

Regional STATE OF THE ENVIRONMENT REPORT 2016–2017



Local Land
Services
Central Tablelands



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

The preparation of the Regional State of the Environment Report 2016-17 was funded by the 15 participating local Councils with administrative support from Central Tablelands Local Land Services and Central West Local Land Services. It shows trends, where possible, in relation to reports produced for the region in 2013-14, 2014-15 and 2015-16.

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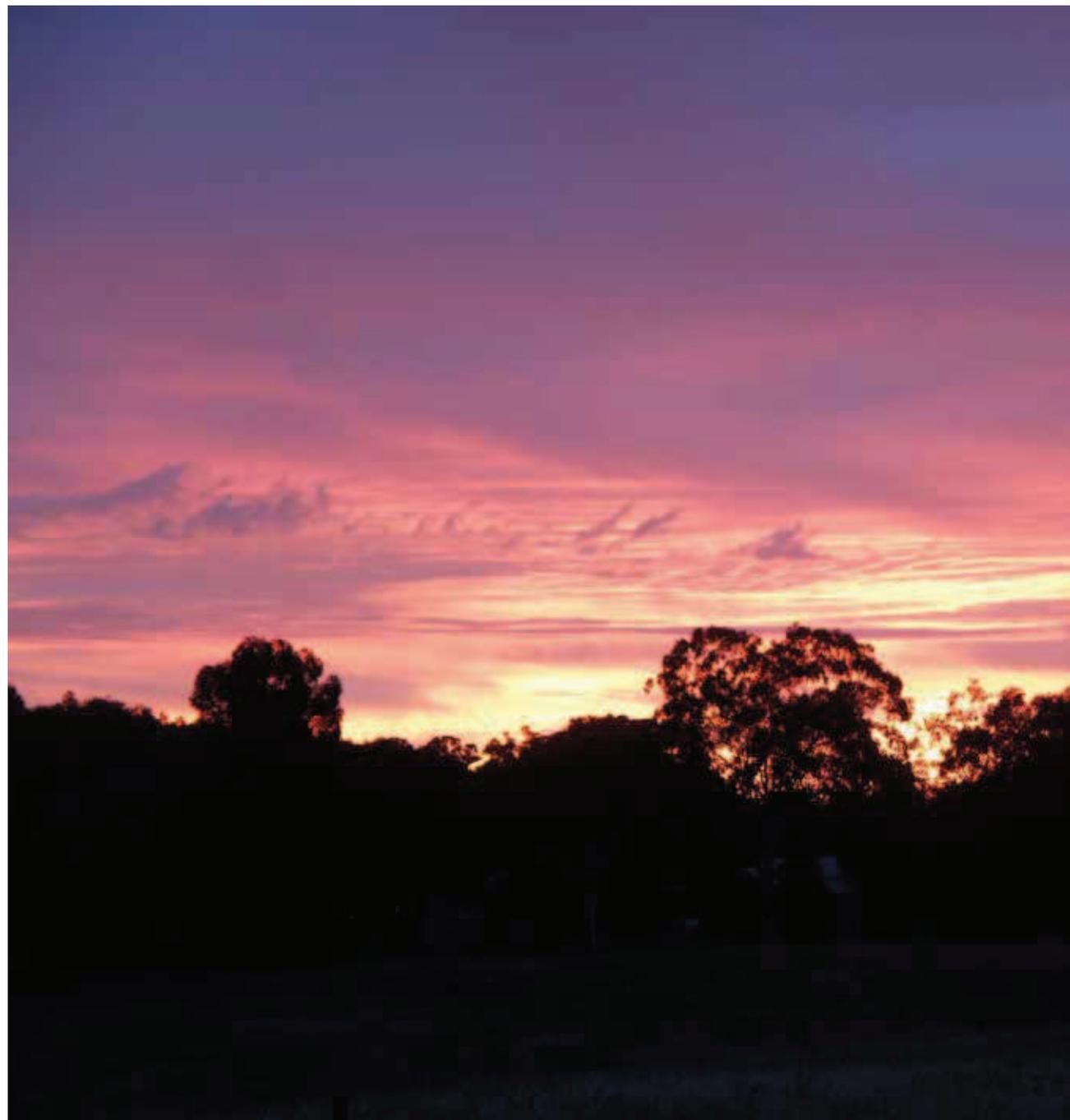
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Abbreviations

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
km ²	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?

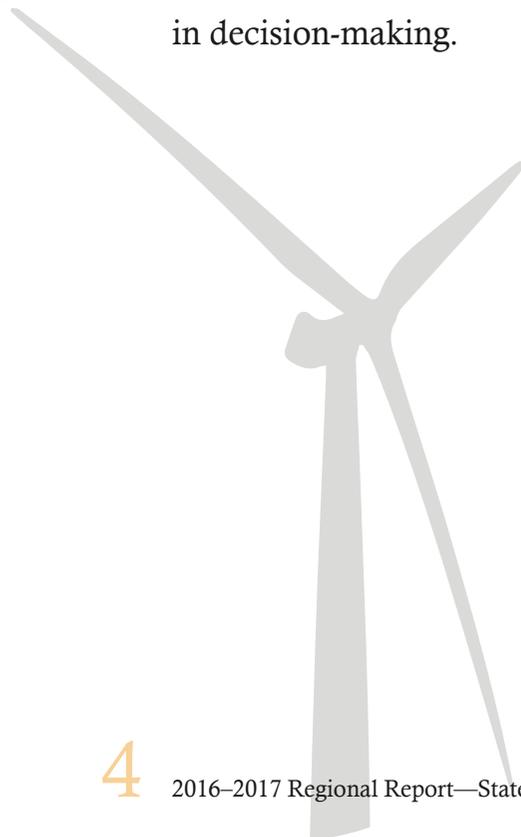
The participating Councils in the region are:

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).



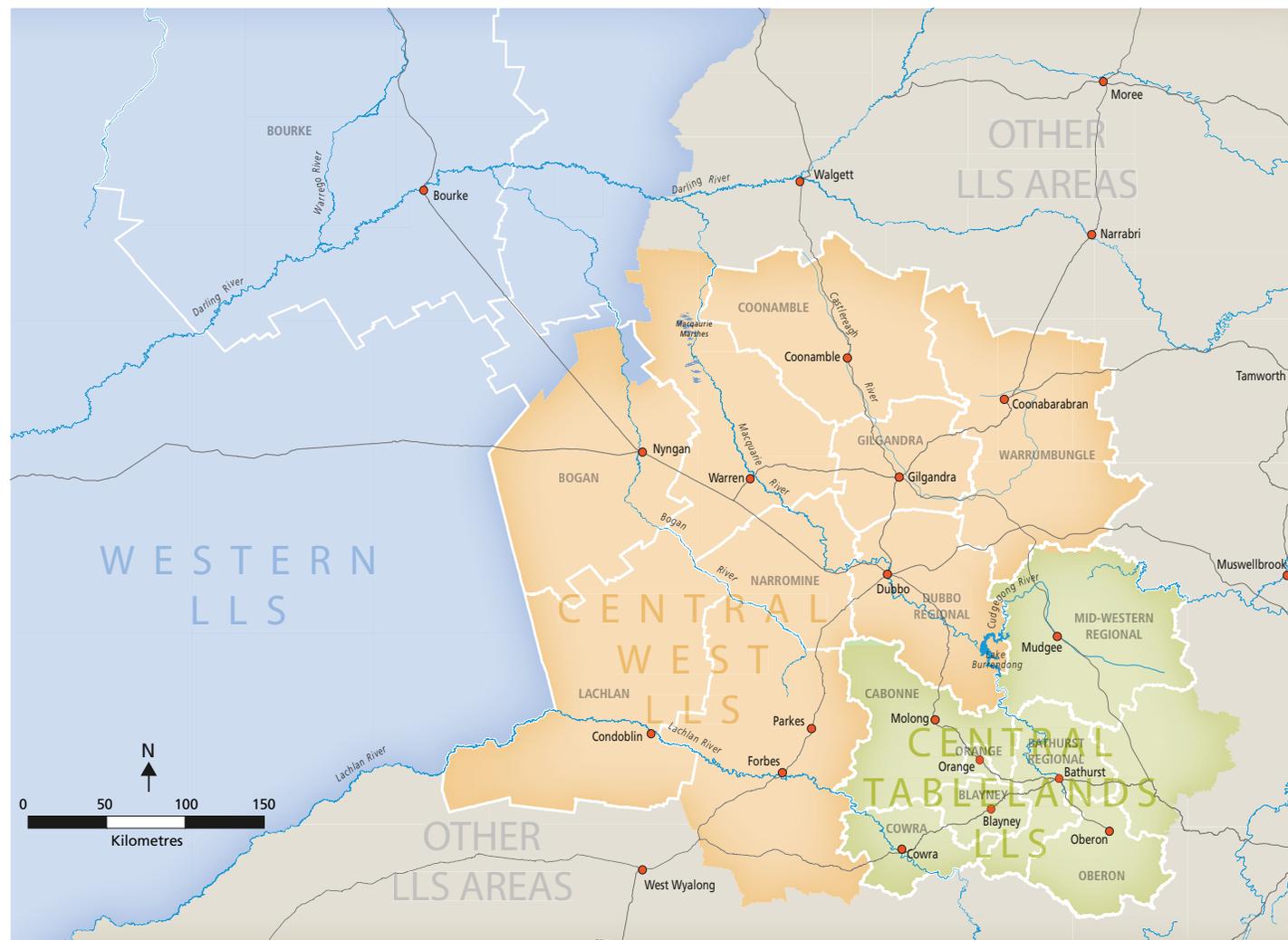
Reporting for 2016-17

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:

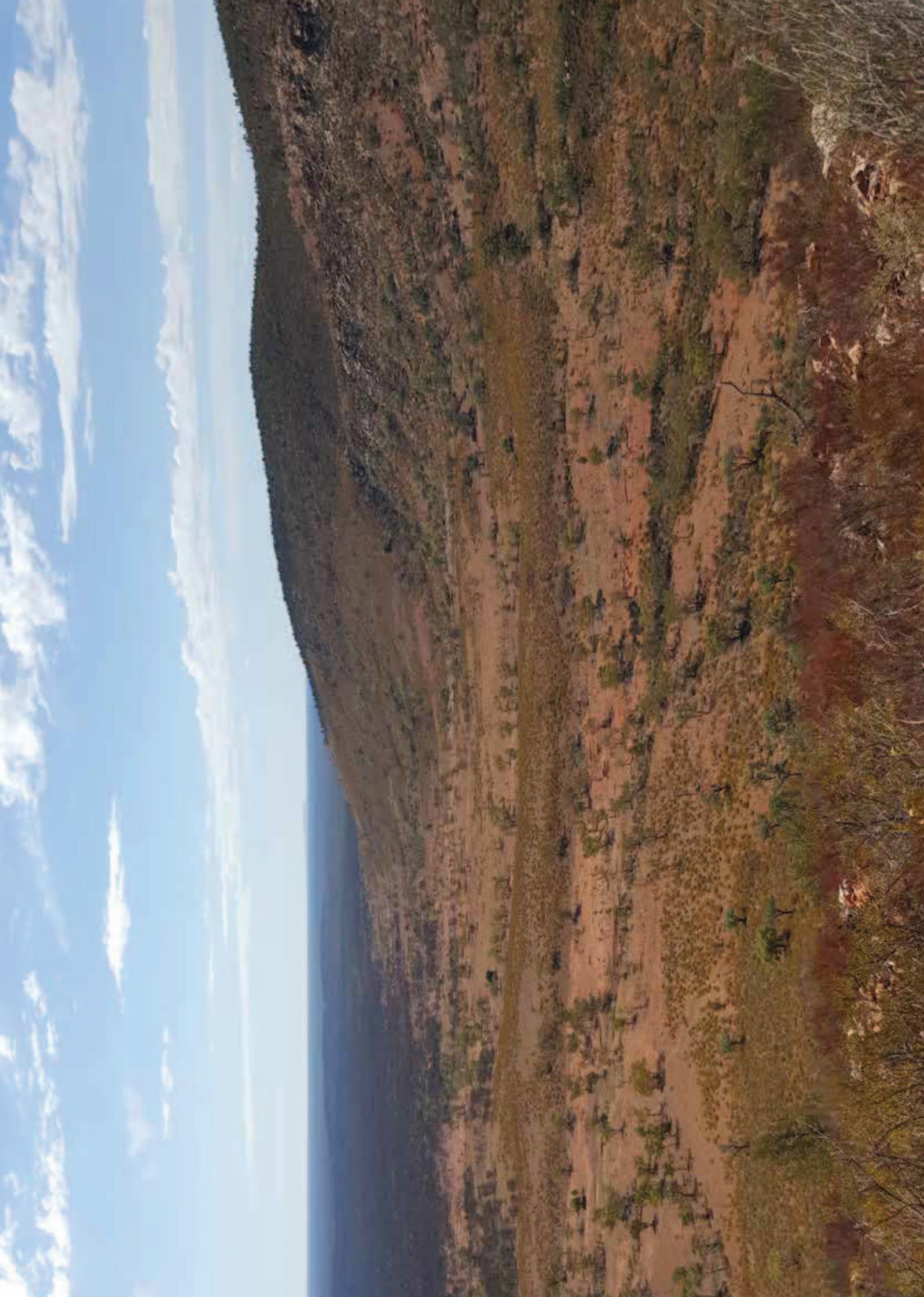
- ↑ improvement
- no or little change
- ↓ worsening trend

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).

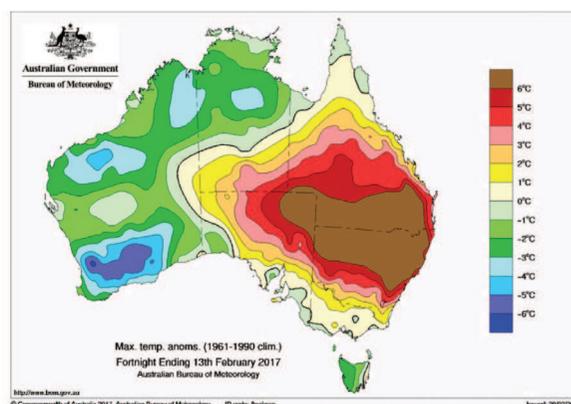
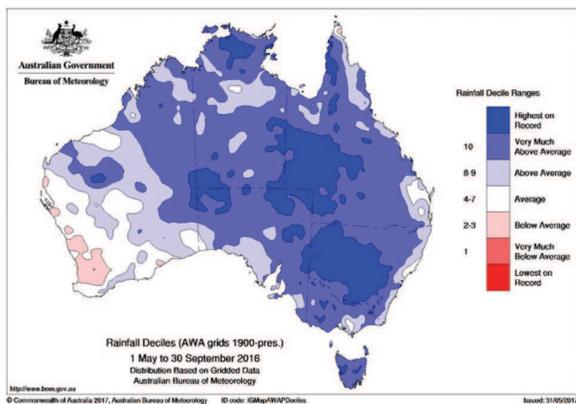
September was an exceptionally wet month as a succession of rain-bearing systems affected the eastern part of Australia. Monthly rainfall was at least double the long-term average over almost all of inland NSW and it was the wettest September on record, especially in the state's western half (BOM, 2017e).

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.

Broadacre farming,
Dubbo Regional Council.

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



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.

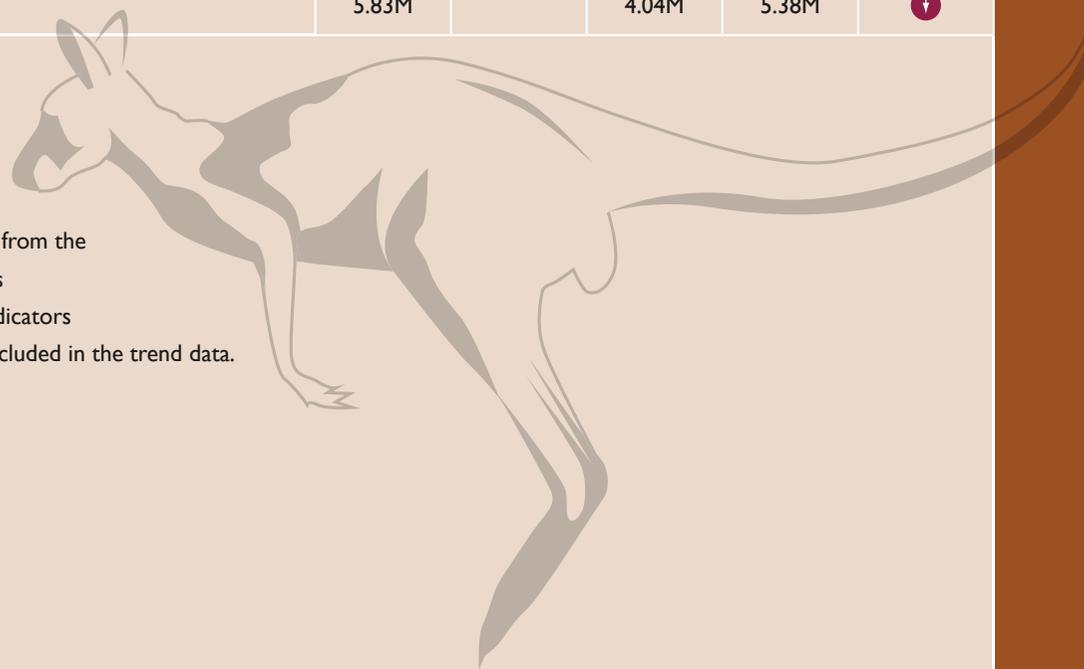


FIGURE 2: Number of potentially contaminated sites across the region

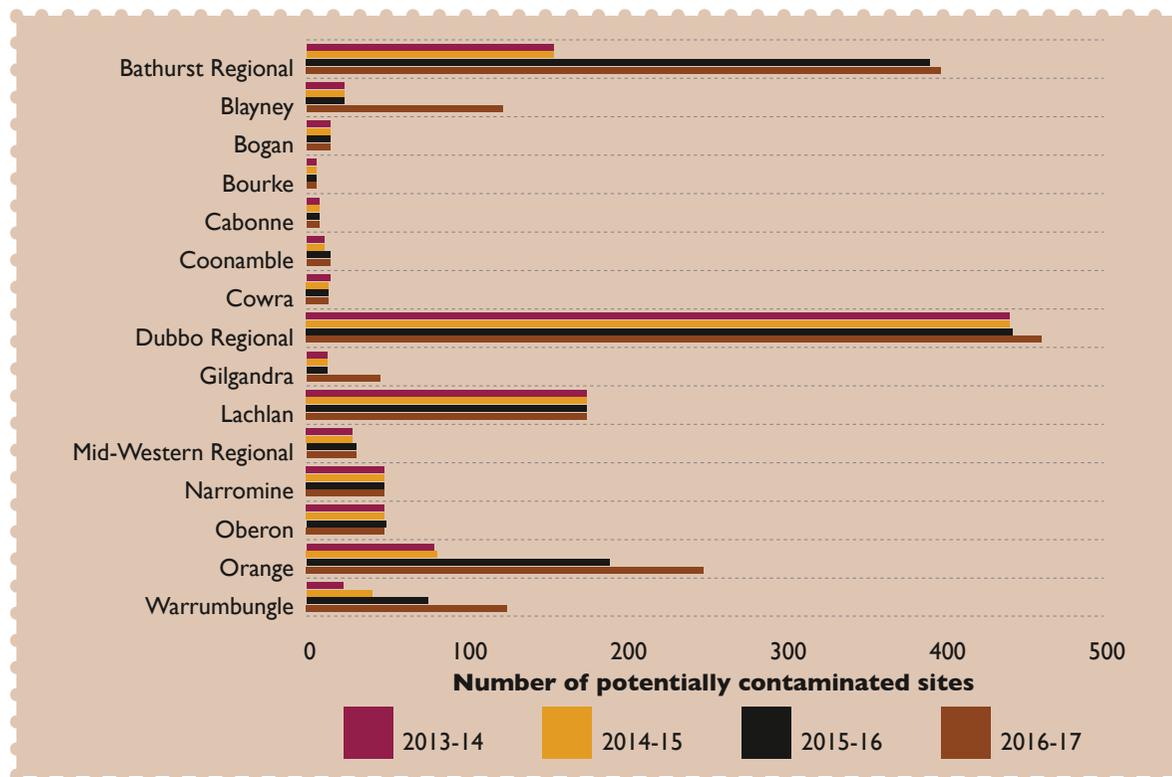
environmental functions” (Dept. of the Environment, 2014). Sustainable land management is crucial to minimising land degradation, rehabilitating degraded areas and ensuring the optimal use of land resources for the benefit of present and future generations.

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/



whoware/registers.htm). All participating Councils also have or are collating a list of potentially contaminated sites based on past land use.

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.

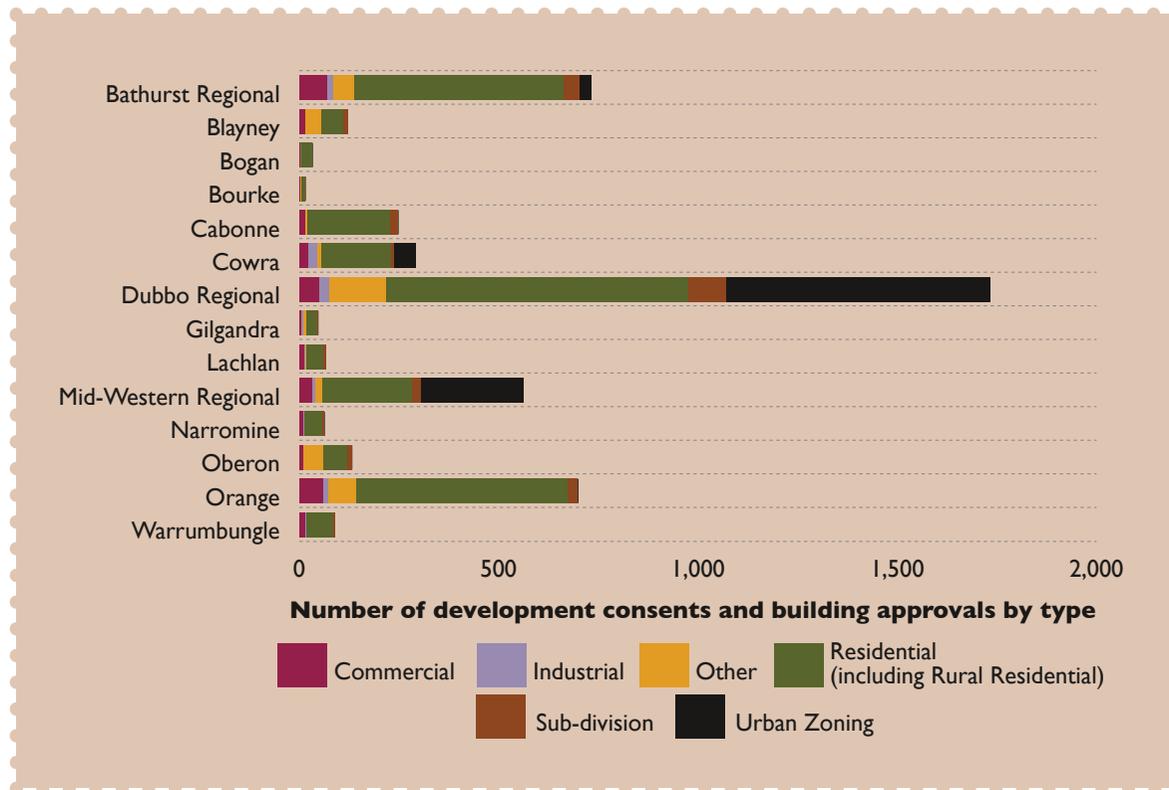


FIGURE 3: Number of development consents and building approvals by type 2016-17

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 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

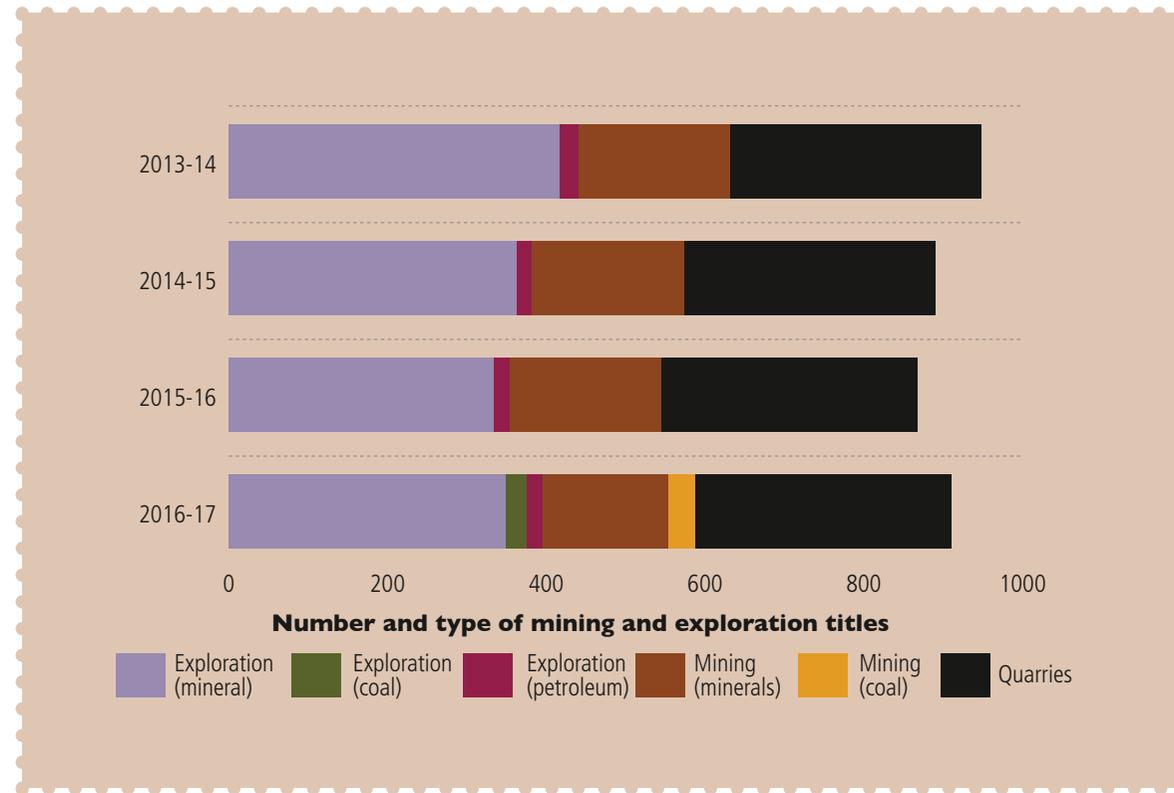


FIGURE 4: Number and type of mining exploration titles in the reporting region

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.

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 section 149 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

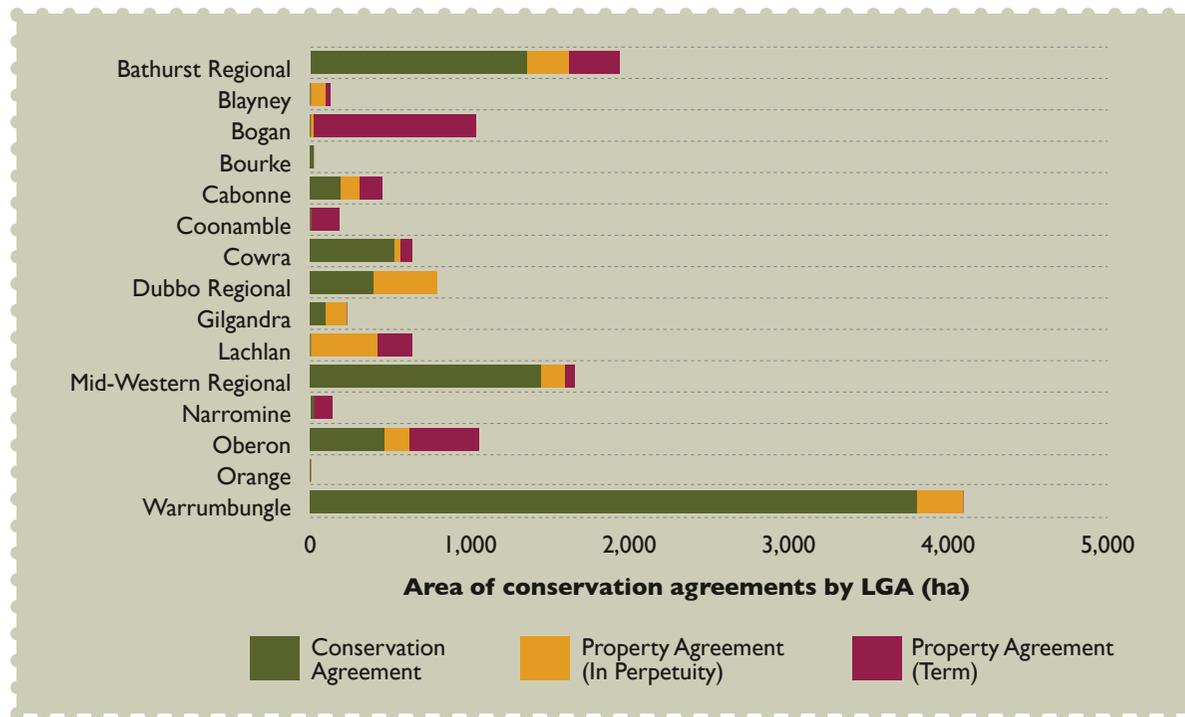
The Wildlife Refuges scheme has existed since 1948 and is one of the longest-running schemes in Australia that supports conservation on private and public land. Wildlife refuges may contain remnant native vegetation, as well as habitat provided by wildlife corridors, windbreaks, woodlots or farm dams.

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

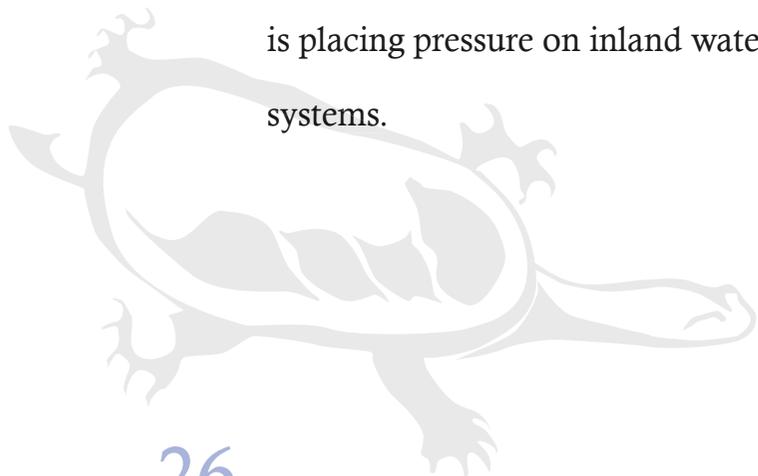


Table 4: Summary Table of Indicator Trends – Water Quality

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	↑
	<i>E.coli</i> 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 Gungahlin, and the Cudgong 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.

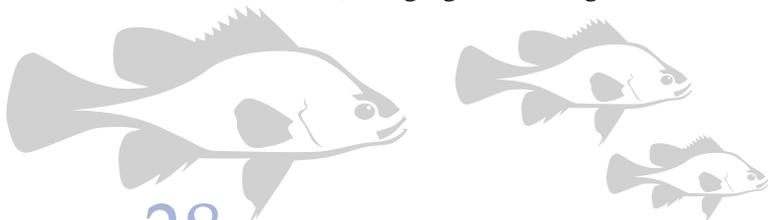
No data was provided this year by the NSW Office of Water for these indicators.

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,

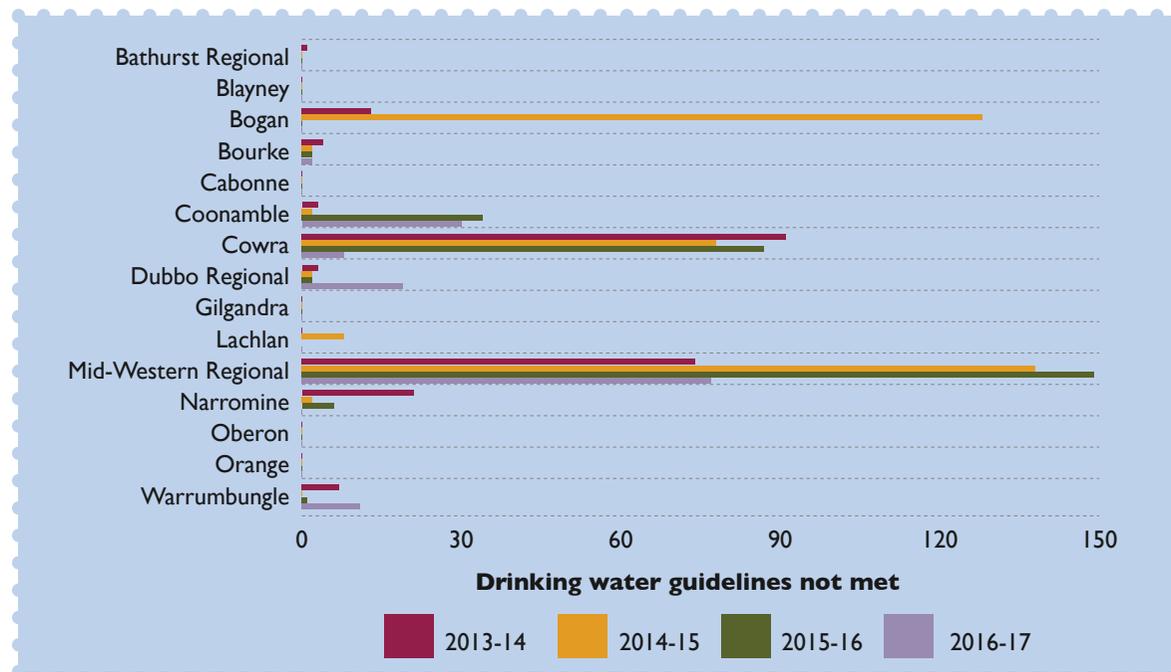


FIGURE 6: Number of instances in which drinking guidelines have not been met

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.

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 licence 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.

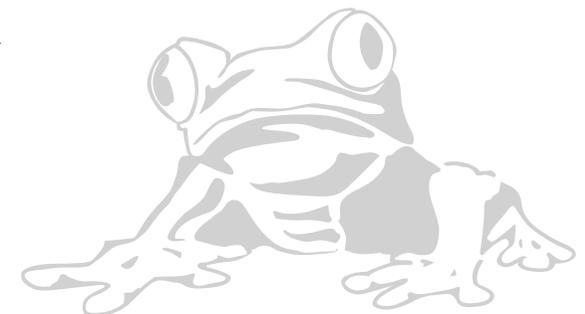


Table 5: Summary Table of Indicator Trends – Water Quantity

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 unlicensed. 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 – Coss, 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)

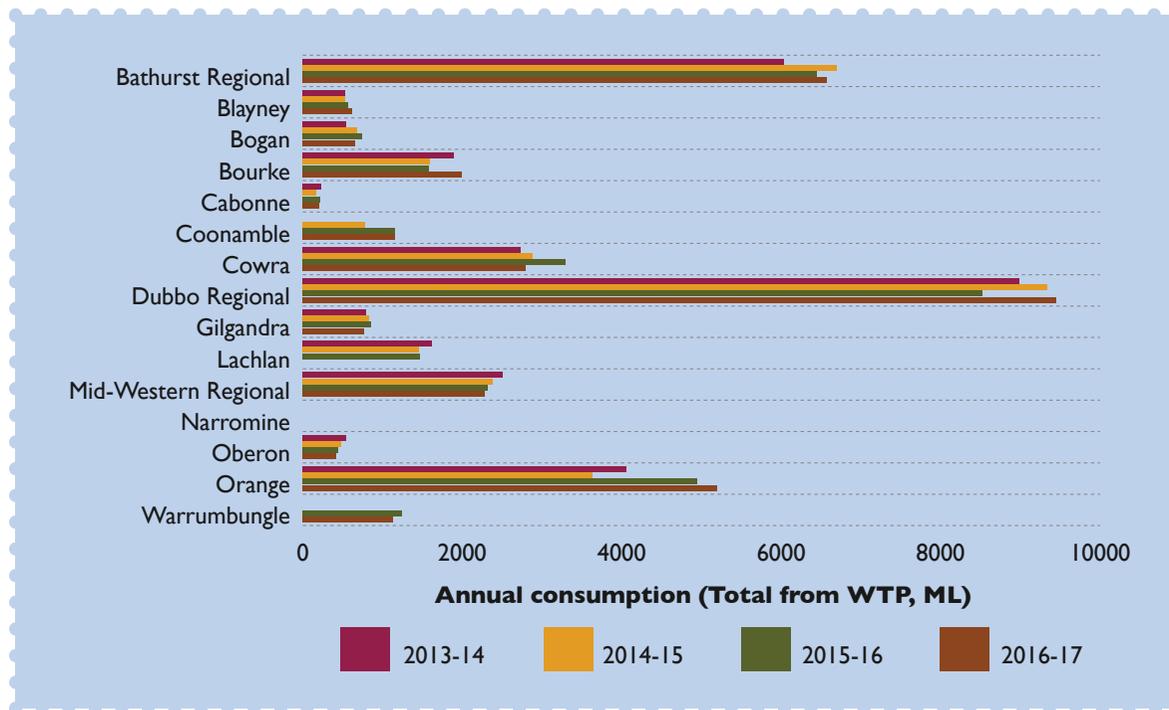


FIGURE 7: Annual town water consumption.

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.

