Attachment C

Draft State of the Environment Report

WALGETT SHIRE COUNCIL
LANA NOSTRAE DIVITIAE EST

DRAFT STATE OF THE ENVIRONMENT REPORT

2017

1 INTRODUCTION

All councils are required to prepare a State of the Environment report (SOE) and make that report available to the public, as well as submitting it to the Division of Local Government, Department of Premier and Cabinet. Supplementary reports provide an update on existing issues, as well as outlining new ones that have arisen since the previous SOE. Comprehensive SOEs are required to be prepared in the "year ending after each election of the councillors for its area".

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).

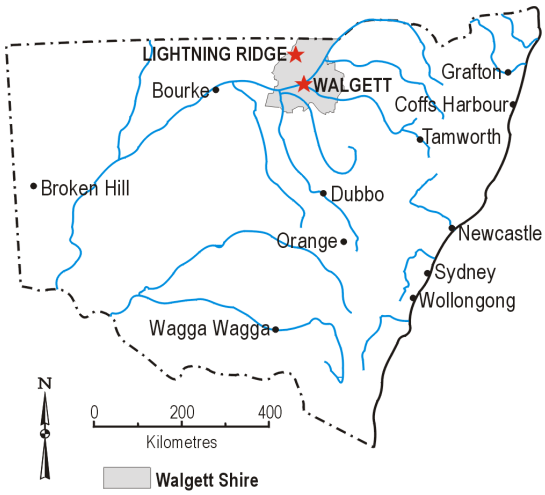


Figure 1 – Location of Walgett Shire in NSW.

Figure 2 – Adjoining shires.

2.1 LAND TITLES

Administratively Walgett Shire is separated into the Central Division (11,310 km^2) and the Western Division (11,030 km^2). 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.

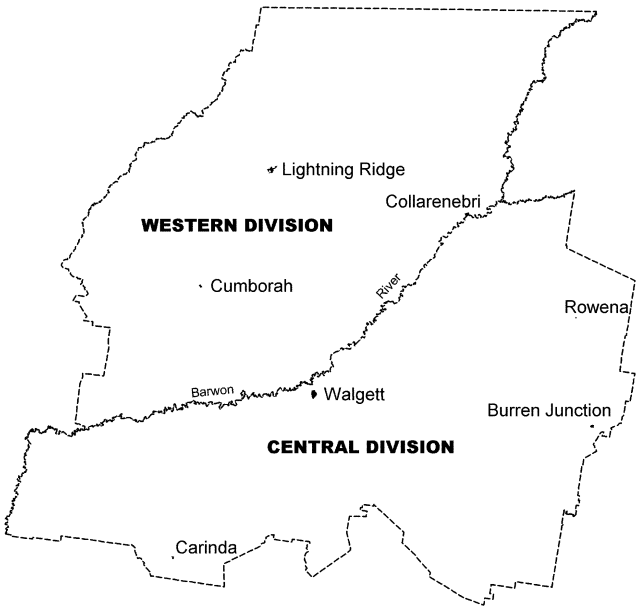


Figure 3 – Western and Central Divisions.

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.

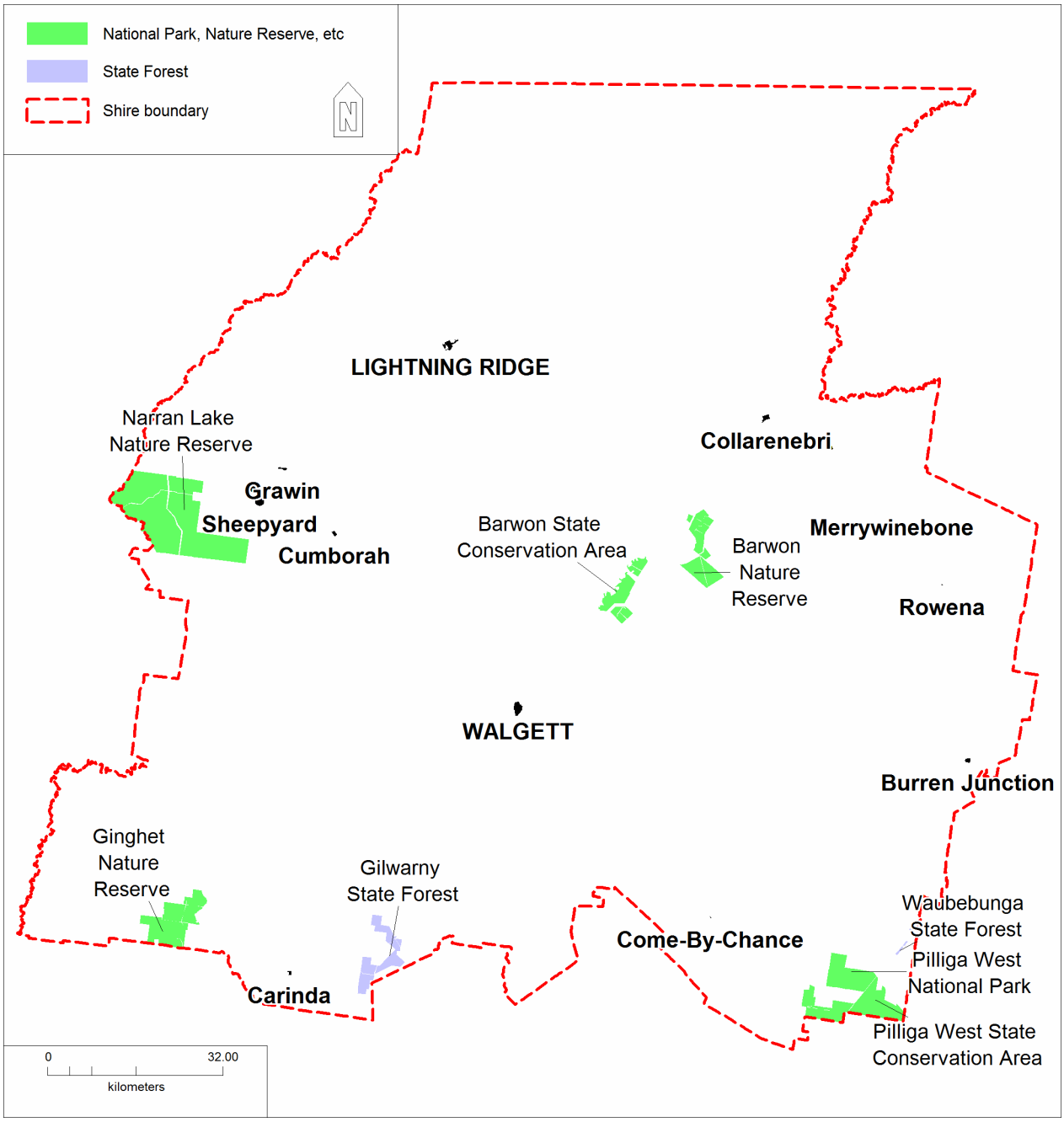


Figure 4 – Nature reserves and state forests within the Walgett Shire.

2.1.1 CROWN RESERVES BY MANAGEMENT TYPE FOR WALGETT LGA

- Council - 53
- Corporation - 9
- No management - 4
- Administrator - 0
- Trust unknown - 13
- Devolved to Council - 19
- Department of Industry - Crown Lands & Water - 1
- Trust Board – 5

2.1.2 Rural WLLs

Total number of Rural WLLs in Walgett LGA: 542

Area of Rural WLLs in Walgett LGA: 1,331,694ha

2.1.3 Cultivation Consents

Total number of consents: 169 Cultivation Consents

Area of Cultivation Consents: 122,394 ha

2.1.4 Voluntary Surrender Scheme (VSS) at Lightning Ridge

The total cost of the VSS (exclusive of GST) was $6.8 million. The VSS included the surrender of nine lots comprising four properties and covering an area of over 19,500 hectares.

2.1.5 Lightning Ridge and Surrounding Opal Fields Management Reserve (LRSOFMR)

The reserve area is 20,300 hectares.

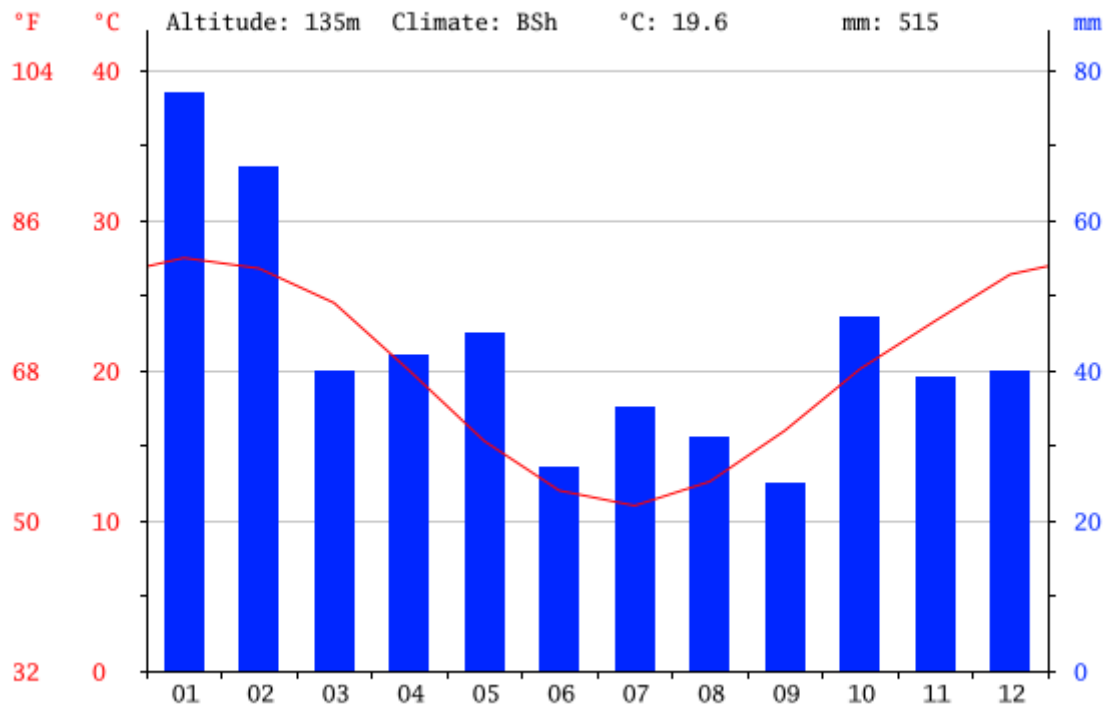
The reserve purposes are: Opal Mining and Exploration, Public Access, Tourist Facilities and Services, Accommodation, Heritage Purposes, Public Recreation, Future Public Requirements, Environmental Protection, Rural Services and Government Services.

The Reserve is currently managed by the Land Administration Ministerial Corporation through the NSW Department of Industry – Lands. It is anticipated that a Community Trust will be appointed to manage the Reserve in the future.

2.2 NATURAL ENVIRONMENT

2.2.1 Climate

Walgett's climate is hot to very hot in summer and mild to cool in winter, with occasional frosts. Summer temperatures frequently rise above **40 °C**, and a maximum temperature of **49.2 °C** (**120.6 °F**) was recorded on 3 January 1903, which is one of the hottest temperatures recorded in the state. (Ref Wikipedia)



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.

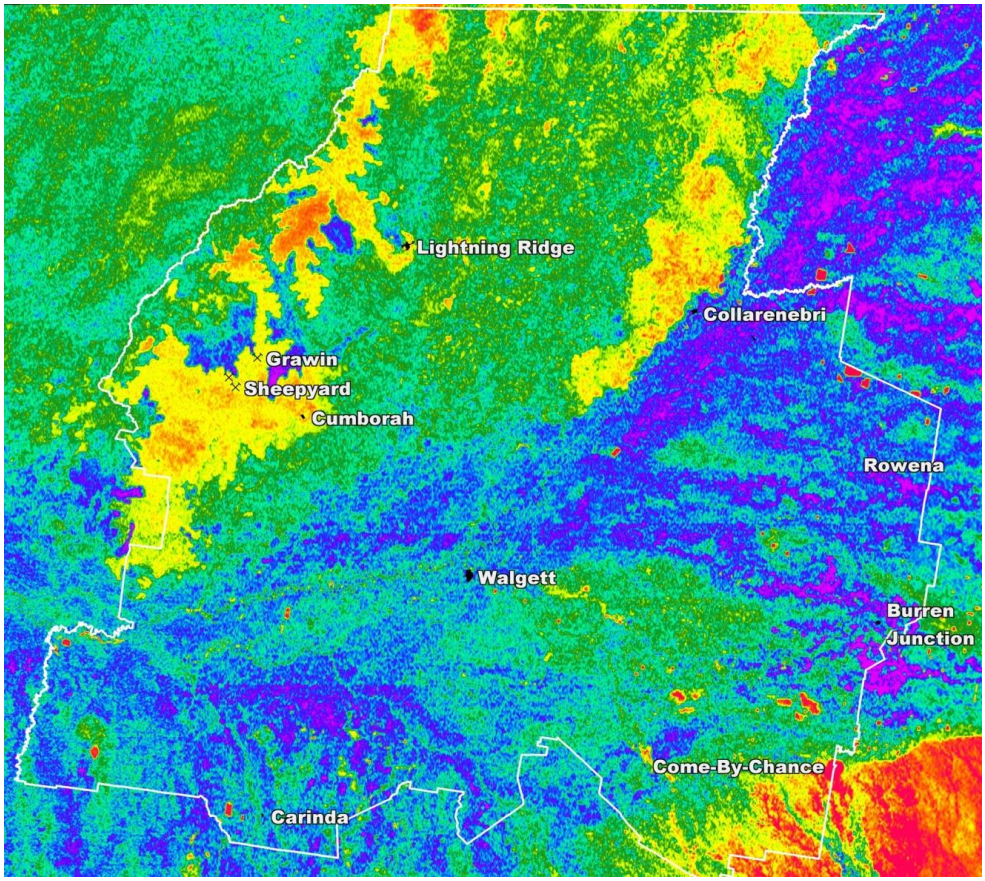


Figure 5 – Radiometric potassium 'image' showing elevated land and water storages as red/yellow, flood plains as green and purple.

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.

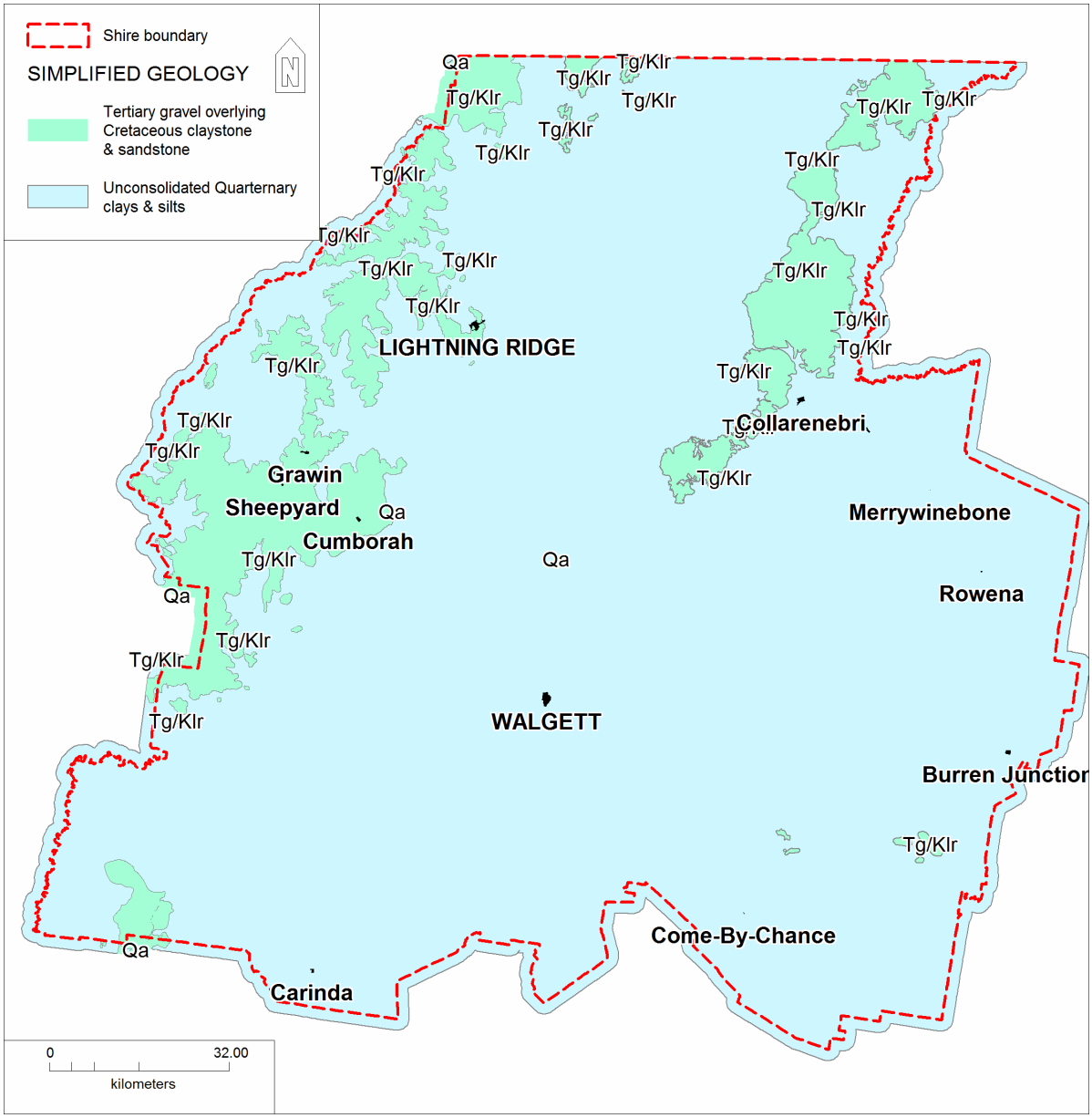


Figure 6 – Simplified geological map of the Walgett Shire [1].

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*

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

camaldulensis (river red gum). Open woodland areas have a similar dominant tree species.

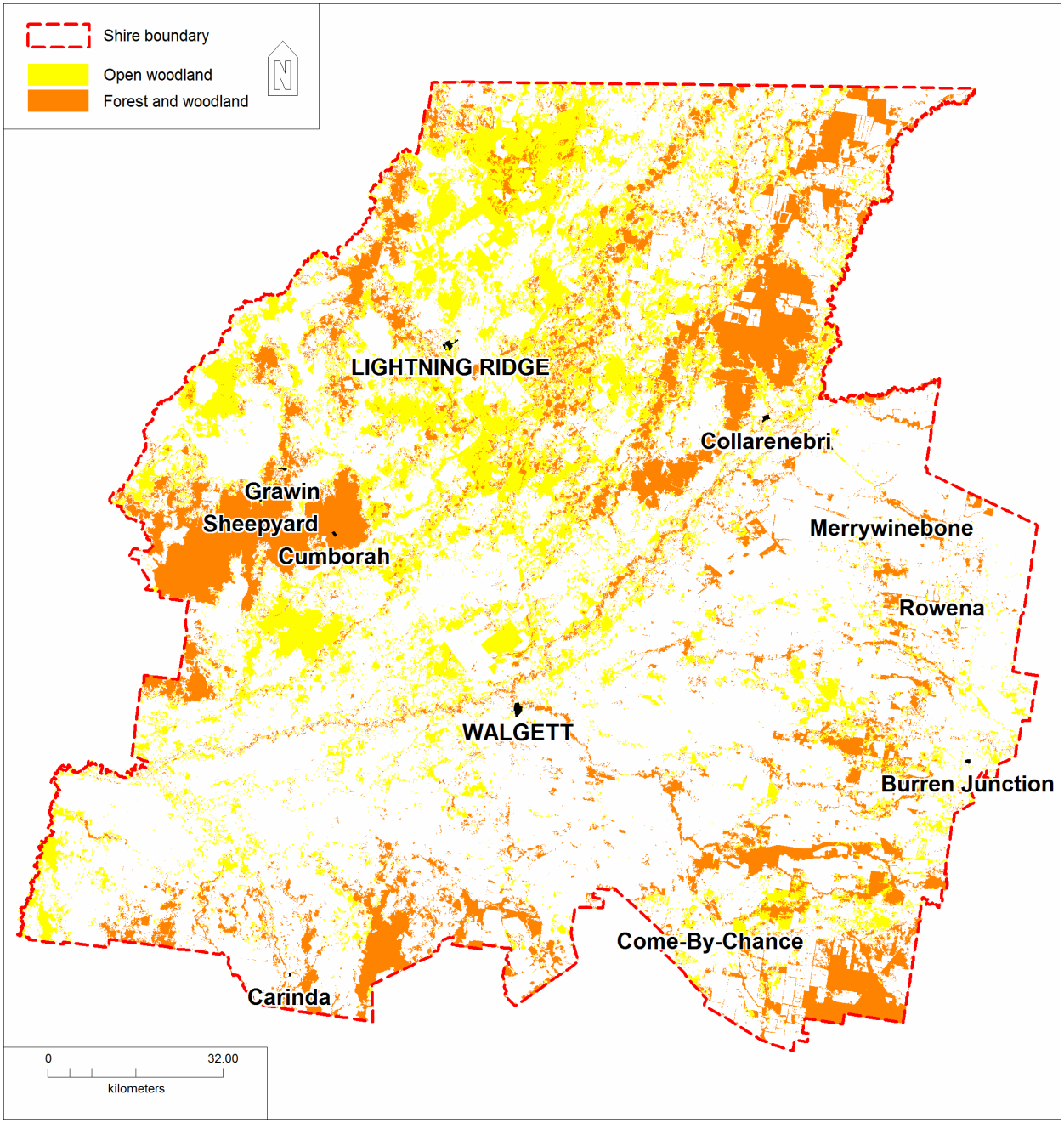


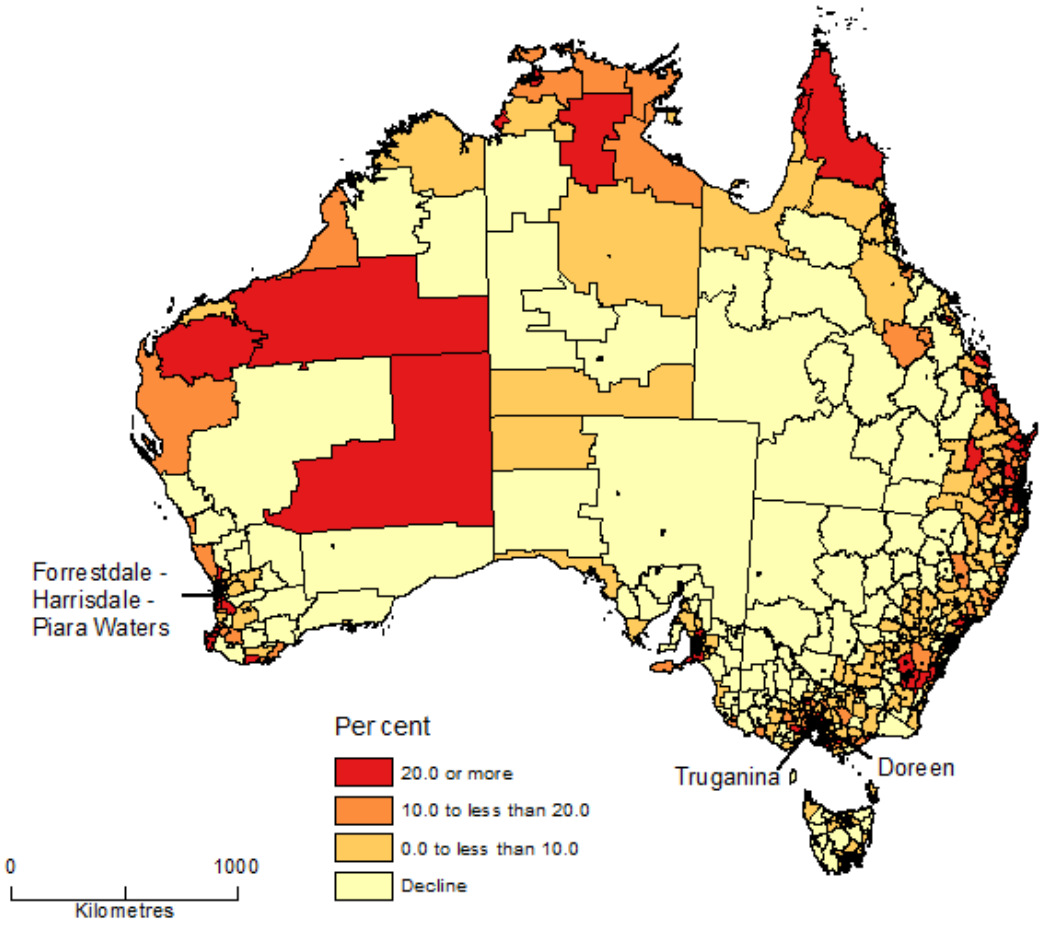
Figure 7 – Simplified vegetation classification map of Walgett Shire [2].

[2] 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, Sheepyard and Lightning Ridge. Population trends are similar to many rural areas of Australia.

Population Change, Australia - 2006-2016 (ABS – 2017)



Population profiles derived from census data are summarised in Table 1.

Table 1 – Population distribution and dwellings (locality)[3].

Name	2006 Population	2011 Population	2011 Dwellings	2016 Population	2016 Dwellings
Walgett	1,946	2,267	998	2,145	993
Lightning Ridge	2,682	2,492	1,721	2,284	1,594
Carinda	194	185	116	158	101
Collarenebri	973	767	397	650	357
Burren Junction	130	300	211	276	169
Shire Total	**8,131**	**6,941**	**2,664**	**6,107***	**3,693***

* Includes areas outside villages.

Figures above supplied by the Australian Bureau of Statistics do not correspond with anecdotal evidence, suggesting large variances in the quality of the data for Walgett Shire.

Age - The median age of people in Walgett (A) (Local Government Areas) was 43 years. Children aged 0 - 14 years made up 20.1% of the population and people aged 65 years and over made up 19.1% of the population.

Ancestry - The most common ancestries in Walgett (A) (Local Government Areas) were Australian 35.4%, English 22.1%, Australian Aboriginal 7.1%, Irish 6.6% and Scottish 5.6%.

[3] Australian Bureau of Statistics Census of Population and Housing.

Country of Birth - In Walgett (A) (Local Government Areas), 77.4% of people were born in Australia. The most common countries of birth were England 1.3%, New Zealand 1.0%, Germany 0.7%, Philippines 0.6% and Croatia 0.4%.

2.4 ECONOMIC

Income - The median weekly personal income for people aged 15 years and over in Walgett (A) (Local Government Areas) was $464, compared to an average of $664 across NSW.

Tenure - Of occupied private dwellings in Walgett (A) (Local Government Areas), 38.0% were owned outright, 13.1% were owned with a mortgage and 39.5% were rented. Median rents where $145.00 compared to NSW average $380.00.

Motor Vehicles - In Walgett (A) (Local Government Areas), 35.1% of occupied private dwellings had one registered motor vehicle garaged or parked at their address, 26.9% had two registered motor vehicles and 17.7% had three or more registered motor vehicles.

Internet Access - In Walgett (A) (Local Government Areas), 58.2% of households had at least one person access the internet from the dwelling. This could have been through a desktop/laptop computer, mobile or smart phone, tablet, music or video player, gaming console, smart TV or any other device. Compared to average in NSW of 82.5%.

Industry

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.

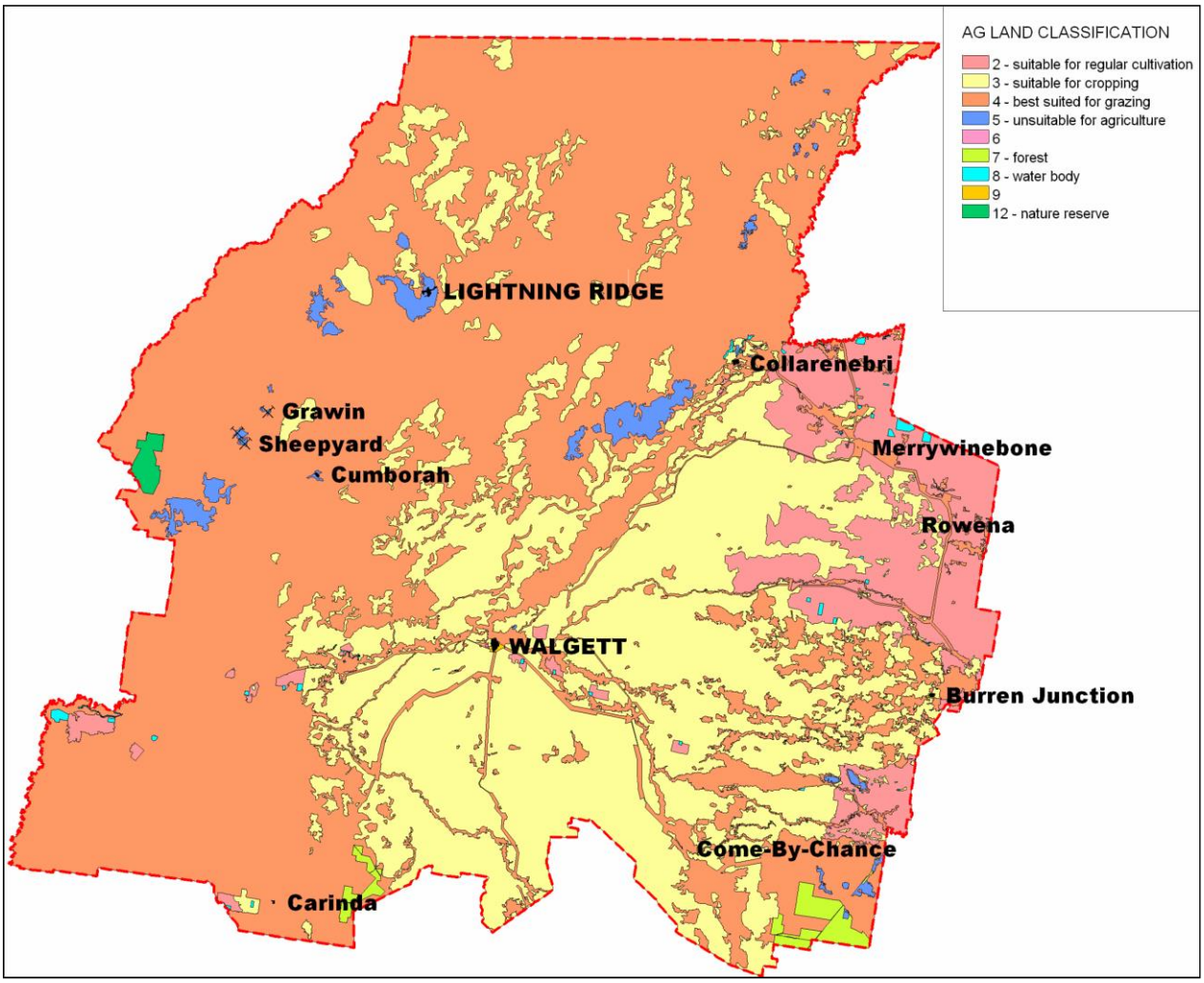


Figure 8 – Land capability map. [4]

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

[4] 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.

perspective, land affected by INS often has negligible productivity. Selective clearing, or thinning, of INS can have positive environmental and agricultural outcomes [5].

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.

[5] 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 7,104km^2 (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.

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 [6]. 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 [7].

[6] Western Australian no tillage farmers assoc.
http://www.wantfa.com.au/index.php?option=com_content&view=article&id=94&Itemid=69

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

3.1.3 Response

In 2014 Local Land Services replaced the former Catchment Management Authorities. The Walgett LGA is managed by North West Local Land Services and while they have an office in Walgett their main office is in Narrabri.

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 soils[8].

There is an ongoing concern within the agricultural community that:

- 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.

[8] NSW Office of Environment & Heritage web site at http://www.environment.nsw.gov.au/vegetation/pvp.htm

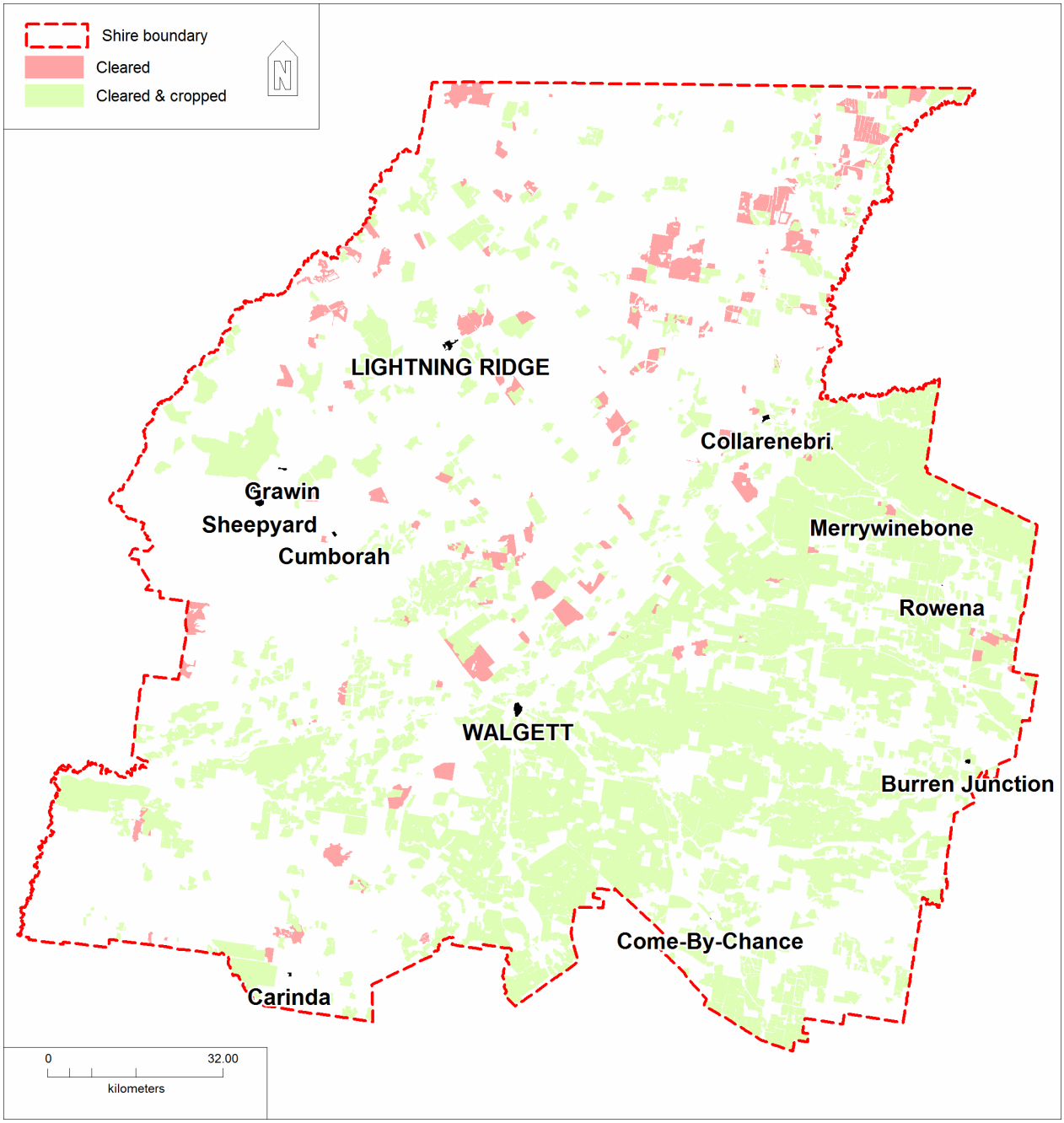


Figure 9 – Minimum extent of cleared land 2009.[9]

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

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 (ie 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.

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.

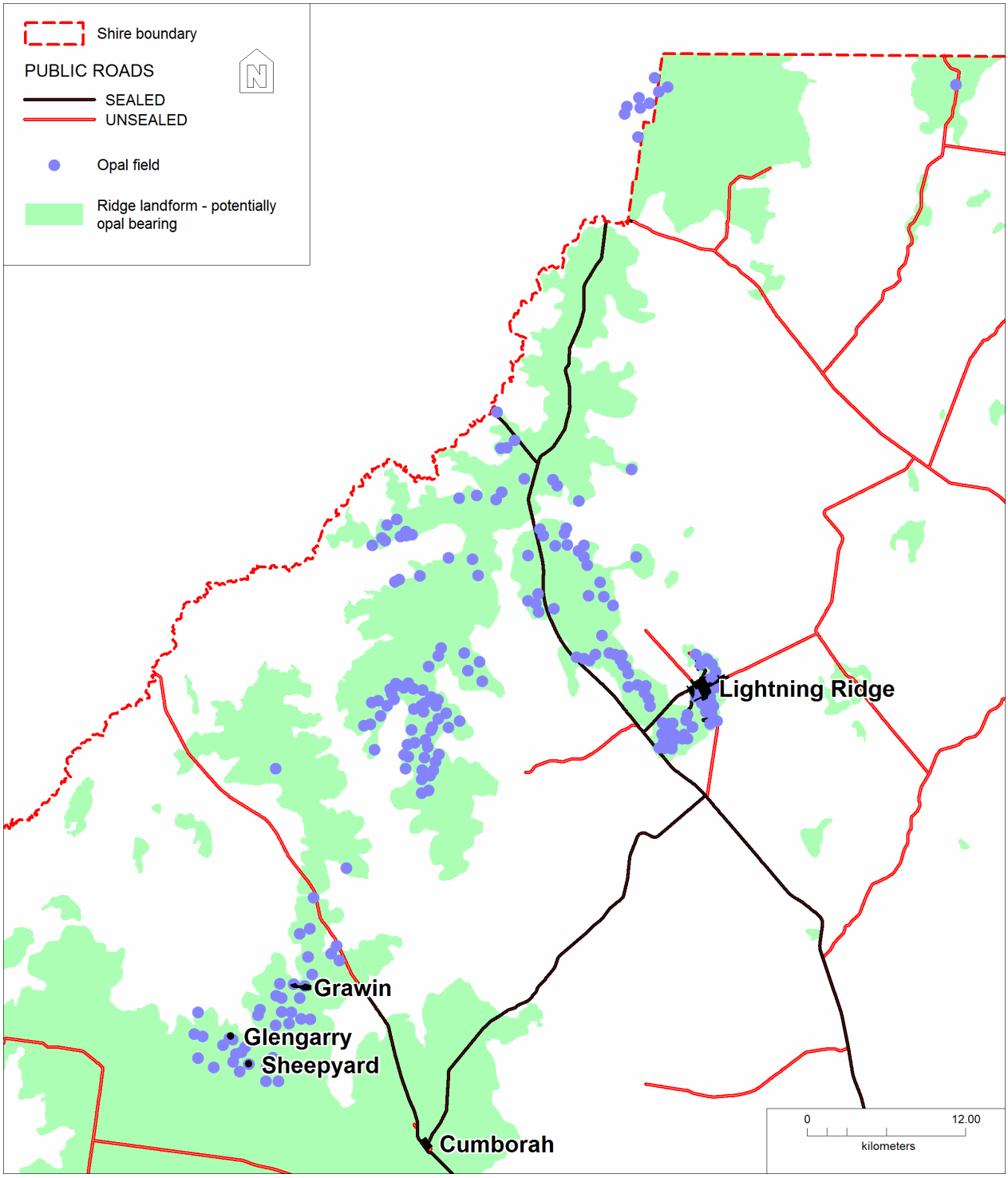


Figure 10 – Location of opal fields.

Plate 1 – Example of an opal mining area, Coocoran opal fields [10].

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.

[10] 2009 aerial photograph, supplied by NSW Land & Property Information.

Table 2 – Mineral claims statistics for the Lightning Ridge region [11].

MINERAL CLAIMS	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
RENEWED	2,692	2,931	3,075	3042	2897	2423
REGISTERED	284	260	393	438	408	387
CANCELLED	225	283	253	291	301	245
LAPSED	87	144	121	131	156	141
REHABILITED & SECURITY BOND RELEASED	290	636	673	549	615	392
CURRENT 30 June	3306	3148	3208	3207	3159	3173

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 2011-2012, including:

- Backfilled 198 mine shafts, predominantly on opal fields in the vicinity of Lightning Ridge.
- Backfilling 1 subsidence area.
- Removing rubbish and mullock from several sites.
- Upgrading fencing of mine shafts with heritage values.

[11] 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[11].

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 may provide neighbours to a development site 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 Walgett Local Environmental Plan 2013

The zoning of a given land parcel of land is a key factor which determines whether a proposed development is permitted or not within a given area. Council's current zoning maps under the are established under the Walgett Local Environmental Plan 2013.

3.4 WEEDS - Cylindropuntia rosea – Hudson Pear

3.4.1 Pressure

A wide range of agricultural and environmental weeds exist within Walgett Shire [12]. One of the major problem species is *Cylindropuntia rosea*, and another is *Cylindropuntia tunicata*. 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.

[12] http://www.noxiousweeds.org.au/declared-weeds

[13] http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles/hudson-pear

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

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 NSW.[13]. 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 111km^2, as shown in Figure 11. Scattered plants have been found over an area of about 458 km^2. *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.

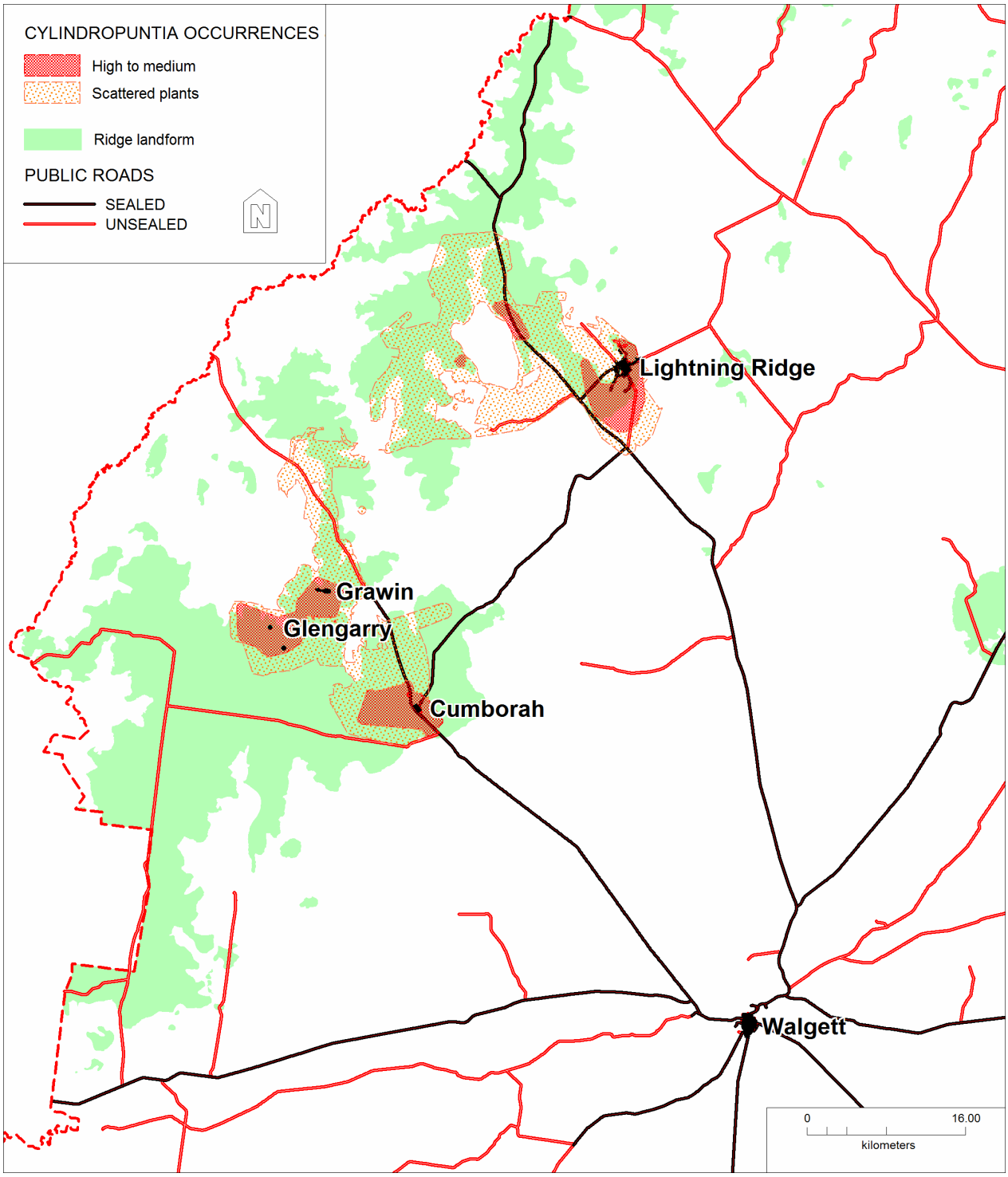


Figure 11 – Approximate distribution of *Cylindropuntia rosea*.

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 Sheepyard Miners Associations.

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 Hudson pear [13].

In August 2010 samples of *D. tomentosus* were transported from Mexico to Australia for detailed host-specificity testing in quarantine , and this process is ongoing.[14]. A release date for the imported *D. tomentosus* insect has still not yet been determined.

Current efforts to control the C. *rosea* are primarily chemically based and focused on the preserved opal fields surrounding Lightning Ridge, Grawin, Glengarry and Sheepyard.

[14] http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0020/96140/hudson-pear.pdf

[15] http://www.dpi.qld.gov.au/4790_19382.htm

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.

Plate 3 – 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 4), 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 5 – 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	Weirpool of Namoi & Barwon. Can be supplement by 2 bores.	Treated Raw	Conventional treatment & chlorine disinfection (Cooling Tower for bore water supply)	20 10	793 816
LIGHTNING RIDGE	Artesian Bore	Raw	Nil	17	770
COLLARENEBRI	Weir on Barwon River	Treated Raw	Ultrafiltration & chlorine disinfection	8 2	252 253
VILLAGES	Bore	Raw	Nil	5	77
			TOTAL	**62**	**2961**

Council has an obligation to ensure that water supplies are suitable for their intended uses. The Australian Drinking Water Guidelines 2011 (ADWG)[15] 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.

[16] Australian Drinking Water Guidelines 2004, available from http://www.nhmrc.gov.au/publications/synopses/eh19syn.htm

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.

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 *E. coli*. Data is also provided on total coliform counts, which are not normally of concern provided that samples are free of *E. coli*.	Permanent, weekly in Walgett, Lightning Ridge and Collarenebri. Fortnighly in Carinda. Monthly in Rowena and Cumborah.
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 2016 to 30 June 2017.

TOWN/VILLAGE	ISSUE
WALGETT	• 14 out of 67 samples showed the presence of total coliforms. • Average turbidity was 0.47 NTU (the ADWG recommends a maximum of 5.0 NTU). • pH value exceeded asthetic guideline value of 6.5-8.5 once with value of 8.6 when bore water was used.
LIGHTNING RIDGE	• 8 out of 48 samples showed the presence of total coliforms. • 1 out of 48 samples showed the presence of *E. coli.* • Average sodium content was 233.5mg/L (the ADWG recommends a maximum of 180mg/L). NOTE: Slightly elevated sodium value is typical for this supply system and others sourced from artesian bores in the region.

TOWN/VILLAGE	ISSUE
COLLARENEBRI	• 6 out of 68 samples showed the presence of total coliforms. • 1 out of 68 samples showed the presence of *E. coli.* Average turbidity was 0.25NTU.
CARINDA	NON-POTABLE SUPPLY • 6 out of 23 samples showed the presence of total coliforms. • Average sodium content was 290mg/L (the ADWG recommends a maximum of 180mg/L).
ROWENA	• 5 out of 8 samples showed total coliforms. • Average Sodium level was 231mg/L (the ADWG recommends a maximum of 180mg/L).
CUMBORAH	• 5 out of 14 samples showed the presence of total coliforms. • 1 out of 14 samples showed the presence of *E. coli*. • Average Sodium level was 275.5mg/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, several 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.

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

Cadellia pentastylis (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, Grawin 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 2017[16].

LOCATION	WASTE QUANTITY (tonnes)	LOCALITY POPULATION 2011	WASTE PER CAPITA (tonnes)
WALGETT	17091	2,267	7.54
LIGHTNING RIDGE	11078	2,492	4.45
COLLARENEBRI	240	767	0.33
CARINDA	52	185	0.28
ROWENA	52	160	0.33
BURREN JUNCTION	144	300	0.48

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

[17] 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.

8.1.1 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.

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 HERITAGE

9.1.1 Pressure

There are numerous heritage sites located within the Walgett Shire, some of which would not be recognised by a casual observer. Relatively common examples include scarred trees, stone tools, camp sites and railway infrastructure. All sites can be at risk of damage from livestock or people.

9.1.2 State Heritage Registers

The Office of Environment and Heritage (OEH) maintains the Aboriginal Heritage Information Management System (AHIMS) and the State Heritage Register a list is provided in Table 9. 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.

Table 9A - Aboriginal Places listed under the National Parks and Wildlife Act.

Aboriginal place name	Local government area	Local Aboriginal Land Council	Gazettal date	Comments
Moordale Wells	Walgett	Walgett	12/22/1989 p. 11053-1105	

Table 9B - Items listed under the NSW Heritage Act.

Item name	Address	Suburb
Collarenebri Aboriginal Cemetery	Gundabloui Road	Collarenebri

Table 9C - Items listed by State Agencies.

Item name	Address	Suburb
Angledool Weir	Narran River	Angledool
Bangate Weir	Narran River	Angledool
Calmundri Weir	Barwon River	Walgett
Collarenebri Police Station and Official Residence 1	Earl Street, Corner Walgett Street	Collarenebri
Collarenebri Weir		Collarenebri

Grawin Creek Bridge	Gwydir Highway	Collarenabri
Walgett Courthouse	Wee Waa Street	Walgett
Walgett Weir	Barwon River	Walgett
Walgett, Two-mile Creek Underbridge	723.128km, Narrabri To Walgett Railway	Walgett

9.1.3 Walgett Shire Local Heritage

Walgett Shire Council's Heritage Advisor prepared the Walgett Shire Community Based Heritage Study in 2008. The study was publicly exhibited from 27 February until 27 March 2008. Both the study and the Thematic History of Walgett Shire are available on Councils website.

Australian Museum Business Services (AMBS) was commissioned by Walgett Shire Council (Council) to prepare an Aboriginal Heritage Study for the Walgett Shire Local Government Area (LGA). The heritage study will inform future management of Aboriginal cultural heritage within the existing relevant New South Wales (NSW) and Commonwealth Statutory frameworks.

In 2011 Australian Museum Business Services 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.

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.

9.1.4 Heritage Registers

Items recorded by the Australian Heritage Commission in the Register of the National Estate database (non-statutory archive), as of October 2017[20], are listed in Table 10. Ultimately the present state of many heritage items in the Shire is relatively poorly understood.

Table 10 – Sites listed on the Australian Heritage Database.

Place	Location	Listing
Indigenous Place	Barokaville Station via Walgett, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Indigenous Place	Brewarrina, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Indigenous Place	Gingie Station via Walgett, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Indigenous Place	Walgett, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Narran Lakes Area	Brewarrina, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Two Mile Creek Rail Bridge	Walgett, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Walgett Courthouse 55 Wee Waa St	Walgett, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Walgett Freedom Ride Sites 1965 71 Fox St	Walgett, NSW, Australia	(Nomination now ineligible for PPAL) National Heritage List
Walgett Shire Council Chambers (former) 78 Fox St	Walgett, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)

9.1.5 Walgett Local Environmental Plan 2013

The following items are identified and protected under the Walgett Local Environmental Plan 2013.

Locality	Item name	Address	Significance
Angledool	Angledool meat house	23037 Castlereagh Highway	Local
Burren Junction	Shop	26 Alma Street	Local
Burren Junction	Shop	27 Alma Street	Local
Burren Junction	Shop	31 Alma Street	Local
Burren Junction	Catholic church	32 Alma Street	Local
Burren Junction	Post office	45 Alma Street	Local
Burren Junction	House (teacher's)	2 Hastings Street	Local
Burren Junction	Anglican church	15 Hastings Street	Local
Burren Junction	Bore baths	28253 Kamilaroi Highway	Local
Burren Junction	Glenburnie homestead complex	30533 Kamilaroi Highway	Local
Burren Junction	House	23 Slacksmith Street	Local
Burren Junction	House	35 Slacksmith Street	Local
Burren Junction	House (former bank)	8 Waterloo Street	Local
Burren Junction	Country Women's Association	13 Waterloo Street	Local
Burren Junction	Police station	15 Waterloo Street	Local
Burren Junction	Hall	19 Waterloo Street	Local
Carinda	Surveyor's mark	Carinda Road	Local

Carinda	Carinda School of Arts	6 Colin Street	Local
Carinda	Catholic church	9 Colin Street	Local
Carinda	Carinda Hotel	22 Colin Street	Local
Carinda	Anglican church	45 Colin Street	Local
Carinda	Wangrawally homestead complex	5245 Cumberdoon Way	Local
Carinda	Teacher's residence	2 McNamara Street	Local
Collarenebri	Moongulla homestead complex	5177 Boora Road	Local
Collarenebri	Collarenebri Aboriginal Cemetery	Off Gundabloui Road	State
Collarenebri	Collarenebri Public School	42 Herbert Street	Local
Collarenebri	Presbyterian church	43 Herbert Street	Local
Collarenebri	Presbyterian manse (former)	43 Herbert Street	Local
Collarenebri	Masonic lodge (former)	52 Herbert Street	Local
Collarenebri	Collarenebri Racecourse Grandstand	Ridge Road	Local
Collarenebri	Police station	25 Walgett Street	Local
Collarenebri	Tattersall's Hotel	1 Wilson Street	Local
Collarenebri	House	41 Wilson Street	Local
Collarenebri	Open air cinema	45 Wilson Street	Local
Collarenebri	Enclosed cinema	49 Wilson Street	Local
Collarenebri	House	57 Wilson Street	Local
Collarenebri	Anglican church	58 Wilson Street	Local
Come-by-Chance	Come-by-Chance Hall	Colless Street	Local
Cryon	Cryon Hall	Kamilaroi Highway	Local
Cryon	Cryon Outback Cafe	32562 Kamilaroi Highway	Local
Cumborah	Anglican church	1 Cumborah Street	Local
Cumborah	Zac's Shack	Hammond's Hill Opal Field	Local
Cumborah	Earth walled buildings	Narran Lake Road	Local
Lightning Ridge	Allport House	29 Harlequin Street	Local
Lightning Ridge	Amigo's Castle	Hatter's Flat Opal Field	Local
Lightning	School building	3 Kaolin Street	Local

Ridge			
Lightning Ridge	Nettleton's first shaft	McDonald's 6 Mile Opal Field	Local
Lightning Ridge	Bodel's Hut	3 Mile Opal Field	Local
Lightning Ridge	Lunatic Hill Open Cut	3 Mile Opal Field	Local
Lightning Ridge	The Mud Hut	3 Mile Opal Field	Local
Lightning Ridge	Bush Nurse Association Cottage	7 Morilla Street	Local
Lightning Ridge	Spicer's Hut	7 Morilla Street	Local
Lightning Ridge	Cooper's Cottage	20 Morilla Street	Local
Lightning Ridge	Old police station	28 Morilla Street	Local
Lightning Ridge	Walford House	13 Pandora Street	Local
Lightning Ridge	Serbian Orthodox church	132 Pandora Street	Local
Lightning Ridge	Astronomer's monument	Pony Fence Opal Field	Local
Lightning Ridge	Francis Hut (Paddy O'Hara's Hut)	5 Rainbow Street	Local
Pilliga	Milchomi Coaching Stables	7446 Come By Chance Road	Local
Pilliga	Epping Shearing Shed	552 Epping Road	Local
Rowena	Rowena Hall	3 Middle Street	Local
Rowena	St Mark's Anglican Church	14 Shaw Street	Local
Walgett	Borah Tank	Castlereagh Highway	Local
Walgett	Railway Station Goods Depot	Castlereagh Highway	Local
Walgett	Railway weighbridge	Castlereagh Highway	Local
Walgett	Two Mile Creek Railway Bridge	Castlereagh Highway	Local
Walgett	Barwon Vale homestead and stables	1744 Cumberdoon Way	Local
Walgett	Allawa homestead	2123 Cumberdoon	Local

	complex	Way	
Walgett	Survey mark	7 Euroka Street	Local
Walgett	Walgett Masonic Hall	72 Euroka Street	Local
Walgett	War memorial	Intersection of Fox and Wee Waa Streets	Local
Walgett	Tree	Fox Street	Local
Walgett	War Memorial Park	70 Fox Street	Local
Walgett	Old Shire Chambers	72 Fox Street	Local
Walgett	Nurses' home	152 Fox Street	Local
Walgett	Well	Grey Park	Local
Walgett	Milrea homestead complex	42837 Kamilaroi Highway	Local
Walgett	Euralah homestead	4393 Mercadool Road	Local
Walgett	Anglican church	19 Pitt Street	Local
Walgett	House	52 Warrena Street	Local
Walgett	Presbyterian church	28 Wee Waa Street	Local
Walgett	Walgett Court House	55 Wee Waa Street	Local
Walgett	Walgett Post Office (former)	65 Wee Waa Street	Local

10 MORE INFORMATION

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

- Walgett Shire Council - http://www.walgett.nsw.gov.au/
- Walgett Shire Council Environmental Services - http://www.walgett-online.com/
- Walgett Growth Management Study and Strategy, which provides information on the environment and land use issues within the Shire,
- Walgett Shire Local Environmental Plan 2013 - https://www.legislation.nsw.gov.au/#/view/EPI/2013/373/sch5
- Data on threatened species, populations and ecological communities http://www.threatenedspecies.environment.nsw.gov.au/index.aspx
- NSW Natural Resources Atlas,
- 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.epa.nsw.gov.au/licensing-and-regulation/public-registers
- 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://waterinfo.nsw.gov.au/wq/
- Public Register of Approved Clearing PVPs and Development Applications, http://www.environment.nsw.gov.au/vegetation/publicregister.htm