

11

Recommendations

Red-Necked Wallaby – endemic to south-east Australia. This wallaby is very common in the mountains west of Canberra, but is less often seen in the drier, more open woodlands of Canberra Nature Park. This species is not considered to be endangered or threatened.

Photo: Leo Berzins



11.1 Overview

The Australian Capital Territory (ACT) environment is in reasonable condition and well managed. With significant community support, the ACT Government's management of our environmental assets is commendable. This is borne out in the results of the independent assessment of management effectiveness (see Chapter 10).

By far the most significant challenge to the environment that supports life on our planet is climate change. This is a challenge that requires decisive action at local, city, state and global scales. The people of the ACT should be proud that they have supported significant and leading action on climate change. As we complete this report, the ACT Government has committed to achieving the target of meeting 100% of its energy consumption needs with renewable energy by 2025. The importance of such leadership cannot be overestimated. The handful of cities and states making such serious commitments not only give the international community real examples to follow, but also hope.

There are some areas where our assessments of air, land, water, biodiversity and heritage show that management decisions are not always resulting in improvements to environmental outcomes.

Where opportunities exist for Government to make strategic and practical decisions to improve environmental outcomes, they are presented in this chapter as recommendations. The recommendations are designed to focus effort where it is likely to have the greatest effect by identifying opportunities to integrate multiple environmental outcomes into government policies and programs. This includes, for example, ensuring biodiversity outcomes are incorporated into planning strategies at a landscape level, and ensuring that all environmental policies incorporate consistent monitoring, reporting and evaluation frameworks.

This chapter also discusses longer-term environmental challenges where no clear government response is identifiable, or where potential solutions are long term, complex, require significant investments or involve major behavioural change by the whole community. These have been raised to stimulate thought, discussion and debate in the

hope this may result in innovative approaches being brought to light.

The chapter includes:

- recommendations from the 2011 State of the Environment Report¹ and the Government's success in implementing them
- justification for the 2015 recommendations
- the 2015 recommendations derived from the chapters in the body of the report
- key longer-term challenges that the Office of the Commissioner for Sustainability and the Environment (OCSE) considers should be the focus of our thinking.

11.2 Climate change

11.2.1 Progress against 2011 recommendations

The 2011 State of the Environment Report¹ recommended that the ACT Government should:

- as a priority, develop and implement pathways to achieve carbon neutrality in ACT Government buildings and services. These should be implemented through the second Action Plan of Weathering the Change² and include monitoring, evaluation of actions and annual public reporting on progress
- develop and implement a pathway to achieve the legislated climate change emissions reduction and renewable energy targets. This should be implemented through the second Action Plan of Weathering the Change²
- develop a climate change adaptation planning and implementation response through sector vulnerability risk assessments; monitoring, evaluation and reporting; and integrating adaptation planning outcomes into existing ACT planning and management frameworks
- develop a regional approach to planning for climate change through partnerships with the New South Wales (NSW) Government, local councils and regional organisations.

The ACT's second climate change policy and action plan, *AP2: A new climate change strategy and action plan for the Australian Capital Territory*³ addresses all of these issues. Progress since implementation commenced in 2013 is substantial:

- **The ACT is currently on track to reach its 90% renewable energy target.** In 2013–14, 18.6% of the ACT's electricity supply came from renewable sources. By 2018, the ACT will have secured a renewable energy supply equal to 80% of its forecast 2020 electricity demand through large-scale renewable projects, including
 - the 20 megawatt (MW) Royalla solar farm
 - an additional 20 MW of large-scale solar power

- 200 MW of wind projects to come on line in 2016
- a second 200-MW wind auction in 2015
- the 1 MW Community Solar Auction
- 50 MW Next Generation Solar Expression of Interest.

- **The combined actions in Transport for Canberra^a are designed to improve vehicle efficiency and increase use of walking, cycling and public transport use.** The upcoming Low Emission Vehicle Strategy will build on the ACT Government's Green Vehicle Duty Scheme to further encourage the uptake of low-emissions vehicles.
- **The Zero Emissions Building Policy was included as action 4 of the ACT climate change strategy.** The current review of the *Building Act 2004* and ACT building regulation system is a key component of this work.
- **Engagement with the community has been ongoing through individual AP2 actions and Actsmart.** The ACT Government released a community engagement strategy for AP2. A key avenue for engagement is the Actsmart online sustainability portal, which allows the public to access information on a range of sustainability issues, including climate change.
- **The ACT Government releases an inventory of ACT greenhouse gas emissions each year.** This is required under the *Climate Change and Greenhouse Gas Reduction Act 2010*. The ACT has met its first legislated emissions reduction target of per capita emissions peaking by 2013. Territory emissions fell by 8 per cent between 2011–12 and 2013–14, in line with the projections presented in AP2.
- **Work on climate change adaptation has been progressing.** The draft Climate Change Adaptation Strategy, expected in 2015–16, is based on the draft 2013 Australian Government framework, work by National Climate Change Adaptation Research Facility, the NSW integrated vulnerability and risk assessment, and climate change projections in the NSW and ACT Regional Climate Model (NARClIM).

a www.transport.act.gov.au

If we intend to provide a better life, and a better world, for future generations, we can't ignore the quality of the environment we leave them.

-John Kasich

Sectoral vulnerability risk assessments have been undertaken by Health, Emergency Services and strategic planning in the Environment and Planning Directorate (EPD). The ACT Planning Strategy⁴ incorporates consideration of climate change adaptation and mitigation, and adaptation initiatives are incorporated into centre master plans. Climate change adaptation planning will be included in the Statement of Planning Intent and it is expected that changes to the Territory Plan 2008 will follow the completion of the adaptation strategy.

- **The ACT Government has set a target of carbon neutrality in government operations by 2020.** This has been done through the Carbon Neutral Government (CNG) Framework 2012, including cost-effective energy management and efficiency initiatives with support from the CNG loan fund. For example, the installation of LEDs for internal lighting at more than 90 government buildings and schools will have an estimated cost saving of \$1.3 million per year and reduce electricity use by 20–30% at most sites. A trial of carbon budgets for directorates commenced in July 2015.
- **Active regional partnerships have been developed.** This has been done through:
 - a memorandum of understanding (MOU) in which the ACT is partnering with NSW's Office for Environment and Heritage (OEH) to ensure cross-border harmonisation on climate change adaptation across sectors
 - the ACT Regional Natural Resource Management (NRM) Planning for Climate Change Project, in which the EPD is consulting and collaborating extensively on the application

of spatial planning products and decision support tools to guide adaptation planning for the NRM sector

- ongoing collaborations with regional stakeholders from NSW (eg NSW OEH, NSW Department of Primary Industries, NSW South East Local Land Services, NARCLIM), the Australian Government (eg Atlas of Living Australia, Australian Bureau of Agricultural and Resource Economics and Sciences, Bureau of Meteorology, CSIRO) and the C Plus 1 group of six local government areas within one hour commute of Canberra (Palerang, Queanbeyan, Yass, Goulburn–Mulwaree, Upper Lachlan and Cooma–Monaro).

11.2.2 Justification for the 2015 recommendation

The ACT compares well with other Australian and international cities in mitigating and adapting to climate change. Against international targets, it also compares well in terms of greenhouse gas emissions reduction targets.

Continued application of a precautionary approach through the application of the most robust and current science is vital to ensuring the effectiveness of the ACT's climate change mitigation and adaptation actions and policies.

Continued use of best-practice international tools and mechanisms, such as the Greenhouse Gas Protocol, as well as analysing the approaches of different cities to inform climate change action plans, greenhouse gas emissions reductions targets and, more generally, energy efficiency goals within ACT climate change policy, will ensure the most effective and efficient action.

In the Interim Status Report on AP2, the OCSE found that many of the ACT's climate change adaptation mechanisms are currently addressed somewhat incidentally and within policies or plans that have other, non-adaptation goals. However, this is being redressed through the recently released first stage of the Government's *Adapting to a changing climate: Directions for the ACT*.⁵ This will provide new opportunities to incorporate adaptation responses

into all relevant policies or programs and to coordinate approaches across government.

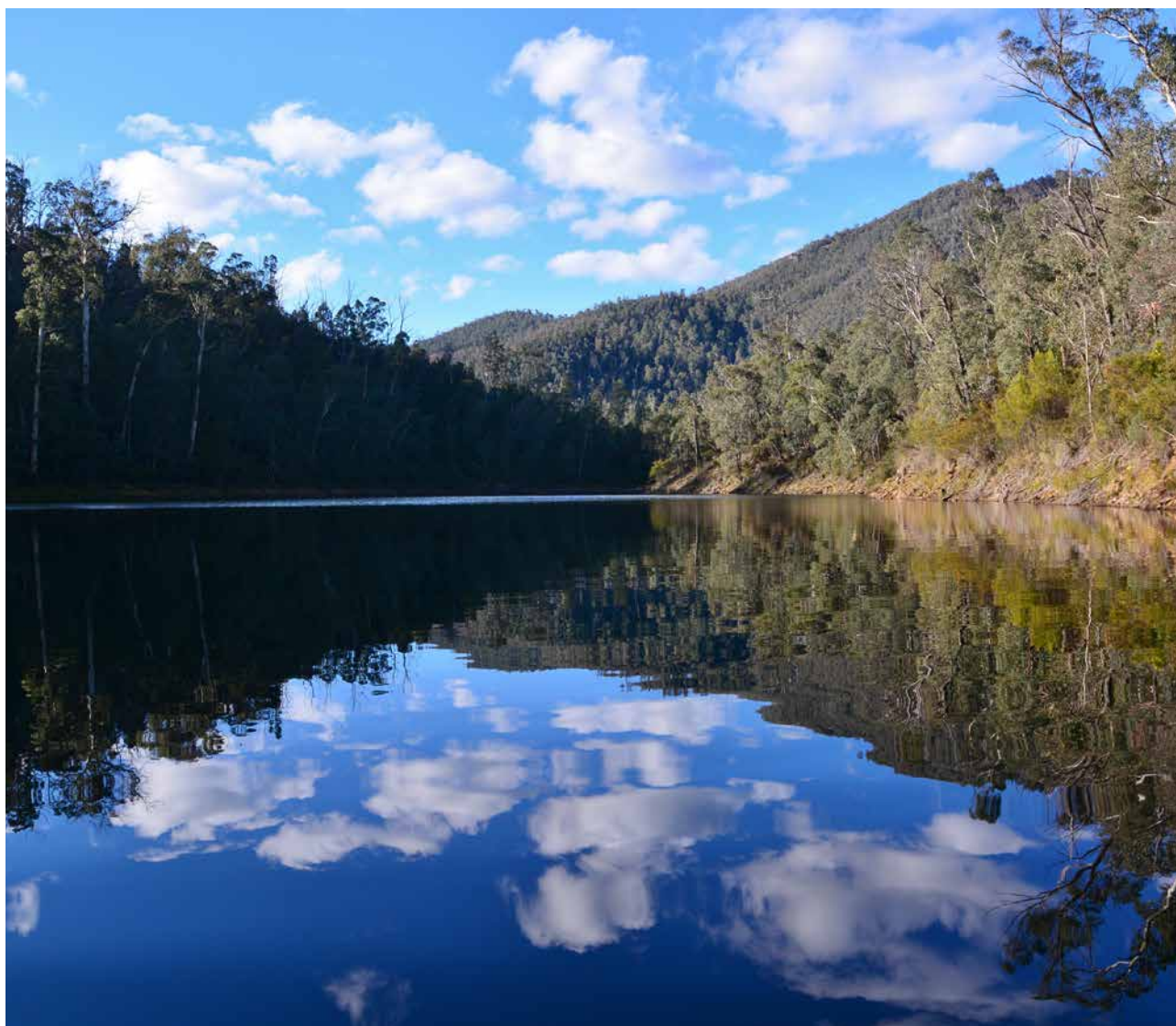
The adaptation strategy should:

- use best-practice international tools and mechanisms and draw from analysis of the approaches used by different cities
- be cross-sectoral and effectively integrated into other key strategies that guide the management of the environment, including planning, nature conservation, water, soils, emergency management, health and economic development
- incorporate an effective monitoring, evaluation and reporting framework.

To assist with monitoring, reporting and evaluation, it would be beneficial for the Government to undertake a health check of the proposed adaptation strategy using the cost-effective qualitative tool devised by the OCSE in the 2014 status report on AP2. This tool will also assist the ACT Government to prioritise adaptation actions.

Recommendation 1

That the ACT Government ensures that the new Climate Change Adaptation Strategy is best practice, cross-sectoral and integrated into other key strategies, with effective monitoring, reporting and evaluation.



Bendora Dam

Photo: Mark Jekabsons

11.3 Human needs

11.3.1 Progress against 2011 recommendations

The 2011 State of the Environment Report¹ recommended that three important strategies that were under development at the time be finalised and implemented. The OCSE considered that these would lead to improved and ongoing sustainable approaches to meeting human needs. The key strategies were the ACT Planning Strategy,⁴ the Sustainable Transport Action Plan (subsequently called Transport for Canberra^b) and the ACT Waste Management Strategy.⁶ It was also recommended that the ACT develop adaptable housing strategies to address the needs of a changing population.

The 2011 report also recognised the need for a regional approach to planning and risk management to address future challenges of population growth and climate change.

The three key strategies were completed and are now being implemented:

- ACT Planning Strategy, June 2012⁴
 - Master Plans are to be prepared for centres to provide direction for future change and growth, including sustainable design outcomes. Master Plans for the Tuggeranong Town Centre, five group centres, including Weston, and the Pialligo rural village have been completed; and Master Plans for the Weston group centre and Oaks Estate have been endorsed. The EPD is currently working on plans for Tharwa rural village, Kippax, Belconnen, Woden, Mawson, Curtin and Calwell centres.
 - The Land Development Agency (LDA) has developed both greenfield and infill developments, and is seeking to increase density in intensification localities such as Constitution Avenue, while also maintaining high-quality public open spaces and delivering water-sensitive urban design infrastructure.

- There is, as yet, no public reporting on implementation of its nine strategies to deliver five outcomes.

- ACT Waste Management Strategy, March 2012⁶
 - The ban on single-use shopping bags was implemented in November 2011 and, in 2014, this was reported to be successful in reducing waste to landfill.
 - Actsmart and Territory and Municipal Services (TAMS) are providing Canberrans with education and assistance to recycle more through the extensive network of public and private facilities.
 - The resource recovery rate has stabilised at around 70–75% since 2005–06. This is short of the target of the ACT Waste Management Strategy for resource recovery of more than 80% by 2015. Meeting this target and making progress towards a carbon-neutral waste sector will be difficult.
 - The ACT Government has recently taken steps towards a review of the *Waste Minimisation Act 2001* and committed more than \$2.8 million in the 2015–16 Budget for a feasibility study to determine how the ACT can facilitate the delivery of expanded resource recovery services and the generation of electricity from waste.
- Transport for Canberra, December 2011.^c The September 2014 report card results were:
 - increase the population living within a 10-minute walk of a rapid public transport corridor – achieved
 - efficient and reliable movement of people and goods – achieved
 - by 2017, achieve 80% compliance with Disability Standards for Accessible Public Transport 2002 for buses and bus stops – on track to be achieved
 - annual ACT fatalities below the national average – achieved

^b www.transport.act.gov.au

^c www.transport.act.gov.au

- by 2016, increase journey-to-work trips for walking to 6.5%, cycling to 6% and public transport to 10.5% – needs improvement
- by 2020, reduce ACT transport emissions by 138 000 tonnes – on track to be achieved
- increase cycle and walking trips – on track to be achieved.

The September 2015 update will highlight initiatives and progress that the Government has made to reduce ACT transport emissions.

Two other important strategy documents were released:

- ACT Infrastructure Plan 2011–2021⁷
- ACT Affordable Housing Plan.^d

In addition, two significant regional developments have occurred:

- The ACT and NSW MOU for Regional Collaboration was signed in December 2011. Priority actions include developing a Strategic Regional Direction Statement that highlights opportunities for maximising economic development and sustainable development of the region and identifies a mechanism for delivering collaborative strategic land use and growth-related infrastructure planning across the region. Currently, work is under way to support growth-related development and to improve infrastructure connectivity and transport links between the ACT and NSW, particularly at South Jerrabomberra in Queanbeyan and at West Belconnen.
- The ACT Government became a formal member of the Canberra Region Joint Organisation in May 2012, having previously held observer status.

11.3.1 Justification for the 2015 recommendations

The 2012 ACT Planning Strategy,⁴ along with other key strategies, forms an excellent framework for guiding sustainable development in the ACT. The other key strategies are AP2,³ the ACT Water Strategy,⁸

the ACT Waste Management Strategy,⁶ Transport for Canberra^e and the ACT Nature Conservation Strategy.⁹

The OCSE notes that all these strategies have monitoring, reporting and evaluation commitments. The AP2 reporting and evaluation framework provides a good model that has been effectively implemented. This includes regular, published six-monthly implementation status reporting as well as scheduled reviews every three years. The Transport for Canberra report cards are also a useful method of reporting. However, monitoring and reporting on several other strategies remains somewhat inconsistent. There have been some challenges with the reporting and monitoring of the ACT Waste Management Strategy. Public reporting and monitoring on the ACT Planning Strategy has been delayed and is now scheduled for late 2015. The ACT Nature Conservation Strategy stated that monitoring and reporting would occur through the State of the Environment Report; however, it is yet to be determined how the indicators, when developed, will relate to the existing state of the environment indicator set. The OCSE considers that consistent and effective monitoring, reporting and evaluation frameworks for these key strategies should be implemented.

To further guide sustainable development for the ACT, the Government should consider developing integrated monitoring, reporting and evaluation for all these strategies. The benefits of this integration would be to:

- streamline processes across Government
- assist in effective and efficient implementation
- recognise and take advantage of synergies
- avoid duplication and overlap
- provide public accountability
- provide feedback into other government policies and programs.

Integrated reporting would also present an opportunity for ACT Government directorates to agree on a set of sustainability indicators relevant to the ACT, based on currently available datasets that are routinely collected, and that can be implemented within current reporting requirements. This would build on the OCSE's work with the directorates and the universities on a robust set of ecologically sustainable

d www.economicdevelopment.act.gov.au/buy-land-and-build/affordable_housing/affordable_housing_action_plan

e www.transport.act.gov.au

development indicators that can closely align with indicators against which the directorates routinely collect data. Insights from a series of workshops held by the OCSE in 2014, the findings from commissioned research by Dr Jerry Bates¹⁰ and the significant international research on genuine progress indicators will add to this process.

This process could also encompass the need for more integrated sustainability reporting across the Canberra region and could fit well into the cross-jurisdictional work that is now progressing on regional cooperative relationships. The OCSE is currently developing collaborative partnerships across the region to encourage strategic action and regional reporting. There is opportunity to highlight this in the (proposed) regional 2016 State of the Environment Report.

Recommendation 2

That the ACT Government implements the monitoring, reporting and evaluation commitments in the ACT Planning Strategy and the ACT Waste Management Strategy, and details those for the ACT Nature Conservation Strategy.

Recommendation 3

That the ACT Government considers integrated monitoring, reporting and evaluation of all the key strategies to guide achievement of improved sustainability outcomes for the ACT, including the ACT Planning Strategy, AP2, Transport for Canberra, the ACT Water Strategy, the ACT Nature Conservation Strategy and the ACT Waste Management Strategy.



Mulligans Flat in flood

Photo: Mark Jekabsons

11.4 Air

11.4.1 Progress against 2011 recommendations

The 2011 State of the Environment Report¹ recommended that the ACT Government should:

- improve knowledge of our indoor air quality; the Chief Health Officer should consider the health impact of indoor air quality in the ACT in the 2014 Chief Health Officer's Report¹¹
- improve local air quality outdoors through
 - requiring air quality assessments in all new greenfield developments, to identify and manage air emissions, potentially detrimental to human health and the environment
 - installing and operating a second performance air monitoring station to ensure that the ACT is compliant with National Environment Protection Measure (NEPM) standards
 - determining the feasibility, including costs, of mobile monitoring of appropriate Ambient Air Quality NEPM standards at locations in and around Canberra.

Progress against these recommendations includes:

- Indoor air quality
 - The Chief Health Officer's 2014 report did not include indoor air quality monitoring, as this was not considered a health priority at the time.
- Local air quality
 - A second NEPM-compliant monitoring station was installed in Florey and became operational early in 2014. The ACT is now compliant with the Ambient Air Quality NEPM.
 - Mobile monitoring of local air quality was not supported. It was deemed to be cost-prohibitive and the data collected not likely to be of sufficient quality to support evaluation or policy-making.
 - Although an air quality assessment report was undertaken for the Molonglo Valley development, such assessments are not required for all greenfield developments.

The results of ambient air quality monitoring continue to show that the ACT has good air quality when measured against the national reporting standards and that air quality in the ACT is regularly better than that of other capital cities. Reporting shows that wood smoke from domestic fires, bushfires and controlled burns, and emissions from motor vehicles continue to be the biggest sources of pollution in the ACT, and efforts need to continue to reduce pollution from these sources. Although indoor air quality is not reported on in this report, it is recognised that there are health risks associated with indoor air quality and that monitoring of this may help to avoid or mitigate any resulting health issues.

11.4.2 Justification for the 2015 recommendation

Currently, the policies and practices we have in place are able to maintain the ACT's air quality at an excellent level. However, the growing population, and urban greenfield developments and intensification may pose a challenge to maintaining this high level of air quality. In particular, increased urban greenfield development may cause increasing pressure on ambient air quality, due to particulate pollution from domestic wood fires. A precautionary approach would be to undertake air quality assessments of wind conditions, inversion qualities and other relevant factors before greenfield development. This would determine whether wood-fired domestic heaters are suitable for the site early in the development process.

Recommendation 4

That the ACT Government requires that the air quality impacts of future urban developments are explicitly considered – in particular, the impact of pollution from domestic wood heaters in greenfield developments.

11.5 Land

11.5.1 Progress against 2011 recommendations

The 2011 State of the Environment Report¹ recommended that the ACT Government should improve monitoring to assess the impact of erosion on local land and water resources, and to help understand the interactions between the ACT's catchment and ecosystem services. In particular:

- undertake baseline soils mapping to facilitate monitoring and assessment of soil condition
- identify indicators of land health, including soil health, vegetation quality and change, and land-use changes; and monitor and publicly report on these on a regular basis
- improve limited land-health data by including land-health assessments in water catchment data to inform soil condition across the ACT
- improve actions related to sediment and erosion mitigation.

The Government response gave in-principle support to these recommendations and acknowledged the importance of understanding soil condition and maintaining soil health. Progress has been made against these recommendations during the reporting period.

The *ACT Nature Conservation Strategy 2013–23*⁹ includes the priorities of:

- developing baseline information for the ACT through the mapping of vegetation communities
- developing an ACT Soils Strategy to provide a strategic approach to the completion of soil mapping, and to guide the development of a program to monitor soil condition and advise on best-practice management of different soil types and land uses.

Soil mapping and erosion assessment work has taken place:

- Soil landscape mapping was completed previously at the 1:100 000 scale for the eastern half of the ACT by the NSW Government.¹² The OEH has been contracted by the ACT Government to fill data gaps for existing ACT soil landscapes and to identify new landscapes for the western half of the ACT, using standard Australian soil survey and analytical methods. As part of the mapping process, related soil types in each landscape are described, and their chemical and physical properties and constraints identified.
- The assessment of likely hotspots for soil erosion leading to in-stream turbidity is being undertaken for the Upper Murrumbidgee Catchment in a collaboration between Icon Water, the EPD and the Murrumbidgee Catchment Management Authority.
- The EPD has contracted the OEH to complete a hydrogeological landscape framework for the ACT. This project will provide the ACT with a comprehensive salinity assessment, showing areas of high, low and medium risk in a salinity hazard risk assessment map. The framework will also assist in determining the capability of rural, urban and conserved lands for a range of land uses and management objectives.

11.5.2 Justification for the 2015 recommendations

It is encouraging to see that progress has been made on previous recommendations, and that soil mapping and landscape information have been included as priority actions in the ACT Nature Conservation Strategy. This information will allow the ACT Government to better monitor soil condition and detect any negative changes in soil health, and to look at causes and undertake measures to avoid and mitigate further deterioration, if required.

This information can also be applied to land capability assessment and can help determine the most appropriate uses for future land releases in the ACT. For these reasons, it is of high importance

that the activities relating to soil and landscape knowledge marked as key priorities in the ACT Nature Conservation Strategy are fully implemented, and that data are accessible and available to inform land-use planning and management.

The major challenge in land-use and land planning in the ACT is developing Canberra in a strategic manner on a landscape scale. Rather than assessing impacts one development at a time, the landscape should be considered as a whole, and the impacts and potential for improvement taken into account. This challenge also presents the opportunity for the ACT to develop in a way that continues to conserve important aspects of our environment and biodiversity, including maintaining and improving vegetation and habitat connectivity across the Territory.

Such an approach is acknowledged in policy, including in the ACT Planning Strategy, and there is provision for strategic environmental assessments under the *Planning and Development Act 2007*. However, there has been no application of this mechanism, except in the context of the, *Environmental Planning and Assessment Act 1999* (Cwlth). Strategic environmental assessments should be informed by effective use of the new land capability data that are becoming available through mapping work under the ACT Nature Conservation Strategy, and the improved water data coming from the ACT Basin Priority Project monitoring work.^f

Implementation of this approach will help to better manage the impacts of development on air, land, water, biodiversity and heritage through better land-use design and siting, planning restrictions (such as covenants) and land management arrangements. It will also highlight opportunities to protect and improve environmental values – for example, maintaining or improving connectivity, and avoiding fragmenting natural areas. Implementation will assist in addressing the biodiversity, air, water and heritage recommendations in this report.

Recommendation 5

That the ACT Government provides resources to fully implement priority actions in the ACT Nature Conservation Strategy, particularly actions aimed at developing foundation knowledge of landscape function and soils in the ACT.

Recommendation 6

That the ACT Government uses strategic environmental assessments as provided for in the *Planning and Development Act 2007* to reduce and manage cumulative and cross-sectoral impacts on the environment, and take opportunities to improve sustainability outcomes.

^f Since October 2011, a number of strategic assessments have been endorsed in the ACT under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). Endorsement under the EPBC Act relates to actions that are likely to have a significant impact on matters of national environmental significance.

11.6 Water

11.6.1 Progress against 2011 recommendations

The 2011 State of the Environment Report¹ recommended that the ACT Government should:

- establish cross-boundary management of the ACT's water resources, including
 - developing catchment policy and an integrated water supply catchment management strategy, as recommended in previous State of the Environment reports
 - strengthening integrated management action by facilitating improved exchange and use of information, such as spatial information, between government agencies, NRM groups and Catchment Management Authorities, and by promoting sustainable catchment management with landholders and the community
- complete an assessment of the ACT's at-risk groundwater resources
- update water management, monitoring and reporting programs to inform
 - actions to mitigate impacts of urban development on water quality
 - the efficacy of water-sensitive urban design measures
 - improvements in sediment and erosion mitigation actions
 - the management of ACT lakes.

The Commissioner's report on an investigation into the state of water courses and catchments for Lake Burley Griffin (published in April 2012) focused on the lake itself, but also included some broader recommendations on urban and rural catchment management and improved coordination of catchment management.

Recommendations on urban catchment management included the development of a strategic approach to water-sensitive urban design, including:

- ensuring that water-sensitive urban design requirements are enforced

- monitoring the effectiveness of existing water-sensitive urban design infrastructure, including the efficacy of existing gross pollutant traps
- comparing ACT approaches with other jurisdictions.

Recommendations on rural catchment management included:

- on-ground actions to reduce the potential for soil erosion within the catchment area of Lake Burley Griffin by the ACT and NSW governments, with support from the National Capital Authority
- investigation of the role of Jerrabomberra Wetlands watercourses in improving water quality in the catchment.

Recommendations to improve the coordination of catchment management included the establishment of a Burley Griffin–Molonglo–Queanbeyan Catchment management agreement between the ACT, NSW and Australian governments to include strategic objectives for the integrated coordinated management of the lake and catchments.

Most of these recommendations are addressed through work being undertaken as part of the new ACT Water Strategy and the ACT Basin Priority Project. Significant progress has been made against these recommendations during the reporting period:

- ACT Water Strategy, August 2014,⁸ includes outcomes, strategies and actions to guide water management across the ACT and region, including catchment management, storm water and flood management, water supply and services, water for the environment, recreational water use, and public health.
- Cross-boundary management of water resources
 - Catchment management arrangements have been established that better integrate water and land management, and improve the ACT spatial planning framework for NRM to inform management of land, water and biodiversity.
 - The ACT and Region Catchment Management Coordination Group has been established, with a focus on improving cooperation, coordination and alignment of effort in regional catchment management issues; the priority action of

the group is to develop a regional integrated catchment management strategy.

- Water supply
 - The enlarged Cotter Dam and the Murrumbidgee to Googong pipeline have ensured that current potable water supply challenges have been met.
- Groundwater resources
 - An updated report (August 2013) on groundwater recharge rates in the subcatchments – with the majority of abstraction bores and covering a full range of conditions from extreme drought to a La Niña high-rainfall cycle – validated previous calculations on subcatchment recharge rates. Only a few low-volume bores have been installed during the past two years and these have not significantly increased the risk profile of the subcatchments.
- ACT Basin Priority Project
 - The first phase of an Australian Government-funded project to improve water quality leaving the ACT – a comprehensive ACT-wide water quality monitoring program with a focus on six priority catchments – has been implemented. The six priority catchments are Lower Molonglo (new development); Upper Molonglo (source water); Tuggeranong (lake); Yarralumla Creek (infill/developed); Riverview, West Belconnen (greenfield development); and Fyshwick (industrial/wetlands development).
 - The water quality monitoring program is updating and realigning existing monitoring arrangements to reflect changes in land use and technology. As well as addressing water quality monitoring across the ACT, more intensive monitoring is occurring in the six priority catchments, as well as a detailed audit of the performance of existing infrastructure.
 - An investigation, audit and analysis of ACT Government water quality infrastructure assets was conducted to assess the effectiveness of existing water quality infrastructure and recommend possible improvement opportunities.

- Catchment management
 - In August 2014, the Government released the report of the review of water-sensitive urban design regulations in the ACT. Research was also undertaken on water-sensitive urban design implementation in other jurisdictions, and its influence on housing affordability and recommendations are being implemented
 - Land managers have implemented on-ground projects to improve management, monitoring and reporting, including the installation of 12 groundwater and 6 surface water monitoring stations at Jerrabomberra Wetlands, allowing development of a model for groundwater and surface water movements across the wetlands. They are managing an additional 20 000 hectares after the construction of the enlarged Cotter Dam and the Googong Foreshores. The focus is to ensure water quality is not compromised by threatening processes such as environmental weed invasion, erosion and sedimentation, vertebrate pests and inappropriate visitor interaction.

11.6.2 Justification for the 2015 recommendation

Although most water resource indicators in the ACT are in a very good or good state, some are not and warrant some special attention. These are total nitrogen levels, which are in a very poor state; and turbidity, chlorophyll-a and ecological condition, which are in a poor state.

Assessing and managing the longer-term consequences of this condition is of high importance. In some cases, it may not be possible to quickly reverse the situation. Long-term strategic management and, possibly, land-use change – neither of which may be feasible – may be needed. Consequently, developing strategies and actions to improve these aspects of water quality should be a high priority.

The location of sampling points is also important to consider. For example, Australian River Assessment System Observed:Expected scores, turbidity and chlorophyll-a samples, which were all assessed as being in a poor state during the current reporting period, were predominantly taken from areas where

land-use pressures are the most intense in the ACT (ie urban and agricultural areas). If more samples were taken in conservation areas, then the percentage of sites classified as exceeding guideline levels would likely be much lower. In an overall assessment of water resource indicators, the proportion of sampling points in different environmental and land-use settings should therefore be considered.

Most water resource indicators had a good amount of data available. The data available for these indicators were collected at regular intervals (eg multiple times in every year of the assessment) and collected in many places across the ACT. For the state and trend of water resources in the ACT to be efficiently and effectively monitored into the future, it is essential that the current monitoring network be maintained.

In contrast, data related to groundwater availability and quality were relatively limited. There seems to be a limited number and spread of bores, with much data collected outside the current reporting period. However, given the current limited use of groundwater in the ACT, this is not an issue. In the future, if groundwater use increases or pollution continues, then more extensive groundwater monitoring may be required. It is also important that monitoring of rainfall and groundwater levels occurs at each monitoring site to better understand the long-term relationship between rainfall and groundwater recharge.

Understanding the links between pressures and the state and trend of water quality indicators will become increasingly important as these pressures intensify. This is expected through the increased land-use change and water resource development needed to support our growing population, and the changing rainfall patterns under climate change. Without understanding the driving mechanisms behind each indicator, it can be difficult to manage water quality into the future. The strategic collection of long-term data on indicators and pressures is critical. This information will help in the assessment of the state and trend of water resources. Importantly, it can also help model the relative importance of different drivers of water resource conditions and determine the most effective management action.

Recommendation 7

That the ACT Government assess the consequences of, and understand the driving mechanisms behind, the poor condition of water resources as shown by the indicators for total nitrogen, turbidity, chlorophyll-a and ecological biodiversity, and assess the need for collecting more information for indicators with little available data.

11.7 Biodiversity

11.7.1 Progress against 2011 recommendations

The 2011 State of the Environment Report¹ recommended that the ACT Government should:

- develop a biodiversity monitoring strategy, building on existing government and nongovernment skills, capacity and programs, and focusing on periodic reporting. This should include, where appropriate, systematic statistical methodologies that support monitoring of trends and changes to biodiversity assets in the ACT
- identify opportunities to integrate multiple environmental assessments into monitoring projects and activities
- publicly report decisions, activities and data collected in relation to individual species, populations and ecological communities
- collaborate with the NSW Government and regional organisations to contribute to regional and national biodiversity datasets
- improve the integration of biodiversity values into urban planning decisions through
 - integrating biodiversity corridors and habitat connectivity into the Territory Plan process
 - identifying appropriate clearance thresholds for ecological communities across the ACT through completion of the biodiversity offset policy
- as part of the review of the *Nature Conservation Act 1980*
 - include an objects clause that protects biodiversity
 - include a definition of 'biodiversity'
 - align all biodiversity provisions in the *Environment Protection Act 1997* with those in the *Nature Conservation Act 1980*
 - consider whether unauthorised loss of biodiversity should be included as an offence
 - assess the effectiveness of managing threatening processes through action plans, including the listing of key threatening processes in the *Nature Conservation Act 1980*.

The Government has achieved significant progress since 2011 in addressing these recommendations:

- **The ACT Nature Conservation Strategy provides the framework for nature conservation in the ACT from 2013 to 2023**, guiding future planning of the Territory's open spaces, rural areas, urban areas, riverine corridors and nature reserves, including investment of funding and resources in nature conservation. The strategy is supported by Implementation Plan 1, which provides a road map of the most significant milestones required to deliver the ACT Nature Conservation Strategy actions and targets during 2013–2018.
- **The Biodiversity Research and Monitoring Program (BRAMP), July 2015** was established under the new *Nature Conservation Act 2014*. It sets out key biodiversity research and monitoring activities for the two-year period to 30 June 2017. BRAMP aims to improve knowledge and understanding of biodiversity, and inform its management in the ACT. It will contribute to an evidence base for future policy, program and resource allocation decisions.
- **The Conservation Effectiveness Monitoring Program** has compiled a database of current biodiversity monitoring programs occurring on reserves. This has informed the development of a reserve condition monitoring framework, designed to link current biodiversity monitoring investments across government, academic institutions and community groups into a coordinated, strategic program focused on monitoring ecological values of eight broad ecological communities in ACT nature reserves.
- **There have been significant advances in integrating biodiversity values into planning and development:**
 - Significant plants, animals and registered trees are now included in ACTMAPi.
 - A connectivity layer is now included in ACTMAPi, based on a study of woodland connectivity; it is also integrated into the ACT Environmental Offsets Calculator.

- the ACT Environmental Offsets Policy came into force in April 2015, which is supported by the ACT Environmental Offsets Calculator.
- *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) strategic approvals for Molonglo and Gungahlin were completed and endorsed in the reporting period. The approved biodiversity plans that guide development in Molonglo and Gungahlin provide the capacity to achieve better environmental outcomes and address cumulative impacts at a landscape level.
- Work has commenced on two draft variations to the Territory Plan designed to improve biodiversity values: DV297 will ensure implementation of EPBC Act biodiversity offsets, and DV319 will ensure implementation of biodiversity outcomes pursuant to the Gungahlin Strategic Assessment.
- Other projects include:
 - **implementation of the Jerrabomberra Wetlands Concept Plan** to ensure that biodiversity objectives for the wetlands are considered in planning the proposed East Lake residential development and vice versa
 - **the Million Trees initiative throughout the Murrumbidgee River Corridor** which has conducted weed spraying and ground preparation, and planted tube stock along multiple sites – Woodstock Nature Reserve, Lower Molonglo Nature Reserve, Pine Island and the Tharwa area
 - **the Urban Treescapes project**, in which approximately 2400 trees were planted throughout Canberra’s urban forest during 2014–15, and approximately 8000 trees planted as gifted assets from green and brown field developments and Roads Capital Works projects. These trees are primarily located on public unleased land, particularly nature strips and urban open space
 - **establishment of new nature reserves in Canberra Nature Park**, including Mulligans Flat, Goorooyarroo and Isaacs Ridge nature reserves to improve connectivity within the ACT Reserve System
 - **amendments to the Nature Conservation Act 2014** to improve alignment and consistency with the *Environment Protection Act 1997*, and

to provide penalties for offences relating to the loss of biodiversity and clearing or damaging land in nature reserves.

11.7.3 Justification for the 2015 recommendations

In compiling the data necessary to report on the biodiversity indicators, it became apparent that the ACT’s current biodiversity monitoring programs have not allowed the indicators to be populated with data that:

- are comprehensive and cover all the ACT geographic areas that need to be covered
- use consistent and current methods that allow trends and comparisons to be established
- are guided by data collection and storage protocols and procedures
- are clearly linked to conservation outcomes.

Although there are resource constraints to be considered in developing solutions to these issues, a project that the ACT Government started in 2014 should allow significant progress in addressing these issues. The Conservation Effectiveness Monitoring Program forms the basis of this project. It examines current reserve monitoring programs and proposes a framework for integrating and coordinating monitoring investments into a strategic reserve condition monitoring program for ACT nature reserves. The information contained in the program’s report details the important scientific and legislative considerations required for the development of a rigorous scientific monitoring program. The proposed reserve condition monitoring program framework was designed to make use of current monitoring investments as far as possible to limit the amount of additional resources required. Implementation of this project will:

- ensure that the ACT monitoring program is informed by integrating current monitoring investments
- provide the opportunity to strategically link management actions with conservation outcomes
- enable the evaluation of management effectiveness in achieving on-ground conservation improvements.

These first phases of the Conservation Effectiveness Monitoring Program should be complemented by a project to maximise the effective use of the significant amount of technical, scientific and geospatial data contained in consultant's reports commissioned for a range of projects, primarily associated with development and held by many ACT Government agencies. Making available this otherwise unknown or inaccessible data would:

- improve resource efficiencies and cost effectiveness
- improve the quantitative data sources and availability, and plug information gaps
- help to answer management questions identified in the Conservation Effectiveness Monitoring Program.

Recommendation 8

That the ACT Government provides the necessary resources to complete the next phases of the Conservation Effectiveness Monitoring Program.

Recommendation 9

That the ACT Government formalise biodiversity conservation data collection and storage protocols and procedures, to integrate reports commissioned by different agencies with existing government data.



Eastern Pygmy Possum

Photo: Mark Jekabsons

11.8 Heritage

11.8.1 Progress against 2011 recommendations

The 2011 State of the Environment Report¹ recommended that the ACT Government should:

- develop an action plan for heritage that addresses the backlog of heritage nominations and recognises key future places for protection
- strengthen audit, compliance and enforcement processes in line with recommendations of the 2010 Marshall Review¹³
- develop an MOU with the Australian Government to protect assets, subject to Australian Government approvals, on the ACT Heritage Register
- promote ACT heritage values as a part of the Canberra 2013 centenary celebrations.

During the reporting period, progress has been made against most of these recommendations:

- A priority list has been developed to reduce the backlog of nominations, resulting in the provisional and full registration of many of the nominated objects and places.
- The Heritage Unit now has two officers trained in investigations and has developed a compliance enforcement policy to strengthen this process.
- The ACT's heritage values were promoted in the centenary year through the Heritage Festival, which included 125 events involving 75 groups and individuals from the private, government and community sectors.

The MOU recommendation was not agreed to by the ACT Government and was not implemented.

11.8.2 Justification for the 2015 recommendation

Jurisdictions across the country vary in the way they monitor and report on heritage. Like the ACT State of the Environment Report, the NSW report assesses the state of heritage based on the number of registrations during the reporting period.

Others assess condition only, and some do not assess the state of heritage in their reporting at all.

Although the registration of heritage places and objects provides a measure of the number and type of heritage that is afforded protection, it does not take into account the condition of the registered places and objects.

The 2011 national State of the Environment Report¹⁴ included the physical condition and integrity of heritage places as an indicator of the state of heritage across the nation. However, it found that, at a local level, data about the condition and integrity of heritage were not available.

The lack of condition monitoring may make it difficult to assess the deterioration of heritage over time, and reduces the ability of the ACT Government to maintain the condition and integrity of heritage places and objects. Also, as discussed in the Marshall Review, the audit and monitoring of condition would allow the assessment of the ongoing effectiveness of heritage protection measures.

The implementation of a regime to audit the condition of heritage in the ACT may assist in monitoring and identifying the impacts that pressures on heritage, such as urban development and climate change, are actually having over time, and allow appropriate action to be taken to preserve the condition of these places and objects.

Recommendation 10

That the ACT Government and the ACT Heritage Council commence a program of audits to assess and monitor the condition of heritage places and objects on the ACT Heritage Register.

11.9 Long-term challenges identified through the 2015 State of the Environment Report

A rapidly changing climate, modified by human emissions of greenhouse gases, is our most significant environmental challenge. In responding to this, the ACT Government, strongly supported by the community, has set emissions reduction targets that are at the forefront of global commitments. We must lend strong and unwavering support to follow through on commitments and action to reduce our emissions in the face of social, economic and political changes. We must continue to value scientific evidence and work actively with partners in other jurisdictions and other nations.

Reducing the environmental impact of our consumption of goods and services also stands out as a major challenge that requires thought, discussion and commitment to changing behaviour across all sectors of the society and the economy in the ACT and our region. As a wealthy and well-educated community, we understand that our lifestyle choices will shape the environment that our children and grandchildren will live in. Our choices profoundly affect the ecological services that our environment can provide for us. The ecological footprint analyses in successive State of the Environment reports show that our ecological footprint is increasing and, at 3.3 million hectares, it is nearly 14 times the land area of the ACT. Most of our ecological impact occurs outside our borders and, from a global perspective, is not sustainable in the longer term. The ACT is taking more than its share.

Overconsumption has been considered in previous State of the Environment Reports. The 2011 report saw that the role of the ACT Government was to complete major strategies around sustainability, including the ACT Planning Strategy,⁴ the Sustainable Transport

Action Plan (now Transport for Canberra⁵) and the ACT Waste Management Strategy.⁶ These are now in place and, along with AP2, form the framework for working towards a more sustainable Territory.

There are other actions that Government can take and those proposed in the 2011 report remain appropriate. Significant progress has been made in some areas:

- strengthening community engagement in sustainability by providing comprehensive information – the Actsmart sustainability hub is now established and should be fully developed to effectively play this role
- undertaking research into attitudes to sustainability and consumption patterns and behaviours – more could be done
- fostering behavioural change through community engagement with a particular focus on sustainable transport – an area of significant government planning and action
- supporting community organisations to play their part (eg running events that bring people together then educating and motivating them to strive to live more sustainably) – grants are available, but may need to be refocused to encourage this
- developing and maintaining green infrastructure, which is a major factor contributing to the livability of Canberra – work has begun on a living infrastructure strategy.

However, this is not a challenge that can be met by government alone. As individuals and as a community, we must make considered and informed choices in our everyday lives, and move towards levels and patterns of consumption that enable the ACT to reduce its

ecological footprint. In doing so, we will reduce our demands on ecosystem services. The 2011 report suggested we focus our lives on wellbeing and shift away from increased spending on goods. The analysis suggested that people may be happier and live more sustainably when they 'favour intrinsic goals and embed them in family and community rather than extrinsic ones which tie them to display social status'.¹⁵

For our community, the challenges become:

- finding better ways of seeking out the goods and services that can be delivered in the most footprint-efficient way. This could mean choosing products that are energy and water efficient to use, durable, and recyclable when they are no longer useable
- seeking out alternatives to consuming products, including cultural, community, sporting groups and volunteer groups such as ParkCare and Landcare
- supporting a community focus on a range of activities for all age groups that will make it attractive to spend time in activities rather than money on goods.

As a community, we have shown that we can make dramatic changes in our behaviour. In a response to the millennium drought, which affected much of south-eastern Australian and lasted from 2000 to 2010, we reduced our water consumption by more than half and our total water use significantly. With a projected decrease in rainfall and increasing population, there is a need for the ACT community to continue its excellent water-saving behaviours into the future. The ACT Water Strategy has recognised that this challenge also requires government action, including innovative ways of using water more efficiently, and providing information and feedback.

In the longer term, these are the kinds of responses from all of us that are needed to 'future proof' our community in the face of climate change and the increasing pressures that we are placing on our ecosystems. By acting individually and as a community, and by supporting government action, we can transform our society in a safe, fair and manageable way to a new, more sustainable future. We will show leadership and do our fair share to reduce our global impacts, while realising the benefits of a new, more sustainable economy.

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