

LEGISLATIVE ASSEMBLY



Standing Committee on Natural Resource Management

VISITS OF INSPECTION - ALBURY, FEBRUARY 2005
WAGGA WAGGA, AUGUST 2005
(THE 5TH LANDCARE/CATCHMENT MANAGEMENT
FORUM)

New South Wales Parliamentary Library cataloguing-in-publication data:

New South Wales. Parliament. Legislative Assembly. Standing Committee on Natural Resource Management.

Visits of inspection, Albury (February 2005), Wagga Wagga (August 2005) : the 5th Landcare/Catchment Management Forum : [report] / NSW Parliament, Legislative Assembly, Standing Committee on Natural Resource Management. [Sydney, N.S.W.] : the Committee, 2006. – 32 p. ; 30 cm. (Report ; no. 53/6)

Chair: Pam Allan.
“December 2006”.
1921012544

1. Landcare New South Wales. Catchment Management Forum (5th : 2005 : Wagga Wagga, N.S.W.)
2. Soil conservation.
3. Watersheds—Management.
 - I. Title
 - II. Allan, Pam.
 - III. Series: New South Wales. Parliament. Legislative Assembly. Standing Committee on Natural Resources Management. Report ; no. 53/6

333.73 (DDC)

Table of Contents

MEMBERSHIP & STAFF	III
TERMS OF REFERENCE	V
CHAIR’S FOREWORD	VII
CHAPTER ONE - BACKGROUND	1
Natural Resource Issues in the Murray-Darling Basin	1
Managing Salinity Impacts in the Murray-Darling Basin	4
On-farm Management of Salinity and Drought impacts	5
Purpose of Inspection	6
CHAPTER TWO - NATURAL RESOURCES IN THE MURRAY CATCHMENT	7
Water Resource management - DIPNR	7
Catchment Management in the Murray Region	12
Murray Darling Freshwater Research Centre	16
Urban Water Management	17
Sustainable Water Management at Thurgoona	19
Concluding Comments	20
CHAPTER THREE - 5TH LANDCARE/CATCHMENT FORUM	23
Leaving Smaller Footprints	23
Keynote Speakers	23
Soil, Water, Biodiversity and Community footprints	24
In–forum tours	25
Discussions with successful Landcarers	26
NSW Landcare Awards	26
Concluding Comments	29

Membership & Staff

Chairman	Hon Pam Allan MP, Member for Wentworthville
Members	Hon Richard Amery MP, Member for Mount Druitt
	Mr Gregory Aplin MP, Member for Albury
	Hon Ian Armstrong MP, Member for Lachlan
	Mr Peter Draper MP, Member for Tamworth
	Mr Gerard Martin MP, Member for Bathurst
Staff	Ian Thackeray, Committee Manager
	Louise Armstrong, Senior Committee Officer
	Chris Papadopoulos, Committee Officer
	Vanessa Pop, Assistant Committee Officer
Contact Details	Standing Committee on Natural Resource Management Legislative Assembly Parliament House Macquarie Street Sydney NSW 2000
Telephone	02 9230 2390
Facsimile	02 9230 3309
E-mail	naturalresources.management@parliament.nsw.gov.au
URL	www.parliament.nsw.gov.au

Terms of Reference

- (a) current disincentives that exist for ecologically sustainable land and water use in New South Wales;
- (b) options for the removal of such disincentives and any consequences in doing so;
- (c) approaches to land use management on farms which both reduce salinity and mitigate the effects of drought;
- (d) ways of increasing the up-take of such land use management practices;
- (e) the effectiveness of management systems for ensuring that sustainability measures for the management of natural resources in New South Wales are achieved;
- (f) the impact of water management arrangements on the management of salinity in NSW.

Chair's Foreword

Last year, the Standing Committee of Natural Resource Management visited the Murray-Darling Basin to inspect natural resource management and attend the 5th Landcare/Catchment Forum in Wagga Wagga.

Both the Murray and Murrumbidgee catchment areas are intensively developed and support productive agricultural activities and large rural populations. Both catchments also suffer from dryland salinity, water quality and biodiversity issues. Each community is demonstrating that quite a lot can be achieved through innovative and fresh approaches to these issues, however.

In and around the once bustling Murray River port of Albury, an impressive range of environmental programs to create a more sustainable and liveable city have been recently undertaken. A quick trip to Charles Sturt University meant the committee was able to see first-hand how development impacts can be mitigated with on site wetlands. Similarly the committee was able to view how wastewater can be treated and discharged to adjoining the Wonga Wetlands. With the support of the Murray-Darling Freshwater Research Centre, the facility provides both environmental impact mitigation and education to the local community.

The Department of Infrastructure, Planning and Natural Resources explained its role in managing the States water to provide water for both irrigation and environmental flows to protect places like the Barmah-Millewa Forest. Finally, the committee visited a farming enterprise that incorporates Landcare principles and techniques. The Keogh family from Mullengandra are successfully demonstrating that being environmentally friendly can also mean being more profitable.

Caring for the landscape was also the focus of the 5th Landcare/Catchment Forum, co-hosted by the Wagga Wagga City Council, the Department of Natural Resources and Murrumbidgee Catchment Management Authority. The Forum's theme, "Leaving Smaller Footprints" encapsulated the challenges ahead for all of us.

Attendance at such forums is always inspiring and encouraging. Clearly many farmers are concerned with looking ensuring a sustainable future for their children. It was encouraging to hear fifth generation farmers talk about successfully working with Indigenous communities to blend farming, pest management and conserve valuable biodiversity, in the fragile and culturally sensitive Willandra World Heritage Area. Such approaches should be supported and rewarded, which is indeed what took place at the NSW Landcare Awards night – where a number of those who are dedicated to developing more sustainable approaches to land and water use were recognised for their efforts.

I would like to thank all of those who were involved in both the Albury Tour of Inspection and the Landcare Forum, as attending such activities informs and contributes to our ongoing work.

Pam Allan

Chair

Chapter One - BACKGROUND

NATURAL RESOURCE ISSUES IN THE MURRAY-DARLING BASIN

- 1.1 This Committee was established on 8 May 2003 to inquire into issues relating to the sustainable management of natural resources in NSW. Two reports have been tabled to date - one on the impacts of water management on salinity and another considering the on-farm approaches to land-use that reduce salinity and mitigate the effects of drought.
- 1.2 The Committee is currently inquiring into issues around the ecologically sustainable use of land and water.

Impacts of river regulation

- 1.3 The Murray-Darling Basin, Australia's largest and most extensive river system, drains the southern part of Queensland, New South Wales, the Australian Capital Territory, Victoria and South Australia.
- 1.4 The Murray-Darling Basin also provides over 41% of the gross value of Australia's agricultural production.¹ In order to achieve this, much of the natural flow of water from the two main channels, the Darling River and the River Murray is diverted for agricultural purposes. Subsequently, rivers within the Basin are the most regulated in the world. By the end of the twentieth century flows in the lower part of the River Murray were reduced to only 21% of those that would have occurred prior to agricultural development.²
- 1.5 Productive agriculture in the world's driest continent has come at a cost, however and sustainable extraction limits are now exceeded, which has been made worse by associated clearing of native vegetation. The resultant landscape changes have produced a number of negative impacts on both natural and agricultural values.
- 1.6 Firstly, the rising of more saline water tables has created higher salt loads for river systems. It has also contributed to dryland salinity and contributed to subsequent soil degradation. In turn this has considerably impacted on the Basin's capacity for agricultural production.
- 1.7 As well as agricultural impacts, altered flow regimes also contribute to the degradation of places with environmental, social and cultural importance.
- 1.8 The environmental resources of river systems include floodplain ecosystems and wetlands, which are adapted to natural variations in seasonal flooding and drying cycles. The region's water quality, soils and terrestrial and aquatic biodiversity has been affected by the reduction in the amount of water that flows down main channel and its associated wetlands.

¹ Murray-Darling Basin Ministerial Council, Draft Integrated Catchment Management in the Murray-Darling Basin 2001-1021: Delivering a Sustainable Future [September, 2000], p 1. In, Farrier, D. *Integrated Natural Resources Management in the Murray-Darling Basin, Australia: The Dryland Salinity Lever*. Centre for Natural Resources, Law and Policy, University of Wollongong.

² Murray-Darling Basin Ministerial Council, The Salinity Audit, December 1999, p2.

Background

- 1.9 Additionally, native fish stocks are depleting, often as a result of competition with invasive species more suited to the changed environment and many wetland flora and fauna populations are now endangered or threatened with extinction. Wetlands, normally places of refuge for terrestrial animals during drought, are drying up and much floodplain vegetation is being severely impacted upon by water regulation practices.
- 1.10 Through the Murray-Darling Basin Agreement 1992, the Murray-Darling Basin Commission was established to oversee the promotion and co-ordination of effective planning and management for the equitable, efficient and sustainable use of water and land in the Basin.³

Natural systems provide ecosystems services

- 1.11 Healthy and ecologically sound natural ecosystems such as rivers and wetland areas provide goods and services that also benefit human populations. These are known as 'ecosystems services.' Other examples of ecosystems services include forest timber, preventing soil erosion by vegetation and ameliorating dryland salinity by using trees to minimise rising watertables.⁴
- 1.12 At the 2005 Australian Water Summit,⁵ Professor Derek Eamus from the Institute for Water and Environmental Resource Management and the Department of Environmental Services (University of Technology, Sydney) said that ecosystem services contribute (globally) US \$33 trillion per year. He also said that without the flows needed to maintain ecosystem health, society would have to find the funds to pay for the technology to maintain a liveable and sustainable water supply.
- 1.13 This is of major concern from environmental, social and economic perspectives because for too long, Australian society has depended greatly upon the natural resource base to provide its most basic of material needs. Ecosystem collapse will inevitably impact upon society - and there is evidence that important ecosystems are being severely compromised by water being over-allocated for agricultural production.
- 1.14 An example of the impacts that are occurring in the Murray-Darling Basin can be highlighted by a recent survey conducted by Murray-Darling Basin Commission. The survey found that since 2002, floodplain stands of River Red Gums and Black Box in Victoria and South Australia have experienced significant population losses, with a corresponding significant change in tree health over a short period of time.
- 1.15 The report concluded that such a high proportion of stressed trees over a large portion of the River Murray floodplain is cause for concern. While improvements in drought-related tree decline can normally be expected once rainfall or flooding resumed, the recovery potential for the trees may be limited because compared with previous drought periods, there has been increased irrigation activities and associated diversion of flows and a corresponding increase in saline groundwater. Such a conclusion raised

³ Murray-Darling Basin Commission website: http://www.mdbc.gov.au/about/the_mdbc_agreement

⁴ Eamus D., Macinnis-Ng, C. M. O. Hose G. C., Zeppel, M.J.B, Taylor, D.T and Murray, B.R. (2005) Ecosystem services: an ecophysiological examination, *Australian Journal of Botany*, 53, 1-19.

⁵ Sydney Convention and Exhibition Centre, April 2005.

the widespread implications for both the appearance and the ecological functions of the area.⁶

Approaches to protecting the Basin's wetlands

- 1.16 The Murray-Darling Basin spans five States in eastern Australia and many wetland and floodplain places that have been attributed to natural heritage significance. Wetland loss has been a major natural resource management issue for both the State and Australian Governments for some time.
- 1.17 The Commonwealth Wetlands Policy 1997 provides for the management of wetlands on Commonwealth land, implementing Commonwealth policy, working with states, territories and local governments and acting as a scientific basis for policy and management and international action.
- 1.18 Additionally, Australia is signatory to the Convention on Wetlands (held in Ramsar, Iran in 1971), which aims to promote conservation and wise use of wetlands and a number of wetlands within the Basin are listed on the Ramsar register of internationally significant.⁷
- 1.19 Such wetlands can be subject to protection under the Commonwealth's Environment Protection and Biodiversity Conservation Act 2000, which is intended to protect environmental matters of the national environment significance and promote ecologically sustainable development.
- 1.20 The State level, the NSW Wetland Policy 1996 sets out objectives and nine management principles for wetland management.⁸ Under this policy it is generally accepted that water regimes need to maintain or restore the physical, chemical and biological processes of wetlands.
- 1.21 A number of New South Wales statutes and several planning instruments can be used to protect wetlands in NSW. These include:
- the Threatened Species Conservation Act 1995;
 - the Water Management Act 2000;
 - the Fisheries Management Act 1994;
 - the National Parks and Wildlife Act 1974;
 - the Native Vegetation Act 2003.
- 1.22 Planning controls under the Environmental Protection and Assessment Act 1979 can also be used, as can State Environmental Planning Policies. These include the State Environmental Planning Policy No. 14 (Coastal Wetlands), State Environmental Planning Policy No. 19 (Bushland in Urban Areas) and State Environmental Planning

⁶ Murray-Darling Basin Commission (2004) Survey of River Red Gum and Black Box Health along the River Murray in New South Wales, Victoria and South Australia –MDBC Publication No. 06/05

⁷ Department of Environment and Heritage, Australian Government website
<http://www.deh.gov.au/water/wetlands/ramsar>

⁸ Department of Land and Water, New South Wales Government website
<http://www.dlwc.nsw.gov.au/care/wetlands/wetlandmanagement/protection.html#Policies>

Background

Policy No. 44 (Koala Habitat) (which protects Swamp Mahogany, commonly associated with wetlands).⁹

Recent developments

- 1.23 In more recent years it has been clear that a national, more strategic approach is needed to ensure the river gets the flows that it needs so that ecosystem health can be maintained.
- 1.24 In co-operation with each State, the Australian Government aims to return water flows to the River Murray. Under the 2003 Living Murray Initiative, States and the Commonwealth agreed to return 500 GI to the River by 2009.
- 1.25 Through the 2004 National Water Initiative, Governments will work together to maintain productivity and efficiency of Australia's water use and ensure river and groundwater system health.¹⁰

MANAGING SALINITY IMPACTS IN THE MURRAY-DARLING BASIN

- 1.26 The Committee has already considered how current water management arrangements impact on managing increasing levels of salinity in the landscape.¹¹
- 1.27 The inquiry covered a number of matters dealing with issues around the management of water trading in the Murray-Darling Basin.
- 1.28 Where salinity occurs, agricultural yield losses can be large and, without mitigation practices, salt loads are predicted to increase for many catchments. By 1987, 560,000 hectares of land within the Basin were found to demonstrate water tables rising to within two metres of the land's surface.¹²
- 1.29 In 2000, production yields of 89,000 hectares of land in NSW were limited by salinity. This figure is predicted to rise to 286,000 hectares by 2020.¹³ In 1999, it was predicted that by the year 2010, without new interventions, all irrigation regions within the southern part of the Basin will have water tables within two metres of the surface. In 2000, 180,000 hectares of land in NSW demonstrated shallow watertables or were affected by dryland salinity.¹⁴
- 1.30 Australian Governments have long recognised that the demand for the use of water in the Murray-Darling Basin is unsustainable and, accordingly in 1999, established the Strategic Water Reforms Framework.

⁹ Ibid.

¹⁰ The National Water Initiative was signed by the Prime Minister, the Premiers of New South Wales, Victoria and South Australia and the Chief Minister of the Australian Capital Territory on 25 June 2004. Media Release, Murray-Darling Basin Commission website http://www.mdbc.gov.au/data/page/15/MR_BMF_flooding_051205.pdf

¹¹ Standing Committee of Natural Resources Committee, *The Impact of Water Management Arrangements on Salinity Management*, October 2004, New South Wales Government.

¹² National Land and Water Resources Audit, *Australians and Natural Resource Management*, March 2002, p89.

¹³ Ibid, p91

¹⁴ Ibid.

- 1.31 The reforms set the scene for new institutional arrangements intended to deliver environmental, economic and social needs. New approaches to water management policy and law incorporate improved knowledge about the environment's capacity to handle introduced water use practices.
- 1.32 In 2004, New South Wales became a signatory to the National Water Initiative which highlighted the need for environmental impacts of water trading to be managed by rules that ensure salinity objectives are included in water trading practices.¹⁵
- 1.33 Recent State reforms in New South Wales include new legislation that aims to:
- share water between the environment and other legitimate users;
 - set the rules for how much water can be extracted, by whom and when;
 - separate water rights from land title, so that water can be traded independently from land;
 - recognise that significant environmental benefits are possible if water is properly managed through efficient use of water and by allowing governments to buy water for environmental flows.
- 1.34 Other natural resources legislation passed as part of the water reform process includes:
- The *Catchment Management Act 2003*, which established Catchment Management Authorities and provides for them to be responsible for much of the water sharing process, including water plan review and funding water recovery schemes.
 - *Natural Resources Commission Act 2003*, which established the Natural Resources Commission, who will recommend state-wide standards and targets for natural resource management and in particular recommend approval of catchment action plans and water sharing plans to be developed by the Catchment Management Authorities.¹⁶

ON-FARM MANAGEMENT OF SALINITY AND DROUGHT IMPACTS

- 1.35 The Committee has recently inquired into approaches to on-farm land use management which both reduce salinity and mitigate the effects of drought and ways of increasing the up-take of such land use management practices.
- 1.36 The Committee found that progressive farmers and businesses are utilising practices that reduce salinity (eg tree belts, improvement of native pasture, saltbush, lucerne, salt tolerant pasture plants, pasture cropping, no-tillage farming and rotational grazing). Such methods might have a double benefit in that they also assist farmers to weather drought.
- 1.37 The recent drought has been costly for both farmers and NSW and Federal Governments in drought assistance and there would certainly be advantage in Government encouraging and assisting farmers to adopt land use practices which mitigate salinity and the effects of drought at the same time, where possible.

¹⁵ Standing Committee on Natural Resources Management, October 2002, op cit.

¹⁶ Ibid.

PURPOSE OF INSPECTION

- 1.38 The visit of inspection to Albury was an opportunity for the Committee to have a first hand look at how various organisations and agencies were developing specific land use practices that were tackling the salinity problems in that part of the Murray-Darling Basin.
- 1.39 The Committee visited the following organisations and sites. Each is addressed in more detail in the following chapters:
- **Department of Infrastructure Planning and Natural Resources**, Murray-Murrumbidgee Region Mr David Harriss, Regional Director;
 - **Walla Walla** - salt interception scheme;
 - **The Murray-Darling Freshwater Research Centre**;
 - **Albury Water (Albury City Council)** Waterview treatment plant and the **Wonga Wetlands**;
 - **Murray Catchment Management Authority** and the Keogh family property at Mullengandra;
 - Professor David Mitchell, Adjunct Professor, **Environmental and Information Sciences, Charles Sturt University**.

Chapter Two - Natural Resources in the Murray Catchment

- 2.1 The Murray Catchment spans 35,170 square kilometres and is bounded by the Murray River to the south, the Murrumbidgee River catchment divide to the north and the Australian Alps to the east.
- 2.2 The agricultural sector in the catchment area consists of grazing, cropping, irrigation, forestry and horticulture. The catchment plays a significant role in Australia's agricultural production with an annual farm gate value of agricultural production in excess of \$800 million and supports a population of around 101,000 people.
- 2.3 The catchment has significant areas with ecological values, including remnant terrestrial and aquatic vegetation, providing habitat for a range of threatened species including birds, plants, mammals and amphibians.
- 2.4 Additionally, there remains significant natural and developed resources at a regional, state and national significance, including Kosciuszko National Park, the Murray River (and associated anabranches, floodplains and wetlands), the redgum forests of Barmah-Millewa and the Koondrook and Werai forests.¹⁷
- 2.5 Salinity, water quality, soil and biodiversity management are key areas for the region. The Committee met with a number of people and organisations involved with on-ground natural resources management at both the regional, property and catchment scale.

WATER RESOURCE MANAGEMENT - DIPNR*

- 2.6 The NSW Government recognises that freshwater is a limited resource that needs to be protected from overuse.¹⁸ Mr David Harriss, Regional Director for the Murray-Murrumbidgee Region, the then Department of Infrastructure, Planning and Natural Resources (DIPNR) provided the delegation with a briefing on the water allocation management and the *Living Murray Initiative*.

Allocating limited water supplies

- 2.7 New South Wales shares the water resources within the Murray-Darling Basin with Victoria and South Australia. DIPNR's primary natural resource role in the State was to be responsible for monitoring riverine condition, surface waters, groundwater and managing 'flows' in regulated rivers.

¹⁷ Murray CMA website: <http://www.murray.cma.nsw.gov.au/>

* The Committee met with the Department of Infrastructure Planning and Natural Resources (DIPNR) in Albury. Since the inspection, the new Premier has reorganised government agencies, including DIPNR. For the sake of simplicity this report will continue to refer to DIPNR.

¹⁸ NSW Water Reforms: A secure and sustainable future. Ministerial Statement. Available at www.dipnr.nsw.gov.au.

- 2.8 With the exception of stock, domestic and non-commercial irrigation access rights for properties that front a watercourse, the right to access water is controlled by a licensing system. Water access licences have been controlled by the Crown since the proclamation of the *Water Act 1912*.
- 2.9 DIPNR administered a number of statutes relevant to water management, including the *Water Management Act 2000*, the *Water Management Amendment Act 2004*, the *Water Management Amendment Act 2005*, the *Catchment Management Authorities Act 2003* and the *Natural Resources Commission Act 2003*.¹⁹
- 2.10 DIPNR had the key function of managing water allocations, however, Mr Harriss told the delegation that water allocations will now be managed through the Catchment Management Authorities (CMAs) which will develop water sharing plans (under the *Water Management Act 2000*). He said that CMAs within the Basin include the Murrumbidgee CMA, the Lower Murray Darling CMA and the Murray CMA, whose activities are overlain with the Murray-Darling Basin Agreement.²⁰
- 2.11 Mr Harriss told the Committee that inflows are assessed and allocations determined. He said the Department website provides information on the process and how much water is available. The delegation was also told that the State's water resources are currently overallocated, due to government decisions during the 1960s and 1970s to provide many entitlements that were not expected to be activated.
- 2.12 Mr Harriss also said that whilst surface water overallocation is currently the main issue, groundwater issues are a "sleeping giant" that will need to be addressed in the near future. For example, groundwater pumping at Wacool to take the pressure off rising saline groundwater, means that aquifers at Deniliquin are being drawn down considerably.
- 2.13 Mr Harriss told the delegation that all licenced water users have had their allocation reduced and that each licensee is responsible for determining how best to manage each allocation in a way that will facilitate better business decisions.
- 2.14 He also said that New South Wales uses more water per month than Victoria, due to the large amount of agriculture. Mr Harriss told the delegation that future planning decisions for appropriate development will be based on information about the available water resource and that as a result, irrigated crops such as corn, will be less likely.
- 2.15 A security of rights has been developed to suit different agricultural enterprises. The level of licence security is determined by the type of agriculture and where it is located. For example, cereal cropping in the Hay Plains has lower security entitlements compared to Euston/Mildura area, which due to horticultural requirements receives a higher security status.
- 2.16 Mr Harriss said that the Department would prefer the area around Tocumwal area to be developed. This area, in western New South Wales is not at risk of having water supplies controlled by Murray Irrigation Corporation, unlike Sunraysia, the area currently the focus of development.

¹⁹ The Department of Infrastructure, Planning and Natural Resources website: www.dipnr.nsw.gov.au.
²⁰ Murray-Darling Basin Website, op cit.

Water management issues in the Darling

- 2.17 Flow regulation from the Lower Darling extends to the Menindee Lakes, extraction levels and water quality are affected by agreements to meet water needs in both South Australia and locally.²¹ The example of the Great Anabranh of the Darling River was provided as an example of how complicated the issues within the Basin can be.
- 2.18 The Great Anabranh is a regulated system, that comprises a complex of ephemeral wetlands. The wetlands would normally receive flows when the Darling River floods, the largest retaining water for up to five years. Water for the Anabranh is supplied from the Menindee Lakes System²² however, regulation has affected flows to Nearie Lake Nature Reserve, as modifications in the flooding regime has impacted on vegetation and fauna species.²³
- 2.19 The agricultural focus for the area has been grazing sheep, growing cotton and developing tourism. Mr Harriss told the delegation that when not flooded many of the lakes are cropped. However, the competing demands from tourism, irrigation and floodplain management has decreased water quality and increased salinity.
- 2.20 Mr Harriss also said that DIPNR is trying to recover water for Menindee Lakes via the Anabranh, by managing seepage from irrigation channels and piping water to horticultural areas. He said that whilst DIPNR sees merit in providing a pipeline from the Anabranh to the Chowilla floodplains for stock and domestic water, local communities would prefer not to further impact upon the Anabranh.

Water supply issues in the Murray

- 2.21 The delegation discussed issues around the Barmah-Millewa area (between Deniliquin, Echuca, and Tocumwal).
- 2.22 The Barmah Choke is a section of the River Murray that is limited in its capacity to carry flows during high rainfall periods. Large volumes of water temporarily bank up behind the Choke, which reduces the height of downstream flood peaks and floods the area surrounding Lake Barmah.²⁴
- 2.23 Mr Harris said that the period of peak water demand downstream of the Barmah Choke is usually late summer or early autumn. He said that the amount of water banked up behind the Choke is likely to be a critical factor and can limit water supply when rainfall in the irrigation areas downstream of Echuca is low and irrigation demands are high.
- 2.24 He also said that when the Hume and Dartmouth dams are reasonably full, water managers may announce high irrigation allocations. Another issue for supply is when

²¹ Water Quality and River Quality Flow Interim Objectives. Department of Environment and Conservation, <http://www.epa.nsw.gov.au/ieo/FarWest/index.htm>

²² Water Quality and River Quality Flow Interim Objectives, op cit.
[Hhttp://www.epa.nsw.gov.au/ieo/FarWest/report-H02.htm#P333_38972](http://www.epa.nsw.gov.au/ieo/FarWest/report-H02.htm#P333_38972)

²³ *Refugia for Biological Diversity in Arid and Semi-arid Australia*, Biodiversity Series, Paper Number 4. Biodiversity Unit, S.R. Morton, J. Short and R.D. Barker Appendix by G.F. Griffin and G. Pearce.
<http://www.deh.gov.au/biodiversity/publications/series/paper4/drp.html>

²⁴ The Barmah Choke -
http://www.mdbc.gov.au/river_murray/river_murray_system/barmah/barmah_choke.htm

the Menindee Lakes storage is low, which means that most of the South Australian water share must be supplied from Hume Dam and Lake Victoria. During periods of peak demand, New South Wales can be asked to contribute additional flows from major regulated tributaries, such as from the Murrumbidgee and the Darling. However, volumes of such contributions may be constrained by other requirements.

Water trading

- 2.25 The Committee asked how the Department will manage the impacts of water trading as a result of the interstate water trading agreements.
- 2.26 Mr Harriss stated under the Environmental Planning and Assessment Act 1979, Drainage and Irrigation Management Plans (which are approved by the Regional Director) delineates high and low impact zones in transferring an allocation.

Living Murray Initiative

- 2.27 Mr Harriss told the Committee Members his unit provided the basis for COAG's National Water Initiative, which addresses water management issues and encourages the adoption of best-practice approaches to the management of water in Australia. He said that as part of this program, New South Wales aims to improve delivery efficiencies, rather than buying water on the water market that are being encouraged under the new arrangements.
- 2.28 In all, DIPNR has 54 projects aimed at saving water, in particular by reducing channel seepage and better pipeline management. However in low value areas, there are plans to buy the required water. Mr Harriss highlighted to the Committee there are community concerns that Government involvement will increase the price, possibly distorting the market price of water.
- 2.29 He said that DIPNR will also enhance wetland rehabilitation by allowing them to dry naturally.

Providing environment flows

- 2.30 The Murray-Darling Basin Water Agreement was signed by COAG in July 2004; setting out arrangements for investing \$500 million over five years (commencing in 2004-2005) to reduce the level of water overallocation and to achieve specific environmental outcomes in the Murray-Darling Basin. In order to fund water recovery, New South Wales and Victoria have each provided \$115 million, with \$65 million from South Australia and \$5 million each from the Australian Capital Territory and Queensland.²⁵
- 2.31 Mr Harriss told the Committee that the *Living Murray Initiative* aims to recover environmental water for six significant ecological assets identified by the MDB Ministerial Council in November 2003. These were the River Murray Channel, the Barmah-Millewa Forest, Gunbower and Koondrook-Perricutta, Hattah Lakes, Chowilla

²⁵ Water recovery measures to be funded under the *MDB Water Agreement* may include investment in water infrastructure and behavioural change and purchase of water on the market, with recovered water to be set aside for environmental purposes.

Floodplain, the Coorong and the Murray Mouth. He said the process will bank 500,000 megalitres of water to provide additional flows at the appropriate time.

- 2.32 Through the *Living Murray's First Step* program, the Murray-Darling Basin Commission has conducted scientific, economic and social analysis of options to improve the health of the River Murray. A number of technical reports have supported decisions regarding water being returned to the environment.²⁶
- 2.33 Interim objectives and outcomes for actions under the *First Step* program include to enhance forest, fish and wildlife values, successful breeding of colonial waterbirds (in at least three years in ten) and healthy vegetation in at least 55% of the forest. The Murray-Darling Basin Commission has developed an environmental plan that will identify how much water is needed to meet the objectives and guide the management process.
- 2.34 The Barmah-Millewa Forest, one of the ecologically significant assets identified for treatment under the Living Murray Initiative, is the largest area of Red Gum forest in Australia, which covers over 66,000 hectares and is a wetland of International Importance under the Ramsar Convention and is part of the NSW Central Murray State Forests Ramsar site.²⁷
- 2.35 The forest provides habitat for numerous threatened plants, birds, fish and reptiles and during appropriate seasonal conditions, supports colonies of breeding waterbirds. Mr Harriss said that environmental flows to maintain the ecological integrity of the area will be provided under the new arrangements.
- 2.36 Mr Harriss told the delegation that the Department can provide extra water (ie, 100,000 megalitres) to the forest to coincide with a natural flooding event. He also said that water in the Barmah-Millewa account can be lent for irrigation purposes downstream and then be taken back if required to provide a flood for the forest.
- 2.37 According to the Murray-Darling Basin Commission announced in late 2004 that water delivered through such commitments indicates that the Barmah-Millewa forest, Ramsar listed wetland, is showing signs of improvement.²⁸
- 2.38 In October 2005, New South Wales and Victorian Governments commenced delivering another 500 gigalitres water to the Barmah-Millewa Forest. The water was borrowed from environmental water committed to the Forest, but loaned to irrigators because of the 5 year drought.²⁹

²⁶ These reports can be found on <http://www.thelivingmurray.mdbc.gov.au/reports>

²⁷ Barmah Forest

[Hhttp://www.thelivingmurray.mdbc.gov.au/implementing/six_significant_ecological_assets/barmah_millewa_forest](http://www.thelivingmurray.mdbc.gov.au/implementing/six_significant_ecological_assets/barmah_millewa_forest)

²⁸ Media Release, Murray-Darling Basin Commission website

http://www.mdbc.gov.au/data/page/15/MR_BMF_flooding_051205.pdf

²⁹ Under an agreement forged by the Murray-Darling Basin Ministerial Council in 1993, 100 gigalitres of water is allocated to the forest every year. New South Wales and Victoria have each agreed to provide an extra 25 gigalitres when possible. Due to extreme drought over the past five years this water was not released and was instead borrowed by irrigators who otherwise would have been unable to produce a crop. <http://www.parliament.nsw.gov.au/prod/parlment/hanstrans.nsf/v3ByKey/LC20051011>

2.39 Rainfall in southern New South Wales meant that borrowed water from the forest's environmental allocation had to be paid back. Although the flows revived the stressed river red gums and stimulated wildlife breeding events. This action highlights to the Committee the ongoing contest between the needs of production and the environment and indicates strongly that we still do not have a sustainable balance in our land and water use.

Walla Walla Salt interception scheme

2.40 Early studies undertaken by the Department (then DLWC) found that in a 2.4 km reach of the Billabong Creek north of Walla Walla, the salinity of the creek increased from 2120 to 3130 mS/cm. Further studies have estimated that a groundwater inflow of 4ML/day and with salinities around 5000mS/cm enters the creek in this location.

2.41 Site specific investigations have been undertaken on the property "Lonerenong" owned by Graeme Lieschke. These investigations showed that on this property a more saline groundwater unit overlays a deeper and relatively fresh groundwater unit.

2.42 The trial salt interception scheme has involved a 6 month trail of pumping the water from the deeper, fresher groundwater unit to relieve the pressure on the upper more saline groundwater that is entering the creek.

2.43 It is estimated that under pre-scheme conditions about 4 ML/day of groundwater with an average salinity of 5000 mS/cm entered the Creek at low flows (<320 ML/day). This equates to approximately 12 tonnes of salt per day.

2.44 The test bore is currently pumping 4ML per day from the deeper aquifer (generally < 700mS/cm) and returning this to the Billabong Creek. The pumping of the freshwater into the creek provided an additional benefit of essential stock and domestic water supplies to the creek during the recent drought.

2.45 In August 2005 the Murray-Darling Basin Commission declined the NSW offer to rein the salt interception schemes as a joint scheme.

2.46 At the same time the property (Lonerenong) was placed on the market. The Department of Natural Resource purchased the property and is establishing easements for the continued operation of the scheme, as well as a vegetation corridor. The property will then be sold.

2.47 DNR plans to establish a joint venture with industry leasing salinity credits, to finance the continued operation of the scheme.

CATCHMENT MANAGEMENT IN THE MURRAY REGION

2.48 The Committee met with staff and board members from the recently established Murray Catchment Management Authority (CMA) - Mr Paul Trevethan (Board Member), Mr Anthony Couroupis (General Manager), Ms Helen Wilson (Team Leader, Community and Implementation), Ms Kim Krebs and Mr Dale Stringer (Catchment Implementation Officers).

- 2.49 The CMA provided a briefing to the Committee on the catchment management approaches and took the Committee to inspect targeted on-farm works at a property in the Mullengandra area owned by Mr Adrian Keogh and his family.

Achieving NRM outcomes

- 2.50 Natural resource management outcomes will be achieved by CMAs developing planning instruments established under the natural resource management reforms. These included catchment action plans, water sharing plans and property vegetation plans. CMAs will also develop and manage investment strategies to assist landholders to better protect and improve their management of existing native vegetation and perennial pastures, and establish salt bush where required.
- 2.51 The CMA told the Committee delegates that a new Catchment Action Plan (CAP) as required under the *Catchment Management Act 2003*, will be developed from the Murray Catchment Blueprint (developed by the previous Murray Catchment Management Board).
- 2.52 The Committee was told that the main issues for the Murray Catchment are water quality (salinity and turbidity), soil health and biodiversity. The CAP will focus on issues specific to Murray catchment and utilise the existing Murray Catchment Blueprints based on state-wide standards and targets of a range of natural resource management indicators being developed by the Natural Resources Commission.³⁰ The CAP will address these issues and facilitate sustainable and profitable agricultural production.
- 2.53 The CMA aims to deliver the required on-ground works through having ten implementation officers, with five in the South Western area, who will provide an integrated package of incentives to landholders to assist them develop farm forestry, strategic revegetation works, perennial pastures, saline site management, native pasture management, enhancement of existing vegetation, revegetation and riparian management.
- 2.54 The Murray CMA will also provide landholders with access to data to prepare Property Vegetation Plans and allocate funds (including incentive funding), to support their development and provide education and training on natural resource management, especially vegetation management.
- 2.55 The Committee was told by the CMA that \$820,433 was committed to on-ground works within the catchment from funds from the National Action Plan for Salinity and Water Quality and the National Heritage Trust. Property plans will be developed with landholders to assess where works are required.

³⁰ The Natural Resources Commission Act 2003 established The Natural Resources Commission (NRC) to provide the NSW State Government with independent advice on a range of natural resource management issues, including to recommend state-wide standards and targets for natural resource management, review and recommend the approval of CAPs and audit CMAs' implementation of these plans and their effectiveness in achieving state-wide standards and targets. NRC website: www.nrc.nsw.gov.au

2.56 The CMA told the Committee they have already achieved a number of on-ground projects including establishment of perennial pastures, active management of remnant vegetation and restoring and regenerating broad vegetation types in the area. The CMA has also made progress with managing existing native vegetation pastures, revegetating and managing riparian zones and plantation forestry for recharge control.

Salinity within the Murray Catchment

2.57 The CMA told the Committee delegates that approximately 80% of the salt load within the Murray Catchment originates from the eastern part of the catchment around Holbrook and Culcairn. This area receives the highest rainfall and supports dryland agricultural practices including grazing, forestry and cropping.

2.58 In 2000, the total salt load for this part of the catchment was over 101 tonnes per annum. This figure is expected to rise to over 140,000 tonnes per annum by 2020. The irrigation districts of Wakool, Cadell, Berrigan and Denimein have Land and Water Management Plans which require the salinity load export to be capped to 2000 levels at approximately 22 tonnes per annum year until 2020.³¹

2.59 On the other hand, the Murrakool area, in the western part of the catchment demonstrates the lowest salt loads at approximately 2-3 tonnes per annum, but which is predicted to rise to around 4000 tonnes per annum by 2020. In this area there is some dryland farming, low levels of irrigation and plains grazing as well as being where the Barmah-Millewa native forests are located.

2.60 According to the CMA, the Murray Blueprint end-of-valley river salinity target for the Murray River (downstream of the Wakool River junction) for 2020 was a return to the average salinity concentrations for 2000, but allowing for a limited 3% increase in the salt concentration by 2010. The recommended instream salinity target is approximately 230 EC³², however the CMA is concerned this may increase to 250 EC by 2020 "if business continues as usual."

2.61 The CMA told the Committee that proposed actions listed in the CAP to be implemented over the next 10 years to manage salinity impacts include recharge management with deep rooted native vegetation, plantation forestry, perennial pastures, control of saline discharge areas and reduced leakage through better water management and sustainable farming practices.

2.62 Vegetation targets listed in the Catchment Action Plan to facilitate salinity management are;

- 37 ha of woody vegetation;
- 267 ha of farm forestry;
- 26 ha of land managed to reduce saline run-off;
- 1651 ha of perennial pastures;

³¹ Watson, A. J. 2002. *NSW Murray Catchment Salinity Report: salt loads, salinity risk and a focus for actions*. Department of Land and Water Conservation.

³² In water, salinity is usually measured by its electrical conductivity (EC), which is a measure of the concentration of ions in water or in the soil solution. H<http://www.agric.nsw.gov.au/reader/water-quality-supply/ac2-salinity.htm>

- 329 ha of native vegetation enhanced;
- 219 ha of native vegetation established;
- 33 ha of riparian areas protected;
- 2.1 km gully erosion managed;
- 3.9 km streambank erosion managed.

Landcare farming at Mullengandra

- 2.63 The Keoghs' farm around 4,500 hectares of freehold and leased land, was primarily comprised of sheep grazing enterprises, with some fodder cropping and cattle. Management of the properties has been significantly refused to lift production and address land degradation issues. For example, the farm's paddock layout was changed to better manage grazing across the property.
- 2.64 As much as 40 hectares of fencing (including of four major dams) was completed with the support of Holbrook *Landcare* and the Greencorps. Holbrook *Landcare* also assisted with farm planning processes and suggested new ideas. Mr Keogh said his family found they were able to change their mindset from "this can't be done" to "this can be done". However, some boundary issues remain, but neighbours are now "looking over the fence" as they are interested in what the Keoghs are doing on their property.
- 2.65 Over the last two to three years, non-productive annual pastures have been replaced with perennial pastures. This has improved production and reduced dryland salinity and erosion. Mr Adrian Keogh told the Committee that they had planted triticale, wheat, canola and lucerne. Silage of the perennial pastures is helping to drought proof the property and a native revegetation program is reducing recharge and stabilising the once serious gully erosion.
- 2.66 The Committee was told that pasture improvements had increased profitability and the family can now afford to set aside some land for fallowing and to harvest the pasture seed. Stocking rates have increased by one third annually and *Landcare* funding had provided for tree belts which assisted during a recent cold snap that was crucial in preventing sheep deaths.
- 2.67 Better on-farm practices employed by the Keoghs include direct drilling with a direct seeder owned by the community, which the CMA assisted in acquiring, as most individuals were unable to afford their own machine and paying for contractors was also expensive. The Committee was also told that in the future the family would employ an agronomist to assist with pasture management and develop erosion management programs.
- 2.68 The Keoghs were particularly supportive of *Landcare* and expressed a hope that the new CMAs would not be too complex nor erode the good will and success that *Landcare* had achieved. Mr Keogh told the Committee that the CMAs, in 12 months since they had been established, had not developed the same interaction with the community that the Landcare program had.

- 2.69 He said that since the original Catchment Management Committees were established (the late 1980s) through the development of Catchment Management Boards (the late 1990s) and now through the Catchment Management Authorities, engagement by Landcare Facilitators had decreased and he felt that they should be better supported.
- 2.70 The Keoghs also told the Committee they felt that the proposed Property Vegetation Plans (under the incoming *Native Vegetation Act 2003*) were potentially confusing and that they had thought vegetation management issues should have been dealt with through the property management planning processes they had been working on with the support of Landcare Facilitators and the Catchment Management Authority.

MURRAY DARLING FRESHWATER RESEARCH CENTRE

- 2.71 The Murray-Darling Freshwater Research Centre was established in 1986-87 as a joint venture between the Murray-Darling Basin Commission and CSIRO Land and Water. Originally the Centre was developed as an adjunct to the Albury Wodonga Development Corporation, but is now the main focus for a Murray-Darling limnological research program.
- 2.72 The Centre provides sound scientific knowledge to underpin strategies for the effective water resource management in the Murray-Darling Basin. A multi-disciplinary team of scientists and technicians conduct research into function of lowland river ecosystems, including floodplains and associated wetlands. The main laboratory is in Albury/Wodonga with two satellite laboratories at Mildura and in Goondiwindi.³³
- 2.73 The Centre is one of 20 partner organisations that form the Cooperative Research Centre for Freshwater Ecology, a national research centre specialising in river and wetland ecology, based in Canberra.
- 2.74 The Committee delegates met with staff from the Centre, including the Deputy Director, Dr Darren Baldwin. Dr Baldwin leads research priorities and fosters and coordinates consultancies conducted by the Centre. Staff told the Committee how science assists river managers face the main challenges of ensuring long-term ecological sustainability of river systems and also ensuring the survival and on-going economic sustainability of local industries and communities.
- 2.75 Currently, the Centre is conducting research to manage the problems that have arisen as a result of land and water management practices over the past 150 years. Such problems including salinisation, loss of aquatic habitat and biodiversity, changes in flow patterns, the impacts of river regulation and associated water quality issues. The increased incidence of toxic algal blooms is of particular concern in the area.
- 2.76 Committee Members were also shown on-site water quality projects that evaluated the impacts of salinity levels on biodiversity. Activities to assist with restoration were also discussed and the delegates were told that restoration activities are often less successful than they could be because of the “incremental nature” of such activities, which may only address one of the many driving forces on the environment.

³³

Wonga Wetlands Website: [Hwww.wongawetlands.nsw.gov.au/laboratory/Centre.htm](http://www.wongawetlands.nsw.gov.au/laboratory/Centre.htm)H

- 2.77 Dr Baldwin told Members that other driving forces often need to be taken into consideration or, in some cases that the driving force being addressed by the restoration activity may be the wrong one. Dr Baldwin stressed that in order to deal with this problem, restoration activities need to be used within a “learning culture” and scientific approaches implemented, such as through Adaptive Management which, the Committee was told, “is rarely implemented properly.”
- 2.78 The presentation highlighted to the Committee that adaptive management is:
- intended to be treated like a scientific experiment;
 - to be used as a opportunity to learn;
 - a properly designed monitoring program that addresses specific questions;
 - to involve both scientists and resource managers from the outset;
 - to be sufficiently resourced for both baseline data gathering and long-term monitoring, not just capital works.
- 2.79 An example of where adaptive management was poorly implemented cited by the Centre is Wingecarribee Swamp, south of Sydney. This is mainland Australia's largest peat swamp and once had the highest known species and habitat diversity of any peatland swamp in Australia.
- 2.80 Wingecarribee Swamp is also a nationally significant wetland and is home to four rare and endangered species including the Giant Dragonfly, *Petalura gigantea*, an ancient bog dwelling species, which lives for thirty years and is now listed as endangered under the Threatened Species Conservation Act.³⁴ The Committee delegates were told that peat mining within the swamp was not managed appropriately and a land slip caused the collapse of the entire ecosystem.³⁵
- 2.81 Dr Baldwin also told the Committee that the Murray-Darling Basin Commission’s *Living Murray Initiative* was a notable example of the application of good adaptive management principles. He also said the Centre aims to continue to formulate and carry out research projects on wetlands and surrounding floodplains ecosystems, either alone or in cooperation with other research bodies.

URBAN WATER MANAGEMENT

Reclaiming Waste-water in Albury City

- 2.82 Mr Daryl McGregor, the Manager of Albury Water, took the Committee to a waste water and constructed wetlands program. Sustainable water management is also an issue for urban water supplies and Mr McGregor told the Committee that water availability and sustainability, public health issues, water conservation, water quality (including phosphorous and blue green algae contamination) water trading and changing community perceptions were crucial issues for the City of Albury.

³⁴ University of Wollongong Website:
<http://www.uow.edu.au/arts/sts/sbeder/wingecarribee/value/habitat.html>

³⁵ <http://www.abc.net.au/rn/science/earth/stories/s12078.htm>

- 2.83 Mr McGregor proposes that the adoption of sensible water conservation strategies combined with sound catchment management strategies can assure the future of urban water supplies, and that people need to change the way they value and use water without compromising public health standards.
- 2.84 Waterview Wastewater Reclamation Facility combines technically advanced purification with a philosophy of beneficially re-using reclaimed water. The overall water management strategy was developed and implemented by the City of Albury. Waterview is recognised as a world leader in best practice treatment, reclamation and re-use.
- 2.85 Waterview was officially opened in 1999 and involves processes to remove nutrients with advanced biological factors, ultra violet disinfection, sand filtration, storm flow treatment and sludge dewatering.
- 2.86 The Committee visited the Waterview Laboratory which provides a professional, efficient, cost effective service to clients in the Murray Valley and throughout southern New South Wales and northern Victoria. Clients include engineering consultants, local Councils, universities, manufacturing and private industry.³⁶
- 2.87 The reclaimed water produced by the facility flows via a series of cascades to the Flow Distribution Lagoon where it is combined with the reclaimed water produced by the existing Kremur Street Sewage Treatment Plant. Water is directed from this storage to the irrigated pine plantations, Wonga Wetlands and adjacent irrigated hardwood forests. There is no discharge of reclaimed water to surface waters.

Wonga Wetlands

- 2.88 Wonga Wetlands, which is located downstream from Albury along the floodplain of the River Murray is a good example of environmental management by the City of Albury.
- 2.89 The City of Albury plans to develop the wetlands as a significant ecological, educational and environmental resource for the community, establishing an important eco-tourism and nature-tourism destination. Since the creation of the wetlands, more than 130 bird species have been recorded at the site, some of which have not been recorded there before.³⁷
- 2.90 Community facilities at Wonga include an education and interpretive centre, nature trails, boardwalks and bird hides. Additionally, flora and fauna and biodiversity research projects conducted in partnership with local schools, TAFE's and Universities, including the Murray-Darling Freshwater Centre and Charles Sturt University are promoted and supported.
- 2.91 Mr McGregor told the Committee that a Wiradjuri community campsite is being developed as part of the project. He also said they wish to seek sponsorship to continue to develop and maintain existing facilities and develop the tourism potential of the wetlands.

³⁶ City of Albury Website. Hwww.alburycity.nsw.gov.au/environment/waterview.htmH

³⁷ Ibid.

SUSTAINABLE WATER MANAGEMENT AT THURGOONA

- 2.92 The Committee visited Charles Sturt University, Thurgoona Campus where they were met by Professor David Mitchell, a wetland ecologist and Adjunct Professor at the School of Environmental and Information Sciences, who discussed the importance of water resource conservation with the Committee.
- 2.93 Professor Mitchell had told Conference delegates that he made a presentation at the 21st Commonwealth Agricultural Conference held in Albury in March 2004 where he highlighted that Australian water resources are affected by the combined effects of natural drought and flood cycle variability and the implementation of inappropriate European practices on this landscape.
- 2.94 He said that developing large scale water storage systems to remove water from the natural landscape for use in agriculture has had significant cost to the environment. Although Australian species have evolved to survive harsh, arid conditions, water is still vital to ecosystem health and that in the long term, water must be managed holistically and it is vital to repair damaged ecosystems and achieve balance between environmental, social and economic benefits.³⁸
- 2.95 Professor Mitchell drew the attention of Members to the sustainability aspects of the Thurgoona Campus of the University, which has won an award for being Australia's first example of a 'greenfields campus.' He said that a number of environmental enhancements had been undertaken, for example, in revegetation programs, on-site water management through artificial creeks and wetlands and composting toilets.
- 2.96 The campus buildings are made from rammed earth and recycled building materials and windmills and solar collectors provide electricity for a fully networked computer centre, lecture theatres, library, laboratories, residential cottages and an herbarium.
- 2.97 The campus has been designed to specifically cater for environmental and information science graduates and postgraduates. Students gain hands-on experience in field research "on-site", studying archaeological sites, the rehabilitation of eroded creek beds, conducting ecological and hydrological surveys, as well as interpretive planning of the built and bush environment.³⁹
- 2.98 Research in salinity management is also being conducted at the university. As part of the CRC for Plant Based Management of Dryland Salinity, Dr Ben Wilson is working with colleagues from the University of Western Australia and the Victorian Department of Primary Industries is studying how ecosystems function in soil affected by salinity and waterlogging. Research will focus on both individual species and the ecosystem as a whole.

³⁸ The Philosophy of Water – "Water is Life", 21st Commonwealth Agricultural Conference Albury NSW, March 2004. Conference paper.

³⁹ Website Charles Sturt University <http://www.csu.edu.au/faculty/sciagr/eis>

CONCLUDING COMMENTS

The essential dilemma for policy makers and the community was succinctly articulated by the Murray Darling Freshwater Research Centre when it asked, how can we achieve ecological sustainability while at the same time maintaining economically viable communities?

The good news is that there are many on-farm practices being developed that are both profitable for landholders and sustainable in the long-term.

The endeavours that the Committee observed in the Albury area are driving many of these emerging practices. The scope and scale of the activities seen and discussed by the Committee delegation in the Albury area are not only a positive sign of the recognition of the need to take action but provide concrete models of how to make things better.

The importance of science and research coupled with landholder commitment to change direction is vital. So, too, is learning from our successes and mistakes through the adaptive management process.

Current government reform aims to put the focus on resource management at the regional and local level by making Catchment Management Authorities the key to delivering policy outcomes. It is important to get decision making and information exchange down to a practical level. The success of this localised, regional approach depends on the CMAs being informed, relevant and practical, replacing distant bureaucrats.

However, this process is still evolving and concerns were raised in Albury about the effectiveness of it. Mr Keogh observed that Landcare had been crucial in his success but Landcare facilitators were “disappearing”, being replaced by what was felt to be more bureaucratic approaches. Landholders are not as inclined to listen to bureaucrats.

This is a message the Committee has heard elsewhere in its inquiry and sees this as significant challenges for the new CMAs. They must win the trust and respect of landholders, utilising all the practical expertise available.

There are many stakeholders and organisations in this field and it is critical that all their activities be as coordinated and focused on achieving the best outcomes possible for the whole community.

Mr Harriss (DIPNR) flagged the “sleeping giant” of the problem of over-allocation of groundwater, an issue which merits further investigation.

Mr McGregor’s comment about the need for people to change the way they value water is at the heart of natural resource management and sustainability and strategies need to be developed to do this.

It is important that the successful approaches like those observed by the Committee on this inspection contribute to change beyond their immediate locale. They have the potential to form a network of working models that can help inform and convince others of the merits and advantages of these approaches.

While the Committee's most recent report focuses on on-farm practices, longer term sustainable natural resource management is also a responsibility of urban communities. The efforts of Charles Sturt University to develop a "greenfields campus" and of Albury Water to better manage water for the community in the Albury urban areas is a recognition of this.

In conclusion, the Committee delegation learnt much in a short time in Albury that will inform and contribute to its remaining reports.

Chapter Three - 5th Landcare/Catchment Forum

- 3.1 On 18-20 August 2005, a delegation of the Committee attended the 5th Landcare/Catchment Forum, which was hosted by the Murrumbidgee Landcare Association, the Murrumbidgee Catchment Management Authority, the Department of Infrastructure, Planning and Natural Resources and Wagga Wagga City Council, who worked in partnership with the community and Traditional Owners to develop the forum.
- 3.2 The Forum theme was 'Leaving Smaller Footprints' which focused attention on sustaining and even increasing economic activity, while treading lightly on the environment.

LEAVING SMALLER FOOTPRINTS

- 3.3 The two day Forum was held at the Kyeamba Smith Hall in Wagga Wagga and was attended by landholders, landmanagers, all landcarers and those who support work in sustaining and improving natural resources.
- 3.4 The Forum provided an opportunity to reflect on the challenges and opportunities apparent by recent changes in natural resource management. The concept of “leaving smaller footprints” means balancing the economic, social and environmental aspects of agricultural business.
- 3.5 Wiradjuri Elder Mrs Flo Grant welcomed the conference delegates to Wiradjuri Traditional Lands, jointly with the host representatives Wagga Wagga City Council Mayor -Kerry Pascoe, Mr Nelson Quinn from the Murrumbidgee *Landcare* Association and the Chair of the Murrumbidgee Catchment Management Authority and Conference Convenor, Mr Lee O'Brien.
- 3.6 In addition to conference activities, delegates attended tours of landcare projects within the Murrumbidgee Catchment Area and were invited to attend the NSW *Landcare* Awards dinner as part of the Forum proceedings.

KEYNOTE SPEAKERS

- 3.7 The Rt Hon Ian Sinclair AC, President of the Murray-Darling Basin Commission told delegates of the importance of individuals, communities, industries and organisations finding ways to leave smaller footprints.
- 3.8 The Foundation Keynote was provided by Emeritus Professor Bob Douglas AO, who was Foundation Director at the National Centre for Epidemiology and Population Health and Chair of the Board of *Australia21*, a not-for profit organisation that is committed to developing networks of understanding and influence on a number of important topics.
- 3.9 Professor Douglas talked to delegates about the importance of searching the big issues that challenge leaving smaller footprints, as it is crucial for the future of human health and well-being. He said that human beings are not living sustainably and there is potential for the natural capital on which human society and its economy depends to collapse.

- 3.10 He also said that whilst Australians are faring well economically, there is evidence of serious damage to both social and environmental systems and that if Australians expect to enter the 22nd century, drastic change in conventional values, economic structures and social arrangements is required.⁴⁰
- 3.11 Andrew and Carolyn Nichols who manage 'Redbanks' in Tasmania, winners of the 2004 National Landcare Awards Rural Press Primary Producer, told delegates that when it came to taking up better practices, primary producers need one-on-one support from Government agencies, rather than expecting already busy farmers to learn and apply new ideas overnight.

SOIL, WATER, BIODIVERSITY AND COMMUNITY FOOTPRINTS

- 3.12 A number of concurrent sessions were held to discuss issues on soil, biodiversity, water and improving community involvement.

Soil conservation

- 3.13 Anne Williams from "Magomadine" in Coonamble, told delegates about the impacts of devastating dust storms during the drought of 1994. Their experience lead them to develop no-till farming for a dryland cropping and steer fattening enterprise.
- 3.14 Gerry Gillespie, Chair of Zero Waste Australia, highlighted the importance of carbon cycling in maintaining sustainable soils.

Water management

- 3.15 Howard Jones, a Grapegrower from Dareton and who is a Director of Western Murray Irrigation Ltd, and Chair of the Murray Wetlands Working Group, discussed how community groups manage adaptive environmental water cooperatively with private industry.
- 3.16 Guy Roth, CEO of the Australian Cotton Cooperative Research Centre, told delegates that conducting research and providing education and extension services within the industry context can reduce water footprints.

Biodiversity

- 3.17 Patty Byrnes of *Wamberra Station* (Mildura) explained how her fifth generation farming family has successfully blended biodiversity conservation and profit. The Byrnes family manages more than 51,000 hectares near Mungo National Park and the Willandra World Heritage Area. The family monitors mallee fowl populations and is protecting both natural and farming values with property planning and feral animal management, with the support of local Indigenous communities. The enterprise is so successful that they are now involved with training young Indigenous people in relevant work skills.
- 3.18 Leigh Vial and his family are irrigation and dryland farmers at Wakool who have found that fencing remnant vegetation, providing water for billabongs, revegetating Black Box country, planting salt bush and direct seeding ensures more financial gains.

⁴⁰ See also - Goldie J, Douglas, B and Furnass B. Chapter 1- An urgent need to change direction, In: *In Search of Sustainability*, Goldie, Douglas and Furnass (Eds). CSIRO Publishing ACT.

Community involvement

- 3.19 Andrew Campbell, farmer and CEO of Land and Water Australia discussed new and emerging sustainability services and tools to assist the community.
- 3.20 Hedley Thomson, from the City of Ballarat and who was a National Landcare Award Finalist told delegates about the internationally recognised project that he has been involved with. This is the largest community project for Ballarat in 100 years. ‘The Yarrowee River Trail Network’ brings the Yarrowee River back to the heart of the city.

IN-FORUM TOURS

- 3.21 The forum included tours to domestic, primary, secondary and tertiary sector sites to examine how some industries, organisations and individuals are leaving smaller footprints.

ErinEarth

- 3.22 Presentation Sisters Kaye Bryan and Carmel Wallis are Catholic nuns who have harnessed community support to create a house and garden modelled on living sustainably. Aspects of the project include education on practical ways to live that reduce the human “footprint” on the natural landscape. The property features a passive solar energy efficient house, stormwater drainage, wetlands and runoff reduction ponds, organic recycling, compost, permaculture and waterwise gardens and grey water recycling.

Armstrong Brothers

- 3.23 Ian and Bruce Armstrong manage an agri-business property, which is a striking example of managing the farm scale footprint in the food production chain that reconciles its operation with several catchment management objectives. The enterprise emphasises perennial pastures, increase native species in the pasture mix, and use underground computerised drip irrigation.

Cargill Beef

- 3.24 Greg O'Hare, Group Engineering Manager of Cargill's Beef Australia hosted a tour of one of the largest beef processing facilities in the country, located north of Wagga Wagga. The current capacity is set to increase from 900 to 2000 head per day over the next decade, mostly for export and major supermarkets domestically. The company has developed a dedicated environmental plan to counter the various impacts associated with its operations. Key environmental initiatives include an odour biofilter, water treatment facility, and paunch disposal.

Wagga Wagga Agricultural Institute

- 3.25 The Wagga Wagga Agricultural Institute manages the first Australian accredited Environmental Management System (EMS) for an agricultural research facility. The system evolved over two years driven by a core group of 4 committed people dedicated to developing an EMS for the corporate sector.

- 3.26 The Institute's EMS is now heralded by government agencies across New South Wales and is attracting international attention. The system incorporates good record keeping in a corporate scale business context, sustainable human resource approaches, results driven operations and managed auditing and environmental certification processes.

DISCUSSIONS WITH SUCCESSFUL LANDCARERS

Panel of identities

- 3.27 Several successful farmers who have won awards for their landcare efforts, including Arron Wood, Young Australian Environmentalist of the Year 2001, were able to discuss what motivates them to continue their excellent work.
- 3.28 Other speakers included Gary Hannigan, Farmer of the Year, from Churinga Station at Broken Hill, John Weatherstone, Ibis Award Winner and LWA Scholar, from Lynfield Park in the NSW Southern Tablelands, Jeanette Campbell, OA, from Coolamon and Jenny Bradley, the RIRDC Rural Women's Award, 2005.

Future Generation Landcarers

- 3.29 After lunch, the "younger generation" gave their perspective to conference delegates about their efforts to live in more ecologically sustainable ways. The Panel included Angus Metcalfe, from Old Milong in Young, Graham Strong from Arcadia in Narrandera, Kelly Dowling, from Coolong in Dalton and three youth delegates from the River Health Conference that was being concurrently held.
- 3.30 All of the panellists expressed a strong desire to remain both environmentally, economically and socially sustainable, in particular to ensure there was a future for their own future generations.

NSW LANDCARE AWARDS

- 3.31 Held once every two years, the Landcare Awards celebrate the valuable contribution by individuals and groups in regional and urban communities. New South Wales' winners will be flown to Melbourne in 2006 to contest other state and territory finalists in the National Landcare Awards. National winners will be announced in October 2006 at the Landcare and Sustainable Landscapes International Conference.
- 3.32 There were gold, silver and bronze awards in a number of Awards categories such as education, Rivercare, Bushcare, Coastcare as well as local government and community partnerships. Awards were made to Indigenous community groups, primary producers and individual landcarers.
- 3.33 The National Landcare Program Individual Landcarer Award given to Judith Cox from Deepwater Landcare Group and Granite Borders Landcare Committee and the Murray-Darling Basin Commission Rivercare Award to Robyn Watson of "Kilmarnock", near Boggabri.^{41,42}

⁴¹ More information on the NSW Landcare Awards can be found on [Hhttp://www.murrumbidgee.cam.nsw.gov.au/58.0.html](http://www.murrumbidgee.cam.nsw.gov.au/58.0.html)H

⁴² http://www.landcareonline.com/news_details.asp?sType=news&news_id=26&from=archive

- 3.34 Much of NSW was represented in the awards pool, including the Namoi, the Murrumbidgee, the Lachlan, the Shoalhaven, Border Rivers, Northern Rivers, Central West and the Nepean. Landcarers from metropolitan areas were also represented.
- 3.35 Landcare group, local government and individual effort from within the Murray CMA was recognised with the following Gold awards:
- NSW South West Slopes Landcare and Local Government (Australian Government Landcare Regional Award);
 - Landcare Community Partnerships Award Corowa Shire Council (Landcare Australia Local Government);
 - Alistair Robb of Buraja Station, Corowa (Rural Press Landcare Primary Producer Award).
- 3.36 Additionally, Corowa Shire Council was awarded a Silver award for the Redlands Hill Reserve Rehabilitation Project, which involved the development of a 61-hectare flora reserve near Corowa.
- 3.37 The Rural Press Landcare Primary Producer Award went to Mr Alistair Robb from Buraja Station. Mr Robb was nominated by the Corowa and District Landcare Group for his commitment to improving the biodiversity on his property.
- 3.38 Located in Lowesdale, Buraja Station is a mixed sheep and cereal cropping enterprise of 830 hectares. Mr Robb identified depleted soil conditions as a major issue and embarked on an extensive liming program to correct acid soil problems, cropping rotation and lucerne based perennial pastures for increased water use efficiency and to minimise leakage into the groundwater system. Crops and pastures are established using direct drilling to minimise soil disturbance. The farm now has full stubble retention and rotational grazing was introduced.
- 3.39 In 1996, Mr Robb completed a whole farm plan which included fenced several areas of remnant vegetation, which they plan to develop into a “green” corridor. They also plan to increase the amount of land which has trees on it from only four percent to at least 15 percent. The plan is continually reviewed and adapted to take account of seasons and markets.
- 3.40 He is also involved in the Environmental Management System Riverina project, which is important to manage catchment targets for improved health of soils, water and biodiversity and which also provides direction for the farm business.
- 3.41 Other Gold Awards were awarded to:
- Robertson Environment Protection Society (Australian Government Bushcare Nature Conservation Award);
 - Red Chiefs Lands Council, Gunnedah (Alcan Landcare Indigenous Community Award);
 - Holy Family Primary School (Westpac Landcare Education Award Garden Grubs Landcare Program);
-

5th Landcare/Catchment Forum

- Manning Coastcare Group (Merewether Australian Government Coastcare Community Award); and,
- Little River Landcare Group (Alcoa Landcare Community Group Award).

CONCLUDING COMMENTS

When keynote speakers opened the 5th Landcare/Catchment Forum by telling delegates that it is important for all individuals, communities, industries and organisations to find ways to minimise their impacts on the environment – or there is the potential for environmental collapse - they were not saying anything new.

Whilst the concept that our lifestyles contribute to different sized “ecological footprints” may seem new to many – much of the past two decades at least has been concerned with establishing a way to determine the impacts of our consumption on the land, its ability to grow food and fibre, its function as water catchment, the forest products it provides and its ability to assimilate waste.

Andrew and Carolyn Nichols, National Landcare Award Winners have requested Government agencies provide more one-on-one support, rather than expecting busy farmers to learn and apply new ideas in relatively short time periods. Tours to domestic, primary, secondary and tertiary sector sites showed how industries, organisations and individuals can leave smaller footprints on the environment.

Homes and gardens that feature aspects of sustainable living through solar energy efficient house and stormwater drainage, wetlands and runoff reduction ponds, organic recycling, compost and permaculture garden, waterwise garden and grey water recycling, should be promoted as the suburban dream of the future.

The Armstrong brothers provided an example how agri-businesses can reconcile its operation with catchment management objectives through perennial pastures, increase native species and better-use efficiency.

Industries need to be encouraged to develop environmental plans and environmental management systems, as such intense operations have the potential to impact upon air and water quality.

The highlight of the conference was hearing how successful Landcare farmers are motivated and it is exciting to see that in many cases there is a “next” who have a connection to their landscape and a commitment to protecting it.

The NSW Landcare Awards recognised and rewarded those who are dedicated to ensuring improved practises and who are pro-actively attempting to leave land that they know and love in “better condition than they found it.”

The Forum was encouraging in that clearly there are many people working in different areas and who are implementing more sustainable approaches to natural resource management. It would appear that more sustainable farming approaches, better water use management and biodiversity conservation may be in the process of being developed and achieved. However, Governments need to be conscious that determining an “ecological footprint” will not in itself change consumption policies.⁴³

As with the Albury inspection, the Committee was able to learn much that will inform and contribute to its remaining reports.

⁴³ Consumption and the Environment **Environmental Economics Seminar Series** *Department of the Environment, Sport and Territories, 1996*
<http://www.deh.gov.au/pcepd/economics/consumption/ecologic.html>