

2011/2012 Annual Report



State of the Environment, Supplementary Report
2011 /2012

APPENDIX C



Riverina & Murray Regional Organisation of Councils

Local Government Areas of Balranald, Berrigan, Carrathool,
Conargo, Corowa, Deniliquin, Greater Hume, Hay, Jerilderie, Leeton,
Murray, Murrumbidgee, Narrandera, Wakool & Wentworth

An aerial photograph of a flooded landscape. The water is a deep blue, and numerous dead, white tree trunks stand vertically in the water. In the foreground, there is a dense line of green trees. The text '2011/12 Supplementary State of the Environment Report' is overlaid in large, green, bold letters with a white outline.

2011/12 Supplementary State of the Environment Report

NOVEMBER 2012



Riverina & Murray Regional Organisation of Councils



Habitat Planning
Town Planning & Environmental Assessment

Suite 1 / 622 Macauley Street
Albury NSW 2640

Phone: 02 6021 0662
Fax: 02 6021 0663

habitat@habitatplanning.com.au



Balranald Shire



Berrigan Shire



Carrathool shire



Conargo Shire



Corowa Shire



Deniliquin



Greater Hume Shire



Hay Shire



Jerilderie Shire



Leeton Shire



Murray Shire



Murrumbidgee Shire



Narrandera Shire



Wakool Shire



Wentworth Shire

A photograph of a sunset or sunrise with the sun low on the horizon, partially obscured by the dark, silhouetted branches of trees. The sky is a mix of orange, yellow, and blue.

Terms & Abbreviations

TERMS

"the report"	the RAMROC State of the Environment Supplementary Report 2011/12
"the area" or "region"	the area addressed by the SoE Report

ACRONYMS & ABBREVIATIONS

ABS	Australian Bureau of Statistics
ANRA	Australian Natural Resource Atlas
BOM	Australian Bureau of Meteorology
CMA	Catchment Management Authority
DECC	former Department of Environment & Climate Change
DECCW	former Department of Environment, Climate Change & Water
DLG	NSW Department of Local Government
DPI	Department of Planning & Infrastructure
DWE	former Department of Water & Energy (now NSW State Water)
EPA	Environmental Protection Authority
EP&A Act	NSW <i>Environmental Planning & Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection & Biodiversity Conservation Act 1999</i>
ERP	Estimated Resident Population
LEP	Local Environmental Plan
LGA	Local Government Area
LHPA	Livestock Health & Pest Authority
MIL	Murray Irrigation Limited
NSW	New South Wales
OEH	NSW Office of Environment & Heritage
RAMROC	Riverina & Murray Regional Organisation of Councils
RLPB	former Rural Lands Protection Board
SLA	Statistical Local Area
SoE	State of the Environment
TSC Act	NSW <i>Threatened Species Conservation Act 1995</i>



Contents

1. Introduction	1.1
1.1 What is the purpose of an SoE Report?	1.1
1.2 Why undertake an SoE report	1.1
1.3 Why a Regional SoE report?	1.1
1.4 This SoE report	1.2
1.6 Limitations on reporting	1.2
2. The Region	2.1
2.1 RAMROC	2.1
2.2 Region definition	2.1
2.3 Area	2.2
2.4 Population	2.2
2.5 Council's environmental projects	2.3
2.6 Council's environmental issues	2.4
3. Land	3.1
3.1 Salinity	3.1
3.2 Acid sulfate soils	3.1
3.3 Land contamination	3.3
3.4 Scheduled premises	3.4
3.5 Bushfires	3.5
4. Atmosphere	4.1
4.1 Rainfall	4.1
4.2 Temperature	4.4
4.3 Council monitored emissions	4.5
5. Biodiversity	5.1
5.1 Threatened species	5.1
5.2 Critically endangered species and communities	5.2
5.3 Changes to threatened species listings	5.4
5.4 Threatened Ecological Communities	5.5
5.5 Native vegetation	5.6
5.6 Environmental reserves	5.7
5.7 Weeds	5.8
5.8 Pests and feral animals	5.9



6. Water	6.1
6.1 Water quality	6.1
6.2 Flooding	6.2
6.2 Water consumption	6.3
6.3 Water storages	6.4
6.3 River flows	6.5
7. Human Settlement	7.1
7.1 Town planning	7.1
7.2 Development	7.2
7.3 Waste disposal and recycling	7.3
7.4 Energy Consumption	7.4
7.5 Effluent disposal	7.5
7.6 Motor vehicles	7.6
7.7 Anti-social behaviour	7.7
8. Cultural Heritage	8.1
8.1 Heritage items	8.1
8.2 Heritage funding	8.2
8.3 Aboriginal items	8.3



Introduction

1.1 What is the purpose of a State of Environment (SoE) report?

The purpose of SoE reporting is to provide accurate, up-to-date and accessible information about environmental conditions, trends and pressures for a nominated area or region. SoE reporting is used to:

- report on major causal factors that are influencing the environment ;
- report on the effectiveness of responses designed to address change;
- identify the issues most relevant to the sustainability of the environment ;
- contribute to public understanding of the state of the environment ;
- identify relevant gaps in information;
- further develop and improve the SoE reporting process; and
- facilitate policy development .

1.2 Why undertake an SoE report?

In 2009 changes were made to the annual reporting requirements for councils in NSW. The requirement for councils to prepare an SoE report was maintained.

The legislative requirements have been amended to provide councils with the flexibility to prepare an SoE report in an integrated way that enables them to focus their resources on monitoring and reporting on environment issues that are of concern to their community and where a council may influence its management.

The information contained within the SoE report should be used by councils in the preparation of their Community Strategic Plans.

1.3 Why a regional SoE report?

Fifteen councils within the Riverina and Murray Regions of NSW have opted for a regional approach to SoE reporting under the umbrella of the Riverina and Murray Regional Organisation of Councils (RAMROC). SoE reporting at the regional level is encouraged by the NSW Department of Local Government because:

- many environmental issues are regional in nature (e.g. air and water pollution, wildlife corridors, threatened species recovery), requiring regional action;
- regional cooperation can reduce the time and resources involved in preparing an SoE report; and
- environmental information is often collected and held by government authorities and other bodies on a regional rather than on a local government basis.



Many councils already co-operate for SoE reporting under Regional Organisations of Councils (ROCs) or Total Catchment Management (TCM) programs. Councils increasingly have access to data on the basis of catchments, and in more densely populated areas, airsheds.

All of the councils participating with this year's SoE report are a members of RAMROC. The council's involved in the SoE report in the last reporting period were Albury, Balranald, Berrigan, Carrathool, Conargo, Corowa, Deniliquin, Greater Hume, Hay, Jerilderie, Leeton, Murray, Narrandera, Wakool and Wentworth. This reporting period includes these Councils with the exception of Albury who are now bound by different reporting requirements. The councils of Albury, Griffith and Urana are the only RAMROC member councils not participating in this SoE report.

1.4 This SoE report

This is a supplementary or update SoE Report to the principal SoE Report undertaken in 2009. It is the third such supplementary report to be prepared for participating RAMROC member councils.

The prescriptive requirements of previous SoE reporting have been removed under the changes to council reporting, so that reports can focus on how Councils have met the environmental objectives of their respective Community Strategic Plans. However, as it would be too difficult to respond to each Community Strategic Plan for councils participating in this SoE report, the format of previous reports has been maintained. This format still allows each council to satisfactorily meet its SoE reporting requirements under the *Local Government Act*.

The content of this report has been grouped into six main categories, namely Land, Atmosphere, Biodiversity, Water, Human Settlement and Cultural Heritage. Primary local data has been sourced from each council via a questionnaire. This information is supplemented by other data at the local government level sourced from state and federal government agencies such as the NSW Office of Environment and Heritage (OEH) and the Australian Bureau of Statistics (ABS).

1.5 Limitations on reporting

The following limitations to the data and information presented in the SoE report need to be acknowledged.

- Despite an exhaustive search of databases and information sources across government, non-government and community organisations, there remains a lack of both qualitative and quantitative environmental data for inland areas of NSW at the local government level. Data for the purposes of identifying trends (time series) is particularly difficult to source.
- A lot of data takes time to be made publicly available and as such even information released during 2011/12 can already be up to four years old. Consequently some of the data presented in the SoE report may be 'new' but not necessarily relate to the 2011/12 reporting period.
- Although Council's are provided with the same questionnaire for the purposes of collecting local data, there are gaps and inconsistencies in the way the data is presented in this report as Council's unintentionally respond in different ways. Consequently caution should be exercised in making direct comparisons between Councils for these data sets.

The Region

2.1 RAMROC

The Riverina and Murray Regional Organisation of Councils (RAMROC) brought together the former Murray ROC and RIVROC on the 1st of July 2007. RAMROC represents the interests of 18 member councils, 15 of which have been included in this SoE. The RAMROC 'region' features a mix of urban centres, significant environmental assets and large areas of land in agricultural production.

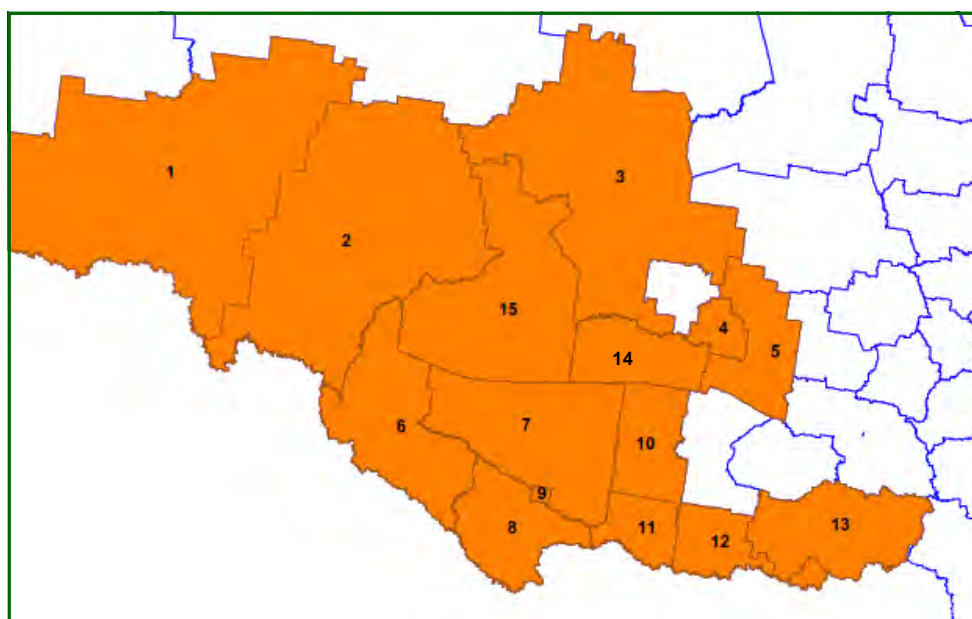
Overall the RAMROC region has an area of 126,595 square kilometres and encompasses parts of the Murray, Murrumbidgee, Lower Murray-Darling and Lachlan River catchments.

RAMROC's mission is to work collaboratively to enhance the economic, social, economic and environmental capabilities of our communities so as to ensure the long term sustainability of the region.

2.2 Region definition

The region for the purposes of this SoE report is approximately 91,000 square kilometres (more than 9 million hectares) in area and is comprised of the following LGAs (see Figure 1).

Figure 1 - Region for the SoE



1. Wentworth
2. Balranald
3. Carrathool
4. Leeton
5. Narrandera
6. Wakool
7. Conargo
8. Murray
9. Deniliquin
10. Jerilderie
11. Berrigan
12. Corowa
13. Greater Hume
14. Murrumbidgee
15. Hay



2.3 Area

Size of the participating Local Government Areas (LGAs) varies greatly between those in the south-east and those in the north and west. The smallest in the region include Deniliquin (130km²), and Leeton (1,167km²) whereas Carrathool (18,939km²), Balranald (21,699km²) and Wentworth (26,268km²) are large in area but small in population.

The medium sized LGAs are also dominated by agricultural land uses though can have multiple regional centres much closer together than the largest of the LGAs. The smaller LGAs are based more to the south-east of the region than the larger LGAs.

There has been no changes to LGA sizes during the reporting period.

2.4 Population

The south-eastern LGAs are generally more populous

than those in the west (see Table 1). Again this is a reflection of the multiple smaller townships based loosely around major regional centres. Of the participating councils, Leeton and Corowa have the largest populations of around 11,000 with Jerilderie (1,496), Conargo (1,540), Murrumbidgee (2,261) and Balranald (2,283) represent the smallest. The population of the region is generally concentrated in urban centres along the Murray, Edward and Murrumbidgee Rivers.

The combined population of participating councils represents less than 1.2 percent of the population of NSW.

Four LGA's experienced growth between the last two census (Murray quite substantially) although there was a net loss of population in the region of 1,684. Some of the less populated Councils have lost a significant proportion of their population in this relatively short period, continuing a longer term trend.

Table 1 - Resident Population at Census in LGAs

LGA	2001	2006	2011	Net change 2006-2011	% change 2006-2011
Balranald	2,773	2,441	2,283	-158	-6.5
Berrigan	8,138	7,993	8,066	+73	+0.9
Carrathool	3,316	2,819	2,587	-232	-8.2
Conargo	1,823	1,675	1,540	-135	-8.1
Corowa	10,785	10,976	11,000	+24	+0.2
Deniliquin	8,333	7,431	7,120	-311	-4.2
Greater Hume	10,537	9,731	9,815	+84	+0.9
Hay	3,599	3,383	2,956	-427	-12.6
Jerilderie	1,922	1,642	1,496	-146	-8.9
Leeton	11,925	11,111	11,037	-74	-0.7
Murray	6,156	6,417	6,957	+540	+8.4
Murrumbidgee	2,662	2,503	2,261	-242	-9.7
Narrandera	6,739	6,012	5,902	-110	-1.8
Wakool	4,929	4,362	3,962	-400	-9.2
Wentworth	7,214	6,779	6,609	-170	-2.5
TOTAL	90,851	85,275	83,591	-1,684	-2.0

Source: ABS



2.5 Council environmental projects¹

During the course of the year there have been many environmental projects undertaken by councils across the region. These are summarised in the following table. Other environmental projects are highlighted in the relevant sections of the report.

New projects

- Upgrades to houseboat sullage pump out station (Wentworth)
- Pooncaire weir pool upgrades (Wentworth)
- Wentworth wharf retaining and bank stabilisation (Wentworth)
- Ongoing research into Wentworth sewerage treatment plant effluent re-use project to remove effluent ponds from floodplain (Wentworth)
- The LGSA provided funding to the NSW Environmental Trust to deliver a twelve month project to assist NSW councils to undertake priority roadside vegetation management works known as the *Roadside Vegetation Implementation Project* (Conargo).
- Horseshoe lagoon biodiversity works involving revegetation and improvement of Horseshoe Lagoon (Murray)
- *Water for Food Campaign* (Jerilderie)

Continuing projects

- Completion of the enhancement of two reserves as part of the Murray CMA Public Lands Biodiversity grant. (Berrigan)
- Capturing and re-use of stormwater (Murray)
- Diversion of green waste/masonry from waste stream (Murray)
- Upgrading water systems for parks and gardens (Jerilderie)
- Commencement of construction of the Effluent Reuse Scheme (Deniliquin)
- *Dollar for Dollar Native Fish Stocking Programme* since it was introduced in 1998. This enables community groups to apply to the NSW Recreational Fishing Trust for matched funds to purchase native fish from licensed commercial hatcheries in NSW for the stocking of rivers and dams across the state.(Conargo)
- Subsidised Tree Planting program which provides native trees at reduced cost to shire residents (Conargo)

¹Information sourced from relevant Councils 2012



2.6 Council's environmental issues¹

In response to the question "*what does council consider to be the most important environmental issue now and in the future?*" the following results were revealed.

The number of star symbols indicates the frequency that each environmental issue was raised by a council.

Current issues

- Water supply ★★★★★★★★★★
- Waste management ★★
- Murray Darling Basin Plan ★
- Flooding ★★★★★★★★
- Pest animals ★
- Noxious weeds ★
- Fire ★
- Riparian zone management ★
- Water quality ★★

¹Sourced from relevant councils, 2012

Future issues

- Water supply ★★★★★★★
- Murray Darling Basin Plan ★★
- Increase in severity of unseasonal weather events ★
- Flooding ★★
- Climate change ★
- Pest animals ★
- Management of the Murray River and its environs ★
- Waste management ★★★★★
- Changing rural sector ★
- Energy use and cost ★
- Provision of public infrastructure associated with mining ★
- Fire ★
- Water quality from flooding ★
- Water management ★
- Land degradation ★

The results from the questionnaire show that during the 2011/12 reporting period clearly the issue of water supply is the most significant for councils. Judging from the responses, this issue is now more significant than in the previous reporting period. The concerns stem largely from the recommendations of the Murray Darling Basin Plan in regards to environmental flows and the uncertainty of supply for existing irrigators. Councils are concerned as to the impact this uncertainty will have on their communities through the consequences of reduced population and employment. Recent floods were an issue for many participating councils both in terms of the damage caused and lower lying flat areas, remnant floodwaters.

WATER SUPPLY

remains the top current and future issue for councils



Land

3.1 Salinity¹

Salinity is a dynamic process with the potential for movement and accumulation of salts over time and as a result of land use and management practices. Salt is a natural part of some landscapes, however human activities such as vegetation clearing and cropping can change the hydrology of the landscape and accelerate the process.

The state of soil salinity in the region is summarised in Table 2.

Rising groundwater levels dissolve salts that are then stored in the ground. Salinity can affect plant growth and impact on crop yields and cause serious impact on infrastructure, buildings and houses. Salinity also affects water quality which causes the health of rivers to decline.

The NSW government works with the Australian Government, local government and the community to manage salinity. There are several strategies in place including Catchment Action Plans, NSW Salinity Strategy, Basin Salinity Management Strategy and Caring for our Country.

3.2 Acid Sulfate Soils¹

Potential acid sulfate soils occur naturally in soil but become actual acid sulfate soil when they are dried. They usually become dry from human activities (e.g. removal of water).

Land affected by acid sulfate soils in the region is summarised in Table 2.

Acid sulfate soils occur naturally in both coastal (tidal) and inland or upland (freshwater) settings. Left undisturbed, these soils are harmless, but when excavated or drained, the sulfides within the soil react with the oxygen in the air, forming sulfuric acid. Impacts of acid sulfate soil can be habitat degradation, fish kills and weed invasion. Other potential impacts include animal ill health by polluted water, decreased productivity of agricultural land and infrastructure damage.

The Murray Darling Freshwater Research Centre in conjunction with the Department of Environment, Climate Change and Water and local Catchment Management Authorities are working to identify affected or potential acid sulfate soils sites and to educate councils and residents on effects, prevention and possible rehabilitation.

¹ NSW Office of Environment and Heritage, 2011, Environmental Issues



Table 2 - Salinity and Acid Sulfate Soils in LGAs 2011/12¹

	Land affected by salinity	Salinity Management Plan	Salinity monitoring sites	Land affected by Acid Sulfate Soils	Acid Sulfate Soils Management Plan
Balranald	No	No	No	Not known	No
Berrigan	Yes, unknown ha	No	By MIL	No	No
Carrathool	No	No	No	No	No
Conargo	Yes, unknown ha	No	No	No	No
Corowa	Yes, 5ha	No	No	No	No
Deniliquin	Yes 2km ²	No	No	No	No
Greater Hume	Yes, unknown ha	No	1 monitoring site	Unknown	No
Hay	Unknown	No	No	Unknown	No
Jerilderie	Yes, 5ha	No	No	No	No
Leeton	Yes, 1,000 ha	Yes	12 monitoring sites	No	No
Murray	Yes, unknown ha	Cadell Land & Water Management Plan	Yes	No	No
Murrumbidgee	Yes	Yes	19	-	No
Narrandera	Yes, 10ha	Yes		No	No
Wakool	Yes, unknown ha	No	Wakool/ Tullakool sub-surface	No	No
Wentworth	Yes, unknown ha	No	19	Yes (area unknown)	No

¹Information sourced from relevant Councils



3.3 Land contamination¹

Land is contaminated generally when the level of a hazardous substance is greater than that which would naturally occur at the same site such as heavy industries or chemically intensive agriculture. Hazardous substances potentially pose an immediate or long-term risk to the health of humans or the environment.

Details of Councils records of land contamination during the 2010/11 period can be found in Table 3.

Although contaminated sites may occur anywhere, they are typically clustered in areas which have been used for heavy industry or chemically intensive agriculture. They may also include residential properties, for example, from flaking of lead-based paints or excessive pesticide use.

Local councils deal with contamination under the planning and development framework, including *State Environmental Planning Policy No. 55 – Remediation of Land* and the *Managing Land Contamination – Planning Guidelines*. The NSW Office of Environment and Heritage deals with significant contamination.

¹ NSW Office of Environment and Heritage, 2011, Environmental Issues

Table 3 - Contaminated Lands 2011/12 ¹					
LGA	Contaminated Land Register ¹	Number of sites	Change from last year?	EPA Notice current	EPA notice former
Balranald	Yes	3	No	0	0
Berrigan	No	n/a	No	0	0
Carrathool	No	n/a	Yes	0	0
Conargo	No	n/a	No	0	0
Corowa	Yes	0	None	0	0
Deniliquin	Yes	Potentially 195	Yes, sites added and removed	1	0
Greater Hume	Yes	67	No	0	0
Hay	Yes	55	No	0	0
Jerilderie	Yes—draft	1	No	0	0
Leeton	Yes	6	No	0	0
Murray	No	n/a	No	0	0
Murrumbidgee	No	n/a	No	0	0
Narrandera	Yes	7	Yes, sites added	0	0
Wakool	Yes	2	Yes	0	0
Wentworth	Yes	5	One additional site	0	0
¹ Information supplied by relevant council					

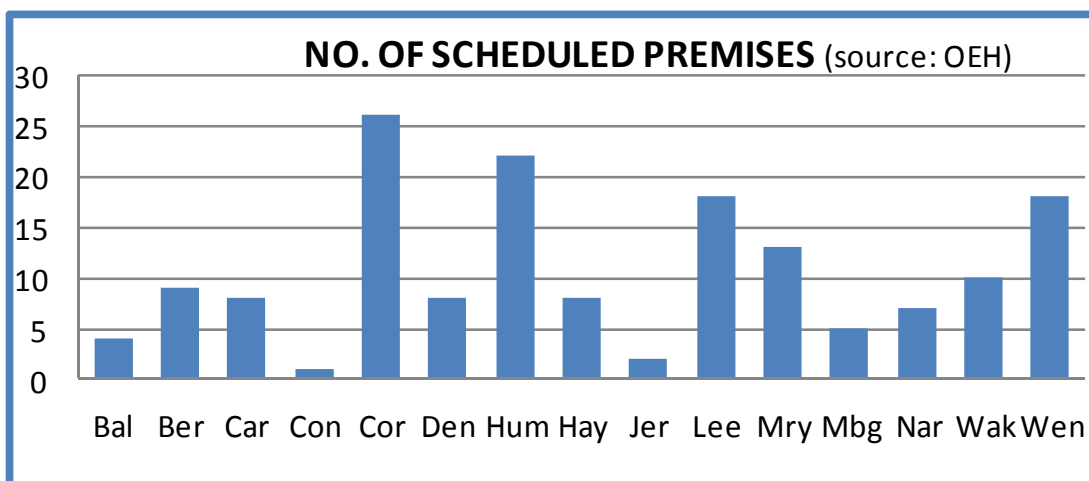


3.4 Scheduled premises

There are 159 scheduled premises throughout the area included in this SoE report. The number of licenses per category is summarised in the following table. The most common licenses are those relating to agriculture such as produce processing and feedlots (including piggeries). There are 19 licenses applicable to small sewerage treatment plants that service the many towns in the region. Extractive industry is also a common activity with 12 licensed premises.

The distribution of licenses across the RAMROC regions are shown in the chart following the table. As would be expected, generally the greater the population, the greater the number of scheduled premises.

Animal accommodation (2)	Aquaculture and mariculture (1)	Bird accommodation (1)
Boat construction/maintenance (3)	Cattle, sheep or horse accommodation (11)	Ceramics production (1)
Composting (5)	Container reconditioning (1)	Crushing, grinding or separating (5)
Dairy animal accommodation (3)	Dangerous goods production (1)	Explosives production (1)
General agricultural processing (28)	General animal products production (2)	General chemicals storage (1)
Grape processing (2)	Irrigated agriculture (4)	Land based extractive industry (12)
Metal waste generation (2)	Mineral processing (1)	Mining for minerals (8)
Miscellaneous licensed discharge to waters (4)	Non-thermal treatment of hazardous and other waste (3)	Petroleum products and fuel production (1)
Pig accommodation (19)	Railway systems activities (3)	Rendering or fat extraction (1)
Road construction (2)	Sewerage treatment processing by small plants (19)	Slaughtering or processing animals (3)
Solid waste landfilling (1)	Tanneries or fellmongering (1)	Thermal treatment of hazardous and other waste (1)
Waste disposal by application to land (4)	Wood or timber milling or processing (1)	Wood preservation (1)





Delicensed premises

The following scheduled premises delicensed during the 2011/12 reporting period:

- Hanson Construction Materials in Corowa (Concrete works)
- Deniliquin Hospital in Deniliquin (Hazardous, Industrial or Group A Waste Generation or Storage)
- Albury Galvanizing in Jindera (Hazardous, Industrial or Group A Waste Generation or Storage)
- Boral Resources in Moama (Concrete works)
- Mawsons Concrete in Buronga (Concrete works)

Declarations of contaminated land

On 1st February 2012 the Environment Protection Authority (EPA) issued a 'declaration of significantly contaminated land' under Section 11 of the *Contaminated Land Management Act 1997* relating to the Deniliquin Shell-Coles Express Service station in Davidson Street (Cobb Highway) Deniliquin (Lots 1 and 2 in DP 758782). The declaration was made based on the EPA finding the site is contaminated with petroleum including the substances Benzene and Total Petroleum Hydrocarbons. Submissions relating to the declaration closed on 10th March 2012.

Required pollution studies & reduction programs

There were several pollution studies and reduction programs directed by the EPA to be implemented in the region as conditions of scheduled premises licences during the 2011/12 reporting period. These include:

Implementing the Land and Water Management Plan (LWMP) by Western Murray Irrigation Limited

This program relates to the Buronga, Coomealla and Curlwaa irrigation areas at Dareton in the Wentworth LGA. Specifically, the licensee (WMI) must progressively implement the best management practices contained in the LWMP consistent with best management practices advised by the EPA. Require the irrigators who operate within the Western Murray Irrigation Area to progressively implement best management practices contained in the LWMP consistent with best management practices advised by the EPA. Take all steps within the licence period as necessary to meet the requirements of the Murray Darling Basin Ministerial Council, Basin *Salinity Management Strategy 2001-2015*.

The program was specified to commence on 11th May 2012.

Odour control works by Australian Natural Extracts Pty Limited at 23 Almond Lane, Corowa

The licence requires that:

- (a) By 31 May 2012 engage a suitably qualified and experienced person in the field of commercial composting to review the current soil composting operation and the plan of management and provide recommendations to minimise the creation of offensive odours from the composting activity, and by 30 June 2012 provide a copy of the recommendations to minimise odour from the premises to the Manager South West Region, EPA, PO Box 544, Albury NSW 2640
- (b) By 31 May 2012 engage a suitably qualified and experienced person in the field of soil and water management works to: Prepare an irrigation management plan to manage the water level in the dam located on the premises at the corner of Bullecourt Road and Almond Lane to minimise the creation of offensive odours, and By 3 August 2012 undertake appropriate earthworks to improve surface water management and drainage for the composting operation at the premises.



3.5 Bushfires¹

Bushfires are an intrinsic part of the Australian environment. Natural ecosystems have evolved with fire, and the landscape along with its biological diversity, has been shaped by both historic and recent fires. Many of Australia's native plants are fire prone and very combustible while numerous species depend on fire to regenerate¹. Fire is both feared and harnessed. Indigenous Australians have long used fire as a land management tool and it continues to be used to clear land for agricultural purposes and to protect properties from intense, uncontrolled fires.

The number of bushfire occurrences and the number of hectares burnt through the region are summarised in Table 4. The significant rainfall may have impacted the number of bushfires which occurred in the reporting period with two Councils reporting a decline in bushfire events.

Climate change is a popular reason for an increased number and intensity of recent bushfires, as is drought and El Niño. Changes in land management practices have also contributed, changes in Aboriginal fire management, the removal of stock grazing from environmentally significant areas and agricultural land management practices (such as retaining stubble for protection against erosion) have increased fuel loads and can contribute to the intensity of a bushfire event. The La Niña weather pattern that provided significant rainfall and lower average temperatures has impacted on the number of bushfires in the region.

Councils enforce bushfire safety standards for new dwellings, buildings and subdivisions, to ensure they meet standards of the *Planning for Bushfire Protection* guidelines. Some councils also manage clean up programs (such as free collection/disposal of green waste nearing fire season) and other conduct burn-offs and maintain fire vehicles for volunteer and rural brigades.

¹ Geoscience Australia, 2011, *Hazards*

Table 4 - Bushfire data¹

LGA	Area of bushfire prone land	Bushfire events ²	Area burnt ²	Fire trucks maintained by council ²	Rural Fire Brigades in LGA
Balranald	733,335ha	15 (+15)	13,500ha	23	10
Berrigan	12,288ha	49 (+28)	24ha (+32ha)	0	5
Carrathool	n/a	58	1,170ha	50	25
Conargo	5,588ha	7 (-51)	1,150ha (-20ha)	26	13
Corowa	15,757ha	38 (+17)	30ha (-120ha)	28	12
Deniliquin	1,796ha	5	50ha	4	1
Greater Hume	198,600ha	67	54	72	35
Hay	n/a	n/a	n/a	n/a	n/a
Jerilderie	n/a	n/a	n/a	17	10
Leeton	250ha	n/a	n/a	14	4
Murray	n/a	n/a	n/a	0	10
Murrumbidgee	11,667ha	12	437ha	15	8
Narrandera	n/a	n/a	n/a	29	19
Wakool	19,736ha	36	33ha	24	15
Wentworth	1,525,387ha	19 (-7)	900ha (+740ha)	31	17

¹Sourced from relevant councils

Atmosphere

4.1 Rainfall¹

The RAMROC region covers an extensive area (almost 700 kilometres east to west and almost 400 kilometres north to south).

Average and actual rainfall varies substantially across the region as can be seen by the charts at Figure 4. The charts display monthly rainfall for the reporting period (columns) against a background of the historical average. The data provides an overview of the rainfall in the region, only displaying the results for a single nominated weather station centrally located within each LGA.

Overview

The Bureau of Meteorology (BoM) summary of rainfall in NSW for 2011 made the following references to the RAMROC region.

The 2010-2011 period was the 4th wettest on record for NSW, following similar La Niña events in 1973-1974, 1955-1956, and 1949-1950. The Murray-Darling Basin recorded 592.1 mm during 2011, above the historical average of 493.4 mm and the 13th wettest on record. Rainfall was heaviest in western NSW, mostly associated with record-breaking rainfall in this region between January and March, with the wettest year in Broken Hill since 1974.

The high rainfall during 2011 was associated with the lingering impacts of the strong 2010 La Niña event, in addition to a weak La Niña which developed towards the end of the year. January-March was the wettest start to a year on record in southwestern NSW, with several flooding events across the state. Conditions were closer to average during the middle of the year, with below average rainfall in southern NSW between April and September and the driest winter since 2002 in the Murray-Darling Basin.

The highest annual rainfall in 2011/12 amongst the weather stations nominated for each LGA was

721mm

at Culcairn in Greater Hume Shire.

The highest daily rainfall total amongst the weather stations nominated for each LGA was

149mm

at Leeton on 4th March 2012.

Boooroorban in Conargo Shire experienced a record

94mm

of rain on 19th December 2011. This was the highest daily total over the 87 years records have been kept. The previous highest was 86mm on 7th December 1930.

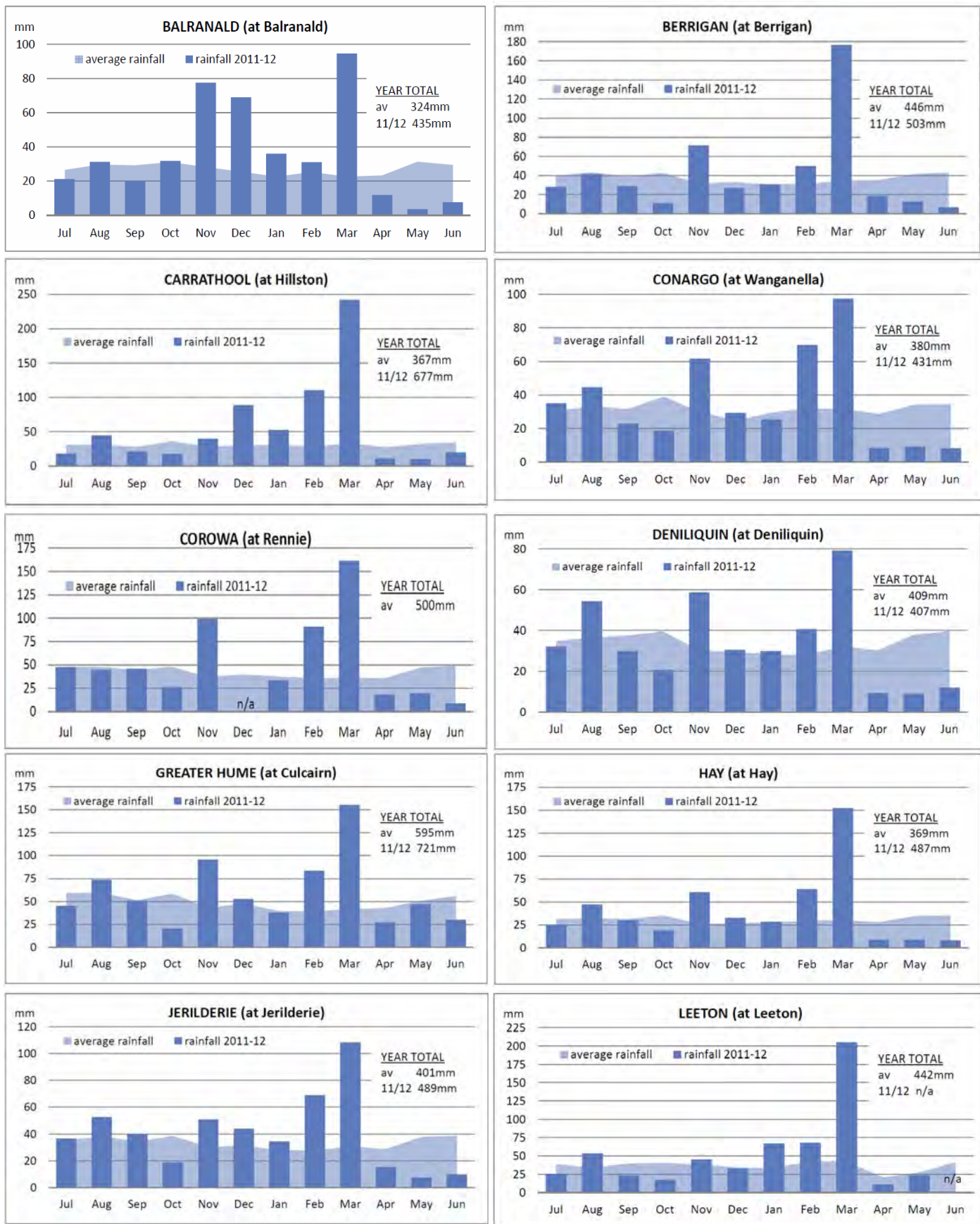
The lowest annual rainfall in 2011/12 amongst the weather stations nominated for each LGA was

396mm

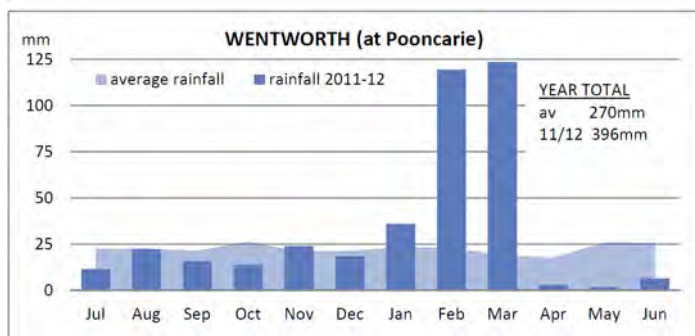
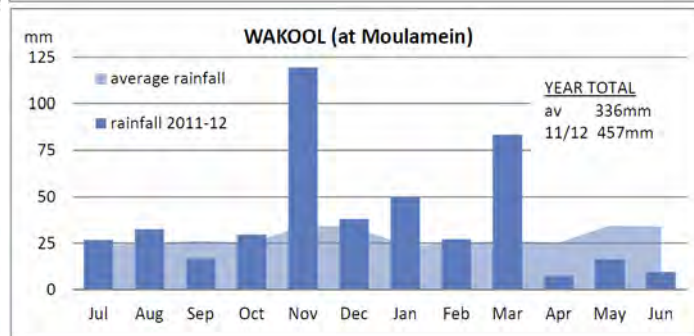
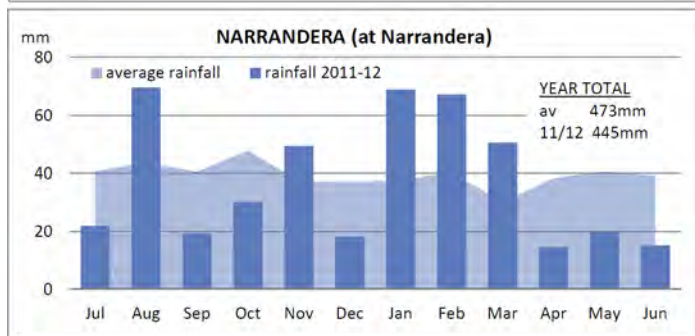
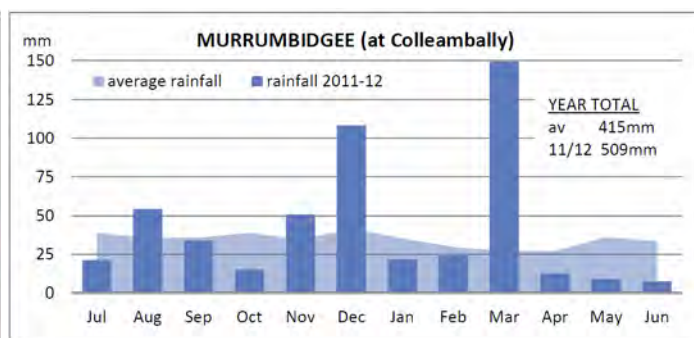
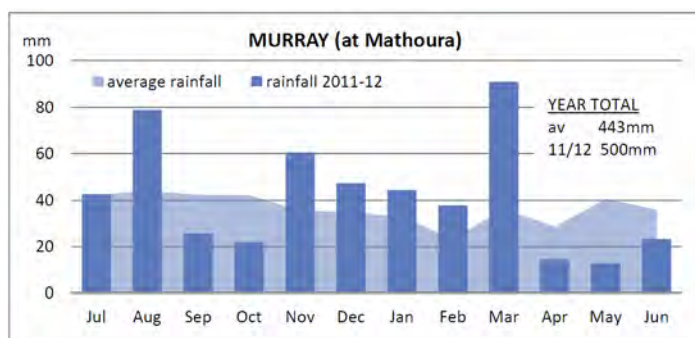
at Wentworth.



Figure 4 - Monthly rainfall (2011/12 vs historical average)¹



¹Australian Government: Bureau of Meteorology, 2011, *Climate Data Online*



Most Council areas experienced rainfall in March 2012 substantially in excess of the monthly average. This resulted in flooding to many areas.

Of the 15 participating Councils, more than half exceeded their annual average rainfall in 2011/12 by more than 100mm or 4 inches.

In 2011/12 Carrathool (at Hillston) experienced nearly double its average annual rainfall. This weather station received 310mm or in excess of 6 inches of rain more than its historical average.

Of the 15 participating Councils, only Narrandera and Deniliquin had below average annual rainfall in 2011/12.

Following in some cases record rainfall in March, most Council areas experienced below average rainfall in the fourth quarter of 2011/12.



4.2 Temperature¹

Actual temperature can vary significantly from historical averages experienced across the region as can be seen by the charts at Figure 5. The charts display the difference between the mean monthly low and high temperature recorded in 2011/12 and the long term averages.

The charts provide an overview of the temperature variances across the region for the reporting period. There are less weather stations recording temperature than rainfall and consequently the data charted for some Council areas is from the one weather station. For those areas without a temperature recording weather station, the nearest one has been nominated as a substitute.

Late winter and early spring temperatures were considerably higher (in excess of 5 degrees Celsius) in 2011/12 than the average in Carrathool (at Hillston).

Overall across the region, both mean minimum and maximum monthly temperatures were higher than average for the second half of 2011.

Overall across the region, both mean minimum and maximum monthly temperatures were lower than average for the first half of 2012.

Of the 15 participating Councils, the highest mean monthly temperature in 2011/12 was

34.0°C

recorded by Wentworth for January 2012.

Of the 15 participating Councils, the lowest mean monthly temperature in 2011/12 was

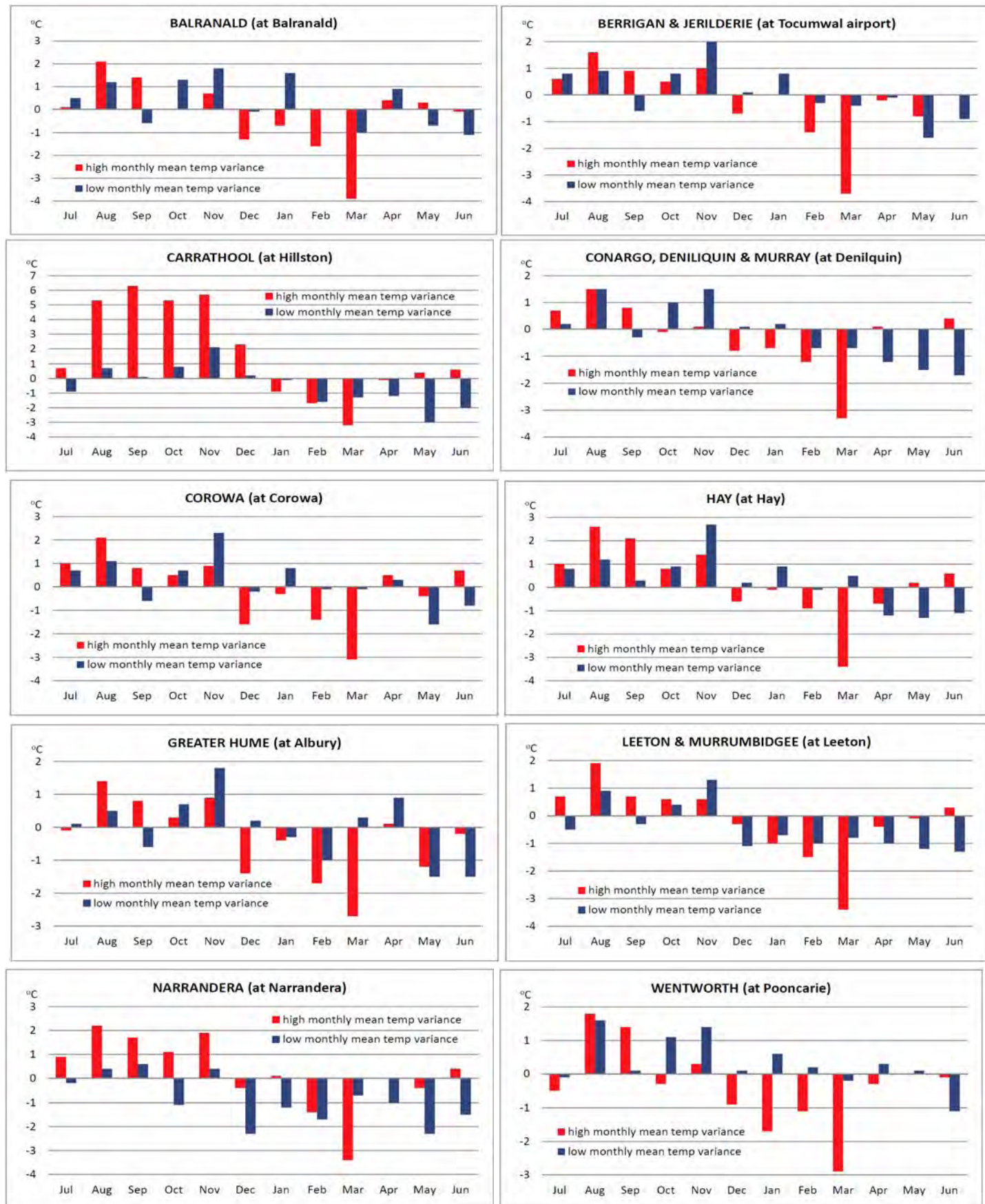
2.2°C

recorded by Greater Hume for Jun 2012.

The mean maximum monthly temperature for March 2012 was considerably lower (by 3 to 4 degrees Celsius) than the historical average across the region. This was most likely due to the incidence of high rainfall in this month.



Figure 5 - Mean monthly temperature (difference between 2011/12 and historical average)



¹Australian Government: Bureau of Meteorology,

4.3 Council monitored emissions¹

Councils monitor several sources of emissions within their LGA.

Tables 5 and 6 record smoke pollution and pollution complaints .

Some technologies and actions have a greater impact on the environment than others. As technology progresses, there are more and more sources and solutions when it comes to emissions, particularly from industrial sources.

LGA	Stubble permits issued ¹	Solid fuel heater approvals ¹	Controlled burns by council ¹
Balranald	3	0	2,300ha
Berrigan	0	5	None
Carrathool	n/a	8	n/a
Conargo	71	0	None
Corowa	11	n/a	2,109ha
Deniliquin	n/a	0	None
Greater Hume	n/a	9	Council landfills and transfer station compounds, approx. 4-5 hec total.
Hay	n/a	0	n/a
Jerilderie	n/a	0	n/a
Leeton	n/a	3	n/a
Murray	0	n/a	n/a
Murrumbidgee	145	2	0
Narrandera	n/a	n/a	n/a
Wakool	62	10	0
Wentworth	0	1	100ha

¹ Sourced from relevant councils

LGA	Pollution complaints ¹	Alternative fuel vehicles?
Balranald	0	No
Berrigan	0	Yes
Carrathool	n/a	None
Conargo	1	None
Corowa	n/a	None
Deniliquin	n/a	None
Greater Hume	16	1 hybrid
Hay	0	None
Jerilderie	5	None
Leeton	0	None
Murray	No register	No
Murrumbidgee	0	No
Narrandera	No register	None
Wakool	No register	None
Wentworth	2	n/a

¹ Sourced from relevant councils

Figures 6, 7 & 8 provide a snapshot of vehicle emissions both from a Council perspective and all vehicles. Council's maintain extensive vehicle fleets to perform the numerous functions of local government. Only two Councils (Berrigan and Greater Hume) indicated they include at least one vehicle running on alternative fuel. The average age of all registered vehicles increased across the region. Older vehicles are more likely to contribute to air pollution as they are less fuel efficient and feature less pollution control devices (particularly diesel vehicles).

More than half of all registered vehicles in the region run on unleaded petrol. Leeton has the highest proportion of registered vehicles on unleaded fuel. Alternative fuels such as LPG and vehicles with hybrid engines remain a very small proportion of all vehicles on the road.

Figure 6 - Council vehicle fleets 2011/12¹

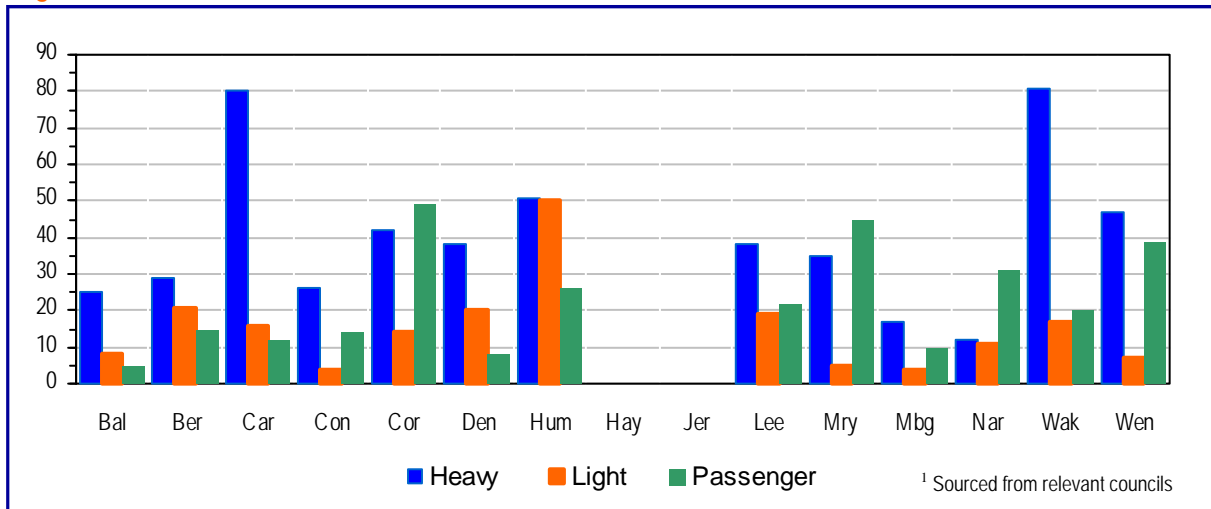


Figure 7 - Age of all vehicles

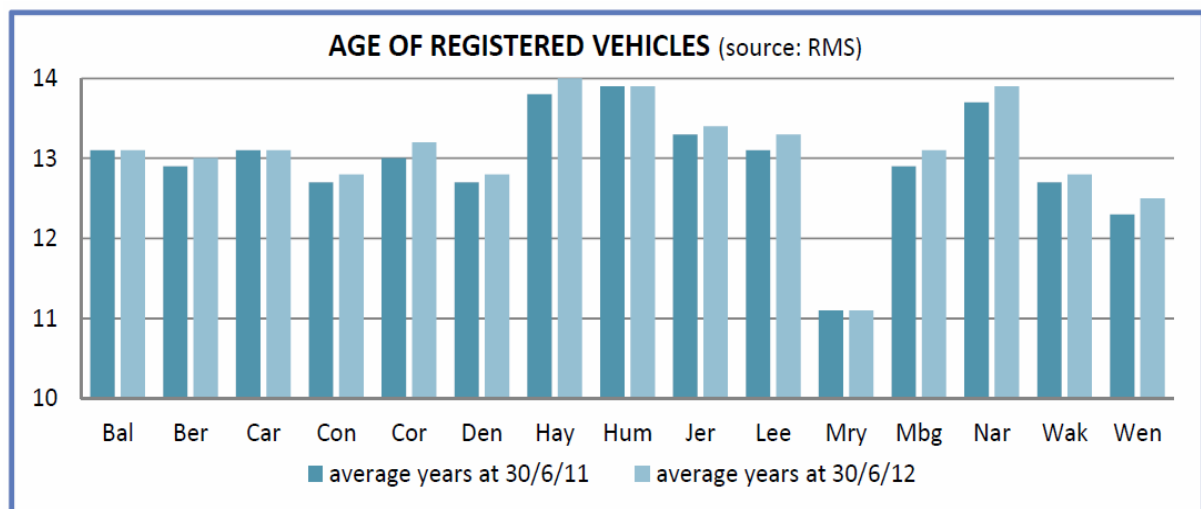
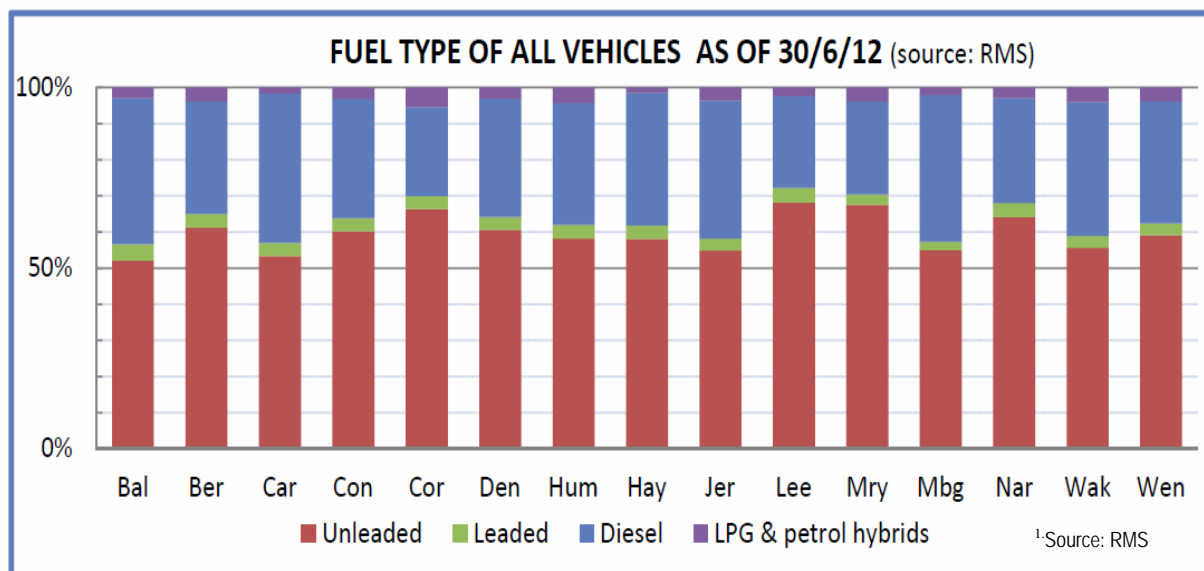


Figure 8 - Distribution of fuel types across all registered vehicles



Biodiversity

5.1 Threatened species¹

The number of threatened species recorded in each LGA in the region as of 2011/12 is detailed in Table 7. It should be noted that a higher or lower number of threatened species may be misleading as to whether it is a negative or positive number. For example, having a high number of threatened species could mean a LGA has valuable habitat for the species or could mean that a lot of species have been affected.

A low number of threatened species could indicate less species affected, it could indicate that threatened species have been affected to the point in which they longer exist within a given area. It must also be noted that larger and more remote LGAs with lower populations and items that have not attracted as much tourist or scientific interest may have many species that have been as yet unidentified or unnoticed within the area.

Councils contribute to protection of species through tree planting and protection, land management, pest and weed control, working with community groups/landholders and co-operation with regional and State authorities (such as CMAs and DPI).

Table 7 - Threatened species identified in LGAs¹

LGA	Amphibians	Birds	Fish	Mammals	Reptiles	Plants	Insects	TOTAL
Balranald	1	10	5	4	0	7	0	27
Berrigan	1	7	4	4	1	5	0	22
Carrathool	1	9	2	3	1	7	0	23
Conargo	1	7	3	4	1	11	0	27
Corowa	1	6	4	4	0	5	1	21
Deniliquin	1	7	3	4	0	3	0	18
Greater Hume	2	6	3	5	2	9	1	28
Hay	1	8	3	2	0	8	0	22
Jerilderie	1	7	2	4	1	5	0	20
Leeton	1	6	2	3	1	2	0	15
Murray	1	7	3	4	2	12	1	30
Murrumbidgee	1	7	2	2	0	3	0	15
Narrandera	1	7	3	3	1	10	0	25
Wakool	1	8	3	4	1	10	0	27
Wentworth	1	9	2	2	0	11	0	25

¹EPBC Protected Matters Report October 2012 (includes species listed as 'critically endangered', 'endangered' and 'vulnerable')



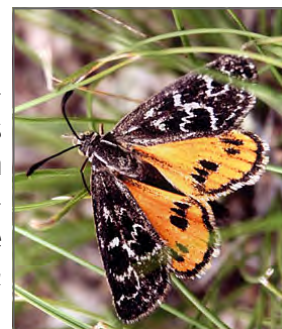
5.2 Critically endangered species & communities¹

There are two 'critically endangered species' and two 'critically endangered ecological communities' recognised within the RAMROC region.

Golden Sun Moth

This moth occurs in Corowa, Greater Hume and Murray LGA's.

Historically, the distribution of the Golden Sun Moth corresponded with native temperate grasslands across NSW, the ACT, Victoria and South Australia. These grasslands covered approximately 2,000,000ha of south-eastern Australia. It is probable the moth occurred wherever there were high densities of wallaby grasses within these grasslands. Less than 1% of these temperate native grasslands remain. As a result, the remaining Golden Sun Moth populations are highly reduced and fragmented (Clarke & O'Dwyer 2000).



Spiny Rice-flower

This species mostly occurs in Victoria but does extend in to Murray Shire.

The Spiny Rice-flower is endemic to Victoria, and occurs in lowland grassland, grassy woodland and open shrublands from south-western to north-central Victoria (DEWHA 2009b; TSSC 2003f). It is most often found within the ecological community Natural Temperate Grassland of the Victorian Volcanic Plain, a critically endangered ecological community listed under the EPBC Act.



This species has a very restricted area of occupancy, estimated to be 5.7 km² with an upper limit estimated to be 10 km² (TSSC 2003f). Populations of the Spiny Rice-flower are substantially fragmented, due to historical land clearance for settlement, industry and agriculture (Carter & Walsh 2006h). The number of mature individuals of Spiny Rice-flower is estimated at 55 000, occurring over 184 sites. The majority of sites support very small populations of less than 100 plants (DEWHA 2009a).

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland & Derived Native Grassland

This ecological community is found in all participating LGA's with the exception of Balranald, Hay and Wentworth.

White Box Yellow Box Blakely's Red Gum Woodland has been drastically reduced in area and highly fragmented because of clearance for cropping (for cropping, pasture improvement or other development); deterioration of remnant condition (caused by firewood cutting, increased livestock grazing, weed invasion, inappropriate fire regimes, soil disturbance and increased nutrient loads); degradation of the landscape in which remnants occur (including soil acidification, salinity, and loss of connectivity between remnants).

Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains

This ecological community is listed as occurring in Corowa, Greater Hume, Jerilderie and Murray LGA's.

This community is wetlands characterised by a particular hydrology, geographical position and vegetation structure. These are isolated, freshwater wetlands that are usually inundated on a seasonal basis through rainfall, then dry out, so surface water is not permanently present. They occur on the lowland plains of temperate south-eastern Australia and have a vegetation structure that is open, i.e. woody cover is absent to sparse, and the ground layer is dominated by herbs (grasses, sedges and forbs) adapted to seasonally wet or waterlogged conditions.



5.3 Changes to threatened species listings¹

The *Threatened Species Conservation Act 1995* (TSC Act) protects threatened and endangered species throughout NSW. The Scientific Committee determines inclusions, exclusions and alterations to the TSC Act given applications and advice submitted for consideration. The schedules of the TSC Act contain the protected species, communities and populations, and these are constantly changing depending upon the Committee's decisions. There was just one final determination made by the Scientific Committee in the reporting period (see below) relating to a threatened species and it is a 'key threatening process'.

Land management practices, climate change, natural resource requirements and invasion of exotic species (plant, animal and viral) are some of the many factors contributing to the decline of certain native species in Australia, and in particular the RAMROC reporting area.

Final Determination¹

On 26th August 2011 the Scientific Committee, established by the *Threatened Species Conservation Act*, made a Final Determination to list '**Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants**' as a KEY THREATENING PROCESS in Schedule 3 of the Act.

Invasion by exotic plants has been identified as the primary cause of extinction of four native plant species in Australia, with another 57 species recognized as threatened by competition with invasive exotic plants (Leigh and Briggs 1992). In NSW, introduced invasive plants have been recognized as having an adverse impact on 341 species, 14 populations and 64 ecological communities listed as threatened under the *Threatened Species Conservation Act 1995* (Coutts-Smith and Downey 2006).

Case study— Vegetation

Vegetation Mapping Project

NSW Office of Environment & Heritage, Feb 2012

This project was funded under the *NSW Rivers Environmental Restoration Program* (RERP) which aims to restore the health of five iconic floodplain wetlands in the Murray–Darling Basin, including the Lower Murrumbidgee wetlands, Lachlan wetlands, Gwydir wetlands, Narran Lakes and Macquarie Marshes.

The floodplain and wetland communities that occur on the Lower Murrumbidgee (Lowbidgee) floodplain have been in severe decline over their range since European settlement. This decline has accelerated over the last 30 years due to land clearing and altered hydrological regimes. The vegetation communities of these floodplains are highly fragmented and poorly conserved in NSW (Benson 1999). All remaining wetland and floodplain vegetation in the Lowbidgee floodplain is of conservation significance and is important for maintaining and restoring the ecological health of this unique inland floodplain wetland complex.

This study, carried out in 2010, mapped the extent of the vegetation communities of the Lowbidgee floodplain in 2008. The study area (totaling 222,277 ha) included Yanga National Park, located 20 km north-west of Balranald in southwestern NSW and the Lowbidgee for a distance of approximately 80 km east to the town of Maude.

The aims of this study were to:

- create maps of the distribution of vegetation communities in 2008 of the Lowbidgee floodplain and Yanga National Park using high-resolution digital aerial photography
- define the condition of river red gum communities in 2008
- establish a series of vegetation plots within key vegetation communities for more detailed floristic survey and as a benchmark for trend analysis
- make recommendations for monitoring the response of key flood-dependant vegetation communities to environmental water releases to assist in the adaptive management of environmental water.



5.5 Native vegetation

Native vegetation extent and condition is an indicator of ecosystem health and the overall and health of ecosystem diversity.

The condition of native vegetation across the region ranges from pristine to total replacement as the degree of modification varies from area to area. Modification can occur in varying degrees by land management practices and unplanned threats and disturbances such as weed invasion and fire.

The modification of native vegetation can change the structure, function and species composition of vegetation.

Some councils require permit to remove native vegetation, which can include conditions such as planting vegetation to offset the vegetation removed. Four of the 15 participating Councils (highlighted in green in Table 11) indicated a change in 2011/12 in that they now prohibit fire wood collection.

Table 11 - Tree removal ¹				
LGA	Permit required?	Applications	Offsets	Firewood collection? ¹
Balranald	Yes	0	Yes	0
Berrigan	No	-	-	Allowed—nil
Carrathool	Yes	10	Yes	Allowed—nil
Conargo	In sandhill areas	-	Yes	Not allowed
Corowa	Yes	12	No	Allowed—n/a
Deniliquin	No	-	-	Not allowed
Greater Hume	No	n/a	No	298 (+48)
Hay	No	-	-	Not allowed
Jerilderie	Yes (street trees only)	3	-	Not allowed
Leeton	Yes (Council land only)	n/a	Yes (1 for 1)	Not allowed
Murray	Yes	2	No	Not allowed
Murrumbidgee	Yes	9 (+8)	Yes (1 for 1)	Yes
Narrandera	No	-	-	Not allowed
Wakool	No	-	-	Not allowed
Wentworth	No	-	-	Not allowed

¹Sourced from relevant councils

Case study— Roadside vegetation

Roadside Vegetation Implementation Project

Conargo Shire Council

The LGSA provided funding to the NSW Environmental Trust to deliver a twelve month project to assist NSW councils to undertake priority roadside vegetation management works known as the *Roadside Vegetation Implementation Project* (RVIP).

Conargo Shire was successful in obtaining funding to the value of \$48,332 for direct seeding, rabbit control, spraying of environmental weeds and signage to link up existing remnant vegetation on Shire roads and TSR's within the Shire.

The work involves other agencies including the Murray CMA (direct seeding), Riverina LHPA (rabbit control), Central Murray Weeds County Council (environmental weed control).

The RVIP supports the implementation of priority works identified in *Roadside Vegetation Management Plans* (RVMP) or other equivalent approved plans of NSW Councils.

The objectives of the RVIP is:

- to allow for the protection, re-vegetation and regeneration of large areas of linear reserves across the state;
- to improve environmental condition and enhance ecological corridors in NSW;
- to provide funds to regional councils and help regional economies, and
- to add value to a considerable investment already made by the Environmental Trust which funded councils to prepare RVMP's in 2005.



5.6 Environmental reserves¹

Across the region a network of protected areas exist. The protected areas are the foundation for biodiversity conservation. The Riverina Region has 123,154 ha of managed reserves.

A number of councils retain land for biodiversity or environmental purposes. Some LGAs contain State Forest, National Parks and/or Nature Reserves, though these are not usually maintained by Council.

The NPWS identifies weeds, pest animals and inappropriate fire regimes to be major contributing factors to the degradation of parks and reserves. Climate change and drought are also significant factors.

Some council's reserve land for biodiversity or environmental purposes (refer to Table 8). Council's responses to weeds and pests can be seen in this section of the report.

Case study— Yanga National Park

Description of wetland ecological character

NSW Office of Environment & Heritage, Feb 2012

This project seeks to define the ecological character of wetlands on the lower Murrumbidgee (Lowbidgee) floodplain with the focus on the newly designated Yanga National Park. The sustainable management of the region's wetlands is contingent upon a sound understanding of the key ecological components, the processes which sustain those values, and the natural variability primarily driven by a variable hydrological regime. Detailed knowledge is essential to understand a wetland's water requirement and how a wetland will response to water management change, and thus can greatly enhance the ability to manage environmental water allocations (EWAs).

The report also identifies the actual and potential threats to the existence and integrity of a region's wetlands and identifies and recommends indicators for monitoring change in ecological character. The report developed for the region should also identify management actions that could be incorporated within management plans.

Table 8 - Council retained land for environment¹

LGA	Council retained land for environment	Area	Protected
Balranald	Yes	5ha	Yes
Berrigan	Yes	434ha	Yes
Carrathool	No	-	-
Conargo	Yes	n/a-	Yes
Corowa	Yes	61ha	Yes
Deniliquin	No	-	-
Greater Hume	Yes	n/a	Yes
Hay	No	-	-
Jerilderie	No	-	-
Leeton	No	-	-
Murray	Yes	n/a	Yes
Murrumbidgee	No	-	-
Narrandera	Yes	500ha+	Yes
Wakool	Yes	n/a	Yes
Wentworth	Yes	876ha	Yes

¹ Sourced from relevant Councils

Case study— Biodiversity works

Horseshoe Lagoon biodiversity works

Murray Shire Council

Council in conjunction with the Murray CMA undertook re-vegetation works and other improvements at the Horseshoe Lagoon reserve. The brief was to remove all non-native vegetation and identified target weeds from the site and then re-establish the site using only local indigenous plant species. These plants in the future will also allow Murray CMA staff to collect seed from a large number of rare local species in a single site giving many long term benefits to the local environment. Education was also a big part of the project with the local Moama school children involved in the re-vegetation works which enabled them to learn the importance of managing and caring for our local environment. Signage was also installed in key points of the site to educate all visitors to the reserve.



5.7 Weeds¹

Some weeds are required by law to be controlled by landholders. These are known as noxious weeds and the law that controls these in NSW is the *Noxious Weeds Act 1993*.

Weeds that are declared noxious are those weeds that have potential to cause harm to the community and individuals, can be controlled by reasonable means and most importantly, have the potential to spread within an area and to other areas.

A weed is declared noxious because its control will provide a benefit to the community over and above the cost of implementing control programs.

The number of declared noxious weeds and their class in each LGA can be viewed in Figure 9. Declared noxious weeds can be broken into five groups, depending on their presence and impact on agriculture, the environment and people. Classes can be viewed on the DPI website.

Noxious weeds have the potential to become more widespread and will cause impact on agriculture, human health or the environment. They can be spread by vehicles, animals, people, wind and water among other means.

Most councils implement a weed management plan, and may be involved in catchment wide programs and involve the community and landholders as part of the management plan.

Weeds of National Significance

Under the *National Weeds Strategy*, 20 introduced plants were identified as Weeds of National Significance (WONS). These weeds are regarded as the worst weeds in Australia because of their invasiveness, potential for spread, and economic and environmental impacts. In April 2012 African boxthorn, Asparagus weeds, Bellyache bush, Brooms, Cat's claw creeper, Fireweed, Gamba grass, Madeira vine, Opuntoid cacti (Prickly pear), Sagittaria, Silverleaf nightshade and Water hyacinth were added to the list of WONS.

Case study— African boxthorn

New Weeds of National Significance

NSW Department of Primary Industry, April 2012

African boxthorn is a member of the family *Solanaceae*, which also includes silverleaf nightshade, tobacco and tomatoes. It was introduced into Australia from South Africa in the mid 1800s and was commonly used as a hedge plant.

It is now a serious weed threat in all States and is one of the major weed threats to the semi-arid rangelands of western NSW. Consequently, it is a declared noxious weed in most parts of NSW. African boxthorn is an aggressive invader of pastures, roadsides, reserves, remnant bushland and waterways. It forms an impenetrable, spiny thicket that inhibits the movement of stock and provides a haven for feral animals. Many insects, including fruit fly, the common house fly and the tomato fly, breed in the fruit of this weed.

In NSW, African boxthorn is more prevalent on the well drained soils of the slopes and plains. Often, it has spread from around old homesteads and urban areas. It grows on all soil types but establishes best on lighter soils, particularly along dry creek beds.

The most cost effective way of controlling mature bushes forming thickets is to physically remove the top growth and as many of the roots as possible. The removed plant material should then be burnt. Removal of the roots is much easier and more effective when the soil is moist.



5.8 Pests & feral animals¹

Invasive species affect our environment, economy and social well-being. They can reduce the productivity of our land and waterways and reduce biodiversity in natural areas. Invasive species can out-compete, or prey on other species and spread disease. They can also damage buildings, roads and other structures¹.

Participating LGAs were far less affected by pests in this reporting period than last (see Table 9). Common pests throughout the region include rabbits, foxes, locusts, mice and feral dogs and cats.

Councils work with local landholders, community groups and state agencies (such as the NSW Department of Primary Industries) to control pests on properties. Feral cat and dog populations can be reduced through registration, micro-chipping and de-sexing of domestic pets. Councils have pest control plans and policies, and regulate domestic animals through the *Companion Animals Act*, which requires registration of all domestic dogs (other than specified, such as working dogs). Council's and State Government have brochures, workshops and extensive advertisement to educate residents on methods to reduce the spread and impact of pests such as locusts and mice.

Table 9 - Pest and domestic animal control¹

LGA	Pests 2010/11	Pests 2011/12	Common pests	Dogs impounded	Cats impounded	Other animals impounded	Animals euthanized
Balranald	Locusts & mice	No	-	22 (-70)	0	0	0
Berrigan	Rabbits, foxes, mice & locusts	Mice, Corellas & foxes	Foxes, rabbits & Corellas	64 (-21)	2 (-13)	0	54 (-23)
Carrathool	Locusts & mice	No	-	12 (-1)	7 (+7)	0	5 (+2)
Conargo	Mice & locusts	Mice	Feral cat & foxes	4 (-2)	0	0	0
Corowa	Mice	No	Rabbits & foxes	55 (-22)	9 (-17)	0	6 (-26)
Deniliquin	Mice	No	Rabbits	92 (-24)	0	3 (-3)	37 (-3)
Greater Hume	Mice	No	Rabbits, feral cats, wild dogs & foxes	251 (+166)	47 (+30)	14 (+14)	62 (+34)
Hay	Locusts, mice & crickets	Crickets, locusts, mosquitoes & mice	Crickets, locusts, mosquitoes & mice	90 (-93)	14 (-7)	0 (-2)	53 (-84)
Jerilderie	Locusts, crickets & mice	No	Mice	13 (+3)	0	0	8 (+4)
Leeton	Locusts & fruit flies	No	Locusts	356 (-21)	214 (+19)	0 (-8)	210 (+3)
Murray	Locusts & mice	No	Mice, foxes & rabbits	92 (-6)	24 (-6)	30 (+13)	73 (+51)
Murrumbidgee	Mice & locusts	Mice & rabbits	Mice, rabbits, foxes, fruit fly, feral cats & wild dogs	23	1 (-5)	0	5 (+5)
Narrandera	Mice & crickets	Mice, locusts, crickets & mosquitoes	Locusts/rabbits/white cedar grubs	103 (-24)	21	0	20 (-41)
Wakool	No	Rabbits	Rabbits, foxes & cats	19 (+4)	0	2 (-6)	8 (+1)
Wentworth	Locusts	No	Rabbits	177 (-1)	79 (+15)	0	60 (-25)

¹Sourced from relevant councils

Water

6.1 Water quality

Water is a limited and precious resource and must be managed for immediate needs and for long-term economic and environmental sustainability. With the effects of climate change now a reality, and increasing demands for water, sound policies are required to ensure a sustainable supply of water for the recent drought and for future generations.

Most councils undertake potable water quality monitoring. Five councils have identified groundwater issues. Most Councils experienced flooding, resulting in significant cost to repair infrastructure and damage to crops. Flooding increases the flow for most river systems and decreases the risk of Blue-green Algae outbreak.

Water quality and availability can be affected by drought and floods.

Councils monitor potable water and some councils also monitor ground water. Councils also encourage sustainable land practices and manage urban stormwater flows.

Table 12 - Water monitoring¹

LGA	Alerts issued for potable water	Water quality complaints	Blue-green algae outbreaks	Ground water issues
Balranald	0	0	0	No
Berrigan	0	25	Yes	High water table
Carrathool	0	0	0	n/a
Conargo	n/a	No register	0	None
Corowa	0	17	0	None
Deniliquin	0	n/a	Yes	No
Greater Hume	0	0	0	None
Hay	0	0	0	None
Jerilderie	0	15	0	None
Leeton	0	5	0	Salinity
Murray	0	0	0	None
Murrumbidgee	Yes Oct 2011 & Mar 2012	2	0	High water table
Narrandera	0	0	0	Salinity, high water table, colour/ odour/iron levels
Wakool	0	0	0	n/a
Wentworth	0	0	n/a	High water table, brackish groundwater, salt interception schemes

¹Sourced from relevant councils and Murray RACC New Alerts



6.2 Flooding

All but Deniliquin and Murray LGAs within the RAMROC region again reported flooding during the 2011/12 reporting period. This has occurred following years of drought and created a new set of environmental issues for Councils to manage.

The flood events reported ranged from 1 in 20 year to the significant 1 in 300 years in Leeton. The majority of the Councils recorded substantial damage to crops and infrastructure in particular roads. Murrumbidgee reported \$8.5 million damage and Narrandera \$6 million.

Table 13 - Flooding ¹

LGA	Flooding in 2010/11	Flooding in 2011/12	Damage 2011/12
Balranald	Yes, 1 in 20yr	Yes, 1 in 25yr	Yes
Berrigan	Yes, 1 in 20yr	Yes, 1 in 111yr	Yes
Carrathool	Yes, 1 in 50yr	Yes, 1 in 60yr	n/a
Conargo	Yes	Yes, 1 in 30yr	Yes
Corowa	Yes, 1 in 100yr	Yes, 1 in 100yr	\$4 million
Deniliquin	Yes, less than 1 in 5yr	No	-
Greater Hume	Yes	Yes, 1 in 100yr	Yes
Hay	Yes, 1 in 20yr	Yes, 1 in 100yr	\$1.3 million
Jerilderie	Yes, 1 in 20yr	Yes, 1 in 30yr	Yes
Leeton	Yes	Yes, 1 in 300yr	\$2.6 million
Murray	Yes, 1 in 20yr	No	-
Murrumbidgee	Yes, 1 in 10yr	Yes, 1 in 100yr	\$8.5 million
Narrandera	Yes, 1 in 20yr	Yes	\$6 million
Wakool	Yes, 1 in 20yr	Yes	\$1.1 mil
Wentworth	Yes, 1 in 10yr	Yes, 1 in 20yr	\$182,420

¹Sourced from relevant councils

Case study— Environmental flows

Fish in Edward and Wakool Rivers

NSW Office of Environment & Heritage 'Water Gallery'

Dissolved oxygen levels are now being boosted in this popular fishing river system thanks to extra environmental water deliveries being coordinated by OEH. Recent rainfall and flooding throughout the catchment had caused extra organic material to be deposited into the river, resulting in a 'blackwater' effect and lowering dissolved oxygen levels to below 2 milligrams per litre. This may have been causing native fish such as the Murray cod and yellow belly to experience severe stress and possible death.

It is expected that by 30 June 2012, up to 60 gigalitres of environmental water will have been released into the Edward-Wakool river system, since environmental releases commenced in early April.

There are promising signs that the poor quality blackwater is being diluted and better quality habitat created for native fish and other aquatic fauna. The Edward River at Moulamein recently registered healthier oxygen levels of around 4 milligrams per litre and there have been very few reports of fish kills to NSW Fisheries and the Murray- Darling Basin Authority.

This initiative has been delivered in partnership with the Commonwealth, State Water Corporation, Murray CMA, Forests NSW, NPWS, NSW Office of Water, Fisheries NSW, the river operators and the local community. All the environmental water for this event was sourced from the Commonwealth Environmental Water Holder.



6.3 Water consumption

Water in Australia is a valuable resource, required for almost every industry, particularly agriculture, as well as drinking water and household use. An indication of water consumption for each LGA is recorded in the table below.

Large amounts of water are used in households by washing machines, dishwashers, hot water systems and showers. Garden irrigators, washing of cars and private swimming pools also contribute to domestic potable water use. Some businesses require large amounts of water for processing (such as food processing). Agriculture requires water for stock and irrigation of crops. Councils can use large amounts of water for irrigation of sporting facilities and parks.

Incentives for water tanks and water saving appliances in homes are available for reducing domestic water use. Some businesses (such as car washes) utilise recycled water. Councils can enforce water restrictions to limit non-essential uses (such as watering lawns or pools) and often utilise recycled water for the maintenance of council owned parks and sporting facilities (see Table 14), and sometimes government owned school ovals.

It is worth noting that all but Murray and Greater Hume Councils lifted water restrictions in 2011/12.

Table 14 - Water use 2011/12 ¹

LGA	Water supply ¹	Total consumption	Daily average household water consumption ¹	Water restrictions	Area irrigated by treated wastewater	Treated wastewater used
Balranald	Murrumbidgee River	833ML	n/a	No	n/a	99ML
Berrigan	Murray River & channel	586ML treated 516ML raw	400 litres	No	Two golf courses	350ML
Carrathool	Bore	n/a	n/a	No	n/a	n/a
Conargo	Bore and creek	11.4ML	68 litres	No	None	-
Corowa	Murray River	1,258ML	n/a	No	50ha tree lot	295ML
Deniliquin	Edward River	478ML	112 litres	No	4ha	10ML
Greater Hume	Groundwater & river	404ML	195 litres	Stage 1	n/a	n/a
Hay	Murrumbidgee River	709ML	n/a	No	None	-
Jerilderie	Billabong Creek	n/a	313 litres	No	5ha racecourse	20ML
Leeton	River, via channel & treated	2,076ML	500 litres	No	10ha	200ML
Murray	Murray River	1,010ML	77 litres	Yes	40ha sports fields & vineyards	n/a
Murrumbidgee	Groundwater	n/a	n/a	No	None	-
Narrandera	Bore	593ML	332 litres	No	None	-
Wakool	Murray River	n/a	1,450 litres	No	None	-
Wentworth	Murray River	411ML filtered 868ML raw	n/a	No	None	-

¹Sourced from relevant councils



6.4 Water storages

There are a number of major water storage facilities within the RAMROC region. Most are located at the heads of catchments so as to control the flow of water within rivers downstream for the purposes of irrigation. In more recent times the storages are also being utilised to provide for environmental flows in the river systems. Following a significant improvement in the quantity of water within the storages in 2010/11, these levels have been maintained or further improved in 2011/12 with above average rainfall in most areas.

Figure 9 charts the supply level and monthly discharges for the water storages over 2010/11 and 2011/12. It shows most of the storages reached near or full capacity during this period. Lake Cargelligo in the Lachlan catchment actually exceeded its capacity in early 2012 following the substantial rain events. Dartmouth Dam in the Murray catchment, which is the largest storage facility in the region with nearly 4 million megalitres, has been steadily filling over the two year period to the point it was predicted to spill late in 2012 for the first time in more than 20 years. This is however now unlikely to occur.

Releases from storages have been more irregular than usual over the past two years. Rather than being dictated by the irrigation season, some storages at various times have been releasing water as a means of controlling the capacity of the storage (i.e. as they approach full supply level). Overall, most storages have been releasing various quantities of water on a more or less constant basis in the latter half of the reporting period (i.e. since late 2011).

6.5 River flows

River heights and flows have fluctuated substantially over the reporting period, mainly as a result of major rainfall events occurring in the catchment.

Figure 10 charts the river heights at various locations throughout the RAMROC region over the 2010/11 and 2011/12 reporting periods. Depending on the timing of the significant rainfall, some river heights followed a similar seasonal pattern (e.g. 10 Mile Creek and the Darling at Pooncarie) whereas others were very different (e.g. Murrumbidgee at Balranald).

In 2011/12 record river heights were experienced in the Wakool at the Wakool-Barham Road crossing on 2nd January 2012 and the Murrumbidgee at Carrathool on 16th March 2012.

Case study— Stormwater re-use

Moama stormwater retention basin

Murray Shire Council

Council enlarged an existing stormwater basin to increase its holding capacity. As part of the works a connection line to the Moama Recreation Reserve was installed so that harvested water could be diverted to the reserve for use on the 10 Hectares of irrigated sport fields and other passive recreation areas of the Reserve. This harvesting will give water security to the reserve and also means that irrigation water will no longer be required from the town water supplies. Water usage on the Reserve is approximately 50 mega litres per year.

Case study— Floodplain Management Plan

Murrumbidgee River—Hay to Maude

NSW Office of Environment & Heritage, August 2011

The FMP will allow for future floodplain management planning by providing a coordinated and integrated network of floodways, appropriately located and sufficiently sized to convey unimpeded floodwaters to support the floodplain environment and minimise flood risk.

Once adopted, the FMP, including the FMP floodway network, will form the basis for determining whether flood control works on the floodplain will be granted approval under Part 8 of the *Water Act*.

The FMP floodway network has been designed to effectively convey floodwaters to flood dependent ecosystems including river red gum and black box woodlands, lignum swamps, billabongs and flood runners within the FMP floodplain and to the downstream Lowbidgee floodplain wetlands. The FMP also specifies works modifications to resolve identified environmental connectivity and hydraulic issues associated with existing flood control works.

In 2011/12 record river flows were measured in the Murrumbidgee at Narrandera on 10th March 2012 and Balranald on 25th April 2012..



Figure 9 -Levels and discharges from major water storages servicing RAMROC area

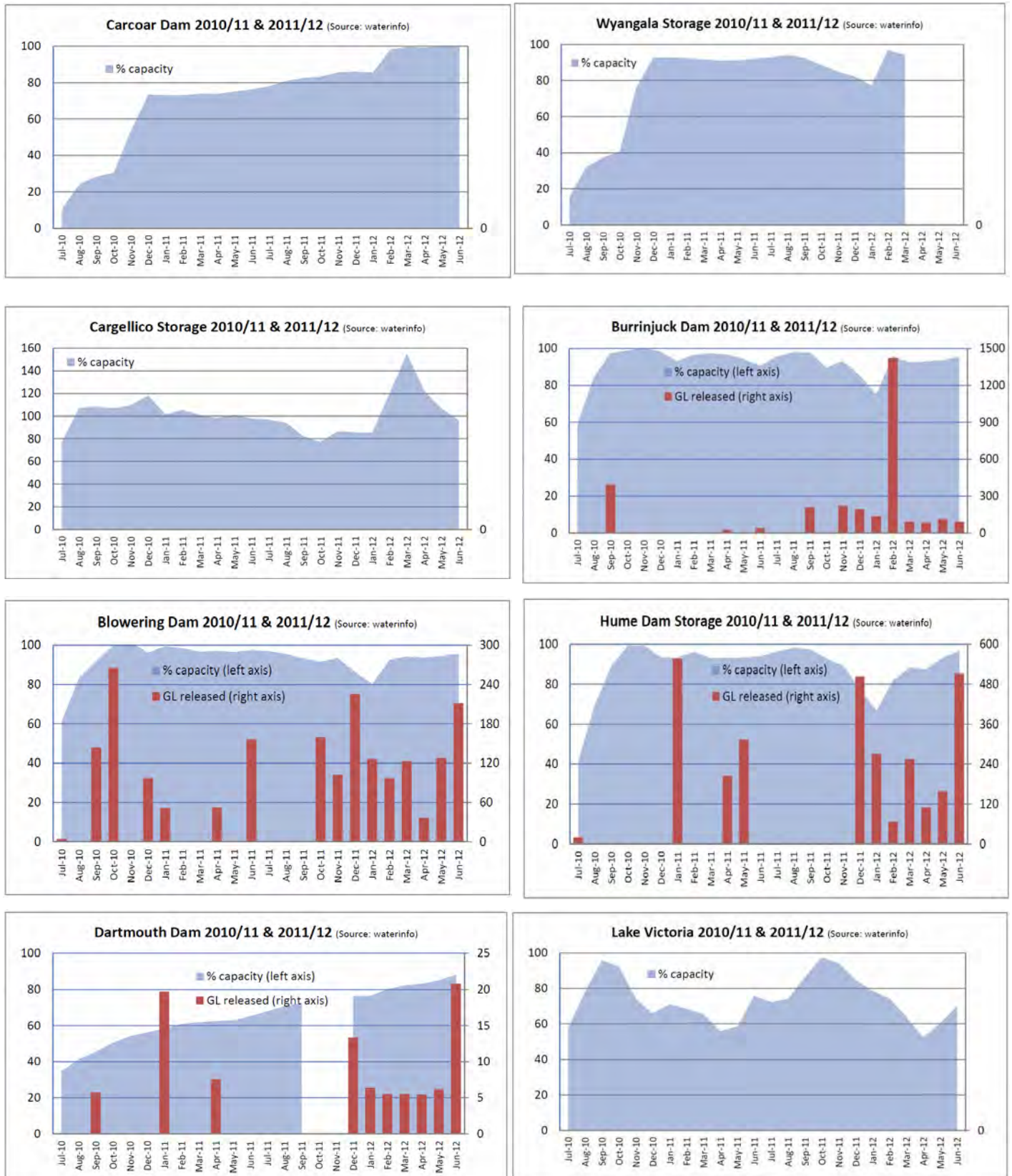
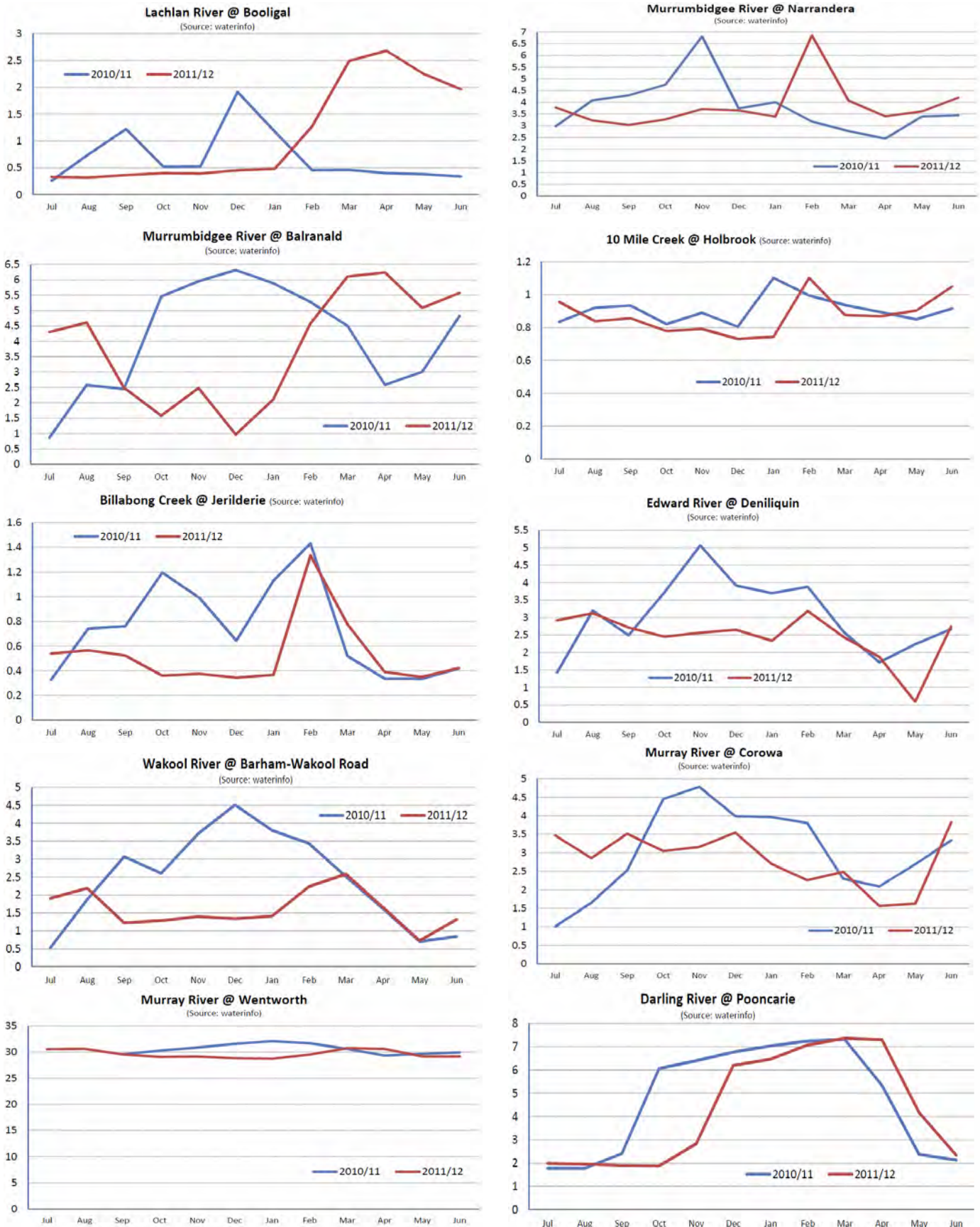




Figure 10 -River heights at selected locations in the RAMROC region



Human Settlement

7.1 Town planning

Local Environmental Plans (LEPs) guide planning decisions for local government areas. Through zoning and development controls, they allow Councils and other consent authorities to manage the ways in which land is used and developed. LEPs are the primary planning tool for Councils to shape the future of their communities.

In 2006, the NSW Government gazetted a Standard Instrument for preparing new LEPs as a means of providing more consistency in planning controls across NSW. All Councils were required to prepare new LEPs in accordance with the Standard Instrument. The fact that only six of the participating Councils have completed their new LEP by the end of this reporting period is an indication of how difficult and frustrating many Councils have found the process.

In preparing their new LEPs most Councils have taken the opportunity to apply environmental zones and overlays to environmentally sensitive land that previously may have not been afforded such protection.

Table 15 summarises the stage at which each Council was at with their new LEP as of 30th June 2012.

LGA	Age of current LEP at 30/6/12	Status of new Standard Instrument LEP at 30/6/12	Increase in area of environmental zones in new LEP	Use of environmental overlays in new LEP
Balranald	2 years	Commenced	No	Yes
Berrigan	20 years	Waiting S65 certificate for exhibition.	95ha proposed plus conversion of State Forests to E1	Yes
Carrathool	36 years	With Minister (commencement imminent)	No	Yes
Conargo	13 & 25 years	S64	No	Yes
Corowa	1 day!	Commenced	No	Yes
Deniliquin	15 years	Draft	n/a	Yes
Greater Hume	12, 14 & 36 years	With Minister (commencement imminent)	No	Yes
Hay	1 year	Commenced	No	Yes
Jerilderie	1 week	Commenced	No	Yes
Leeton	29 years	Waiting Gateway determination to exhibit.	n/a	n/a
Murray	1 year	Commenced	2,000ha to E3 & 66,000ha to E1	Yes
Murrumbidgee	18 years	Public exhibition	n/a	n/a
Narrandera	21 years	Public exhibition completed	No	Yes
Wakool	20 years	With Minister (commencement imminent)	No	Yes
Wentworth	1 year	Commenced	1,644,000ha	Yes

¹Sourced from relevant councils



7.2 Development

Rates of development run parallel with rate of population decline in each LGA. Those Councils with the most stable population trends tend to have more development activity.

Table 16 provides a summary of development activity in each Council during 2011/12. A green number in the new dwellings column indicates an increase over the previous year and a red number a decrease. The number in brackets indicates the difference between 2011/12 and 2010/11.

The Murray River LGA's of Corowa, Murray and Berrigan, as well as Greater Hume recorded the highest number of new dwelling approvals in the RAMROC region during 2011/12. More than half of the participating Councils recorded an increase in new dwelling applications over the previous reporting period. Balranald, Leeton and Wentworth experienced a sharp decline in dwelling approvals whereas Murray enjoyed the largest increase.

A small number of designated development applications and those for community projects were recorded across the RAMROC region. Some Council's indicated the general economic downturn of recent years as having an influence on the amount of development being undertaken.

Table 16 - Development in 2011/12¹

LGA	New dwellings approved ¹	New lots approved/certified	Designated dev/major projects ¹	Retirement villages/aged care dev ¹	Other public dev	Influences on rate of development ¹
Balranald	4 (-19)	14	0	2	1	None
Berrigan	46 (+5)	12	0	1 (10 units)	0	None
Carrathool	12 (+9)	15	1 (poultry)	0	1 (child care)	Broader economic climate.
Conargo	1 (-)	8	0	0	0	None
Corowa	65 (+7)	21	0	0	0	None
Deniliquin	7 (-12)	10	0	0	1 (family centre)	None
Greater Hume	43 (-2)	13	0	0	8	None
Hay	2 (-1)	3	0	0	0	Doctor has departed.
Jerilderie	9 (+8)	0	0	0	0	None
Leeton	18 (-24)	17	0	1 (alts & adds)	1 (alts & adds)	None
Murray	59 (+13)	63	0	2 (6 units)	1 (adds to school)	Economic slowdown
Murrumbidgee	3 (-)	18	0	0	0	None
Narrandera	6 (+3)	2	0	0	0	Economic down turn.
Wakool	12 (+6)	25	0	0	0	Cessation of logging in State Forests
Wentworth	10	72	0	0	1 (adds to school)	Expansion of village and low density residential zoning in new LEP.

¹Sourced from relevant councils



7.3 Waste disposal and recycling¹

Councils within RAMROC operate a range of waste disposal and recycling programs. Some smaller councils choose to participate in regional programs, joining up with neighbouring LGAs to provide a service (such as Berrigan with Moira Shire in Victoria), while others are too remote to justify joint programs.

Councils are continually keeping track of recycling programs and encourage the community to reduce, reuse and recycle. Councils often support school and community programs encouraging the reduction of waste (buying items with less packaging), the reuse of items (like reusable shopping bags) and recycling (or office paper, bottle, cans etc).

Whilst there appears to be some inconsistency in the data provided this year compared to last, only three Councils (Berrigan, Conargo and Greater Hume) reduced the quantity of waste put into land fill. Most Councils actively participate in recycling programs and there is a general trend of increasing quantities of waste being processed this way.

Only Balranald and Narrandera recorded a reduction in quantity of office paper used since the previous reporting period.

Table 17 - Waste disposal and recycling 2011/12¹

LGA	Waste to landfill	Illegal dumping complaints ¹	Recycling program ¹	Quantity sent for recycling	Office paper used by Council ¹	Council recycles office paper ¹
Balranald	1,000 tonnes (+200)	0	No	50 tonnes	600 reams (-100)	Yes
Berrigan	1,034 tonnes (-2,310)	39 (+31)	Yes	778 tonnes (+594)	1,000 reams (+300)	Yes
Carrathool	n/a	n/a	No	-	n/a	n/a
Conargo	1,332 tonnes (-554)	2	Yes	54 tonnes (-253)	n/a	No
Corowa	6,535 tonnes (+663)	n/a	Yes	1,798 tonnes (+507)	n/a	Yes
Deniliquin	7,496 tonnes (+796)	Yes	Yes	211 tonnes	1,200 reams (+300)	Yes
Greater Hume	4,937 tonnes (-63)	25	Yes	920 tonnes (-80) 26,000 litres oil (+1,500)	800 (-)	Yes
Hay	3,000 tonnes (+300)	0	No	-	n/a	n/a
Jerilderie	100 tonnes (-)	0	No	-	345 reams (+72)	No
Leeton	16,867 tonnes (+11,437)	6	Yes	824 tonnes (+44)	800 reams (+50)	Yes
Murray	n/a	6	Yes	14,609 tonnes (+11,109)	n/a	Yes
Murrumbidgee	93 tonnes (+6)	1	Yes	162 tonnes	425 reams (+236)	Yes
Narrandera	3,490 tonnes (+178)	n/a	Yes	700 tonnes	780 reams (-220)	Yes
Wakool	1,676 tonnes (+481)	0	Yes	397 tonnes (-4)	n/a	Yes
Wentworth	23,000 tonnes (-)	5	No	-	620 reams	Yes

¹ Information from relevant councils



7.4 Energy consumption

Energy costs continue to increase for most Councils, although Hay, Leeton and Narrandera indicated a reduction in 2011/12 (see Table 19). Some Councils are actively undertaking programs to reduce their energy costs such as the installation of solar panels, identification of opportunities to reduce consumption and education of staff.

All Councils that provided a figure for the cost of natural gas recorded reduction in 2011/12 over the previous year.

There was considerable uptake of the State Government's Home Saver Rebate Scheme over the short time it was in place (see Table 18). Unfortunately the scheme has since been discontinued.

Table 18 - Total uptake of NSW Home Saver Rebates to 30th June 2012¹

LGA	Rainwater tank	Hot water system	Ceiling insulation	Washing machine	Dual flush toilet	TOTAL
Balranald	33	18	-	3	1	55
Berrigan	167	94	4	55	5	325
Carrathool	28	26	4	33	-	91
Conargo	57	30	2	9	1	99
Corowa	224	209	10	68	17	528
Deniliquin	154	176	12	26	9	377
Greater Hume	214	162	17	90	9	492
Hay	41	30	2	20	11	104
Jerilderie	30	14	2	10	2	58
Leeton	109	168	10	81	15	383
Murray	106	91	34	45	1	277
Murrumbidgee	15	29	2	24	-	70
Narrandera	85	108	13	39	10	255
Wakool	44	49	5	8	-	106
Wentworth	83	145	1	7	1	237

¹Sourced OEH Note this program ceased on 30 June 2012.

Table 19 - Energy costs 2011/12¹

LGA	Cost of electricity	Gas	Steps undertaken to reduce energy consumptions
Balranald	\$201,317 (+\$55,117)	n/a	None
Berrigan	\$349,637 (+\$30,528)	n/a	-
Carrathool	n/a	n/a	-
Conargo	\$52,900 (+\$19,900)	n/a	Monitoring power usage at various facilities and investigating the feasibility of solar energy options.
Corowa	n/a	n/a	-
Deniliquin	\$596,410 (+\$118,955)	n/a	Council took part in Planet Footprint's free subscription via Office of Environment & Heritage.
Greater Hume	\$377,000 (+19%)	\$2,953 (-50%)	Installed solar panels on community building.
Hay	\$316,000 (-\$49,000)	n/a	Undertaking energy audit.
Jerilderie	n/a	n/a	Loss control policy adopted.
Leeton	\$729,328 (-\$158,635)	\$2,479 (-\$836)	Encourage change of behaviour for staff, review actual connections and rationalise.
Murray	n/a	n/a	-
Murrumbidgee	\$203,402	n/a	-
Narrandera	\$23,093 (-\$4,588)	\$616 (-\$400)	-
Wakool	\$340,286 (+17%)	n/a	-
Wentworth	\$271,000 (+48,000)	n/a	-

¹Sourced from relevant councils

Case study— Energy efficiency

Environmental Upgrade Agreements (EUAs)

NSW Office of Environment & Heritage September 2011

The *Local Government Amendment (Environmental Upgrade Agreements) Act 2010* commenced on 18 February 2011 which facilitates upgrading or retrofitting of non-residential or multi-residential buildings (of more than 20 lots).

Under this agreement, a finance provider lends funds to a building owner for water, energy and other environmental upgrades and this low-risk loan is repaid through a local council charge on the land.



7.5 Effluent disposal

Councils of varying sizes and resources run differing programs when it comes to disposal of effluent (see Table 20). Interestingly a number of Councils indicated a reduction in the number of dwellings connected to a reticulated sewerage system. The reason for this is not known but is more likely to be a lack of consistency in the data provided over the previous year rather than dwellings being disconnected from the system.

There are more than 9,500 dwellings in the RAMROC region that rely upon on-site disposal of wastewater. At least 168 new on-site treatment systems were approved in the reporting region during 2011/12. Wakool accounted for the majority of these with 99 approvals.

Table 20 - Effluent management 2011/12 ¹				
LGA	Dwellings connected ¹	Dwellings not connected ¹	Approvals for on-site ¹	Standard for on-site disposal
Balranald	900 (+100)	306	6	In line with silver bullet.
Berrigan	3,060 (-30)	760	4	Yes
Carrathool	606 (-479)	162	0	No
Conargo	n/a	n/a	1	Conargo Shire Onsite Sewerage Management Plan
Corowa	4,000 (-666)	1,000	n/a	Yes
Deniliquin	2,906 (-244)	90	8	Yes
Greater Hume	1,400 (-)	2,100	n/a	Local Govt Act & Australian Standards
Hay	1,220 (+77)	250	0	Standard NSW Public Health Policy
Jerilderie	345 (+5)	176	0	Standard Public Health Policy
Leeton	3,000 (+50)	1,772	26	Aerated Waste Water treatment systems
Murray	2,698 (+438)	n/a	9	NSW Health Accredited
Murrumbidgee	724 (+2)	n/a	1	Australian Standard 1546
Narrandera	1,613 (-)	800	4	No
Wakool	1,074 (-121)	n/a	99	Yes
Wentworth	1,620 (+9)	1,310	10	Yes
¹ Sourced from relevant councils				



7.6 Motor vehicles

There was a total of 86,265 vehicles registered in the participating councils as of 30 June 2012 representing an increase of 1,618 or 1.9% over the previous year (see Figure 11). Leeton (12,134), Greater Hume (11,354) and Corowa (10,740) recorded the highest number of registered vehicles while Conargo (1,811) and Jerilderie (1,681) had the lowest. Murrumbidgee maintains the highest number of registered vehicles per capita by some margin with Murray the lowest. In the RAMROC region, only Berrigan, Corowa, Murray, Wakool and Wentworth have less registered vehicles than population.

The largest increase in registered vehicles between the end of 2010/11 and end of 2011/12 was 390 in Leeton representing a sizeable 3.3%. Deniliquin also posted a healthy increase of 224 or 2.8%. Wentworth only recorded an increase of 12 registered vehicles.

There were 415 vehicle accidents within the RAMROC region in 2010 being the latest data available. These accidents resulted in 17 fatalities and 321 injuries. Figure 12 charts the relationship between accidents, registered vehicles and population. Generally there is a higher rate of vehicle accidents in Greater Hume, Balranald and Jerilderie and a lower rate in Corowa, Deniliquin, Leeton and Berrigan.

Figure 11 -Vehicle registration in the RAMROC area ¹

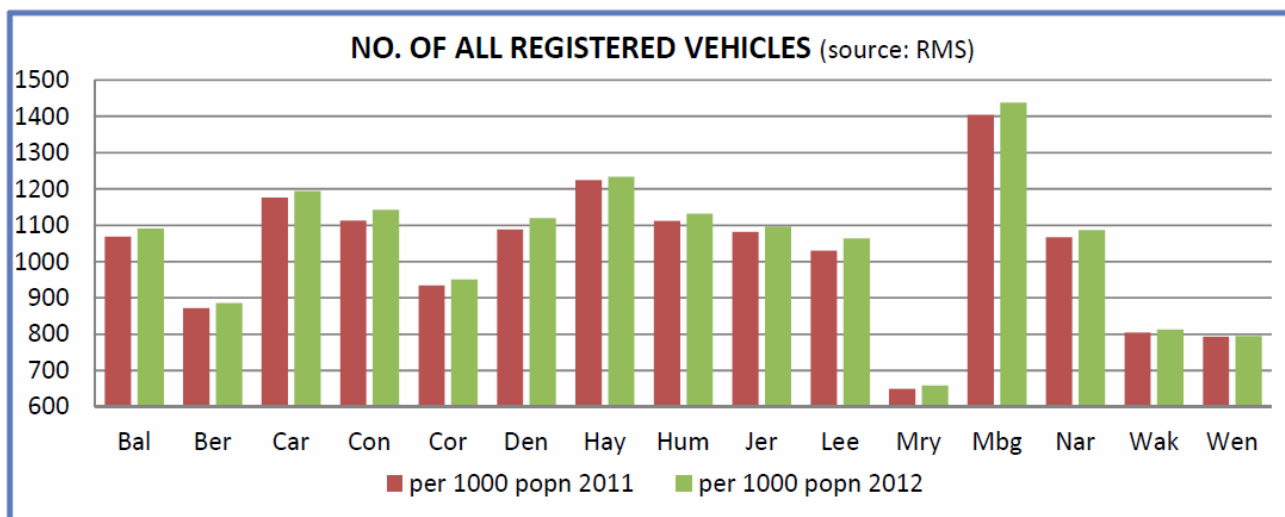
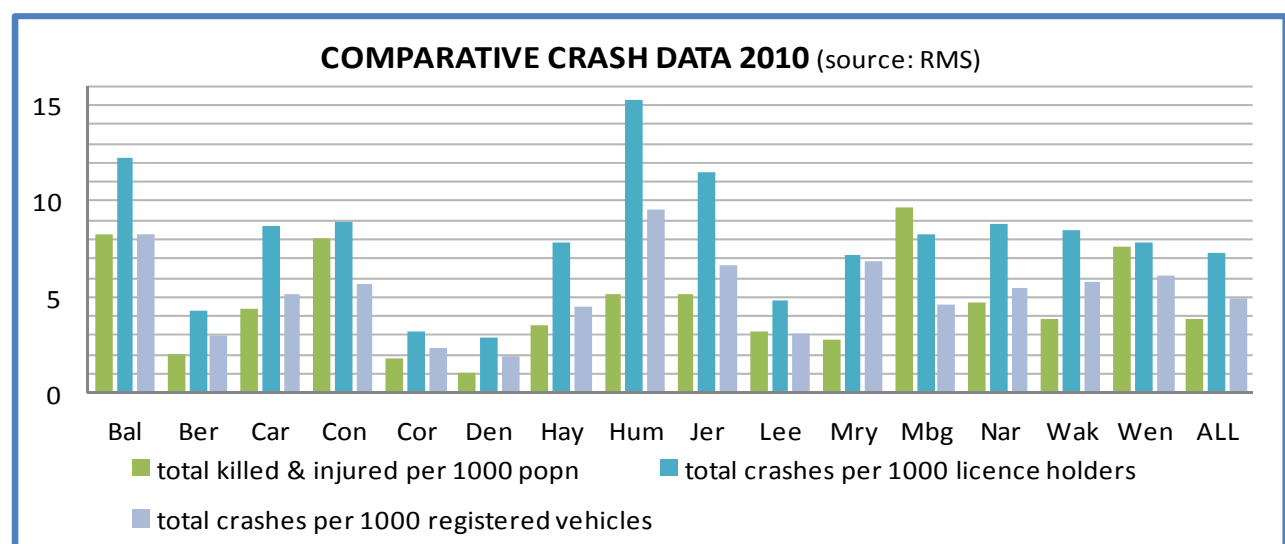


Figure 12 - Vehicle accidents in the RAMROC area ¹





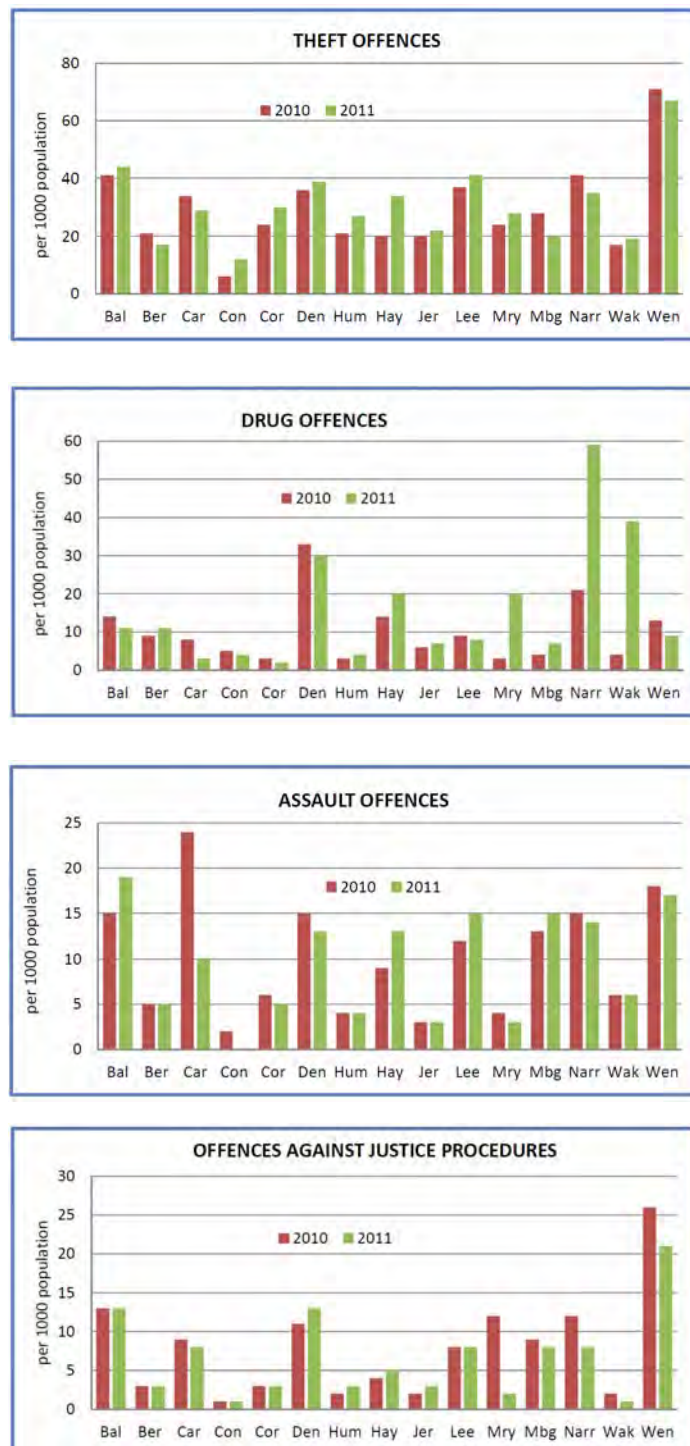
7.7 Anti-social behaviour

Crime occurs in most human settlements albeit at different rates. The data charted in Figure 13 consists of criminal incidents reported to police and recorded by the NSW Police. Recorded crime statistics for some offence categories may not accurately reflect the actual level of crime in an area. This is because some crimes are not reported, some are not easily measured and records of offences which are detected by, rather than reported to police are strongly affected by policing practices for example drug offences and drink driving offences. The NSW Bureau of Crime Statistics and Research cautions that crime rates in LGA with small population sizes (less than 3,000) are not always good indicators of offending crime rates.

The data charted in Figure 13 is the rate per 1,000 population in each LGA to allow some comparison between LGA's. Mid-Murray River LGAs (Corowa, Berrigan and Murray) generally have a lower incidence of crime, that could be linked to the presence of a higher proportion of retirees in the population.

On balance, crime rates appear to have declined from the previous reporting period, although there are some exceptions such as that for drug offences in Narrandera and Wakool.

Figure 13 - Crime reported in the RAMROC area¹



¹ NSW Bureau of Crime Statistic and Research, 2011, *Crime Statistics*, Based on 2006 Census Population Data



8.1 Heritage items

The number of heritage listings for each LGA is on the following page. Note that the Heritage Branch website may not include recent listings, also some councils are in the process of constructing new LEPs that may include or remove some items. In some cases a substantial number of items have been added to heritage schedules.

Local and State heritage items are not hierarchical with one being more important than the other. Instead, they are complementary and indicate the contextual relationship of the significance of the item. It is about context not rank. The significance is relative to the community of interest associated with an item.

No damage or vandalism was reported to a heritage item in the RAMOC region in this reporting period.

Albury has reported 12 alterations made to heritage items during which included ten alterations and two partial demolitions.

A number of LGAs do not know if there has been any alterations or demolitions, or damage to any heritage items during the reporting period.

Identification of important items through heritage studies,

protection of items through legislation and funding for heritage projects/maintenance can all attribute to the ongoing protection of items of heritage significance.

8.2 Heritage funding

NSW Heritage Grants program assists owners and managers of state significant heritage items, Aboriginal heritage and local government heritage management in NSW¹.

Nearly \$10 million has been approved for 323 projects across NSW under the NSW Heritage Grants Works Program.

Numerous Councils received funding for heritage projects in the reporting period from the NSW Heritage Grant Works Program and other sources. A selection of projects in the RAMROC region funded by the NSW Heritage Grants Works Program are found in Table 21. Wentworth received funding from the NSW State Government—Community Building Partnership to Develop the 'Cultural Precinct of Wentworth' project.

There is a limited amount of funding available for heritage projects and limited resources (staff) for projects.

Councils can apply for funding through the Heritage Branch. Councils also encourage and provide information to owners of heritage items to seek funding for maintenance.

Table 21 - NSW Heritage Grants within the RAMROC region 2011-2013¹

Project name	Project purpose	LGA	Approved funding
Old Wentworth Gaol (1881), Wentworth, Perimeter Walls Conservation	To carry out conservation work on the perimeter wall of the former 1881 Wentworth Gaol.	Wentworth	\$65,000
Ned Kelly Post Office, Jerilderie, Conservation and Adaptive Re-use as Exhibition Space	To carry out conservation work to the former Post Office in Jerilderie made famous by Ned Kelly and adaptive re-use as an exhibition space for the Historical Society.	Jerilderie	\$40,000
Former Hay Gaol (1880) Perimeter Walls and Watch Towers Stabilisation and Conservation	To undertake urgent stabilisation and conservation work to the perimeter walls and watch tower at the State Heritage Register-listed 1880 former Hay Gaol complex designed by Colonial Architect James Barnett.	Hay	\$60,000

¹ NSW Office of Environment and Heritage, 2011, *NSW Heritage Grants*



Table 22 - Heritage items in the RAMROC region 2011/12¹

LGA	Local items listed in LEP	Other local items	Items of State significance	Items of National sig.	Funding provided	New items added
Balranald	8	8	2	1	No	None
Berrigan	3	n/a	5	0	Annual fund for distribution to community upon application and approval	None
Carrathool	0	79	2 4	0 9	No	None
Conargo	1	30	0	0	Funding received from the Heritage Branch for Local Heritage fund to enable grants to be provided to individuals for the restoration and enhancement of local heritage buildings and items.	None
Corowa	78	78	3	0	No	Coreen School
Deniliquin	33	33	3	0	* Council received funding to complete a heritage DCP *Council received funding for the local heritage fund and funding for the heritage advisor	None
Greater Hume	89	89	2	0	Yes. Heritage Advisor Program and Local Heritage Fund Program	Yes, Draft Schedule 5 prepared of new draft LEP
Hay	21	21	4	0	Yes from NSW govt for Repair to hay Gaol wall and tower	None
Jerilderie	19	19	1	0	Yes – For Repairs to Post and Telegraph office \$34,000 from Heritage Branch	15 new items in new LEP.
Leeton	42	150	8	0	Yes Heritage Advisor Funding and heritage grant program funding	None
Murray	65	65+	3	1	Yes. Funding from the NSW Heritage Branch to engage a heritage advisor and contribute towards a local heritage fund.	None
Murrumbidgee	5	5	0	0	No	No
Narrandera	8	8	8	41	Yes, LEP Schedule of Heritage—Items of Significance	None
Wakool	5	48	6	7	No	None
Wentworth	155	115	2	1	No	66

¹Based on advice from Councils



8.3 Aboriginal items¹

Aboriginal heritage consists of those places and objects that contribute to the story of Aboriginal people in NSW. It can help identify the links that places may have with each other and their cultural significance. Aboriginal people moved around NSW and passed on stories, information and knowledge by going to these special places.

Aboriginal heritage includes places and items that are important to the local Aboriginal community or to Aboriginal people of NSW. These are places or objects that people have a connection to, both physically and spiritually. Aboriginal heritage can include natural features such as creeks or mountains, ceremonial or story places or areas of more contemporary cultural significance such as Aboriginal missions or post contact sites.

The details of Aboriginal heritage listings for each LGA is listed in the Table 23.

Identification of important items through heritage studies, protection of items through legislation and funding for heritage projects/maintenance can all attribute to the ongoing protection of items of heritage significance.

Table 23- Aboriginal heritage items within RAMROC LGAs 2011/12¹

LGA	Known items	Items included in LEP	New archaeological items in 2010/11?
Balranald	108 (DECCW AHIMS database)	2	No
Berrigan	0	0	No
Carrathool	n/a	n/a	No
Conargo	0	0	No
Corowa	n/a	n/a	No
Deniliquin	0	0	No
Greater Hume	19 Culcairn (AHIMS) 14 Henty (AHIMS) 10 Jindera (AHIMS) 1 Walla Walla (AHIMS) 6 Burrumbuttock (AHIMS)	0	Yes. RMS Holbrook by-pass study
Hay	322 (AHIMS)		New predictive overlay created for Hay DCP.
Jerilderie	n/a	n/a	No
Leeton	1	n/a	No
Murray	n/a	n/a	No
Murrumbidgee	2	n/a	No
Narrandera	1	n/a	No
Wakool	n/a	n/a	No
Wentworth	8	0	No

¹ Sourced from relevant Councils