

GWYDIR SHIRE COUNCIL

**State of the Environment Report
2012-2016**



Contents:

1.	Introduction:	
1.1	Purpose of State of the Environment Reporting.....	3
1.2	The 2012-2016 State of the Environment Report.....	3
1.3	Shire Profile	4
2.	Land	
2.1	Land.....	15
3.	Air	
3.1	Air	17
4.	Water	
4.1	Water	18
5.	Biodiversity	
5.1	Biodiversity	21
6.	Waste	
6.1	Waste	24
7.	Noise	
7.1	Noise	27
8.	Heritage (Aboriginal & Non-Aboriginal)	
8.1	Heritage.....	28
9.	Evaluation and Planning for the Future	29
10.	Limitations	30
11.	Bibliography	31
	Appendix 1- Soil Type Descriptions	32
	Appendix 2- DWMP Water Sample Analysis Results	37
	Appendix 3 – Threatened Species Lists	49

1. Introduction

1.1 Purpose of State of the Environment Reporting

Council's responsibility to produce an annual State of the Environment Report (SoE) directly reflects the increasing accountability of local government to manage and protect the environment. This not only relates to the efforts of Council's themselves but also refers more importantly to the role of local communities to make choices and decisions that will restore and sustain the environment and maintain a high standard of living.

SoE reporting provides a means of giving the community easily understood & readily available information about the local environment and about impacts on that environment.

It also provides a public account of the activities of government, industry and the community in efforts to protect and restore the environment.

1.2 The 2012-2016 State of the Environment Report

This State of the Environment Report prepared by Gwydir Shire Council covers the period 1 July 2012 to 30 June 2016.

This report provides updates on key theme areas arising in the preceding 48 months. Any measurable changes in the state of the environment, pressures on that environment and the responses in place to address these pressures will be reported on.

The key theme areas for SoE reporting have not changed and are:

- ◆ Biodiversity
- ◆ Land
- ◆ Air
- ◆ Water
- ◆ Waste
- ◆ Noise
- ◆ Aboriginal Heritage and Non-Aboriginal Heritage.

The drought conditions from the previous years gave way to flooding and heavy rains in the start of 2012. Coming out of the flooding the later part of the year the general state of the environment in the Shire has improved markedly.

1.3 Shire Profile

Location:

Gwydir Shire is located in North West New South Wales within the North West Slopes and Plains region.

The Shire covers an area of 9122 sq km and has a population of 5000 people. The northern part of the Shire almost touches the NSW/Queensland border, while to the east it is bounded by Inverell, Guyra and Uralla Shires, to the west by Moree Plains and Narrabri Shires and to the south by the Tamworth Regional Council.

The Shire has a number of urban areas at Warialda, Bingara, Gravesend, Warialda Rail, North Star, Croppa Creek, Coolatai and Upper Horton.

Gwydir Shire draws its name from the Gwydir River which is the main water course of the southern and central areas of the Shire. Bingara is situated on the Gwydir River whilst Warialda on Reedy Creek, one of the larger head water tributaries of the Gwydir.

Population:

The population of the Shire for the reporting period is detailed in the following. This has been compared against historical Australian Bureau of Statistics data and regional New South Wales.

Location	Population	% Change
NSW	7,748,000	1.42%
Gwydir	5,000	-0.5%

Gwydir Shire has two towns Bingara – population 1093 and Warialda – population 1120 and seven villages, Warialda Rail - population 201, Crooble, Coolatai, Gravesend - population 322, Upper Horton- population 207, Croppa Creek and North Star - population 423. With the exception of Warialda Rail all of these villages are relatively remote from the two main towns. This leaves approximately 1634 people distributed throughout the remainder of the Shire.

The Shire is located within the Border Rivers and Gwydir Catchments and is part of the Border Rivers, Gwydir Catchment Management Authority.

Figure 1: Gwydir Shire boundaries.

Gwydir Shire Council

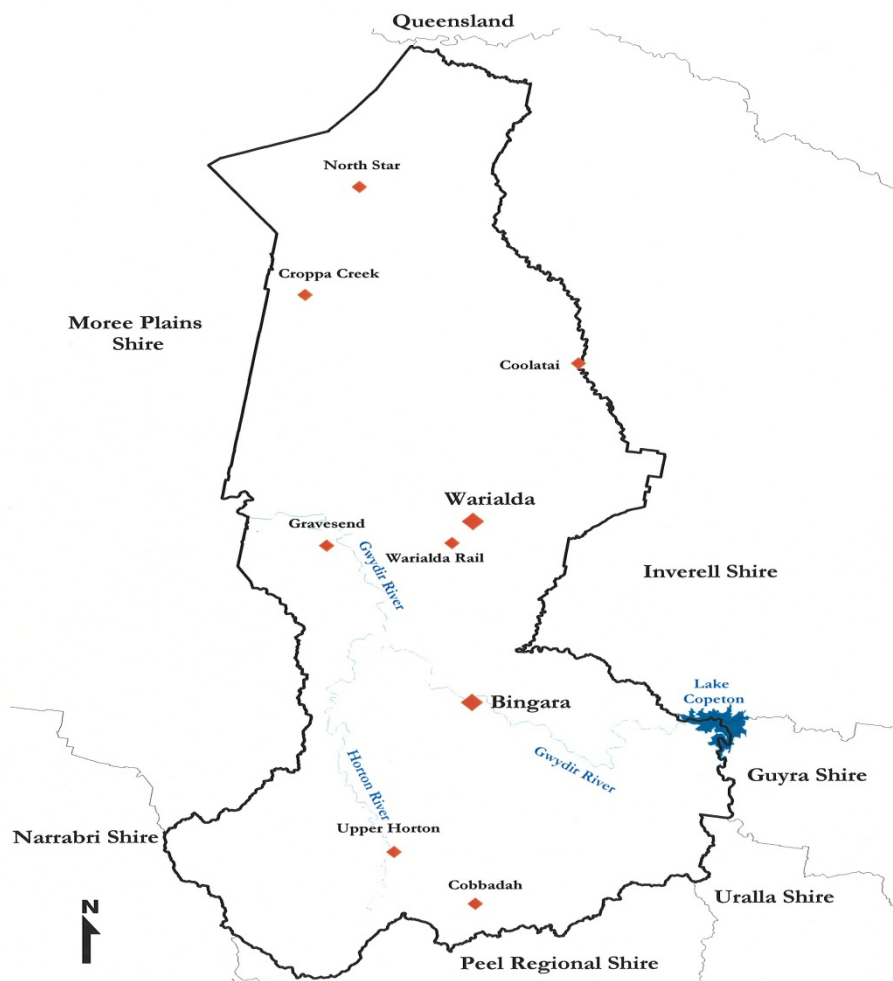


Figure 1: The Gwydir Shire Council boundaries incorporating both the Gwydir and Border Rivers Catchments.

Land Use:

The major land use in the Shire is agriculture with the main source of income being beef, sheep and cropping. The slopes around Bingara and Warialda are generally a mixture of grazing on native grasses with some small areas of grazing on improved pastures and crops. While large sections of cropping occur in the north western section of the Shire, which is characterised by flat black earth soils. Figure 2 below provides a more in-depth look at the Shire's broad soil types.

Landholders have started to diversify their agricultural pursuits from the common, beef, sheep & crops to intensive livestock industries such as piggeries, aquaculture, horticulture, olives and seed oils such as sunflower and linseed.

The urban area only comprises a small proportion of the total shire area.

Figure 2- Gwydir Shire Council soils map

Gwydir Local Government Area - Broad Soils

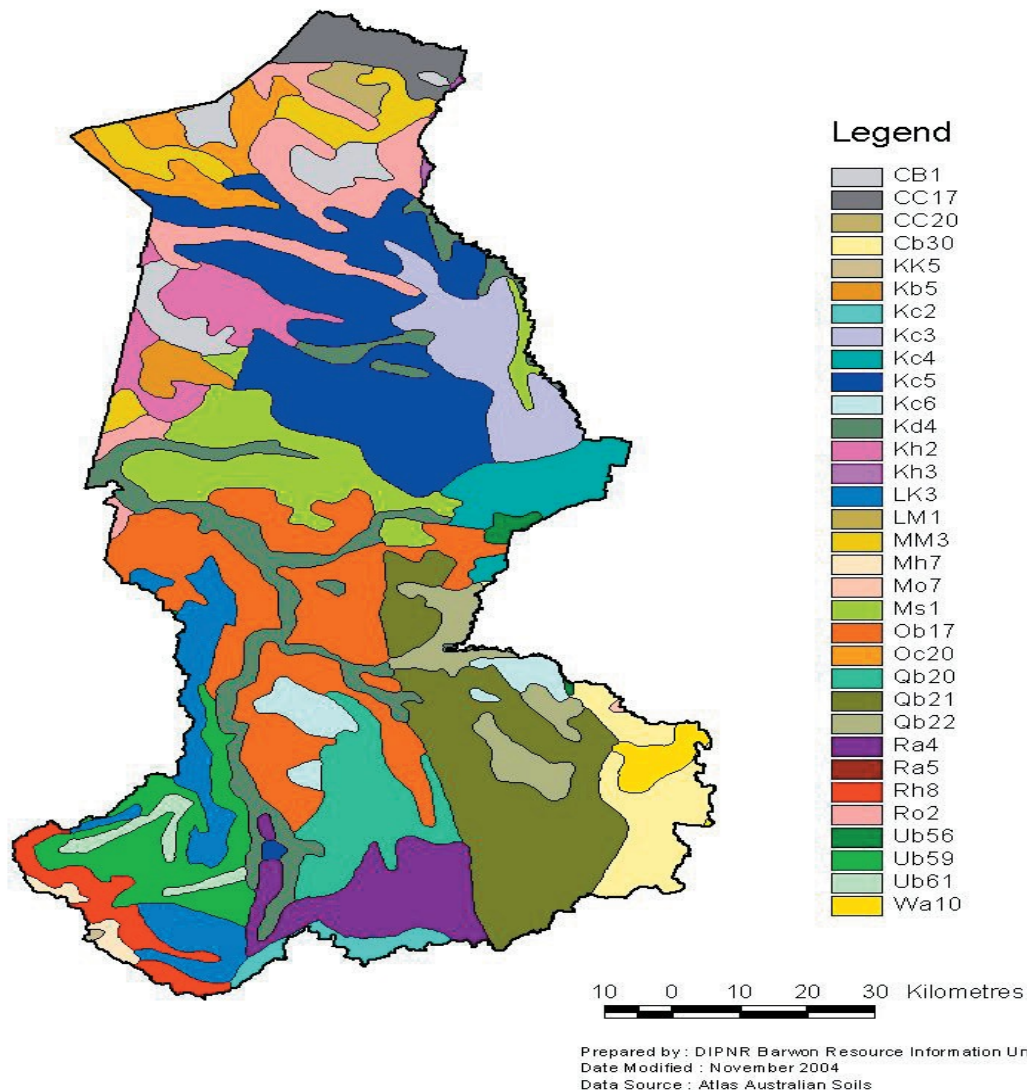


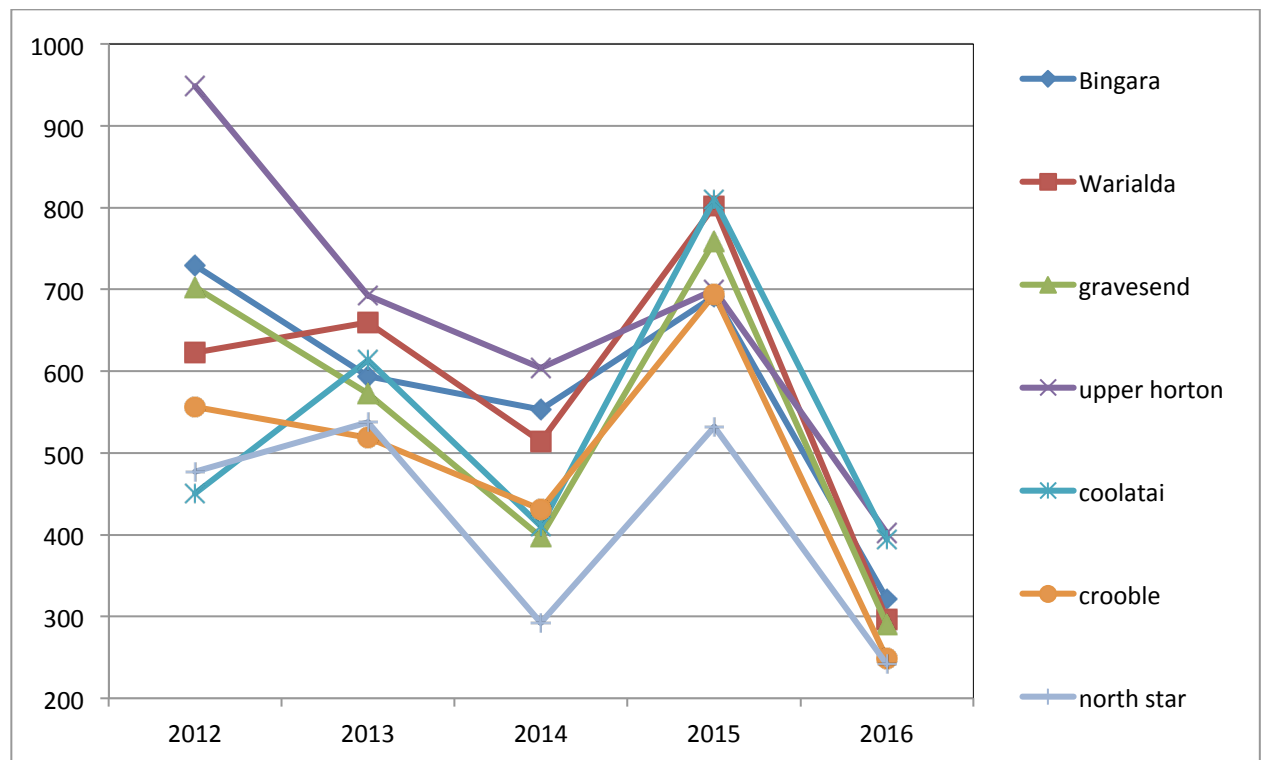
Figure 2- Gwydir Shire Council soils map- soil type descriptions are found in Appendix 1.

Climate: The climate over the district is strongly influenced by the topography and elevation of the area.

Council has installed 2 weather stations in the townships of Bingara and Warialda adjacent to the sewage treatment facilities. These stations monitor the following parameters:

- Rainfall
- Temperature
- Wind speed and direction
- Relative humidity &
- Solar radiation.

Rainfall across Gwydir Shire LGA showing variations over four years



Gravesend missing data: October 2013 March 2014 data
Coolatai missing data: January & August 2012 March 2014
North Star missing data: May 2013 March & November 2014 November 2015
2016 Data to June 2016

Demographics:

The Shire has a population of 4965 spread across the two towns Bingara – population 1093 and Warialda – population 1120 and seven villages, Warialda Rail - population 201, Crooble, Coolatai, Gravesend - population 322, Upper Horton- population 207, Croppa Creek and North Star - population 423. With the exception of Warialda Rail all of these villages are relatively remote from the two main towns. This leaves approximately 1599 people distributed throughout the remainder of the Shire.

Employment:

Employment in Gwydir Shire is based on the rural enterprises in the district and tourism operations. Council is also a large employer itself.

Ecologically Sustainable Development (ESD) strategy

Ecologically sustainable development allows council to treat the economy, the environment and social issues in a connected way, without having to separate them artificially. The Commonwealth of Australia (1992) has defined ESD as

'Using, conserving and enhancing the community's resources so that ecological processes, on which life

depends, are maintained and the total quality of life, now and in the future can be increased'.

In simple terms, ESD is about meeting the needs of the present without sacrificing the ability of future generations to meet theirs.

The simplified broad objectives of ESD include:

- Recognising and addressing the needs of everyone, including future generations;
- Careful use of natural resources;
- Protection of the environment;
- Being cautious in activities which may harm the environment; and
- An economic system that achieves the above objectives while supporting development.

The implementation of specific actions is the responsibility of everyone and as such relies on input and involvement from across all Government Departments and the Community as a whole.

In the past, Council's implementation of ESD as a custodian and trustee of public assets has been informal and adhoc. This is not to say Council had done nothing. There are many good examples of sustainable changes which have been made to activities undertaken by Council and this continues in a more structured way.

Council continues to ensure that its public works program is undertaken in a manner to have the least impact on the environment. The following Council programs aim to preserve, protect, restore and enhance the environment:

- Improvement of waste disposal depots through attendants, fencing, improved maintenance, including compaction, cover and better signage;
- Expansion of the streams in kerbside pick-ups for the residents of the shire in Bingara, Warialda, Croppa Creek, Gravesend, Warialda Rail and North Star to include General waste, recycling and Food and Garden Organics.
- Continuing the use of drop off sites at the village landfills to recycle scrap steel, green waste, batteries, glass, paper, cardboard, plastic and aluminium cans; and
- Implementation of the Storm Water Management Plans.
- Council implementing energy reduction across the organisation and planning to switch to a predominantly solar powering of the site using the most energy

Gwydir Shire is a member of the Northern Inland Regional Waste (NIRW), which is a group made up from Council's across New England and North West that develops and implements waste management programs on a regional level.

The programs that this Council participates in are:

- DrumMuster program – for the collection and recycling of used chemical drums;
- Chemical Collection program – for the collection of hazardous farm and household chemicals;
- Waste Oil Collection – Council has three Waste Oil Collection facilities at Bingara landfill, Warialda and North Star depots for residents to use;
- Scrap Metal recycling; and
- Green Waste chipping and composting
- Trash and treasure buyback centre
- partnering with mobile muster and cartridge muster.

Council continues to work in partnership with the North West Local Land Service, the Upper Gwydir Landcare Association and other Landcare groups like Warialda Rivercare Committee to restore and rehabilitate degraded sections of Crown Land alongside the waterways within the Shire.

Biodiversity:

Biodiversity is the term used to describe the variety of organisms (plants, animal, fungi and microbe), the genes they contain and the ecosystems they form. There are numerous and complex relationships present between living entities and the environment. These relationships provide the interconnecting web or fabric, which supports all life.

Whilst biodiversity is threatened by a range of processes within Gwydir Shire there are many significant projects being implemented to restore these ecosystems. The removal of threatening factors such as noxious and environmental weeds and the reintroduction of native vegetation through Landcare projects will assist in the re-establishment of viability and diverse ecosystems in Gwydir Shire.

The lack of baseline information on flora and fauna for much of the Shire (as evidenced by the lack of fauna records in the NSW Wildlife Atlas) makes producing accurate "State of the Environment" reports with any value for monitoring difficult to say the least.

In many regards the Shire is very diverse - it includes fauna and flora elements of the

- Nandewar Bioregion,
- Darling Riverine Plains Bioregion
- Brigalow Belt South Bioregions.

As a consequence there are many species that occur in the Shire at the northern, southern, eastern or western edge of their distributions and makes Gwydir Shire a prime bird watching area. However, the native bushland has been seriously fragmented, that fragmentation continues and the waterways have suffered reduced flow rates.

The threats to biodiversity in the region are many; some of the major threats are listed below.

Land clearing

Land clearing laws have slowed but not stopped the amount of land cleared for agriculture in the region. Managing land already cleared for long-term sustainability is vital for the future of the region. Encouraging landholders to take up training in land management courses offered through the LLS is vital in this regard.

Firewood collection

Unregulated firewood collection is a serious threat to many species including woodland birds, possums, frogs and reptiles. Fallen timber is broken down by insects and other organisms, effectively returning carbon to the soil while providing homes and shelter from predation for a variety of species. The physical barriers presented by fallen timber to the trampling of cattle are one of the few defences to the species that live and forage in leaf litter such as Speckled Warblers and the endangered Five-clawed Worm Skink. Termites and other soil dwelling organisms aerate the soil and allow water to penetrate. If the fallen timber is removed trampling by cattle or sheep compacts the soil, killing these organisms and instead of the water penetrating the soil it washes over the top, taking with it loose particles and leaf litter (sheet flooding).

Removal of firewood reduces biodiversity, increases erosion, reduces water retention in the soil, and reduces soil carbon (therefore soil health) and thus soil productivity. The burning of firewood at home releases carbon dioxide into the atmosphere.

Overgrazing, or grazing in sensitive environments

Whilst much of the most severe overgrazing occurs on private land in times of drought, when native plant and animal populations are at their most vulnerable, and most likely to be restricted to Council reserves is when stock are most likely to be placed in these areas. It is imperative that representative areas of all vegetation communities within the shire remain off limits to stock at all times for the future maintenance of biodiversity.

Pollution and degradation of waterways

Many of the waterways in the Shire have undergone serious environmental degradation. Ottley Creek, which represents part of the boundary between the Gwydir and Inverell Shires, has a number of ongoing environmental issues, including unregulated access to its banks by stock, leading to erosion of the banks, the spread of weeds and the fouling of the water. A number of invasive and noxious weeds occur along the banks including but not limited to Noogoora Burr, Willows and Cats Claw Vine.

Invasive species of plants

Coolatai Grass is presently taking over large areas of the Shire. This and other invasive grass species (such as Buffel Grass) can substantially impact biodiversity in a number of ways. Because of the densities of these grasses the amount of sunlight reaching the substrate is limited, reducing basking opportunities for many small reptiles. Other issues with these grasses include displacing native ground-dwelling plants and more seriously, increasing the intensity of any fire that might pass through. Annual burning which takes place out of necessity in some areas of Coolatai Grass has knocked out fire-sensitive species of plants. In many areas of Australia, Buffel Grass has reduced native vegetation substantially.

Invasive species of animals

Pigs and foxes cause substantial damage to agriculture and native wildlife. In relation to biodiversity, other invasive animal species are also causing problems in the Shire. While foxes are probably the most serious threat to small to medium-sized terrestrial vertebrates and ground-dwelling birds, cats, both feral and domestic also cause serious damage to the environment. "Wild dogs" are regarded as a major agricultural issue and are indiscriminately killed without regard for the role that dingos play in the ecology - especially the role of controlling foxes and cats. Studies have demonstrated that dingos left to their own devices have a tightly controlled pack system restricted to a territory and it is individual dogs, usually rogues that cause problems with stock losses. Targeting the specific dogs is much more effective at limiting stock losses than the blanket baiting which is regarded as politically expedient.

Common Mynahs are appearing in increasing numbers. These birds, along with Starlings, are a major threat to any other hollow-dwelling animal including Parrots, Insectivorous Bats and Sugar Gliders. Their impact on bird diversity is severe. A trapping program could be instigated to stop the spread of these birds.

Big-Headed Ants (also known as Coastal Brown Ants *Pheidole megacephala*) are a serious domestic nuisance. These ants are regarded as a noxious pest in other Australian states because they threaten biodiversity. Feral Honeybees are also a threat to the pollination ecology of a number of plants and compete directly with native nectar feeding birds such as Swift Parrots and Regent Honeyeaters. Greater controls on feral colonies would increase yields from responsible Apiarists and reduce the pressure on native pollinators.

Inappropriate fire regimes

A number of the reserves in the region are operated by NPWS who lack the staff numbers to undertake fuel reduction or habitat management burns. More habitat management burns would lead to a greater diversity of plant communities and could protect threatened communities such as Dry Vine Thickets. Cypress Pine identified as a Woody Weed, can be controlled with fire as it would have been during the period prior to European Settlement (Alex Dudley, 2009 Council correspondence).

Regional Weed Management

During 2012-2016, Gwydir Shire Council continued to operate under the regional weeds strategy and the NIWAC Weeds Action Business Plan. This program is committed to reducing the negative impact of noxious and other environmental weeds on the regional economy, community and environment.

To facilitate operational and publicity issues covering the Shire, the Weeds Unit has two full time authorised weeds officers. They conduct, to the limit of available resources, roadside surveillance and treatment programs throughout the Shire to prevent the introduction of new weeds species and to control the numbers and minimise the spread of weeds already present.

In conducting its weed control coordination program Council seeks to identify existing and potential weed problems of major significance to agriculture, human welfare, amenity and biodiversity. It coordinates the approach to weed management by all stakeholders and enhances cooperation between Council, State Authorities, Corporate and Community sectors. The weed program raises the profile of weeds as a major environmental management issue and engages and educates the community wherever possible, eg local agricultural shows.

During the reporting period 4 of the 5 areas of property inspections were undertaken. Cooperation was received from landholders, however, due to the drought some types of weeds are hard to detect when they are not in a growth cycle. There are a small number of properties where correspondence with the owners was not replied to and access to these properties is limited to inspecting from the roadside and adjoining properties.

Council continued to pursue its policy of promoting weed awareness at every opportunity. The publicity program has led to a higher level of weeds awareness throughout our rural community and resulted in more landholders taking a greater interest in controlling weeds on their lands. Council is a partner in the North West Weeds website: www.northwestweeds.nsw.gov.au

Weeds are dealt with on a priority basis, with particular attention being paid to St John's Wort, African Boxthorn, Galvanised Burr, Bathurst Burr, Green Cestrum and Pathenium Weed. Another weed, Mimosa Bush (Vachellia Farnesiana) was also heavily targeted throughout the year.

Council in partnership with Moree Plains Shire Council, Inverell Shire Council and the former Border Rivers Gwydir Catchment Management Authority (now the Local Lands Service) have established the *Harrisia Cactus* containment line to slow the spread of this invasive species further into NSW from QLD. Council works with affected property owners to control *Harrisia Cactus* on their properties.

Council in partnership with, and administered by, Moree Plains Shire Council, received grant funding from the North West Local Land Services for Green *Cestrum* Control on the Slaughterhouse Creek and Gwydir River. The aim of the project is to reduce the density of the Green *cestrum* infestation to a point where landholders are able to look after it themselves.

Gwydir Shire Council's private property inspection program aims at increasing public awareness of noxious weeds in general and to encourage all occupiers of private land to adopt and implement effective weed management plans to:

- (a) Reduce the local environmental impact of weeds;
- (b) To improve the value and sustainability of their land; and
- (c) To ultimately meet specific requirements imposed by the Noxious Weeds Act 1993.

Inspection and extension activities takes into account the ever-present risk of new weed incursions through movement of motor vehicles, machinery, animals, environmental conditions and climate change where extreme changes to weather patterns increase risks. The work involves regular inspections of local nurseries, saleyards, abattoirs, road side rest areas, feedlots, railway corridor vegetation, grain handling facilities, riverside reserves, and waste facilities.

Main weeds and areas targeted during 2012-2016

- African Boxthorn in Bingara, Upper Horton, Riverview, Pallal, Gravesend and Warialda areas;
- Bathurst Burr generally shire wide but particularly in the Warialda area;
- Blue Heliotrope in Bundarra, Cobbadah, Upper Horton, Gineroi & Bingara areas.
- Common Pear in the North Star and Warialda areas;
- Galvanised Burr in the Gravesend, Elcombe, Gineroi, Bingara and Warialda areas;
- St John's Wort in Bingara, Barraba, Gineroi, Upper Horton, Riverview and Pallal areas;
- Green *cestrum* mainly in the Gravesend area with spot areas in Barraba, Bingara, Upper Horton and Warialda;
- Blackberry in small amounts in the Bingara, Copeton and Bundarra areas
- *Harissa Cactus* mainly in Boonal and North Star areas;

- Paterson's curse in Barraba, Horton, Bingara, Gravesend, North Star, Bingara and Warialda;
- Mimosa bush in Gravesend and Warialda;
- Mother of Millions in North Star, Warialda, Gravesend and Bingara areas;
- Sweet Briar in the Barraba, Bingara and Bundarra areas;
- Tiger Pear in the Warialda, Barraba, Bingara and Gravesend areas
- Tree pear in Warialda and North Star areas;
- Noogoora Burr monitoring in the Bingara, Coolatai, Barraba, Upper Horton, Narrabri and Warialda areas
- Parthenium weed, although inspections for Parthenium weed are carried out mainly in the Bingara, Croppa Creek, North Star and Warialda areas, the Gwydir Shire has only two known Parthenium weed infestations. Both are small infestations and have been treated appropriately. Constant monitoring of the sites are conducted to ensure control.

Gwydir Shire Council participates in the following weed control plans and policies:

State Weed Plan	Regional Weed Plans	Local Weed Plans
Parthenium weed	African boxthorn	Paterson's curse
	St John's wort	Johnson grass
	Green cestrum	Rope pear
	Silverleaf nightshade	Prickly pear
	Mother of millions	Sweet briar
	Blue heliotrope	Galvanised burr
	Blackberry	Mimosa bush
	Harissa Cactus	Tiger pear
		Velvety tree pear

Noxious Weeds - Customer service requests received for the period:

Bingara	Upper Horton	Warialda	other
26	0	11	14

2. Land

2.1 Land:

Land is one of the most important natural resources in Australia. Land has not only economic value but also ecological, social and cultural importance. For the management of land to be successful certain areas need to be addressed. These include land degradation, conflicts in land use and sustainable management of land based resources (LMCC- 2000:22).

Council's progress with the development of the new LEP during the reporting period has continued. Consultation with the Department of Planning has resulted in the 1st draft of the Gwydir Shire Local Environment Plan 2010.

Council continues to foster partnerships with the Border Rivers-Gwydir Catchment Management Authority and local Landcare groups.

	State	Pressure	Response	Future Activities
Land use	DA approvals as follows: <ul style="list-style-type: none"> • New dwellings = TBC • Additions = TBC • Garage/Shed = TBC • Subdivisions = TBC • Septic = TBC • Pools/ decks = TBC • Other = TBC Gwydir LGA has 6 Environmental Protection Licences registered under the <i>Protection of the Environment Operations Act, 1997</i> .	Expanding rural residential areas. Past land clearing practices. According to NPWS 70% of shire has been cleared with only 30% remaining as native woody vegetation (NPWS 2004.)	Gwydir Sustainability Strategy & New LEP	To successfully implement the Sustainability Strategy and LEP
Land Degradation	Possible contaminated sites are the old landfills at Bingara and North	Unsustainable land practices including	Landcare and LLS activities and	Continued support of local landcare projects to

	<p>Star.</p> <p>Soil erosion in the form of sheet and gully erosion affects areas of the LGA and stream bank erosion is a major contributor to soil loss and sedimentation of waterways.</p> <p>Halls creek project to reduce soil erosion and improve water quality within the catchment</p>	<p>overgrazing.</p> <p>Clearing and continued stock watering around waterways.</p> <p>Grazing stock, clearing of vegetation, changes to water courses</p>	<p>projects.</p> <p>LLS funding to assist in fencing and revegetation Halls Creek continues.</p>	<p>address erosion & related issues.</p> <p>Continue to work closely with the LLS</p> <p>Continue working with land holders along the creek to prevent soil erosion and improve water quality.</p>
Open Space	<p>Council continues to manage a number of parks, showgrounds, reserves and commons for use by the public.</p>	<p>Litter & Pollution</p> <p>Impacts from recreational activities such Motorbikes, horse riding and fishing.</p> <p>Sufficient community & visitor use.</p>	<p>Clean up campaigns, anti-litter education campaigns. Provision of litter bins.</p> <p>Warialda Rivercare Committee activities</p>	<p>Develop plans of management for land that is classed as Community land.</p> <p>Continue to support CUA day and Warialda Rivercare Committee.</p>
Flood Prone Land	<p>Two major flood events occurred during the reporting period.</p>	<p>Infrastructure development, climate change.</p> <p>Erosion and undercutting of riparian areas.</p>	<p>Land Use planning</p> <p>Implementation of Urban Stormwater Management Plans</p>	<p>Continue to revise and update the Stormwater management plans</p> <p>Seek funding to undertake & develop a Flood Management Study & Plan for Bingara.</p>

3. Air

3.1 Air:

The atmosphere plays a critical role in regulating global weather and climate and is therefore essential to all plant and animal life on earth (NSW EPA 2000). Air quality within the Shire remains good. With a lack of industrial developments and a small population air quality isn't under an enormous strain.

The two main pressures on air quality in the Shire are Smoke from wood fires (solid fuel heaters, bushfires, burning off) and methane from cattle.

	State	Pressure	Response	Future Activities
Air Quality	<p>An acceptable level of air quality occurred over the reporting period.</p> <p>Solid fuel heaters during the winter months led to the occasional smoke haze being trapped over Bingara and Warialda.</p> <p>No odour complaints were received by Council during reporting period.</p>	<p>Wood heaters, Bush fires</p> <p>Agricultural activities e.g. burning off of pastures.</p> <p>Motor vehicles and residential, agricultural and industrial energy use are major source of greenhouse gases.</p>	<p>Legislation – BASIX requiring a 25% reduction in greenhouse gases/energy use.</p> <p>“POEO Control of Burning” regulation allows council to control amount of burning off that occurs within the Shire.</p> <p>Council has weather stations in Warialda and Bingara.</p>	<p>Investigate opportunities for the expansion of air quality monitoring within the LGA.</p> <p>Participation in wood smoke reduction campaigns.</p> <p>Investigate feasibility of running a bio diesel fuel program in Council vehicles.</p> <p>Conversion of small plant and equipment from 2 stroke to 4 stroke</p> <p>Look into the feasibility of setting up solar panels on council buildings for energy efficiency</p>

4. Water

4.1 Water:

Water management in all its forms are not necessarily consistent with the natural flow of water through aquatic environments. The ways in which we use water resources is often at odds with natural systems ability to provide these resources.

The Gwydir River is the major aquatic system in the region, and given Gwydir Shire's position in the middle of the catchment it is in a unique position to provide for the management of that part of the system.

The quality of water at a number of locations throughout the LGA continues to be monitored on a regular basis to help provide an indication of water quality in Gwydir Shire.

Drinking water supplied to the towns and villages is also monitored on a weekly basis to ensure it conforms to the "Australian Drinking Water Guidelines". The results of this monitoring program can be viewed in Appendix 2.

The previous high arsenic detected in higher levels than the Australian Drinking Water Guidelines (ADWG) in the Bingara Water Supply and the Gwydir River has been mitigated by the construction of a water treatment plant.

	State	Pressure	Response	Future Activities
Water Quality	High levels of nutrients and sediment loads are major water quality issues that occurred following periods of decent rain.	Litter, green waste, erosion, fertilisers and pesticides Sedimentation & erosion from land degradation 2 OEH licensed premises with allowable discharge to waterways.	The water treatment works at Bingara has been fully operational for the reporting period. Landcare projects and other on-ground works, Environmental management plans	Develop Stormwater plans for the remaining villages in the shire, Croppa Creek, North Star & Upper Horton and combine all the documents together into one cohesive plan of management. Continued support of Landcare projects which

			<p>and sediment control plans</p> <p>Stormwater management plans & infrastructure</p> <p>Water quality monitoring program.</p>	<p>focus on river restoration and groundcover improvements.</p> <p>Consult with the LLS and Department of Planning to coordinate activities relating to the monitoring of water in the catchment.</p>
<p>Water Supply:</p>	<p>Water supplied to the Bingara Township from the Gwydir River, Warialda Township from groundwater, Gravesend Village from groundwater and North Star from groundwater are all monitored under the “Drinking Water Monitoring Program” (DWMP). Results can be found in Appendix 2.</p> <p>There were 16 new services connected during the reporting period.</p> <p>Across the Shire there were 49 water quality complaints about discolouration.</p> <p>There were on average 24 pipeline breaks per year but none lead to an environmental incident.</p>	<p>Urban expansion, Water Supply</p> <p>Surface water extraction via agricultural activities</p>	<p>Environmental education on water saving tips and devices, with brochures available at Council offices.</p> <p>Drinking water monitoring program.</p> <p>Legislation- BASIX, 40% reduction in water consumption.</p>	<p>Drinking Water Quality Risk Assessment was undertaken on all drinking water supply systems and Drinking water quality management system has been developed to ensure the quality of the water supply. Incident response management plans have been developed and tested.</p> <p>Continue to submit applications for the Australian Government Community Water Grants program to undertake water saving and water efficient projects.</p> <p>Air scouring of water lines</p>

				<p>should improve colour problems.</p> <p>Gwydir Shire Council has joined the Namoi water alliance and is working with other member councils on regional activities that benefit the individual councils, such as water saving advertisements, consistent water restriction levels, bulk purchase of chemicals, specialist equipment availability and best practice compliance documentation.</p>
Wastewater treatment	<p>There are 2 ways in which wastewater is treated:</p> <ol style="list-style-type: none"> 1. Reticulated system in Bingara and Warialda. <p>Bingara averages 110ML per year of sewage. The sewerages receives tertiary treatment with OML discharging to the river after the treatment process. Recycle 8 ML back through the sewerage plant on process water.</p>	<p>Continued development in unsewered areas.</p> <p>On site Sewage Management Systems (Septics) and there inadequate operation and maintenance poses threats to local waterways.</p>	<p>OSSM System Audits are undertaken for existing or new OSSM systems to ensure that they are being maintained and operated appropriately.</p> <p>Septic Safe pamphlets are</p>	<p>Continue to undertake OSSM system audits and complete the identification of the number of OSSM systems in operation.</p>

	<p>Warialda averages 170ML per year of sewage that undergoes tertiary treatment and recycled 19ML per year of treated effluent to the local golf course.</p> <p>2. Onsite Sewerage Management- there were TBC new onsite systems approved during the reporting period.</p> <p>Bringing the total OSSM systems registered to 718 (TBC) within the LGA.</p>		<p>available to residents to provide advice and information on how to operate and maintain an OSSM system.</p>	
--	---	--	--	--

5. Biodiversity

5.1 Biodiversity:

Biodiversity is the term used to describe the variety of organisms (plants, animal, fungi and microbe), the genes they contain and the ecosystems they form. There are numerous and complex relationships present between living entities and the environment. These relationships provide the interconnecting web or fabric, which supports all life.

Whilst biodiversity is threatened by a range of processes within Gwydir Shire there are many significant projects being implemented to restore these ecosystems. The removal of threatening factors such as noxious and environmental weeds and the reintroduction of native vegetation through landcare projects will assist in the reestablishment of viability and diverse ecosystems in Gwydir Shire.

	State	Pressure	Response	Future Activities
Terrestrial Biodiversity	Gwydir Shire has 92 Threatened Species that are known to occur or potentially occur with the LGA.	Threats to biodiversity are from: <ul style="list-style-type: none"> Urbanisation, 	Legislation: <ul style="list-style-type: none"> Native vegetation act <i>Native Vegetation Act</i> 	Continue to support Landcare projects involved in biodiversity

	<p>12 endangered and 4 critically endangered populations that are known to occur or potentially occur with the LGA.</p> <p>16 Endangered Ecological Communities that are known to occur or potentially occur with the LGA.</p> <p>37 Key threatening processes applicable to the Gwydir Shire.</p> <p>(Appendix 3- Threatened Species Lists)</p>	<ul style="list-style-type: none"> • Farming • vegetation clearing • Loss of habitat corridors • Weed infestations • Altered fire regime • Grazing 	<p>2003</p> <ul style="list-style-type: none"> • landholders needing Property Vegetation Plans (PVPs) signed by the Border Rivers/Gwydir CMA • <i>Threatened Species Legislation Amendment Act 2004</i> • <i>Environmental Protection and Biodiversity Conservation Act, 1999</i> • Feral animal control work through Northern Slopes RLPB and landholders • Revegetation works through landcare projects • Community education at schools and shows <p>A total of 544 priority actions have been identified to help recover threatened species and tackle threatening processes in the Shire.</p>	<p>enhancement and National Tree Day and other tree planting activities.</p> <p>Develop a Roadside Vegetation Management Plan.</p>
--	--	--	---	--

			LLS funded BioLinks grant Projects for Halls Creek	
Aquatic Biodiversity	<p>Significant fish habitats exist in Gwydir Shire these include:</p> <ul style="list-style-type: none"> • Floodplain areas • Riparian vegetation • Instream aquatic vegetation • Snags • Gravel bars & • Over-hanging banks <p>Alien or introduced species:</p> <ul style="list-style-type: none"> • Carp – <i>Cyprinus carpio</i> • Gambusia – <i>Gambusia holbrooki</i> • Goldfish – <i>Carassius auratus</i> 	<p>Degradation of general aquatic environment is related to:</p> <ul style="list-style-type: none"> • land use adjacent to waterways including cattle access • Pollution • Sedimentation • litter 	<p>Utilisation of Sediment and Erosion control measures on construction works.</p> <p>Fisheries Grant for Fish Habitat on the Gwydir River</p>	<p>Continue to support landcare applications for funding.</p> <p>Target reduce salt and ammonium phosphates to river system</p>
Weed Management	<p>There are 92 declared noxious weeds identified in the Gwydir Shire area.</p> <p>Problem weeds throughout the Shire include African boxthorn, blue heliotrope, green cestrum, mimosa bush, mother-of-millions, Paterson's curse, sweet briar and St John's wort.</p>	<p><i>Weed infestations</i> are related to:</p> <ul style="list-style-type: none"> •Land clearing •Fragmentation •Stormwater Runoff •Garden 'escapees' •Stock movement <p>Cultivation of weeds, in Gardens and fish tanks</p>	<p>Weed education through field days, public displays at shows, radio and TV ads.</p> <p>The northwest weeds website still continues to be an excellent educational tool for the public, averaging 686,578 "hits" per month.</p> <p>Involvement in the regional weed group the "Northern Inland Weeds</p>	<p>Continue to apply for funding from Department of Lands for weed control on crown land.</p> <p>Continue to undertake weed education activities.</p> <p>Implement the Roadside Weed Management Plan.</p> <p>Develop partnerships with the LLS</p> <p>Investigate human health issues related to weeds.</p>

			<p>Advisory Committee” (NIWAC).</p> <p>Legislation- Noxious Weed Act 1993.</p> <p>Landcare projects working towards weed eradication. Out break contained And Notification to DPI Weed contained and destroyed. DPI notified Notification to DPI.</p> <p>Monitor in conjunction with other authorities</p>	<p>Continue to review and submit declaration applications where necessary</p>
--	--	--	--	---

6. Waste

6.1 Waste:

Gwydir Shire with Moree Plains and Narrabri councils entered into a 10 year regional waste contract with Cleanaway. The contract provides kerbside general waste, recycling and Food and Garden Organics services to residents for the towns and villages of Bingara, Warialda, Warialda Rail, Gravesend, Croppa Creek and North Star in an effort to encourage residents to participate in reducing waste going to landfill and making better use of resources.

Residents in these towns received a new 140 litre wheelie Bin with a Red lid for general waste, 360 litre wheelie Bin with a Yellow lid especially for recyclables, 240 litre wheelie Bin with a Green lid especially for food and garden organics, and a Kitchen Caddy to store and transport to the Green lidded bin their Kitchen organics.

	State	Pressure	Response	Future Activities
Landfill Management	<p>19391.62 Tonnes of Combined Waste and Recycles was collected and/or dropped off during reporting period.</p> <p>8494.13 tonnes of general waste was landfilled</p> <p>10900.49 tonnes of material was recycled or processed during reporting period.</p> <p>Council continues supervising the use of the Bingara and Warialda Waste Recovery Centres during opening hours in order to direct and educate users in the recycling of waste material and disposal. Smaller landfills continue to be maintained. Gravesend landfill is not locked due to residents complaints.</p>	<p>Limited capacity of Landfill sites.</p> <p>Quantity of waste going to landfill</p> <p>Cost</p> <p>Residents' not segregating their waste streams appropriately is a constant issue with recyclables and other items ending up in landfill cells.</p> <p>Fires</p>	<p>Full time landfill supervisor, allowing regular maintenance at small village tips</p> <p>Greenwaste chipping E-Waste Recycling Scrap Metal recycling Oil recycling Battery recycling Weekly cover and compaction Introduce larger recycling bins. Improved signage, surveillance and design at landfills</p>	<p>Progressive rehabilitation of landfill sites.</p> <p>Upgrading fencing of landfill sites.</p> <p>Possible tip fees and penalties, sorting fees. Limited access to tips regulated hours</p> <p>Utilise mobile surveillance cameras at problem areas</p>
Waste Management	<p>10900.49 tonnes of material was recycled or processed during reporting period.</p> <p>DrumMuster- 42324 drums collected and processed during the reporting period.</p> <p>Chemical Collection – 5545kg of chemicals collected during reporting period.</p>	<p>Increasing population, modern way of life (throw away society)</p> <p>State Government legislation</p> <p>Contamination of recyclable</p> <p>Some events are annual and costly and can only</p>	<p>Recycling program National Recycling week. Community events such as:</p> <ul style="list-style-type: none"> • Clean Up Australia • Drum muster • Chemical Collection • Waste education at shows & schools <p>Subsidised worm farm sales.</p>	<p>Continue involvement in waste projects like drummuster, chemical collection and other educational activities.</p>

		occur at one venue	<p>Chemical collection is alternating between being held at Warialda and Bingara</p> <p>Waste oil collection 3 sites for waste oil Bingara, North Star and Warialda</p> <p>Education and advertisement.</p>	
--	--	--------------------	---	--

7. Noise

7.1 Noise:

Constant exposure to noise can cause annoyance, speech and sleep interference, decrease in concentration and physiological disturbances.

The Shire is a sparsely settled rural area with modest levels of industrial activity. Noise issues within the Shire are fairly minimal with most complaints coming from noise from barking dogs.

	State	Pressure	Response	Future Activities
Noise Pollution	Domestic Noise Complaints	Low background noise levels Changing population in urban areas	Appropriate planning, Legislation and enforcement actions.	Undertake a community noise awareness education campaign. Continue to ensure development is compatible with the local environment.

8. Heritage

8.1 Heritage:

Heritage can comprise natural heritage, being significant places and objects that are part of the biophysical environment and Cultural heritage including places and objects significant to Aborigines, Torres Strait Islanders and non-indigenous Australians.

Australia's natural and cultural heritage is integral to the environment. Heritage provides the cultural and physical links with the past, with the history of human habitation and settlement in Australia and with the evolution of biota and the physical landscape (LMCC, 2000:122).

Continuing links with the towns and village's history helps maintain the "sense of community," distinctive character and heritage of the shire.

	State	Pressure	Response	Future Activities
Aboriginal Heritage	<p>Loss of Aboriginal heritage and a lack of knowledge of the value and significance of aboriginal sites continue to be an issue.</p> <p>90 Aboriginal site features have been identified in the old Bingara LGA area.</p> <p>There are 3 recognised Aboriginal Heritage sites.</p>	<p>Lack of awareness combined with agricultural activities.</p> <p>Natural erosion can result in the loss of Aboriginal heritage.</p> <p>There is also a perception amongst some landowners that any identified sites within their property may lead to land claims by Aboriginal Land Councils. This has meant many people are reluctant to inform the DEC if such sites are located on freehold land.</p>	<p>Education and Awareness raising activities through promoting the Myall Creek Memorial site.</p> <p>Land use planning</p> <p>Maintenance and upgrading of the Myall Creek Memorial site.</p>	<p>Liaise with Aboriginal Lands Councils and NPWS to finalise the Aboriginal Heritage list for the whole shire.</p>
Non-Aboriginal Heritage	<p>28 items listed as heritage significant in Council's LEPs.</p> <p>Gwydir Shire has a number of State</p>	<p>Expanding urban environment</p> <p>Lack of resources for</p>	<p>.</p> <p>Land use planning.</p>	<p>Develop a close working relationship with the NPWS in conserving and promoting the new</p>

	<p>Community Conservation Areas, National Parks and State Forests.</p> <p>The area locked up as State Community Conservation areas is:</p> <ul style="list-style-type: none"> • Bingara State CCA = 1975 hectares • Gwydir River CCA = 4769 hectares • Warialda National Park = 1600 hectares • Warialda State CCA = 2904 hectares <p>The area existing as National Park make up:</p> <ul style="list-style-type: none"> • 2340 hectares of Mount Kaputar NP. • 17 297 hectare Aracoola National Park. • 717 hectare Planchonella Nature Reserve (14 km North West of Coolatai, 44 km North of Warialda). 	<p>maintenance</p> <p>Lack of community awareness</p> <p>Increased tourism visitation places pressure on providing new facilities in conservation areas, which requires careful management.</p> <p>Deterioration & loss of built heritage</p> <p>Deterioration & loss of natural heritage</p>	<p>Tourism promotion of the shires excellent natural features including the new Community Conservation Areas.</p>	<p>Community Conservation Areas (CCA).</p> <p>Continue to support heritage projects through providing funding under the Local Heritage Fund.</p> <p>Continue to seek funding for the maintenance and upgrading of heritage items.</p> <p>Heritage Listing for Roxy Theatre Complex</p>
--	--	---	---	--

9. Evaluation & Planning for the Future

9.1 Evaluation & Planning for the Future

Council has an excellent opportunity to develop and implement best practice environmental planning through the development of a new Local Environmental Plan and Sustainability Strategy. Progress to date continued to be slow; however, further consultation with the Department of Planning is scheduled in an effort to advance the process.

This review of land use planning and Councils core activities will help to ensure that Councils' objective "To ensure that the Council's long term role is viable and sustainable by meeting the needs of our residents in a responsible caring way, attract sustainable development while maintaining the traditional rural values, character and culture of its people." (GSC, 2005, 6) can be met.

Over the next few years Council will be aiming to undertake the following activities:

- Continue to monitor water quality of the waterways within the shire & establish water quality targets & a strategy to achieve these targets.
- Continue to implement an effective trade waste policy to arrest pollutants at their source and licence commercial and industrial waste dischargers.
- Write funding applications for environmental work in order to continue with river restoration and rehabilitation to improve the shire's aesthetic values and continue support of Landcare activities.
- Continue to provide and improve Councils waste services to residents e.g. developing avoid, reduce, reuse, recycle programs across the Shire.
- Finalise and implement the Gwydir Sustainability Strategy and new LEP.
- Develop a Roadside Vegetation Management Plan that links with the LEP and Sustainability strategy.
- Council will continue to support waste reduction programs such as Clean Up Australia, Chemical Collection, and DrumMuster.
- Undertake community education activities covering a variety of environmental issues. For example, litter reduction campaigns, energy smart ideas, plastic bag alternatives, recycling programs, Noxious and Environmental weeds etc.

The Future:

Looking forward, Council over the next four years will endeavour to supply the most economically and environmentally friendly service and where possible expand this service with the intention of achieving ecological sustainability.

10. Limitations

10.1 Limitations

Opinions and recommendations contained in this report are based upon data provided by employees or representatives of Gwydir Shire Council and the information gained from contacts with relevant government authorities and other organisations.

This report addressed the current State of the Environment in Gwydir Shire as at June 2016, based on relevant in-house information which was available at that time.

This State of the Environment Report has been prepared for the purpose described solely in the Local Government Act 1993 (NSW) for the Minister for Local Government and no responsibility is accepted for use of any part of this report in any other context or for any other purpose.



Dichopogon strictus, commonly known as chocolate lily

Pictured here at The Living Classroom Bingara

11. Bibliography

- Environmental Protection Authority (NSW EPA), 2003, *Regulation of Open Burning in NSW: An Environmental guideline for councils, fire management authorities and landowners*, Sydney
- Environment Protection Authority (NSW EPA) 2000, *New South Wales State of the Environment Report*, Sydney
- NSW Government Environment & Heritage 2012, *Threatened Species – Border Rivers Gwydir*, accessed 28 November 2012, <http://www.environment.nsw.gov.au/threatenedSpeciesApp/AreaHabitatSearch.aspx?cmaname=Border+Rivers-Gwydir>. (NSW Government Environment & Heritage 2012)
- Department of Environment & Conservation (National Parks & Wildlife Service), (2004), *Local Government State of the Environment Report 2004*, NPWS, Northern Division
- Department of Infrastructure Planning & Natural Resources (DIPNR) (2004), *Building Sustainability Index*, Fact Sheet, DIPNR.
- Department of Infrastructure Planning & Natural Resources (DIPNR) (2004), *Threatened Species Data*, Inverell
- Department of Primary Industries, (NSW Fisheries), (2005), *Gwydir LGA-Information for State of the Environment Report*”, Office of Conservation, Tamworth
- Gwydir Shire Council (2005), *Management Plan 2004/5 to 2006/07*, Bingara
- Gwydir Shire Council *Supplementary State of the Environment Report 2010/11*
- Lake Macquarie City Council (LMCC), (2000), *State of the Environment Report 1999-2000*, LMCC printing department
- New South Wales Bureau of Meteorology climate services
- North west weeds website, www.northwestweeds.nsw.gov.au
- Waste Recycle Companies data
- 2006 ABS Census

Appendix 1

Appendix 1

Soil Type Descriptions

Gwydir Shire LGA- Broad Soils Legend Description

“CB1”

“Moderately undulating landscape with slight gilgai (few inches) formation: broad ridge tops and upper slopes of moderately shallow grey cracking clays, Associated are: (i) some dark cracking clays; (ii) various alkaline soils, and (iii) in the lower-lying situations deeper grey cracking clays

“CC17”

“Plains of slightly gilgaied (few inches) cracking clays associated with major and minor functional and non-functional drainage-ways: chief soils are grey clays and brown clays.

“CC20”

“Gently undulating cracking clay plains with moderate to strong (2 4 ft) gilgai microrelief: chief soils are deep grey clays (Ug5.24) with some brown clays (Ug5.34). Soil reaction values of these cracking clays vary and comprise: (i) alkaline or neutral surfaces with acid subsoils (common); (ii) acid throughout (fairly common); and (iii) alkaline throughout (rare).

“Cb30”

“Rugged granitic areas with rock walls and tors: chief soils are leached sands with various shallow sand soils.

“KK5”

“Plateau remnants at high elevation (>4500 ft), rock outcrops: organic loamy soils in the moister sites

“Kb5”

Gently sloping plain of dark cracking clays and/or other dark clays

“Kc2”

“Dissected basaltic plateau: undulating terrain of dark cracking clays

“Kc3”

“Dissected basaltic plateau--strongly rolling to hilly with some steep, broken slopes, bouldery: chief soils are dark cracking clays

“Kc4”

“Dissected basaltic plateau with hills and flat-topped ridges, sometimes bouldery: gently rolling to rolling terrain of dark cracking clays and red-brown cracking clays.

“Kc5”

“Dissected basaltic plateau with hills and flat-topped ridges, sometimes bouldery: gently rolling to rolling terrain of dark cracking clays and red-brown cracking.

“Kc6”

“Undulating to hilly with some steep slopes, bouldery in places: chief soils are cracking clays with red friable earths and sometimes red earths. Some variations exist between individual occurrences: this unit has similarities with units Kc4 and Mo7.

“Kd4”

“Valley plains of dark cracking clays. Associated are soils locally peculiar to the various adjoining units.

“Kh2”

“Flat to gently undulating plains showing slight (few inches) gilgai features: chief soils are dark cracking clays and hard alkaline dark soils often occurring together as soil complexes.

Associated are cracking grey and brown clays, some deep subsoil and/or D horizon layers may be strongly acid.

“Kh3”

“Valley plains of dark cracking clays and various alkaline soils

“LK3”

“Mountainous--very rugged to steep areas with rock outcrops and sometimes bare rock walls: shallow loamy soils having an A, horizon with shallow forms of many soils

“LM1”

“River terraces and levees: chief soils are loamy soils having an A2 horizon and red pedal subsoils and yellow-brown earths. Associated are sand-ridge formations in areas of restricted surface drainage.

“MM3”

“Flat to gently undulating with slight gilgai (few inches) formation: chief soils are deep cracking clays. Associated are shallow forms often containing ironstone gravels. These areas are usually underlain by strongly mottled acid clays.

“Mh7”

“Plateau remnants at high elevation (>4000 ft)--generally steep slopes with some benches: chief soils are shallow brown friable porous earths.

“Mo7”

“Dissected basaltic plateau--gently to strongly rolling terrain with hills, knolls, and flat-topped ridges: chief soils are neutral red friable earths and structured red clays, together with various dark cracking clays and red-brown cracking clays. These soils may cover relatively large individual areas as separate entities or may occur in various soil complexes.

Associated are: red earths containing ironstone gravels on residuals, sometimes flat-topped, of bauxitized basalt; other red earths on rolling terrain and hill slopes and soils on crests and upper slopes of knolls and ridges which are often flanked by cracking clays.

“Ms1”

“Undulating to hilly with some fairly broad flat areas, often broken by rocky knolls and ridges, some of which may be steep: chief soils are sandy acid yellow earths, sandy acid and neutral red earths and shallow sand soils on the ridges and their slopes where ferruginised rock and ironstone gravels are common.

“Ob17”

“Undulating to hilly with some steep ridges, rock outcrops: chief soils are hard alkaline and neutral red soils with cracking clays.

“Oc20”

“Plain--generally slightly raised above the level of the adjacent cracking clay plains: chief soils are shallow forms of hard alkaline red soils which usually contain ironstone gravels. Acid clays may underlie these areas.

“Qb20”

“Steep hilly with rock outcrops: chief soils are hard neutral red soils.

“Qb21”

“Hilly to steep hilly terrain with rock outcrops: chief soils are hard neutral red soils with shallow loamy soils.

“Qb22”

“Rolling country: hard neutral red soils

“Ra4”

“Undulating to low hilly: chief soils are hard neutral brown and red soils Associated stony ridge tops of shallow loamy soils.

“Ra5”

“Hilly with some steep slopes, rock outcrops: chief soils are hard neutral brown and red soils with shallow loamy soils

“Rh8”

“Mountainous--steep often rugged terrain with boulders: chief soils are friable brown soils. Associated are red friable earths in areas of relatively gentle relief.

“Ro2”

“Plains: chief soils are hard alkaline brown soils and smaller areas of cracking clays. These soils may form soil complexes locally.

“Ub56”

“Low hilly to hilly terrain with some flat to undulating portions, rock outcrops: chief soils are hard neutral yellow mottled soils.

“Ub59”

“Hilly: chief soils are hard neutral and acidic yellow and yellow mottled soils

“Ub61”

“Valley plains: chief soils are hard neutral yellow and yellow mottled soils

“Wa10”

“Undulating to hilly, granitic tors: chief soils seem to be sandy acidic yellow mottled soils; leached sands; and yellow earths”. Associated are occasionally red earths and red earths containing large amounts of ironstone or bauxitic gravel.

Appendix 2

Appendix 2

Drinking Water Monitoring Program Water Sample Analysis Results

Bingara Water Supply

Result Summary Report

Program:	Drinking Water Monitoring Program,Operational Monitoring Program,Project Program	Report Type:	Results Summary Report
AHS:	All	Entered Date Range:	-
PHU:	All	Barcode:	All
Water Utility:	All	Analysis Type:	All
Supply System:	Bingara GS01	Characteristics:	All
Town:	All	Treatment Type:	All
Treatment Plant:	All	Collected Date	01-07-2012 - 30-06-2016

Range:

Source: All

Sample Site: All

Sample Count: 260

Analysis Type	Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile
Chemistry												
	Aluminium	0.2000	mg/L	0.1219	0.1050	0.1266	0.005	0.62	50	7	0.5	0.0
	Antimony	0.0030	mg/L	0.0005	0.0005	0.0001	0.0001	0.0005	50	0	0.0005	0.0001
	Arsenic	0.0100	mg/L	0.0011	0.0010	0.0004	0.001	0.003	50	0	0.002	0.0001
	Barium	2.0000	mg/L	0.0185	0.0180	0.0043	0.013	0.031	50	0	0.0251	0.0100
	Boron	4.0000	mg/L	0.0622	0.0500	0.0215	0.05	0.1	50	0	0.1	0.0001
	Cadmium	0.0020	mg/L	0.0003	0.0003	0.0000	0.00025	0.00025	49	0	0.00025	0.0001
	Calcium	10000.0000	mg/L	18.0020	17.8000	6.9206	8	29.6	50	0	29.1	8.0001
	Chloride	250.0000	mg/L	20.2200	21.0000	4.8457	12	28	50	0	27	1.0001
	Chromium	0.0500	mg/L	0.0025	0.0025	0.0003	0.0002	0.0025	50	0	0.0025	0.0001
	Copper	2.0000	mg/L	0.4150	0.0920	0.6923	0.011	2.924	50	4	2.315	0.0001
	Fluoride	1.5000	mg/L	0.0918	0.1000	0.0357	0.05	0.17	50	0	0.14	0.0001
	Fluoride Ratio	0.8 - 1.2		0.0000	0.0000	0.0000	0	0	2	0	0	0
	Iodine	0.5000	mg/L	0.0201	0.0200	0.0063	0.01	0.04	50	0	0.03	0.0001
	Iron	0.3000	mg/L	0.2656	0.0200	1.0415	0.005	7.24	50	7	0.99	0.0001
	Lead	0.0100	mg/L	0.0025	0.0010	0.0071	0.0007	0.051	50	1	0.006	0.0001
	Magnesium	10000.0000	mg/L	14.3314	14.6600	5.2743	5.8	23.02	50	0	22.31	6.9001
	Manganese	0.5000	mg/L	0.0327	0.0175	0.0357	0.0025	0.165	50	0	0.103	0.0001
	Mercury	0.0010	mg/L	0.0001	0.0001	0.0000	0.00002	0.0001	50	0	0.00005	0.00001

Molybdenum	0.0500	mg/L	0.0025	0.0025	0.0003	0.0004	0.0025	50	0	0.0025	0.0025
Nickel	0.0200	mg/L	0.0049	0.0050	0.0005	0.0013	0.005	50	0	0.005	0.005
Nitrate	50.0000	mg/L	0.5920	0.5000	0.2648	0.5	2	50	0	1	0.5
Nitrite	3.0000	mg/L	0.0500	0.0500	0.0000	0.05	0.05	50	0	0.05	0.05
pH	6.5 - 8.5		7.2616	7.2000	0.2450	6.7	7.8	50	0	7.7	6.5
Selenium	0.0100	mg/L	0.0010	0.0010	0.0001	0.0002	0.001	50	0	0.001	0.001
Silver	0.1000	mg/L	0.0010	0.0010	0.0000	0.001	0.001	49	0	0.001	0.001
Sodium	180.0000	mg/L	23.4800	23.0000	8.3256	12	40	50	0	36	12
Sulfate	500.0000	mg/L	57.7000	56.0000	19.0780	34	105	50	0	85	34
Total Dissolved Solids (TDS)	600.0000	mg/L	160.9210	164.5000	52.0692	78	242	50	0	238	92
Total Hardness as CaCO3	200.0000	mg/L	102.8140	105.1000	40.8085	2.9	167.7	50	0	164.3	40.8
True Colour	15.0000	Hazen Units (HU)	2.2530	2.0000	1.2550	0.5	6	50	0	5	0.5
Turbidity	5.0000	NTU	0.9304	0.4000	1.7239	0.05	10.9	50	1	3.3	0.05
Zinc	3.0000	mg/L	0.1280	0.0450	0.3390	0.005	2.24	50	0	0.69	0.005
Microbiology											
E. coli	0.0000	mpn/100 mL	0.0000	0.0000	0.0000	0	0	210	0	0	0
Total Coliforms	0.0000	mpn/100 mL	1.5571	0.0000	12.2474	0	140	210	10	0	0

Warialda Water Supply:

Program:	Drinking Water Monitoring Program,Operational Monitoring Program,Project Program	Report Type:	Results Summary Report
AHS:	All	Entered Date Range:	-
PHU:	All	Barcode:	All
Water Utility:	All	Analysis Type:	All
Supply System:	Warialda GS4	Characteristics:	All
Town:	All	Treatment Type:	All
Treatment Plant:	All	Collected Date Range:	01-07-2012 - 30-06-2016
Source:	All		
Sample Site:	All		

Sample Count: 223

Analysis Type	Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile
Chemistry												
	Aluminium	0.2000	mg/L	0.0051	0.0050	0.0023	0.001	0.01	9	0	0.01	
	Antimony	0.0030	mg/L	0.0005	0.0005	0.0000	0.0005	0.0005	9	0	0.0005	
	Arsenic	0.0100	mg/L	0.0008	0.0010	0.0002	0.0005	0.001	9	0	0.001	
	Barium	2.0000	mg/L	0.0901	0.0900	0.0057	0.082	0.102	9	0	0.102	
	Boron	4.0000	mg/L	0.0500	0.0500	0.0000	0.05	0.05	9	0	0.05	
	Cadmium	0.0020	mg/L	0.0003	0.0003	0.0000	0.00025	0.00025	9	0	0.00025	

Calcium	10000.0000	mg/L	22.7678	22.6000	2.6178	19.1	26.01	9	0	26.01
Chloride	250.0000	mg/L	49.0000	47.0000	8.4705	40	66	9	0	66
Chromium	0.0500	mg/L	0.0025	0.0025	0.0000	0.0025	0.0025	9	0	0.0025
Copper	2.0000	mg/L	0.0069	0.0025	0.0059	0.0025	0.018	9	0	0.018
Fluoride	1.5000	mg/L	0.1178	0.1300	0.0487	0.05	0.21	9	0	0.21
Iodine	0.5000	mg/L	0.0344	0.0300	0.0053	0.03	0.04	9	0	0.04
Iron	0.3000	mg/L	0.0051	0.0050	0.0023	0.001	0.01	9	0	0.01
Lead	0.0100	mg/L	0.0010	0.0010	0.0000	0.001	0.001	9	0	0.001
Magnesium	10000.0000	mg/L	18.5822	18.8700	1.8675	16.42	21.63	9	0	21.63
Manganese	0.5000	mg/L	0.0025	0.0025	0.0000	0.0025	0.0025	9	0	0.0025
Mercury	0.0010	mg/L	0.0001	0.0001	0.0000	0.00005	0.0001	9	0	0.0001
Molybdenum	0.0500	mg/L	0.0025	0.0025	0.0000	0.0025	0.0025	9	0	0.0025
Nickel	0.0200	mg/L	0.0050	0.0050	0.0000	0.005	0.005	9	0	0.005
Nitrate	50.0000	mg/L	2.5111	2.9000	0.9701	1	3.7	9	0	3.7
Nitrite	3.0000	mg/L	0.0500	0.0500	0.0000	0.05	0.05	9	0	0.05
pH	6.5 - 8.5		8.0444	8.1000	0.1333	7.9	8.3	9	0	8.3
Selenium	0.0100	mg/L	0.0010	0.0010	0.0000	0.001	0.001	9	0	0.001
Silver	0.1000	mg/L	0.0010	0.0010	0.0000	0.001	0.001	9	0	0.001
Sodium	180.0000	mg/L	34.6667	33.0000	3.8079	31	43	9	0	43
Sulfate	500.0000	mg/L	5.3333	5.0000	0.8660	4	7	9	0	7
Total Dissolved Solids (TDS)	600.0000	mg/L	223.0000	219.0000	14.7394	204	250	9	0	250
Total Hardness as CaCO3	200.0000	mg/L	133.3444	140.6000	13.0812	115.7	149.7	9	0	149.7
True Colour	15.0000	Hazen Units (HU)	0.5556	0.5000	0.1667	0.5	1	9	0	1
Turbidity	5.0000	NTU	0.2056	0.1000	0.2493	0.05	0.8	9	0	0.8
Zinc	3.0000	mg/L	0.0189	0.0200	0.0143	0.005	0.05	9	0	0.05
Microbiology										

E. coli	0.0000	mpn/100 mL	0.0234	0.0000	0.3418	0	5	214	1	0
Total Coliforms	0.0000	mpn/100 mL	1.6963	0.0000	15.4293	0	202	214	16	1

Gravesend Water Supply:

Program:	Drinking Water Monitoring Program,Operational Monitoring Program,Project Program	Report Type:	Results Summary Report
AHS:	All	Entered Date Range:	-
PHU:	All	Barcode:	All
Water Utility:	All	Analysis Type:	All
Supply System:	Gravesend GS02	Characteristics:	All
Town:	All	Treatment Type:	All
Treatment Plant:	All	Collected Date Range:	01-07-2012 - 30-06-2016
Source:	All		
Sample Site:	All		

Sample Count:

Analysis Type	Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile
Chemistry												
	Aluminium	0.2000	mg/L	0.0139	0.0100	0.0114	0.005	0.04	9	0	0.04	
	Antimony	0.0030	mg/L	0.0005	0.0005	0.0000	0.0005	0.0005	9	0	0.0005	
	Arsenic	0.0100	mg/L	0.0010	0.0010	0.0000	0.001	0.001	9	0	0.001	
	Barium	2.0000	mg/L	0.0428	0.0370	0.0173	0.028	0.085	9	0	0.085	
	Boron	4.0000	mg/L	0.0500	0.0500	0.0000	0.05	0.05	9	0	0.05	
	Cadmium	0.0020	mg/L	0.0003	0.0003	0.0000	0.00025	0.00025	9	0	0.00025	
	Calcium	10000.0000	mg/L	41.3333	35.6000	16.3947	25.7	81.4	9	0	81.4	
	Chloride	250.0000	mg/L	43.4444	36.0000	22.4227	27	96	9	0	96	
	Chromium	0.0500	mg/L	0.0025	0.0025	0.0000	0.0025	0.0025	9	0	0.0025	
	Copper	2.0000	mg/L	0.0138	0.0070	0.0116	0.0025	0.032	9	0	0.032	
	Fluoride	1.5000	mg/L	0.1833	0.1900	0.0296	0.13	0.24	9	0	0.24	
	Iodine	0.5000	mg/L	0.0178	0.0200	0.0067	0.01	0.03	9	0	0.03	
	Iron	0.3000	mg/L	0.0417	0.0400	0.0378	0.005	0.1	9	0	0.1	
	Lead	0.0100	mg/L	0.0012	0.0010	0.0004	0.001	0.002	9	0	0.002	
	Magnesium	10000.0000	mg/L	15.9478	13.7800	6.8640	9.48	33.06	9	0	33.06	
	Manganese	0.5000	mg/L	0.0039	0.0025	0.0018	0.0025	0.007	9	0	0.007	
	Mercury	0.0010	mg/L	0.0001	0.0001	0.0001	0.00005	0.0003	9	0	0.0003	
	Molybdenum	0.0500	mg/L	0.0025	0.0025	0.0000	0.0025	0.0025	9	0	0.0025	
	Nickel	0.0200	mg/L	0.0050	0.0050	0.0000	0.005	0.005	9	0	0.005	
	Nitrate	50.0000	mg/L	2.8556	1.4000	4.0119	0.5	13.3	9	0	13.3	
	Nitrite	3.0000	mg/L	0.0500	0.0500	0.0000	0.05	0.05	9	0	0.05	
	pH	6.5 - 8.5		7.7667	7.8000	0.1803	7.4	8	9	0	8	
	Selenium	0.0100	mg/L	0.0010	0.0010	0.0000	0.001	0.001	9	0	0.001	

	Silver	0.1000	mg/L	0.0010	0.0010	0.0000	0.001	0.001	9	0	0.001
	Sodium	180.0000	mg/L	30.4444	29.0000	3.9405	27	39	9	0	39
	Sulfate	500.0000	mg/L	36.2222	36.0000	16.5965	17	75	9	0	75
	Total Dissolved Solids (TDS)	600.0000	mg/L	240.4444	223.0000	74.7180	159	417	9	0	417
	Total Hardness as CaCO3	200.0000	mg/L	168.8667	143.1000	69.1285	103.2	339.4	9	1	339.4
	True Colour	15.0000	Hazen Units (HU)	1.3889	1.0000	0.7817	0.5	3	9	0	3
	Turbidity	5.0000	NTU	0.4000	0.1000	0.5690	0.05	1.8	9	0	1.8
	Zinc	3.0000	mg/L	0.0511	0.0500	0.0257	0.02	0.1	9	0	0.1
Microbiology											
	E. coli	0.0000	mpn/100 mL	1.8455	0.0000	19.2593	0	202	110	2	0
	Total Coliforms	0.0000	mpn/100 mL	3.9273	0.0000	23.6425	0	202	110	7	1

North Star Water supply:

Program:	Drinking Water Monitoring Program,Operational Monitoring Program,Project Program	Report Type:	Results Summary Report
AHS:	All	Entered Date Range:	-
PHU:	All	Barcode:	All
Water Utility:	All	Analysis Type:	All
Supply System:	North Star GS3	Characteristics:	All
Town:	All	Treatment Type:	All

Treatment Plant: All

Collected Date Range:

01-07-2012 - 30-06-2016

Source: All

Sample Site: All

Sample Count: 56

Analysis Type	Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile
Chemistry												
	Aluminium	0.2000	mg/L	0.0056	0.0050	0.0018	0.005	0.01	8	0	0.01	
	Antimony	0.0030	mg/L	0.0005	0.0005	0.0000	0.0005	0.0005	8	0	0.0005	
	Arsenic	0.0100	mg/L	0.0005	0.0005	0.0000	0.0005	0.0005	8	0	0.0005	
	Barium	2.0000	mg/L	0.2951	0.2985	0.0351	0.247	0.342	8	0	0.342	
	Boron	4.0000	mg/L	0.0500	0.0500	0.0000	0.05	0.05	8	0	0.05	
	Cadmium	0.0020	mg/L	0.0003	0.0003	0.0000	0.00025	0.00025	8	0	0.00025	
	Calcium	10000.0000	mg/L	25.7875	24.9000	3.8256	21.8	33.3	8	0	33.3	
	Chloride	250.0000	mg/L	34.2500	33.0000	4.1318	30	40	8	0	40	
	Chromium	0.0500	mg/L	0.0025	0.0025	0.0000	0.0025	0.0025	8	0	0.0025	
	Copper	2.0000	mg/L	0.0260	0.0190	0.0171	0.011	0.056	8	0	0.056	
	Fluoride	1.5000	mg/L	0.0713	0.0500	0.0300	0.05	0.12	8	0	0.12	
	Iodine	0.5000	mg/L	0.0100	0.0100	0.0000	0.01	0.01	8	0	0.01	
	Iron	0.3000	mg/L	0.0475	0.0150	0.0728	0.005	0.22	8	0	0.22	
	Lead	0.0100	mg/L	0.0029	0.0010	0.0042	0.001	0.013	8	1	0.013	
	Magnesium	10000.0000	mg/L	10.6363	10.6550	0.9102	9.48	12.32	8	0	12.32	
	Manganese	0.5000	mg/L	0.0025	0.0025	0.0000	0.0025	0.0025	8	0	0.0025	
	Mercury	0.0010	mg/L	0.0001	0.0001	0.0000	0.00005	0.00005	8	0	0.00005	

	Molybdenum	0.0500	mg/L	0.0025	0.0025	0.0000	0.0025	0.0025	8	0	0.0025
	Nickel	0.0200	mg/L	0.0050	0.0050	0.0000	0.005	0.005	8	0	0.005
	Nitrate	50.0000	mg/L	0.6500	0.5000	0.2828	0.5	1.2	8	0	1.2
	Nitrite	3.0000	mg/L	0.0500	0.0500	0.0000	0.05	0.05	8	0	0.05
	pH	6.5 - 8.5		7.2875	7.2500	0.2416	7	7.8	8	0	7.8
	Selenium	0.0100	mg/L	0.0010	0.0010	0.0000	0.001	0.001	8	0	0.001
	Silver	0.1000	mg/L	0.0010	0.0010	0.0000	0.001	0.001	8	0	0.001
	Sodium	180.0000	mg/L	62.8750	60.0000	7.9541	54	74	8	0	74
	Sulfate	500.0000	mg/L	4.1250	4.0000	0.6409	3	5	8	0	5
	Total Dissolved Solids (TDS)	600.0000	mg/L	260.5000	254.0000	20.1282	237	288	8	0	288
	Total Hardness as CaCO3	200.0000	mg/L	108.1875	107.0500	10.4707	93.9	123.1	8	0	123.1
	True Colour	15.0000	Hazen Units (HU)	0.4700	0.5000	0.0849	0.26	0.5	8	0	0.5
	Turbidity	5.0000	NTU	1.2500	0.0750	2.6536	0.05	7.6	8	1	7.6
	Zinc	3.0000	mg/L	0.0613	0.0500	0.0429	0.02	0.15	8	0	0.15
Microbiology											
	E. coli	0.0000	mpn/100 mL	0.1667	0.0000	0.9070	0	6	48	2	0
	Total Coliforms	0.0000	mpn/100 mL	5.7708	0.0000	30.4668	0	202	48	4	8

Appendix 3

Threatened Species Lists

Threatened Fauna Species found in Peel CMA sub-region
as at 29th November 2016
(*Species listed under the *Threatened Species Conservation Act 1997* and *Fisheries Management Act 1994*)

Scientific Name	Common Name	NSW Status	Occurrence
Adelotus brevis - endangered population	Tusked Frog population in the Nandewar and New England Tableland Bioregions	Endangered Population	Known
Litoria booroolongensis	Booroolong Frog	Endangered	Known
Chalinolobus nigrogriseus	Hoary Wattled Bat	Vulnerable	Known
Chalinolobus picatus	Little Pied Bat	Vulnerable	Known
Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable	Known
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	Vulnerable	Known
Mormopterus eleryi	Bristle-faced free-tailed bat, Hairy-nosed Freetail Bat	Endangered	Known
Mormopterus lumsdenae	Northern Free-tailed Bat	Vulnerable	Known
Myotis macropus	Southern Myotis	Vulnerable	Known
Nyctophilus corbeni	Corben's Long-eared Bat	Vulnerable	Known
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Predicted
Saccolaimus flaviventris	Yellow-bellied Sheath-tail-bat	Vulnerable	Known
Scoteanax rueppellii	Greater Broad-nosed Bat	Vulnerable	Known
Vespadelus troughtoni	Eastern Cave Bat	Vulnerable	Known
Alectura lathamii - endangered population	Australian Brush-turkey population in the Nandewar and Brigalow Belt South Bioregions	Endangered Population	Known
Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Known
Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Known
Burhinus grallarius	Bush Stone-curlew	Endangered	Predicted
Calyptorhynchus lathamii	Glossy Black-Cockatoo	Vulnerable	Known
Chthonicola sagittata	Speckled Warbler	Vulnerable	Known
Circus assimilis	Spotted Harrier	Vulnerable	Known
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Known
Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Known
Ephippiorhynchus asiaticus	Black-necked Stork	Endangered	Known
Falco subniger	Black Falcon	Vulnerable	Known
Geophaps scripta	Squatter Pigeon	Endangered	Known

Glossopsitta pusilla	Little Lorikeet	Vulnerable	Known
Grantiella picta	Painted Honeyeater	Vulnerable	Known
Hieraaetus morphnoides	Little Eagle	Vulnerable	Known
Lathamus discolor	Swift Parrot	Endangered	Predicted
Lophoictinia isura	Square-tailed Kite	Vulnerable	Known
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Vulnerable	Known
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	Known
Neophema pulchella	Turquoise Parrot	Vulnerable	Known
Ninox connivens	Barking Owl	Vulnerable	Known
Petroica boodang	Scarlet Robin	Vulnerable	Predicted
Petroica phoenicea	Flame Robin	Vulnerable	Known
Poephila cincta cincta	Black-throated Finch (southern subspecies)	Presumed Extinct	Predicted
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Vulnerable	Known
Stagonopleura guttata	Diamond Firetail	Vulnerable	Known
Stictonetta naevosa	Freckled Duck	Vulnerable	Predicted
Tyto novaehollandiae	Masked Owl	Vulnerable	Predicted
Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Known
Macropus dorsalis	Black-striped Wallaby	Endangered	Known
Petaurus norfolcensis	Squirrel Glider	Vulnerable	Known
Petrogale penicillata	Brush-tailed Rock-wallaby	Endangered	Known
Phascolarctos cinereus	Koala	Vulnerable	Known
Sminthopsis macroura	Stripe-faced Dunnart	Vulnerable	Known
Amalosia rhombifer	Zigzag Velvet Gecko	Endangered	Known
Anomalopus mackayi	Five-clawed Worm-skink	Endangered	Predicted
Hoplocephalus bitorquatus	Pale-headed Snake	Vulnerable	Predicted
Myuchelys bellii	Bell's Turtle, Western Saw-shelled Turtle	Vulnerable	Known
Uvidicolus sphyurus	Border Thick-tailed Gecko	Vulnerable	Known
Pseudomys delicatulus	Delicate Mouse	Endangered	Predicted

**Threatened Fauna Species in
Gwydir Shire – Northern Basalt CMA Sub Region
as at 29th November 2016**

(*Species listed under the *Threatened Species Conservation Act 1997* and *Fisheries Management Act 1994*)

Scientific Name	Common Name	NSW Status	Occurrence
Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	Known
Chalinolobus picatus	Little Pied Bat	Vulnerable	Known

<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	Vulnerable	Known
<i>Mormopterus eleryi</i>	Bristle-faced free-tailed bat, Hairy-nosed Freetail Bat	Endangered	Known
<i>Nyctophilus corbeni</i>	Corben's Long-eared Bat	Vulnerable	Known
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Vulnerable	Known
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	Vulnerable	Known
<i>Vespadelus troughtoni</i>	Eastern Cave Bat	Vulnerable	Known
<i>Alectura lathamii</i> - endangered population	Australian Brush-turkey population in the Nandewar and Brigalow Belt South Bioregions	Endangered Population	Known
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	Vulnerable	Known
<i>Calyptorhynchus lathamii</i>	Glossy Black-Cockatoo	Vulnerable	Known
<i>Chthonicola sagittata</i>	Speckled Warbler	Vulnerable	Known
<i>Circus assimilis</i>	Spotted Harrier	Vulnerable	Known
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	Vulnerable	Known
<i>Daphoenositta chrysoptera</i>	Varied Sittella	Vulnerable	Known
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	Endangered	Known
<i>Falco subniger</i>	Black Falcon	Vulnerable	Known
<i>Geophaps scripta</i>	Squatter Pigeon	Endangered	Known
<i>Glossopsitta pusilla</i>	Little Lorikeet	Vulnerable	Known
<i>Grantiella picta</i>	Painted Honeyeater	Vulnerable	Known
<i>Hieraaetus morphnoides</i>	Little Eagle	Vulnerable	Known
<i>Lathamus discolor</i>	Swift Parrot	Endangered	Predicted
<i>Lophoictinia isura</i>	Square-tailed Kite	Vulnerable	Known
<i>Melanodryas cucullata cucullata</i>	Hooded Robin (south-eastern form)	Vulnerable	Known
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	Known
<i>Neophema pulchella</i>	Turquoise Parrot	Vulnerable	Known
<i>Nettapus coromandelianus</i>	Cotton Pygmy-Goose	Endangered	Known
<i>Ninox connivens</i>	Barking Owl	Vulnerable	Known
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	Vulnerable	Known
<i>Rostratula australis</i>	Australian Painted Snipe	Endangered	Predicted
<i>Stagonopleura guttata</i>	Diamond Firetail	Vulnerable	Known
<i>Stictonetta naevosa</i>	Freckled Duck	Vulnerable	Predicted
<i>Tyto novaehollandiae</i>	Masked Owl	Vulnerable	Known
<i>Jalmenus eubulus</i>	Pale Imperial Hairstreak	Critically Endangered	Predicted
<i>Macropus dorsalis</i>	Black-striped Wallaby	Endangered	Known
<i>Petaurus norfolcensis</i>	Squirrel Glider	Vulnerable	Known

Phascolarctos cinereus	Koala	Vulnerable	Known
Sminthopsis macroura	Stripe-faced Dunnart	Vulnerable	Known
Amalosia rhombifer	Zigzag Velvet Gecko	Endangered	Known
Anomalopus mackayi	Five-clawed Worm-skink	Endangered	Known
Hoplocephalus bitorquatus	Pale-headed Snake	Vulnerable	Known
Uvidicolus sphyurus	Border Thick-tailed Gecko	Vulnerable	Known
Pseudomys delicatulus	Delicate Mouse	Endangered	Known

**Threatened Fauna Species in
Gwydir Shire – Eastern Nandewar - B CMA Sub Region
as at 29th November 2016
(*Species listed under the *Threatened Species Conservation Act 1997* and *Fisheries Management Act 1994*)**

Scientific Name	Common Name	NSW Status	Occurrence
Adelotus brevis - endangered population	Tusked Frog population in the Nandewar and New England Tableland Bioregions	Endangered Population	Predicted
Chalinobus dwyeri	Large-eared Pied Bat	Vulnerable	Predicted
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	Vulnerable	Predicted
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Predicted
Saccolaimus flaviventris	Yellow-bellied Sheath-tail-bat	Vulnerable	Known
Alectura lathami - endangered population	Australian Brush-turkey population in the Nandewar and Brigalow Belt South Bioregions	Endangered Population	Known
Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Predicted
Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Known
Burhinus grallarius	Bush Stone-curlew	Endangered	Predicted
Calyptorhynchus lathami	Glossy Black-Cockatoo	Vulnerable	Predicted
Chthonicola sagittata	Speckled Warbler	Vulnerable	Known
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Known
Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Known
Falco subniger	Black Falcon	Vulnerable	Known
Glossopsitta pusilla	Little Lorikeet	Vulnerable	Known
Hieraaetus morphnoides	Little Eagle	Vulnerable	Known
Lathamus discolor	Swift Parrot	Endangered	Predicted
Lophoictinia isura	Square-tailed Kite	Vulnerable	Predicted
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Vulnerable	Predicted

Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	Predicted
Neophema pulchella	Turquoise Parrot	Vulnerable	Known
Ninox connivens	Barking Owl	Vulnerable	Predicted
Petroica boodang	Scarlet Robin	Vulnerable	Known
Petroica phoenicea	Flame Robin	Vulnerable	Predicted
Stagonopleura guttata	Diamond Firetail	Vulnerable	Known
Tyto novaehollandiae	Masked Owl	Vulnerable	Predicted
Cercartetus nanus	Eastern Pygmy-possum	Vulnerable	Predicted
Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Known
Petaurus norfolcensis	Squirrel Glider	Vulnerable	Known
Petrogale penicillata	Brush-tailed Rock-wallaby	Endangered	Predicted
Phascolarctos cinereus	Koala	Vulnerable	Known
Hoplocephalus bitorquatus	Pale-headed Snake	Vulnerable	Predicted

**Threatened Flora Species found in Peel CMA sub-region
as at 29th November 2016
(*Species listed under the Threatened Species Conservation Act 1997 and
Fisheries Management Act 1994)**

Scientific Name	Common Name	NSW Status	Occurrence
Dichanthium setosum	Bluegrass	Vulnerable	Known
Digitaria porrecta	Finger Panic Grass	Endangered	Predicted
Homopholis belsonii	Belson's Panic	Endangered	Predicted
Indigofera baileyi	Bailey's Indigo	Endangered	Known
Lepidium peregrinum	Wandering Pepper Cress	Endangered	Known
Polygala linariifolia	Native Milkwort	Endangered	Known
Rutidosis heterogama	Heath Wrinklewort	Vulnerable	Predicted
Swainsona sericea	Silky Swainson-pea	Vulnerable	Known
Thesium australe	Austral Toadflax	Vulnerable	Known
Acacia jucunda	Yetman Wattle	Endangered	Known
Acacia macnuttiana	MacNutt's Wattle	Vulnerable	Known
Acacia pycnostachya	Bolivia Wattle	Vulnerable	Known
Astrotricha roddii	Rodd's Star Hair	Endangered	Known
Capparis canescens	Wild Orange	Endangered	Known
Grevillea beadleana	Beadle's Grevillea	Endangered	Known
Homoranthus croftianus	Bolivia Homoranthus	Endangered	Predicted
Leucopogon confertus	Torrington Beard-heath	Endangered	Predicted
Phebalium glandulosum subsp. eglandulosum	Rusty Desert Phebalium	Endangered	Known
Pimelea venosa	Bolivia Hill Pimelea	Endangered	Predicted
Pomaderris queenslandica	Scant Pomaderris	Endangered	Predicted
Prostanthera staurophylla sensu	Torrington Mint-bush	Endangered	Predicted

stricto			
Angophora exul	Gibraltar Rock Apple	Endangered	Known
Cadellia pentastylis	Ooline	Vulnerable	Known
Eucalyptus boliviana	Bolivia Stringybark	Vulnerable	Predicted
Eucalyptus caleyi subsp. ovendenii	Ovenden's Ironbark	Vulnerable	Known

Threatened Flora Species*
within the Gwydir Shire – Northern Basalt CMA Sub Region
as at 29th November 2016
(*Species listed under the *Threatened Species Conservation Act 1997* and *Fisheries Management Act 1994*)

Scientific Name	Common Name	Form	NSW Status
Tylophora linearis	Tylophora linearis	Vulnerable	Known
Platyzoma microphyllum	Braid Fern	Endangered	Known
Cyperus conicus	Cyperus conicus	Endangered	Known
Desmodium campylocaulon	Creeping Tick-trefoil	Endangered	Known
Dichanthium setosum	Bluegrass	Vulnerable	Known
Digitaria porrecta	Finger Panic Grass	Endangered	Known
Homopholis belsonii	Belson's Panic	Endangered	Known
Lepidium aschersonii	Spiny Peppergrass	Vulnerable	Known
Polygala linariifolia	Native Milkwort	Endangered	Known
Swainsona murrayana	Slender Darling Pea	Vulnerable	Known
Swainsona sericea	Silky Swainson-pea	Vulnerable	Known
Thesium australe	Austral Toadflax	Vulnerable	Known
Diuris tricolor	Pine Donkey Orchid	Vulnerable	Known
Acacia jucunda	Yetman Wattle	Endangered	Known
Acacia pycnostachya	Bolivia Wattle	Vulnerable	Known
Capparis canescens	Wild Orange	Endangered	Predicted
Hakea pulvinifera	Lake Keepit Hakea	Endangered	Known
Pomaderris queenslandica	Scant Pomaderris	Endangered	Known
Cadellia pentastylis	Ooline	Vulnerable	Known

Threatened Flora Species*
within the Gwydir Shire – Eastern Nandewar - B CMA Sub Region
as at 29th November 2016
(*Species listed under the *Threatened Species Conservation Act 1997* and *Fisheries Management Act 1994*)

Scientific Name	Common Name	Form	NSW Status
Muehlenbeckia costata	Scrambling Lignum	Vulnerable	Predicted
Tylophora linearis	Tylophora	Vulnerable	Predicted

	linearis		
Cyperus conicus	Cyperus conicus	Endangered	Predicted
Digitaria porrecta	Finger Panic Grass	Endangered	Known
Homopholis belsonii	Belson's Panic	Endangered	Known
Polygala linariifolia	Native Milkwort	Endangered	Predicted
Thesium australe	Austral Toadflax	Vulnerable	Predicted
Commersonia procumbens	Commersonia procumbens	Vulnerable	Known
Cadellia pentastylis	Ooline	Vulnerable	Predicted

Endangered Ecological Communities*
within the Gwydir Shire – Peel CMA Sub-Region

as at 29th November 2016

(*Species listed under the *Threatened Species Conservation Act 1997* and *Fisheries Management Act 1994*)

Brigalow within the Brigalow Belt South; Nandewar and Darling Riverine Plains Bioregions	Known
Cadellia pentastylis (Ooline) community in the Nandewar and Brigalow Belt South bioregion	Known
Inland Grey Box Woodland in the Riverina; NSW South Western Slopes; Cobar Penepplain; Nandewar and Brigalow Belt South Bioregions	Predicted
White Box Yellow Box Blakely's Red Gum Woodland	Predicted

Endangered Ecological Communities*

Occur within the Gwydir Shire – Northern Basalt CMA Sub Region

as at 29th November 2016

(*Communities listed under the *Threatened Species Conservation Act 1997* and *Fisheries Management Act 1994*)

Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions	Known
Cadellia pentastylis (Ooline) community in the Nandewar and Brigalow Belt South Bioregions	Known
Carbeen Open Forest Community in the Darling Riverine Plains and Brigalow Belt South Bioregions	Known
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions	Known
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penepplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	Known
Semi-evergreen Vine Thicket in the Brigalow Belt South and Nandewar	Known

Bioregions	
White Box Yellow Box Blakely's Red Gum Woodland	Known
Coolibah-Black Box Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain and Mulga Lands Bioregion	Predicted
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Predicted

Endangered Ecological Communities*
within the Gwydir Shire – Eastern Nandewar - B CMA Sub Region
as at 29th November 2016
(*Communities listed under the *Threatened Species Conservation Act 1997* and *Fisheries Management Act 1994*)

Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions	Known
Cadellia pentastylis (Ooline) community in the Nandewar and Brigalow Belt South Bioregions	Predicted
Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions	Known
Semi-evergreen Vine Thicket in the Brigalow Belt South and Nandewar Bioregions	Known
White Box Yellow Box Blakely's Red Gum Woodland	Known

Key Threatening Processes* applicable to Gwydir LGA Area
as at 29th November 2016
(*Key Threatening Processes listed under the *Threatened Species Conservation Act 1997* and *Fisheries Management Act 1994*)

Invasion and establishment of exotic vines and scramblers	Weed	Occurrence
Invasion and establishment of Scotch Broom (Cytisus scoparius)	Weed	Predicted
Invasion of native plant communities by African Olive Olea europaea subsp. cuspidata (Wall. ex G. Don) Cif.	Weed	Predicted
Invasion of native plant communities by Chrysanthemoides monilifera	Weed	Predicted
Invasion of native plant communities by exotic perennial grasses	Weed	Predicted
Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)	Weed	Predicted
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Weed	Predicted
Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners Manorina melanocephala	Pest animal	Predicted
Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)	Pest animal	Predicted
Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758	Pest animal	Predicted

Key Threatening Processes* applicable to Gwydir LGA Area

as at 29th November 2016

(*Key Threatening Processes listed under the *Threatened Species Conservation Act 1997* and *Fisheries Management Act 1994*)

Competition from feral honey bees, <i>Apis mellifera</i> L.	Pest animal	Predicted
Herbivory and environmental degradation caused by feral deer	Pest animal	Predicted
Importation of Red Imported Fire Ants <i>Solenopsis invicta</i> Buren 1972	Pest animal	Predicted
Introduction of the Large Earth Bumblebee <i>Bombus terrestris</i> (L.)	Pest animal	Predicted
Invasion and establishment of the Cane Toad (<i>Bufo marinus</i>)	Pest animal	Predicted
Invasion of the Yellow Crazy Ant, <i>Anoplolepis gracilipes</i> (Fr. Smith) into NSW	Pest animal	Predicted
Predation and hybridisation by Feral Dogs, <i>Canis lupus familiaris</i>	Pest animal	Predicted
Predation by <i>Gambusia holbrooki</i> Girard, 1859 (Plague Minnow or Mosquito Fish)	Pest animal	Predicted
Predation by the European Red Fox <i>Vulpes Vulpes</i> (Linnaeus, 1758)	Pest animal	Predicted
Predation by the Feral Cat <i>Felis catus</i> (Linnaeus, 1758)	Pest animal	Predicted
Predation, habitat degradation, competition and disease transmission by Feral Pigs, <i>Sus scrofa</i> Linnaeus 1758	Pest animal	Predicted
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Other threat	Predicted
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	Habitat loss/change	Predicted
Anthropogenic Climate Change	Habitat loss/change	Predicted
Bushrock removal	Habitat loss/change	Predicted
Clearing of native vegetation	Habitat loss/change	Predicted
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	Habitat loss/change	Predicted
Loss of Hollow-bearing Trees	Habitat loss/change	Predicted
Loss or degradation (or both) of sites used for hill-topping by butterflies	Habitat loss/change	Predicted
Removal of dead wood and dead trees	Habitat loss/change	Predicted
Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	Disease	Predicted
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	Disease	Predicted
Infection of native plants by <i>Phytophthora cinnamomi</i>	Disease	Predicted