



Attachment C

State of the Environment Report





STATE OF THE ENVIRONMENT REPORT

FOR 2012-2013

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1 INTRODUCTION

All councils are required to prepare a comprehensive State of the Environment report (SOE) in the year ending after each election of the councillors for its area, and make that report available to the public, as well as submitting it to the Division of Local Government, Department of Premier and Cabinet.

1.1 GUIDELINES

The Department of Local Government has published guidelines for state of the environment reporting, titled 'Environmental Guidelines – State of the Environment Reporting by Local Government', published December 1999.

2 WALGETT SHIRE - BACKGROUND

The Shire has a total area of 22,330 square kilometres and is located in north-western New South Wales as shown in Figure 1. Walgett Shire adjoins a number of other shires, and the state of Queensland (Figure 2).

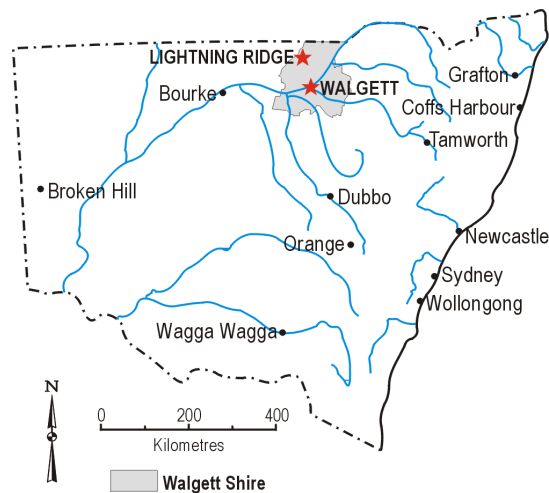


Figure 1 – Location of Walgett Shire in NSW.



Figure 2 – Adjoining shires.

2.1 LAND TITLES

Administratively Walgett Shire is separated into the Central Division (11,310 km²) and the Western Division (11,030 km²). The Barwon River separates the two divisions, as shown in Figure 3. Freehold land titles are dominant within the Central Division, while most of the Western Division consists of Crown Land held under Western Lands Leases.

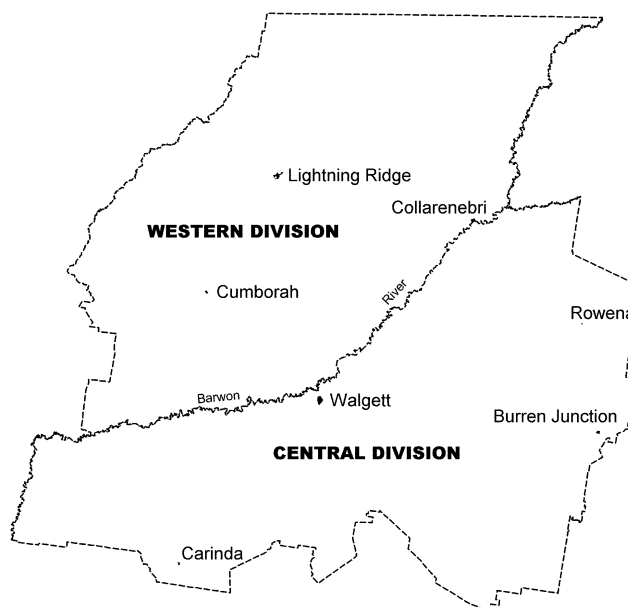


Figure 3 – Western and Central Divisions.

As shown in Figure 4, within the Shire there is about:

- 445 square kilometres (44,500 hectares) of Nature Reserves and National Parks.
- 36 square kilometres (3,600 hectares) of State Forest.

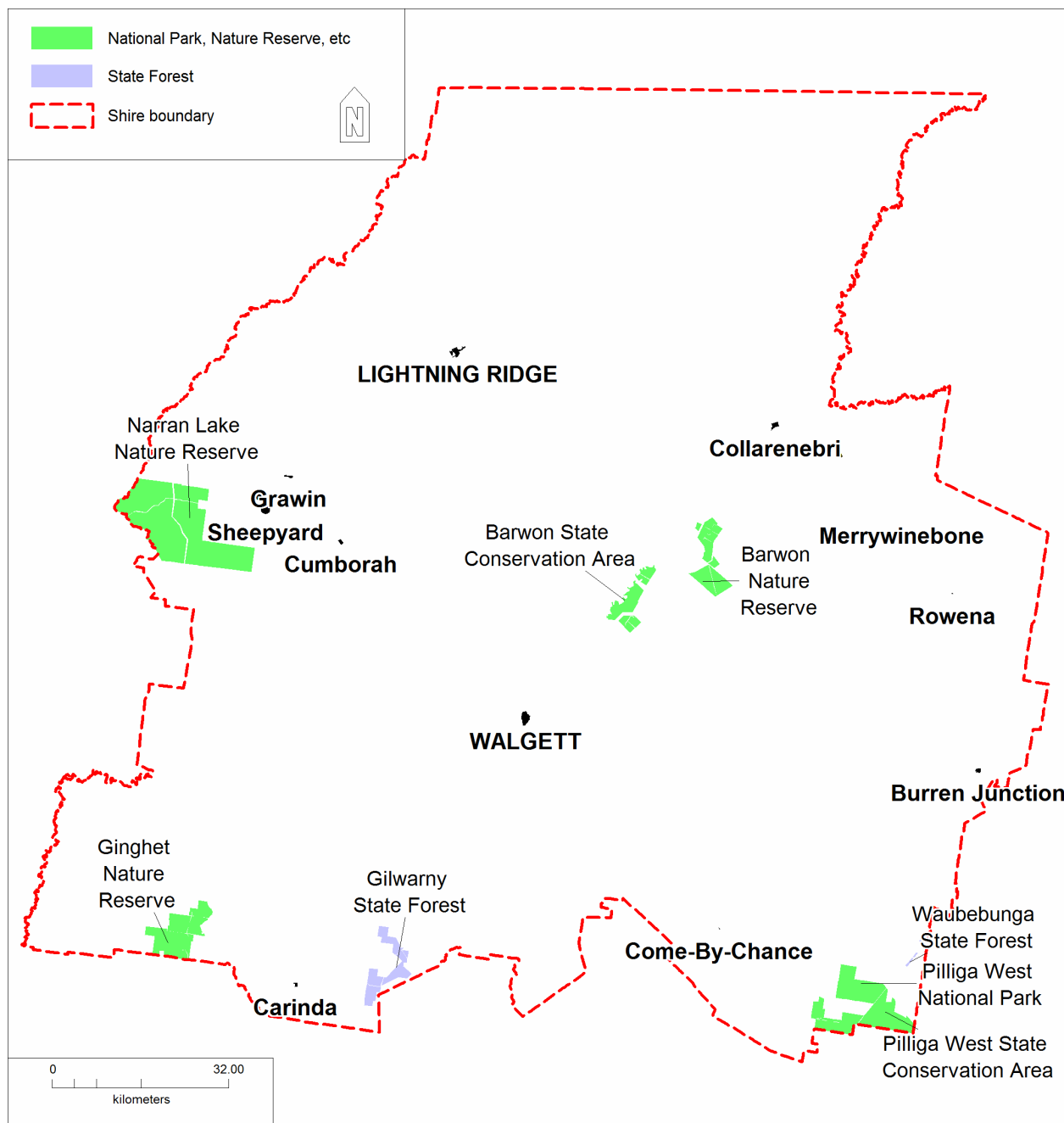


Figure 4 – Nature reserves and state forests within the Walgett Shire.

2.2 NATURAL ENVIRONMENT

2.2.1 Climate

The climate of the region is semi-arid with peak monthly rainfall usually occurring in summer and a smaller peak from May to July. Average daily temperatures, considered on a monthly basis, show a minimum of 4°C in July and a maximum of 35°C in the summer months.

2.2.2 Landform

A number of rivers pass through the Shire including the Barwon, Namoi, Macquarie, Castlereagh, Narran and Moonie rivers. The dominant landform is a floodplain, with an elevation between 120 and 145 m above sea level. In the northern portion of the shire there are a number of ridges that reach a maximum elevation of about 160 m above sea level.

Both the floodplain and ridge landforms can be seen in Figure 5 which is an ‘image’ showing the relative levels of radiometric potassium detected from aerial surveys conducted by NSW Mineral Resources in the mid-1990s. Red and yellow coloured areas represent land that has comparatively elevated levels of radiometric potassium while green and purple coloured areas have comparatively lower levels. The red and yellow areas are generally ridge landforms or significant man made water storages.

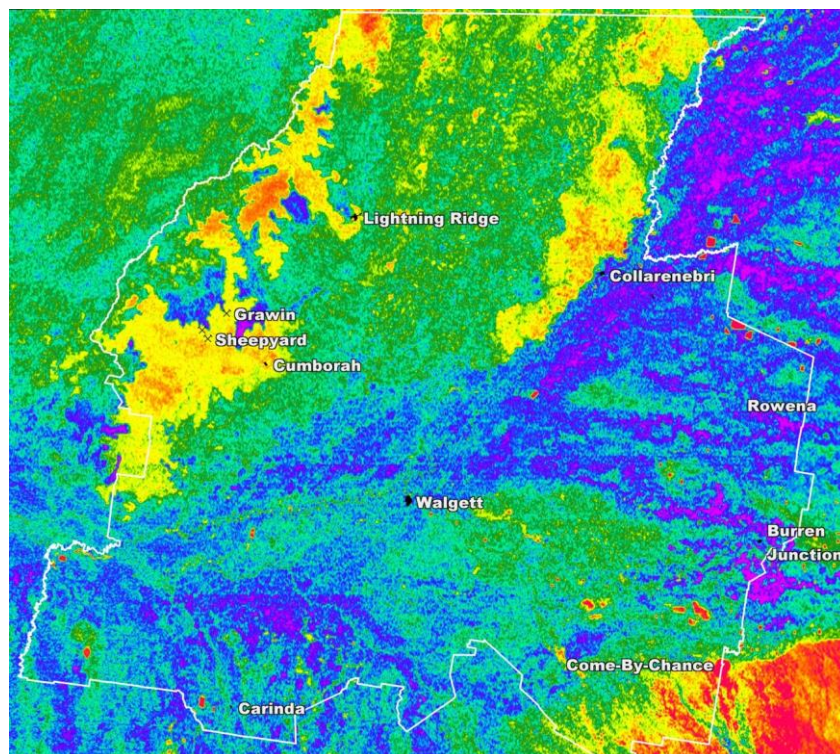


Figure 5 – Radiometric potassium ‘image’ showing elevated land and water storages as red/yellow, flood plains as green and purple.

2.2.3 Geology

Extensive flood plains of unconsolidated Quaternary alluvial silt and clay dominate local geology, as shown in Figure 6 below. There are also some comparatively small claypans and intermittent lakes that typically contain finer grained sediments such as mud and silt. Ridges of Cretaceous claystone and sandstone exist in the Lightning Ridge, Cumborah and Collarenebri areas. The ridges typically have a veneer of unconsolidated Tertiary alluvial gravel, which can also be consolidated in some areas forming a rock known as silcrete.

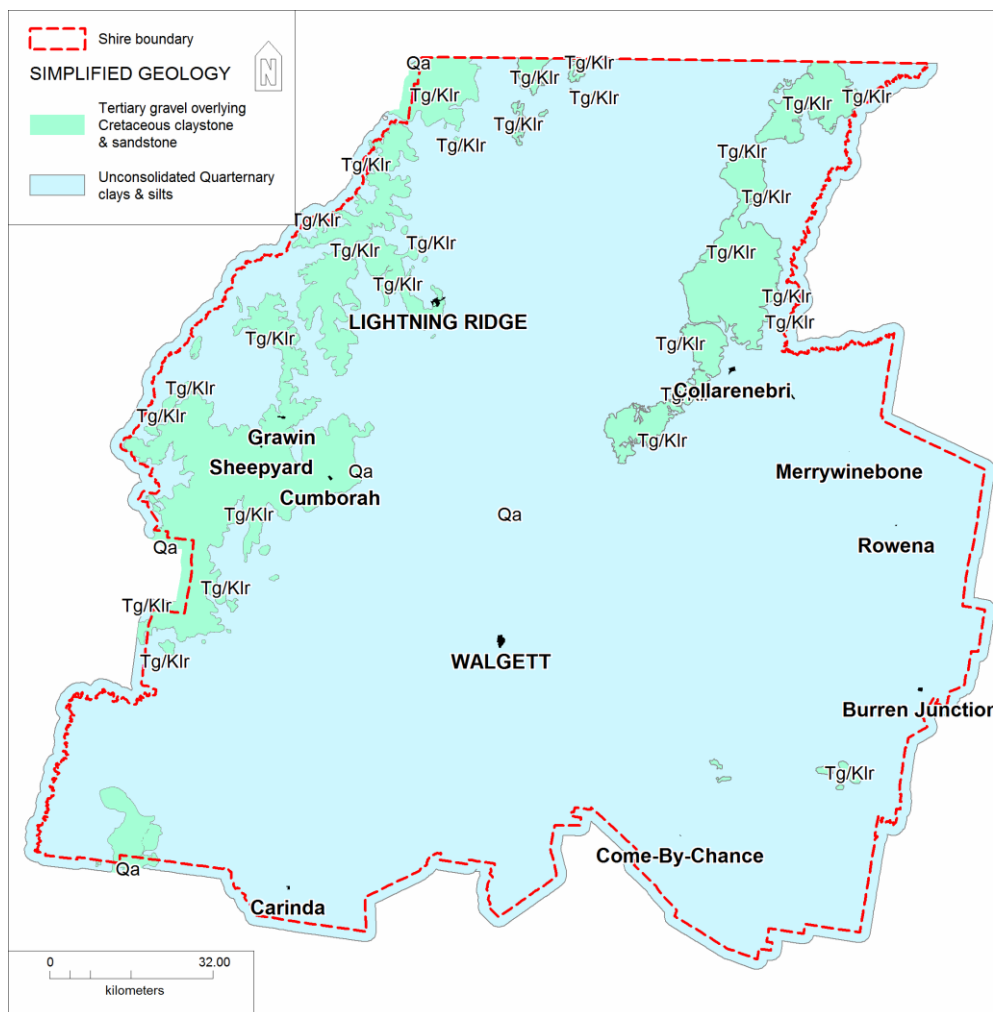


Figure 6 – Simplified geological map of the Walgett Shire ¹.

¹ Derived from GIS data provided by Mineral Resources division, NSW Department of Trade and Investment, Regional Infrastructure and Services.

2.2.4 Vegetation

Native vegetation communities within the shire are predominantly woodlands and open woodlands, as shown in Figure 7. Dominant tree species within the woodlands include *Eucalyptus populnea* (bimble box), *Callitris glaucophylla* (white cypress pine), *Eucalyptus microtheca* (coolibah), *Eucalyptus largiflorens* (black box) and *Eucalyptus camaldulensis* (river red gum). Open woodland areas have a similar dominant tree species.

Out of a total land area in the Shire of 2,231,000 hectares, 577,000 are dedicated to rainfed cropping, and 289,000 are rainfed pasture. Developed areas comprise only 407 hectares².

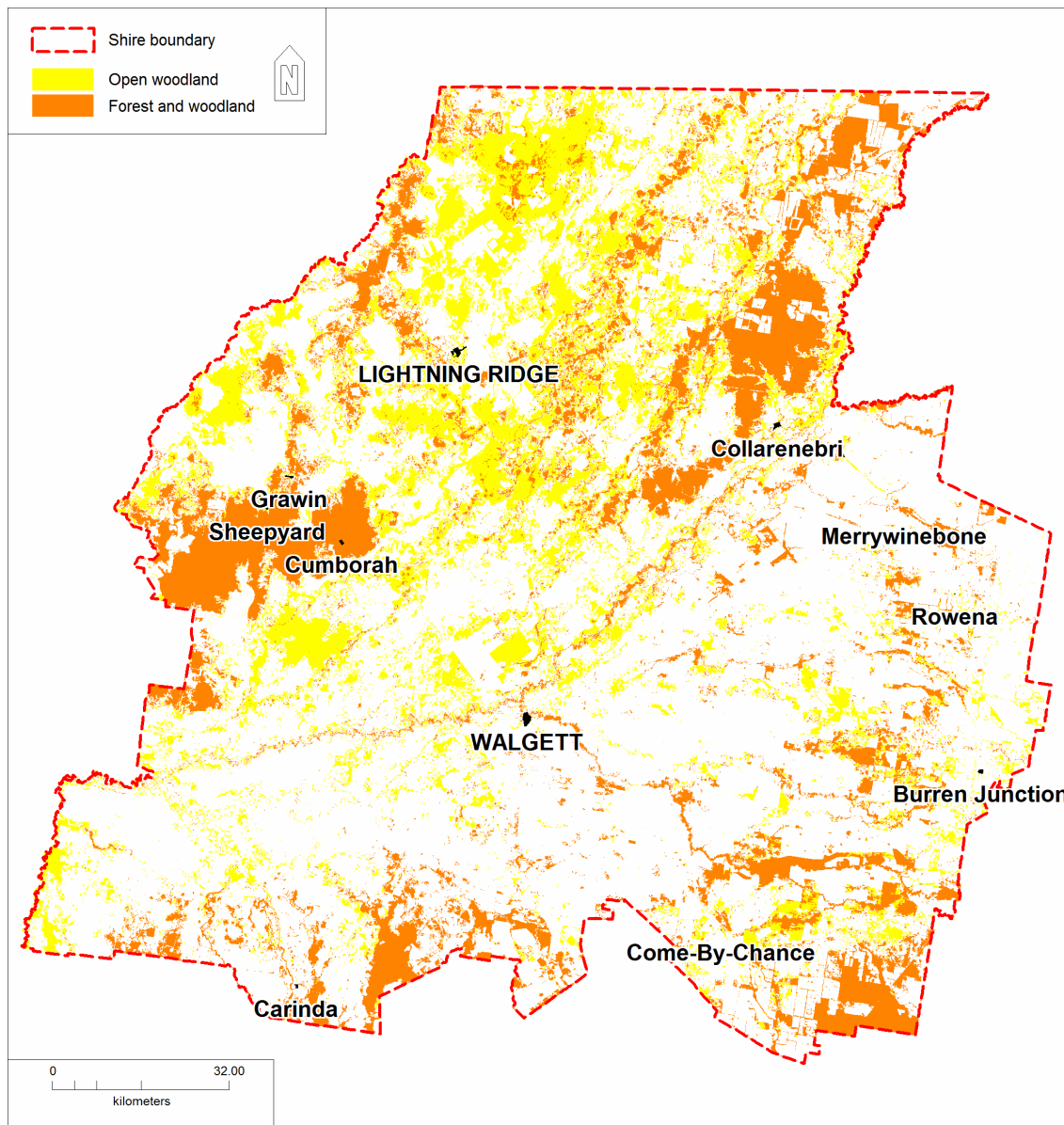


Figure 7 – Simplified vegetation classification map of Walgett Shire ³.

² Australian Bureau of Statistics National Regional Profile.

³ Derived from 2004 remote sensing data provided by the NSW Rural Fire Service.

2.3 POPULATION

Urban centres within the Shire include Burren Junction, Carinda, Collarenebri, Cumborah, Cryon, Lightning Ridge, Rowena and Walgett. There are also numerous people living in mining camps on the opal fields at Grawin, Glengarry, Sheeppark and Lightning Ridge.

Population profiles derived from census data obtained in 2006 and 2011 are summarised in Table 1.

Table 1 – Urban population distribution and dwellings⁴.

Name	2011 Population	2011 Dwellings
Walgett	1,625	688
Lightning Ridge	1,496	876
Collarenebri	386	180

2.4 ECONOMIC

Dominant industries within the region include cropping (wheat, cotton, chickpeas), grazing (sheep, cattle), opal mining and tourism. Most of the land in the south east of the Shire is suitable for cropping while the land in the west and north tends to be better suited for grazing, as shown in Figure 8.

Of the employed people in the Walgett Local Government Area, 23.8% worked in Sheep, Beef Cattle and Grain Farming. Other major industries of employment included School Education 8.2%, Local Government Administration 3.5%, Hospitals 3.2% and Public Order and Safety Services 2.5%⁴.

⁴ Australian Bureau of Statistics Census of Population and Housing.

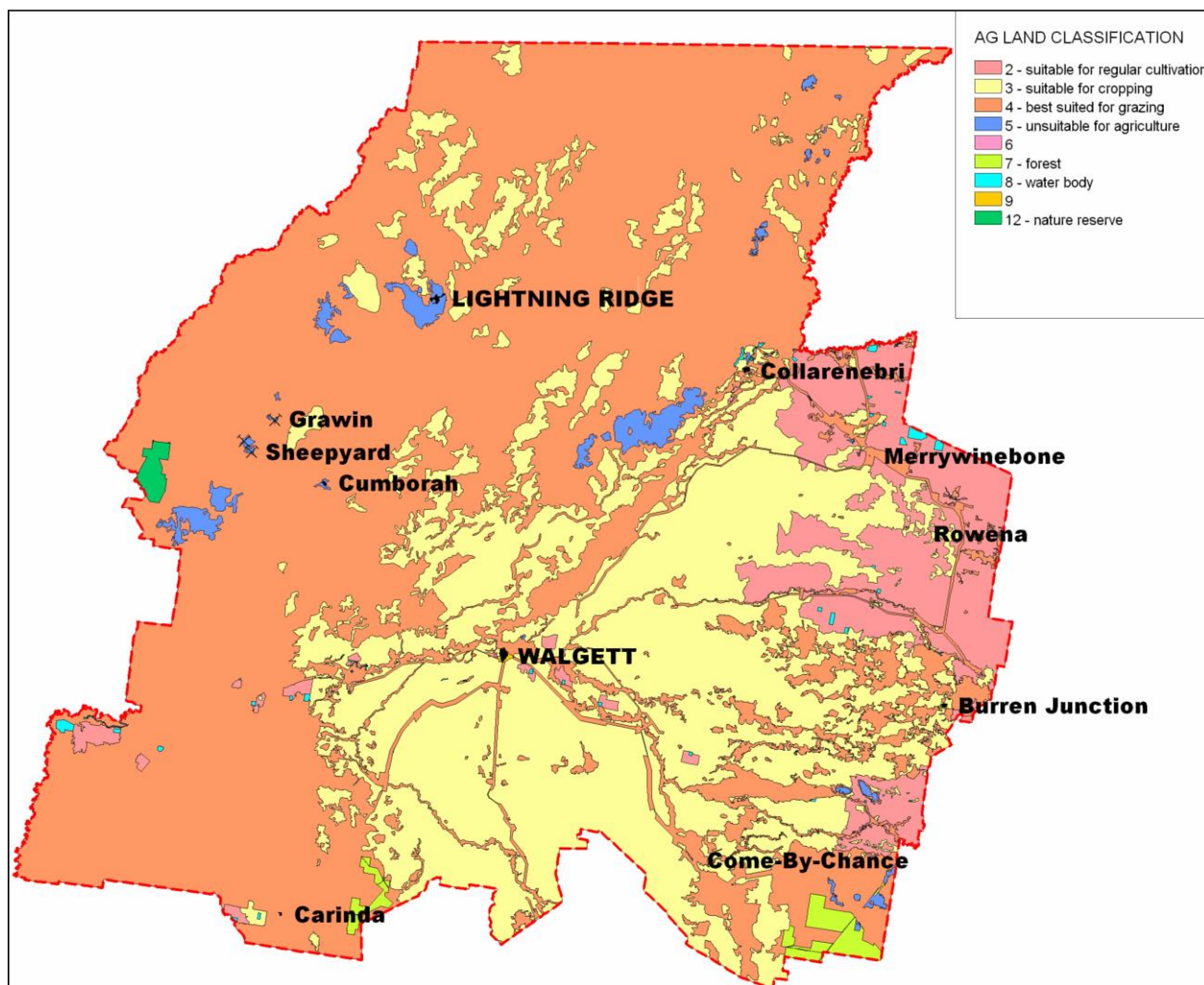


Figure 8 – Land capability map. ⁵

3 LAND

3.1 CLEARING

3.1.1 Pressure

Excessively dense areas of native vegetation in the form of invasive native scrub (INS), dominated by woody weeds such as budda, cypress pine, turpentine and eucalypts, can have significant adverse environmental and agricultural impacts. INS is quite common within the Shire, especially in the Western Division. Dense stands of INS reduce habitat and can lead to increased potential for soil erosion, changes to soil surface hydrology and a change in biodiversity as a result of reduced ground cover. From an agricultural perspective, land affected

⁵ Adapted from GIS data produced by Hindle, J.P., Grosskopf, T. & Watson, C.R., for the Agricultural Land Classification Study – Walgett Shire, published 2000 by NSW Agriculture.

by INS often has negligible productivity. Selective clearing, or thinning, of INS can have positive environmental and agricultural outcomes ⁶.

There is a widespread desire within the local agricultural community for a reduction in regulatory controls which restrict or inhibit land clearing. Many landholders would like the opportunity to clear additional land for the cultivation of crops such as wheat and chickpeas. This desire has been partially stimulated by progressive improvements in cultivation techniques that preserve soil moisture and maximise crop yields.

There are a range of land degradation issues that can arise from inappropriate land clearing, including:

- Soil erosion – Removal of endemic vegetation and cropping of marginal lands can result in increased rates of soil erosion. Drought conditions can further accelerate rates of soil erosion.
- Dryland salinity – Clearing reduces the abundance of deep rooted perennial vegetation which is replaced with comparatively shallow rooted crops and pastures. This can then result in rising water tables.
- Loss of flora and fauna – Clearing reduces the extent and diversity of native vegetation communities, and the habitat available for occupation by native fauna. Many plant and animal species cannot adapt to the changed environmental conditions.
- Water quality degradation – Clearing and cropping near watercourses can reduce surface water quality by increasing soil erosion and sediment loads within watercourses, as well as by allowing pesticides and nutrients to more readily flow into watercourses.
- Chemical alteration of soil – Removal of native vegetation and its replacement with a grazing or cropping system driven by man will change the level of organic carbon, potentially increase the amount of man-made chemicals such as pesticides and fertilisers, as well as possibly alter the nature of biological activity in the soil.
- Weed establishment – The elimination of native vegetation can often result in an increase in the variety and density of weeds species.

⁶ Western Catchment Management Authority

http://www.western.cma.nsw.gov.au/Publications/2011_NV_9_INS.pdf.

3.1.2 State

To be able to determine the current extent of land clearing within the Shire, an understanding of the land use history for the region is required, along with accurate mapping of the extent, density and composition of vegetation communities prior to thinning or clearing. The required mapping does not exist. Nevertheless, high resolution (0.5m pixel) aerial photography taken in 2009 was used to produce a map showing areas where there is clear evidence that endemic vegetation has been cleared (Figure 9). This map indicates that at least 7,104km² (31.8%) of the Shire has been cleared. Extensive areas of thinned vegetation are not shown. Most of the cleared land is held under freehold title and located within the Central Division.

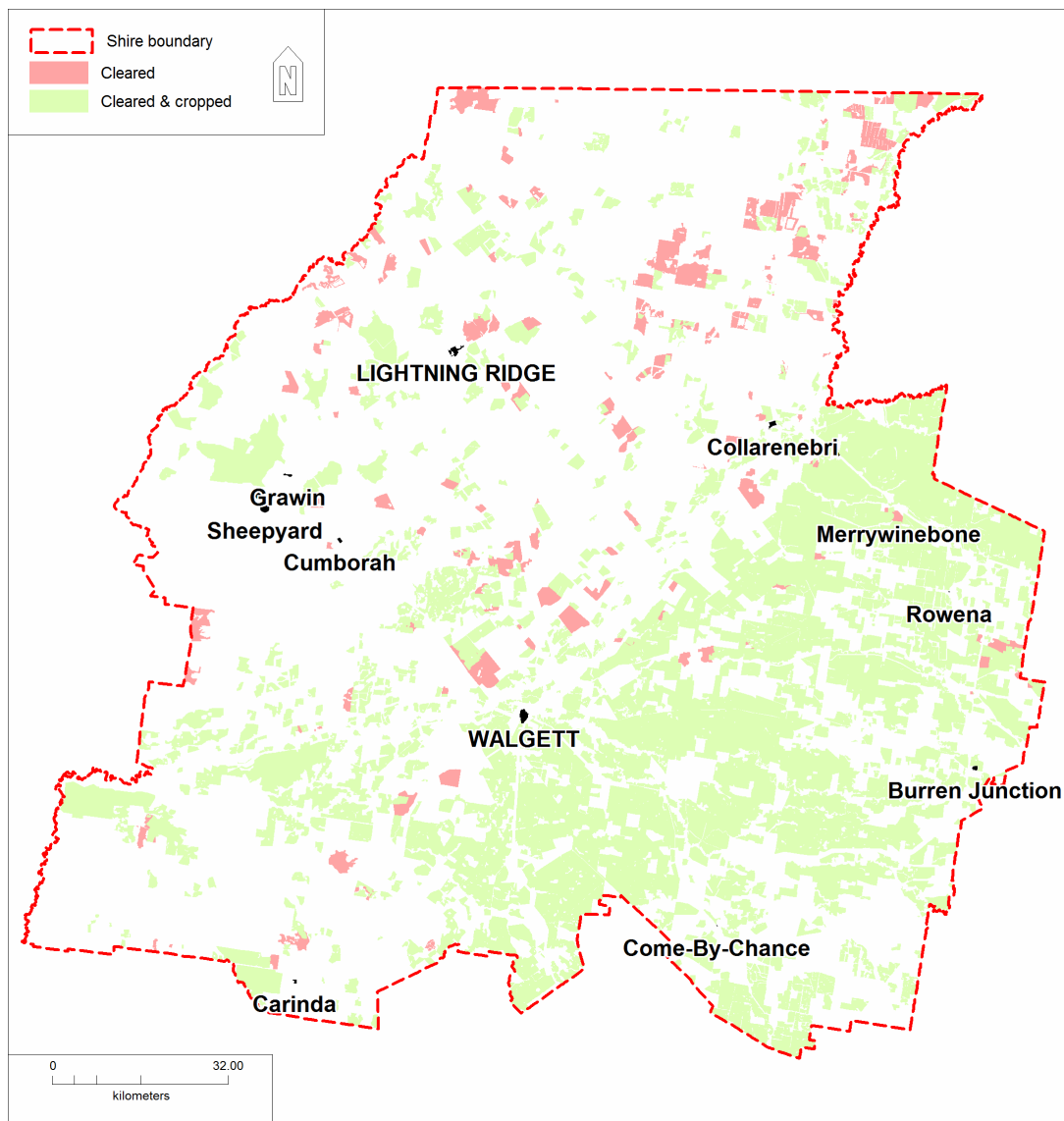


Figure 9 – Minimum extent of cleared land 2009.⁷

⁷ Derived from 0.5m resolution aerial photographs taken during 2009 by the Land and Property Management Authority.

During the 2000s there has been an increasing trend toward farmers moving from cultivation farming to no-till farming systems. One survey has shown that 82% of responding farmers in northern NSW, including within the Walgett region, practice no-till farming ⁸. Recognised benefits of no-till farming include:

- Reduced susceptibility to land degradation through stubble retention,
- More manageable soils and improved soil structure, especially in control traffic situations due to less trafficability,
- Higher levels of organic matter and biological activity,
- Greater amounts of water harvested to grow the crop in dry areas,
- Often less in-crop weed emergence and safer use of pre-emergent herbicide for weed control,
- Under no-till management fields tend to lose less carbon to the atmosphere compared with fields that are cleared yearly,
- Less labour, fuel and machinery costs per hectare; and
- Improved whole farm profitability and sustainability ⁹.

3.1.3 Response

In the period from 1-7-2012 to 30-6-2013 Council was notified that the following Catchment Management Authorities (CMA) had approved the Property Vegetation Plans (PVPs) as follows:

- The Central West CMA approved 0 PVPs (total).
- The Border Rivers – Gwydir CMA approved 0 PVPs (total).
- The Namoi CMA approved 0 PVPs (total).
- The Western CMA approved 4 PVPs (total).

PVPs are a voluntary, legally binding agreement between a landholder and the CMA, which are registered on the land title binding subsequent land owners. CMAs assess PVP proposals for positive and negative impacts on salinity, water quality, biodiversity and soils¹⁰.

There is an ongoing concern within the agricultural community that:

⁸ Western Australian no tillage farmers assoc.

http://www.wantfa.com.au/index.php?option=com_content&view=article&id=94&Itemid=69

⁹ Grains Research & Development Corp http://www.grdc.com.au/uploads/documents/GRDC_adoption_of_no-till.pdf

¹⁰ NSW Office of Environment & Heritage web site at <http://www.environment.nsw.gov.au/vegetation/pvp.htm>

- A better balance needs to be established between opportunities for development and environmental outcomes.
- Excessive regulatory controls on clearing are having an unnecessary adverse impact on the local economy and the sustainability of agriculture.
- Opportunities exist for additional clearing within the Shire that will not have significant adverse environmental impacts, especially the Western Division.

3.2 OPAL MINING

3.2.1 Pressure

There is a widespread desire within the local opal mining community for improved access to land for mining and prospecting. Active opal prospecting and mining occurs to varying degrees on the opal mining 'fields' shown in Figure 10. Opal prospecting is generally undertaken by drilling holes in the ground that range from 0.1 to 1m in diameter and are up to 25m deep. Once opal has been found in an area, underground and open cut mining techniques may be used to extract the opal bearing claystone.

Opal mining can have a number of detrimental environmental impacts, including:

- Soil compaction and erosion – Vehicle movements associated with opal mining and prospecting can result in increased rates of soil compaction and erosion. Rill and gully erosion can occur, especially when access tracks are located perpendicular to the contours of the land.
- Loss of native flora and fauna – Clearing associated with the establishment of mine sites, mullock stockpiles and tailings dams reduces the extent and diversity of native vegetation. Vegetation removal also reduces the habitat available for native fauna.
- Loss of native fauna and domestic livestock – Mine shafts and exploration drill holes can pose a hazard for livestock and fauna, especially if they are not secured (i.e. fenced, covered or backfilled). Animals can be injured, sometimes fatally, when falling into them.
- Chemical alteration of soil and runoff – Moderate levels of salinity within mullock, especially that recovered from deeper (>5m) rock layers, may increase the salinity of soil and runoff.
- Weed establishment – Weeds, especially cacti and succulents, tend to occur more frequently and at a higher density in the vicinity of mining camps on the preserved' opal fields. Many

species were introduced to the area as ornamental plants, but have since become naturalised and are now effectively environmental and agricultural weeds.

- Rubbish – Active and abandoned mine sites can be associated with various forms of rubbish, including derelict mining equipment, car bodies and bottles.

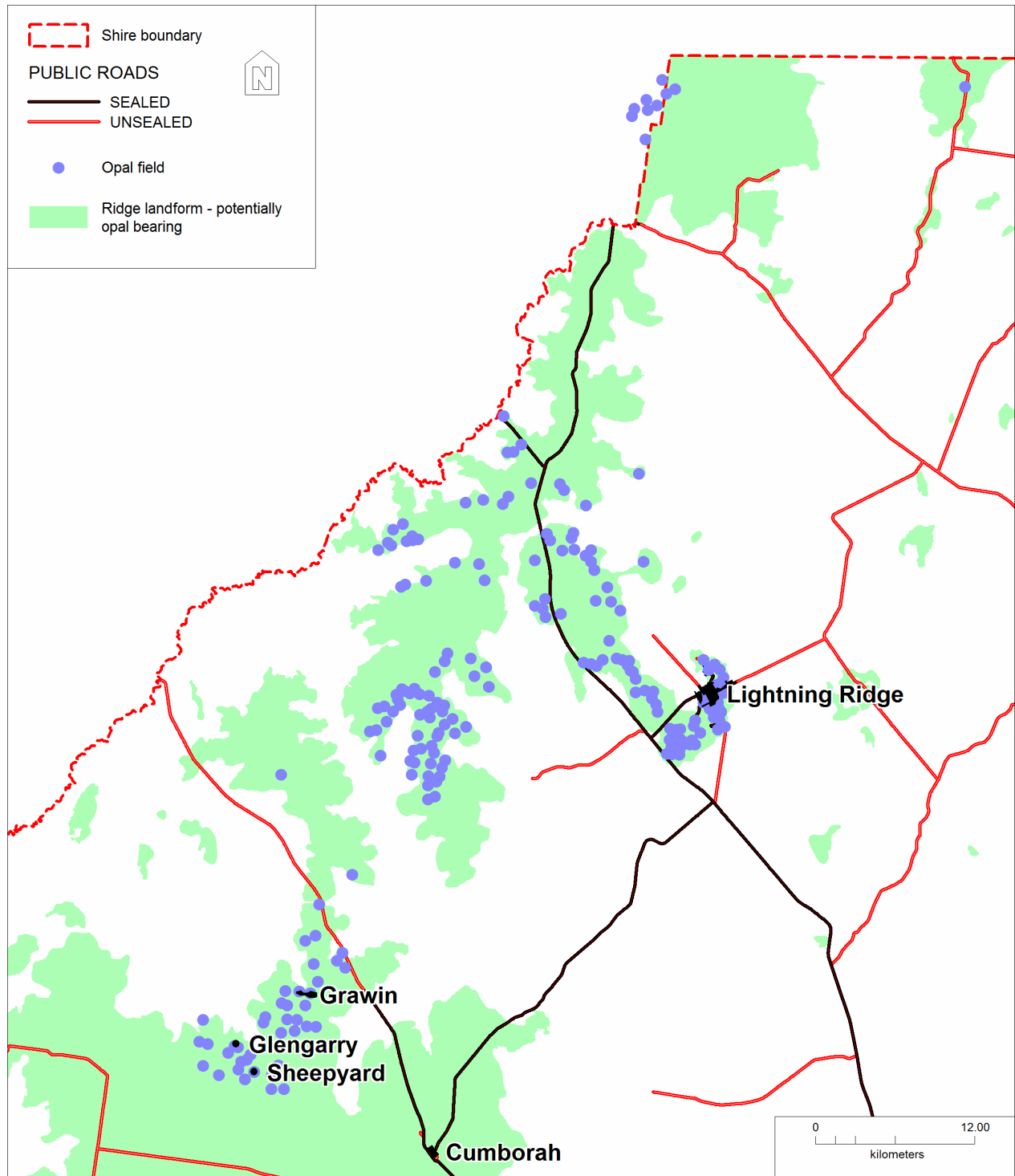


Figure 10 – Location of opal fields.

An example of an area where opal mining and prospecting operations have occurred is shown in Plate 1. Mullock resulting from mining and prospecting operations tends to be white coloured.



Plate 1 – Example of an opal mining area, Coocoran opal fields ¹¹.

3.2.2 State

One of the most active opal mining areas continues to be the Mulga ‘rush’ in the Grawin Glengarry area, discovered late in 2000. Mineral Claim statistics (Table 2) indicate that there has been an ongoing decline in the total number of current claims over recent years.

¹¹ 2009 aerial photograph, supplied by NSW Land & Property Information.

Table 2 – Mineral claims statistics for the Lightning Ridge region ¹².

MINERAL CLAIMS	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
RENEWED	3,394	3,336	2,915	2,696	2,738	2,692	2,830
REGISTERED	784	514	406	381	118	284	257
CANCELLED	626	581	593	372	325	225	279
LAPSED	260	267	290	222	135	87	136
REHABILITATED & SECURITY BOND RELEASED	2,275	2,158	2,618	1,950	774	290	436
CURRENT 30 June	No data.	4,233	3,778	3,482	3,340	3306	3148

3.2.3 Response

Opal mining is primarily regulated by the Mineral Resources division, NSW Department of Trade and Investment, Regional Infrastructure and Services. In recent years the Department has increased the typical security deposit required to be lodged for each Mineral Claim from \$100 to \$700. In the event that a claim is not satisfactorily rehabilitated when mining operations have ceased, the Department can use the security to undertake any rehabilitation earthworks that may be required.

The Department has advised that various rehabilitation projects were undertaken during 2012-2013, including:

- Rehabilitation of the Western Fall Open Cut Mine and a subsidence area in Coocoran C opal field.
- Backfilling of numerous mine shafts on the Warrengulla property, and near the Lightning Ridge landfill.
- Removing rubbish and mullock from several sites.
- Upgrading fencing of mine shafts with heritage values.

¹² Mineral Resources division, NSW Department of Trade and Investment, Regional Infrastructure and Services, Lightning Ridge



Plates 2 & 3 – Before and after example of a rehabilitated opal mining subsidence area, near Astronomer's Monument, Lightning Ridge.

3.3 LOCAL ENVIRONMENTAL PLAN

3.3.1 Pressure

Under the provisions of the Environmental Planning and Assessment Act 1979, Council is the authority which determines whether a development proposal should be approved via a Development Application. As part of the process to assess a development proposal, Council provides neighbours to significant development with the opportunity to make written submissions regarding the proposal. Periodically Council receives objections to a proposal and is obligated to balance the concerns of objectors against the benefits which are expected for the community if a development is approved.

3.3.2 State

The zoning of a given parcel of land is a key factor which determines whether a proposed development is permitted or not within a given area. Council's has recently updated it's zoning maps in conjunction with the introduction of a new environmental planning instrument.

3.3.3 Response

During 2011-2012 Walgett Shire Council adopted a Draft Local Environmental Plan (LEP). The LEP superseded the Interim Development Order No. 1 – Shire of Walgett on 5 July 2013. The LEP is based on recommendations contained in the Walgett Shire Growth Management Study and Strategy. Key changes resulting from gazettal of the LEP include:

- A planning scheme that is based on current planning legislation.
- Replacement of “Village” zones in Walgett and Lightning Ridge with specific residential, commercial and industrial zones. This will provide more certainty for developers and residents about what land uses are, and are not, permitted within particular areas. In turn it is expected that this will reduce the potential for land use conflict in the future.
- A minimum subdivision size of 400 hectares for a dwelling entitlement in rural areas. This development standard is expected to reduce fragmentation of rural land for non-agricultural uses, hence contribute to ensuring the long term availability of land for agricultural use.
- Zoning older opal fields commonly known as the ‘preserved opal fields’ to reflect their dominant historic, and expected future, land use.

- Establishment of a large lot residential zone in Carinda to define the village centre and provide a range of housing opportunities.

3.4 WEEDS - *Cylindropuntia rosea*

3.4.1 Pressure

A wide range of agricultural and environmental weeds exist within Walgett Shire¹³. One of the major problem species is *Cylindropuntia rosea*, and another is *Cylindropuntia tunicata*¹⁴.

Although these weeds are superficially similar in appearance, *C. rosea* has white spines (as shown in Plate 2) and pink flowers, while *C. tunicata* has spines that are pale brown and off yellow coloured flowers. Locally both species are known by a range of informal names, including thistle cholla, Hudson pear and tiger pear.



Plate 4 – *Cylindropuntia rosea*, spines are about 4cm long.

¹³ <http://www.noxiousweeds.org.au/declared-weeds>

¹⁴ <http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles/hudson-pear>

Locally *C. rosea* is the most abundant of the two species, and has recently been declared a noxious weed under the *Noxious Weeds Act 1993*. Its control class is a class 4 noxious weed throughout NSW¹⁵. It forms plants up to two metres tall that occur in densities ranging from less than one plant per hectare up to more thousands of plant per hectare. Segments of the cactus readily break upon contact with a tyre, animal or person and become temporarily impaled in the tyre or flesh, and are frequently transported to another location that was previously free of infestation with the plant.

Both species are significant agricultural and environmental weeds. The spines readily penetrate the flesh of animals, including humans. Dense infestations of the plant form barriers that are hazardous for animals to walk through.

3.4.2 State

Based on data supplied by the Castlereagh Macquarie Country Council, historically there has been five medium to high density occurrences of *C. rosea* with a combined area of about 111km², as shown in Figure 11. Scattered plants have been found over an area of about 458 km². *C. tunicata* plants are known from the general vicinity of the Grawin opal fields and the Old Coocoran opal field.

Presently plants larger than 0.5m high are quite rare because most have been killed by herbicide spraying since the early 2000s. Now the vast majority of plants are under 10cm in size and tend to be found clustered at sites where larger plants grew previously.

¹⁵ <http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles/hudson-pear>

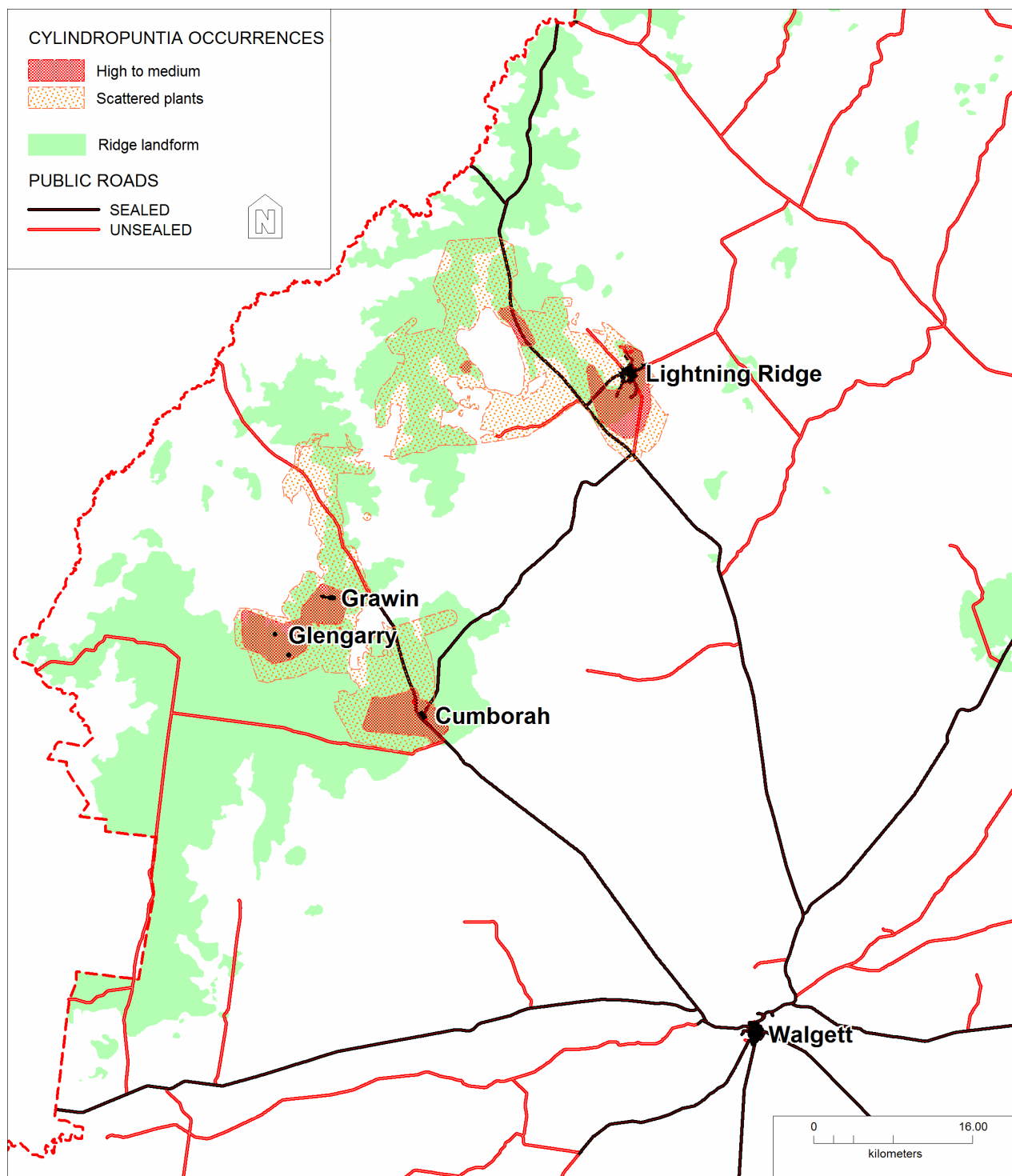


Figure 11 – Approximate distribution of *Cylindropuntia rosea*.

3.4.3 Response

Commencing in 2002-03, substantial work to control *Cylindropuntia rosea* using herbicide has been undertaken with the assistance of a grant from the Natural Heritage Trust to the Lightning Ridge Miners Association. Since 2002-03 there has been an ongoing project led by the Castlereagh Macquarie County Council to use herbicides to control *C. rosea*. In the period from 2005 to 2009 Walgett Shire Council committed \$40,000 per annum to the project (\$200,000 total). Funds and resources have also been provided by:

- The Western Catchment Management Authority.
- NSW Department of Trade and Investment, Regional Infrastructure and Services
- The Natural Heritage Trust.
- Local landholders, opal miners and residents.
- The Lightning Ridge and Grawin Glengarry Sheeppark Miners Associations.

Walgett Shire Council is currently sourcing additional grant funding for control, and a meeting of key stakeholders is planned for September 2013.

Controlling *C. rosea* using traditional methods, such as chemical application, is made more difficult by the types of terrain and vegetation in which infestations are located. As the plant occurs over an extremely large area, there is no possibility of successfully locating and destroying all cactus segments. However, there is a place for traditional control techniques in an integrated approach to *C. rosea* management. Core infestations would be best dealt with using biological control agents whilst targeting outlying areas with chemical applications or other conventional techniques such as physical removal. Biological control agents, once established, would form self-perpetuating populations that will gradually spread throughout the distribution of *C. rosea*. This Integrated Weed Management approach has the advantage of diverting limited resources to areas with the greatest potential impact as it is usually from these outlying infestations that a weed species spreads.

The NSW Department of Trade and Investment, Regional Infrastructure and Services has been coordinating research into potential biological controls in recent years. *Dactylopius tomentosus*, a species of cochineal insect introduced to control rope pear (*C. imbricata*) also attacks *C. rosea*, but is not particularly damaging. Recent South African research has shown that there are several biotypes of *D. tomentosus* present in Mexico, at least one of which is likely to be more damaging to *C. rosea*. The Department expects that there should be few host specificity issues associated with the introduction of additional *D. tomentosus* biotypes as there are no Australian native

species in the Cactaceae (cactus) family and the species is already present in Australia.

Cochineal insects used to control cactus all appear to be very specific and this is likely to be the case with the biotype for *C. rosea*.

In August 2010 samples of *D. tomentosus* were transported from Mexico to Australia for detailed host-specificity testing in quarantine, and this process has recently been completed¹⁶. The Department is scheduled to release 3 variants of the imported *D. tomentosus* insect in the 2014 calendar year.

Significant progress is being made in efforts to control *C. rosea* and *C. tunicata*, although it appears unlikely that either species will be eliminated from the Shire, given they are established over broad areas and they have not been successfully eliminated from small areas. Current efforts to control the *C. rosea* are primarily chemically based and focused on the preserved opal fields surrounding Lightning Ridge, Grawin, Glengarry and Sheeppyard.

4 AIR

4.1 WALGETT AIRPORT PESTICIDE RESIDUE POND

4.1.1 Pressure

At the Walgett airport there is a wash down bay that was used for several years up to 1999 to clean crop dusting planes, as shown in Plate 3. Runoff water from the washing down of crop dusters was held within an earth dam, which is now contaminated with pesticide residues. Soil samples taken by environmental consulting firm, URS, in 2001 showed that there were significant levels of a number of pesticides within 0.5m of the surface of the pond. Historically there have been a number of complaints, especially during summer months, about chemical odours from people living near the Walgett aerodrome.

¹⁶ http://www.dpi.qld.gov.au/4790_19382.htm



Plate 5 – Pesticide residue pond, November 2001.

4.1.2 State

Council has been considering options for dealing with the contaminated site. In December 2009 soil known to be contaminated was excavated and stockpiled on the site (see Plate 6), pending further analysis of the contaminant levels within the soil. Council received some complaints from nearby residents during the excavation process that a noxious chemical odour was emanating from the site, especially during periods when the wind was blowing from an easterly direction.



Plate 6 – Contaminated soil stockpile covered with plastic & soil, December 2010.

Parsons Brinckerhoff provided Council with a report titled '*Waste Classification for Stockpile Located in the Vicinity of Former Crop Duster Wash Down Area at the Walgett Airport*', dated 7 January 2010. The key issues which arose from that report include:

- Soil analysis results which indicate that the contaminated soil stockpile is classified as “restricted solid waste” under current Department of Environment Climate Change and Water (DECCW) ‘Waste Classification Guidelines’.
- Contaminated soil remains in the floor of the excavated area and in the vicinity of where it is assumed that the pond overflowed when in use.
- The level of contamination in the soil means that it is presently classified as “*restricted solid waste*” and cannot be disposed of in the Walgett Waste Depot (which can only accept “*general solid waste*”).

4.1.3 Response

Parsons Brinckerhoff were engaged by Council to trial the addition of lime to the contaminated soil, which may hydrolyse (break down) the contaminants over time. The NSW Office of Environment and Heritage previously indicated that this may reduce the contamination to a “general solid waste” classification, thereby enabling the legitimate disposal of the soil at the Walgett Waste Depot.

The report titled '*Pilot Soil Treatment Trial for stockpile located in the vicinity of former crop duster wash down area at the Walgett Airport*' was completed by Parsons Brinckerhoff on 16 September 2010. Key issues arising from the report include:

- Adding hydrate lime to the soil was suitable to hydrolyse (ie. decompose by reacting with water) the two main contaminants in the soil (Chlorpyrifos and Endosulfan) and accelerate their degradation.
- The current recommendation is for the soil to be treated and remediated on site (as opposed to the previous recommendation of removing the contaminated to the Walgett waste disposal facility).

Early in 2011 Parsons Brinckerhoff advised Council that recent information it had obtained indicated that lime in the soil may have ‘masked’ the true level of contamination in soil samples analysed for the 16 September 2010 report. As a result further analysis work is required to

reliably determine how effective lime is for reducing contamination levels. Council expects to undertake further consultation with the NSW Office of Environment and Heritage (includes the former EPA) regarding this matter prior to determining what action to take.

5 WATER

5.1 URBAN WATER SUPPLIES

5.1.1 Pressure

Walgett Shire Council supplies water to numerous residential and commercial residences within urban areas as outlined in Table 3 below. The 'sites' figure represents the number of properties on which Walgett Shire Council levies water rates (includes some vacant lots).

Table 3 – Council operated urban water supplies.

LOCATION	SOURCE	SUPPLY	TREATMENT	WATER METER ASSESSMENT SITES	
				BUSINESS (OTHER)	20mm DOMESTIC/ BUSINESS
WALGETT	Weir on Namoi River Bore also available	Treated Raw	Filtration & chlorination	20	793
				10	810
LIGHTNING RIDGE	Artesian Bore	Raw	Nil	17	770
COLLARENEBRI	Weir on Barwon River	Treated Raw	Microfiltration & chlorination	8	250
				2	251
VILLAGES	Bore	Raw	Nil	5	77
TOTAL				62	2951

Council has an obligation to ensure that water supplies are suitable for their intended uses. The Australian Drinking Water Guidelines 2004 (ADWG) ¹⁷ are the key standards against which NSW Health and local Councils assess drinking water quality. The guidelines specify thresholds for drinking water quality amongst other things.

The quality of water supplied by Council may vary for a number of reasons, including:

- Environmental changes affect raw water quality, for example river water invariably has an increased sediment load during flood periods.
- Human activities affect raw water quality, for example pesticide residues in river water.
- The types and effectiveness of water treatment processes applied to water prior to its distribution within urban areas.
- The age and condition of water mains and storage reservoirs. For example periodic cleaning of reservoirs is required to remove sediment.

¹⁷ Australian Drinking Water Guidelines 2004, available from <http://www.nhmrc.gov.au/publications/synopses/eh19syn.htm>

5.1.2 State

Walgett Shire Council assesses potable water quality via a number of sampling programs as detailed within Table 4.

Table 4 – Monitoring programs associated with urban potable water.

PROGRAM	PURPOSE	FREQUENCY
Potable urban – microbiological	Samples submitted to NSW Health Division of Analytical Laboratories in Sydney to test all Council's potable urban supplies for contamination by <i>E. coli</i> . Data is also provided on total coliform counts, which are not normally of concern provided that samples are free of <i>E. coli</i> .	Permanent, weekly in Walgett, Lightning Ridge and Collarenebri. Monthly in Rowena, Cumborah and Carinda.
Potable urban – chemical	Samples submitted to NSW Health Division of Analytical Laboratories in Sydney to test all Council's urban supplies for compliance with chemical thresholds specified in the ADWG. Each sample is analysed for pH, turbidity, Total Dissolved Solids (TDS), aluminium, antimony, arsenic, barium, boron, cadmium, calcium, chloride, chromium, copper, cyanide, fluoride, iodine, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, nitrate, nitrite, selenium, silver, sodium, sulphate, total hardness as CaCO ₃ , true colour, zinc.	Permanent, twice yearly

A summary of significant results for the period is provided in Table 5.

Table 5 – Significant water analysis results 1 July 2012 to 30 June 2013.

TOWN/VILLAGE	ISSUE
WALGETT	<ul style="list-style-type: none"> 1 out of 48 samples showed the presence of total coliforms.
LIGHTNING RIDGE	<ul style="list-style-type: none"> 2 out of 55 samples showed the presence of total coliforms. The average pH was 8.6 (the ADWG recommends a maximum of 8.5). Average sodium content was 233mg/L (the ADWG recommends a maximum of 180mg/L). <p>NOTE: Slightly elevated sodium value is typical for this supply system and others sourced from artesian bores in the region.</p>
COLLARENEBRI	<ul style="list-style-type: none"> 4 out of 50 samples showed the presence of total coliforms. 2 out of 50 samples showed the presence of <i>E. coli</i>. The average pH was 10.1 (the ADWG recommends a maximum of 8.5). Water colour was 26.00 hazen units when guidelines recommend a maximum of 15.00 hazen units. <p>NOTE: The colour of the water was adversely affected by flood events within the Barwon River.</p>

TOWN/VILLAGE	ISSUE
CARINDA	<p>NON-POTABLE SUPPLY</p> <ul style="list-style-type: none"> • 2 out of 13 samples showed the presence of total coliforms. • Average sodium content was 298 mg/L (the ADWG recommends a maximum of 180mg/L). • Average true colour measurement was 609 mg/L when guidelines recommend a maximum of 600 mg/L.
ROWENA	<ul style="list-style-type: none"> • 5 out of 12 samples showed total coliforms. • 1 out of 12 samples showed the presence of <i>E. coli</i>. • Sodium levels were 225 mg/L (the ADWG recommends a maximum of 180mg/L).
CUMBORAH	<ul style="list-style-type: none"> • 11 out of 11 samples showed the presence of total coliforms. • The average pH was 8.65 (the ADWG recommends a maximum of 8.5). • Average sodium content was 270.5 mg/L (the ADWG recommends a maximum of 180mg/L).

5.1.3 Response

From Table 5 it is apparent that total coliforms were found on a number of occasions in the various potable water supplies. The ADWG indicate coliforms can be present in drinking water as a result of:

- faecal contamination
- the presence of biofilms on pipes and fixtures
- contact with soil as a result of leaks, fractures or repair works.

Due to their widespread occurrence in soil and water environments, total coliforms (in the absence of *E. coli*) are not regarded as a specific indicator of faecal contamination. The relative abundance of coliforms makes them useful in monitoring the efficiency of water treatment and disinfection processes.

As noted in Table 5, some samples show that the respective water supplies were contaminated with *E. coli* during the year. The contamination was addressed by chlorination to destroy the *E. coli*. Follow up testing was undertaken to confirm that the contamination had been dealt with. Flood events in the Barwon River have had an ongoing periodic adverse impact on the Collarenebri supply system. Council is actively reviewing options for upgrading the treatment system to improve quality of supply.

6 BIODIVERSITY

6.1 ENDANGERED ECOLOGICAL COMMUNITIES

6.1.1 Pressure

A number of types of woodlands that exist within the Shire have been extensively cleared and modified since the arrival of European man. Fragmentation, overgrazing, weed invasion and alteration of flood regimes, amongst other things, can pose a threat to the long term viability of such ecological communities.

6.1.2 State

The NSW Threatened Species Conservation Act 1995 establishes an independent Scientific Committee, not subject to the control and direction of the Government, to determine which species, populations and communities are to be listed as threatened. That committee has determined that a number of ecological communities which are known to exist within the Shire should be regarded as endangered under the Act. Table 7 summarises the communities listed under that Act.

Under section 78A(8)(b) of the Environmental Planning and Assessment Act 1979, any Development Application which involves land that is critical habitat, or is likely to significantly affect threatened species (listed in Appendix B), populations or ecological communities or their habitat, must be accompanied by a 'species impact statement'. A species impact statement must be prepared in the manner prescribed under Division 2 of Part 6 of the Threatened Species Conservation Act 1995.

Table 7 – Endangered ecological communities.

ENDANGERED ECOLOGICAL COMMUNITY	DATE
Artesian Springs Ecological Community	2001
Brigalow-Gidgee woodland/shrubland in the Mulga Lands and Darling Riverine Plains Bioregions	2005
Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions	2005
<i>Cadellia pentastylis</i> (Ooline) community in the Nandewar and Brigalow Belt South Bioregions	1998
Carbeen Open Forest community in the Darling Riverine Plains and Brigalow Belt South Bioregions	1999
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes Bioregions	2005
Coolibah – Black Box Woodland of the northern riverine plains in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, and Mulga Lands Bioregions	2012

6.1.3 Response

In June 2011 the NSW Office of Environment and Heritage provided Council with mapping data for environmentally sensitive areas, including Endangered Ecological Communities, intended for use in Local Environmental Plan (LEP) mapping. A Council review of the data indicated that it was generally of comparatively poor quality, incomplete, and not fit for use in LEP mapping.

The lack of accurate mapping for threatened species, including endangered ecological communities, represents a significant gap in the information required to improve the management of threatened species.

7 WASTE

7.1 URBAN WASTE DISPOSAL

7.1.1 Pressure

The main waste depots within the Shire are located at Walgett and Lightning Ridge and are manned during opening hours. Within the short term the Lightning Ridge facility is expected to be at the end of its useful life. Smaller facilities are operated at Burren Junction, Carinda, Collarenebri, Rowena and Come-by-Chance.

7.1.2 State

Estimates of the quantities of waste received at the Walgett and Lightning Ridge waste depots are provided in Table 8. No kerbside recycling is undertaken in any of the communities within the Shire, but the contractors operating the Walgett and Lightning Ridge waste depots undertake opportunistic recycling where possible. Vegetation removed as a result of Council maintenance operations is chipped and reused as mulch where possible.

Table 8 – Waste volumes 2012-2013 ¹⁸.

LOCATION	WASTE QUANTITY (tonnes)	URBAN POPULATION 2006	WASTE PER CAPITA (tonnes)
WALGETT	18,637	1,731	10.75
LIGHTNING RIDGE	5,645	1,556	3.63
COLLARENEBRI	246	477	0.52
CARINDA	56	94	0.60
ROWENA	55	23	2.39

Given that the figures within Table 8 show a wide range in the quantity of waste on a per capita basis, it appears that the figures are likely to contain significant inaccuracies.

7.1.3 Response

For several years Walgett Shire Council has been engaged in consultation with the community regarding options for waste disposal at Lightning Ridge. Consideration of two potential sites was abandoned after Council received objections from the community. Further work is required to formalise future waste disposal arrangements at Lightning Ridge.

Further work is also required by Council to:

- Accurately determine the volumes of waste being disposed of.
- Increase the proportion of waste that is being recycled.

8 NOISE

8.1 DOMESTIC NOISE

8.1.1 Pressure

Noise is rarely regarded as a significant issue within the Shire, as there are few substantial noise generating developments. Most problems arise in a domestic context with issues such as a barking dog or loud music. Such issues tend to occur more frequently in association with camp mineral claims on the opal mining fields.

¹⁸ Population figures taken from ABS data, except Rowena where figures are based on number of dwellings multiplied by the ABS dwelling occupancy rate for the relevant Collector District

8.1.2 State

Council receives sporadic complaints about the noise created by generators operating at what are perceived as “late” hours by the complainant.

Although the issue is relatively simple in itself, complications arise from community attitudes that vary from acceptance that “it is part of living on the opal fields” through to an expectation that legislative requirements should be rigorously enforced. In some cases it appears that personality conflicts may be a significant factor in the complaint.

8.1.3 Response

In the majority of situations Walgett Shire Council advocates that any party concerned by generator noise should discuss the matter directly with the owner of the generator. The suggested objective of the discussion is to develop a mutually acceptable outcome. Other situations are dealt with on a case-by-case basis.

9 ABORIGINAL HERITAGE

9.1.1 Pressure

There are numerous aboriginal heritage sites within the Walgett Shire, most of which would not be recognised by a casual observer. Relatively common examples include scarred trees, stone tools and camp sites in rural areas. Such sites can be at risk of damage from livestock or people.

9.1.2 State

The NSW Department of Environment, Climate Change and Water maintains the Aboriginal Heritage Information Management System (AHIMS), which is a database of most known aboriginal heritage sites. The database is known to be incomplete, with many known sites not listed. It is also expected that there are significant numbers of currently unknown sites that are likely to be found in the future, especially where a systematic survey of a particular area occurs.

Aboriginal heritage items recorded by the Commonwealth Department of the Environment, Water, Heritage and the Arts in the Register of the National Estate database are listed in Table 9. Following amendments to the *Australian Heritage Council Act 2003*, the Register of the National Estate (RNE) was frozen on 19 February 2007, which means that no new places can be added, or removed. On 19 February 2012 all references to the Register were removed from the

Environmental Protection and Biodiversity Conservation Act (1999) and the Australian Heritage Council Act (2003). The RNE is maintained on a non-statutory basis as a publicly available archive.

Table 9 – Sites listed on the Register of the National Estate ¹⁹.

ITEM	LOCATION	STATUS
Collarenebri Aboriginal Cemetery	Collarenebri	Registered
Indigenous Place	Walgett	Indicative Place
Indigenous Place	Barokaville Station, via Walgett	Indicative Place
Indigenous Place	Gingie Station, via Walgett	Indicative Place
Indigenous Place	Brewarrina	Registered
Indigenous Place	Walgett	Indicative Place
Indigenous Place	Walgett	Registered

9.1.3 Response

At a meeting held on 27 October 2009 Walgett Shire Council resolved to accept an expression of interest from Australian Museum Business Services to undertake the study in accordance with the Walgett Shire Aboriginal Heritage Study Consultant's Brief (based on a standard brief provided by the Heritage Office). A key element of the brief was to prepare a thematic aboriginal history of the Walgett Shire.

Australian Museum Business Services have completed the Walgett Shire Aboriginal Heritage Study. Two versions of the study have been provided to Council as follows:

- * Complete version – which includes culturally sensitive information, including maps showing the location of some aboriginal heritage sites within the Shire.
- * Public version – which does not include culturally sensitive information. This version can be accessed via Council's web site at

<http://www.walgett.nsw.gov.au/planning/1119/188801.html>

Access to the complete version has been restricted to senior Council staff involved in infrastructure planning and development assessment. It will be used to determine whether there

are known items of aboriginal heritage in a given area and/or whether the area is likely to be a place of heritage significance. In turn this will assist in determining whether an aboriginal heritage assessment is required.

Chapter 6 of the study includes a series of recommendations by Australian Museum Business Services to Walgett Shire Council regarding Aboriginal Heritage. At a meeting held on 26 July 2011 Council resolved to endorse the land use planning recommendations in sections 6.1.1, 6.1.2, 6.1.3, 6.1.4 and 6.1.5 of the study.

10 NON-ABORIGINAL HERITAGE

10.1.1 Pressure

Walgett Shire Council engaged a Heritage Advisor to undertake a community based heritage study, which was completed at request in 2008²⁰. That study identified numerous buildings and other features as being of heritage significance. Several heritage buildings have since been destroyed by fire and storms. Many of the heritage structures are vulnerable to damage due to their age, limited maintenance and being predominantly constructed from wood.

The Walgett Local Environmental Plan (LEP) includes a schedule of heritage items that are of local significance. This has the effect of requiring Council, as the relevant consent authority, to consider the impact of the proposed development on the heritage significance of the item or area concerned before granting development consent.

10.1.2 Heritage Registers

The Walgett Freedom Ride Sites (1965) are the only local items listed in the National Heritage List²¹. There are no items listed in the State Heritage Register for Walgett Shire. Items recorded by the Australian Heritage Commission in the Register of the National Estate database (non-statutory archive)²¹, are listed in Table 10. Ultimately the present state of heritage items in the Shire is relatively poorly understood.

²⁰ Community Based Heritage Study of Walgett Shire <http://www.walgett.nsw.gov.au/planning/1119/3457.html>

²¹ Australian Heritage Database <http://www.environment.gov.au/cgi-bin/ahdb/search.pl>

Table 10 – Sites listed on the Register of the National Estate ²².

ITEM	LOCATION	STATUS
Cuddie Springs Palaeontological Site	Carinda	Indicative Place
Lightning Ridge Hot Artesian Bore Baths Pandora St	Lightning Ridge	Indicative Place
Narran Lakes Area	Brewarrina	Registered
Nettleton's Shaft	Lightning Ridge	Registered
Two Mile Creek Rail Bridge	Walgett	Registered
Walgett Courthouse 55 Wee Waa St	Walgett	Registered
Walgett Shire Council Chambers (former) 78 Fox St	Walgett	Indicative Place

10.1.3 Response

During 2012-2013 Walgett Shire Council invited owners heritage items to apply for grants to assist with the maintenance of those items. Grants paid are detailed in Table 11 below. As noted, the Heritage Branch of the NSW Office of Environment and Heritage reimbursed Council for \$7,152 of the grant funds.

Table 11 – Walgett Shire local heritage fund grants 2012-2013.

Applicant	Heritage Item Address	Project Description	Total Project Cost	Applicant's contribution	Local Heritage Funding
Lightning Ridge Historical Society	3 Mile Opal Field Lightning Ridge	Stabilise and repair former 3 Mile Post Office hut.	\$1,875	\$975	\$900
D Marshall	13 Waterloo St Burren Junction	Restore floors of Burren Junction CWA Hall	\$4,416.50	\$2,208.25	\$2,208.25
J Keir	Colless Street, Come by Chance	Restore floors of Come by Chance Hall	\$5000	\$2500	\$2500
P & C Marshall	"Glenburnie", Burren Junction	Finalise restoration of stables	\$7350	\$3675	\$3675
Total			\$28745	\$15070	\$13675

²² Australian Heritage Database <http://www.environment.gov.au/cgi-bin/ahdb/search.pl>

11 MORE INFORMATION

More information on local environmental matters can be found at the following web sites:

- [Walgett Shire Growth Management Study and Strategy](#), which provides information on the environment and land use issues within the Shire,
- [Draft Walgett Shire Local Environmental Plan 2012](#).
- Data on threatened species, populations and ecological communities
<http://www.threatenedspecies.environment.nsw.gov.au/index.aspx>
- NSW Natural Resources Atlas, <http://www.nratlas.nsw.gov.au/wmc/savedapps/nratlas>
- Ecologically Sustainable Development, <http://www.deh.gov.au/esd/>
- Murray–Darling Basin Authority, <http://www.mdba.gov.au/>
- NSW State Heritage Inventory and State Heritage Register,
http://www.heritage.nsw.gov.au/07_subnav_02.cfm
- Australian Heritage Database, <http://www.environment.gov.au/cgi-bin/ahdb/search.pl>
- Public register under the Protection of the Environment Operations Act 1997,
<http://www.environment.nsw.gov.au/prpoeo/index.htm>
- NSW Department of Primary Industries- Hudson Pear, Weed of National Significance,
<http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles/hudson-pear>
- River water quality indicators, <http://www.waterinfo.nsw.gov.au/>
- Public Register of Approved Clearing PVPs and Development Applications,
<http://www.environment.nsw.gov.au/vegetation/publicregister.htm>

For more information on specific issues covered in this report please contact the Director of Planning and Regulatory Services, Matthew Goodwin, at Walgett Shire Council.