58
Adcorp	External recruitment advertising	76,125.58
Adcorp	Non-campaign advertising for the release of the *Guide to the proposed Basin Plan*	45,315.35
The Public Affairs	External recruitment advertising	48.41
McCann Erickson	National Farmers Federation Annual Review	2,270.25
Total		**$172,712.75**

Appendix E

Ecologically sustainable development and environmental performance

The Murray–Darling Basin Authority (MDBA) is an integral part of the Australian Government's Water for the Future program, which has four priorities:

- taking action on climate change
- supporting healthy rivers
- using water wisely
- securing our water supplies.

The MDBA is responsible for planning the integrated management of the water resources of the Murray–Darling Basin, a responsibility reflected in MDBA's outcome in the 2010–11 Portfolio Budget Statements:

> Equitable and sustainable use of the Murray–Darling Basin by governments and the community including through development and implementation of a Basin Plan, operation of the River Murray System, shared natural resource management programs, research, information and advice.

Ecologically sustainable development is the core of MDBA activities and business. Section 21(4)(a) of the *Water Act 2007* (Cwlth) requires that when exercising its powers to perform functions relating to the Basin Plan, MDBA must consider the following ecologically sustainable development principles:

- decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations
- if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- the principle of intergenerational equity — that the present generation should ensure that the health, biodiversity and productivity of the environment is maintained or enhanced for the benefit of future generations
- the conservation of biodiversity and ecological integrity should be a fundamental consideration in decision-making
- improved valuation, pricing and incentive mechanisms should be promoted.

Our contributions to ecologically sustainable development through our policies and programs

The general programs referred to below are from the *Murray–Darling Basin Authority corporate plan 2009–10 to 2012–13*.

Program 1: Basin Plan corporate plan objective

> To prepare, implement, monitor and enforce the Basin Plan, and undertake activities relevant to jurisdictional water resource plans, for the sustainable management of water resources in the Murray–Darling Basin.

Key elements of this program include:

- preparing a Basin Plan that includes sustainable limits on water that can be taken from surface water and groundwater systems across the Murray–Darling Basin, an environmental watering plan, a water quality and salinity management plan, water trading rules and an evaluation, monitoring and compliance strategy
- advising the Commonwealth Water Minister on the accreditation of state water resource plans
- measuring and monitoring water resources in the Basin.

Program 2: Natural Resource Management corporate plan objective

> To develop and implement strategies for the protection and enhancement of the Basin's shared water and other natural resources.

Key elements of this program include:

- finalising water recovery programs, progressing works programs and managing environmental water for the River Murray
- delivering Basin-wide programs for protection and enhancement of natural systems
- developing a Basin-wide information strategy, including a water rights information service.

Program 3: River Murray corporate plan objective

> To manage, operate and sustain the River Murray assets to deliver states' shares of water and environmental outcomes in the River Murray System.

Key elements of this program include:

- delivering agreed water shares
- sustaining and improving physical assets to contemporary best practice standards
- improving environmental and consumptive use outcomes through development of improved water management and delivery tools.

During 2010–11, construction continued on new infrastructure under the Environmental Works and Measures Program to maximise the environmental gains from the use of water recovered for the environment within the Basin.

Our contribution to ecologically sustainable development through internal operations

In our internal operations, MDBA follows the principles of ecologically sustainable development, as reflected in the following examples:

- operating a paper, plastic and organic waste recycling program
- using 100% recycled A3 paper and 80% recycled A4 paper for all printing
- minimising paper use by setting printers to double-sided printing
- recycling printer cartridges
- using recycled paper products in all bathrooms
- using water-saving flushes in all bathrooms to reduce water consumption
- using power-efficient centralised multifunction devices instead of distributed desktop printing
- implementing server virtualisation to reduce power usage
- turning off computers automatically overnight to save power
- monitoring desktop computer power usage so that the success of power-saving initiatives can be measured
- operating lighting through movement sensors in all work spaces, so that lights are switched off when areas are not in use
- purchasing energy-saving whitegoods and information communication technology equipment
- minimising wastage through surplus stock by identifying most likely print run requirements so they reflect expected demand.

We continue to look at further opportunities in our internal operations and in our premises to further minimise our impact on the environment.

Appendix F

MDBA publications

	Title	Pub No./format
1	*Basin Salinity Management Strategy report 2009–10*	117/11*
2	*Independent Audit Group for salinity report 2009–10*	118/11
3	*The Living Murray implementation report and Independent Audit Group report 2009–10*	143/11
4	*Water audit monitoring report 2009–10*	144/11
5	*River Murray System annual operating plan 2011–12*	146/11
6	*Acid sulfate soils in the Murray–Darling Basin*	147/11
7	*Northern Basin Program review report*	213/11
8	*Mapping the condition of the river red gum and black box stands in The Living Murray icon sites 2009*	51/10
9	*Detailed assessment of the acid sulfate soils in the Murray–Darling Basin*	57/10
10	*Irrigated agriculture in the Mallee: Estimating root zone*	58/10
11	*Guide to the proposed Basin Plan: overview*	60/10
12	*Guide to the proposed Basin Plan: technical background*	61/10
13	*Options for the next generation of the NRM programs in the Murray–Darling Basin*	107/10
14	*Murray–Darling Basin Authority annual report 2009–10*	110/10
15	*Lake Victoria annual report 2009–10*	113/10
16	*Review of Cap implementation Independent Audit Group report 2009–10*	114/10
17	*Drought contingency monitoring at Tumudgery Creek, NSW*	115/10
18	*Drought contingency monitoring at Back Creek, NSW*	116/10
19	*Basin Salinity Management Strategy summary 2009–10*	brochure
20	*Murray–Darling Basin overview*	brochure

	Title	Pub No./format
21	*The development of wetland conceptual models for the semi-arid zone*	04/09
22	*Waterbird response to flooding in the northern Murray–Darling Basin 2008*	05/09
23	*The Mark V Williams' cage for coordinated trapping of Murray fishways*	09/09
24	*Murray cod modelling to address key management actions*	14/09
25	*The Living Murray annual environmental watering plan 2009–10*	28/09
26	*Metals in the River Murray*	31/09
27	*Education resources starter pack*	47/09
28	*A review of the impact of eastern gambusia on native fishes of the Murray–Darling Basin*	63/08
29	*River Murray water quality monitoring program*	factsheet

* Indicates year production of publication began

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Abbreviations and acronyms

ACCC	Australian Competition and Consumer Commission
AHD	Australian height datum
ANAO	Australian National Audit Office
APS	Australian Public Service
BSMS	Basin Salinity Management Strategy
CRC	cooperative research centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Cwlth	Commonwealth
EA	enterprise agreement
EC	electrical conductivity unit
EBC	Environment and Behaviour Consultants
EIS	Enterprise Information Strategy
EL	executive level
ESD	ecologically sustainable development
FOI	freedom of information
GL	gigalitre
HSMA	Health and Safety Management Arrangements
ICT	information communication technology
IPS	information publication scheme
IST	Information Stewards Team
LTCE	long-term Cap equivalent
MDBA[1]/the Authority[2]	Murray–Darling Basin Authority: [1] the agency; [2] the six-member Authority
MDBC	Murray–Darling Basin Commission
MDFRC	Murray–Darling Freshwater Research Centre
mg/L	milligrams per litre
ML	megalitre
ML/d	megalitre per day
MLDRIN	Murray Lower Darling Rivers Indigenous Nations

Ministerial Council	Murray–Darling Basin Ministerial Council
NBAN	Northern Murray–Darling Basin Aboriginal Nations
OH&S	occupational health and safety
PAES	Portfolio Additional Estimates Statements
PBS	Portfolio Budget Statements
RMIF	River Murray Increased Flows
RMO	River Murray Operations
SDL	sustainable diversion limit
SRA	Sustainable Rivers Audit
TLM	The Living Murray

Glossary

Acid sulfate soils	Soils formed naturally when sulfate-rich water (e.g. saline groundwater or sea water) mixes with sediments containing iron oxides and organic matter. Under waterlogged, anaerobic (oxygen-free) conditions, bacteria convert sulfates to sulfides, which can form sulfidic sediments. When these sediments are exposed to oxygen, such as during drought conditions, chemical reactions may lead to the generation of sulfuric acid.
Acidification	The process of change or conversion into an acid.
Algal bloom	A sudden increase in the number of algae in a water body, to levels that cause visible discolouration of the water.
Allocation	The water to which the holder of an access licence is entitled from time to time under licence, as recorded in the water allocation account for the licence. Under New South Wales' *Water Management Act 2000*, water allocations in that state are called 'available water determinations'.
Anabranch	A branch of a river that leaves the main stream and rejoins it downstream.
Aquatic ecosystem	An ecosystem that is in or depends on water.
Australian Competition and Consumer Commission	The ACCC promotes competition and fair trade in the marketplace to benefit consumers, businesses and the community. It also regulates national infrastructure services. Its primary responsibility is to ensure that individuals and businesses comply with the Commonwealth competition, fair trading and consumer protection laws. It has a role in enforcing the Water Market Rules 2009 and the Water Charge (Termination Fees) Rules 2009. In this, the ACCC intends to use a cooperative approach, including working with irrigation infrastructure operators to achieve compliance. However, when necessary, it is prepared to use remedies available to it under the *Water Act 2007* (Cwlth).
Australian height datum	In 1971 the mean sea level for 1966–68 was assigned the value of zero on the Australian height datum (AHD) at 30 tide gauges around the coast of the Australian continent. The resulting datum surface, with minor modifications in two metropolitan areas, was termed the Australian height datum and was adopted by the National Mapping Council of Australia as the datum to which all vertical control for mapping is to be referred. Elevations quoted using this datum are normally followed with the acronym 'AHD'.

Australian National Committee on Large Dams The Australian National Committee on Large Dams Incorporated is an incorporated voluntary association of organisations and individual professionals with an interest in dams in Australia. The committee's technical working groups produce, for example, guidelines on design, management and risk assessment of dams.

Bankfull The maximum amount of discharge that a stream channel can carry without overflowing. Bankfull flows are an important trigger for fish breeding in the Murray–Darling Basin.

Barmah Choke A narrow section of the River Murray that constrains the volume of water that can pass during major floods. During floods, large volumes of water are temporarily banked up behind the Barmah Choke, which floods the Barmah–Millewa Forest wetland system.

Barrages Five low and wide weirs built at the Murray Mouth in South Australia to reduce the amount of sea water flowing in and out of the mouth due to tidal movement. The barrages also help to control the water level in the Lower Lakes and River Murray below Lock 1 (Blanchetown, South Australia).

Baseline Conditions regarded as a reference point for the purpose of comparison. In the Basin Plan, the baseline is defined by a number of elements, including the time under consideration; climate characteristics; each jurisdiction's policies, water management rules, entitlement systems and operating rules; the configuration and specification of water resource models; and the mix and location of various water uses and water sources.

Basin Community Committee The Basin Community Committee advises the Murray–Darling Basin Authority about the performance of its functions, including engaging the community in the preparation of each draft Basin Plan; community matters relating to the Basin water resources; and matters referred to the committee by MDBA.

Basin Officials Committee A committee set up to facilitate cooperation and coordination between the Commonwealth, the Murray–Darling Basin Authority and the Basin states in funding works and managing the Basin's water and other natural resources.

Basin Plan A plan for the integrated management of the water resources of the Murray–Darling Basin, to be adopted by the Commonwealth Minister for Water under s. 44 of the Water Act.

Basin Salinity Management Strategy	A 15-year plan for communities and governments in cooperating to control salinity in the Murray–Darling Basin. The strategy establishes targets for the river salinity in each major tributary valley and across the Murray–Darling system. The strategy was agreed by the Murray–Darling Basin Ministerial Council on 17 September 2001.
Basin state agencies	Under the Water Act, a person or entity appointed or established by, or on behalf of, a Basin state. For a more detailed definition, see s. 4 of the Water Act.
Basin states	For the purposes of the Basin Plan, the Basin states are defined in the Water Act as New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory.
Basin water resources	According to s. 4 of the Water Act, Basin water resources are within or beneath the Murray–Darling Basin, but do not include water resources within or beneath the Murray–Darling Basin that are prescribed by the regulations, or groundwater that forms part of the Great Artesian Basin.
Biodiversity	The variety of species of plants, animals and microorganisms, their genes and the ecosystems they comprise, often considered in relation to a particular area.
Blue-green algae	A group of photosynthetic bacteria more correctly referred to as 'cyanobacteria'.
Borefield	A deep hole of small diameter bored to the aquifer of an artesian basin, through which water rises under hydrostatic pressure.
Bureau of Meteorology	Under the Water Act, the Bureau of Meteorology has a water information role — compiling and delivering Australia's water information — to accurately monitor, assess and forecast water availability, condition and use.
Cap (the Cap on diversions)	A limit, implemented in 1997, on the volume of surface water that can be diverted from rivers for consumptive use. Under the draft Basin Plan, the Cap will be replaced by long-term average sustainable diversion limits.
Carryover	A way to manage water resources and allocations that allows irrigators to take a portion of unused water from one season into the new irrigation season.
Catchment	The area of land drained by a river and its tributaries.
Channel	Of a watercourse, a natural or artificial streamflow with definite bed and banks to confine and conduct water. Of a landform, the bed of a watercourse that commonly is barren of vegetation and is formed of modern alluvium (deposited during relatively recent geologic time).

Climate change	A significant change in usual climatic conditions, especially those thought to be caused by global warming.
Commonwealth Environmental Water Holder	The official who manages the environmental water entitlements held by the Australian Government. Under the Water Act, this official is responsible for using these entitlements to protect and restore the environmental assets of the Murray–Darling Basin, or assets outside the Basin where water is held by the Australian Government for that area.
Community	An ecological unit composed of a group of organisms or a population of different species occupying a particular area, usually interacting with each other and with their environment.
Connectivity	Connections between natural habitats, such as a river channel and adjacent wetland areas. Connectivity is a measure or indicator of whether a water body (river, wetland, floodplain) has water connections or flow connections to another body.
Consumptive use	Use of water for irrigation, industry, urban, stock and domestic use, or for other private consumptive purpose.
Convention on Wetlands of International Importance	See 'Ramsar Convention'.
Conveyance water	The water required to ensure sufficient flow in a river to physically deliver water for critical human water needs without it evaporating or seeping into the riverbed. Under the Water Act, 'conveyance water' is water in the River Murray System required to deliver water to meet critical human water needs as far downstream as Wellington in South Australia.
Cooperative research centres	Cooperative research centres are key bodies for Australian scientific research across a range of sectors to enhance Australia's industrial, commercial and economic growth.
Critical human water needs	Under s. 86A(2) of the Water Act, 'critical human water needs' is the minimum amount of water required to meet core requirements of communities dependent on Basin water resources. The definition also includes non-human requirements that, if not met, would cause prohibitively high social, economic or national security costs.
CSIRO	CSIRO is Australia's national science agency. Water for a Healthy Country is one of CSIRO's national research flagships. CSIRO's Land and Water Division takes part in a wide range of research relevant to the Murray–Darling Basin.

Cultural flows (or cultural water flows)	These are water entitlements legally and beneficially owned by the Indigenous Australian nations of the Murray–Darling Basin. Such water entitlements are of sufficient and adequate quantity and quality to improve the spiritual, cultural, environmental, social and economic conditions of Indigenous Australians.
Cyanobacteria	A group of photosynthetic bacteria (see 'Blue-green algae').
Demonstration reach	A demonstration reach is a section of river where a number of management actions, such as provision of fish passage, resnagging and management of alien species, are carried out. The purpose of such a reach is to demonstrate to the community the benefits from rehabilitating native fish habitat and populations using an adaptive management framework.
Dewatering	Lowering of the water level at a particular location.
Discharge	Flow of groundwater from a saturated zone to the earth's surface; flow of surface water out of a defined catchment.
Diurnal	Any pattern that recurs daily, such as a cycle of daily temperature change or oxygen levels in water.
Diversion	A structure in a river or canal that diverts water to another watercourse; a turning aside or alteration of the natural course of a flow of water; or the transfer of water from a water source by a canal, pipe, well or other conduit to a watercourse or to the land (as in the case of an irrigation system).
Diversion limit compliance method	The method to determine compliance with a long-term annual diversion limit. Under s. 22 (1), item 8 of the Water Act, it is mandatory content of the Basin Plan.
Drawdown	The lowering of the water level in a weir pool.
Dredging	The mechanical removal of mud and other material to deepen a waterway.
Drought refuge	An area that a species can retreat to during times of drought; for instance, a permanent pool that remains when a river dries out during droughts.
Ecologically sustainable development	Using, conserving and enhancing the community's resources so that the ecological processes on which life depends are maintained and the total quality of life, now and in the future, can be increased.
Ecology	The study of the interrelationships of living things to one another and to the environment.

Ecosystem	A dynamic complex of plant, animal and microorganism communities and the non-living environment, interacting as a functional unit.
Electrical conductivity	A unit commonly used to indicate water salinity. One unit of electrical conductivity equals one microsiemen per centimetre, measured at 25 °C.
Entitlement (or water entitlement)	The volume of water authorised to be taken and used by an irrigator or water authority, including bulk entitlements, environmental entitlements, water rights, sales water and surface-water and groundwater licences.
Entitlement holder	An irrigator or water authority.
Environmental asset	A key environmental asset for the purposes of the Basin Plan is a water-dependent ecosystem that meets one or more criteria outlined in the Water Act. Environmental assets include water-dependent ecosystems, ecosystem services and sites of ecological significance.
Environmental connectivity	Environmental connectivity consists of links between water-dependent ecosystems that allow migration, colonisation and reproduction of species. These connections also enable nutrients and carbon to be transported throughout the system to support the healthy functioning and biodiversity of rivers, floodplains and wetlands. Hydrological and ecological links are between upstream and downstream sections of river (longitudinal connectivity), and between rivers and their floodplains (lateral connectivity).
Environmental flow	Any river flow pattern provided with the intention of maintaining or improving river health.
Environmental outcome	An outcome (usually of a project) that benefits the ecological health of the river system.
Environmental water	Water used to achieve environmental outcomes, including benefits to ecosystem functions, biodiversity, water quality and water resource health.
Environmental water requirements	The amount of water needed to meet an ecological or environmental objective.
Environmental Watering Plan	A plan to restore and sustain the wetlands and other environmental assets of the Basin and to protect biodiversity dependent on the Basin water resources.
Environmental Works and Measures Program	A program to deliver works and measures to improve the health of the River Murray system by making the best use of available water, optimising the benefits of any water recovered in the future, and considering other policy interventions.

Environmentally sustainable level of take	The level of water extraction from a particular system that if exceeded would compromise key environmental assets or ecosystem functions and the productive base of the resource.
Ephemeral stream	A stream that flows only in direct response to precipitation, usually for a short time, and stops flowing during dry seasons. Most dry washes in more arid regions may be classified as ephemeral streams.
ePMDS	An electronic performance management and development scheme.
Farm dam	Small dams (usually of <5 ML storage capacity) designed to capture run-off from rainfall events. While most farm dams are located on farms, the term includes dams on other types of properties, such as public or urban land.
Fish passage	The capacity for fish to travel upstream and downstream; weirs and dams obstruct the passage of fish within streams, and structures such as fishways are built to restore fish passage by enabling fish to pass.
Fishway	A structure that provides fish with passage past an obstruction in a stream.
Floodplain	Any normally dry land area susceptible to inundation by water from any natural source.
Flow	The movement of water; the rate of water discharged from a source, given in volume with respect to time.
Flow event	A single event of flow in a river; sometimes required to achieve one or more environmental targets. A series of flow events comprises a flow history.
Flow regime	The characteristic pattern of a river's flow quantity, timing and variability.
Flow variability	When applied to the Murray–Darling Basin, refers to the combined variability of the magnitude (size in height and volume), the duration (the time the flow lasts) and the frequency (how often a flow occurs).
Geoscience Australia	Geoscience Australia is an Australian Government agency that provides geoscientific information to facilitate informed decisions on exploitation of resources, environmental management and safety of critical infrastructure.
GL	A gigalitre; 1 billion litres.
Global warming	The increase in the average temperature of Earth's near-surface air and oceans since the mid-20th century and its projected continuation, believed to be caused in part by the greenhouse effect.

Groundwater	Water occurring naturally below ground level (in an aquifer or otherwise).
Groundwater connectivity	Surface-water and groundwater systems are not separate resources but components of one system. Their connectivity is a dynamic relationship that fluctuates both seasonally and over the long term in response to climatic variations and the delayed impact of groundwater extractions. Where the connection is strong, groundwater extraction may directly affect surface-water streamflow by inducing leakage to groundwater, or intercepting stream base flow over short and long timeframes. Similarly, surface-water extraction and management regimes may affect the availability of groundwater.
Habitat	The natural environment or place where living things exist and grow.
Held environmental water	Water available under an access, delivery or irrigation right that is held to achieve environmental outcomes.
High flow	A persistent increase in seasonal base flow that remains within the channel; high flows do not fill the channel to 'bankfull'.
Hydrologic year	See 'Water year'.
Icon sites	Six locations chosen for The Living Murray program because of their regional, national and international ecological value, and the concurrence that they are at risk and require improved water flow regimes. The sites are Barmah–Millewa Forest; Gunbower–Koondrook–Perricoota Forest; Hattah Lakes; Chowilla Floodplain and the Lindsay–Wallpolla islands; Murray Mouth, Coorong and Lower Lakes; and the River Murray Channel.
Inflow	The source of the water that flows into a specific body of water; for a lake, inflow could be a stream or river, and inflow for a stream or river could be rain.
Key environmental asset	An environmental feature deemed 'key' for the purposes of the Basin Plan because it meets at least one of five criteria set by MDBA.
Lock	A rectangular chamber with gates at either end, allowing vessels to move from one water level to another.
Long-term Cap equivalent	An average that takes into account the different characteristics and reliability of water entitlements and allocations in New South Wales, Victoria and South Australia. This creates a common unit of measure, allowing equitable comparison of a broad range of water recovery measures.
Loss	Water lost from a river system that is not available to other users (e.g. water loss caused by evaporation and seepage).

Low flow	A continuous flow through a water channel that either maintains the flow above a cease-to-flow condition or provides habitat as a change from high flow.
Macroinvertebrate	An animal without a backbone that is large enough to be seen without magnification.
Main channel	Many rivers of the Murray–Darling Basin have a large number of channels, particularly in their lower reaches; however, they usually have a main channel, which is the one given the name of the river.
Median	The single middle value in a range of values. If there is an even number of values (therefore two middle values), the median is the average of the two middle values.
ML	A megalitre; 1 million litres.
ML/d	Megalitres per day.
mg/L	Milligrams per litre.
Modelling	The application of a mathematical process or simulation framework (e.g. a mathematical or econometric model) to describe various phenomena and analyse the effects of changes in some characteristics on others.
Monitoring and Evaluation Program	A program to monitor and evaluate the effectiveness of the draft Basin Plan as required by the Water Act. This program must set out the principles to be applied and the framework to be used for monitoring and evaluation, including the requirements for reporting.
Murray Lower Darling Rivers Indigenous Nations	A confederation of 10 Indigenous Australian nations in the southern part of the Basin, comprising representatives of the Wiradjuri, Yorta Yorta, Taungurung, Wamba Wamba, Wadi Wadi, Mutti Mutti, Latji Latji, Ngarrindjeri, Barapa Barapa and Wergaia peoples.
Murray–Darling Basin	The entire tract of land drained by the Murray and Darling rivers, covering parts of Queensland, New South Wales, Victoria and South Australia and the whole of the Australian Capital Territory.
Murray–Darling Basin Commission	The Murray–Darling Basin Commission was the executive arm of the Murray–Darling Basin Ministerial Council, set up under the Murray–Darling Basin Agreement in 1992. The functions of the Commission were subsumed by the Murray–Darling Basin Authority in 2008.

Murray–Darling Basin Ministerial Council	The Murray–Darling Basin Ministerial Council has an advisory role in the preparation of the Basin Plan, and policy and decision-making roles for matters such as state water shares, critical human water needs, and the funding and delivery of natural resource management programs. The Ministerial Council is chaired by the Commonwealth Water Minister and includes one minister from each Basin state.
National Water Commission	The organisation responsible for driving progress towards the sustainable management and use of Australia's water resources under the National Water Initiative.
Native Fish Strategy	This strategy aims to ensure that the Murray–Darling Basin sustains viable fish populations and communities throughout its rivers. The strategy's goal is to rehabilitate native fish communities to 60% of their estimated pre-European settlement levels within 50 years.
Natural flow	Water movement past a specified point on a natural stream from a drainage area for which there have been no effects caused by stream diversion, storage, import, export, return flow, or change in consumptive use caused by human-controlled modification to land use.
Natural resource management	The management of natural resources such as land, water, soil, plants and animals, with a particular focus on how management affects the quality of life for both present and future generations.
Northern Murray–Darling Basin Aboriginal Nations	A confederation of 21 Aboriginal nations in the northern part of the Basin, comprising representatives of the Barkindji, Barunggam, Bidjara, Bigambul, Budjiti, Euahlayi, Gamilaroi, Githabul, Gunggari, Jarowair, Gwamu (Kooma), Kunja, Kwiambul, Malangapa, Mandandanji, Mardigan, Murrawarri, Ngemba, Ngiyampaa, Wailwan and Wakka Wakka peoples.
Nutrient	An element or compound essential to life, which sustains individual organisms and ecosystems; the portion of any element or compound in the soil that can be readily absorbed and assimilated to nourish growing plants.
Offtake	A location where water is diverted from an open water supply system for consumptive use.
Ramsar Convention	The Convention on Wetlands of International Importance is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.
Recharge	The process of replenishing an aquifer, usually from rainfall or losses from surface-water bodies such as rivers and lakes.
Reference condition	The condition of a river, as assessed by an audit, relative to how it would have been had it not been changed.

Regulated	A water system in which water is stored or flow levels are controlled through the use of structures such as dams and weirs.
Regulated flow	A controlled flow rate resulting from the influence of a regulating structure such as a dam or weir.
Regulation	The artificial manipulation of the flow of a body of water.
Resnagging	A program to reinstate snags or instream woody habitats used by native fish to shelter from currents and predators, and as feeding and spawning sites and nurseries for juvenile fish.
Risk allocation	When there are reductions to the volume or change to the reliability of an entitlement holder's water allocation from the Basin Plan, the risks are shared between individual entitlement holders and governments according to a formula in the Water Act that recognises climate change and other natural events, new knowledge and changes in government policy.
River health	Status of a river system based on water quality, ecology and biodiversity.
Riverine	Relating to, formed by or resembling a river, including tributaries, streams, brooks and so on; pertaining to or formed by a river; situated or living along the banks of a river.
Run-off	Flow of surface water from a given area resulting from the effects of rainwater.
Saline	Water that contains a significant concentration of dissolved salts, predominantly sodium chloride.
Salinity	The concentration of dissolved salts in groundwater or river water, usually expressed in electrical conductivity units or milligrams of dissolved solids per litre.
Salinity register	A salinity-based accounting system that underpins the Basin Salinity Management Strategy, providing an accounting record of Basin state actions that affect river salinity.
Salt interception scheme	Large-scale groundwater pumping and drainage projects that intercept saline groundwater inflowing to rivers, and dispose of the saline waters by evaporation and aquifer storage at more distant locations.
Salt load	The amount of salt carried in rivers, streams, groundwater or surface run-off in a given time.

Schedule for Water Sharing	Water-sharing arrangements that replace the 'normal' arrangements of the Murray–Darling Basin Agreement to deliver water to meet critical human water needs when water availability is so low that the normal arrangements cease to be appropriate. The schedule sets out how state and territory water entitlements are determined, delivered and accounted for during tiers 2 and 3 (see s. 135(6)(a) of the agreement), and during the transition to and from tiers 2 and 3.
Spatial	Usually refers to area or distance.
Spatial data	Any data that can be mapped.
Surface water	Includes water in a watercourse, lake or wetland, and any water flowing over or lying on the land after having precipitated naturally or after having risen to the surface naturally from underground (see s. 4 of the Water Act).
Surface-water diversion	Changing the natural flow of surface water to another location by artificial means, such as dams or pipelines.
Sustainable diversion limit	The maximum long-term annual average quantities of water that can be taken, on a sustainable basis, from the Basin water resources as a whole, and the water resources, or particular parts of the water resources, of each water resource plan area.
Sustainable Rivers Audit	A program designed to determine the ecological condition and health of river valleys in the Murray–Darling Basin, to give a better insight into the variability of river health indicators over time and to trigger changes to natural resource management.
Take	The removal of water from, or the reduction in flow of water in or into, a water resource.
The Living Murray program	A partnership of the Australian Government and the governments of New South Wales, Victoria, South Australia and the Australian Capital Territory, aimed at achieving a healthy, working River Murray System.
Threatened species	Species or ecological communities considered threatened with extinction as defined by the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) or relevant jurisdictional legislation.
Water accounting	A systematic process of identifying, recognising, quantifying, reporting and assuring information about water, the rights or other claims to water, and the obligations against water. Water accounting applies Australian Water Accounting Standards.

Water allocation	The specific volume allocated to the holders of water entitlements in a given season, often quoted as a percentage of the volume of each entitlement. For example, a 20% allocation in a particular season allows a water user with a 100 ML entitlement to take 20 ML of water.
Water-dependent ecosystems	Ecological communities that depend on periodic or sustained inundation, waterlogging or significant inputs of surface water or groundwater for their ecological integrity.
Water entitlement	Water users in the Basin hold legal entitlement, or licence, to a share of the available water. The entitlement usually specifies size (or volume) of the share; the source of the water (e.g. the river, catchment or aquifer); and the category (which can be a combination of priority and purpose).
Water for the Future	An initiative to prepare Australia for a future with less water. It has four key priorities — taking action on climate change, using water wisely, securing water supplies, and supporting healthy rivers and wetlands.
Water market rules	Rules that apply to irrigation infrastructure operators holding group water entitlements on behalf of their members, which are designed to ensure that members can separate their portion of the group-held entitlement into a separate entitlement held by the individual. Water market rules are required under the Water Act, but are not within the Basin Plan. These rules are made by the Commonwealth Water Minister.
Water quality	The condition of water and its suitability for different purposes. Water quality refers to a combination of physical, chemical and biological characteristics of water in the context of the value or use for which the water body is being recognised.
Water Quality and Salinity Management Plan	A plan to protect and enhance water quality in the Basin for environmental, social, economic and cultural uses. It will be included in the Basin Plan.
Water quality components	Salinity, turbidity, total nitrogen content and total phosphorous content.
Water recovery	Implementation of measures that result in water being made available under The Living Murray.
Water recovery registers	Water recovery measures are approved and monitored using a system of staged registers — the developmental register, the eligible measures register and the environmental water register.
Water-regulating structure	An object (e.g. a bar or gate) fitted to regulate water flow or depth.

Water resource	Of groundwater, water that occurs naturally beneath the ground level (whether in an aquifer or otherwise), or water that has been pumped, diverted or released to an aquifer for the purpose of being stored there. Murray–Darling Basin groundwater resources exclude groundwater in the Great Artesian Basin. Of surface water, includes water in a watercourse, lake or wetland, and any water flowing over or lying on land after having precipitated naturally, or after having risen to the surface naturally from beneath the ground level.
Water resource plan	A plan that provides for the management of the water resources of a water resource plan area, recognised under provisions of the Water Act.
Water resource plans	Statutory management plans developed for particular surface-water and groundwater systems, currently known by different names throughout the Murray–Darling Basin (e.g. 'water sharing plans' in New South Wales and 'water allocation plans' in South Australia).
Water trading rules	A set of overarching consistent rules enabling market participants to buy, sell and transfer tradeable water rights.
Water year (or hydrologic year)	A continuous 12-month period starting from July, or any other month as prescribed under the water regulation or a resource operations plan, but usually selected to begin and end during a relatively dry season. The water year is used as a basis for processing streamflow and other hydrologic data.
Weir	A dam in a river to stop and raise the water (to conduct it to a mill, form a fishpond or the like).
Weir pool	A body of water stored behind a weir.
Wetland	Areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres. An area that is periodically inundated or saturated by surface water or groundwater on an annual or seasonal basis that displays hydric soils and that typically supports, or is capable of supporting, hydrophytic vegetation.

List of requirements

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* The reference is to the location of the item in Attachment A of the Department of Prime Minister and Cabinet's *Requirements for annual reports* (issued 8 July 2011) — for example, 'A.4' refers to the fourth item in the attachment.

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11(7)		Discussion of any significant changes from the prior year or from budget	Suggested	20, 209–254
11(8)		Agency resource statement and summary resource tables by outcomes	Mandatory	266

* The reference is to the location of the item in Attachment A of the Department of Prime Minister and Cabinet's *Requirements for annual reports* (issued 8 July 2011) — for example, 'A.4' refers to the fourth item in the attachment.

Ref*	Part of report	Description	Requirement	Page
11(9)		Developments since the end of the financial year that have affected or may significantly affect the department's operations or financial results in future	If applicable, mandatory	n/a
12		**Management accountability**		
		Corporate governance		
12(1)		Agency heads are required to certify that their agency complies with the Commonwealth Fraud Control Guidelines	Mandatory	iii
12(2)		Statement of the main corporate governance practices in place	Mandatory	162–205, 256
12(3)		Names of the senior executive and their responsibilities	Suggested	30
12(3)		Senior management committees and their roles	Suggested	162–166
12(3)		Corporate and operational planning and associated performance reporting and review	Suggested	192–195
12(3)		Approach adopted to identifying areas of significant financial or operational risk	Suggested	166–170
12(3)		Policy and practices on the establishment and maintenance of appropriate ethical standards	Suggested	192–199, 204
12(3)		How the nature and amount of remuneration for senior executive service officers is determined	Suggested	182–183
		External scrutiny		
12(4)		Significant developments in external scrutiny	Mandatory	172
12(4)		Judicial decisions and decisions of administrative tribunals	Mandatory	173
12(4)		Reports by the Auditor-General, a parliamentary committee or the Commonwealth Ombudsman	Mandatory	172
		Management of human resources		
12(5)		Assessment of effectiveness in managing and developing human resources to achieve departmental objectives	Mandatory	177–180

* The reference is to the location of the item in Attachment A of the Department of Prime Minister and Cabinet's *Requirements for annual reports* (issued 8 July 2011) — for example, 'A.4' refers to the fourth item in the attachment.

Ref*	Part of report	Description	Requirement	Page
12(6)		Workforce planning, staff turnover and retention	Suggested	181–187
12(6)		Impact and features of enterprise or collective agreements, individual flexibility arrangements (IFAs), determinations, common law contracts and Australian workplace agreements (AWAs)	Suggested	182–183
12(6)		Training and development undertaken and its impact	Suggested	177–180
12(6)		Occupational health and safety performance	Suggested	164, 189–192
12(6)		Productivity gains	Suggested	n/a
12(7)		Statistics on staffing	Mandatory	183–185
12(8)		Enterprise or collective agreements, IFAs, determinations, common law contracts and AWAs	Mandatory	182–183
12(9) & B		Performance pay	Mandatory	182
12(10)–(11)	Assets management	Assessment of effectiveness of assets management	If applicable, mandatory	141–150 196–197
12(12)	Purchasing	Assessment of purchasing against core policies and principles	Mandatory	197–199
12(13)–(24) & C, D	Consultants	The annual report must include a summary statement detailing the number of new consultancy services contracts let during the year; the total actual expenditure on all new consultancy contracts let during the year (inclusive of GST); the number of ongoing consultancy contracts that were active in the reporting year; and the total actual expenditure in the reporting year on the ongoing consultancy contracts (inclusive of GST). The annual report must include a statement noting that information on contracts and consultancies is available through the AusTender website. (Additional information as in Attachment D to be available on the Internet or published as an appendix to the report. Information **must** be presented in accordance with the pro forma as set out in Attachment D.)	Mandatory	197–199

* The reference is to the location of the item in Attachment A of the Department of Prime Minister and Cabinet's *Requirements for annual reports* (issued 8 July 2011) — for example, 'A.4' refers to the fourth item in the attachment.

Ref*	Part of report	Description	Requirement	Page
12(25)	Australian National Audit Office access clauses	Absence of provisions in contracts allowing access by the Auditor-General	Mandatory	199
12(26)	Exempt contracts	Contracts exempt from the AusTender	Mandatory	199
13		**Financial statements**	**Mandatory**	
		Other mandatory information		
14(1) & C		Occupational health and safety (s. 74 of the Commonwealth *Occupational Health and Safety Act 1991*)	Mandatory	189–192
14(1) & C		Freedom of information from 1 July 2010 to 30 April 2011 inclusive (see terms of subs. 8(1) of the Commonwealth *Freedom of Information Act 1982* as it existed before 1 May 2011)	Mandatory	174–175
14(1) & C		Advertising and market research (s. 311A of the *Commonwealth Electoral Act 1918*) and statement on advertising campaigns	Mandatory	270
14(1) & C		Ecologically sustainable development and environmental performance (s. 516A of the *Environment Protection and Biodiversity Conservation Act 1999*)	Mandatory	271–273
14(2) & D		Grant programs	Mandatory	196, 203
14(3) & D		Disability reporting — explicit and transparent reference to agency-level information available through other reporting mechanisms	Mandatory	188
14(4)		Correction of material errors in previous annual report	If applicable, mandatory	n/a
F		List of requirements	Mandatory	295

* The reference is to the location of the item in Attachment A of the Department of Prime Minister and Cabinet's *Requirements for annual reports* (issued 8 July 2011) — for example, 'A.4' refers to the fourth item in the attachment.

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