Regional 2016–2017 STATE OF THE ENVIRONMENT REPORT

NSW GOVERNMENT | Local Land Services Central Tablelands

NSW GOVERNMENT | Local Land Services Central West

For the Councils of the
Greater Central West Region of NSW:
Bathurst Regional, Blayney, Bogan, Bourke,
Cabonne, Coonamble, Cowra, Dubbo Regional,
Gilgandra, Lachlan, Mid-Western Regional,
Narromine, Oberon, Orange, Warrumbungle

Acknowledgements

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Contents

Sunset, Dubbo Regional Council LGA

Abbreviations

AHIMS	Aboriginal Heritage Information Management System
BPEM	Best Practice Environmental Management
CBD	Central Business District
CMA	Catchment Management Authority
CRS	Community Recycling Station
DA	Development Application
DCP	Development Control Plan
EC	Electrical Conductivity
EECs	Endangered Ecological Communities
EPA	Environmental Protection Authority
GJ	Gigajoule
GL	Gigalitre
GPT	Gross Pollutant Trap
ha	Hectare
IP&R	Integrated Planning and Reporting
kL	Kilolitre
km²	Square kilometres
LBL	Load Based Licensing
LEP	Local Environmental Plan
LGA	Local Government Area
LLS	Local Land Services
mg	milligram
MGB	Mobile Garbage Bins
ML	Megalitre
MRF	Materials Recycling Facility
NSW	New South Wales
NTU	Nephelometric Turbidity Units
PM10	Particulate Matter (10 microns or less)
RID	Report Illegal Dumping
RSoE	Regional State of the Environment
SLM	Sustainable Land Management
SoE	State of the Environment
WTP	Water Treatment Plant

Introduction

A State of the Environment (SoE) Report is an important management tool which aims to provide the community and Council with information on the condition of the environment in the local area to assist in decision-making.

Why a Regional SoE Report?

Environmental issues are not restricted to Council boundaries. Regional State of the Environment (RSoE) Reports are recommended by the NSW Government and used by some groups of Councils in NSW to enable a better understanding of the state of the environment in a regional context and to identify future collaborative pathways. More specifically, a regional approach to reporting:

- facilitates a better understanding of the state of the environment across the region
- encourages collaboration in regards to partnering on projects and sharing ideas and resources
- assists in the management of shared environmental resources
- forges stronger regional links across participating Councils.

Who is involved?

The participating Councils in the region are:

Bathurst Regional Council
Blayney Shire Council
Bogan Shire Council
Bourke Shire Council
Cabonne Council
Coonamble Shire Council
Cowra Shire Council
Dubbo Regional Council
Gilgandra Shire Council
Lachlan Shire Council
Mid-Western Regional Council
Narromine Shire Council
Oberon Council
Orange City Council
Warrumbungle Shire Council

Regional SoE reporting has been supported and coordinated by the Central Tablelands Local Land Services (LLS) and formerly the Central West Catchment Management Authority (CMA) since the first regional report was prepared in 2008. As shown in Figure 1, the participating Councils are located across three LLS regions – Western, Central West and Central Tablelands.

All participating Councils have provided data to be included in this report, with additional regional information sourced from Central Tablelands LLS and Central West LLS and other government agencies (see the Appendix for details of data sources).

Reporting for 2016-17

Prior to 2009, as a requirement of the *Local Government Act 1993,* all local Councils in NSW produced an annual SoE Report on major environmental impacts, related activities and management plans. In 2007-08 and 2008-09, Councils in the region, along with the Central West CMA, collaborated to produce a regional SoE Report based on the requirements of the Act.

In 2009, the *Local Government Act 1993* was amended. The amendments required the use of an Integrated Planning and Reporting (IP&R) Framework to guide a Council's future strategic planning and reporting. As part of the IP&R Framework, Councils were required to develop environmental goals and objectives with their communities in relation to identified priority local environmental issues. These environmental goals and objectives form part of each Council's overarching Community Strategic Plan.

Whilst Community Strategic Plans were being developed by the participating Councils, RSoE Reports were produced under the requirements of the 1993 Act for 2009-10, 2010-11 and 2011-12.

The IP&R Framework requires that Councils prepare annual reports which include reporting on environmental objectives in their Community Strategic Plans. In the year in which a Council election is held, the annual report must also include a SoE Report.

In 2012, the participating Councils and the Central West CMA decided to continue collecting data and reporting on an annual basis so that they could produce a comprehensive RSoE Report in 2016 (the year of the Council elections) that covered the intervening years.

The participating Councils decided to continue the regional reporting for 2016-17 awaiting a decision regarding a possible amendment to the Act that will remove the requirement for a separate SoE Report in the year of a Council election.

Figure 1: Map showing participating Council areas and Local Land Services regional boundaries

This report

View across the plains from Mt Gunderbook, Bourke LGA.

The themes covered in this report were guided by those in the former Central West Catchment Action Plan. The themes are:

- Land
- Biodiversity
- Water and Waterways
- People and Communities
- Towards Sustainability

Use of Indicators

Indicators are important management tools used in environmental reporting. They summarise and communicate information about the condition of key aspects of complex environments so that our decision making can be better informed.

In this report, a suite of indicators has been identified that help report on the environmental themes listed above.

Where indicator data for previous years is available, it is provided along with data for 2016-17 in a summary table at the commencement of each theme chapter.

There is a description for each indicator trend within the chapter and an explanation of possible reasons for it occurring. There are also case studies highlighting responses to environmental issues across the region.

The trend arrows in the summary tables are based on comparing the average of data from the past three years with the data for 2016–17, where direct comparison can be made.

The trend arrows used in the summary table are:

- improvement
- no or little change
- worsening trend

Council Snapshot Reports

In 2012, the participating Councils decided to produce additional brief snapshot reports for each of their Local Government Areas (LGAs). These Council Snapshot Reports were produced annually from 2013 to 2017. They report on the indicator trends for each LGA.

It should be noted that two Councils were amalgamated prior to the end of June 2016. Dubbo City Council and Wellington Council were amalgamated to form Dubbo Regional Council. In this report, the data of the former Dubbo City and Wellington LGAs for the three previous years has been amalgamated and compared with Dubbo Regional Council data for 2016-17.

Weather Events in the Region 2016-17

Across the Central Tablelands and Greater Central West there were a number of extreme weather events over the year.

The Bureau of Meteorology issued a number of special climate statements during the year, for record breaking rain in spring 2016 and then for record breaking heat in 2017 (BOM, 2017d).

These conditions impact the environment and Councils in many ways, including flooding, increased power and water use during heat waves, heat stress on vegetation in parks and reserves and on the local communities. These weather events are all consistent with the predictions of climate change for the region (BOM, 2017b).

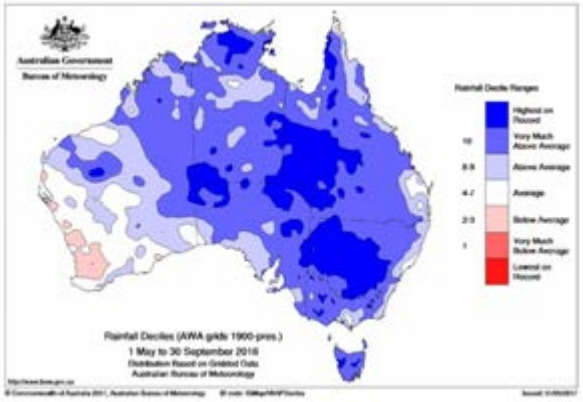
Following a record-warm start in 2016, May to September 2016 was the wettest such period on record for NSW. June and July 2016 brought severe storms and flooding over the Central Tablelands and Greater Central West, resulting in widespread damage, with downed trees and powerlines leading to power outages, road closures and property damage across the State. In response joint disaster assistance was announced for 21 affected regional NSW communities including Bathurst, Blayney, Cabonne, Coonamble, Cowra, Gilgandra, Lachlan, Mid-Western, Narromine, Orange, Warren and Warrumbungle (BOM, 2017e).

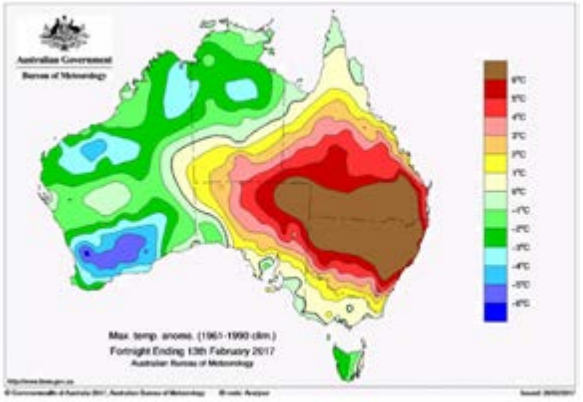
September was an exceptionally wet month as a succession of rain-bearing systems affected the eastern part of Australia. Monthly rainfall was at least double the long-term average over almost all of inland NSW and it was the wettest September on record, especially in the state's western half (BOM, 2017e).

The heavy September rainfalls, combined with abnormally wet catchments resulted in substantial flooding. Major flooding was recorded in the Bogan, Macquarie and Lachlan rivers with the Lachlan River catchment experiencing the most significant impacts (BOM, 2017e).

In many places flooding persisted into the first week of October as flood waters progressed downstream and rainfall

Cudgegong River in flood, Midwestern LGA.





Far left: Australian rainfall deciles for May to September 2016.

Centre: Maximum temperature anomaly (difference from the long-term average) for Australia from 31 January to 13 February 2017.

continued. The flooding affected broad areas and many daily rainfall records were set during the month. Near the end of October, severe thunderstorms affected central NSW, causing strong winds, hail and flash flooding (BOM, 2017a; BOM, 2017c).

During mid-November, severe storms affected central and far-western NSW, with golf-ball sized hail in some areas, very heavy rain causing localised flash flooding and strong winds with gusts of up to 100 km/h. The storms caused widespread damage including downed trees and powerlines, building and vehicle damage. There were over 100 calls to the SES and power outages reported affecting 12,000 premises (BOM, 2017a; BOM, 2017c).

Summer 2016–17 saw prolonged and, at times, extreme heat over Australia, with NSW recording its overall warmest summer on record, 2.56 °C above the historical (1961–90) average and 0.12 °C above the previous record set in summer 2005–06. NSW recorded its third-warmest January on record (warmest since 2006) and fifth-warmest February on record. While the January 1939 southeast Australian heatwave remains one of the most significant in recorded history, the frequency of such intense large-scale heatwaves has increased across spring, summer and autumn, and especially over the last 20 years.

Three heatwaves across January and early February 2017 saw unusually high daily maximum and minimum temperatures for at least three consecutive days over large parts of NSW. During these heatwaves, daily maximum temperatures exceeded 40 °C over very large areas and were typically 8 to 12 °C above the January and February averages. Bathurst and Dubbo recorded new all-time annual February maximum temperatures of 41.5°C and 46.1°C on 11 February, breaking the previous records set in January 1939.

Many sites measured record runs of consecutive days of high temperatures above threshold values. February 2017 saw eight individual days where at least one-third of NSW had maximum temperatures eight degrees or more above average and, separately, three individual days where over a third of the state was more than ten degrees above average. Record maximum temperatures from 2017 now make up eight of the top ten highest February temperatures for NSW (BOM, 2017f).

Autumn and the start of winter showed a similar trend in temperature increase, with NSW experiencing maximum and minimum temperatures above average, with minimum temperatures the warmest on record in March. June 2017 saw maximum temperatures above average with some parts of central NSW including Dubbo and Bathurst experiencing their warmest June days on record (BOM, 2017a; BOM, 2017c).

Long-term trends

Temperature data for NSW shows that from late spring to early autumn, the frequency of warm events is increasing. The 2017 warm event is the latest in a sequence of prolonged or intense warm spells that have affected Australia roughly every six weeks since the end of 2012 and, overall, the time between heat events is shortening (BOM, 2017f). Climate projections show that NSW can expect an increase in average temperatures in all seasons, a decrease in average winter rainfall and an increased intensity of extreme rainfall events (BOM, 2017b).

Land

This chapter focuses on aspects of sustainable land management (SLM) in the region. There are a number of challenges to the sustainable use and management of our soil and land resources, such as wind and water erosion, soil contamination, soil acidity, soil salinity, soil degradation and loss of land to development.

These challenges can be caused by clearing, overgrazing and pollution from a range of sources including disused operations such as petrol stations. The sustainable use of soil and land in agricultural areas of the region is of increasing significance, particularly in the face of a changing climate.

Sustainable land management can be defined as "the use of land resources, including soils, water, animals and plants, for the production of goods to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their

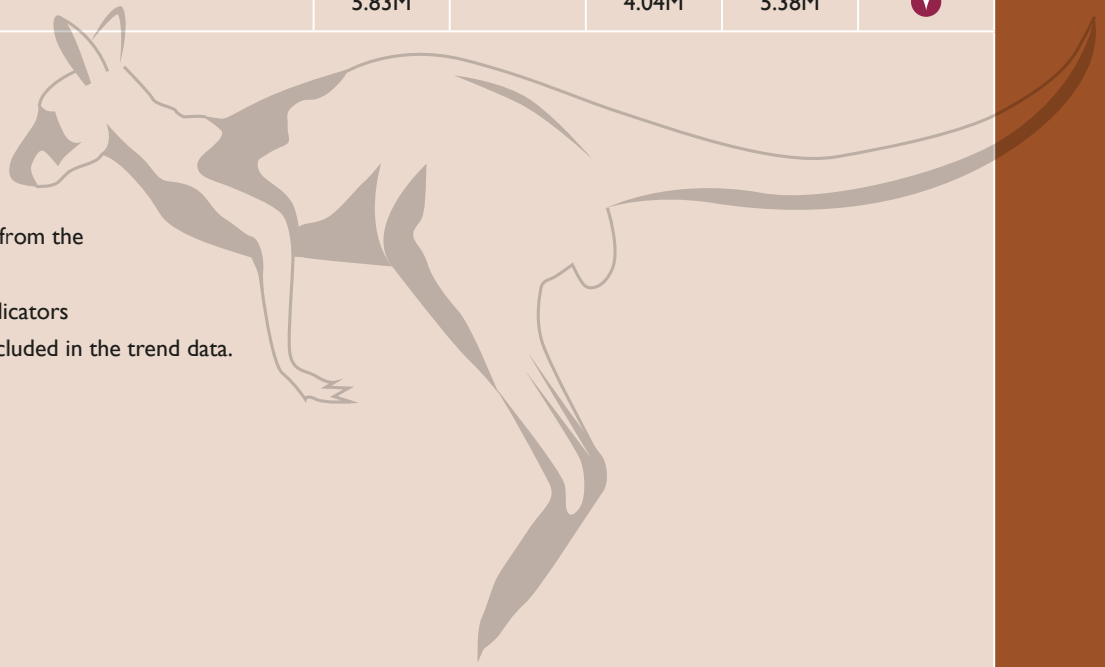
Broadacre farming, Dubbo Regional Council.

Table 2: Summary Table of Indicator Trends - Land

Issue	Indicator	2013-14	2014-15	2015-16	2016-17	Trend
Contamination	Contaminated land sites - Contaminated Land Register (number)	10	7	7	8	→
	Contaminated land sites - potentially contaminated sites (number)	1,094	1,113	1,501	1,766	↓
	Contaminated sites rehabilitated (number)	9	5	9	13	↑
Erosion	Erosion affected land rehabilitated (ha)	4	3	822	2,267	↑
Land use planning and management	Number of development consents and building approvals	3,852	3,458	3,428	4,799	↓
	Landuse conflict complaints (number)	95	93	115	114	↓
	Loss of primary agricultural land through rezoning (ha)	1,119	2,235	80	124	↑
Minerals & Petroleum	Number of mining and exploration titles	868	819	807	841	↓
	Area covered by mining and exploration titles (ha)	5.83M		4.04M	5.38M	↓

↑ improvement
→ no or little change
↓ worsening trend

Note – the above trends are for data in 2013-14, 2014-15, 2015-16 and 2016-17 from the same sources. The trend is based on comparing the average of the previous years of reporting with 2016-17. They should be read in terms of the limitations for indicators discussed throughout this chapter. Refer to the Appendix for a list of Councils included in the trend data.



environmental functions" (Dept. of the Environment, 2014). Sustainable land management is crucial to minimising land degradation, rehabilitating degraded areas and ensuring the optimal use of land resources for the benefit of present and future generations.

Condition

Contamination

Contaminated land has the potential for immediate or long-term adverse effects on human health and the environment. Land contamination is usually the impact of past land uses such as service stations, fuel depots, horticultural facilities, orchards, sheep dips, agri-chemical dumps, pistol ranges, mines, landfills and gasworks. A site is classified as contaminated when hazardous substances occur at concentrations that are above normal background levels, posing a potential risk to human health or the environment.

The NSW Office of Environment and Heritage maintains a register of Contaminated Sites (www.environment.nsw.gov.au/whoweare/registers.htm). All participating Councils also have or are collating a list of potentially contaminated sites based on past land use.

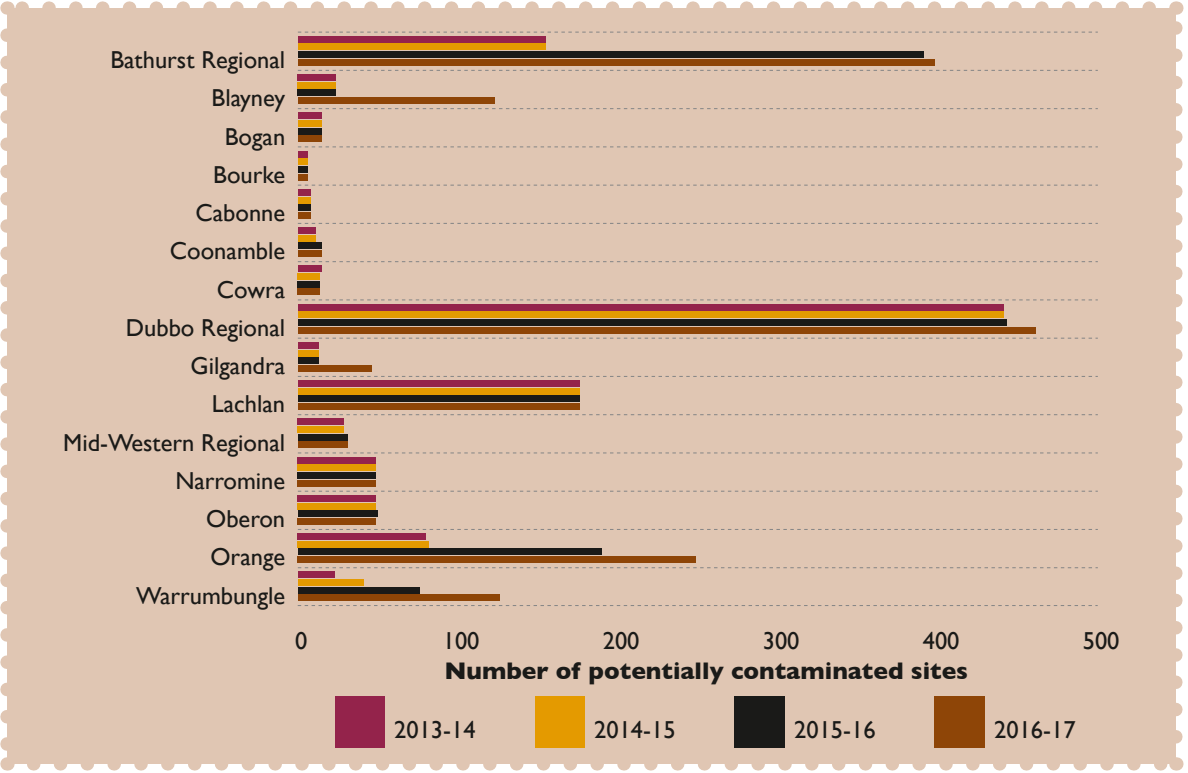


Figure 2: Number of potentially contaminated sites across the region

Indicator – Contaminated land sites (Contaminated Land Register)

Across the region the number of sites on the NSW Contaminated Land Register increased to eight as a result of the Electrolux site in Orange LGA being declared a significantly contaminated site in May 2017.

Indicator – Contaminated land sites (potentially contaminated sites)

The number of potentially contaminated sites reported across the region increased by almost 18% compared to 2015-16. The main reason for this change were the audits of information held by Councils involved in the Contamination Central Project. As shown in Figure 2, the increase largely arose from sites being identified as contaminated land registers were updated in the Blayney, Orange and Warrumbungle LGAs.

CASE STUDY: Derelict Underground Petroleum Storage System Tank Removal & Remediation (Warrumbungle LGA)

Warrumbungle Shire Council received grant funding to investigate, appropriately decommission, remove and perform site remediation of underground petroleum storage system (UPSS) tanks and their associated infrastructure in Council road reserves across the shire. Works were conducted in the townships of Baradine, Coonabarabran, Coolah and Dunedoo.

Stage 1 of the project involved investigation of the four project sites to ascertain the size of the systems and extent of contamination. Ground penetrating radar was used to determine the location and orientation of the tanks and underground services were located within the immediate vicinity which enabled the project team to decide on an appropriate removal or in-situ remediation plan.

Stage 2 works, conducted in the second quarter of 2017, involved removing liquid from the tanks and then removing or foam filling the tanks as deemed appropriate by the Stage 1 investigation. At the Baradine site all three 500 gallon tanks and associated infrastructure were removed successfully and a groundwater monitoring program was undertaken to prove there was no further contamination risk. The Coonabarabran site UPSS consisted of five tanks of which four were removed and one was filled in-situ. At the Coolah site, both UPSS tanks were successfully removed whereas accessibility necessitated in-situ filling of the one UPSS tank at the Dunedoo project site.

Warrumbungle Shire Council's Development Services team project managed the works and the investigation, removal and remediation process was contracted to Ground Doctor Pty Ltd. This project was assisted by a grant provided by the New South Wales Government through the EPA's Contaminated Land Management Program under funding provided by the NSW Environmental Trust.

UPSS Removal, Baradine.

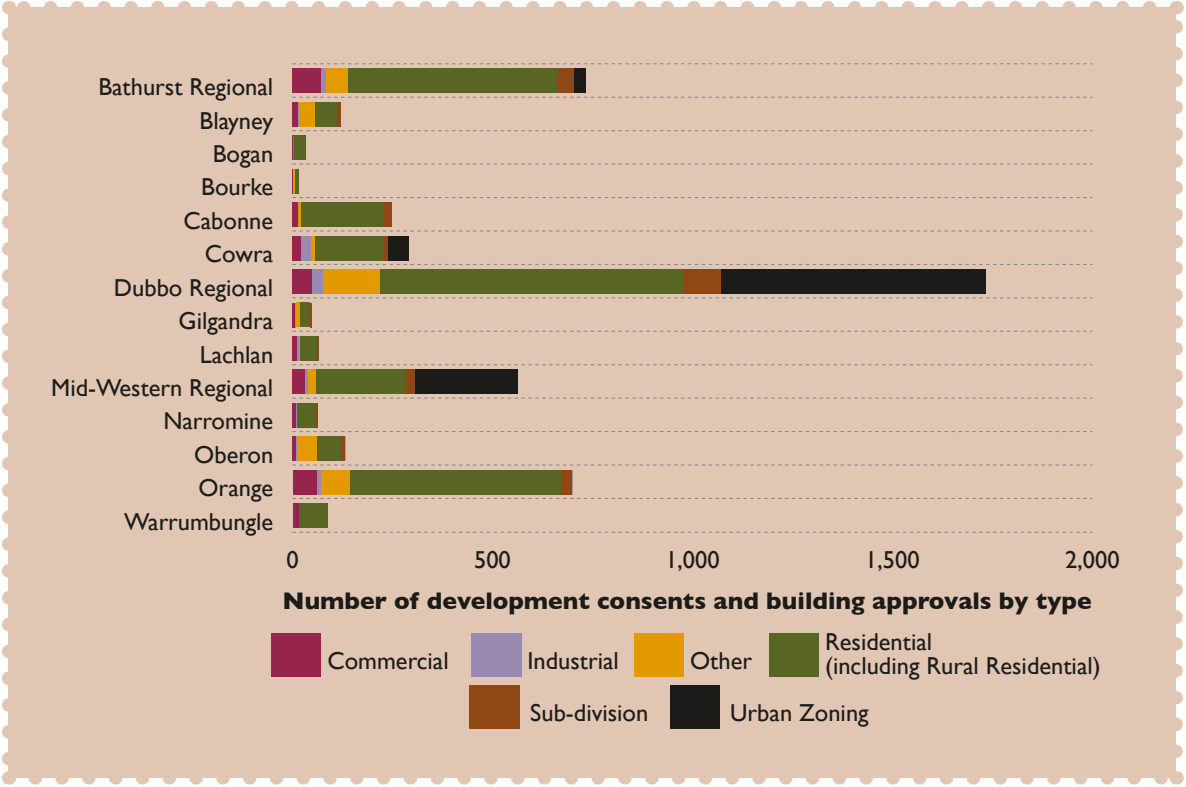


Figure 3: Number of development consents and building approvals by type 2016-17

Threats

Development and land use

Development in and around urban areas can impact significantly on the natural environment including clearing for building blocks. On the other hand, there can be economic and social benefits to a community from increased development activity.

Indicator – Number of development consents and building approvals

As shown in Figure 3, development activity in the region increased by 40% in 2016-17; however, most of the increase in consents and approvals was due to the inclusion of two new categories of development in this report: Sub-division (262) and Urban-Zoning (1001). With these two categories removed, the current trend in development activity is essentially unchanged.

Indicator – Landuse conflict complaints

The number of landuse conflict complaints to Councils was almost unchanged across the reporting region compared with 2015-16. Whilst the number of complaints in Dubbo Regional and Orange LGAs halved compared with last year, this was offset by significant increases in complaints to the Blayney, Cabonne and Mid-Western Regional Councils.

Indicator – Loss of primary agricultural land through rezoning

The loss of agricultural land through rezoning can have deleterious environmental impacts. Not only may the agricultural land have economic value, it could contain remnant native vegetation which may be lost as a result of development following rezoning.

In 2016-17, 124 hectares was reported as rezoned from rural to other categories in across the region: 95 hectares by Cabonne Council and 29 hectares by Bathurst Regional Council. This area was greater than in 2015-16, but significantly less than the previous two years, particularly 2014-15 when Bathurst Regional Council gazetted its new Local Environmental Plan (LEP).

Mining

The boom in global demand for Australian resources has continued to have a significant impact on the economy of the Central West of NSW.

In many areas, mining is a major employer and exploration for new commercial deposits is widespread across the region. The resources industry provides job opportunities for many people who in other times would have been forced to leave the region to find work and it also brings new people into the region. This diversity can provide social benefits in in terms of employment and wealth creation, but may also negatively impact on the social structure of some smaller regional centres. In addition, the number and scale of active mines and exploration projects can threaten the local environment through vegetation clearance, possible contamination of groundwater, and subsidence which may affect surface water.

Indicator – Number and type of mining exploration titles
Indicator – Area covered by mining and petroleum exploration projects

As shown in Figure 4, the underlying declining trend reported for mining and exploration in recent years appears to have been arrested in 2016-17 with the total area now only 8% less than reported in 2013-14.

The largest increase this year was in the area covered by petroleum exploration licences which, at just under 2 million hectares for the region, is almost the same as the level reported in 2013-14.

The number and area of coal mining and exploration projects was reported separately for the first time this year. From this data, the dominance of coal mining in the region is evident. Although there are many more minerals exploration licences (covering three times the area for coal exploration), coal mining covers 28,575 hectares - 80% more than the area of minerals mining in the region.

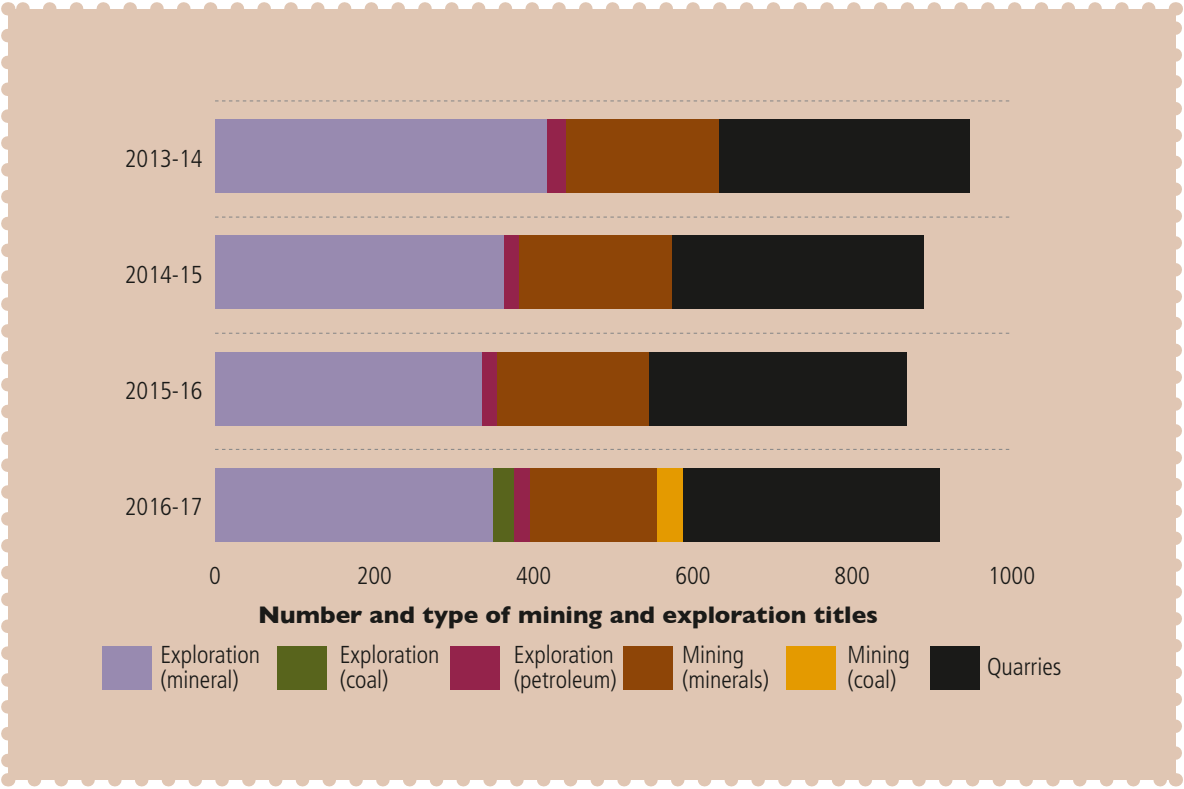


Figure 4: Number and type of mining exploration titles in the reporting region

Response

Contamination

The Contamination Central project, led by Bathurst Regional Council, was completed during the reporting period. The three year project was funded by a $450,000 grant from NSW EPA and provided training and assistance in policy development across the 18 Environment and Waterways Alliance Council members.

Sunset behind silos at Gilgandra.

Indicator – Contaminated sites rehabilitated

In a significant increase from the past three years, 13 contaminated sites were reported as rehabilitated across the region in 2016-17. These sites included four in the Warrumbungle LGA where Council received grant funding to investigate, appropriately decommission, remove and perform site remediation of underground petroleum tanks and their associated infrastructure in Baradine, Coonabarabran, Dunedoo and Coolah.

Erosion

Indicator – Erosion affected land rehabilitated

The Central West LLS reported that 2,246 hectares were rehabilitated in its area in 2016-17, with a further 21 hectares in the Gilgandra and Lachlan LGAs. This is the largest total area rehabilitated across the region since 2008-09.

Sustainable agricultural practices

Sustainable agricultural practices benefit the environment by minimising wind and water erosion, soil structure decline, organic carbon loss and salinity. These practices include understanding land and soil capability, non-tillage farming systems and crop and stock rotation.

Indicator – Farm entities demonstrably practicing sustainable agricultural

The Central West LLS reported that the land area used for sustainable agricultural practice is a total of 118,501 hectares which is almost thirty times the area reported in 2015-16. Such a large increase is unlikely to be a true reflection of on-ground practices and is more likely due to a change in the reporting methodology.

CASE STUDY: NSW EPA Regional Capacity Building Project: Contaminated Land Management

While contaminated land issues are not very common, they can become complex and it is this infrequent nature that means Council staff often cannot develop expertise in this area. Lack of expertise can become a risk to Council if a major contamination issue arises.

In recognition of this lack of expertise within Councils, in 2014 the NSW Environmental Protection Authority (EPA) made grants available as part of the Contaminated Land Management Regional Capacity Building Program. This program has funded four projects in regional areas including the $450,000 'Contamination Central' project which involves Bathurst Regional Council and 18 other Central West Councils Environment & Waterways Alliance members.

The Councils involved were Bathurst Regional, Blayney, Bourke, Cabonne, Coonamble, Cowra, Dubbo Regional, Forbes, Gilgandra, Lachlan, Lithgow, Mid-Western Regional, Narromine, Oberon, Orange, Parkes, Warrumbungle and Weddin. The project was able to employ a Project Officer with experience in contaminated land as well as local government to implement the project.

Though the issue is complex, there are many common examples and impacts across the region. In light of this, the Contamination Central project invited staff from across the 18 Councils to:

- Participate in workshops to identify common issues and how best to deal with them through a new policy template
- Participate in a range of training sessions on:
  - Legislation including the *Environmental Planning and Assessment Act, 1979*, the *Protection of the Environment Operations Act, 1997*, the *Contaminated Land Management Act, 1997* and *State Environmental Planning Policy No 55—Remediation of Land and guidelines*, and section149 planning certificates
  - How to review contaminated land investigation reports
  - How to incorporate contaminated land considerations into the Development Application process
  - How to identify and record contaminated land into a register
  - How to implement a Contaminated Land Policy
  - How to use Contamination Central information resources
- Receive assistance to develop an information system that would hold a register of properties identified as having a history of potentially contaminating activities.

The Project Officer was also on hand to help staff work through current issues as they were presented. These examples were then used to develop fact sheets and case studies to be presented to Councils at the conclusion of the project. Also developed were community information brochures and booklets and a staff information flipchart which is used as a quick reference guide for common contaminated land matters.

The project concluded at the end of 2016-17 and has been considered a success with the majority of Councils adopting a policy and further developing their registers, whilst over 300 staff have participated in training events.

Biodiversity

Biodiversity is the variety of all life forms on earth - the different plants, animals and micro-organisms and the ecosystems of which they are a part. Biodiversity is critical to maintaining functioning ecosystems which provide important services upon which all life depends.

Ecosystems that are rich in biodiversity are more resilient and healthy and are better able to recover from outside stresses such as drought, pests, bushfire and climate change.

Understanding biodiversity gives us the ability to more effectively address environmental challenges including:

- controlling pests and supporting species that pollinate crops
- maintaining groundwater tables
- absorbing carbon
- protecting water quality.

Local Councils may impact on biodiversity through a variety of activities including landuse planning and the management of Council reserves.

Condition

Loss of Biodiversity

Indicator – Total area in the National Parks Estate
Indicator – Addition to the National Park estate

The National Park estate includes national parks, nature reserves, state conservation areas and regional parks.

The total area of the National Park estate in the reporting region has remained unchanged over the past three years, with minor variations shown in the summary table due to spatial analysis issues (e.g. accounting for boundaries of LGAs).

Mt. Gunderoo, Bourke LGA (Scott Willoughby).

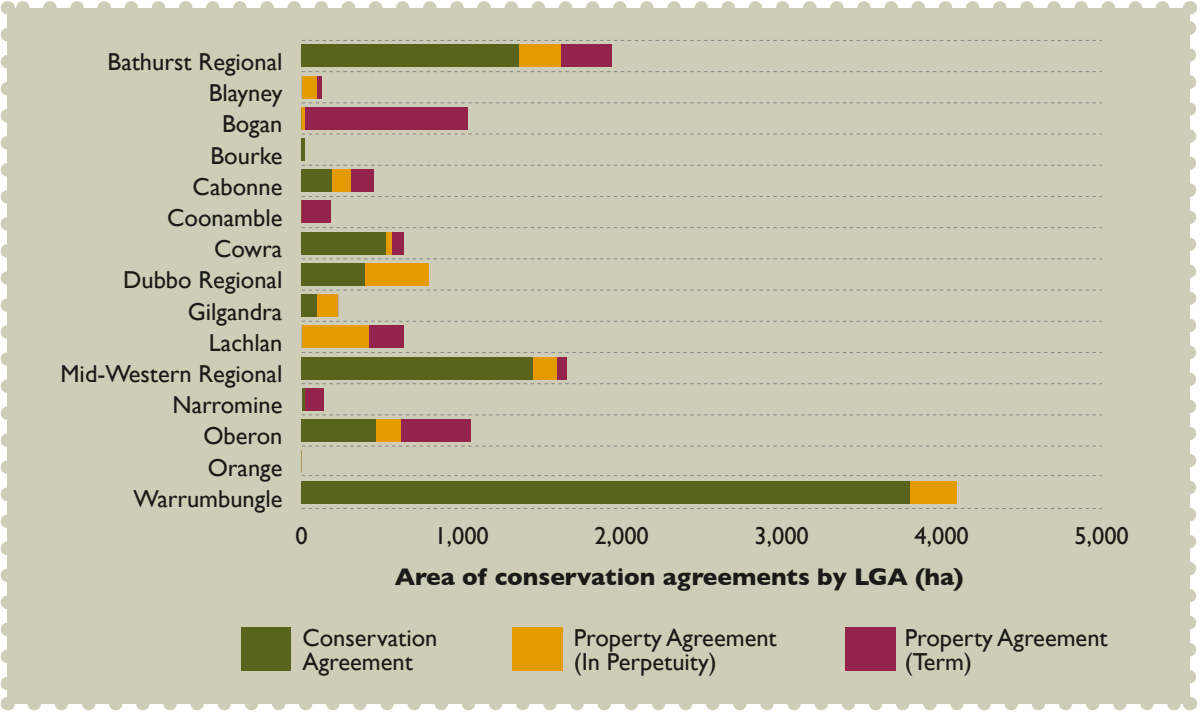
Table 3: Summary Table of Indicator Trends – Biodiversity

Issue	Indicator	2013-14	2014-15	2015-16	2016-17	Trend
Habitat Loss	Total Area in the National Parks Estate (ha)		786,872	786,908	786,857	→
	Total Area of State Forests (ha)		240,300	240,088	240,237	→
	Total Area Protected in Wildlife Refuges (ha)	184,000	169,000	182,000	182,000	→
	Total Area protected under voluntary conservation agreements (ha)	10,101	11,690	11,757	12,993	↑
	Extent of Travelling Stock Reserves in LGA (ha)			281,455	290,735	↑
	Proportion of Council reserves that is bushland/remnant vegetation	38%	38%	38%	38%	→
	Habitat areas revegetated (ha)	159	63	69	175	↑
	Vegetation protected and rehabilitated through LLS incentive funding (ha)	7,214	5,302	95,645	38,339	↑
	New Voluntary Conservation Agreements, Property Vegetation Plans & biobanking (number)	2	75	63	28	↓
	Roadside vegetation management plans (number)	10	10	15	15	↑
	Roadside vegetation rehabilitated (ha)		76	16	29	↓
Threatened Species	State Threatened species listed in LGA (number)	291	284	288	290	→
	Threatened species actions implemented (e.g. PAS, recovery plans) (number)	15	16	14	13	↓
	Fish restocking activities: native species (number)	539,000	479,000	886,000	550,000	↓
Noxious weeds and feral animals	Fish restocking activities: non-native species (number)	306,000	293,000	340,000	316,000	↓
	Number of declared noxious weeds	124	139	139	102	↑
	Invasive species (listed noxious or WONS) under active management (number)	191	193	205	227	↑

↑ improvement → no or little change ↓ worsening trend

Note – the above trends are for data in 2013-14, 2014-15, 2015-16 and 2016-17 from the same sources. The trend is based on comparing the average of the previous years of reporting with 2016-17. They should be read in terms of the limitations for indicators discussed throughout this chapter. Refer to the Appendix for a list of Councils included in the trend data.

Figure 5: Total Area under Voluntary Conservation Agreements by LGA in 2016-17



Indicator – Total Area of State Forests
Indicator – Change in Area of State Forests

The total area of State Forests in the reporting region has remained unchanged over the past three years, with minor variations shown in the summary table due to spatial analysis issues (e.g. accounting for boundaries of LGAs).

Indicator – Total Area protected in Wildlife Refuges

The Wildlife Refuges scheme has existed since 1948 and is one of the longest-running schemes in Australia that supports conservation on private and public land. Wildlife refuges may contain remnant native vegetation, as well as habitat provided by wildlife corridors, windbreaks, woodlots or farm dams.

There was no change this year in the area protected in Wildlife Refuges on private property.

Indicator – Total Area protected under voluntary conservation agreements

The area of all Conservation Agreements and Property Agreements in 2016-17 is provided in Figure 5.

An additional 1,236 hectares of land was reported as protected under Voluntary Conservation Agreements in 2016-17. The two largest increases were in the Mid-Western Regional and Oberon LGAs, with the latter likely a correction of a reporting anomaly in 2015-16.

Indicator – Extent of Travelling Stock Reserves in LGAs

There are 290,735 hectares of travelling stock reserves across the region with almost 70% of this area in the Bourke LGA, and small areas in every other LGA. The changes in areas compared with last year probably reflect an improvement in the methodology of calculating this data by LLS rather than any underlying increases.

Indicator – Proportion of Council reserves that is bushland/remnant vegetation

This indicator has stabilised with little change over the last few years. It should be noted that Blayney, Cabonne, Coonamble and Narromine Councils all continue to report that they have no bushland/remnant vegetation on Council reserves.

Threatened species

There are numerous threatened species and Endangered Ecological Communities (EECs) across the region. Box-Gum Woodland, (also

CASE STUDY: Conserving Koalas in the Central Tablelands

Koalas are a threatened species under both State and Federal legislation and are known to occur across parts of the Central Tablelands region of NSW. Remnants of Koala habitat are available across the Central Tablelands, however many of these areas are fragmented leaving this species at further risk of predation and road accidents.

It is estimated that across Australia 80% of Koala habitat has disappeared due to land clearing for urban development, agriculture and mining. Isolated pockets of habitat restrict movement and the transfer of genetic material, and also forces Koalas to traverse open space to seek feed trees, water or breeding opportunities. They are therefore exposed to predators such as dogs. It is recorded that over 100 Koalas are attacked and killed by wild and domestic dogs every year.

In 2016, a collaboration of three Councils sought funding through the Local Government Taking Action to Protect Ecosystems project which aims to assist Councils throughout the Central Tablelands to protect and enhance the natural environment through the delivery of projects. This project was provided by Central Tablelands Local Land Services through funding from the Australian Government's National Landcare Programme and Catchment Action NSW.

Bathurst Regional Council conducted a community planting day using Eucalyptus trees known to be Koala feed species to restore habitat across part of an 80ha property at Mount Panorama. Koalas have been recorded within 1km of this site.

Blayney Shire Council increased Koala habitat along Caloola Road by planting Eucalyptus trees known to be both primary and secondary Koala feed trees.

Mid-Western Regional Council held a community day with a local ecologist to educate people about Koalas and their habitat. Council also facilitated the planting of 500 Koala feed trees throughout the LGA.

Koalas at St Helens Park (Richard Lonza).

Spoonbill, Ploughmans Wetland, Orange LGA.

known as Box Gum Grassy Woodland) is one of the most threatened communities in the State with 7% of original extent remaining. It is listed on both State and National registers. Box Gum Woodland was widely found across the region, however the high level of clearing linked to agricultural land use has caused a significant decline.

Indicator – State Threatened species listed in Central West and Lachlan Catchments

There are two new threatened species listed across the region this year.

Threats

There are several threats to biodiversity in the region including land clearing, invasive plants species and feral and pest animals.

Indicator – Fish restocking activities: non-native species

Approximately 315,500 non-native fish (brown and rainbow trout) were restocked across the region in the current reporting year which is the second highest total reported in the eight years that this indicator has been tracked. Over 32% of the restocking occurred in the Oberon LGA.

Indicator – Number of declared noxious weeds

The Central Tablelands and Central West regions have a total of 102 declared noxious weeds, and a significant number of environmental weeds present. The reporting by area of noxious weeds has changed this year, moving from Counties to LLS regions. This reorganisation has involved a major rationalisation of noxious weeds reporting across the region, leading to the reduction from the 139 declared noxious weeds reported last year to only 102 as at 30 June 2017.

Response

Land clearing

Indicator – New Voluntary Conservation Agreements, Property Vegetation Plans & biobanking

The Central West LLS reported 28 new land conservation management agreements for 2016-17 which is similar to the level of activity reported for this indicator before the transition from CMAs to LLSs. Central Tablelands LLS reported no new agreements in 2016-17.

CASE STUDY: Fish River Habitat Restoration (Oberon LGA)

This project managed by Oberon Council and Bathurst Regional Council aimed to restore the riparian zone along a section of the river to increase biodiversity, habitat and improve resilience of these systems to disturbances.

The key outcomes of the project included the control of willows, a weed of national significance, along approximately 800m of the Fish River.

Approximately 100 willows were poisoned along 800m of the riverbank. Follow up willow control was undertaken by the Oberon Green Army. Overall approximately 2ha of willows were controlled.

Longstem *Casuarina cunninghamiana* (River Sheoak) were planted along the riverbank to replace the shading effect of the willows over the water. Shrubs were planted in groups to provide habitat within the riparian zone.

The Oberon Green Army planted 170 longstem tubestock along the eastern and western riverbanks.

A community planting day was held in Hassall Park on the 26

March 2017. The event was attended by 19 volunteers from both Bathurst Regional and Oberon LGAs with a further 170 longstem tubestock planted.

It is anticipated that as the plants within the revegetated areas establish, there will be a visible improvement in the condition of the project site, including an increase in vegetative cover, increase in flora and fauna, and a decrease in erosion over time.

These works will help towards creating a healthier riparian corridor, and improve habitat for a range of native fauna including the Endangered Booroolong Frog.

Oberon Green Army

CASE STUDY: Creating Superb Homes for Parrots

Central West Councils Environment & Waterways Alliance hosted two highly successful Hollows for Habitat forums in Orange and Dubbo in 2016. These forums highlighted the plight of hollow-dependent fauna across the region with a range of expert speakers presenting to around 200 people. A highlight of these events was the demonstration of the hollow augmentation technique by experienced and qualified arborists, a process that involves cutting artificial hollows into standing trees.

The forums generated interest and awareness of hollow-dependent species to such a degree that a dedicated project was funded by Central Tablelands LLS. The Creating Superb Homes for Parrots project saw five Alliance Councils partner to install over 200 hollows for Superb Parrots using the hollow augmentation technique. Additionally, a series of associated revegetation works have been completed to create future habitat for the Superb Parrot.

The Superb Parrot (*Polytelis swainsonii*) is a large green parrot with distinctive scythe-shaped wings in flight. Males sport a bright yellow forehead and throat with a red crescent at the base of the throat. Females are a slightly duller green with a light blue colouration in place of the male's brightly coloured face and throat markings.

Superb Parrots are a listed threatened species under both NSW and Federal legislation. Threats to the Superb Parrot that have been addressed as part of this project include:

- Loss of living and dead hollow bearing trees
- Loss of breeding and foraging habitat
- Poor regeneration of nesting trees and food resources.

This project was managed by Central Tablelands LLS through funding from Catchment Action NSW. Works have been conducted in partnership with Bathurst Regional Council, Blayney Shire Council, Cabonne Council, Cowra Council and Orange City Council.

Additional funding has been received from The Norman Wettenhall Foundation to fund a PhD project on the efficacy of the hollow augmentation process.

Community planting day for the Superb Parrot. (M. Callan).

Indicator – Roadside vegetation management plans

All Councils except Warrumbungle Shire Council reported that they had a roadside vegetation management plan in place. Oberon Council noted that it is reviewing its plan in 2017.

Rehabilitation

Rehabilitation and sustainability projects have been developed by organisations to help reduce the impact of land clearing and other threatening processes on biodiversity and to ensure some level of connectivity within the increasingly fragmented landscape.

Indicator – Habitat areas revegetated

In 2016-17, 174.5 hectares of habitat area was rehabilitated across the entire region. The big increase over the previous year was almost entirely due to a Green Army project in the Mid-Western Regional LGA which rehabilitated 100 hectares.

Indicator – Vegetation protected and rehabilitated through LLS incentive funding

For 2016-17, 38,339 hectares of vegetation was reported as protected and rehabilitated through the Central West LLS. Although this number is much lower than the 2015-16 area protected and rehabilitated, it is still a healthy increase compared with the activity reported in the prior few years.

Indicator – Area of roadside vegetation rehabilitated

Three Councils reported that they had rehabilitated a total of 28.5 hectares of roadside vegetation, 20 hectares of which was in the Cabonne LGA.

Threatened species

Indicator – Threatened species actions implemented

The number of threatened species actions implemented across the region in 2016-17 was 13, one less than reported in 2015-16. Only five Councils reported actions this year, including:

- Bathurst Regional Council continued management of road maintenance activities to minimise impacts to the Purple Copper Butterfly and implemented strategic revegetation for the Regent Honeyeater
- Bathurst, Mid-Western Regional and Blayney Shire Councils implemented actions under the Conserving Koalas in the Central Tablelands project.

Native fish

Indicator – Fish restocking activities: native species

In 2016-17, 315,568 native fish were restocked across the region, reverting from last year's exceptionally high number to a total more consistent with the previous two years.

Invasive species

Indicator – Invasive species (listed noxious or Weeds of National Significance) under active management

There was an 11% increase reported this year compared with 2015-16 in the number of invasive species being actively managed by the Councils across the region. However, this year's improvement in this indicator is almost entirely due to a large increase reported by Lachlan Shire Council which has identified 31 additional potential species under its new roadside vegetation management plan.

Water and Waterways

Increasing water consumption and declining water quality are two important environmental issues in the region. The quantity of available water is often variable due to the periodic effects of drought and flood. Many rivers in the Murray-Darling Basin have been dammed to provide a reliable water supply for agriculture and urban use and increasing demand is placing pressure on inland water systems.

Macquarie Marshes (M. Callan).

The quality of water within the river and groundwater systems is also under threat from industrial, urban and agricultural pollution sources, as well as from treated wastewater and stormwater.

Regional impacts of climate change and variability will include less reliable water supplies in the catchments as a result of higher temperatures, variable rainfall and higher evaporation rates. There are increased risks of more intense storms and flooding between protracted droughts.

Lower flows and higher temperatures may also reduce water quality within the region. For example, low flows, higher temperatures, and elevated nutrients create a more favourable environment for potentially harmful algal blooms. In addition, decreases in runoff due to climate change may reduce the extent and function of freshwater wetlands that provide habitat for birds and other wildlife including the regionally significant Ramsar-listed Macquarie Marshes.

WATER QUALITY

Condition

Surface water and groundwater quality

Indicator – Average salinity levels in selected streams

Salinity is measured by placing a conductivity probe in a water sample and measuring the flow of electricity between the electrodes.

Salinity levels can be critical to the survival of some aquatic plants and animals. Many aquatic species can survive only within

Table 4: Summary Table of Indicator Trends – Water Quality

Issue	Indicator	2013-14	2014-15	2015-16	2016-17	Trend
Surface & Ground Water Quality	Average salinity levels in selected streams (EC)	544	386	421	344	↑
	E.coli remote from wastewater treatment plants	951	656	685	1,899	↓
	Average Total Nitrogen in selected streams (mg/L)	1.1	0.65	2.2		
	Average Total Phosphorus in selected streams (mg/L)	0.03	0.03	0.08		
	Average Turbidity in selected streams (NTU)	9.3	12	11		
Riparian	Riparian vegetation recovery actions (number)	25	27	25	35	↑
	Riparian vegetation recovery area (ha)	136	167	178	214	↑
Industrial/ Agricultural Pollution	Load Based Licensing Volume (kg)	237,932	213,219	177,785	274,043	↓
	Exceedances of license discharge consent recorded (number)	20	13	15	20	↓
	Erosion & Sediment Control complaints received by Council (number)	109	55	63	74	↑
Stormwater Pollution	Number of gross pollutant traps installed	71	77	83	94	↑
	Total catchment area of GPTs (ha)	5,278	5,401	5,277	5,438	↑
	Water pollution complaints (number)	44	48	37	34	↑
Town Water Quality	Number of instances drinking water guidelines not met	217	352	281	147	↑
	Number of drinking water complaints	763	813	291	976	↓

↑ improvement → no or little change ↓ worsening trend

Note – the above trends are for data in 2013-14, 2014-15, 2015-16 and 2016-17 from the same sources. The trend is based on comparing the average of the previous years of reporting with 2016-17. They should be read in terms of the limitations for indicators discussed throughout this chapter. Refer to the Appendix for a list of Councils included in the trend data.

Macquarie River, Dubbo

certain salinity ranges so changes in salinity levels result in changes to the variety and types of species found.

Salinity problems occur where deep rooted vegetation is removed from the land and through some farming practices such as flood irrigation. This means that much more water can infiltrate the soil and causes the water table to rise. This water can move towards the surface, bringing with it large amounts of salt from underground storage. After the water evaporates, high concentrations of salt remain which can eventually find its way into water-courses. Variation in conductivity between regions can be influenced by changes in geology between areas.

There was an 18% decrease in 2016-17 compared with 2015-16 in the average salinity level for the three locations which had data available for each of the last four years. Lower levels were recorded at each of the three sites: the Bogan River at Gongolgon, the Castlereagh River at Gungalmn, and the Cudgegong River downstream of Windamere Dam.

Indicator – Average Total Nitrogen in selected streams
Indicator – Average Total Phosphorus in selected streams
Indicator – Average Turbidity in selected streams

Water quality sampling results have been collated from eleven streams or rivers in the region. These results have provided a three year analysis for Total Nitrogen, Total Phosphorus and turbidity.

No data was provided this year by the NSW Office of Water for these indicators.

Indicator – E.coli remote from wastewater treatment plants

Indicator organisms are bacteria whose presence in water gives a simple and meaningful indication that faecal contamination has occurred. Such organisms are always present in high numbers in the faeces of humans (and other warm blooded animals and birds).

One of the major indicator organisms of faecal pollution is *Escherichia coli* (*E.coli*). When indicator bacteria are detected in water, their presence indicates that excrement from birds, animals or humans has recently polluted the water and that all types of pathogens (bacteria, viruses, protozoans and parasites) may also be present.

In 2016-17 this indicator was measured at eight locations compared with only three locations in earlier years. Much higher *E.coli* levels than usual were recorded in the Bathurst

Regional, Blayney, Oberon and Dubbo Regional LGAs. Above average rainfall in parts of the region during the year increased stormwater runoff which could have contributed to the high *E.coli* levels recorded.

The 810 *E.coli* organisms per 100 ml in the Bathurst Regional LGA was the highest level yet recorded across the region in five years of reporting this indicator. In contrast, Cabonne LGA reported a 50% reduction in its *E.coli* level after two years of very high readings.

Town Water Quality

Indicator – Number of instances drinking water guidelines not met

As shown in Figure 6, incidences of drinking water guidelines not met for 2016-17 were almost 48% less than in 2015-16 with a particularly large decrease reported in the Mid-Western Regional LGA.

Bogan LGA reported no incidences this year - a result of the new fluoridation plant and improved compliance with guidelines.

Dubbo Regional Council's increase in 2016-17 was due to the inclusion of data from the former Wellington LGA which had twelve instances in 2016-17.

Indicator – Number of drinking water complaints

There was a spike in the number of drinking water complaints this year with large increases reported in the Dubbo Regional, Mid-Western Regional and Orange LGAs. Almost three quarters of the complaints in 2016-17 were received by Dubbo Regional Council whose total of 724 included 493 complaints received about the water during a 'boiled water alert' in November 2016.

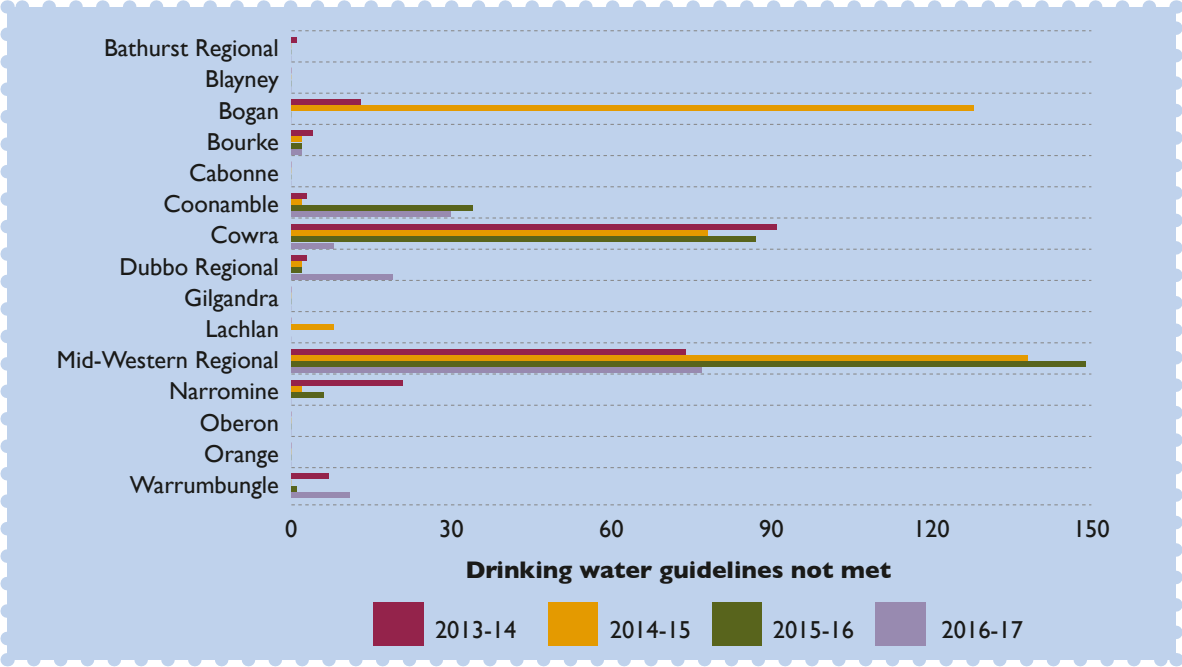


Figure 6: Number of instances in which drinking guidelines have not been met

Threats

Industrial/Agricultural Pollution

Indicator – Load Based Licensing volume

The load-based licensing (LBL) scheme sets limits on the pollutant loads emitted by holders of environment protection licences, and links licence fees to pollutant emissions. LBL is a powerful tool for controlling, reducing and preventing air and water pollution in NSW.

The total LBL volume was almost 100,000 kg (54%) of pollutants more than in 2015-16 for the twelve councils reporting in each of the last four years. More than 75% of the increase came from Orange City Council where the much higher load discharge was due to an abnormally wet season combined with Cadia Valley limiting its water supply from Council.

Indicator – Exceedances of license discharge consent recorded

In 2011, the NSW Government passed legislation (*Protection of the Environment Legislation Amendment Act 2011*) which requires Councils to monitor their discharges to the environment (land, water or air) as part of their Environment Protection License conditions.

The number of incidents of licence discharges exceeding the allowed amount increased by a third in 2016-17 for the twelve Councils reporting this data in each of the last four years.

As flagged in last year's report, the overall picture is actually worse than portrayed because Warrumbungle Shire Council reported twelve exceedances this year (the highest in the region) and its numbers are excluded from the summary table due to it not reporting for the previous two years.

Indicator – Erosion & Sediment Control complaints received by Council

One measure of the threat to waterways from sediment pollution is the number of erosion and sediment control complaints received by the local Councils. The complaints can range from sediment spilling out of construction sites to obvious plumes of sediment flowing into streams.

The total number of erosion and sediment control complaints across the region rose by 17.5% to 74 in 2016-17 for the 14 Councils reporting in each of the last four years. Mid-Western Regional Council received 20 of these complaints with this abnormal number due to storm damage in January 2017. The total from all other Councils actually fell slightly compared to 2015-16.

Indicator – Water pollution complaints

In 2016-17, Bathurst Regional and Dubbo Regional Councils received all but five of the 34 water pollution complaints in the region. Lachlan and Orange were the only two other Councils to receive any complaints.

Response

Riparian rehabilitation

The restoration of riparian (river bank) zones is being carried out across streams throughout Australia, costing millions of dollars annually. These efforts are motivated by an understanding that the overall health of our streams is intimately linked with condition of the riparian zone.

Indicator – Riparian vegetation recovery actions
Indicator – Riparian vegetation recovery area

There was a significant increase in both the number and area of riparian vegetation recovery actions in 2016-17 compared with 2015-16.

Cabonne LGA again reported the largest recovery area of 130 hectares, whilst Bathurst Regional and Dubbo Regional LGAs both reported ten or more discrete riparian vegetation recovery actions.

Stormwater pollution

Litter enters waterways through stormwater and can negatively impact upon water quality and aquatic fauna. Installation of gross pollutant traps (GPTs) is a Council response to litter impacts. These devices trap larger pollutants such as litter and coarser sediments in stormwater drains and outlets, but they do not trap smaller particles or heavy metals. While there are ongoing costs associated with maintenance and cleaning of these traps, there are significant benefits to aquatic ecosystems and the visual appearance of waterways.

Indicator – Total catchment area of GPTs

Eight new GPTs were installed this year: two in the Bathurst CBD and six in the Dubbo Regional LGA. These were responsible for all the reported increase in the reporting region. The new GPTs in the Bathurst CBD only have very small catchments but they have been installed in litter 'hot spot' areas and are trapping a large amount of rubbish.

Table 5: Summary Table of Indicator Trends – Water Quantity

Issue	Indicator	2013-14	2014-15	2015-16	2016-17	Trend
Dam Levels	Average dam levels	55.0%	41.3%	39.6%		
Water extraction	Number of Water Supply Work Approvals from surface water sources	2,345	2,335	2,168	2,288	↓
	Volume of surface water permissible for extraction under licences (GL)	696	725	720	729	↓
	Number of Water Supply Work Approvals from groundwater resources	16,698	16,856	16,781	17,012	↓
	Volume of groundwater permissible for extraction under licences (GL)	223	235	222	231	↓
	Actual volume extracted through groundwater licences (GL)		92	94		
Council water consumption	Area of irrigated Council managed parks, sportsgrounds, public open space (ha)	1,028	1,073	1,191	1,252	↓
	Water used by council for irrigation (including treated and untreated) (ML)	1,745	1,833	1,774	1,666	↑
Town water consumption	Annual metered supply (ML)	25,994	25,278	27,026	25,968	↑
	Annual consumption (Total from WTP) (ML)	28,865	29,229	29,940	30,966	↓
	Average annual household mains potable water usage (kL/household)	254.6	231.0	246.8	240.8	↑
	Average level of water restrictions implemented	0.6	0.5	0.6	0.4	↑
	Water conservation programs (number)	11	14	14	6	↓

↑ improvement → no or little change ↓ worsening trend

Note – the above trends are for data in 2013-14, 2014-15, 2015-16 and 2016-17 from the same sources. The trend is based on comparing the average of the previous years of reporting with 2016-17. They should be read in terms of the limitations for indicators discussed throughout this chapter. Refer to the Appendix for a list of Councils included in the trend data.

CASE STUDY: Detention Basin Enhancement Project (Mid-Western Regional LGA)

In October 2016, Mid-Western Regional Council was awarded a grant of $22,000 from Central Tablelands Local Land Services to assist in the restoration and enhancement of five detention basins and three drainage lines in west Mudgee.

Detention basins are used to retain coarse sediments from runoff and are typically the start of a treatment train. They prevent downstream environments from becoming smothered in sediment, by reducing flow velocity and encouraging sediments to settle out of the water column.

Well-designed detention basins and drainage reserves provide environmental benefits by filtering the water before it reaches river systems thus improving water quality, and offering important urban vegetation for native fauna particularly for bird species in terms of linkage value as well as habitat.

Earthworks were undertaken to transform bare detention basins into artificial wetland spaces. Once earthworks were completed they were planted out with wetland vegetation species. These works increase the biodiversity of the area, provide valuable migratory bird habitat by facilitating open water connections and filter the stormwater before it enters the Cudgegong River. Furthermore, they can now be used for passive recreation. Interpretive signs were installed next to two of the basins along the cycleway to educate the community about the importance of stormwater management.

Five basins and three drainage lines within the Cudgegong River catchment were rehabilitated with native vegetation by the Green Army team and during community planting days such as National Tree Day and a preschool planting event. There were 1,265 trees and shrubs planted and 2,170 wetland plants.

Planting the basins and associated drainage reserves with native vegetation provides valuable habitat to native fauna. Species planted included those known to be critical habitat for a number of threatened bird species in the area including the Regent Honeyeater and Glossy-black Cockatoo.

Detention basin restoration, west Mudgee.

WATER QUANTITY

Condition

Indicator – Dam levels

Dam storage levels indicate both the recent rainfall and the pressures that water consumption place on water storages. Six dams in the region – Carcoar, Wyangala, Lake Cargelligo, Windamere, Oberon and Burrendong – were used to indicate dam levels.

No data was supplied by the NSW Office of Water for this year.

Threat

Surface and Groundwater Extraction

Irrigation places significant pressure on water resources. Historically over-allocation of water licences has seen additional stress placed on aquatic habitats such as the Macquarie Marshes despite the requirement for environmental flows. The demand for groundwater extraction, particularly for irrigation, is increasing in the long-term and placing additional pressure on aquifers and ecosystems.

Indicator – Number of Water Supply Work Approvals from surface water sources

The right to extract irrigation water from surface water sources is regulated under the *Water Management Act 2000*. Under this Act, every pump used to extract water has to have a "Water Supply Work Approval".

The number of Water Supply Work Approvals across the region increased in 2016-17 by 5.5% compared with 2015-16 but the number is still lower than reported in the two prior years.

Indicator – Volume of surface water permissible for extraction under licences

Under the *Water Management Act 2000*, irrigators require an "Access Licence" to extract water from surface water sources governed by a water sharing plan, via one or more pumps (Water Supply Work Approvals). The Access Licences are volumetric entitlements and can be bought and sold with or separately to the land with which they were originally associated.

NSW policy has been to cap the volume of water available for extraction from surface water sources by not increasing the total volume issued under Access Licences. It is expected that this may lead to an overall decrease in this indicator over time, but a 1.2% increase has been reported for 2016-17 compared with 2015-16 and there is no sign of an actual declining trend yet.

Irrigation channels near the Mitchell Highway (Shireen Baguley)

CASE STUDY: Creation of the Waratah Wetlands (Orange LGA)

The area of North Orange between the bypass and Platinum Parade, which is an existing swampy meadow, will be replenished with native plant species and furnished with recreational facilities and paved walkways to create the Waratah Wetlands.

Waterways and springs in the area were a rich source of food for the local Wiradjuri people, yielding waterbirds, fish, crayfish and plants that were used for food and fire. Traditionally, watering places were imbued with spiritual meaning for the Aboriginal people and were used as campsites and for ceremonies.

The area around North Orange also has connections with some of the earliest European settlement of the Orange district. In 1823, NSW Governor Lachlan Macquarie made land grants, including property around Orange, to former convict and highly successful entrepreneur Simeon Lord, in exchange for valuable sites around Macquarie Place in Sydney.

This grant included land around the present Suma Park, between Orange and Narrambla. 'Nyrambla' is the Wiradjuri name for a 'place of small hills'.

In 1847, the Templar family acquired Narrambla. On 17 February 1864, Australia's best-known poet, Andrew (Banjo) Paterson, was born on the Narrambla property where his mother had come to stay with her sister for the birth.

During the 1900s the area was used for many local enterprises including orchards, a piggery, a racetrack, landing strip, a slaughterhouse and grazing paddocks. In the 1970s the area was one of a number of sites managed by the Bathurst Orange Development Corporation, a government initiative aimed at large scale decentralisation. By 2004, housing estates were being developed in the North Orange area. This growth brought with it new businesses, including a shopping centre and child care centre.

When the new Waratah Wetlands is completed, North Orange residents will be able to enjoy water views and to walk amongst native wildlife and vegetation.

While the new wetland will not be part of Orange's stormwater harvesting scheme like the other constructed wetlands across the city, the new project will enhance and beautify the area. The slow movement of water through the wetland cleanses storm water runoff from the bypass and North Orange housing estates.

Water from these residential areas flows from the wetland and from there into Golding Creek, then Ploughmans Creek, and finally to the Bell River which joins the Macquarie River near Wellington.

The Waratah Wetland project is being carried out by Orange City Council in conjunction with the Waratah Sports Club and is supported by Central Tablelands LLS through funding from Catchment Action NSW.

Habitat has been created in Waratah Wetland, North Orange.

Indicator – Actual volume extracted through surface water licences

No data was provided by the NSW Office of Water for this indicator in 2016-17.

Indicator – Number of Water Supply Work Approvals from groundwater resources

As with surface water, every bore used to extract water has to have a "Water Supply Work Approval". The number of these approvals has increased by 1.4% in 2016-17 compared with 2015-16. It is difficult to draw conclusions on the underlying trend as data has only been provided on the current basis for four years and historically many bores have been unlicenced. However, the number of groundwater approvals which have an Access Licence (volume) linked has increased in each of the last three years. These approvals are likely intended for irrigation use.

Indicator – Volume of groundwater permissible for extraction under licences

A 4.3% increase has been reported in 2016-17 compared with 2015-16 for this indicator bringing it up towards the level reported two years ago. It is possible that the changes in the data for this indicator may be due to trading of access licences into and out of the region.

CASE STUDY: Renovation of existing sewer treatment ponds (Coonamble LGA)

In early 2015, Coonamble Shire Council renovated the existing sewer treatment ponds. In order to offset some of the negative impacts associated with a sewerage treatment works, it was decided during the excavation works to create an island in the middle of the new enlarged pond. This would become an artificial wetland which would then provide a sustainable habitat for wildlife. It would also provide an important travelling refuge habitat for local and migratory bird species.

Variability of climate factors including lack of rainfall, high temperatures and evaporation, often leads to unreliable water supplies for bird life. Lower flows and higher temperatures often affect the water quality. With the Macquarie Marshes located on the edge of the Shire, renovating the existing sewer treatment ponds was done with a view to enhancing the environment for water birds by providing a safe and secure area for nesting and roosting, away from foxes and feral cats.

Council also planted native trees and shrubs surrounding the area to provide food in the form of seeds, leaves and insects. These also provide protection for other wildlife and protect smaller herbage.

Renovating the existing sewer treatment ponds has increased the overall population of insects, plants, birds and wildlife in an area less than 200 metres from the Castlereagh Highway and on the edge of the township, an area usually thought of as being unsuitable for anything. It now provides a secure source of water which while not palatable to humans is a life source to birds, animals and insects.

Some of the wildlife observed at the sewer treatment ponds include: Yellow-billed Spoonbill, Australian White Ibis, Australian Raven, Wood Duck, Musk Duck, Pacific Black Duck, Little Falcon, Square Tailed Kite, Superb Fairy Wren, Eurasian Coot, Magpie Lark, Little Corella, Galah, Willy Wag Tail, Common Brush-tail Possum and Common Wallaroo.

The island created for habitat in Coonamble's sewer treatment pond.

CASE STUDY: Central West Councils Environment & Waterways Alliance

The Central West Councils Environment & Waterways Alliance represents 18 member Councils across the Central West of NSW working together to improve environmental outcomes within our region.

The member Councils of the Alliance have a long history of collaboration, dating back to 2000, when a group of Councils first came together as the Salinity Action Alliance. At that time, the Alliance comprised 14 member Councils covering approximately 40,000km² of the Central West with a specific focus on the emerging social, economic and environmental threat of salinity.

In 2005, the Alliance approached the Central West Catchment Management Authority to detail how a partnership would be mutually beneficial and supportive. This set the foundation for what has evolved to be a robust and dynamic relationship delivering sound and practical on-ground environmental outcomes across the catchment. The new partnership saw the scope of the Alliance broaden to include the protection of waterways, reflected in the change of name to the Central West Councils Salinity & Water Quality Alliance in 2007.

With the cessation of the Catchment Management Authority model across NSW in 2014, and the subsequent transition to Local Land Services, the existing Alliance region was broken into two Local Land Services regions spanning some 120,000km². However, the group elected to remain as a single entity and to embrace the additional Councils that were now included within the new boundary structure.

In July 2015, it was decided that the group would again change its name in order to reflect the continual evolution of the group and the environmental priorities within the region. The new name – Central West Councils Environment & Waterways Alliance – recognises that much of the focus of the Alliance now surrounds broad environmental management including issues along the region's waterways – Coxs, Fish, Macquarie, Castlereagh, Bogan, Lachlan, Cudgegong Rivers and their many tributaries.

CASE STUDY: New Bourke Bore (Bourke LGA)

The Bourke potable water supply system extracts water from a weir storage on the Darling River. This source has not proved sufficient during long droughts and therefore it has been decided to use groundwater from a new bore at Walkden with a suitable transfer system to provide a secured supply to Bourke.

The weir storage (often called "Weir Pool") in Bourke has limited storage and is unable to provide sufficient amount of water during long droughts. The weir built across Darling River, approximately seven kilometres downstream of the water treatment plant, forms a pool holding nearly 5,000ML of water.

In addition to Bourke Shire Council, there are a number of farmers who use significant quantities of water for irrigation. If no rain or inflow is received, the weir pool full storage is sufficient for about six to eight months supply.

As an emergency supply, options of carting potable water to Bourke from various supply sources were previously considered should the weir fail to meet demand. A study on water carting was previously undertaken by the NSW Office of Water and Council in 2006.

Water carting was proven to be expensive and therefore the feasibility of obtaining groundwater was investigated. As a result, a new bore at Walkden has now been successfully constructed. A suitable transfer system was installed to pump groundwater from this Walkden Bore to Bourke water treatment plant as an emergency supply.

Construction of the new Bourke Bore.

Indicator – Actual volume extracted through groundwater licences

No data was provided by the NSW Office of Water for this indicator in 2016-17.

Town Water Consumption

Reticulated water consumption is relatively small in comparison to that used for irrigation. In the region it accounts for about 4% of water consumption compared with 88% used for irrigation and 8% for stock and domestic use (Murray Darling Basin Committee, 2007). Nevertheless, with many towns and regional centres growing, there are increasing pressures on water used for town water supplies.

Indicator – Annual metered supply

Metered supply fell by 3.9% in 2016-17 compared with 2015-16 for the ten Councils that have reported this data in each of the last four years.

Indicator – Annual consumption (Total from WTP)

As shown in Figure 7 on page 38, total water consumption rose by 3.4% in 2016-17 compared to 2015-16 for the eleven Councils that have reported this data in each of the last four years.

Opposite: Ben Chifley Dam, Bathurst (David McKellar)

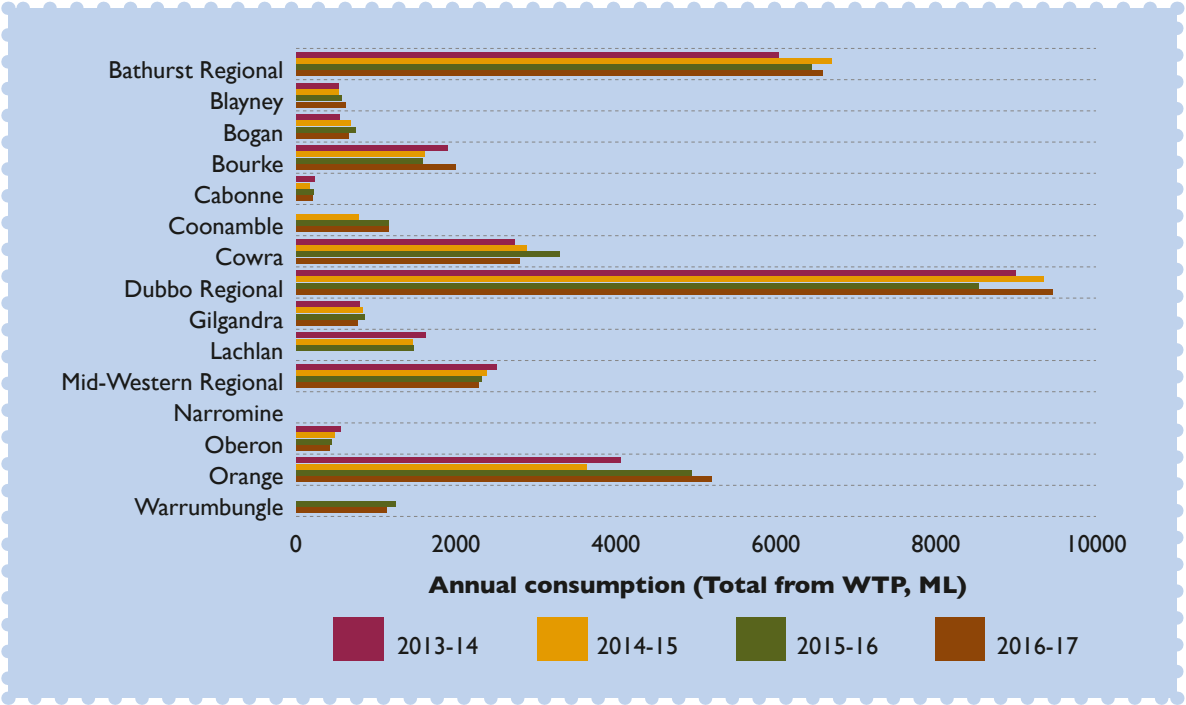


Figure 7: Annual town water consumption.

Indicator – Average annual household mains potable water usage

Household water consumption fell by 2.4% in 2016-17 compared with 2015-16, with six of the ten Councils that have reported this data in each of the last four years reporting a decrease. However, the main contributor to the overall decrease was Cowra Shire Council which reported more than a thousand extra residential meters this year, thus significantly reducing its average consumption per residential meter.

Council Water Consumption

Due to the number of services they provide, local Councils may be large users of water in comparison to businesses and households. Their efficient use of water is therefore critical to overall water consumption as well as their important role in educating and leading the community in water use minimisation.

Indicator – Area of irrigated council managed parks, sportsgrounds, public open space

Half of the 5.1% increase in the total irrigated area in 2016-17 compared with 2015-16 came from Orange LGA due to its improved data quality from a new electronic register of Council managed parks, sportsgrounds and public open spaces. The other half came from the inclusion of the former Wellington LGA into the Dubbo Regional Council area.

Indicator – Water used by council for irrigation (treated and untreated)

In 2016-17, 6.1% less water was used for irrigation compared with 2015-16 by the twelve Councils that have reported on this indicator in each of the last four years. Dubbo Regional Council's consumption fell by about 120 ML this year but it continues to use about as much water as all the other Councils combined.

Response

Town Water Consumption

Indicator – Level of water restrictions implemented

Only three Councils in the region had water restrictions in place during 2016-17: Cabonne, Gilgandra and Orange.

Indicator – Number of water conservation programs

There was a large decrease in the number of water conservation programs in 2016-17 compared with 2015-16, with Dubbo Regional Council implementing no programs at all this period, having previously run half the programs in the region.

People and Communities

Main Street Gilgandra Cooee Soldier (Maree Raglus).

This chapter reports on environmental issues relating to people and communities including Indigenous and non-indigenous cultural heritage, community engagement in environmental matters and air quality.

Councils are responsible for urban planning, infrastructure, some aspects of environmental and heritage protection and restoration, protection and conservation of resources, provision of community facilities, and community services.

Cultural heritage incorporates both Indigenous and non-Indigenous heritage and both may be threatened by increased development and a lack of management and awareness.

Community volunteering is important to the implementation of environmental actions in many Council areas. Volunteers can be bought together for specific projects or can be drawn from existing community groups including Landcare, Greening Australia and other local environment groups.

Air pollution can be harmful to our health. It can contain a mixture of solid particles, liquid droplets and gases from a variety of sources such as industry, motor vehicles, heating appliances, and tobacco smoke.

Table 6: Summary Table of Indicator Trends – People and Communities

Issue	Indicator	2013-14	2014-15	2015-16	2016-17	Trend
Active community involvement	Environmental volunteers working on public open space (hrs)	15,472	12,153	13,561	10,832	↓
	Number of environmental community engagement programs	82	104	114	98	↓
	Number of growers markets/local food retailers specialising in local food	97	130	139	163	↑
Community Impacts	Number of days that air pollution maximum goals for particulate matter were exceeded	2	1	1	0	↑
Indigenous Heritage	Number of Indigenous sites on AHIMS register	9,269	10,080	10,346	10,392	↑
	Inclusion in DCPs & rural strategies (number of Councils which include)	12	12	12	11	↓
	Extent of liaison with Indigenous communities (self-assessed from 0 = none to 3 = High)	1.4	1.4	1.5	1.6	↑
	Development approvals on listed Indigenous sites (number)	5	15	14	11	→
	Number of Indigenous heritage management actions/responses	10	4	2	7	↑
Non-Indigenous Heritage	NSW Heritage Items (number)	110	109	112	111	→
	Locally listed heritage items (number)	2,402	2,669	2,658	2,665	↑
	Actions to protect non-Indigenous heritage (including management plans) (number)	29	37	31	21	↓
	Heritage buildings on statutory heritage lists demolished/degraded in past year (number)	3	3	2	1	↑
	Heritage buildings on statutory heritage lists renovated/improved in past year (number)	117	86	72	114	↑

↑ improvement
→ no or little change
↓ worsening trend

Note – the above trends are for data in 2013-14, 2014-15, 2015-16 and 2016-17 from the same sources. The trend is based on comparing the average of the previous years of reporting with 2016-17. They should be read in terms of the limitations for indicators discussed throughout this chapter. Refer to the Appendix for a list of Councils included in the trend data.

Condition

Air

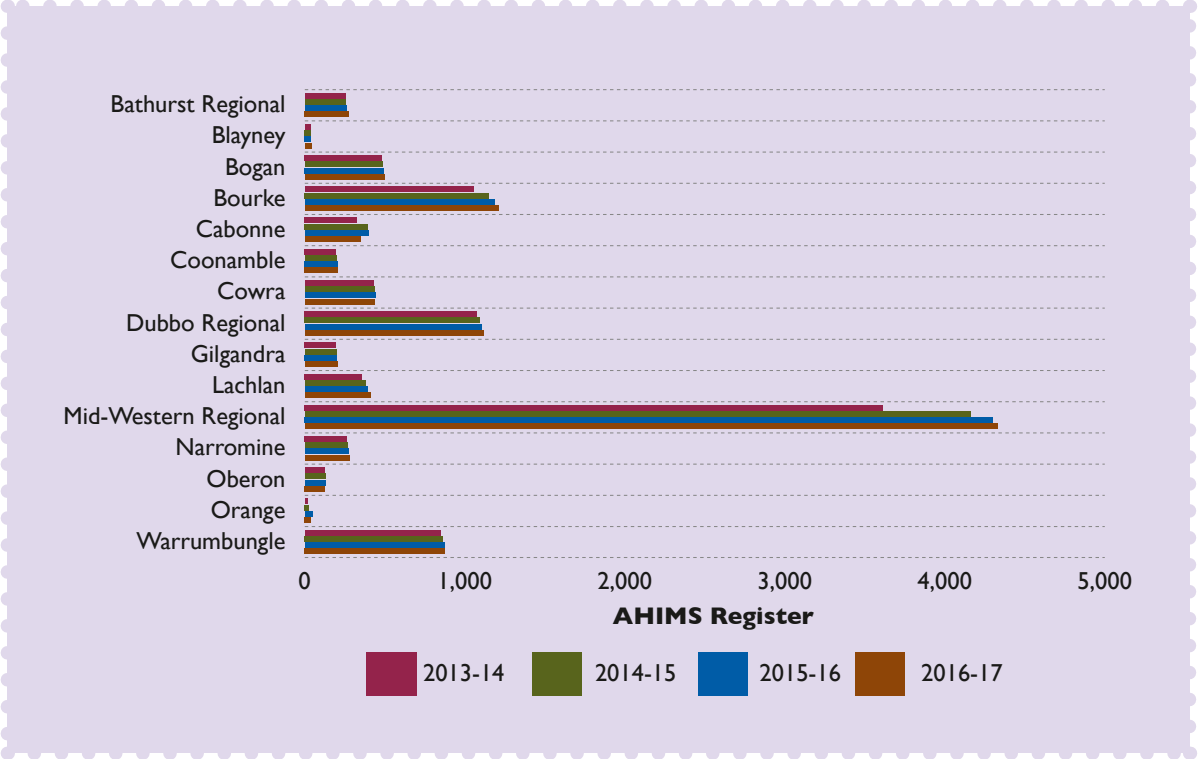
Much of the State-level air quality monitoring is confined to the Greater Metropolitan area which includes Sydney, Wollongong and Newcastle. OEH monitors one site in the reporting region, Bathurst; however, ozone and particulates are the only air pollutants measured at this site. Particulates can include particles, dust, smoke, plant spores, bacteria and salt. Particulate matter may be a primary pollutant, such as smoke particles, or a secondary pollutant formed from the chemical reaction of gaseous pollutants.

Human activities resulting in particulate matter in the air include mining; burning of fossil fuels; transportation; agricultural and hazard reduction burning; the use of incinerators; and the use of solid fuel for cooking and heating.

Particulate matter can be usefully classified by size. Large particles usually settle out of the air quickly while smaller particles may remain suspended for days or months. Rainfall is an important mechanism for removing particles from the air.

The size of a particle also determines its potential impact on human health. Larger particles are usually trapped in the nose and throat and swallowed. Smaller particles may reach the lungs and cause irritation there.

Figure 8: Number of Indigenous sites on the AHIMS register



Fine particles can be carried deep into the lungs and irritate the airways. When exposed to particulate pollution, people suffering from heart disease may experience symptoms such as chest pain, and shortness of breath.

Indicator – Air pollution maximum goals for particulate matter exceeded

In 2016-17, there were no days in which particulate matter (PM10) or fine particles (PM2.5) exceeded the air pollution maximum goals recorded at the Bathurst testing station.

Indigenous heritage

The land has great significance to Indigenous people for the role it plays in social and political relations and the cultural construction and transmission of knowledge, as well as spiritual values.

Indicator – Number of Indigenous sites on AHIMS register

In 2016-17, there were 10,392 sites across the region listed on the Aboriginal Heritage Information Management System (AHIMS)

register. As shown in Figure 8, overall there were 46 sites added since last year, 26 of which were in the Mid-Western Regional LGA, which has over 40% of the sites for the region.

Non-Indigenous heritage

Indicator – NSW Heritage Inventory items

There was almost no change in the number of items listed under the *NSW Heritage Act* across the region with one new site in the Mid-Western Regional LGA added in 2016-17 but one less reported in each of the Blayney and Cabonne LGAs.

Indicator – Locally listed heritage items

With the process of updating and finalising new LEPs now complete, from year to year there are only occasional small changes in the numbers of listed heritage items. The only changes this year were the addition of ten sites in the Bathurst Regional LGA and the de-listing of three sites in the Blayney LGA.

Wool bale rolling, Bourke.

Threats

Development

Indicator – Development on listed Indigenous sites

There was little change in the number of developments on listed Indigenous sites. The highest number was reported by Dubbo Regional Council, with eight approvals. Bathurst Regional, Mid-Western Regional and Orange City Councils each reporting one site.

Indicator – Heritage buildings on statutory heritage lists demolished/degraded in past year

The only listed heritage building degraded in the region during 2016-17 was in the Mid-Western Regional LGA.

Response

Environmental Volunteerism

Indicator – Environmental volunteers working on public open space

The 10,867 person hours logged by environmental volunteers working on public open space across the region was over 20% less than in 2015-16 for the 13 councils that reported this indicator in each of the last four years. Although most of the hours reported were in Bathurst Regional, Dubbo Regional

CASE STUDY: Aboriginal Management Plan for the Cowra Materials Recycling Facility (Cowra LGA)

The Materials Recycling Facility (MRF) in Cowra has been operating since 1988 as a landfill area and a recycling facility.

Cowra Council is expanding the MRF by constructing a Community Recycling Centre shed on an existing cleared area of the MRF site via the development application (DA) process. During the preparation of the DA for the new shed, Council was required to prepare a Management Plan to ensure protection of the 'Open site' (open Camp site) located on the northwest corner of the MRF site adjacent to Glenlogan Road. The 'Open site' is registered on the Aboriginal Heritage Information Management System (AHIMS) and as such Council has recognised that it has specific obligations to ensure this site is protected. Council does not have any further information about the site.

The MRF currently contains the MRF site office, the Cowra Pound, the materials processing and sorting shed and storage areas. The 'Open site' is approximately 0.75 hectares and has been previously partially fenced off from the operational parts of the allotment. As part of the Management Plan the proposal is to complete the fencing and to provide adequate signage. This will ensure that this area is protected from improper use or neglect in the future.

Council has used the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW to prepare this Management Plan. Consultation is not required under the Code. However, Council did consult relevant Aboriginal people and organisations as per the Aboriginal Consultation Policy adopted by Cowra Council and received no submissions as part of this process.

This is a good result for an important part of Cowra Aboriginal heritage which is now protected from any potential harm. It allows development and expansion to occur at an operationally busy site and protection for the camp site to be secured.

The Cowra Materials Recycling Facility.

and Orange LGAs, there were projects in most of the LGAs across the region. For example, Shellharbour Anglican College students and teachers volunteered to work on projects in the Gilgandra Shire including litter pick, weeding at the cemetery, and beautification of the local parks.

Indicator – Number of environmental community engagement programs

The number of environmental community engagement programs across the 14 Councils reporting in each of the last four years fell by 14% in 2016-17 with 62.5% of the programs reported by Dubbo Regional Council. However, there were also several programs run by many of the smaller Councils including Bourke which had a total of 250 participants in four programs including a carp muster, native fish restocking and tree planting days.

Local food outlets

Indicator – Number of growers' markets/local food retailers specialising in local food operating within LGA

The growth in this indicator continued in 2016-17 with over 17% more growers' markets and/or local food retailers specialising in local food. About two-thirds of these were once again in the Cabonne and Orange LGAs but the growth is spreading across the region with twelve Councils now reporting activity.

Indigenous heritage

Indicator – Indigenous heritage inclusion in DCPs & rural strategies

Eleven Councils in the region reported formal consideration of Indigenous heritage in their planning and approval processes.

Nine Councils also reported that they have a specific Indigenous heritage management plan/strategy in place.

Indicator – Extent of liaison with Indigenous communities

Four Councils in the region report having a high level of liaison with local Indigenous groups and eleven of the fifteen Councils reported some level of liaison. An example, was in Coonamble LGA where Council contacted the Local Aboriginal Lands Council regarding a fish table at Warrena Weir and its location.

Non-Indigenous heritage

Indicator – Actions to protect non-Indigenous heritage (including management plans)

In 2016-17, there were only 21 actions to protect non-Indigenous heritage across the region which is ten less than 2015-16. The most active Councils were Bathurst Regional and Gilgandra. Gilgandra's Local Heritage Fund provided support for five local property owners and community groups to renovate/ repair heritage buildings including the Showground Pavilion, Feetham House (Anglican Church), the former Masonic Hall and two other iconic homes of local heritage significance.

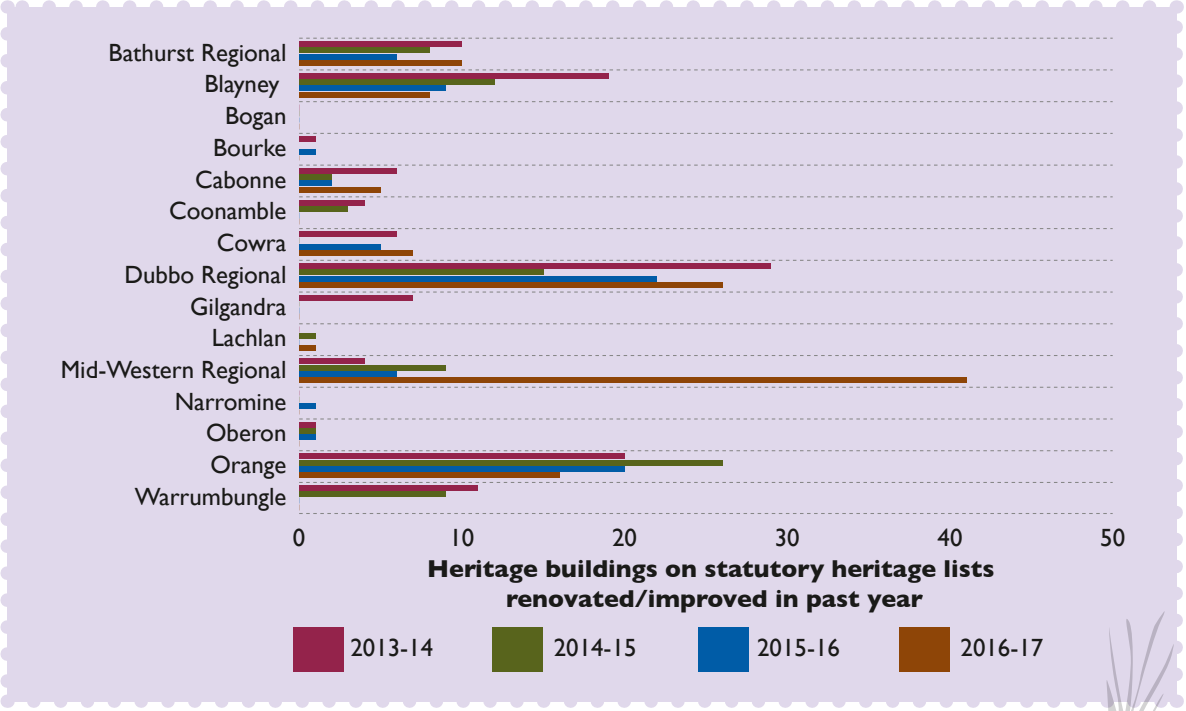


Figure 9: Number of Heritage buildings on statutory heritage lists renovated/improved

Indicator – Heritage buildings on statutory heritage lists renovated/improved in past year

As shown in Figure 9, in sharp contrast to the number of heritage buildings degraded, there were 114 heritage buildings renovated or improved across the region in 2016-17, including 41 in the Mid-Western Regional LGA partly due to the Local Heritage Grant Program.

Towards Sustainability

The term sustainability can have different meaning to different people. It's about taking what we need to live now, without jeopardising the potential for people in the future to meet their needs. Environmental sustainability involves making decisions and taking action that are in the interests of protecting the natural world, with particular emphasis on preserving the capability of the environment to support human life.

Local Councils, who play a key role in managing the natural environment and leading by example, need a sound understanding of sustainability so they are able to reduce environmental impacts and associated costs and improve the quality of life for their local communities.

This chapter outlines what the Councils in the reporting region are doing to move towards environmental sustainability in the areas of:

- Waste management
- Resource purchasing and use
- Climate change
- Policies and procedures.

Condition

Solid Waste

Solid waste generated within the reporting area originates from the following general sources:

- Municipal: comprises general household waste and garden organics (including waste from the Councils' kerbside collections and waste taken directly to landfills by residents).
- Construction and Demolition: includes waste from construction and demolition activities generally associated with development.
- Commercial and Industrial: includes waste from commercial activities in the area including businesses and restaurants.

This waste requires transport, recycling where possible or disposal which uses significant energy resources, as well as creating potential pollutants in the form of air and water pollution and greenhouse gas emissions such as methane. Noise pollution may also occur at some landfills or from the transport of waste.

Indicator – Total waste entombed at primary landfill
Indicator – Total waste entombed at other landfills (excluding recyclables)

As shown in Figure 10 (page 48), total waste to landfill for the region (primary plus other landfills) fell by 13% in 2016-17 compared with 2015-16 with significant decreases reported in the Bathurst Regional, Bourke, Cowra, Dubbo Regional, Gilgandra, Mid-Western Regional and Orange LGAs.

In 2016-17, almost all of Orange LGA's waste was taken from the Ophir Road waste facility (primary) to the Euchareena Road facility as the Ophir Road landfill is nearing

Table 7: Summary Table of Indicator Trends – Towards Sustainability

Issue	Indicator	2013-14	2014-15	2015-16	2016-17	Trend
Waste Generation	Total waste entombed at primary landfill (tonnes)	168,000	175,000	181,000	147,000	↑
	Total waste entombed at other landfills (exc recyclables) (tonnes)	21,569	27,841	28,310	36,149	↓
	Average total waste generated per person (tonnes)	0.87	0.92	0.95	0.78	↑
	Average cost of waste service per residential household	$266	$265	$280	$315	↓
Hazardous/ Liquid Waste	DrumMuster collections (number of drums)	30,289	32,928	26,418	64,238	↑
	Household Hazardous Wastes collected (kg)	31,865	39,256	43,560	54,074	↑
Reduce	Office paper used by Council (A4 reams)	27,665	26,942	25,374	24,579	↑
Recycle	Garden organics collected (diverted from landfill) (tonnes)	27,993	26,576	29,152	40,507	↑
	E-Waste collected (diverted from landfill) (tonnes)	99	41	49	82	↑
	Volume of material recycled (tonnes)	24,956	24,723	29,069	25,340	↓
	Volume of material recycled per person (kg)	113	111	123	106	↓
Littering and illegal dumping	Number of illegal waste disposal complaints to Council	398	429	319	459	↓
Engineering, Infrastructure and Civil Works	New road construction (km)	10	35	23	20	↑
	Road upgrades (km)	1,367	1,486	803	1,356	↓
Risk Management	Flood management plans/ flood mapping - increase in area covered (ha)	1,074	1,295	0	2,513	↑
	Hazard reduction burns (number)	12	9	21	15	↓
Sustainability initiatives	Council sustainability initiatives (number)	43	63	71	55	↓
	Council mitigation initiatives (number)	12	15	18	18	↑
Council Greenhouse Gas Emissions	Annual electricity consumption for Council controlled facilities (MWh)	64,662	67,379	65,909	71,118	↓
	Annual natural gas consumption for Council controlled facilities (Gj)	35,969	35,088	35,492	46,930	↓
	Annual bottled gas consumption for Council controlled facilities (L)	44,469	48,554	38,385	50,971	↓
	Total fuel consumption (KL)	8,116	8,660	8,682	8,508	→
	Proportion of Council's electrical energy demand met from Council-owned renewable energy infrastructure	0.5%	0.8%	0.9%	1.3%	↑
	Council total operational greenhouse gas emissions (tCO2-e/year)	205,000	186,000	218,000	208,000	↓
Community Greenhouse Gas Emissions	Small scale renewable energy uptake (kW installed) – data collected 30 July 2017	10,431	11,310	11,588	10,948	↓
	Number of solar water heaters and heat pumps installed	399	395	268	193	↓

↑ improvement → no or little change ↓ worsening trend

Note – the above trends are for data in 2013-14, 2014-15, 2015-16 and 2016-17 from the same sources. The trend is based on comparing the average of the previous years of reporting with 2016-17. They should be read in terms of the limitations for indicators discussed throughout this chapter. Refer to the Appendix for a list of Councils included in the trend data.

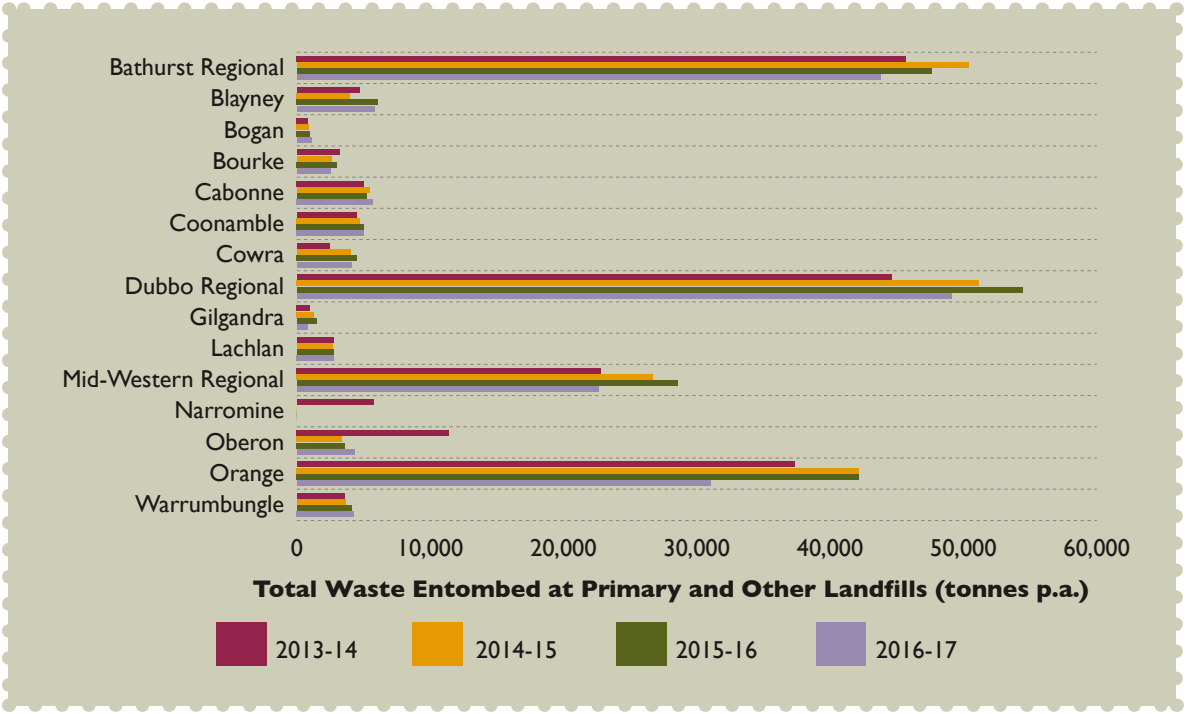


Figure 10: Total waste entombed at primary and other landfills

capacity. This transition has been planned as part of "The Orange Waste Project" which is intended to be a model for sustainable regional waste management.

Indicator – Average total waste generated per person

The average waste per person in the region was approximately 0.8 tonnes in 2016-17. There is still a large disparity between the rural LGAs and those with larger population centres such as Bathurst Regional, Dubbo Regional, Mid-Western Regional and Orange.

Indicator – Average cost of waste service per residential household

The average cost of waste services increased by 12.4% across the region in 2016-17 compared with 2015-16. It rose this year in all but two of the LGAs. The only Council to report a lower waste service cost was Cowra whose cost is still higher than two years ago.

Threats

Illegal Dumping

The number of complaints about rubbish dumping does not necessarily reflect the frequency of incidents, nor the impact of illegal dumping. It does, however, indicate community awareness of illegal dumping and the potential impact that it may have on the environment.

Indicator – Illegal waste disposal complaints to Council

In 2016-17, complaints rose to their highest level across the region since 2011-12 with notable increases reported by Bathurst Regional, Cowra, Mid-Western Regional and Orange Councils. Complaints to Orange City Council (97) were the highest in the ten years this indicator has been tracked: it is believed that this is due to Council and EPA media campaigns.

Road construction and upgrades

Road construction and upgrades can have important economic and social benefits to a region. However, they can impact on the roadside environment which can retain significant remnant vegetation including threatened plant species and EECs.

Indicator – New road construction
Indicator – Road upgrades

In 2016-17, across the region new road construction fell by 11% compared with 2015-16 whilst road upgrades increased by 68.8% compared to 2015-16. The only significant new road projects were in the Bathurst Regional, Bogan, Narromine and Orange LGAs.

The biggest contributor to road upgrade was again Narromine Shire Council which reported approximately 650 kms of work on existing roads this year, after a brief hiatus in 2015-16.

Greenhouse Gas Emissions

The reporting region is a large producer of black coal and there is a heavy reliance on coal for electricity which is one of the highest sources of greenhouse gases. Councils can limit their impact by reducing their electricity consumption. This is a priority area for most Councils.

Indicator – Annual electricity consumption for Council controlled facilities

As shown in the summary table, there was an 8% increase in electricity consumption in 2016-17 for the eleven Councils that have reported this data in each of the last five years. The hotter and drier than average summer across the region contributed to increased electricity consumption due to higher water pumping and increased load on air conditioning. In contrast to the regional trend, there were five Councils that reported reductions in electricity use compared with 2015-16: Cabonne, Cowra, Gilgandra, Mid-Western Regional and Narromine.

Indicator – Annual natural gas consumption for Council controlled facilities

As with electricity, the use of gas provides an indication of contributions made by Councils to greenhouse gas emissions. It should be noted that natural gas has a lower carbon footprint than conventional electricity, meaning that changes to the number of premises using gas instead of electricity could provide potential greenhouse emission reductions.

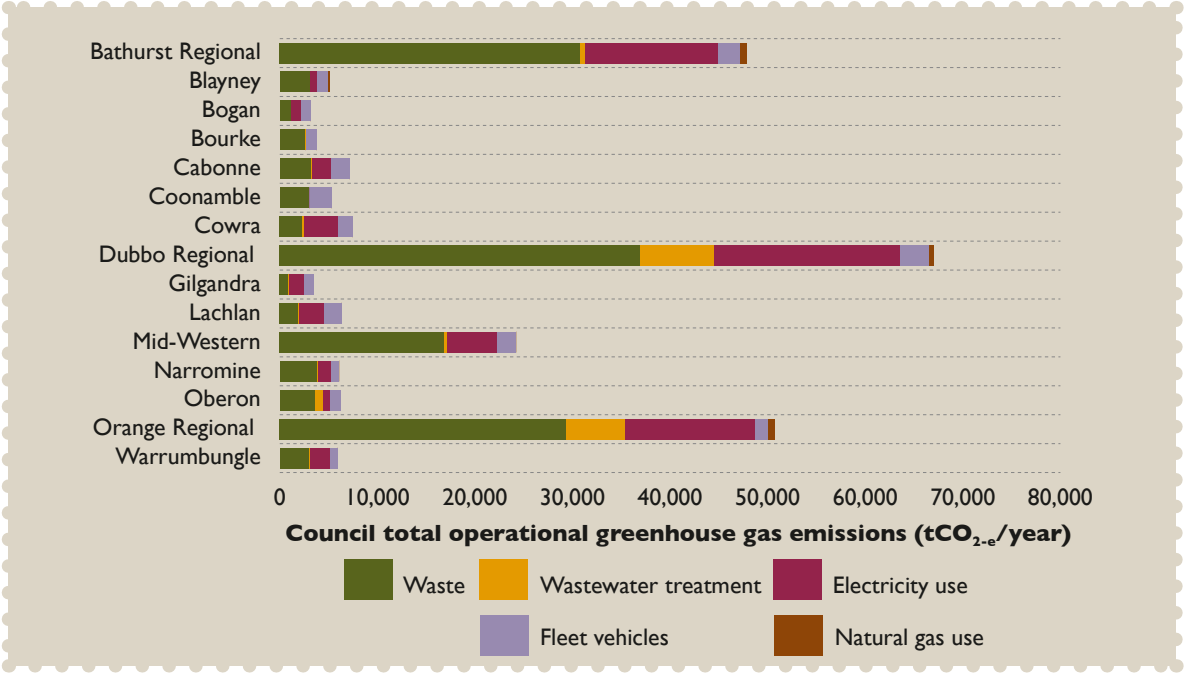
Only five Councils reported any use of gas for Council controlled facilities but their total consumption rose by over 32% in 2016-17 with Blayney and Dubbo Regional Councils both reporting large increases in use.

Indicator – Annual bottled gas consumption for Council controlled facilities

Bottled gas has lower CO_2 emissions that some energy sources, such as coal fired electricity, making it a better choice for the environment.

In 2016-17, bottled gas consumption increased by 32.8% compared with 2015-16 for the eight Councils that reported its use. The majority of the overall increase came from Orange City Council which reported 10,443 litres used in 2016-17 compared with 260 to 350 litres in the previous two years.

Alliance display (M. Callan).



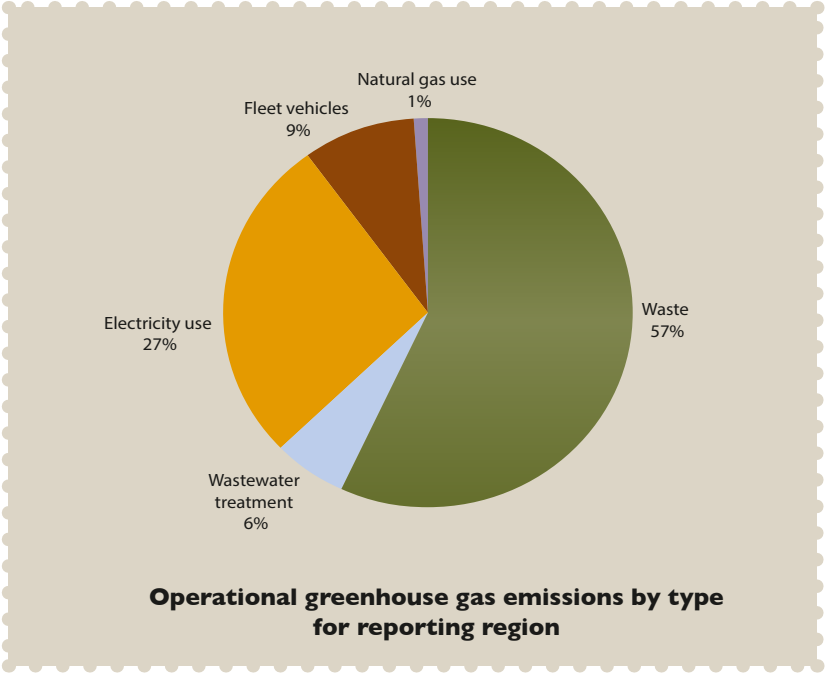


Figure 11: Council total operational greenhouse gas emissions 2016-17

Figure 12: Sources of Council generated greenhouse gas emissions across the region 2016-17

Indicator – Total fuel consumption

As with electricity and gas consumption, fleet fuel use is a significant source of greenhouse gas emissions from Councils.

Fuel consumption from Council owned vehicle fleet and plant was 2% lower in 2016-17 compared with 2015-16 for the fifteen councils reporting this data in each of the last four years.

E10 consumption in the region is still less than 35% of regular unleaded petrol consumption whilst use of biodiesel and LPG is very low, although there was a small increase in LPG use this year. E10, biodiesel and LPG are all fuels with significantly lower lifecycle CO_2 emissions.

Indicator – Council total operational greenhouse gas emissions

Total greenhouse gas emissions calculated for the region in 2016-17 were 4.6% less than 2015-16. The largest contributing factor was an increase in the methane flaring offsets from Dubbo Regional Council.

Before offsets, the total emissions for the region (as shown in Figure 11) rose by 2.9% in 2016-17 compared with 2015-16. This was due to a combination of increased energy consumption and waste to landfill plus improved data inputs from some Councils. Figure 12 shows the sources of Council generated greenhouse gas emissions across the region.

Response

Hazardous Chemicals

Councils in the region are active participants in the DrumMuster program, which provides a collection service for agricultural chemical containers on an ongoing basis throughout the region.

Indicator – Farm chemical drums collected through DrumMuster collections

The number of farm chemical drums collected through DrumMuster across the region in 2016-17 was almost two and a half times the number reported in 2015-16.

CASE STUDY: Sustainable Living Expo (Bathurst Regional LGA)

The Bathurst Sustainable Living Expo is an annual event, now in its tenth year. The Expo has grown and changed over time and in 2017 approximately 6,000 people attended the four hour event. Every year the Expo has a different theme, with this year's being 'Love Food Hate Waste'. The Expo became a series of three opportunities to explore the theme.

To bring expertise and a feeling of celebrity, the Expo featured two famous foodies to help educate and share the message of environmental sustainability. My Kitchen Rules judge Colin Fassnidge demonstrated his 'nose-to-tail' cooking philosophy, while Matthew Evans from Fat Pig Farm spoke about his experience in sustainable farming and paddock-to-plate principles.

On the Friday night a Sustainable Supper was held where the chefs spoke briefly about managing food waste and buying and eating locally-produced food. Food and beverages served were locally sourced. The event was waste wise with reusable, recyclable or compostable plates, napkins and glassware being used. Left overs were carefully stored to form part of the Producers' Lunch the next day.

The Expo was held on Saturday morning in conjunction with the Farmers' Markets, and featured stalls from Council, local businesses and community groups to share and promote the latest concepts in growing food, renewable energy, land management and sustainable living. The presentations included a demonstration from Colin Fassnidge who spoke about how to use the entire animal and the importance of local food, preparation and planning. Matthew Evans presented on "buy local, use seasonal produce and make a plan to use everything you buy" and used his experience at Fat Pig Farm as an illustration. The King & Queen of Green also performed their theatrical show to educate students to 'Love food - hate waste' and to get them excited about environmental sustainability.

To foster respect for the natural environment and to help people better understand native wildlife, perennial Expo favourite Shoalhaven Zoo presented its 'Zoo to You' program twice during the morning and also provided many opportunities for people to interact with native animals in a hands on way.

The Expo was followed by a Producers' Lunch where all the stallholders at the Farmers' Markets were invited to hear from Matthew Evans and his experience of being a stallholder at Salamanca Markets selling his produce from Fat Pig Farm. The food served was again all locally sourced and included leftovers from the Sustainable Supper. The same waste minimisation techniques were applied.

Due to a comprehensive and well-executed communications plan, the Expo had its largest ever attendance.

The Sustainable Supper, Bathurst, focussed on environmental sustainability and waste management.

CASE STUDY: Closure of the Neville Landfill Site (Blayney LGA)

On 20 June 2016, Council resolved to close the Neville Landfill after approximately thirty years of operation. Prior to the resolution to close the Neville landfill site, significant community engagement was undertaken which included 170 direct letters to properties within seven kilometres of the landfill. Nine written submissions were received by Council in response to the correspondence.

The landfill site ceased receiving waste on 3 July 2016 preventing the need for the excavation of a new trench and the expansion of the waste footprint. By August 2016, all surface waste had been removed with six test holes confirming that a majority of the waste footprint already had the required amount of capping cover. On 28 September 2016, Council received EPA endorsement of the proposed closure plan.

As a result of the closure, Council established a Community Recycling Station (CRS) comprising six 240 litre recycling bins collected fortnightly as part of the Domestic Waste Collection Contract. The CRS was established in response to the community highlighting the need to retain recycling options for the Neville region. This recycling station has ensured that the Neville community and wider region have access to recycling facilities at any time whilst also preventing recyclable materials from being deposited at the Blayney Waste Facility.

The initial closure plan proposed that a cap of 300mm of shredded green waste be used to cover the final capping. However, on 26 May 2017 the EPA endorsed a modified closure plan where the final capping soil would be sown with grass seed to establish grass cover. The project was completed on 21 June 2017 and was delivered 30% under budget.

Rehabilitation of the Neville Landfill Site, Blayney, after closure.

Approximately 64,000 chemical drums were collected which is the most since 2011-12, albeit about half the number reported in that year. The large changes in this data over the last two years suggest that stockpiling or a reporting anomaly might be making the year-on-year changes unpredictable.

Hazardous Waste Collection

NetWaste and participating Councils have introduced a biennial hazardous household waste collection for member Councils in response to limited alternative services available.

Indicator – Household Hazardous Wastes collected

The amount of household hazardous waste recycled through the NetWaste contract increased again in 2016-17 up a further 24% on 2015-16. Collections increased in ten of the thirteen LGAs involved, including Coonamble which joined this year. Collections increased by 45% or more in the Bathurst Regional, Blayney, Lachlan, Mid-Western Regional, Oberon and Warrumbungle LGAs.

Reducing waste disposal

Avoiding the creation of waste is generally seen as the best strategy for dealing with the problems it creates. Key responses to deal with waste include reducing the volume of waste reaching landfills, minimising the

environmental impacts of waste facilities, and encouraging the development of new waste treatment and recycling facilities.

Indicator – Garden organics collected (diverted from landfill)

There was a 39% increase in garden organics collected in 2016-17 compared with 2015-16 once again lifting the regional total to its highest level since this indicator was first reported. Increases were reported in nine LGAs with Orange's increase to over 15,250 tonnes meaning that it contributed about 38% of the total for the entire region.

Indicator – E-Waste collected (diverted from landfill)

E-waste items sometimes contain precious metals such as copper and platinum that should be reused. Computer screens and TVs contain toxic chemicals such as lead, mercury and arsenic, which can leach out from landfills and into waterways.

The e-waste collected is diverted from landfill and around 95% of materials recovered are recycled.

In 2016-17, e-waste collections increased by 66.5% compared with 2015-16, making them now comparable with the 2010-14 period after two years of low collections.

Mid-Western Regional Council had the highest e-waste collections for the second successive year with 38.6 tonnes which was 47% of the total for the region.

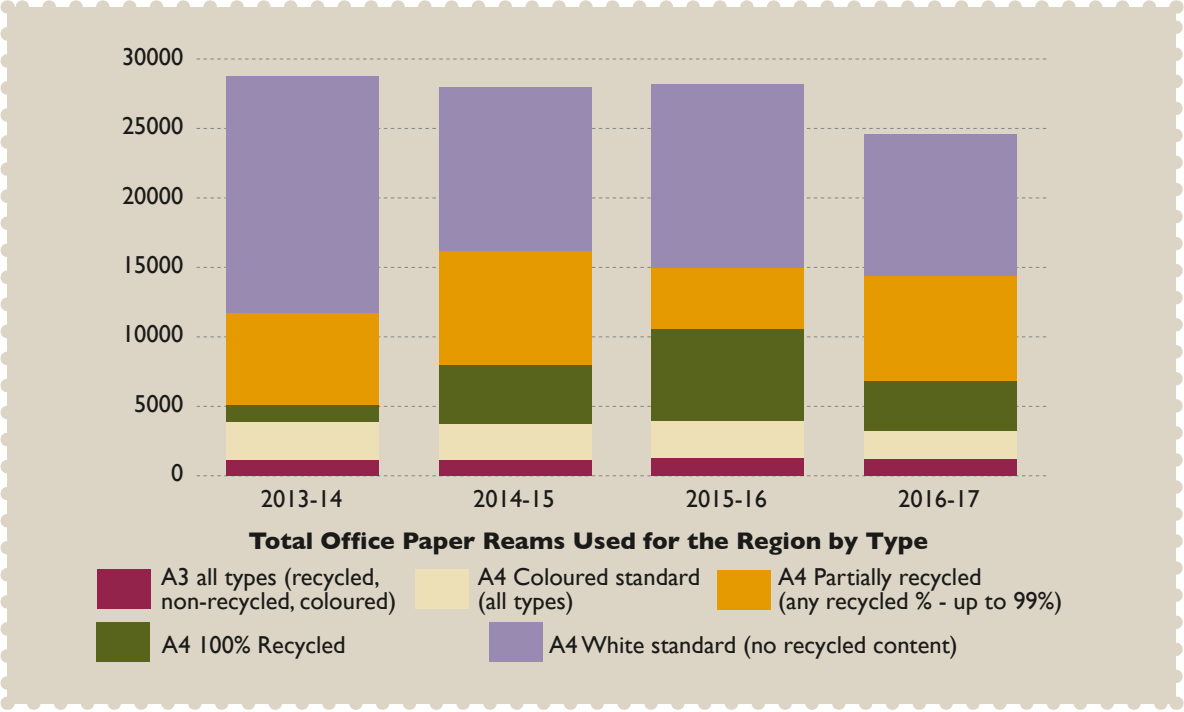


Figure 13: Amount of office paper used across the region

Indicator – Office paper used by Council

As relatively large employers and community leaders, local Councils can be used as one indicator of changing office practices and increased awareness to minimise the use of office paper.

There is a continuing slow but steady decline in the total quantity of office paper used by Councils across the region as shown in the summary table. This year there has also been a decrease in the proportion of non-recycled paper used, as shown in Figure 13.

Reuse

After reduction of potential waste, reuse is the next most effective method of waste management. This should be done prior to discarding or recycling any materials.

Indicator – % Effluent reuse & location of reuse

Ten Councils reported reuse of effluent and/or biosolids during 2016-17. A new example reported this year was 100% effluent reuse for irrigation on a rural property adjacent to the Wellington treatment works.

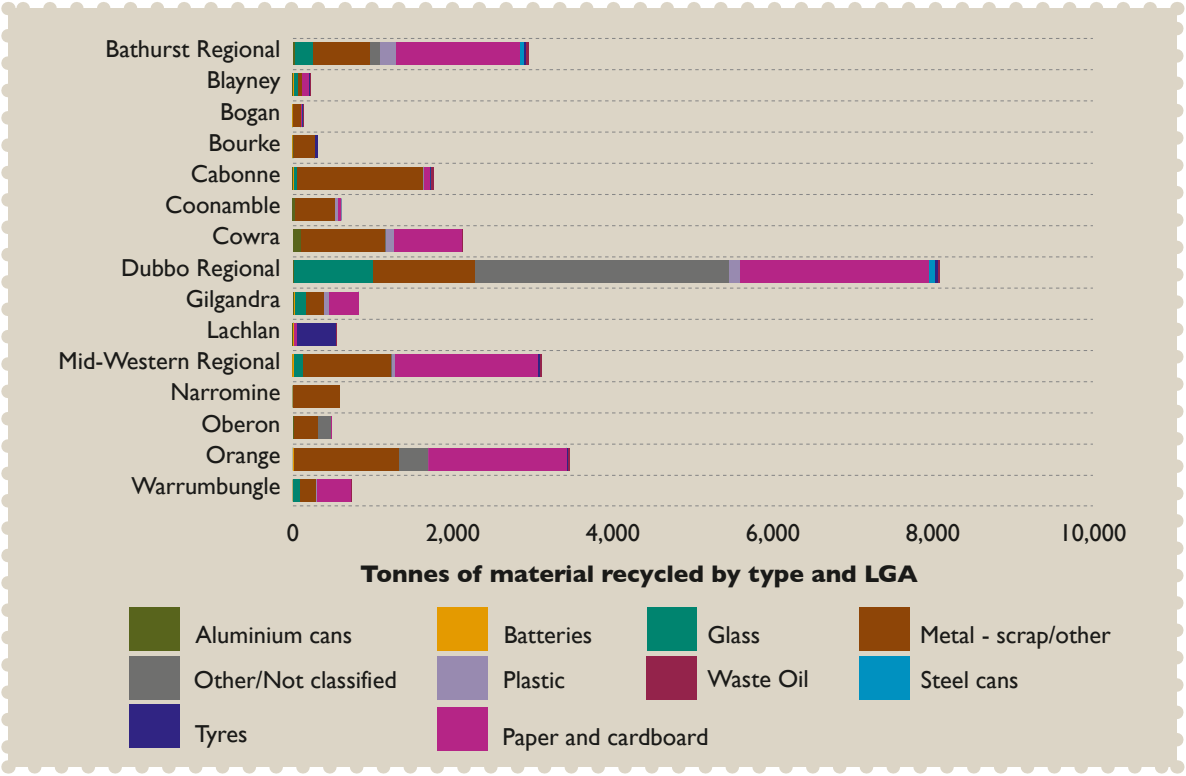


Figure 14: Type of materials recycled 2016-17

Recycle

Indicator – Volume of material recycled
Indicator – Volume of material recycled per person

The total amount of material recycled across the region was 13% lower in 2016-17 than 2015-16 with an average 105.7kg recycled per person across the 14 LGAs that have reported this data in each of the last four years.

The two LGAs with the highest recycling rates this year are Cowra and Gilgandra which each reported over 150 kg per person this year.

The breakdown of the type of materials recycled in each LGA is shown in Figure 14.

Resilience to natural hazards

The region has been impacted greatly by natural hazards in recent years. These natural hazards include flood, drought, heatwaves and bushfires. Resilience is defined as the ability of a community or ecosystem to 'bounce back' to normal functioning after a crisis (emergency or disaster). Some communities can transform, improve and therefore 'bounce forward' after these events.

Risk mitigation is a key to natural hazard resilience and in the region includes the preparation and implementation of flood and bushfire risk management plans.

Indicator – Flood management plans/flood mapping – increase in area covered

The NSW Floodplain Development Manual (2005) requires Councils to prepare floodplain risk management studies and plans for flood-impacted communities within their LGA.

During the 2016-17, 2,513 hectares in the Cowra, Lachlan and Mid-Western Regional LGAs were covered by new Flood Studies. A Flood Study is still ongoing in the Coonamble LGA.

Indicator – Hazard reduction burns

Hazard reduction works provide areas of reduced fuel that can significantly reduce fire behaviour and aid fire suppression activities. There are different types of hazard reduction for bushfire including controlled burning, mechanical clearing like slashing undergrowth, or even reducing the ground fuel by hand.

Although hazard reduction burns are advantageous to the safety of communities and properties, they can have a deleterious impact on the natural environment if they are not conducted sympathetically with the appropriate fire regime for each vegetation community.

CASE STUDY: Combating Illegal Dumping (Dubbo Regional LGA)

The project was undertaken with a grant from the EPA titled 'Combating Illegal Dumping: Clean up and Prevention Grants'. Rangers were responding to approximately 160 complaints of illegal dumping each year and had identified several dumping hotspots.

Dumping included a high proportion of whitegoods, electrical items, furniture and boxes, as well as greenwaste. It was considered that these wastes are the result of moving house, or the purchase of new goods by the dumper. Where investigations resulted in identification of the owner of the waste, it primarily belonged to the lower socio-economic, young adult demographic.

The project aim was to increase the awareness of penalties for illegally dumping waste in addition to education regarding the location of the Council-operated landfill and the 'seven days a week' opening hours.

Three areas were targeted: education, signage and surveillance/enforcement. Educational materials were developed in consultation with local retailers, real estate agents and Housing NSW for distribution to their customers/tenants. This included a brochure and poster.

Permanent road signs were erected in identified hot spots and included information about reporting illegal dumping, penalties, surveillance and the landfill location and opening times.

Surveillance was also undertaken at the hotspot sites and included staff and camera installations. Any reported illegal dumping complaints were investigated, marked using 'under investigation' tape where appropriate and then entered into the Report Illegal Dumping (RID) online database (https://ridonline.epa.nsw.gov.au/#/home) .

The outcomes of the project included:

- 13% reduction in illegal dumping complaints
- 47.2% 'reach' of the campaign (based on a post-project community survey)
- Council is now better resourced to educate, prevent, and monitor the issue of illegal dumping. A number of useful education resources were developed, permanent RID road signs were installed, and as a result of using the RID online reporting system, Council now has the ability to better understand the issue at hand.

CASE STUDY: Sports field lighting upgrade – 'Dark Sky' (Dubbo Regional LGA)

The Hans Clavan Oval is centrally located on the river bank in Bligh Street, Dubbo. It is regularly used in summer and winter by sporting, school and community groups for soccer, rugby league, private events and personal training.

In 2016, the field lighting on the oval was upgraded as a planned part of Council's capital works program to bring infrastructure into line with current standards, in particular the Dark Sky Planning Guideline of July 2016. The Warrumbungle National Park, 160km away, was declared Australia's first 'Dark Sky Park', recognising and protecting its key role in astronomical research. Central to this is the Siding Spring Observatory which attracts over 24,000 visitors each year, and injects more than $5 million directly into the local economy.

Light associated with development in the Dark Sky Region has the potential to reduce the ability of the optical telescopes to engage in scientific investigation and, as a result, impact on the future of the Observatory. As Dubbo is within the Dark Sky Region, it is essential that any lighting upgrades meet the additional requirements of the changes to the *Environmental Planning and Assessment Regulation 2000* contained in the Dark Sky Guidelines.

In addition, there were energy efficiency objectives to be met. A green lighting system was installed which over the course of its 25 plus year-life will reduce emissions by 40% - a saving of approximately 60 tonnes of CO_2 emissions. The new system costs $1 per hour less to run than the existing lights and its installation included all maintenance for ten years, resulting in a cost saving of $48,000 over ten years.

Existing lighting supplied illumination of 100 Lux, the upgrade delivers 200 Lux (in line with Australian Standards for sporting field lighting) and innovative design parameters ensures that it meets the Dark Sky guidelines for 'spill' light.

Hans Clavan Oval lighting.

There were substantially less hazard reduction burns in 2016-17 than reported in 2015-16. Of the 15 burns reported, eleven were in the Mid-Western Regional LGA, impacting 3,160 hectares.

Indicator – Natural disaster declarations

LGAs declared natural disasters are eligible for Natural Disaster Assistance Schemes. These schemes include disaster assistance for individuals, loans for primary producers, loans to small businesses and grants to Councils.

The following natural disasters were declared in the region in 2016-17:

Mid-Western Regional Council Storm - 18 January 2017

- Mid-Western

Inland Storms and Floods - 30 August 2016

- Bathurst
- Blayney
- Bogan
- Cabonne
- Coonamble
- Cowra
- Dubbo
- Gilgandra
- Lachlan
- Mid-Western
- Narromine
- Orange
- Warrumbungle

Inland Storms and Floods - 20 July 2016

- Bathurst
- Blayney
- Bogan
- Cabonne
- Coonamble
- Cowra
- Gilgandra
- Lachlan
- Narromine
- Oberon
- Orange

Best environmental practices in road construction

Roadside environments may contain the only local stands of remnant vegetation including threatened species and EECs. Best practices should be conducted to ensure minimal impact on these environments. Best environmental management practices could include vegetation offsets, diversions around high conservation areas (e.g. koala habitat) and introduction of safe access methods for crossing animals.

Indicator – Application of best practice environmental management (BPEM) in new roads

In 2016-17, ten of the fifteen Councils in the region reported that they include BPEM in new road projects.

Council sustainability initiatives

These indicators have been introduced to try and better gauge how proactive the Councils are in response to sustainability and climate change challenges.

Indicator – Inclusion and demonstrable implementation of environmental sustainability criteria within purchasing policies

In 2016-17, eleven Councils reported that they did include environmental sustainability criteria within their purchasing policies. An example is Dubbo Regional Council whose procurement policy states that staff must avoid unnecessary resource consumption, consider 'whole of life' choices in products and generate economic, social and environmental value.

Indicator – Council sustainability initiatives

The decrease in this indicator in 2016-17 (see summary table) comes primarily from a reduction in initiatives reported by Dubbo Regional Council due to the amalgamation of Dubbo City and Wellington Councils.

Indicator – Council mitigation initiatives

Climate change mitigation refers to efforts to reduce or prevent emission of greenhouse gases. Mitigation can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behaviour. It also includes sequestering of carbon through carbon farming practices, planting of vegetation and methane flaring at landfills.

The total number of climate change mitigation initiatives was unchanged for

Dubbo's 70kW solar system was installed in January 2012 on the Western Plains Cultural Centre in Wingewarra St, Dubbo. This system was installed as part of the BOD (Bathurst Orange Dubbo) Alliance – Inspiring and Integrating Change.

Councils that have reported this indicator in each of the last four years. However, Cabonne, Cowra and Lachlan Councils each reported three or more initiatives this year compared to only one for Cowra in 2015-16. These numbers suggest that the underlying trend is improving despite no change in the reported total.

Indicator – Council adaptation initiatives

Adaptation refers to dealing with the impacts of climate change whilst mitigation means dealing with the causes of climate change by reducing emissions. Adaptation involves taking practical actions to manage risks from climate impacts, protect communities and strengthen the resilience of the economy.

Eight Councils (Bathurst Regional, Blayney, Coonamble, Dubbo Regional, Gilgandra, Lachlan, Orange and Warrumbungle) indicated that they had Council climate change adaptation initiatives in place. The amalgamation of Dubbo Regional and Wellington Councils will have the benefit of bringing Dubbo Regional's well developed initiatives to the former Wellington LGA.

Renewable energy

Renewable energy is generally defined as energy that is collected from resources which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides,

CASE STUDY: Gilgandra Shire Council Landfill Rationalisation (Gilgandra LGA)

From 2014, Gilgandra Shire Council began a community consultation process to permanently close all of its rural landfills. Council was operating Gilgandra Waste Facility, a fully operational waste and recycling collection point in partnership with Carlginda (supported disability workers) as well as four unmanned satellite rural waste and recycling depots in Armatree, Biddon, Curban and Tooraweenah.

The financial and environmental impacts were significant to Council with the costs of maintaining the satellite landfill facilities an ongoing drain on resources.

In 2016, the four satellite sites were decommissioned and fully rehabilitated with a new domestic waste collection contract commencing and including expanded services into the areas affected by the rural landfill closures.

These changes formed an integral part of Council's waste strategy and has improved resource recovery and resulted in an elevated standard of waste management.

Environmental impacts resulting from the closures were positive and included mitigating or eliminating the risk of leachate contaminating groundwater, illegal dumping of hazardous materials, lighting of fires, the need to construct new waste cells and the spread of windblown litter.

One of the positive social impacts from the changes was that rural village residents now experience the same level of service and convenience of other Council residents, with their waste regularly collected from their home. In addition, local businesses were contracted throughout the entire decommissioning and rehabilitation process supporting local industry and employment.

Future operational budgets are reflective of the savings achieved with the landfill closures and provide improved long-term financial outcomes where funds can be directed to improving other waste related services.

Waste and recycling across the whole Shire is now processed entirely through the Gilgandra Waste Facility ensuring that it is handled safely and disposed of correctly. Council is recovering more resources with more efficiency in a way that ensures that waste is recycled or disposed of with minimal impacts and to accepted environmental standards.

Amtree tip before closure.

Amtree tip after closure.

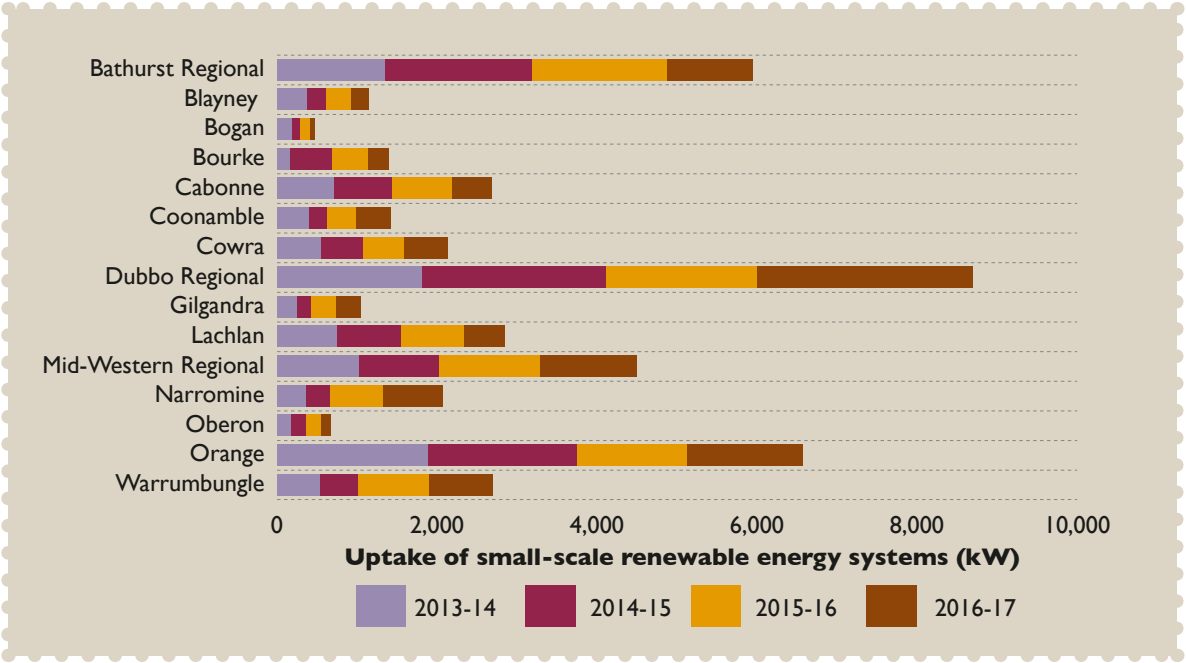


Figure 15: Uptake of small-scale renewable energy systems across the region (kW)

waves, and geothermal heat. Renewable energy comes from natural sources that can be replaced or 'renewed' without harming the environment or contributing to the greenhouse effect and global warming.

Indicator – Council facilities consuming Greenpower

The GreenPower Program is a government managed scheme that enables Australian households and businesses to displace their electricity usage with certified renewable energy, which is added to the grid on their behalf.

Cowra was the only Council to report any consumption of Greenpower by Council facilities in the entire region this year, and even its consumption was only very small.

Indicator – Proportion of Council's electrical energy demand met from Council-owned renewable energy infrastructure

Bathurst Regional, Cowra, Dubbo Regional, Gilgandra and Orange Councils have each installed solar panels at some of their facilities and Mid-Western Regional Council has installed solar panels for the Gulgong sewage treatment plant commencing in June 2017. As yet, the infrastructure put in place by these Councils only contributes a small proportion of their total energy demand.

Indicator – Small scale renewable energy uptake

The Small-scale Renewable Energy Scheme creates a financial incentive for owners to install eligible small-scale installations such as solar water heaters, heat pumps, solar panel systems, small-scale wind systems, or small-scale hydro systems. This indicator tracks the total kilowatts installed for solar panels and small-scale wind and hydro systems.

As shown in Figure 15, the growth rate in installations of small-scale renewable energy systems in the region has slowed with a 5.5% decline in 2016-17 compared to 2015-16. However, the 10,947 kilowatts installed in 2016-17 was still more than double the level in 2011-12.

Indicator – Number of solar water heaters and heat pumps installed

An estimated 192 solar water heaters and air sourced heat pumps were installed across the region in 2016-17. This was 28% less than 2015-16 and continues the declining trend since 2011-12.

The solar hot water market has shrunk in recent years, mainly due to the falling cost of solar PV systems which can provide much or all of the electricity needs of a home, including hot water. Uptake of air source heat pumps has been quite slow due to their relatively high cost but they may still play an important role in the future as the technology improves and prices drop.

CASE STUDY: Introduction of Kerbside Recycling Collection (Lachlan LGA)

On 3 April 2017, Lachlan Shire Council, with the assistance of waste collection contractor JR Richards & Sons, introduced a fortnightly kerbside recycling collection for the residents of Condobolin, Lake Cargelligo, Tottenham, Albert, Fifield and Derriwong. Recycling is provided in addition to a kerbside general waste collection.

The objectives of introducing a kerbside recycling collection were to:

- provide long-term sustainable waste management;
- minimise waste entering landfill;
- provide recycling services to residents of Lachlan Shire; and
- increase the environmental benefits, including greater tonnage and less contamination.

Recycling was introduced to 2,634 premises consisting of domestic and business waste management. Material from the recycling bins is transported to JR Richards's facility in Dubbo. From there, it is transferred to a Materials Recovery Facility in Sydney for sorting.

The introduction of recycling was part of Lachlan Shire Council's Community Strategic Plan 2017/18 – 2026/27 and aims to divert recyclable material from landfill.

New 240 litre general waste mobile garbage bins (MGB) and recycling MGBs were supplied to residents. The two bins are differentiated by having a red lid on a dark green body for general waste and yellow lid and dark green body for recycling. In addition to separate MGBs, information packages were supplied outlining what materials are able to be recycled, which MGB to use for different types of materials and a calendar with collection details and routes outlined.

Despite a few teething problems, such as the occasional MGB not being delivered or people getting their collection days mixed up, the introduction of a kerbside recycling collection within Lachlan Shire has been well received and a great step towards protecting the local environment.

CASE STUDY: Solar Initiatives on Council Assets (Orange LGA)

Orange City Council has begun an initiative which will see solar panels start to appear on many of the Council-owned buildings.

The project has resulted in seven installations to date including panels on childcare and other smaller installations. The most ambitious installation to date includes a 100kW system on the Council Depot roof which has seen energy bills slashed by around 90%. The payback on the project is in the order of three to four years. The Depot is a perfect case study for solar installations as the panels can be matched to the daytime load – there is a very small night time load at the depot.

A second significant installation is the Orange Aquatic Centre. Council has entered into a Power Purchasing Agreement with KENJARHY Solar to install 100kW of solar panels on the Aquatic Centre roof. A Power Purchase Agreement sees Council paying KENJARHY a set price per kW rather than paying the power companies. The Agreement will last for 15 years at which time the panels revert to Council with corresponding significant free self-generation.

KENJARHY is 100% Indigenous owned and operated, and has the ability and expertise to manage substantial contracts within all levels of Government and private enterprise. This allows KENJARHY to directly improve the long-term social and economic impacts for Indigenous people through direct income creation (jobs, careers and contracting opportunities).

Solar panels on Council depot. (L. Hall)

Darling River, Bourke.

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Appendix – Data contributed by and sourced for Councils

Issue	Sub-Issue	Indicator	Unit of Measure	Bathurst Regional	Blayney	Bogan	Bourke	Cabonne	Coonamble	Cowra	Dubbo	Gilgandra	Lachlan	Mid-Western	Narromine	Oberon	Orange	Warren	Warrumbungle	Wellington	Dubbo Regional	Central West LLS	Central Tablelands LLS
Land																							
Land use: planning and management	Contamination	Contaminated land sites - Contaminated Land Register	Number	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦			
		Contaminated land sites - potentially contaminated sites	Number	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		Contaminated sites rehabilitated	Number	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
	Erosion	Erosion affected land rehabilitated	Hectares	♦	♦	●	♦	●		♦	♦	♦	♦	♦	●	♦	♦			●		♦	
		Number of development consents and building approvals	Number	♦	♦	●	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		Landuse conflict complaints	Number	♦	♦	♦	♦	●		♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		Loss of primary agricultural land through rezoning	Hectares	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
Agricultural Land	Sustainable agriculture	Farm entities demonstrably practicing sustainable agricultural practice	Hectares																			♦	
		Extent of agricultural lands affected by severe/moderate salinity	Location & sq km																			●	
Mining		Number and type of operating mines and quarries, licenced under EPA PO& EO Act	Number	♦	♦	♦	♦	♦	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦				
		Area covered by Extractive Industries and mining exploration projects	Hectares	♦	♦	♦	♦	♦	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦				
Biodiversity																							
Biodiversity	Habitat Loss	Total area in the National Parks Estate	Hectares	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦				
		Vegetation protected and rehabilitated through LLS incentive funding	Hectares																			♦	
		Council Reserves - total area	Hectares	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	●	♦	♦		♦	♦			
		Council Reserves - bushland/remnant vegetation	Hectares	♦	●	♦	♦	♦	♦	♦	♦	♦	♦	♦	●	♦	♦		♦	♦			

Issue	Sub-Issue	Indicator	Unit of Measure	Bathurst Regional	Blayney	Bogan	Bourke	Cabonne	Coonamble	Cowra	Dubbo	Gilgandra	Lachlan	Mid-Western	Narromine	Oberon	Orange	Warren	Warrumbungle	Wellington	Dubbo Regional	Central West LLS	Central Tablelands LLS
Biodiversity	Habitat Loss	Voluntary Conservation Agreements, Property Vegetation Plans & biobanking	Number																			●	
		Total area of State Forests	Hectares	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●				
		Total area protected in Wildlife Refuges	Hectares	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦			
		Total area protected under voluntary conservation agreements and property agreements	Hectares	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦			
		Extent of Traveling Stock Reserves in LGA	Hectares	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦				
		Habitat areas revegetated	Hectares	♦	♦	♦	♦	♦	♦	●	♦	♦	♦	♦	●	♦	♦		♦	♦			
		Clearing - area illegally cleared	Hectares & %																			●	
		Roadside vegetation management plans	Yes/No	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		Roadside vegetation rehabilitated	Hectares	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦		♦	●			
	Decreasing occurence of endangered species	State Threatened species listed in Central West & Lachlan Catchments	Number & list of species																				
		Threatened species actions implemented (e.g. PAS, recovery plans)	Number	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦			
		Fish restocking activities: native species	Number	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦				
Noxious weeds and feral animals		Fish restocking activities: non-native species	Number	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦				
		Number of declared noxious weeds	Number of species	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦			●	●
		Invasive species (listed noxious or WONS) under active management	Number of species	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			

Issue	Sub-Issue	Indicator	Unit of Measure	Bathurst Regional	Blayney	Bogan	Bourke	Cabonne	Coonamble	Cowra	Dubbo	Gilgandra	Lachlan	Mid-Western	Narromine	Oberon	Orange	Warren	Warrumbungle	Wellington	Dubbo Regional	Central West LLS	Central Tablelands LLS
Water and Waterways																							
Water quality	Environmental Flows	Annual volume released to rivers for environmental flows	GL																				
	Surface & Ground Water Quality	Average Turbidity in selected streams	NTU																				
		Average Total Nitrogen in selected streams	mg/L																				
		Average Total Phosphorus in selected streams	mg/L																				
		Average salinity levels in selected streams	EC			♦			♦					♦										
		E.coli remote from wastewater treatment plants	Organisms per 100mL	♦	♦	●	●	●	●	●	♦		●	♦		♦				●			
	Riparian	Riparian vegetation recovery actions	Number	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		●	♦		●	
		Riparian vegetation recovery area	Hectares	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		●	♦		●	
	Industrial/Agri-cultural Pollution	Load Based Licencing volume	Total kg of pollutants	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦	●	♦	♦		●	♦			
		Exceedances of license discharge consent recorded	Number	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦	●	♦	♦		●	♦			
		Erosion & Sediment Control complaints received by Council	Number	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦			●			
	Stormwater Pollution	Number of gross pollutant traps installed	Total number of GPTs currently installed	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		Total catchment area of GPTs	Hectares	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦	●	♦	♦		♦	♦			
		Water pollution complaints	Number	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
	Town Water Quality	Number of instances drinking water guidelines not met	Number of instances	♦	♦	♦	♦	♦	♦	♦	♦	♦	●	♦	♦	♦	♦		♦	♦			
		Number of drinking water complaints	Number & Type	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
Water quantity	Surface & Ground Water Extraction	Number of Water Supply Work Approvals from surface water sources	Raw number	♦	♦	♦	♦	♦	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦				
		Volume of surface water permissible for extraction under licences	Gigalitres (GL)	♦	♦	♦	♦	♦	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦				
		Actual volume extracted through surface water licences	Gigalitres (GL)																				
		Number of Water Supply Work Approvals from groundwater resources	Number	♦	♦	♦	♦	♦	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦				

Issue	Sub-Issue	Indicator	Unit of Measure	Bathurst Regional	Blayney	Bogan	Bourke	Cabonne	Coonamble	Cowra	Dubbo	Gilgandra	Lachlan	Mid-Western	Narromine	Oberon	Orange	Warren	Warrumbungle	Wellington	Dubbo Regional	Central West LLS	Central Tablelands LLS
Water quantity	Surface & Ground Water Extraction	Volume of groundwater permissible for extraction under licences	Gigalitres (GL)	♦	♦	♦	♦	♦	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦				
		Actual volume extracted through groundwater licences	Gigalitres (GL)																				
	Council Water Consumption	Council managed parks, sportsgrounds, public open	Hectares	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		Area of irrigated council managed parks, sportsgrounds, public open space	Hectares	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	●			
		Water used by council for irrigation (including treated and untreated)	Megalitres (ML)	♦	♦	●	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦		●	♦			
	Town Water Consumption	Annual metered supply	Megalitres	♦		●	♦	♦	♦	♦	♦	●		♦	♦	♦	♦		●	●			
		Annual consumption (Total from WTP)	Megalitres	♦	♦	♦	♦	♦	●	♦	♦	♦		♦		♦	♦		●	●			
		Total water usage per connection type	Megalitres per annum	♦	♦	♦		♦	♦	♦	♦	♦		♦	●	♦	♦		♦	♦			
		Level of water restrictions implemented	Level (1-5)	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦		♦	●			
		Number of water conservation programs	Number of Programs	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		●	●			
		Number of residential meters	Number	♦	♦	♦	●	♦	♦	♦	♦	♦		♦	●	♦	♦		♦	♦			
	Dam levels	Dam levels	Volume %																				
People and Community																							
Active community involvement		Environmental volunteers working on public open space	Person Hours	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	●	♦	♦	♦		♦				
		Number of environmental community engagement programs	Number of programs.	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	●	♦	♦	♦		♦				
		Number of growers markets/local food retailers specialising in local food operating within LGA	Number	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		Municipal (domestic kerbside) waste	tonnes / person	♦	♦	♦		●	♦		♦	♦	●	♦		♦	♦			♦			
Community Impacts		Number of days that air pollution maximum goals for particulate matter were exceeded	days	♦																			
Valuing natural, built and cultural heritage	Management of Aboriginal Heritage	Number of indigenous sites on AHIMS register	Number & Type	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦			
		Inclusion in DCPs & rural strategies	Yes/No	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	●	♦	♦		♦	♦			
		Extent of liaison with indigenous communities (self-assessed from 0 = none to 3 = High)	Rank (0 = none, 3 = High)	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			

Issue	Sub-Issue	Indicator	Unit of Measure	Bathurst Regional	Blayney	Bogan	Bourke	Cabonne	Coonamble	Cowra	Dubbo	Gilgandra	Lachlan	Mid-Western	Narromine	Oberon	Orange	Warren	Warrumbungle	Wellington	Dubbo Regional	Central West LLS	Central Tablelands LLS
Valuing natural, built and cultural heritage	Management of Aboriginal Heritage	Development on listed indigenous sites	Number approvals	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		Management plan/ strategy in place	Yes/No	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		Actions to protect indigenous heritage (including management plans)	Number	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		●	●			
	Management of Non-Aboriginal Heritage	NSW Heritage Inventory items	Number and type	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦			
		Locally listed heritage items	Number and type	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		Actions to protect non-indigenous heritage (including management plans)	Number	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	●	♦	♦		♦	♦			
		Heritage buildings on statutory heritage lists demolished/degraded in past year	Number	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		●	♦			
		Heritage buildings on statutory heritage lists renovated/improved in past year	Number	♦	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
Toward Sustainability																							
Management of Waste and Resource Recovery	Waste Generation & Disposal	Total waste entombed at primary landfill	Tonnes/annum	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦		♦	♦			
		Total waste entombed at other landfills (exc recyclables)	Tonnes/annum	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦		♦	♦			
		Average cost of waste service per residential household	$ per household	♦	♦	♦	♦	●	♦	♦	♦	♦	♦	♦		♦	♦		♦	♦			
	Hazardous/ liquid waste	Farm chemical drums collected through DrumMuster collections	Number of drums	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦			
		Household Hazardous Wastes collected	kg	♦	♦			♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
	Reduce/ Recycle	Garden organics collected (diverted from landfill)	Tonnes	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		E-Waste collected (diverted from landfill)	Tonnes	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦		♦	♦			
		% Effluent reuse & location of reuse	%	♦	♦	●	♦	♦	♦	♦	♦	♦	●	♦		♦	♦		●	♦			
		Amount of material recycled	Tonnes	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	●	♦	♦	♦	♦	♦			
	Littering	Number of illegal waste disposal complaints to Council	Number of complaints	♦	♦	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
Engineering, Infrastructure and Civil Works		New road construction	km	♦	●	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦		♦	♦			
		Road upgrades	km	♦	●	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		●	♦			
		Inclusion and demonstrable implementation of environmental sustainability criteria within purchasing	Yes/No	♦	●	●	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦		●	♦			

Issue	Sub-Issue	Indicator	Unit of Measure	Bathurst Regional	Blayney	Bogan	Bourke	Cabonne	Coonamble	Cowra	Dubbo	Gilgandra	Lachlan	Mid-Western	Narromine	Oberon	Orange	Warren	Warrumbungle	Wellington	Dubbo Regional	Central West LLS	Central Tablelands LLS
Engineering, Infrastructure and Civil Works		Application of design measures in response to climate change in new infrastructure	Yes/No	●	●	●	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		●	●			
		Application of best practice environmental management (BPEM) in new roads	Yes/No	♦	●	●	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦		●	●			
Risk Management		Council adaptation initiatives	Yes/No	♦	●	♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦	●		●				
		Increase in area covered by flood management plans/ flood mapping	hectares	♦		♦	♦	●	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		Natural disaster declarations (events - flood bushfire and drought)	Hectares	♦			♦	♦	♦	●	♦	♦	♦	♦	●	♦	♦		♦	♦			
	Fire Regimes	Hazard reduction burns	Number & area	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
Energy & Resource efficiency	Mitigation	Office paper used by Council (reams)	Number of reams ordered per annum	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		Council sustainability initiatives	List	♦	●	●	♦	♦	♦	●	♦	♦	♦	♦	♦	♦	●		●	●			
		Council mitigation initiatives	List	♦	●	●	♦	●	♦	●	♦	♦	♦	♦	♦	♦	●		♦	●			
	Council GG Emissions	Annual electricity consumption for Council controlled facilities	MWh	♦	♦	♦	●	♦		♦	♦	♦	♦	♦	●	♦	♦		●	●			
		Annual natural gas consumption for Council controlled facilities	Gigajoules	♦	♦	●	♦	♦	♦	●	♦	♦	♦	♦	♦	♦	♦			●			
		Annual bottled gas consumption for Council controlled facilities	Litres	♦	♦		♦	♦	♦	♦	♦	●		♦	♦	♦	♦			●			
		Total fuel consumption	Total Kilolitres per annum	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦			
		Council facilities consuming Greenpower (relate to State Govt goal of Greenpower uptake)	%	♦	●	●	♦	♦	♦	♦	♦	●	●	♦	♦	♦	♦			●			
		Proportion of Council's electrical energy demand met from council-owned renewable energy infrastruct	%	♦	●	●	♦	♦	♦	♦	♦	♦	●	♦	♦	♦	♦			●			
	Community GG Emissions	Small scale renewable energy uptake	kw installed by LGA	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦			
		Number of solar water heaters and heat pumps installed	Number	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			

♦ Denotes those Councils that were compared in the trend analysis for these indicators

● Data contributed in 2016–17 but not compared in summary tables

Data not contributed

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