STATE OF THE ENVIRONMENT REPORT

ARMIDALE
Regional Council

Koala sleeping in bushland off Rockvale Road in Armidale

Acknowledgement of Country

We acknowledge the traditional custodians of this land and pay our respects to elders past, present and emerging. The Armidale Regional Council pays tribute to their love of land, love of people and love of culture.

Acknowledgement

This document has been prepared based on information supplied by many Council staff and community members. In addition public submissions were also made to the report.

The author would like to acknowledge the time and effort provided by Council staff, external agency staff and members of the public in preparing their submissions and contributing to this report.

Table of Contents

Table of Tables

Table of Figures

Table of Photos

1. Introduction

The *Local Government Act*, 1993, requires that the annual report of a council in the year in which an ordinary election of councillors is to be held must include a report a "state of the environment report" as to the state of the environment in the local government area in relation to such environmental issues as may be relevant to the objectives for the environment established by the community strategic plan. Section 428a below from the *Local Government Act*, 1993 stipulates what is required in the report.

A state of the environment report must be prepared in accordance with the guidelines under section 406.

The state of the environment report is to:

(a) establish relevant environmental indicators for each environmental objective, and

(b) report on, and update trends in, each such environmental indicator, and

(c) identify all major environmental impacts (being events and activities that have a major impact on environmental objectives).

The last State of the Environment reports were prepared separately by Armidale Dumaresq LGA, 2014-2015 and Guyra Shire Council 2008-2009 (Southern New England – and incorporated Armidale Dumaresq, Guyra, Uralla and Walcha). Since those reports amalgamation of Guyra Shire Council and Armidale Dumaresq Council has occurred.

The Integrated Planning and Reporting (IP&R) Framework for Councils in NSW came into effect in 2009. The Framework includes a suite of integrated plans that set out the communities vision and goals and the strategic actions to achieve them. The framework structure is provided below, Figure 1.

The Community Strategic Plan 2017 – 2027 was developed following comprehensive consultation with the community. The objectives in this report relate to the main Community Outcomes under the Community strategic plan 2017 – 2027 which are detailed in Section 3. From the Community Strategic Plan 2017 – 2027 a Delivery Program is developed every four years and an Operational Plan is developed yearly. These documents are put on public exhibition with community consultation undertaken and submissions received prior to adoption by Council. The main items under the Community Strategic Plan 2017 – 2027, Delivery Program for 2018 – 2021 for the Environment related Community Outcomes are provided in Section 3.

Due to the COVID19 pandemic and the subsequent delay in the NSW Council elections, this report has been delayed a year, however this report provides information from 2016 to December 2020 and will be submitted with the Annual Report for 2021. The report will be reviewed by Council staff and then be submitted to Council as part of the Annual Report to the October 2021 Ordinary Council Meeting.

Community members were invited to prepare and submit submissions to the State of the Environment report, the public submission period ran for just over a month and ended on the Monday 1st March 2021. Ten submissions were received for the report and are mentioned throughout the report and summarised and attached in Appendix 1.

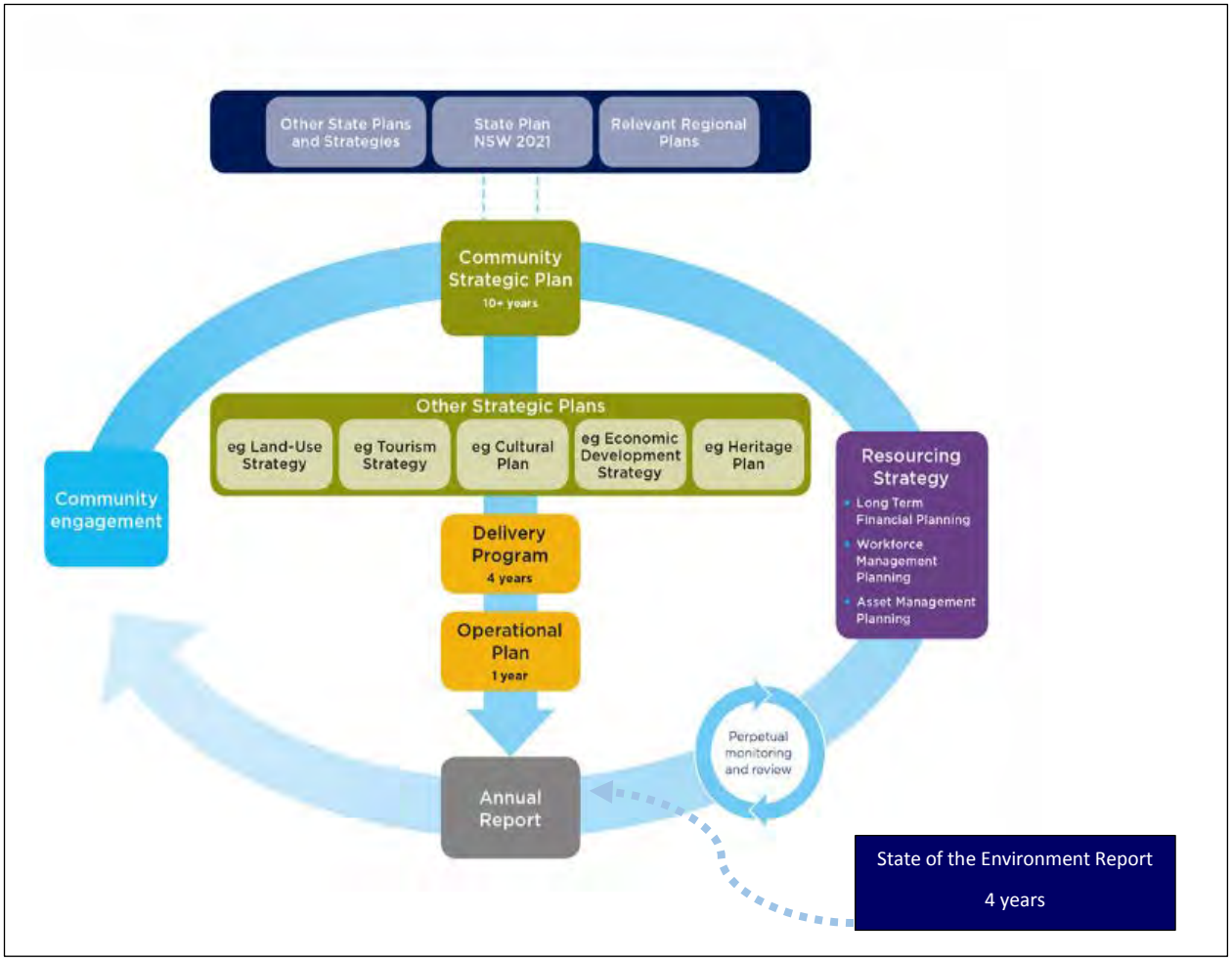


Figure 1. Integrated Planning and Reporting Framework, including 4 yearly State of the environment report. (Initial figure from Office of Local Government, Integrated Planning and Reporting, 2021.)

The requirements in item b) above from the Act, *report on, and update trends in, each such environmental indicator* has been addressed within the report. In Section 11 the below indicator trend arrows are used to provide indication of from left to right of, worsening trend, little or no change trend, improvement trend and significant improvement trend. Note however that not all data and information from the previous reporting period is available, where it is, information on the change is provided and where direct comparison can be made an indicator trend arrow is also provided.

2. Armidale Local Government Area

The Armidale Regional Council Local Government Area (LGA) is located in the Northern Tablelands of NSW and covers an area of 8,621km^2, Figure 2. The LGA sits within the New England Tableland Bioregion whose topography is one of a stepped plateau of hills and plains with elevations of 600 to 1500 on Permian sedimentary rocks, intrusive granites, and extensive Tertiary basalts. Armidale is Australia's highest altitude city at 980m and is located midway between Sydney and Brisbane, while Guyra is situated at an altitude of 1,330m.

The total population of the LGA estimated for 2019 was 30,779, (ABS, Estimated Resident population, 2019). The two main population areas are Armidale, (population 23,352, (2016 Census, ABS, 2020) and Guyra (population 1,983, ABS, 2020). Ben Lomond, Ebor and Hillgrove are three other main villages within the LGA. The total dwellings in the 2016 census for the LGA were 12,738, with an average household size (persons per dwelling) of 2.38.

The Aboriginal and Torres Strait Islander population in the 2016 census was 2,171 and made up 7.2% of the population (ABS, 2020).

The Northern Tablelands has a cool temperate climate with warm to hot summers and very cold winters with the majority of rain falling in the summer months.

The New England Tablelands geology and topography is determined by the New England fold belt which is composed of sedimentary rocks of Carboniferous and Permian age. These rocks were extensively faulted during a rapid continental plate movement associated with granite intrusions in the late Carboniferous period. Much of the bedrock is now overlain by Tertiary basalt flows (up to 100m in thickness) that lie on river gravels and sands or lake sediments. The geology of the region has a strong influence on the topography and has resulted in three main topographical types:

- escarpment areas, (Great Escarpment) on eastern edge where eastern flowing streams have cut deep gorges on the edges of the plateau;
- granite country, typically steep with abundant boulder outcrops and rounded tors;
- basalt country, planar, except where former eruption centres that form high peaks and the individual basalt flows are seen as distinct levels across the plains (NSW DPIE, 2016).

Extensive parts of the LGA are contained within the four National Parks and State Forests located in the east of the LGA. Much of the extensive wilderness in the New England and Oxley Wild Rivers National Parks is World Heritage Listed.

The Aboriginal language groups of the Anaiwan, Gumbaynggirr, Banbai and Ngarrabul people traditional lands were in the local government area. Anaiwan and Gumbaynggirr in the Armidale area, Banbai in the Ben Lomond area, and the Ngarrabul in the Kingsplains area. The regional area has great cultural and spiritual significance to local Aboriginal people. There is a strong oral history indicating seasonal movement between the coastal plains and the tablelands through the rugged gorge systems, (NSW 2017). Numerous cultural heritage sites and Aboriginal places are identified an protected by the *National Parks and Wildlife Act 1974* . The Wattleridge Indigenous Protected Area northwest of Guyra covers an areas of 480ha of botanically diverse bushland.

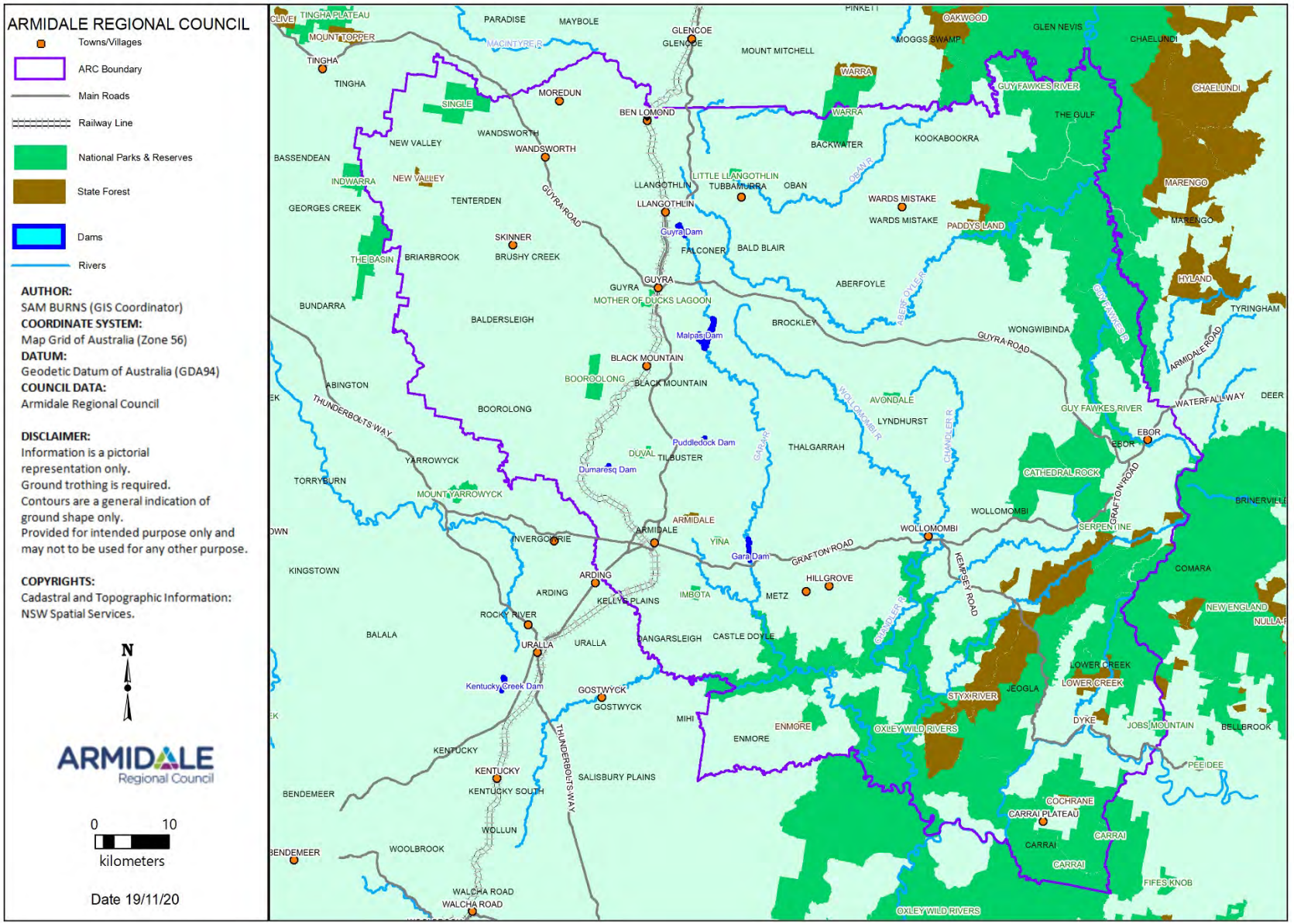


Figure 2. Map of Armidale Local Government Area location.

3. Environmental Objectives

3.1 Community Strategic Plan

A wide ranging and comprehensive consultation program was undertaken in developing the Community Strategic Plan from 2016 – 2027, and the key findings included:

- The unique landscape and environment across the region is a key part of our lifestyle. It is important that measures and programs are in place to help our community adapt to and mitigate the impacts of climate change to ensure that future generations can enjoy the environment in which we live. Our infrastructure makes daily life possible, and it is essential that our roads, footpaths, bridges, kerb and gutter and other infrastructure are maintained in a way which enables us to function in an effective and efficient manner as a community.

The Community Strategic Plan consists of four Strategic Directions which each have Community Outcomes designed to help Council achieve its overarching vision. The four Strategic directions are Environment and Infrastructure, Growth, Prosperity and Economic Development, Leadership for the Region and Our People and Community.

The Environment and Infrastructure Community Outcomes are provided below.

Environment and Infrastructure	
Community Outcome 1	The unique climate, landscape and environment of the region is protected, preserved and made accessible
Community Outcome 2	The community can participate in initiatives which contribute to a sustainable lifestyle
Community Outcome 3	The community is provided with the essential and resilient infrastructure which contribute to a sustainable lifestyle
Community Outcome 4	The community has access to transport which enables connectivity both locally and outside the region

From the four Community outcomes above, fourteen environmental objectives are provided below, the majority stemming from the first two outcomes.

Community Outcome 1: The unique climate, landscape and environment of the region is protected, preserved and made accessible

Supporting Strategies	Partner with local organisations and stakeholders to develop strategies for dealing with climate change impacts on the local agricultural sector
	Tourism strategies and active, eco-tourism partnerships, promote the local landscape and natural attractions while considering potential impacts on the environment and ways to mitigate such impacts
	Maintain and improve local waterways, lagoons and creek lands in partnership with community groups and other agencies
	Partner with stakeholders to develop strategies and provide programs which improve air quality across the region, including the reduction of smoke pollution by using alternative energy sources
	Investigate alternative sources of power generation to reduce the community's carbon footprint

Community Outcome 2: The community can participate in initiatives which contribute to a sustainable lifestyle	
Supporting Strategies	Provide educational programs to increase community awareness of climate change risks and enable the community to implement climate change adaptation and mitigation actions in daily life
	Provide specific educational programs on waste reduction and recycling, including vegetation recycling, and support these programs through increased recycling services across the region
	Prepare disaster management plans to reduce the impact of natural disasters
	Develop a Sustainability Strategy which includes objectives for the region as a whole as well as Council operations
	Provide incentives for eco-tourism operators to establish programs which promote sustainable living and attract tourists to the region
	Advocate for cost-effective access to renewable energy for the local community and businesses

Community Outcome 3: The community is provided with the essential and resilient infrastructure which contribute to a sustainable lifestyle	
Supporting Strategies	Develop a program for the provision of sustainable transport options, including additional cycleways and education programs to encourage sustainable transport

Community Outcome 4: The community has access to transport which enables connectivity both locally and outside the region	
Supporting Strategies	Promote cycling for transport as a healthy, environmentally friendly option
	Evaluate the role of electric vehicles, including driverless electric shuttles and autonomous vehicles, in future transport strategies

The Community Strategic Plan Performance Indicators are high level, overarching performance indicators which were chosen based on community feedback about what was the most important to help achieve the community vision. Some of the performance indicators are not fully within Council's direct control, however Council has a role to advocate for and facilitate improved outcomes in these areas.

Community Strategic Plan Performance Indicators are:

- Reduction in Council's operational energy consumption by 2020
- Reduction in carbon and greenhouse emissions per capita by 2020

Council's Four-Year Delivery Program and the annual Operational Plan, which link directly to the Community Strategic Plan, contain more detailed, operational performance measures which are reviewed and reported on a six-monthly and annual basis, and which will help progress towards the goal of achieving the community vision.

Develop a Sustainability Strategy

EcoARC is Councils GreenPrint for Sustainability strategy prepared as part of Council commitment to the Community Strategic Plan 2017 – 2027. Protecting the environment, reducing pollution and waste and encouraging climate friendly lifestyles were priorities identified by the community in the Community Strategic Plan 2017 – 2027.

The EcoARC document was developed by the Environmental Sustainability Advisory Committee, community representatives and Council staff over 2018 - 2019 and includes nine topics, Global, Air, Biodiversity, Future, Living, Resilience, Transport, Waste and Water. EcoARC was placed on public exhibition in April 2019 and was adopted by Council on 11th December 2019, Resolution 278/19.

For each topic the scope and intent are provided as well as key success indicators, strategic initiatives and advocacy and education actions and recommendations. Work has been undertaken in 2021 with the Environmental Sustainability Advisory Committee members and council staff on priority items in alignment with the existing and future Community Strategic Plan.

4. Climate and Atmosphere

4.1. Climate

The Northern Tablelands has a cool temperate climate with warm to hot summers and very cold winters with severe frosts, and snowfalls occurring at times on the higher parts. Historically the majority of rain fall has occurred within the summer months.

The average annual rainfall is just less than 800mm in Armidale and is 877mm in Guyra, (BOM, 2021). In 2019 the rainfall for Guyra dropped to 330mm, Figure 3 and Figure 4. The highest monthly rainfall for both Guyra and Armidale are shown in the graphs, which show the variation between low (2019), average and highest rainfall months.

Mean monthly minimum temperatures in Guyra vary from -2.9 degrees Celsius (°C) in July to 7.3°C in December. Mean monthly maximum temperatures vary from 10.6°C in July to 24.5°C in January, Figure 5.

Mean monthly minimum temperatures in Armidale vary from 0.3°C in July to 13.4°C in January, while mean monthly maximum temperatures vary from 12.2°C in July to 27.1°C in January, Figure 6. The mean annual evaporation is approximately 1120mm, with monthly values varying from 60mm in June to 210mm in January.

In the late 2010's a widespread drought was experienced across much of the eastern seaboard, with some areas of western NSW experiencing very dry conditions from late 2016. By early 2019 the Combined drought indicator showed that 99.8% of NSW was experiencing drought conditions, (DPI, 2019).

Local rainfalls in 2019 were well below average for both Guyra, 330mm, and Armidale 315mm - the lowest recorded at the Armidale Airport weather station since recording began in 1994. This followed on from 2018 when less than average rainfall occurred. In addition higher temperatures occurred in the summer months, increasing evaporation. More information is provided in Section 5.1 below about the effect of the drought on town water supplies and restrictions.

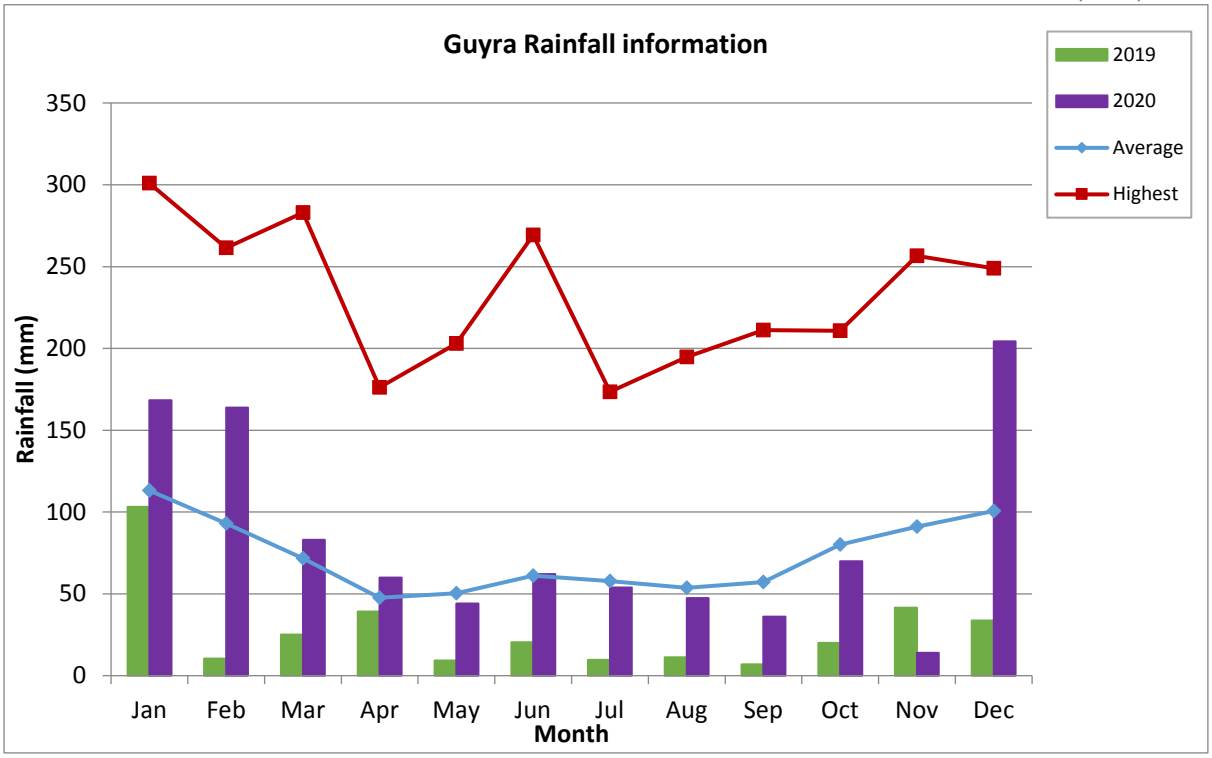


Figure 3. Monthly rainfall information for Guyra, including average and highest monthly rainfall, as well as monthly rainfall figures for 2019 and 2020

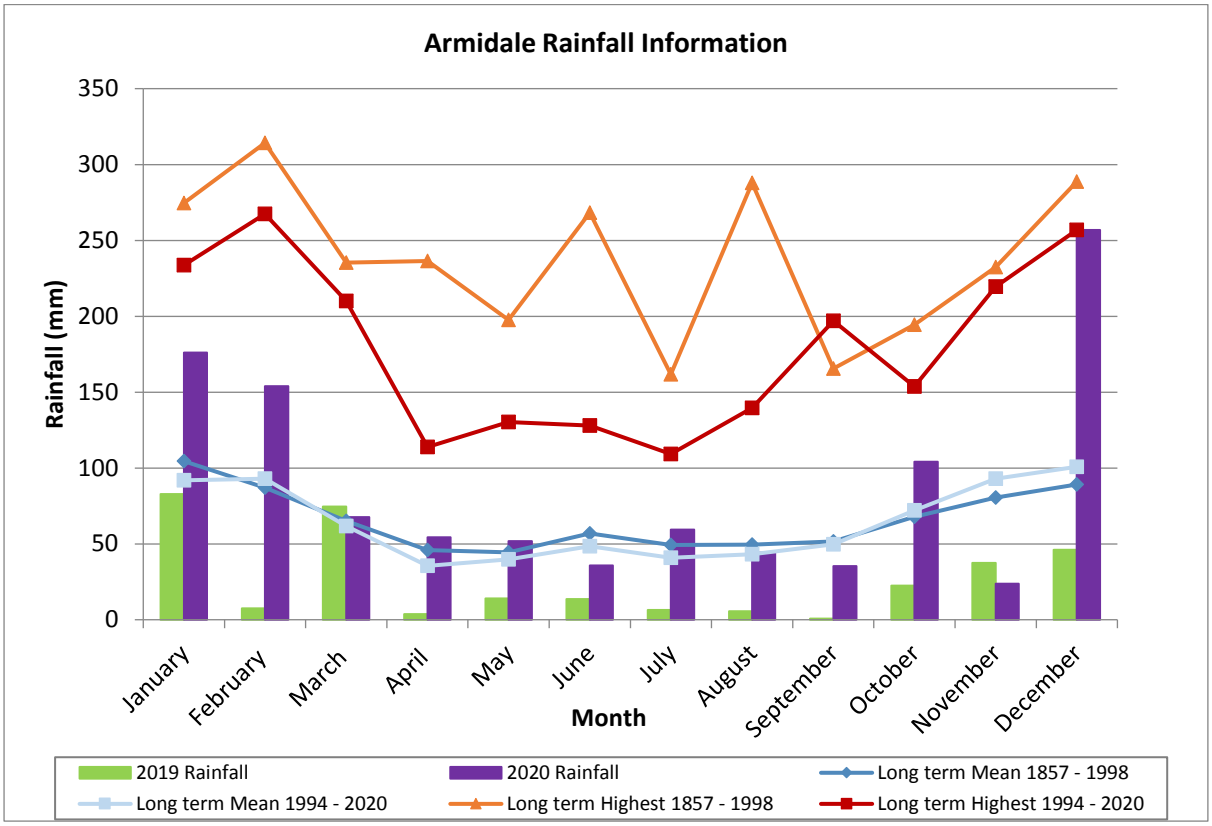


Figure 4. Rainfall information for Armidale, including average and highest monthly rainfall. Information from two different weather stations is provided, BOM 2021.

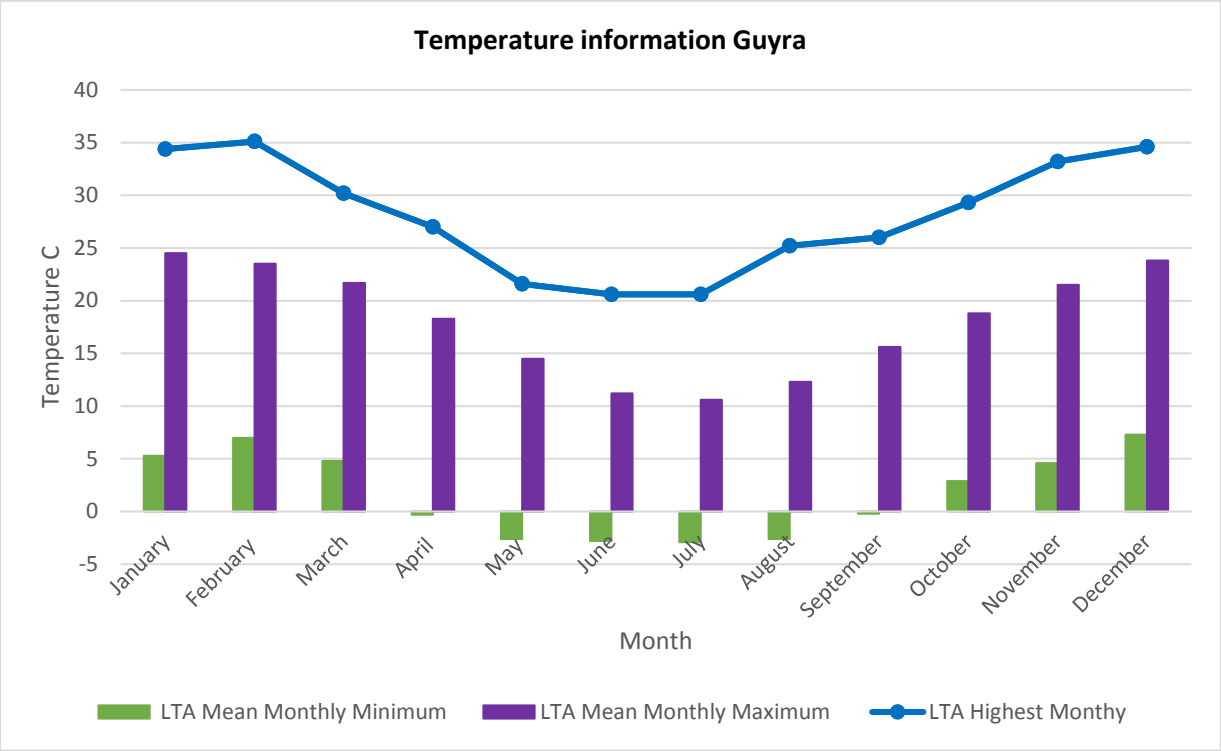


Figure 5. Guyra long term average (LTA) temperatures, BOM 2021.

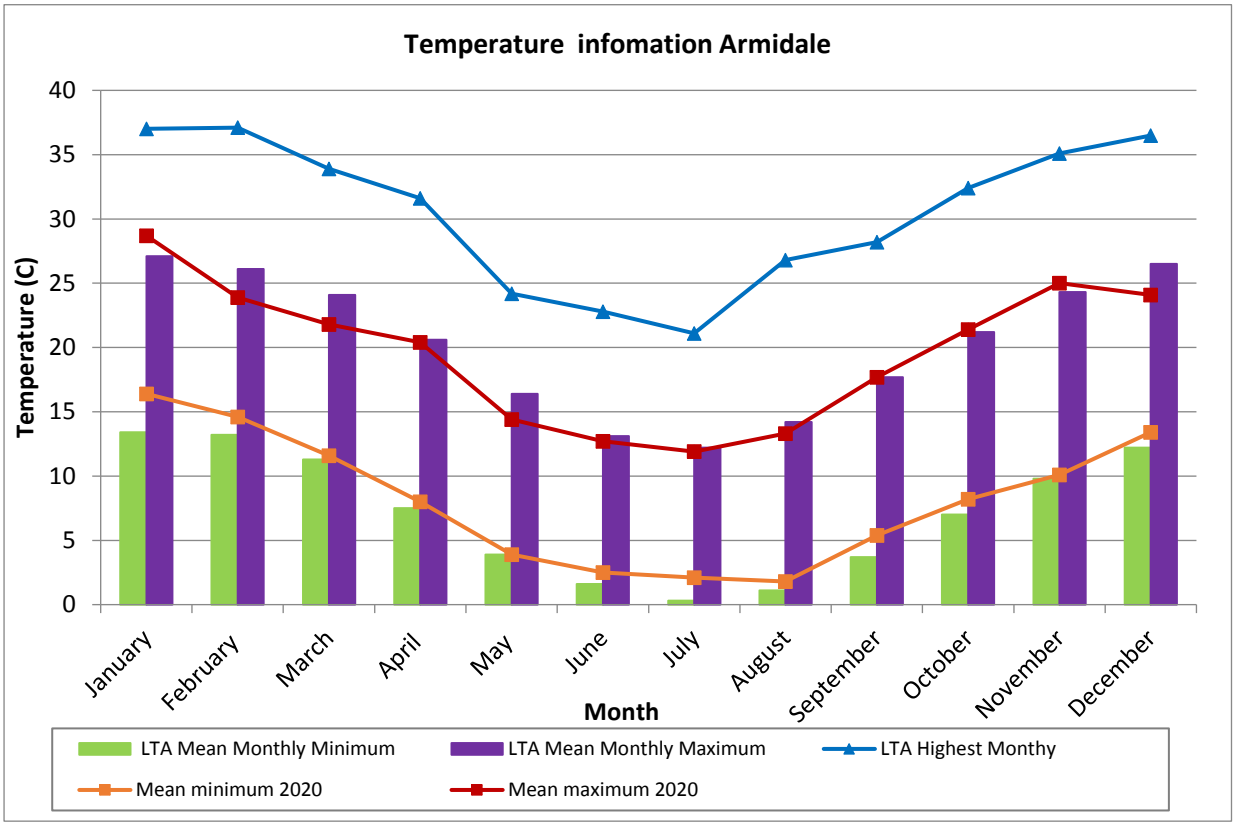


Figure 6. Temperature information for Armidale records with Long term average (LTA) mean minimum and maximum temperatures, as well as 2020 data (BOM, 2021).

Note that historical data for Figure 6 was obtained from the Armidale Radio Station from 1857 to 1997, more recent data was obtained from Armidale Airport 1994 to 2020.

4.2. Climate Change

Community Strategic Plan	
Strategic Direction	Reduction in carbon and greenhouse emissions per capita by 2020. Target: >5% decrease from 2016 baseline

Community Outcome 2: The community can participate in initiatives which contribute to a sustainable lifestyle
Provide educational programs to increase community awareness of climate change risks and enable the community to implement climate change adaptation and mitigation actions in daily life

4.2.1. Climate change predictions for LGA

The NSW Climate Impact Profile 2010 predicts some changes to climate, with the daily maximum temperatures in the New England/North West region projected to increase over all seasons by 1–3°C. Rainfall is projected to increase in all seasons except winter, when it is expected to decrease by 10–20%. Evaporation is likely to increase throughout the year. The overall water balance is likely to remain similar to what it is at present, but with some redistribution of runoff likely to produce substantial increases in summer and a substantial decrease during spring and winter.

The NSW Office of Water (NOW) engaged NSW Public Works to conduct a pilot study to determine the potential impact of variable climatic patterns on 11 local water utility water supply systems in regional NSW. The pilot study found that future secure yield under the methodology proposed by NOW (2013) also known as "5/10/10" rule, is reduced by up to 9% for coastal and table land utilities and by approximately 30% for inland water utilities in mid and southern NSW. The pilot study used 0.9ºC global warming by ~ 2030 and 15 global climate models, NSW Public Works, 2012.

Secure yield of ARC water supply dams was found to be reduced by about 32% with the consideration of climate change (NUWS, 2020). The study utilised climate data provided by DPIE Water for a future climate change scenario corresponding to a 1 degree rise in global temperature by year 2030.

A Drought Management Plan (Town water) for ARC was prepared and put on public exhibition in 2020 outlining short and long term actions, and was adopted by Council on the 24th February 2021. The Drought Management Plan (Town water) guides the ARC as a Local Water Utility and is discussed in Section 5.2.

4.2.2. Project Zero30

In October 2019, the University of New England (UNE) and Council created a joint venture known as Project Zero30. The aim of Project Zero30 is to bring the LGA to net zero greenhouse gas emissions by 2030 through a unique partnership between science, the community, businesses and government, Ordinary Council Meeting Resolution 200/19, 25/9/2019. A Memorandum of Understanding was signed by both parties on the 15th May 2020. The project is designed to achieve net zero $C0_2$ emissions by achieving National Carbon Offset Standard (NCOS) certification by 2030.

The Federal Government's National Carbon Offset Standard (NCOS) is a voluntary standard to manage greenhouse emissions and achieve carbon neutrality. NCOS provides best-practice guidance

on how to measure, reduce, offset, report and audit emissions for organisations, products & services, events, precincts and buildings. Project Zero30 should achieve NCOS certification for the Armidale Local Government Area by 2030 under NCOS category five - Precincts.

Project Zero30 consists of two phases. Phase 1 is concerned with short term actions that can be undertaken from Years 1-3 while Phase 2 will begin once Phase 1 is complete and build upon the activities and the baseline activity of Phase 1.

The status of the project currently is that appointment of a Postdoctoral Research Fellow to undertake the benchmarking required for the project has been undertaken by UNE. Emissions measurement has been commenced with Council currently undertaking research and providing collated data on our electricity consumption. The three committees (Operational, Community and Science) have been formed and are holding regular meetings, Sustainability Officer is on the Operational and also the Community Committee.

Council has representation on the Board of Project Zero 30 and is also responsible for the Community Committee which meets bimonthly and acts as a conduit between the Board and the community.

Carbon emissions electronic trackers are being developed where and individual or business can insert their data to determine their actual carbon emissions and also where the highest emissions are coming from. These electronic trackers will retain the initial information so that as business/individuals modify items their carbon emissions are updated. A carbon emissions beef tracker for farmers has already been developed for members of the beef industry.

The Zero30 project will make recommendation of strategies to reduce carbon emissions for both the community and Council once the emissions benchmarking for the LGA has taken place. This is likely to require polices to be developed, adopted, resourced and actioned by Council, OCM Report 9/12/2020, AINT/2020/41800.

A baseline carbon account is being developed by the Post-Doctoral Research Fellow with 2016 as the baseline. At this stage it is unable to be determined if a reduction in carbon and greenhouse emissions has occurred per capita for the LGA as per Community Strategic Plan, Strategic initiative. The Climate Emergency Working Group in their report *A Framework for Climate Action* detailed emissions for 2017 for Armidale region as being a total of 790,100 tonnes of greenhouse gases from Snapshot NSW.

4.2.3. Climate Emergency Declaration

A Climate Emergency Declaration was declared by Council on the 23rd October 2019 following an Environment Sustainability Advisory Committee (ESAC) meeting on 14th October and a presentation by Dale Curtis (who organised a petition through Change.Org in early June 2019). A Climate Emergency Working Group was developed and a final report *A Framework for Climate Action* from this group was presented to the ESAC meeting on 10th August 2020.

This report provides information from Snapshot NSW on the 2017 Greenhouse gas emissions by sector for the Armidale Local Government Area and provides a net emissions for 2017 of 790,100 tonnes $CO^2{}_{e.}$ Note that this does not includes emissions from the use of gas in residential, commercial or industrial premises. In addition the Zero30 Project, a collaboration between UNE and ARC, as one of their main projects is developing up an emissions profile for the region including determination of the sectors with the highest emissions.

The 2020-2021 budget allocated $60,000 for the Climate Emergency Action Plan (the Climate Emergency Working Group report - *A Framework for Climate Action*).Three projects were determined to proceed from this money, they were approved at the Ordinary Council Meeting on 25/11/2020, Resolution 331/20 and they are detailed below:

Project 1: Installation of a 14.8kWp solar system at Monckton Aquatic Centre with Council staff undertaking the project management at a total cost $41,573. This project is due to start in October 2021 and was delayed due to the upgrades of the electrical system at the Aquatic Centre.

The latter two projects will provide for education of the community on the reduction of energy consumption within their homes, as well as providing for education and information dissemination on reducing climate change risks through the peri-urban community across the Armidale Local Government Area.

Project 2: "I Can Do It" Energy Efficiency Project, cost $5,000. Community education program for decreasing energy use and increasing comfort within households, based on the "I Can do it" program previously undertaken by Sustainable Living Armidale. Workshops commenced in March 2021 and a sustainable house tour was undertaken in May 2021 and the project will continue in spring and summer 2021, dependent on Covid 19 health restrictions.

Project 3: Climate Risk & Peri-urban dwellers project, cost $13,427. This project is to address climate risk in the LGA community, particularly focusing on the experiences of peri-urban landholders with a goal of achieving increased community capacity, education and adaptation. This project was undertaken under an agreement with Southern New England Landcare. Workshops were undertaken in March to May 2021. A final report has been prepared and presentations on the project will be undertaken for the board meetings for Sustainable Living Armidale and also Southern New England Landcare.

4.2.4. Council Greenhouse emissions

A baseline carbon account is being developed as part of Project Zero 30 with 2016 as the baseline year. At this stage it is unable to be determined if a reduction in carbon and greenhouse emissions has occurred per capita for the LGA. The Climate Emergency Working Group in their report *A Framework for Climate Action* detailed emissions for 2017 for Armidale region as being a total of 790,100 tonnes of greenhouse gases.

However, the below information is provided for Council emissions of CO_2e from electrical generation in tonnes, there has been a reduction since 2019 due to increased solar power installations on Council facilities, Table 1. There is a 25.7% reduction on emissions in tonnes from 2016 baseline to 2020, which is a significant improvement. This is largely due to the three solar arrays coming on line from 2019 on, Section 6.2.

Table 1. Council emissions of CO_2e in tonnes, from electrical consumption.

Year	2016	2017	2018	2019	2020
Tonnes of CO_2e per financial year	3,437	3,826	4,583	2,935	2,553

Note that detailed information is provided below in Section 6.2. in regard to measures that have been taken by Council to reduce energy consumption and therefore greenhouse gas emissions.

Calculated greenhouse gas emissions for the fleet (note only based on fuel consumption not vehicle type) is also provided below, Table 2. There was a reduction in the amount of petrol used in the financial year 2019/2020, from the previous years, however note that some of this may stem from the reduction in transport during the latter part of the 2020 financial year due to COVID19 lock

down. The amounts of diesel were also reduced in 2019/2020 from the 2016/2017 and 2017/2018 periods.

Table 2. Indicative greenhouse gas emissions based on fuel use only.

Year	Greenhouse gas emissions CO_{2-e} (T)	
	Diesel	Unleaded Petrol
2016/2017	1,675	184
2017/2018	1,874	241
2018/2019	1,665	199
2019/2020	1,668	169
Total	**6,882**	**793**

Calculated from National Greenhouse Accounts Factors, 2020, Table 4. Fuel combustion emission factors – fuels used for Transport energy, p.16.

Council purchased a Toyota Corolla Hybrid in 2020 and this will be the trend including full electric vehicles as infrastructure and vehicle models become more available.

Calculated greenhouse emissions for Councils Water and Wastewater services are provided below, Table 3. The emissions are mainly from the processes involved in the treatment of, water to potable standard, wastewater processes as well as the pumping involved with both water and wastewater. The calculations are based on information supplied by DPIE. The lower greenhouse emissions in 2019/2020 are thought to be to the lower water and wastewater flows during drought years, when extensive water saving education was supplied to the community.

Table 3. Greenhouse gas emissions for Councils Water and Wastewater services.

Year	Greenhouse Gas Emissions - Water and Wastewater Service CO_{2-e} (T)
2015/16	4,374
2016/17	4,579
2017/18	4,372
2018/19	4,410
2019/20	3,312

4.3. Air quality

Typical air quality in the LGA during warmer months is of very good quality, apart from when bushfires such as occurred in 2019/2020.

Colder weather or Winter air quality in the Armidale city area however during colder months is problematic due to smoke from wood heaters and the temperature inversions in the main CBD and residential area valley, that occur on cold nights, effectively trapping the smoke.

The Community Strategic Plan 2017 – 2027 details this concern and it is provided below in full.

"People in the region love the climate, weather and the unique 'seasons' experienced in this part of the world. Fittingly, protecting the environment, reducing pollution and waste were mentioned as priorities for the community throughout the consultation process. Of particular concern to some was wood-smoke pollution, and the impact this is having on the local air quality, which is said to have exceeded National Air Quality Standards on multiple occasions in recent times".

4.3.1. Winter air quality

Community Outcome 1: The unique climate, landscape and environment of the region is protected, preserved and made accessible	
Supporting Strategies	Partner with stakeholders to develop strategies and provide programs which improve air quality across the region, including the reduction of smoke pollution by using alternative energy sources

The Wood Smoke Advisory Group (WSAG) was formed by the Mayor on 6th December 2018 as an external advisory group to provide their advice on mechanisms and strategies to improve air quality in Armidale during the winter months. The Wood Smoke Advisory Group: Cosy Home Clean Air; *A strategy for addressing wood smoke issues in Armidale*, The report aimed to "focus on strategies to reduce, alleviate and prevent the issues at hand specific to air pollution and the potential health impediments that result from the use of wood heating. The debate is not whether there is a problem but rather the community's perception and understanding of the problem and what we can do about it. It is not about taking away the right to have a wood heater but rather about ensuring the right to have a healthy, clean air environment", Photo 1.

The strategies and recommendations from this report, where they aligned with EcoARC Air, were included into EcoARC.

Photo 1. Early morning cold weather wood smoke in Armidale CBD area.

Council has in place an application process for installing any new solid fuel heaters under the *Local Government Act, 1993*, Section 68. The application form consists of information as location, proximity to any double storey dwellings, as well as a discussion with the approving Council officer in which they speak to wood-smoke issues and highest levels occurring between 11pm and 2am, the need to use well seasoned wood and that moisture meters are available from the Library. Note that in NSW any new solid fuel heater cannot emit more than 1.5grams of carbon/kilogram of wood burnt.

The number of wood heaters installed across the LGA during the reporting period is provided below and shows a downward trend in the number of wood heaters installed from 2017, 51 to 2020, 29, Table 4.

Table 4. Number of approved wood heaters installed across the LGA during the reporting period.

Year	Number of Approved wood heaters in LGA
2016	48
2017	51
2018	50
2019	45
2020	29

Council Officers also undertake investigation of any complaints in relation to smoky chimneys under the *Protection of the Environment Operations Act, 1997*, Clean Air Regulation.

On average Council would receive approximately 50 wood smoke comments per year, and an inspection is undertaken by Council Officers for every complaint. However Council Officers try to assist and review operational items of wood heaters and undertake education on how to achieve optimal function. Approximately only 2-3 smoke abatement orders are issued per year.

Educational material was provided with rates notices in 2019 and 2020 in relation to burning of wood heaters, as well as stalls with information at the monthly, Farmers Markets and Markets in the Mall, in 2018 and 2019. Moisture meters for checking how dry wood is for burning is were available pre COVID19 restrictions at the Library for residents to borrow.

The NSW Department of Planning, Industry and Environment monitors and reports on air quality monitoring from its station in Armidale including, Total solid particulate matter (TSP), particles less than 100 micrometers in diameter); PM_{10} (particles less than 10 micrometres in diameter); and $PM_{2.5}$ (particles less than 2.5 micrometres in diameter). Particulate matter from the rural network sites are reported hourly and expressed as mass of particulate matter (micrograms) per cubic metre of air ($\mu g/m^3$).

The size of the particles affects their potential to cause health problems with PM_{10} particles being small enough to pass through the throat and nose, and enter the lungs, and can affect the lungs and heart potentially causing serious health effects. $PM_{2.5}$ are so small that they can travel deeper into the lungs and bloodstream, and there is sufficient evidence that exposure over a long period of time (years) can cause adverse health effects, NSW Health, 2020.

Armidale Air quality monitoring station recorded 60 days above the daily average in 2019 due to bushfire smoke (35 days) and wood smoke from domestic heaters associated with cold calm nights with temperatures close to or below zero degrees (25 days), Figure 7.

NSW Department of Planning, Industry and Environment (DPIE) Armidale air quality monitoring station

The NSW DPIE Armidale air quality monitoring station is part of the Rural Air Quality Monitoring Network, managed by Climate and Atmospheric Science, and the Department of Planning, Industry and Environment. The Armidale air quality monitoring station is located in Kirkwood Street between Taylor St and Douglas St.

Air monitoring station information:

Commissioned: June 2018

Latitude: 30° 30' 30"S

Longitude: 151° 39' 41.97"E

Elevation: 982 metres

Using data from this station, DPIE provide hourly pollutant concentrations, 24-hour summary and air quality category ratings (AQC).

The following air pollutants and meteorological variables are measured at Armidale: Visibility using nephelometry, Fine particles as $PM_{10,}$ Fine particles as $PM_{2.5}$, Wind speed, wind direction and sigma theta, Ambient temperature, Relative humidity and Rainfall

The data search and download form provides free access to data on all criterion air pollutants and meteorology variables from New South Wales Air Quality Monitoring Network. Note that meteorological data are available in hourly averages only. Real-time data access is provided via the air quality API.

The Department of Planning, Industry and Environment and NSW Health have created air quality categories to guide what activities an individual can do, based on what the air quality is like in their area, https://www.dpie.nsw.gov.au/air-quality/understanding-air-quality-data. Air quality measurements from local monitoring station is summarised using 5 air quality categories (AQC), rating air quality as 'Good', 'Fair', 'Poor', 'Very Poor' or 'Extremely Poor'. For example, if the local air quality category is 'Very Poor' (red), the health advice in the activity guide recommends actions to take. The activity guide is included below, Table 5. and also on the EES website.

To understand how the activity guide relates to measured concentrations of air pollutants, the table below includes information on threshold concentrations used for categorising air quality into the 5 air quality categories. Note that air quality categorisation is no longer defined from Air Quality Index (AQI) values.

Table 5. NSW Air quality categories (from DPIE and NSW Health).

			Air quality categories (AQC)				
Air pollutant	**Averaging period**	**Units**	**GOOD**	**FAIR**	**POOR**	**VERY POOR**	**EXTREMELY POOR**
Ozone O_3	1-hour	pphm	<6.7	6.7–10.0	10.0–15.0	15.0–20.0	20.0 and above
	4-hour rolling	pphm	<5.4	5.4–8.0	8.0–12.0	12.0–16.0	16.0 and above
Nitrogen dioxide NO_2	1-hour	pphm	<8	8–12	12–18	18–24	24 and above
Visibility Neph	1-hour	bsp	<1.5	1.5–3.0	3.0–6.0	6.0–18.0	18.0 and above
Carbon monoxide CO	8-hour rolling	ppm	<6.0	6.0–9.0	9.0–13.5	13.5–18.0	18.0 and above
Sulfur dioxide SO_2	1-hour	pphm	<13.3	13.3–20.0	20.0–30.0	30.0–40.0	40.0 and above
Particulate matter < 10 µm PM_{10}	1-hour	µg/m^3	<50	50–100	100–200	200–600	600 and above
Particulate matter < 2.5 µm $PM_{2.5}$	1-hour	µg/m^3	<25	25–50	50–100	100–300	300 and above

For a broader picture of air quality in New South Wales, view the latest NSW Annual Air Quality Statement/s, download past NSW Annual Air Quality Statements and NSW Annual NEPM Compliance Reports.

The National Environment Protection Measure for Ambient Air (Air NEPM) sets national standards for the six key air pollutants to which most Australians are exposed: carbon monoxide, ozone, sulfur dioxide, nitrogen dioxide, lead and particles. Standards refer to maximum concentrations of the pollutants set by Air NEPM, Table 6 below. Goals refer to allowable exceedances of these maximum concentrations during a year.

Monthly exceedances for particulate matter from May 2018 to December 2020 as measured at the DPIE Armidale air monitoring station for PM10 and PM2.5ug are provided below, Figure 7.

An example graph is shown below of what an hourly average particulate matter exceedance and 24 hour period may look like when measured at the DPIE Armidale air monitoring station, Figure 8. It can be noted that the green dashed/dot line is the PM_{10} 50ug/m^3 24 hour daily maximum concentration, and the orange dashed line is the $PM_{2.5}$ 25ug/m^3 daily maximum concentration, Table 6. Typically an exceedance will occur around 19:00 to 21:00 hours (when people may be looking to bank or close down their wood heaters down for the night) and decrease at around 7am in the morning when typically people are getting up, opening up their wood heater and weather conditions disperse the inversion layer.

Council education campaigns have been targeting, as per NSW EPA information, the need for people to use well aged, dry wood, to make sure that the wood has a bright flame, to check their chimney and not bank their fires down for the night, to an extent that smoke will occur.

In addition to the DPIE Air monitoring station there are a number of citizen science monitors across Armidale city with results available on the Purple Air monitoring network.

There were four submissions received (three only) in relation to winter air quality, and they are provided with all submission in Appendix 1.

Table 6. National Environment Protection Measure for Ambient Air (Air NEPM) (NSW DPIE).

Standards and goals			
Pollutant	**Averaging period**	**Maximum concentration or standard**	**Goal (maximum allowable exceedances)**
Carbon monoxide	8 hours	9.0 ppm	1 day a year
Nitrogen dioxide	1 hour 1 year	0.12 ppm 0.03 ppm	1 day a year none
Ozone	1 hour 4 hours	0.10 ppm 0.08 ppm	1 day a year 1 day a year
Sulfur dioxide	1 hour 1 day 1 year	0.20 ppm 0.08 ppm 0.02 ppm	1 day a year 1 day a year None
PM_{10}	1 day 1 year	50 µg/m^3 25 µg/m^3	None, excluding exceptional event days None
$PM_{2.5}$	1 day 1 year	25 µg/m^3 8 µg/m^3	None, excluding exceptional event days None
Legend			
PM_{10}	particulate matter less than 10 micrometres in diameter		
$PM_{2.5}$	particulate matter less than 2.5 micrometres in diameter		
µg/m^3	micrograms per cubic metre, referenced to a temperature of 0° Celcius and an absolute pressure of 101.325 kilopascals.		
Exceptional event	defined under Clause 18 of the AAQ NEPM as a 'fire or dust occurrence that adversely affects air quality at a particular location and causes an exceedance of 1-day average standards in excess of normal historical fluctuations and background levels, and is directly related to: bushfire; jurisdiction authorised hazard reduction burning; or continental scale windblown dust'. When reporting compliance against NEPM goals for both PM10 and PM2.5 daily averages, any exceedance day deemed to be impact6ed by an exceptional event is excluded and classified as an exceptional event day. Where an exceedance day is determined to be impacted by a non-exceptional event, it is included and classified as a non-exceptional event day.		

From https://www.environment.nsw.gov.au/topics/air/understanding-air-quality-data/standards-and-goals

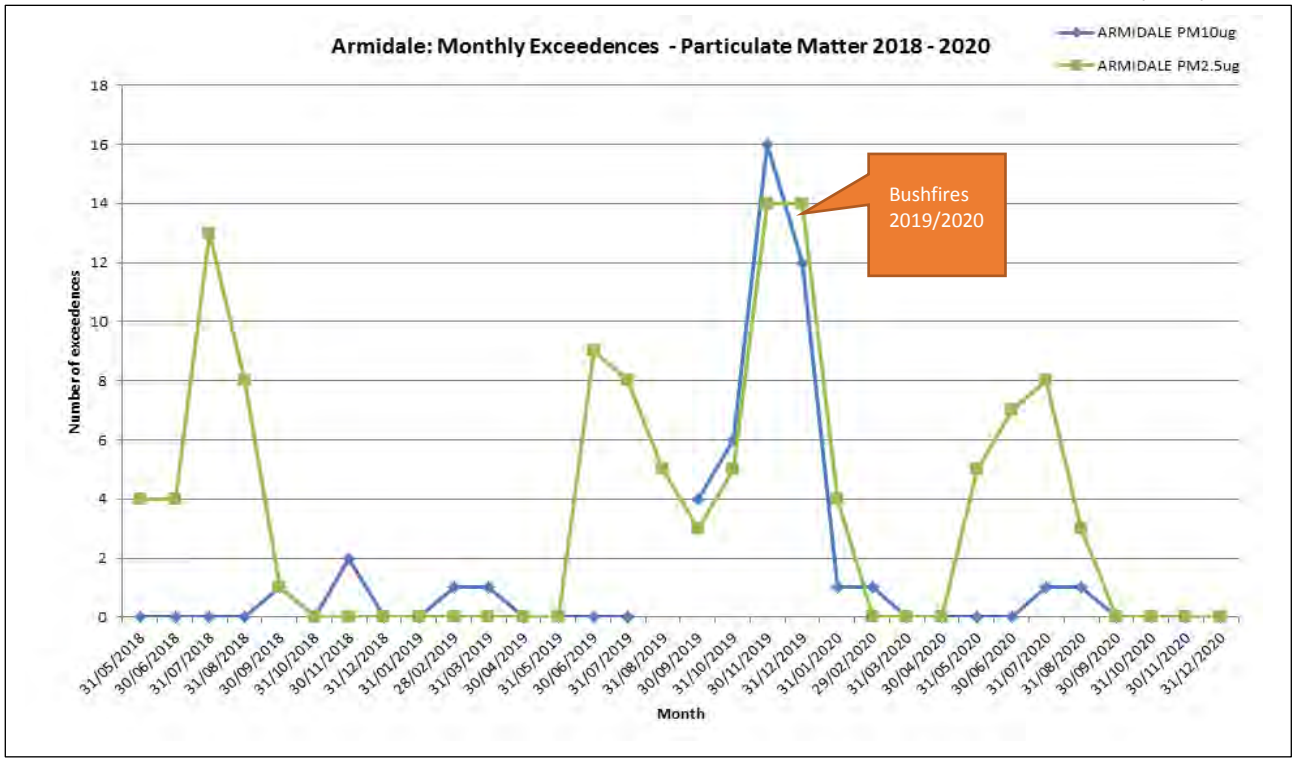
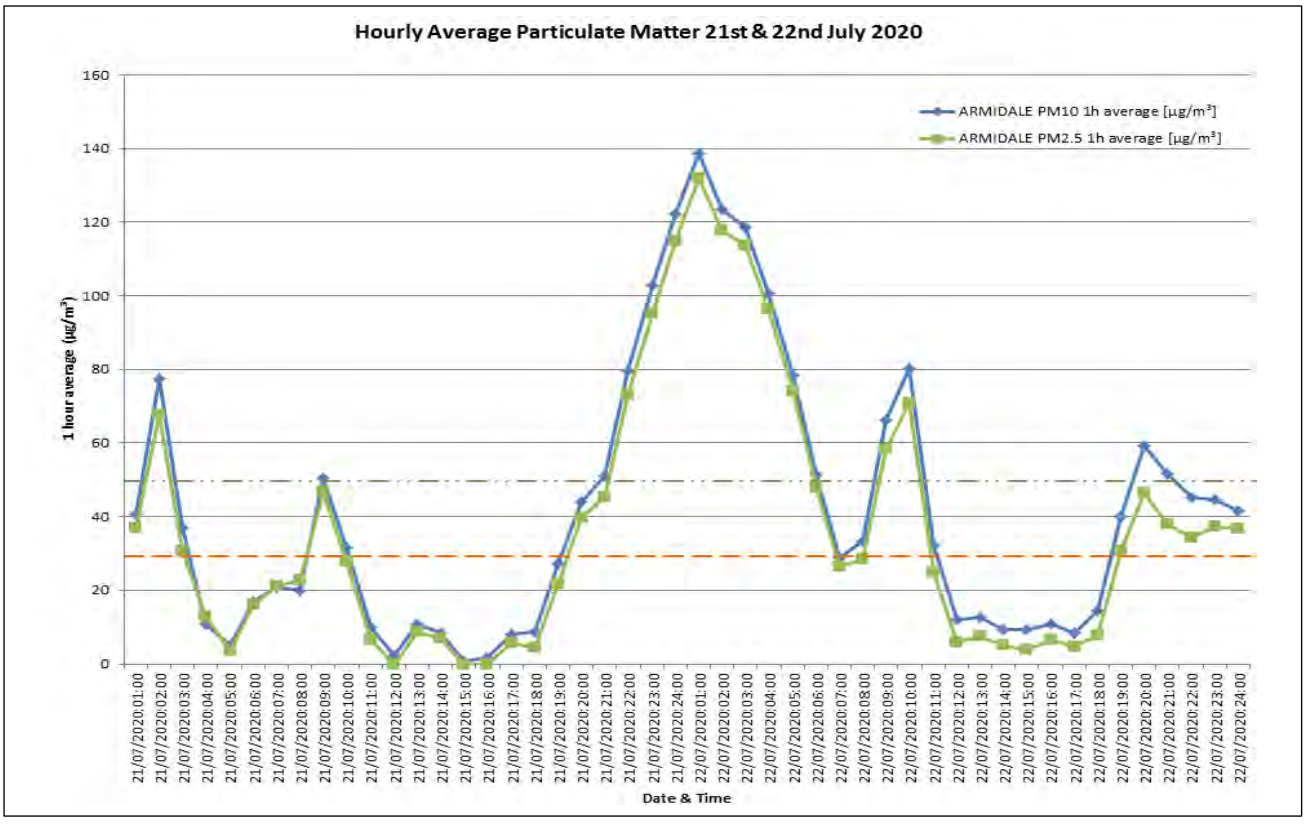


Figure 7. Armidale monthly air quality exceedances of particulate matter (PM) from 2018 to 2020.



PM10µg - 50 µg/m³day, NEPM standard; PM2.5µg - 25 µg/m³day, NEPM standard

Figure 8. Example of 24 hour period reading when exceedance occurs, hourly average particulate matter 21st to 222nd July 2020.

5. Waterways and Water

5.1. Waterways

Community Outcome	**Maintain and improve local waterways, lagoons and creek lands in partnership with community groups and other agencies.**

A number of projects are undertaken by community groups to maintain and improve local waterways and these are detailed below. Due to the extensive nature of the LGA and rainfall, many streams, creeks and rivers exist. The LGA contains many upper tributaries for rivers that flow to either east or west of the Great Divide. Council contribute to various groups in both "in kind" support and also financial support. In kind support can include advice in relation to species selection, weed advice and control, as well as varying degrees of maintenance of sites.

Malpas Catchment Project

Southern New England Landcare members began the Malpas Catchment Project in 1997 to improve natural resource management, sustainable and profitable land use, and water quality in the Malpas and Guyra Dams and Macleay River Catchment. Since then, the project has seen long-term commitment from Council ($20,000/year) to support a part time role to assist the Malpas Catchment Group, and activities within the catchment.

The Guyra and Malpas Dams are the water supply for Armidale city, and the water quality in them is of high importance to the broader community. Malpas catchment lies at the top of the Macleay River Catchment, which flows eastwards over the Great Dividing Range escarpment and into the Pacific Ocean, supplying habitat and fresh water to many communities along the way.

Members and the local community, in particular local graziers, continue to work toward the objectives of the Malpas Community Catchment and Environmental Management Plan, (SNEL, 2020).

Each year a report on this project is provided to Council and the 2020 report details outcomes of a small grant ($5,000) to revegetate further reaches of Urandangie Creek, a major tributary to Malpas Dam and to undertake revegetation works of tree, shrub and sedge plantings. Note that due to the severe drought in 2019 and early 2020 very little revegetation works occurred during this time.

During late 2020 an initial site visit was undertaken with Council staff and Southern New England Landcare Co-ordinator for Malpas Dam to discuss strategic planning for water quality for Malpas Dam, and subsequently other drinking water reservoirs within the LGA. From this a scope of work was produced in 2021 and a tender process commenced for a Catchment Water Quality Strategic Plan for improving the regions water quality. The 10 year strategic plan is designed to outline the goals, high priority actions, supporting initiatives and measurement mechanisms to assess and improve water quality outcomes in the greater catchment areas of Council's storage dams.

Armidale Urban Rivercare Group

Armidale Urban Rivercare Group (ARUP) are a community group of volunteers that conduct revegetation of the urban reaches of Dumaresq Creek with the money devolved to Landcare used to maintain these plantings. This group has been undertaking restoration and rehabilitation work on Dumeresq Creek since 2001. This has involved the clearing of exotic weeds such as willows and poplars within and along the creek banks and the planting of native species.

Council allocate $30,000 annually to Southern New England Landcare to be used for maintenance of Dumaresq Creek and revegetation works, this includes weed control and edge spraying. Note that there was a gap in community volunteering activities this year with COVID19 restrictions.

ARUP were awarded a 3 year Environmental Trust project from 2016 - 2019 of $90,000 where the creek was choked with willows and surrounded by an almost impenetrable Robinia forest, at the end of Canambe Street, B Whan pers. com., Photo 2 and Photo 3 below.

Photo 2. Robinia forest before removal end of Canambe Street and Dumeresq Creek, 2017, photo, B Whan.

Photo 3. Planting bee at Dumeresq Creek near Canambe Street at site above, 2017, photo, B Whan.

Instream works have also been undertaken by this group to remove willows and restore waterholes, followed by plantings and weed control, pers.com B Whan, Photo 4 and Photo 5 below.

Photo 4. Restoration of waterholes on Dumaresq Creek after willows were removed, photo B Whan.

Photo 5. Planting site of Photo 2 above, 2 years after planting bee, photo B Whan.

Dumaresq Dam BackTrack Project

BackTrack has a plan of conservation management for the reserve and manage the area for conservation as well as farm training and mentoring of at risk youth. Council has a Memorandum of Understanding with the BackTrack.

Armidale Creeklands Masterplan

The draft Armidale Creekland's Masterplan which was developed in 2018 and included an extensive community engagement process, was put on public exhibition from 20th August until 17th September 2020. The masterplan is designed to deliver value to the region across a broad range of economic, social, and environmental areas using sustainable water management as the driver**.** Sustainable water management outcomes can include pollution control, ecological restoration, increasing drought resilience of green space and mitigating local urban heat islands.

The Stage 1 Implementation plan was endorsed at the October 2020 Ordinary Council Meeting.

Funding was announced in early June 2021. It is planned that there will be a family precinct section at Albion Park/back of the Monckton Aquatic Centre. Some introduced trees/shrubs will be replaced with native species. Minor landscaping will be undertaken and a shared cycleway installed.

Clean up Australia Day

Newcastle Permanent Building Society staff, customer and volunteers undertook "Clean up Australia Day" in 2019 and 2020, along Dumaresq Creek, with 8 large bags of rubbish removed from the creek in 2019.

Council routine maintenance/clean up Dumaresq Creek

Council undertake routine maintenance along Dumaresq Creek and the surrounding area and the major items under this maintenance are provided below.

A scheduled Monday bin run of park areas surrounding the creek are undertaken by Council staff and any additional rubbish is flagged and removed.

Removal of Shopping trolleys from Dumaresq Creek and surrounds: A meeting was held between Council and Supermarket managers in late 2020 at Councils request to notify the supermarket managers of the problems faced by discarded shopping trolleys in the Armidale CBD and creek lands area. Since early 2021 any shopping trolleys detected by Parks and Gardens staff either on their routine patrols and work or on their Monday bin run are tagged, photographed, a sticker number attached and the Council Rangers notified. Notification to the supermarkets is made by the Rangers and any trolleys not picked up within a certain timeframe are impounded at the Waste facility with an $80/trolley impoundment fee charged. Any trolleys seen in the creek are removed by Council staff.

New signs for Dogs on leash, have been installed as well along Dumaresq Creek.

5.2. Drinking water consumption

5.2.1. Overview of reticulated water system

Guyra's town water is sourced from two small dams located on the Gara River, 7km north of the town. Hydrologic studies show that the dams are too small to guarantee supply during an extended drought. The 'secure yield' of the dams is 390 million litres a year compared to an average annual usage of 435 million litres.

Armidale's main water source is Malpas Dam holding 12,260ML and was built in 1968. The dam provides a high level of drought security to Armidale, confirmed in a recent review of the dam's secure yield. Puddledock and Gara Dams have been retained as backups in case the supply from Malpas Dam needs to be interrupted for operational reasons. Pipes from all three dams are directed to the Water Treatment plant on the north side of town.

It is estimated that 22,000 people in Armidale, and 2000 people in Guyra are covered by the reticulated water supply system. The remaining population of about 6,000 obtain water from rainwater tanks and private bores.

5.2.2. 2017 – 2019 Drought

The drought of 2017 – 2019, was one of the worst recorded for eastern and inland Australia, and included Victoria, Queensland and New South Wales and extended into parts of South Australia and Western Australia, BOM 2020. From BOM 2020; *This was a situation with no clear historical precedent. Very dry conditions in the cool season were followed by only a limited recovery in the October–December period in 2017 and 2018. This meant record-low rainfalls over various multi-year periods. The 2019 cool season was comparably dry to those of 2017 and 2018, and saw extreme dry conditions continue to the end of the year. The three years from January 2017 to December 2019 were the driest on record for any 36-month period starting in January. The most extreme rainfall deficiencies over multi year periods occurred in the northern half of NSW.*

The Armidale LGA was severely affected by this drought and average rainfall and average water use from 1972 is provided below, Figure 9. The sharp decrease in annual rainfall can be seen for 2019, which is the lowest rainfall for that time period. Increases in water restrictions brought in as the drought progressed, are provided below. Another item to remember is that as outlying areas of the LGA and non-residential areas also experienced water shortages, tankers were using water points to fill up farm homestead tanks.

Council introduced water restriction in late February 2019 in Guyra and early March 2019 in Armidale in response to the continuing drought. It was the first water restriction imposed in Armidale since Malpas Dam was built in 1968, and the below photo shows the low water level by July 2019, Photo 6 and when the dam is at capacity and overflowing, Photo 7 . However, water restrictions have been applied in the past in Guyra.

Photo 6. Malpas Dam on 24th June 2019 looking towards the dam wall in the distance.

Photo 7. Malpas Dam wall overflowing on 24th March 2021.

Some of the actions Council took during the restrictions are listed below:

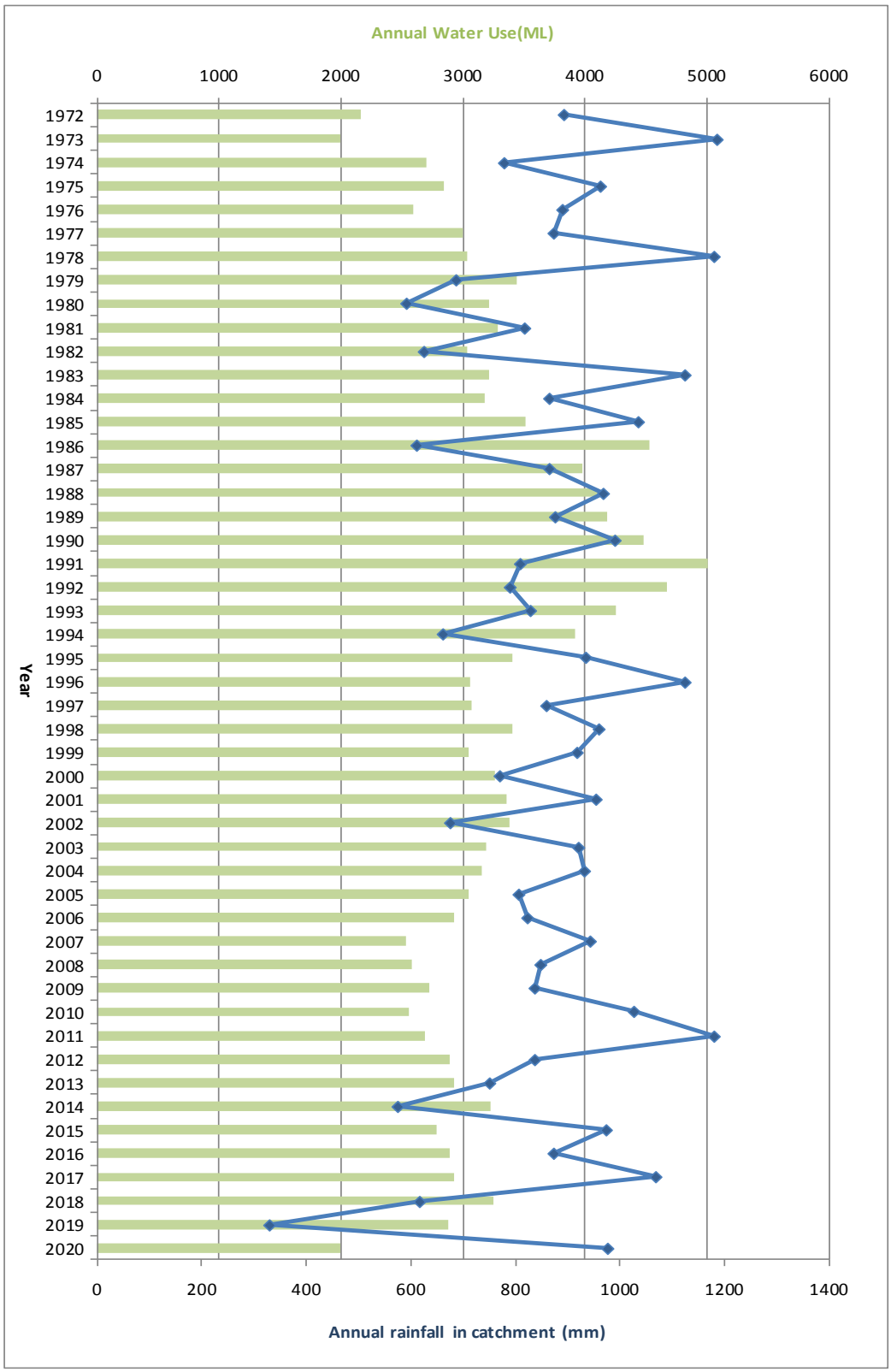
- Demand management through education, rebates and imposed restrictions;
- Finding and fixing leaks in ageing infrastructure;
- Water carting from Armidale to Guyra;
- Commissioning of Malpas Dam to Guyra pipeline;
- Additional testing – deep water samples;
- Targeting high water users to constrain consumption;
- Offering rebates on residential water tanks, front loading dish washers and shower heads.

As the drought worsened, higher levels of water restrictions was progressively introduced with Level 5 Emergency water restrictions on 24th June 2019 in Guyra and 1st October 2019 in Armidale. Residential water consumption was below the target level of 160 litres per capita per day since the introduction of level 5 restrictions.

A number of significant records in relation to rainfall and dam levels occurred and these are provided below:

- Malpas and Guyra dam catchment, as measured by Guyra Post Office weather station (the Bureau's Station No. 056016), observed 330.8mm of rainfall in 2019 which is not only the lowest in 130 years but 40% less than the second lowest (553.9mm) recorded in 1919, exactly a century ago.
- Guyra dam hit the level that it couldn't supply Guyra town forcing water carting from Armidale.
- Malpas dam level fell to 32.8% on 15th Jan 2020. The lowest since it was built in 1968.
- Poor water quality, as dam level drops to unprecedented level, provided extra challenges to treat water.

Annual Armidale LGA Water Use (ML)



Annual rainfall in catchment (mm)

Figure 9. Annual Armidale LGA water use and rainfall, 1972 to 2020.

Being prepared for drought is essential to reduce the impact of water limitations and to enhance the capacity of ARC and the community to respond to drought conditions. The ARC Drought management plan, which was developed during 2020 and adopted by Council on 24th February 2021, guides Council as a Local Water Utility and is part of the necessary preparedness. The Plan gives authority to Council's General Manager, in consultation with Council, to implement the actions described, including water restrictions.

Water Conservation Engagement

Extensive water conservation engagement with the community was undertaken during the latter half of 2019 and early 2020 with the ongoing drought conditions across the region and Stage 5 water restrictions in place. Following on from the GHD Drought Engagement Plan an extensive education program was undertaken by Council staff with primary schools and high school students, UNE, the general public at market stalls as well as community group meetings. In addition extensive education campaigns related to water conservation were run on social media, mainstream media and with pamphlets with rates notices.

The Water wise rebate program was advertised on social media, pamphlet with rates and residential rebates were provided by Council for 300 rebates for rain water tanks up to 100,000L, water saving devices of 3 star Water Efficiency Labelling and Standards (WELS) or higher for dual flush toilets, washing machines, shower heads and taps at a cost of $200,000.

At the same time a Business Water Saving Rebate program with available funding of $143,000 was run, with the only condition that a water efficiency saving audit needed to be undertaken at the premises by Councils Plumbing, Drainage and Trade waste Officer. Extensive work was undertaken by Council staff on this program on commercial property and business audits to chase ongoing water reductions, the top 100 high water users were also involved in the Water wise program and 3 star WELS appliances or higher were installed at these locations consisting of replacement of single flush to dual flush toilets, washing machines and showerheads. Five star WELS or higher front load washing machines were also installed to replace top loading machines, for example just one college at UNE replaced 11 washing machines with water efficient models.

Council also undertook audits of their operations and the following was undertaken:

- Armidale and Guyra Works depots: 2 x 25,000L tanks installed at each of the Armidale and Guyra Works depots (50,000L water storage each) for use in cleaning machinery, tanker fill up etc.

An internal Water audit was undertaken on Council's Central Administration Building at Armidale in late 2019 and the following items were updated or replaced:

- Shower heads were replaced with water saving shower heads (11L/minute to 7.5l/minute) 2019/2020.
- All water taps had water saving devices installed, 2020.
- All 13 toilets are now dual flush, 2020.

UNE installed an additional 682,000L of storage capacity in rainwater tanks installed on campus, and also had water savings of equivalent to 120,000 kL compared to 2019, trend continued down during campus shutdown (Covid 19), see submission Appendix 1.

6. Energy

Community Outcome 1: The unique climate, landscape and environment of the region is protected, preserved and made accessible	
Supporting Strategies	Investigate alternative sources of power generation to reduce the community's carbon footprint

Community Outcome 2: The community can participate in initiatives which contribute to a sustainable lifestyle	
Supporting Strategies	Advocate for cost-effective access to renewable energy for the local community and businesses

6.1. Energy use in LGA

Council does not collect or keep data in relation to energy use within the LGA. However, this was requested from Essential Energy, but this information had not been received prior to this report being completed.

Therefore information on energy use for NSW per capita has been sourced and is shown below, Table 7. This information is from the NSW State of the Environment Report, 2018 and provides data on energy use in NSW from 2006 to 2016 and the following is directly from that report.

In 2017, renewable energy sources provided around 16% of the state's total electricity generation, which is more than double that provided in 2007 (6%). Of the renewable energy generated in 2017, Snowy Hydro accounted for almost 6% of total NSW electricity. Renewable electricity generation (excluding Snowy Hydro) continues to increase in NSW. This is being driven by an increase in wind and solar photovoltaic (PV) technologies, largely due to the Renewable Energy Target (RET). Since 2007, wind generation has increased 50-fold, and solar PV generation has increased 170-fold. In 2017, wind plants in NSW generated 1,944GWh of electricity, and solar PV systems generated 3,304GWh. Over 1,052GWh of electricity was generated from bagasse (sugar cane waste), landfill and other bioenergy sources (NSW EPA, 2018).

The information from this table provides residential energy consumption per capita as dropping from 18.6FGJ in 2006 to 16.7GJ in 2017

The University of New England installed a 3.2MW solar farm which was commissioned in late 2020. 1.5MWh was generated by Stage 1 of the solar farm, UNE Submission, Appendix 1.

Table 7. Per capita energy consumption in NSW and the ACT, (from NSW EPA, SoE 2018 Table 3.1).

Per capita energy consumption

Over the past decade, the population of NSW has increased by almost 13%, or nearly 1 million people. Over that same period, per capita energy consumption has decreased by around 13%. This is largely due to declining energy use in manufacturing and a slight decline in residential energy consumption since 2012–13.

Table 3.1: Per capita energy consumption in NSW and the ACT, 1 July 2006 – 30 June 2016

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Consumption (PJ)	1,182.7	1,199.1	1,135.6	1,211.9	1,252.1	1,220.1	1,225.2	1,192.5	1,154.2	1,156.
Population NSW (Million)	6.9	6.9	7.1	7.1	7.2	7.3	7.4	7.5	7.6	7.7
Population ACT (Million)	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Population, combined (Million)	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1
Consumption (GJ/capita)	164.0	164.0	153.0	161.0	165.0	159.0	157.0	151.0	144.0	142.0
Residential Consumption (PJ)	126.8	127.6	130.8	134.0	137.0	135.5	135.3	129.3	128.8	129.2
Residential Consumption per capita (GJ/capita)	18.6	18.4	18.5	18.8	19.0	18.5	18.3	17.2	16.9	16.7

From NSW EPA State of the Environment Report 2018.

The number of Small Generation Units (SGU) Solar in the LGA to November 2020 was 4,085 with a rated output of 20,019 kW, (Clean Energy Regulator, 2021). The data represents all solar systems that have had certificates validly created against them. The uptake of renewable energy, mostly in the form of solar and deemed as Small generation units (solar), by residents in the LGA, is provided below, Table 8.

The data includes new installations, upgrades to existing systems and stand-alone (off-grid) systems. It needs to be noted that Renewable Energy Target (RET) legislation allows a 12-month creation period for registered persons to create their certificates. The 2020 and potentially 2019 figures will continue to rise due to the 12-month creation period.

Table 8. Number of Small generation units and output for the LGA.

Year	Installation Quantity	SGU Rated Output (kW)
2001-2019	3,317	16,482
2020	768	3536
Total	4085	20,019

Note that significantly more units have been installed in the last 5 to 10 years than previously and it appears this trend is continuing, which is a significant improvement trend.

Council does not take credit for the increase in renewable energy units, as staff are only been able to provide advice in relation to development approvals or exempt provisions where required etc. information at market stalls and similar. More recently individual industrial premises have been installing solar systems for power generation as well.

Solar for Low Income Households Trial

Carrai residents were notified by Council by letter on 26th February 2020 of a new program launched by the State Government, the Solar for Low Income Households Trial. The program aimed to improve energy affordability by helping low income households unlock long term savings on their electricity bills by having a free 3 kilowatt solar system installed on their homes. Residents of the Carrai area, postcode 2440, were thought to be eligible for the program and this postcode was the only postcode in the LGA available for this trial in this program.

6.2. Energy use and reductions at Council facilities

Community Strategic Plan	
Strategic Direction	Reduction in Council's operational energy consumption by 2020. Target: >5% decrease from 2016 baseline

Councils energy consumption (electricity) from 2016 to 2020 ranged from 3,672Mega Watt hours (MWh) in 2016 to 2,837MWh in 2020, Table 9. This is a 22.7% reduction from 2020 on 2016 baseline levels, which reflects the number of solar farms and solar installations which came on line at Council facilities from 2019 to 2020, as detailed below.

Table 9. Council electricity use from 2016 to 2020.

Year	MWh
2016	3,672
2017	4,212
2018	5,092
2019	3,261
2020	2,837

Under funding from the Stronger Regions Infrastructure Fund – Major Projects, Council installed photovoltaic systems (solar power systems) at a number of locations with projects completed in mid 2019, Table 10.

Table 10. Council buildings/facilities with solar power systems and current capacity (kWp).

Council Building/ Infrastructure	Photovoltaic system, (solar power) and Current capacity (kWp)
Kolora Aged Care Facility, Guyra*	99.9kWp~
Armidale Airport Terminal Building *	99.6 kWp~
Armidale Wastewater Treatment System *	99.0 kWp~ ground mounted system
Armidale Mann Street Works Depot *	Mechanics workshop 29.9kWp Note that the size of this unit was limited by Essential Energy and other solar installations in this area
Visitor Information Centre	4.58kWp s

*These projects were funded through the Stronger Regions Infrastructure Fund – Major Projects.

kWp (kilowatts peak) is the peak power of a photovoltaic system. The total amount of electricity the system generates in a year is measured in kilowatt hours, kWh.

~ note that monitoring for each of these sites above is on a web portal so that energy production/consumption can be tracked/reviewed.

The above systems for the first six months of 2020 generated 211 megawatt hours (MWh) and reduced carbon dioxide production by 123 tonnes (CO_{2e} offsets based on Australian Government Department of Environment and Energy emissions factor for NSW (0.81kg CO_{2e}/kWh)).

The current capacity of solar panels detailed in Table 10 is 333kWp and with the two projects below finished by the end of the 2021, this will take it up to 393kWp. The Armidale sewage treatment solar farm is shown below, Photo 8.

Photo 8. Solar installation at Wastewater Treatment Plant, 2018.

Future projects planned include, solar power generation for the, Guyra Community Hall - this will service the Aquatic centre, and the Guyra Works Depot, Table 11. Both these systems are planned to be of 30 – 40kWp capacity.

Table 11. Future planned renewable energy/energy reduction projects on Council buildings or facilities.

Proposed works program for 2021	
*Guyra Works Depot	30 to 40kWp Planned for 2021
*Guyra Community Hall (note this will service the Aquatic centre)	30 to 40kWp Planned for 2021
Other	
Street Lights (Safe Lighting Standards)	Replacement of 724 lights with energy efficient LEDs, - Essential Energy, 2020. Ordinary Council Meeting report 12.1, 22nd April 2020
Armidale Cycleway	Solar lighting - installation of 49 new solar lights (funding through Safer Communities Fund)

*These projects were/are funded through the Stronger Regions Infrastructure Fund – Major Projects.

Energy efficiency replacements for the Central Administration Building (CAB) have been undertaken in addition to the new or proposed renewable energy works above, during the reporting period and they include:

- Security lights (80W ball lights) on outside perimeter and inside of building are to be replaced with LED lights;
- Replacements of lights for the northern pathway and flag lights with LED lights;
- In the Council Chambers fluorescent lights have been replaced with LED fluorescent lights and there are plans to replace all downlights in this area with LED lights, as per Item 6.2.4 above. Heating for this area has also been reduced to only on demand due to the limited use of this Chamber.

Additional energy efficiencies have been installed at other Council facilities/locations:

- Town Hall – LED lights have replaced existing lighting;
- Front gate lighting has been replaced with a solar LED light at both the Companion Animal shelter and the Traffic education centre;
- Solar LED lighting has been installed at the Ebor Rest area and powers LED lighting for picnic table/s;
- Solar LED lighting has also been installed at the Armidale Mann Street Works Depot front gate;
- LED lighting (4) at Trevena and Elm Avenue intersection;

Some other initiatives that Council is undertaking in 2021 include, LED light replacements, future replacement of the air conditioning system at the CAB, and an upgrade of pool pumps and heaters at the ARC Monckton Aquatic Centre

An application for funding report to the NSW Bushfire Industry Package – Sector Development Grants for the upgrade of the Armidale and Guyra Livestock Selling Centres was submitted to the

Ordinary Council Meeting on 19th August 2020 (AINT/2020/28408) Resolution 194/20 and the following is included in the planned project for the Armidale Livestock Sales complex:

- Installation of solar panels;
- Implementation of roof water harvesting and water re use

6.3. Regional Energy Zone

The NSW State Government declared the New England Regional Renewable Energy Zone (one of four in NSW) in August 2020. It is planned that this zone will be a mixture of solar, wind and hydro power generation, generating 8,000MW, or enough power to power 3.5million homes. Council is currently developing a Renewable Energy Policy in relation to land use, bushfire control etc. The majority of these projects are deemed State significant developments.

6.4. Council Vehicle Fleet

Councils fleet of vehicles consists of diesel-powered heavy earth moving equipment, graders, roller etc. trucks and machinery, and 4WD's as well as unleaded petrol-powered cars and light machinery. The total fuel consumption (diesel and unleaded petrol) is provided below for the fleet of cars and trucks for the financial year/s, Table 12. Diesel consumption is much higher than unleaded petrol, 613, 826L for 2020 compared to unleaded petrol 70,983L. There has been a slight decrease in both diesel and unleaded petrol since 2018 till 2020. Information on Councils hybrid vehicle is provided in Section 10.2.

Table 12. Total fuel consumption for all fleet vehicles

Year	Diesel (L)	Unleaded petrol (L)
2016/2017	616,395	77,289
2017/2018	689,551	101,285
2018/2019	612,638	83,661
2019/2020	613,826	70,983
Total	**2,532,410**	**333,218**

Note data is provided for financial year/s.

7. Land

Community Outcome 1. The unique climate, landscape and environment of the region is protected, preserved and made accessible

7.1. Land use and planning

The majority of the LGA is used for agricultural land, extensive areas are used as reserves and these are provided in Section 7.2. There has been little loss of agricultural land from rezoning during the reporting period, however 52ha was rezoned from RU4 agricultural to industrial IN2 associated with the Armidale airport development in 2019.

Development activities from 2016 to 2020 have fluctuated in the time period, ending slighty lower in 2020 of 317 to 2016 as 329 and consist mainly of residential subdivisions, new dwellings, alterations and additions to existing housing stock, Table 13. Continued commercial developments have also occurred.

Table 13. Development activities in the LGA from 2016 to 2020.

Year	Development Activities
2016	329
2017	299
2018	239
2019	259
2020	317

Land-use conflict complaints directed to Council mainly relate to environmental concerns, noise pollution, dumped rubbish and air pollution, and these are provided below from 2016 to 2020, Table 14. Air and noise pollution complaints have remained relatively steady over the reporting period, while dumped rubbish and environmental concern complaints have increased markedly from 2016 to 2020. Environmental concerns are people asking for advice on how to comply with current legislation.

Table 14. Land use conflict complaints 2016 to 2020.

Year	Air pollution	Noise pollution	Dumped Rubbish	Environmental Concerns
2016	14	11	45	37
2017	21	20	62	117
2018	7	14	58	130
2019	20	23	69	188
2020	23	16	74	174

Information on illegal dumping is provided in Section 9.3.

7.2. Land in Reserves

The total area of land in reserves within the LGA is over 169,434 hectares. This includes:

National Parks and Reserves: 149383.8 hectares

State Forestry: 19424.3 hectares

Indigenous Protected Area: Wattle Ridge: 625.4 hectares, part of the traditional lands of the Banbai community.

In addition to the above, Crown Land Reserves such as Travelling Stock Reserves and Council owned reserves exist.

Biodiversity conservation agreements between landholders and government departments including, perpetuity, termed, voluntary conservation and wildlife refuge exist within the LGA and these amount to 7,448 hectares.

Extensive land exists in reserves for playing fields etc. throughout the LGA as well.

7.3. Contaminated land sites

Land may be contaminated from a number of past activities related to previous industries, oil or gas production, storage or dispensing, timber processing or treatment, agricultural activities etc.

Land may be listed as contaminated on the NSW EPA Contaminated Land record of Notices or as potentially contaminated on Councils land information system due to notifications, or neighboring activities.

There are six sites on the NSW Contaminated Land Register as of early 2021, provided below, and all but one are listed as occurring in the Armidale area;

Former Lot 3 Main Street, Armidale;

Former Mobil Depot, Armidale;

Gasworks and portion of Harris Park, Armidale;

Martin Street Estate, Armidale;

RTA and adjoining Martin Street Estate, Armidale;

Tilbuster Park Estate, Tilbuster

In 2020, 560 Lots have been identified on Council's land information system as being potentially contaminated.

8. Biodiversity

Community Outcome 1: The unique climate, landscape and environment of the region is protected, preserved and made accessible

Biodiversity is the variety of all living things, the different plants, animals and micro-organisms, the genetic information they contain and the ecosystems they form. Biodiversity is vital to supporting human life. It ensures clean air, water and healthy soil, provides food and medicine, fuel, building materials and clothing, is the source of natural beauty and benefits our wellbeing, produces oxygen, recycles nutrients, pollinates crops and helps regulate climate. It also enhances enjoyment of outdoor activities and inspiration for art and culture and is valuable in itself.

8.1. Habitat Conservation/Revegetation

8.1.1. Habitat conservation/revegetation projects

Various community volunteers provide time, resources and expertise in managing separate conservation and habitat areas within the LGA and undertaking revegetation projects and these are listed below. These areas provide both wildlife habitat and "green spaces' within urban areas and although they have an intrinsic value, they have also been very valuable during Covid19 lockdown in 2020, as areas that people can use for recreation purposes.

Council contribute and support these various groups in both "in kind" support and also the provision of financial support. (Note also that a number of these groups/areas are mentioned under Section 5.1. Waterways above.)

Armidale Urban Planting Maintenance

The Armidale Urban Planting Maintenance (AUPM) project was developed to manage Armidale's urban environmental assets. Works coordination, reporting, monitoring and evaluation are the responsibility of staff from Southern New England Landcare Ltd, while contractors conduct works and the AUPM working group provides advice and feedback. Maintenance works include removal of weeds, planting, trimming branches and mulching application.

The program, running since 2104, is made possible with the on-going financial support and direction provided by Council. Council also mow to the edge of these works for control of grasses etc.

Armidale Regional Council allocate $30,000 annually to the Southern New England Landcare to be used for maintenance of Dumaresq Creek and revegetation works, this includes weed control and edge spraying. Note that there was a gap in community volunteering activities this year with COVID19 restrictions.

Angophora Bushland Reserve

Angophora Reserve is looked after by a small volunteer Landcare group who undertake weed control and replanting. The Reserve contains many old *Angophora floribunda* trees and native grasses and is part of a gum box woodland The White box-Yellow box – Blakelys red gum Grassy woodland and Derived native grassland listed as Critically Endangered Ecological Community. The Reserve although only small at 1.35 hectares, is within the town boundaries and as such is valuable habitat for birds and native animals. It also forms part of a wildlife corridor for Koalas in the Armidale town ship.

A submission to this report was provided on the Angophora Bushland Reserve from 2016 – 2020 and this is provided in full in Appendix 1. The volunteers take great pride in their work in this reserve which has been especially beneficial for local residents during Covid19 public health order lockdowns. Ruth Tre'mont, ecologist, has produced a booklet about the Reserve containing many photos and information from volunteers. A cumulative plant species list is provided annually to Council as part of the annual report, which is very valuable in its own right as a record of native species endemic to the area. The Reserve is Council owned land and Council staff provide advisory assistance and limited maintenance to the volunteers.

Photo 9. Volunteers working bee at Angophora Reserve, 2017, photo H Stokes.

Snow Gums Bushland Reserve

This Reserve is cared for by a volunteer bush care group. The reserve contains Snow Gums, *Eucalyptus pauciflora*, Ribbon Gum *Eucalyptus viminalis*, and Blakely's Red Gum *Eucalyptus blakelyi* and naturally occurring grassy woodland dominated by the above trees. Snow gums survive at high altitudes and on south facing slopes such as this.

The White box-Yellow box – Blakelys red gum Grassy woodland and Derived native grassland and the Ribbon Gum- Mountain Gum- Snow Gum Grassy Forest/Woodland of the New England Tableland Region are both listed as Critically Endangered Ecological Community.

Minor maintenance is undertaken by Council as well as provision of advice where requested/ required.

Manna Gums Bushland Reserve

The remnant bushland and derived grassland areas has been managed by volunteers sporadically over the last ten years. This area is approximately 4.6 hectares and consists of Ribbon Gum-Mountain Gum- Snow Gum Grassy Forest/Woodland of the New England Tableland Region, listed as Critically Endangered Ecological Community. Black Gully runs through this area.

There is a weed issue due to past disturbance. The retention of this area was recommended in a consultant's report on open spaces as important habitat and representative of local woodland communities that was once widespread. Council are Crown Land Trustees for this Reserve.

Judith Street Walking Track

This project started in October 2019, on land accepted by Council from Crown Lands. A small group of interested people has been formed to be members of a new Southern New England Landcare group to support the ongoing preservation of the walking track. To date about a third of the track has been planted with wattles and other native shrubs, see submission attached, Appendix 1.

Spring Hill Lane

Council acquired Springhill Lane, Crown Land during 2020 for community use and protection of endangered flora and fauna. Council requested the transfer of Springhill Lane, at no cost, following a proposal publicised by NSW Crown Lands in September to dispose of the area.

This will ensure there is connected recreation and open space in this area, extending the Armidale walking track network for the residents of south Armidale. The south hill landscape has important environmental values and the acquisition of Springhill Lane is an opportunity to provide a wildlife linkage to other patches of vegetation, including scattered endangered ecological plant communities. Council's koala sightings register has many koala sightings from the area but their habitat is becoming patchy and separated. This demonstrates the importance of keeping the land in community hands and improving habitat for koalas, and our endangered woodland birds.

Council is planning a revegetation project for several urban areas to improve koala habitat, $30,000 of Federal Government funding has been set aside for this revegetation project. Approximately half of the funding will be invested into Springhill Lane to establish more koala feed trees and strengthen and protect the wildlife corridor. Ray Dufty, Supervisor Parks and Facilities helping volunteers with planting early 2021, Photo 10.

Photo 10. Planting of native trees and shrubs on Spring Hill Lane, early 2021.

Council managed Land

Council has maintained large areas of undeveloped land for conservation within the LGA, including roadsides. In addition Council as a Crown land manager also manages other bushland properties. In urban areas the three bushland sites (>20 total), Council has maintained for conservation within the Armidale town area. This includes as mentioned above, where volunteers have been undertaking rehabilitation/ revegetation including Apex Lookout and Snow Gums Reserve, Manna Gums Reserve and Angophora Bushland Reserve.

Council is also responsible and maintains Cemetery reserves at Armidale, Guyra, Kilcoy, Hillgrove Ben Lomond, Ebor and a number of smaller rural cemeteries. These cemetery reserves provide habitat in the way of trees and grasslands, and in cases are areas that contain remnant Endangered Ecological Communities (EEC). Council also manage peri-urban roadsides for habitat and conservation.

Southern New England Landcare

Council support Southern New England Landcare with the provision of funding to $11,000/annually for the funding for its Resource centre.

University of New England

The University has two conservation zones to protect native endangered ecological communities have vastly improved with the rainfall in 2020, with areas back to pre-drought status. Controlled weed removal is undertaken in these zones to further regeneration activities, (UNE 2020).

8.1.2. Jeogla to Carrai Plateau: Bushfire Wildlife and Habitat Grant.

A grant application titled the Jeogla to Carrai Plateau Bushfire Recovery Project was submitted by Council under the Bushfire Recovery for Wildlife and Habitat Community Grants in late 2020. The Jeogla to Carrai Plateau area was severely impacted by the Carrai Creek Bushfire in October/ November 2019 with wildlife and habitat being severely affected, Photo 11. This followed a severe four year drought in the region.

This project is designed to deliver a landscape scale, feral animal (predator and herbivore), and pest weed, control program through a partnership with New England Weeds Authority and Northern Tablelands Local Land Services, and involvement of Back Tracks and the full $150,000 was applied for by Council. This project will also provide for protection of existing wildlife and habitat and allow natural regeneration processes to occur. The project will work with Back Track's, a community based not for profit organisation helping young people who are having a hard time, get back on track. Council was notified in early March 2021 that they were successful with the grant application.

Photo 11. Landscape scale bushfire damage, below Jeogla area, Kempsey Road, 2020.

8.2. Fauna Conservation

8.2.1 Koala conservation projects

Council has been involved in a number of activities concerning Koala's during the reporting period. The tablelands area is regarded as an important koala refuge area away from the development pressures being experienced on the coastal areas and with typically milder summers than the above average summers starting to occur to the west of the tablelands. Koala's are listed as Vulnerable in NSW.

While Koala's may have been the initial target species, it was always regarded for all of these projects that koalas were in fact an "umbrella" species and that actions undertaken would assist other native species. The projects undertaken in relation to Koalas were all from grant funding from external government bodies.

Koala drinkers

In 2019 Council wrote to the Minister for Energy and the Environment regarding the urgent need to construct and install six (6) 'koala drinkers' to support local koalas in a time of severe drought. The Department of Planning, Industry and Environment (DPIE) agreed to provide an amount of $11,000 ex GST to targeted areas that could support local landholders in providing water sources for koalas over the coming summer period. Due to volunteer labour and efforts a total of eight (8) Koala drinkers (Blinky drinkers) were purchased through this grant and installed in drought and subsequent 2019/2020 key fire damaged areas, Photo 12.

"Blinky drinkers" were installed at Tillbuster (Killens, Travelling Stock Route) (TSR), Sunnyside Road, Newholme at the base of Mt Duval, Black Mountain Cemetery, Waldorf School and Rockdale Road.

Additional funding was provided by Council and so an extra three (3) koala drinkers were purchased.

Photo 12. Koala drinker being installed by Southern New England Landcare volunteers, photo K Watson.

Koala Management Strategy

Armidale Regional Council was granted funding from the Department of Planning, Industry and Environment to develop a Koala Management Strategy in June 2020 under the *Saving our Species Iconic Koala Project 2018 – 2021: Securing Koalas in the wild for the next 100 years*. The Strategy is designed to provide the planning framework in relation to koalas, where development pressures are most likely to occur, as well as identifying key issues impacting local Koala populations, and actions and recommendations to guide and aid recovery and assist in management of this iconic species. Council entered into a Services Contract with NSW DPIE to prepare the Strategy. Council received funding of $23,000 which was used to engage a specialist ecologist firm to develop the Koala Management Strategy. The Koala Management Strategy was adopted by Council in 2021 following a public exhibition period.

Northern Tablelands Koala Conservation Project

The *Saving our Species Iconic Koala Project 2018 – 2021: Securing Koalas in the wild for the next 100 years* sets out broad conservation actions for the koala across NSW. Three major long term partnership projects for koala conservation have been established across NSW for significant koala populations, Southern Highlands, Hastings-Macleay and Northern Rivers. These Partnership projects focus on building stakeholder capacity to deliver on-ground koala conservation, management and threat mitigation involving multiple partners. This project is the fourth project to be added to the list above and the partnership includes the Department of Planning, Industry and Environment (DPIE), Northern Tablelands Local Land Services, Uralla Shire Council, Southern New England Landcare, local ecologists and Armidale Regional Council.

Council representatives participated in the initial investigations stage of the Northern Tablelands Koala Partnership in early 2020 including, providing input on what the partnership could involve and how it might be governed (funding, host organisation, aims, goals, priorities, in kind contribution or resources etc.).

The Northern Tablelands Koala Partnership project was awarded $170,000 through DPIE to support the partnership project in 2020/2021 with the possibility of additional funds in future years. Dedicated staff capacity was identified as the main limiting factor in delivering successful conservation programs in the region for koalas and so these funds allow for the employment of a dedicated Koala Conservation Project Officer to be employed through Southern New England Landcare.

Council's involvement in the Northern Tablelands Koala Project Partnership involves in kind resources from Council e.g. communications, weed advice, education and mapping as well as attendance at quarterly Project meetings.

The project is hosted by Southern New England Landcare and it is expressly aimed at building and fostering partnerships with Councils, research institutions, organisations and community groups to plan and resource koala conservation actions. The partnership aims to raise community awareness and engage the community in on ground actions for koala conservation. Note that some of the above information has been provided by Des Andersen Northern Tablelands Koala Partnership, Koala Project Officer.

Revegetation to improve habitat linkages for Armidale's Koala population

Federal Bushfire Funding Grant: Funding submission for, $30,000, see above under Spring Lane.

8.2.2 Flying fox camp

In late 2017 Grey headed flying foxes*, Pteropus poliocephalus* set up a camp at Black Gully, Armidale, the camp was also occupied at times by the highly transient Little red flying-fox *Pteropus scapulatus*. Flying Foxes and their habitats, are protected under NSW legislation. The Grey headed flying fox is also listed as Vulnerable under Commonwealth legislation, affording it additional protection. The camp extended for approximately 2.38ha in December 2017, but had dwindled to 0.8ha by February 2018.

The camp was estimated to contain in December at its peak between 30,000 to 40,000 Grey headed flying foxes and 20,000 Little red flying-fox.

Council developed information sheets, and held a public meeting and information session on Flying foxes on 7th December 2017, which is also able to be viewed on line. Council commissioned a Management Plan which was prepared in accordance with the NSW Flying-fox Camp Management Policy, 2015 framework, administered by the then Office of Environment and Heritage (OEH).

8.2.3 Feral cat control

A Feral cat and stray cat control program has been implemented in Guyra and is ongoing in Armidale, following a spike of complaints about feral cats in the Guyra district. Close to 100 feral cats have been trapped in 2020 in Guyra and Armidale.

Feral cats have long been recognised as a major problem to Australia's delicate biodiversity and are key contributors to the extinction of native mammals and birds. Feral cats are of the same species as domestic cats, however, they live in the wild and hunt their prey to survive *(ARC website 17th April 2020).*

9. Waste management, diversion and recycling

9.1. Types and amounts of waste

As part of one of its essential services, Council provides waste collection and management services. Household garbage and recycling collection services are provided to residents and additional drop off locations are provided for garden and green waste, electronic waste including TV's, and household problem wastes of paints, oils, car batteries etc. for reuse or recycling.

Diversion of materials that can be reused is also undertaken for items such as concrete, timber and wood products and metals. Concrete is crushed and is able to be purchased for use as aggregate, timber and wood products are chipped and either sold as mulch or used for landfill cover material and metal is recycled. Residential food organic waste and green organic material (known as the City to Soil or FOGO program) is used to make compost of varying grades which can be purchased by residents.

A new landfill at Waterfall Way was opened in October 2020 with all waste from the LGA going to that landfill. The following is from information provided by Council in October 2020:

"With Armidale's Long Swamp Road landfill now at capacity, and Guyra's facility no longer in operation, the Waterfall Way landfill is needed to meet the needs of our growing population," said Mr MacDonald.

"The site is located 12 kilometres east of Armidale and was selected as the most suitable location out of 40 sites assessed. It went through a rigorous planning process and is approved by the EPA."

The $12-million project consists of five operational cells that will be constructed in stages, and each will hold around 211,000 cubic metres of waste. This will mean the new site can hold up to 750,000 tonnes of waste over the next half century.

The new landfill will not be open to the public, however, all waste will still be sorted at the existing sites in Armidale and Guyra, and Council's extensive recyclables and organics operations will continue. Waste that can't be recycled will be taken to the Waterfall Way facility.

The Waterfall Way All landfill is licensed under the NSW Environment Protection Authority (NSW EPA) which provide extensive conditions for operation and management of the landfills.

The amounts of waste for the LGA are provided below, Table 15 and Figure 10. The total amount of waste has decreased from 40,383 tonnes in 2016 to 30,893 tonnes in 2020. As can be seen commercial and industrial waste was highest for the years of 2018 and 2019. Construction and demolition waste was much higher in 2016 than other years. While Commercial and industrial waste has fluctuated over the years, Construction and demolition waste has declined markedly from 2016, 16,882 tonnes to 2020, 5,472 tonnes. Note however in future these numbers may fluctuate due to whatever large construction projects are occurring in the LGA.

Table 15. Amounts and types of waste for LGA.

	Type and amount of waste (tonnes)			
Year	**Municipal**	**Commercial and Industrial**	**Construction and Demolition**	**Total**
2016	12,826	10,675	16,882	40,383
2017	15,151	11,504	7,450	34,105
2018	14,216	14,190	8,687	37,093
2019	15,562	16,225	7,788	39,575
2020	16,379	9,042	5,472	30,893

9.2 Recovered/Recycling types and amounts

Council has an extensive array of waste items that are able to be recovered/recycled, from typical glass, cardboard through to electronic waste, (e-waste), food organics, green organics (FOGO) and concrete and timber.

Recovered/Recycled materials under the NSW EPA is classified as:

> Recovered: aggregate from crushed concrete, compost and /mulch from the City to Soil program;
>
> Recycled: includes glass, cardboard, plastic bottles, e-waste, aluminum etc.

In 2012, Armidale Dumaresq Council launched the City to Soil organic waste collection to 10,000 homes in Armidale and provided a fortnightly collection for kitchen and garden waste and other organic materials, producing high grade compost from this material. Food scraps such as any raw or cooked food, tea bags, coffee grounds, fruit and vegetables, peelings, leftovers, meat, fish, cooking oil, and used tissues and paper towels can all be processed in the composting process.

The organic material is taken to the Long Swamp waste facility, sprayed with an inoculant and placed in windrows, Photo 13 and Photo 14 below. The material is then covered with tarpaulins and left to biodegrade for a period of 12 weeks. It is then screened, with the larger material being chipped. The final product is sold to the public as either an A or B Grade compost, and a photo of the final A Grade product is provided below, Photo 15.

In 2018 Guyra was also included in the City to Soil program. The City to Soil program also serves to decrease the amount of greenhouse gases, particularly methane, that are released when organic matter is buried in landfill and breaks down under anaerobic conditions.

In February 2019 a seminar was held in conjunction with UNE, titled: What a waste: The challenge of food loss and waste.

Extensive information concerning the City to Soil program is contained on Council's website including a video of what people can put in their caddy. In 2020 Council was involved in the translation of the audio for the video to be translated so that members of the Ezidi community were able to learn how to use the system.

https://www.armidaleregional.nsw.gov.au/environment/waste-and-recycling/city-to-soil

Photo 13. Spreading of the green waste organic waste in preparation for windrowing. Note windrows in background.

Photo 14. Food organics green organics in windrows, note that the tyres are used to hold the tarpaulins which are used repeatedly down and prevent them from blowing in the wind.

Between March 2019 and December 2020, Council provided 1,450 ventilated caddy's and over 8,624 rolls of bags to residents of the community, note that a minimal charge on the rolls of bags came into place in 2020. There are 75 bags to a roll. In addition initial investigations were undertaken by staff in late 2020 for the diversion of commercial/industrial food waste from landfill via a NSW EPA grant.

Photo 15. Final product from City to Soil process - A Grade compost.

Recovery and recycling of material also assists in lengthening the life of the landfill, as new landfills are so expensive to set up, this is long term cost saving as well.

The total amount of waste recovered or recycled has fluctuated from 2016 to 2020, from 7,585 tonnes in 2016 to 12,951 in 2018 to 7,588 tonnes in 2020. This is mainly due to construction and demolition waste fluctuations due to major construction/demolition projects.

The recovered/recycled amounts are provided below for the financial years 2016 to 2020, Table 16, Figure 10 and Figure 11.

Table 16. Waste able to be recovered or recycled in tonnes

	Waste able to be recovered or recycled (tonnes)		
Year	**Total waste able to recovered/recycled**	**Waste total with recovery/recycling**	**Waste total without any recovery/recycling**
2016	7,585	32,805	40,390
2017	10,699	23,405	34,104
2018	12,951	24,143	37,093
2019	5,859	33,715	39,715
2020	7,588	23,306	30,894

Note the difference between the total figures for Table number and Table number are due to reporting or rounding.

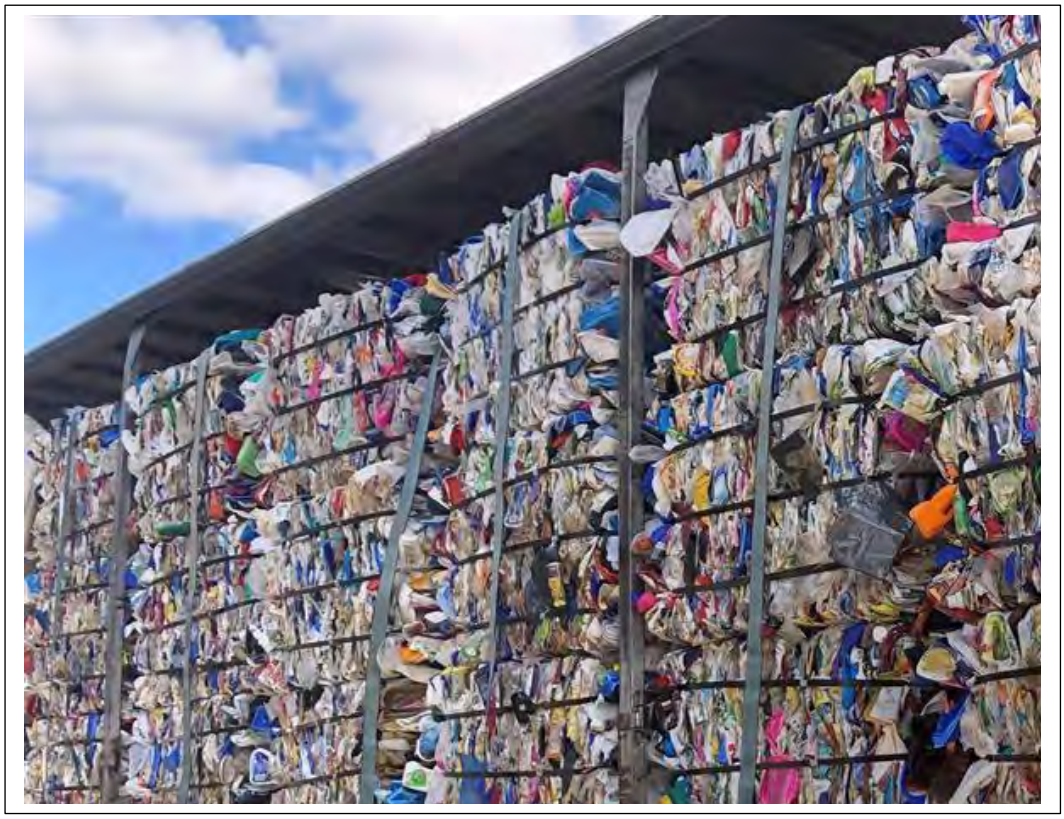


Photo 16. Baled plastic/s ready to be sent for recycling.

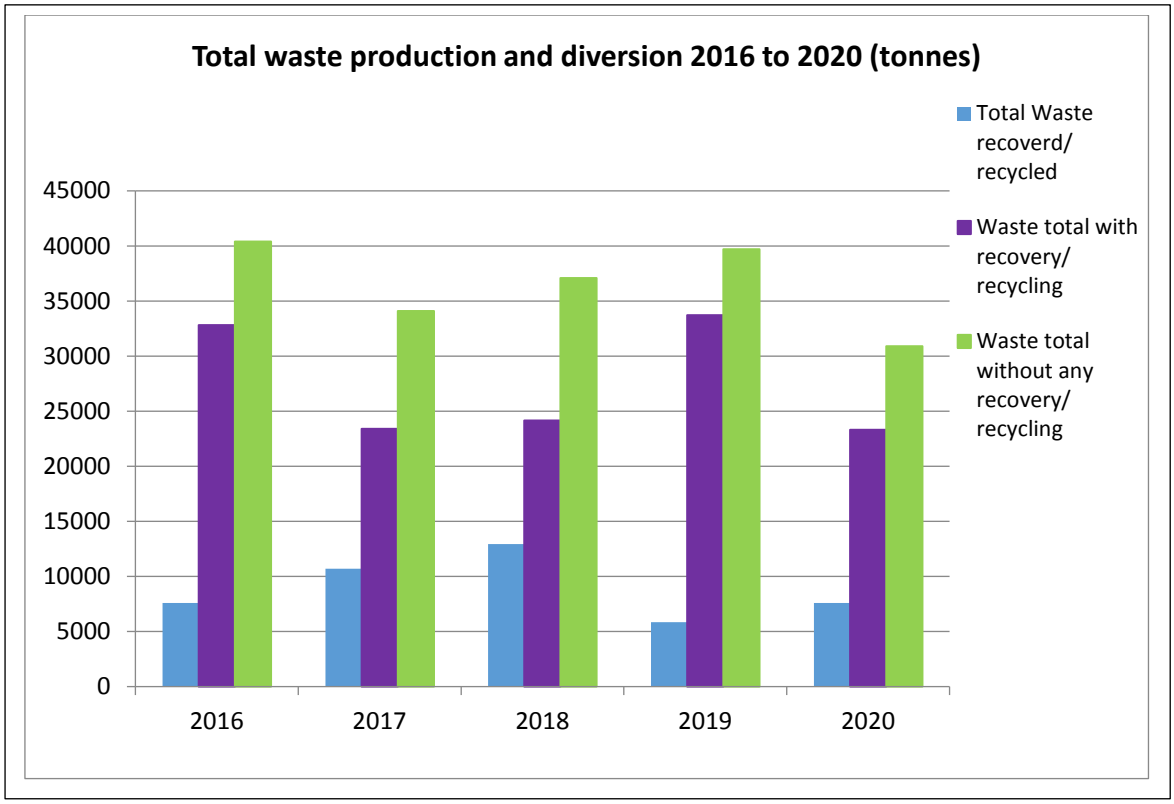


Figure 10. Total waste production and diversion 2016 to 2020.

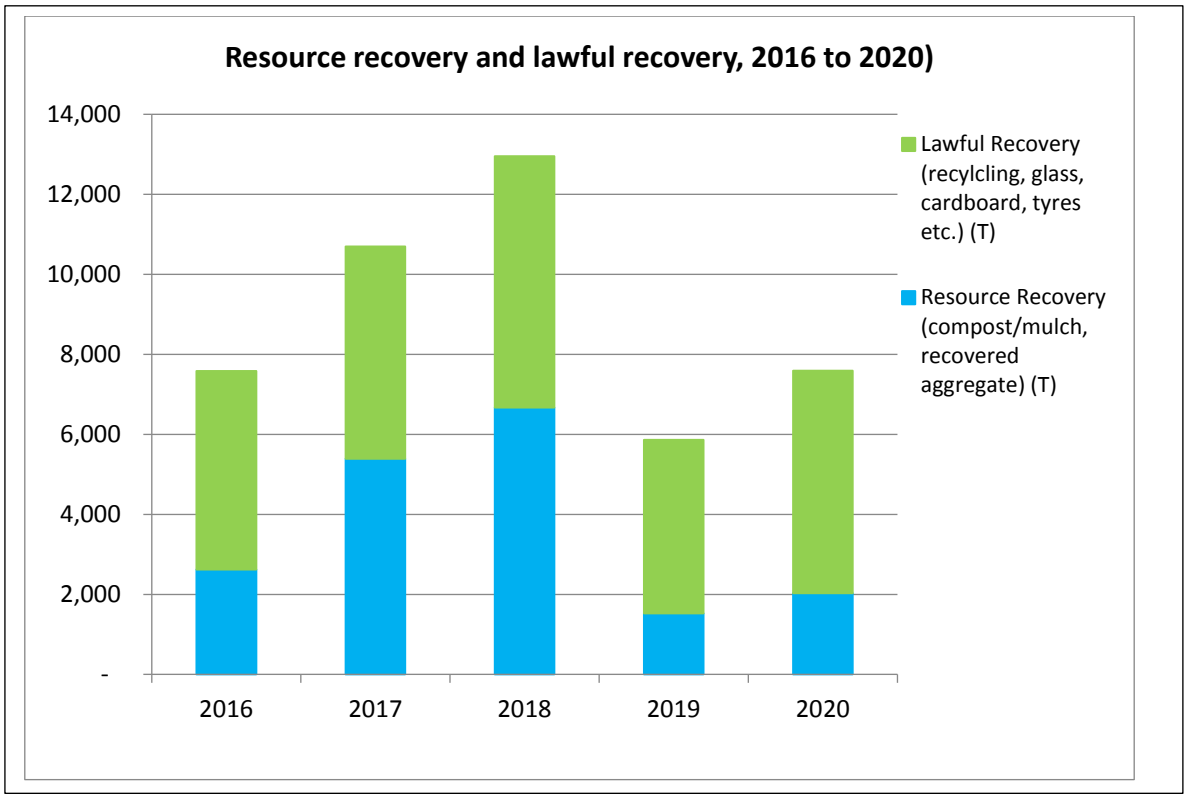


Figure 11. Resource recovery and lawful recovery 2016 – 2020, (NSW EPA categories).

Waste management staff continue to explore options for diversion from landfill and recycling opportunities for items.

In 2020 recycling of mattresses commenced, with over 46.34 tonnes of mattresses diverted from landfill and sent away for recycling till June 2021. Mattresses are stored at the Long Swamp landfill until a container is full, Photo 15. Mattresses are a problematic waste in landfill due to the amount of space that they take up, as due to them commonly having springs, they will not compact. By recycling mattresses these large waste items can be diverted from landfill and their components, such as wood, foam and springs recycled into a number of products. It also reduces waste handling and landfill costs. "Each year in Australia, about 1.6 to 1.8 million mattresses are sent to landfill, where each mattress takes up 0.75 cubic metres of space", ABC 2020.

In late 2020 initial investigations were undertaken by staff in to the inclusion of commercial/industrial food production waste to be incorporated into the City to Soil program via a NSW EPA grant, potential grant opportunities continue to be explored.

The NSW container deposit scheme, Return and Earn, began rolling out across NSW on 1 December 2017. Drink container litter makes up 44% of the volume of all litter in the state. A 10c container machine is located at the Waste facility for households and community groups to bring their 10c recyclable containers to, to return and earn. Other 10c container machines are located at Guyra and at Woolworths at Armidale.

Photo 17. Mattresses ready to be sent for recycling where the component parts are separated and recycled/reused.

Electronic waste (e-waste), is one of the fastest growing types of waste. E-Waste consists of computers, laptops, screens, TV's, cables monitors, printers, mobile phones etc., basically any discarded product with a battery or plug. In Australia it contributes to 140,000 tonnes of waste per year, and is growing at three times the rate of any other waste stream, (Clean up Australia, 2020). Of concern is that 98% of components of e-waste can be fully recycled. E- Waste is collected at the Long Swamp Landfill at no charge and then sent away for recycling, Photo 18.

One of the most important items to be noted in relation to recycling is the low wastage rate for final recycling tonnages for the LGA, which is approximately 5%. The typical recycling wastage rate for most councils using larger yellow lidded bins is approximately 50%. The low recycling wastage rate is due to the quality of the recycling material and the lack of contamination of recycled material. This is mainly due to the initial sorting and separation undertaken by households using the separate small crates, and then additional sorting at the Waste facility by the Recycling contractor.

In early 2018 China announced its National Sword Policy which was a ruling introduced to reduce the volume and contamination levels of recyclable material to no more than 0.5% that it accepted for reprocessing. The crate system used in the LGA did mean that Council was able to continue to meet waste diversion goals.

Photo 18. E-Waste, including computers, TV's, computer screens, printers, cables etc. awaiting collection for recycling.

9.3. Illegal dumping

Illegal dumping is a significant cost for Council's not only locally but across the state. The ability to prosecute these offences is very low due to the fact that we are unable to locate or identify the offenders. This being the case the cost of clean-up actions are primarily worn by Council and ratepayers.

There has been 290 illegal dumping complaints received through Council's reporting system since 2016, an example photo is provided below, Photo 19. Forty nine infringement notices have been issued for littering and dumping within the LGA, with the penalties ranging from $250 to $4000.

Signs and CCTV cameras have been installed at hot spot illegal dumping sites. This has reduced the number of illegal dumping incidents.

Photo 19. Illegal dumping detected by a member of the public and reported to Council for action.

10. Transport

Community Outcome 4: The community has access to transport which enables connectivity both locally and outside the region	
Supporting Strategies	Promote cycling for transport as a healthy, environmentally friendly option
	Evaluate the role of electric vehicles, including driverless electric shuttles and autonomous vehicles, in future transport strategies

10.1 Cycleways/cycling

There is an extensive network of cycleways especially within the city of Armidale. Cycling is a popular mode of transport and increasingly more residents of the region are taking up cycling for regular exercise, this was especially noticeable in 2020 during COVID19 lockdowns.

Information on cycleways and education regarding sustainable transport was provided at various Council run market stalls during 2018 – 2019 at Farmers markets and special events.

The total network of shared pedestrian and cycleways in Armidale, Guyra and Ebor is over 20kms, with the Armidale network totalling 17.8km and Ebor 2km.

Solar lighting was also put onto the Armidale cycleway in 2020 between Markham Street and the Donnelly Street bridge, following advice from Armidale police of the high number of users on that section and police records of previous incidents. The lighting was funded with assistance from the Federal Government's Safer Communities Fund.

10.2. Electric vehicles/charge points

Council purchased a Toyota Corolla Hybrid (electric) vehicle in 2019 which is used mainly out of the Guyra office. The vehicle recharges itself unlike a full electric vehicle which would require recharging.

This will be the trend including full electric vehicles as infrastructure and vehicle models become more available.

A fast electric charging point was installed at the Armidale Visitor Information Centre in late 2020, as part of the NRMA's electric vehicle fast charger network.

10.3. Automated Regional Driverless initiative

An Automated Regional Driverless Initiative (ARDi) vehicle 12 month trial - Phase 1 was undertaken by the University of New England and supported by Armidale Regional Council in 2019. The shuttle bus operate between the residential colleges and the main university campus. Phase 2 was undertaken by Council and operated within the CBD of Armidale.

10.4. Food miles

An item that was raised in relation to Transport in the 2014 – 2015 State of the Environment report was Food miles and Community gardens. Armidale has two community gardens that are currently operating, both welcoming community interest and involvement.

On the southern side of town behind the New England Regional Art Museum, Armidale Community Garden operates, being the longest standing community garden. Vegetables, herbs, fruit trees, flowers, berries are grown here by the volunteers. The garden also provides an opportunity for

volunteers to meet one another, develop friendships and skill sets. Excess produce from the gardens is sold at Farmers Markets. Covid19 restrictions in 2020 meant that visiting the community garden was restricted.

The Uniting Community Garden, is located on the south side of the Uniting Church's Youth Centre Hall. The garden is well established, with very productive raised beds tended by volunteers from the church and others from the wider community. The garden provides both food and a chance for community members to meet. Regular Saturday working bees are held.

11. Indicator trends

This section of the report addresses the Indicator and issues as per Section 428a from the *Local Government Act*, 1993 and Guidelines under section 406, that "such environmental issues as may be relevant to the objectives for the environment established by the community strategic plan and provides for Item (b) report on, and update trends in, each such environmental indicator".

The Community Strategic Plan Performance Indicators are high level, overarching performance indicators which were chosen based on community feedback about what was the most important to help achieve the community vision. Some of the performance indicators are not fully within Council's direct control, however Council has a role to advocate for and facilitate improved outcomes in these areas.

The Community Strategic Plan Performance Indicators in relation to environmental sustainability are:

- Reduction in Council's operational energy consumption by 2020; and
- Reduction in carbon and greenhouse emissions per capita by 2020

The supporting strategies under the Community Strategic Plan related to environmental sustainability are provided below, along with any relevant measures of success, factors or outcomes from the Delivery Program 2018 -2021, that are also taken here to be indicators.

The below indicator trend arrows are used to provide indication of from left to right of, worsening trend, little or no change trend, improvement trend and significant improvement trend. Note however that not all data and information from the previous reporting period available, where it is information on the change is provided and where direct comparison can be made an indicator trend arrow is also provided.

<table>
<tr><th>Community Strategic Plan</th><th>Supporting Strategy and Performance Indicators</th><th>Performance Indicator</th><th>IP&R Indicator</th></tr>
<tr><td>Strategic Direction
p. 14</td><td>Reduction in Council’s operational energy consumption by 2020
Information on this is detailed in Section 6. Note that a Delivery Program outcome is also listed.
Councils Energy consumption from 2016 to 2020 is provided below, energy is in megawatt hours, MWh. Note that a number of solar farms and solar installations came on line at Council facilities from late 2018 to 2020 and these are detailed in Section 6. There is a 22.7% reduction from 2020 on 2016 baseline levels, this is a significant improvement.
<table>
<tr><td>2016</td><td>2017</td><td>2018</td><td>2019</td><td>2020</td></tr>
<tr><td>3,672</td><td>4,212</td><td>5,092</td><td>3,261</td><td>2,837</td></tr>
</table></td><td>>5% decrease from 2016 baseline
Delivery Program: Reduced energy consumption for all of Council facilities</td><td>  </td></tr>
<tr><td>Strategic Direction
p. 14</td><td>Reduction in carbon and greenhouse emissions per capita by 2020
A baseline carbon account is being developed as part of Project Zero 30 with 2016 as the baseline. At this stage it is unable to be determined if a reduction in carbon and greenhouse emissions has occurred per capita for the LGA. The Climate Emergency Working Group in their report A Framework for Climate Action detailed emissions for 2017 for Armidale region as being a total of 790,100 tonnes.
However, the below information is provided for Council emissions from electrical generation in tonnes, there has been a reduction since 2018 due to increased solar power. There is a 25.7% reduction on emissions in tonnes from 2016 baseline to 2020, which is a significant improvement.
<table>
<tr><td>2016</td><td>2017</td><td>2018</td><td>2019</td><td>2020</td></tr>
<tr><td>3,437</td><td>3,826</td><td>4,583</td><td>2,935</td><td>2,553</td></tr>
</table></td><td>>5% decrease from 2016 baseline</td><td> 
Council operations from electricity only</td></tr>
<tr><td>Community Outcome 1.</td><td colspan="3">The unique climate, landscape and environment of the region is protected, preserved and made accessible</td></tr>
<tr><td>1.1</td><td>Partner with local organisations and stakeholders to develop strategies for dealing with climate change impacts on the local agricultural sector (see 2.1 below)</td><td>None provided in CSP or Delivery Program</td><td>See 2.1 below</td></tr>
<tr><td>1.2</td><td>Tourism strategies and active, eco-tourism partnerships, promote the local landscape and natural attractions while considering potential impacts on the environment and ways to mitigate such impacts.
A Tourism Strategy is currently on public exhibition</td><td>None provided in CSP or Delivery Program</td><td>  </td></tr>
</table>

<table>
<tr><th>Community Strategic Plan</th><th>Supporting Strategy and Performance Indicators</th><th>Performance Indicator</th><th>IP&R Indicator</th></tr>
<tr><td>1.3</td><td>Maintain and improve local waterways, lagoons and creek lands in partnership with community groups and other agencies

No performance indicator provided in Community Strategic Plan, however due to the amount of work undertaken by community groups with support from Council as detailed in Section 5.1 this is regarded as being a significant improvement on 2016, see Section 5.</td><td>None provided in CSP or Delivery Program</td><td>  </td></tr>
<tr><td>1.4</td><td>Partner with stakeholders to develop strategies and provide programs which improve air quality across the region, including the reduction of smoke pollution by using alternative energy sources.

Council staff have actively provided education, resources and information via ratepayer notifications, social media, NSW EPA radio advertisements (paid for by Council) and market stalls regarding how to reduce wood smoke from wood heaters.

During warmer summer months no record of above National Environment Protection Measure of Ambient Air Quality Standards (Air NEPM) occurred, apart from in 2019- 2020 due to bushfires. However, during winter months exceedances of the National Ambient Air Quality Standards do occur.

Below is number of exceedances per month of the Air NEPM. A slight improvement from 2018 is detected. Note that the NSW Government Annual Air Quality Statement 2018 lists Armidale as having 32 exceedances*.
<table>
<tr><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>2020</th></tr>
<tr><td>16

(DustTracker – Council CAB)</td><td>16

(to September only)

(DustTracker – Council CAB)</td><td>30*

31/5/2018 only (DPIE Air Monitoring Station)</td><td>25

(DPIE Air Monitoring Station)</td><td>23

(DPIE Air Monitoring Station)</td></tr>
</table></td><td>Delivery Program: Achieve National Air pollution targets by 2020.

Slight improvement 2018 -2020</td><td> 
  </td></tr>
<tr><td></td><td>Note in relation to the Delivery Program aim of 90% reduction in wood smoke through the entire city by 2025, it is unsure where this measure in the Delivery Program has come from and information below is provided on why it appears that it will not be able to be met without the provision of alternative renewable heating options and extensive insulation installations, requiring extensive financial assistance from State Federal governments as well as the willingness of the majority of the Armidale population to change to a different heating option. Council currently has no legal right to undertake the banning or removal of wood heaters in the LGA. Council's role as per the Delivery Program is as a Provider, Facilitator and Advocate. As stated above Council staff have actively provided education, resources and information via ratepayer notifications, social media, EPA radio advertisements and market stalls regarding how to reduce wood smoke from wood heaters.</td><td>Delivery Program, measures of success/ outcome:

Aim for a 90% reduction in wood smoke through the entire city by 2025</td><td>Predicted that unable to be met without 75% – 90% of wood heaters being removed. This is a State/ Federal government decision</td></tr>
</table>

<table>
<tr><th>Community Strategic Plan</th><th>Supporting Strategy and Performance Indicators</th><th>Performance Indicator</th><th>IP&R Indicator</th></tr>
<tr><td>1.4 cont.</td><td>The Wood smoke working group estimated that there was between 2,500 to 3,000 in the core of the city of Armidale, as this is where the major winter air quality issues occur, this discussion focuses on this area. While new wood heaters, since 2019 have been required to meet a 60% efficiency standard and particle emissions limits of no more than 1.5 grams/kilo of wood, older wood heaters do not have the same standards. Based on figures provided for Christchurch NZ, where 34,000 open fires/solid wood heaters were replaced from an initial 57,000 open fires/solid fuel heaters, (59.6% removed) which resulted in a 71% decrease in PM10 (PM2.5 which is more problematic is not mentioned and may require more replacement to achieve a 90% reduction in wood smoke).

For Armidale to reach a target of 90% wood smoke pollution reduction would, it is estimated it would entail Armidale residents removing somewhere between 75% to 90% of their wood heaters from their homes to achieve this aim. This would need to be determined by strong political support from both State and Federal government with incentives for changing to other forms of heating for households.</td><td></td><td></td></tr>
<tr><td>1.5.</td><td>Investigate alternative sources of power generation to reduce the community’s carbon footprint.

The uptake of renewable energy, mostly in the form of solar, by residents in the LGA, is provided below, Section 6.3. However, Council does not take credit it for this in anyway, as we have only been able to provide advice, building approvals permits where required. More recently individual industrial premises have more commonly been installing solar systems for power generation as well. Significant improvement trend is noted.

Climate Emergency Working Group report: Project 1: Solar panels at Monckton Aquatic Centre to reduce energy consumption, Section 4.2.3.

NSW State Government declared New England Regional Renewable Energy Zone (one of four in NSW) in August 2020. It is planned that this zone will be a mixture of solar, wind and hydro power generation, generating 8,000MW, or enough power to power 3.5million homes. Council is currently developing a Renewable Energy Policy in relation to land use, bushfire control etc.
The number of Small generation units (solar) and output for the LGA is provided below from data that is available, Section 6.3. Note that significantly more units have been installed in the last 5 to 10 years than previously and it appears this trend is continuing, which is a significant improvement trend.
All information from the Clean Energy Regulator, 2021.
<table>
<tr><td>Year</td><td>Number of units</td><td>SGU Rated output (kW)</td></tr>
<tr><td>2001-2019</td><td>3317 Units</td><td>16,482</td></tr>
<tr><td>2020</td><td>768</td><td>3,536</td></tr>
</table></td><td>None provided in CSP or Delivery Program</td><td>  </td></tr>
</table>

<table>
<tr><th>Community Strategic Plan</th><th>Supporting Strategy and Performance Indicators</th><th>Performance Indicator</th><th>IP&R Indicator</th></tr>
<tr><td>Community Outcome 2</td><td colspan="3">The community can participate in initiatives which contribute to a sustainable lifestyle</td></tr>
<tr><td>2.1</td><td colspan="2">Provide educational programs to increase community awareness of climate change risks and enable the community to implement climate change adaptation and mitigation actions in daily life
Operational Plan 2021: Climate Emergency Working Group report, Projects 2 and 3, detailed in Section 4.2.3.
2016 | 2017 | 2018 | 2019 | 2020
| | | | | 6</td><td>None provided in CSP or Delivery Program</td><td>  </td></tr>
<tr><td>2.2.</td><td colspan="2">Provide specific educational programs on waste reduction and recycling, including vegetation recycling, and support these programs through increased recycling services across the region.
Specific educational programs have been provided to the community in relation to the above, via a number of channels, ratepayers notices, social media, video clips, market stalls, site visits to the waste facility, mail outs, updated Waste services guide etc. The Food Organics Green Organics diversion to compost program was extended to Guyra in 2018. The type of items that can now be recycled through the waste centres and also Council facilities has increased to include, paint, e-waste, gas bottles etc.</td><td rowspan="5"></td><td>  </td></tr>
<tr><td>Year</td><td>2016 | 2017 | 2018 | 2019 | 2020</td></tr>
<tr><td>Combined recovery & recycling</td><td>7,585 | 10,699* | 12,951* | 5,859 | 7,588</td></tr>
<tr><td>Recycling only</td><td>4,968 | 5,311 | 6,279 | 4,336 | 5,561</td></tr>
<tr><td></td><td>The tonnes of recovered material and recycling for each year are provided below. Note that the materials may not only be from domestic premises however, as the data is not collected or separated in this way. It appears that the amount of material being able to be recovered which includes green waste and materials from the building and construction industries (aggregate etc.), fluctuates depending on the construction activities within the LGA marked with an asterick * below. Construction industry waste is the reason for the increase in numbers for 2017, 2018. Recycling of glass, cardboard, plastics, tyres etc. is shown in the second row and has increased from 2016 by 10.7% with some fluctuations in amounts occurring during other years due to construction industry waste/recovery.</td><td>Delivery Program :
% tonnes of recycling from all domestic waste services</td><td>Recycling only
 
Improvement for 2020 from 2016 figure</td></tr>
</table>

Community Strategic Plan	Supporting Strategy and Performance Indicators	Performance Indicator	IP&R Indicator
2.3	**Prepare disaster management plans to reduce the impact of natural disasters** Note that in NSW, Emergency Management Plans are prepared for a region, ARC sits within the New England Region and is covered by the New England Region Emergency Management Plan. This Plan provides a coordinated and comprehensive approach to emergency management in the New England area.	None provided in CSP or Delivery Program	NA
2.4	**Develop a Sustainability Strategy which includes objectives for the region as a whole as well as Council operations.** The Greenprint strategy, EcoARC was developed as Council's sustainability strategy by members of the Environmental Sustainability Advisory Committee and Council staff and was adopted by Council on 11th December 2019. Committee members are currently developing priorities for an Implementation plan.	None provided in CSP or Delivery Program	
2.5	**Provide incentives for eco-tourism operators to establish programs which promote sustainable living and attract tourists to the region** A Tourism Strategy is currently on public exhibition	None provided in CSP or Delivery Program	
2.6	**Advocate for cost-effective access to renewable energy for the local community and businesses** NSW State Government declared New England Regional Renewable Energy Zone (one of four in NSW) in August 2020. It is planned that this zone will be a mixture of solar, wind and hydro power generation. Council is currently developing a Renewable Energy Policy, part of which will advocate for cost-effective access to renewable energy for the local community.		
Community Outcome 3	**The community is provided with the essential and resilient infrastructure it requires for daily life, and has access to a prioritised schedule of infrastructure works.**		
	Develop a program for the provision of sustainable transport options, including additional cycleways and education programs to encourage sustainable transport. Information on cycleways and education regarding sustainable transport was provided at various Council run market stalls during 2018 - 2019. Solar lighting was also put onto the Armidale cycleway in 2020 between Markham Street and the Donnelly Street bridge, following advice from Armidale police of the high number of users on that section and police records of previous incidents. The lighting was funded with assistance from the Federal Government's Safer Communities Fund	None provided in CSP or Delivery Program	

Community Strategic Plan	Supporting Strategy and Performance Indicators	Performance Indicator	IP&R Indicator
Community Outcome 4	**The community has access to transport which enables connectivity both locally and outside of the region**		
	Promote cycling for transport as a healthy, environmentally friendly option There is an extensive network of cycleways especially within the city of Armidale. Cycling was promoted as a means of transport as part of various market stalls during 2018 – 2019. Cycling is a popular mode of transport and increasingly more residents of the region are taking up cycling for regular exercise, this was especially noticeable in 2020 during COVID19 lockdowns. See other information above. **Evaluate the role of electric vehicles, including driverless electric shuttles and autonomous vehicles, in future transport strategies** An Automated Regional Driverless Initiative (ARDi) vehicle 12 month trial - Phase 1 was undertaken by the University of New England and supported by Armidale Regional Council in 2019. The shuttle bus operate between the residential colleges and the main university campus.	None provided in CSP or Delivery Program	

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Acronyms and abbreviations

Acronym/ Abbreviation	
ABS	Australian Bureau of Statistics
Air NEPM	National Environment Protection Measure of Ambient Air Quality Standards
ARC	Armidale Regional Council
AUPM	Armidale Urban Planting Maintenance
ARUP	Armidale Urban Rivercare Group
BOM	Bureau of Meteorology
CSP	Community Strategic Plan
DP	Delivery Program
DPIE	Department of Industry, Planning and Environment (NSW)
EPA	Environment Protection Authority
L	Litres
LGA Act	Local Government Act, 1993
LGA	Local Government Area
ML	Mega litres
NOW	NSW Office of Water
NSW	New South Wales
OCM	Ordinary Council Meeting
$PM_{2.5}$	particles less than 2.5 micrometres in diameter
PM_{10}	particles less than 10 micrometres in diameter
REZ	Renewable Energy Zone
SNEL	Southern New England Landcare
SoE	State of the Environment (this report)
T	Tonnes
TSP	Total solid particulate matter, particles less than 100 micrometers in diameter
$\mu g/m^3$	micrograms per cubic metre, referenced to a temperature of 0° Celcius and an absolute pressure of 101.325 kilopascals.
UNE	University of New England

Appendix 1

Ten submissions were received for the State of the Environment report to the end date of the public exhibition period 5pm Monday 1st March 2021. A summary table of the submissions is provided below and a copy of the submissions are attached to this report and comments from Council officers are provided in italics for a number of items. Note that personal details for each of the submissions have been removed when requested, however state details have been included where submissions were received from outside of NSW.

Number	Name on Submission	Main points on Submission	Information included in Section number
1.	B Connor Armidale	Received 1/2/2021. Submission in relation to a number of items including the Bike plan and former NSW Traffic education centre. Note that information was provided to B Connor in relation to what Traffic Centre is being used for as well as a meeting on site to discuss concerns.	Section 10
2.	UNE Armidale	Received 4/2/2021: Copy of public version of UNE Environmental Sustainability Report 2020.	Sections 5 and 8
3.	Friends of the Reserve H Stokes Armidale	Received 23/2/2021. Submission on Angophora Bushland Reserve submission, describing the activities that have been undertaken from 2016 – 2020. A booklet produced by Ruth Tre'mont was also provided, very kindly with this submission. Photos were also supplied and some have been included in the report.	Section 8
4.	Judith Street Walking Track H Stokes Armidale	Received 23/2/2021. Submission on Judith Street Walking Track and the formation of a new Southern New England Landcare group to support and revegetation activities.	Section 8
5.	Climate Emergency Working Group H Webb Armidale	Received 22/1/2021. Further information relating to Threatened species that was not included in final Climate Emergency Working Group report, *A framework for Climate Action*. Two separate files were also included with this submission including one on Riparian birds in Dumaresq Creek. Recommendations in relation to continuing revegetation and value of this along Dumaresq Creek.	Sections 5 and 8

Number	Name on Submission	Main points on Submission	Information included in Section number
6.	Name/ address withheld on request Victoria	Received: 1/3/2021: Support the Australian Air quality group submission, recommends that Council make immediate low cost remedies, including not allowing new wood heaters to be installed in urban areas, requiring wood heaters to be removed when a house is sold as recommended in the Sydney Clean Air plan.	Section 4
7.	Secretary Australian Air quality group. No address provided	Received: 1/3/2021: Australian Air quality group submission, argue that ARC should acknowledge the lack of progress in improving air quality despite the recognised serious health effects and then list the measures that should be put in place to remedy the situation as a matter or urgency. Recommendations for urgent actions include, not allowing new wood heaters, setting up an Air Quality Working Group and applying for funding to implement the recommendations of health and air pollution experts.	Section 4
8.	K. Forster Families for Healthy Air Victoria	Received: 1/3/2021: Information from the 2013 Australian Government Senate inquiry report: Impacts on health of air quality, in relation to wood smoke Supports the Australian Air quality group submission - urges ARC to act urgently to reduce and eliminate the sources of wood smoke pollution, not allow new wood heaters to be installed and phase out existing wood heaters.	Section 4
9.	New England Greens Armidale Tamworth E O'Hara Armidale	Received 1/3/2021. Extensive submissions with many recommendations as to what the SoE should contain as well as recommendations that it should make, including recommendations to ARC residents. Note that this is not the part of guidelines of the SoE, which is designed to report on the previous period, see LGA Section 428a in Section 1 of this report.	Elements in Section 4

Number	Name on Submission	Main points on Submission	Information included in Section number
10.	Sustainable Living Armidale T Howard PO Box 85 Armidale	Received 1/3/2021. Contains information about the work undertaken by members of their group and working groups during the reporting period. Four subgroups have contributed to the report. Note that information under the Climate Emergency Working Group had already been incorporated in the report from the $60,000 funded by Council. Note there is mention of an Attachment to this submission, however no attachment was contained with the submission that was received by Council. Also note that a number of Climate actions and others are mentioned that the SoE should refer to that are outside the LGA – however note that the LGA Section 428A, (see Section 1 of the SoE report) specifically refers to the SoE report on "the local government area".	Elements included in Section 4, Section 8

The link to the initial page for contributions to the State of the Environment report is provided below and a copy of the request is provided.

https://yoursay.armidale.nsw.gov.au/state-of-the-environment-report-2016-2020-request-for-community-submissions

State of the Environment Report 2016-2020 - Request for Community Submissions

Consultation has concluded

All Councils within NSW must produce an annual State of the Environment Report and Armidale Regional Council is preparing its State of the Environment Report for 2016-2020.

This is a report to the community on progress with meeting environmental goals and targets in the Armidale Regional Council Community Strategic Plan 2017-2027. Environmental goals set by the community relate to:

- protecting and preserving the unique climate, landscape and environment of the region;
- community participation in initiatives which contribute to a sustainable lifestyle;
- reducing carbon and greenhouse gas emissions;
- improving air quality;

Activities such as energy efficiency and waste reduction, environmental monitoring, education and/or rehabilitation, regeneration works are important contributors to the overall state of the environment. As such Council invites submissions from individuals or organisations like community groups, schools, and businesses outlining their environmental activities and achievements during 2016 – 2020 for inclusion in the State of the Environment Report.

If you would like further information or would like to contribute to the State of the Environment Report please contact Mandy McLeod, Sustainability Officer by email on council@armidale.nsw.gov.au

Written submissions can be made to the General Manager, Armidale Regional Council, PO Box 75A, Armidale, NSW 2350 and should be received by 10pm on Monday 1 March 2021.

Please be aware that if you make a submission, other people may have access to your comments. This may be as a result of a report to a Council meeting or as part of an application under the Government Information (Public Access) Act 2009. Also, under State legislation, any person making a submission on a Draft LEP amendment must also disclose whether they or an 'associate' have made a 'reportable political donation' or gift to a local Councillor or Council employee within the period commencing two years before any submission is made and ending when the Draft LEP is determined. Further details including disclosure forms are available on request from Council.

Lifecycle

Open
This consultation is open for contributions.

Under Review
Contributions to this consultation are closed for evaluation and review. The project team will report back on key outcomes.

Final report
The final outcomes of the consultation are documented here. This may include a summary of all contributions collected as well as recommendations for future action.

STATEMENT OF THE ENVIRONMENT REPORT

ARMIDALE REGIONAL COUNCIL

I write to note some community based activities from the past which may be reconsidered for inclusion in the Environment Report now planned for the coming years. They all come from previous experience with these initiatives and are evidence of the institutional failure which has been characteristic of the Armidale community in the past. None have implementation issues and costs would be minimal. We must stop trying to reinvent the wheel but to see how it goes around. It is not a matter of "why don't they" fix things but "how can we?". It is also important to remember that we are a ***Transition Town*** and with this comes the responsibility to do better.

1. An annual day of community based sustainability workshops where we use local expertise in trying to understand and educate ourselves in how to live more sustainably at an individual level. As was done at the first of such events in 2007, outside advice can come via a computer link.
2. Reorganise a local Bike Plan. This methodology was initially developed in 1976. It was fully operational in Armidale in 1988 and then disbanded. It is an on-the- ground example of the accepted systems approach to traffic safety.
3. Review the possibility of a modified recommencement of activities at the old New South Wales Traffic Education Centre which was officially opened in 1991 and then abandoned by government.
4. The siting of a Knowledge Centre in the Mall. This would be based on previous experience with the use of telecottages and build on the informatics capacity resulting from Armidale's unique advantage with the NBN.
5. Charge the authorities responsible for the National Trust's Saumarez Homestead with the task of completing the sustainability initiatives which have been planned since 2017 but not yet started.

.....Brian Connor , AM, FACRS.

University of New England

2020

ANNUAL ENVIRONMENTAL SUSTAINABILITY REPORT

Estate and Built Environment

Acknowledgement of Aboriginal and Torres Strait Islander Peoples and Country

The University of New England acknowledges that we are on the country of the Anaiwan people, who are the Traditional Custodians on whose Land this University stands.

The University of New England respects and acknowledges that its Peoples, programs and facilities are built on land, and surrounded by a sense of belonging, both ancient and contemporary, of the world's oldest living culture. In doing so, UNE values and respects Indigenous knowledge systems as a vital part of the knowledge capital of Australia

01

2020 Environmental Sustainability Overview

2020 was an atypical year for environmental sustainability aspects of the University of New England (UNE) . Following the extended period of severe drought in NSW, January and February brought heavy rainfall totalling 82.4mm above average. Malpas Dam, was at the lowest level on record on January 15, at just 32%, however by the end of 2020 the dam was still only fluctuating around 62% despite heavy summer rains.

Prior to the COVID-lockdown which saw the majority of staff move to a temporary remote working model, expenditure on utilities including water, waste & recycling, electricity and gas was within the typical range compared to previous years. Post lockdown there was a marked decrease in utilities as staff and students moved to an online work/study mode, resulting in annual savings of almost $1.5M.

The commissioning of the solar farm took place in late 2020 and generated 1.5MWh, or 12% of UNE's annual electricity consumption. After commissioning the new Sport UNE Aquatic Centre in early 2020, the geothermal heating had resulted in a reduction in gas consumption equivalent to 204.86 tonnes of carbon.

Lake Zot remediation was completed in October, and by the end of the year was approximately 55% full. The above average rain also resulted in all SMART Farm dams being at 95% capacity or above.

During 2020 Estate and Built Environment (EBE) made significant progress strengthening ties to the local Aboriginal community, in most part due to the EBE Aboriginal Cultural Advisors' (ACA) active role in engagement, land management and communication.

In early 2020 the repatriation of Ancestral remains from the UNE Archaeology Department to the Dunghutti Nation took place in a ceremony attended by both Dunghutti and Anaiwan Elders.

EBE introduced a new Environmental Sustainability survey for students and staff and received over 1,000 responses. The survey will become an annual occurrence, providing a conduit for feedback from the UNE community.

Planning for 2021 includes a number of energy saving projects, a new recycling contract, a continuation of water efficiency programs, and a range of revegetation and land regeneration activities. The Waste Management Plan will be reviewed and updated, and the 5 year Environmental Sustainability Strategy is anticipated to be complete in early 2021.

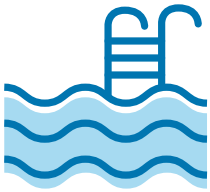
02

2020 Key Achievements

4.8 tonnes of e-waste recycled

Additional 682,000L of storage capacity in rainwater tanks installed on Armidale campus

1.5MWh generated by Stage 1 of the Solar Farm



200 tonnes of carbon avoided from the use of geothermal heating at UNE Aquatic Centre

750,000MJ gas avoided through adoption of green technology for water heating

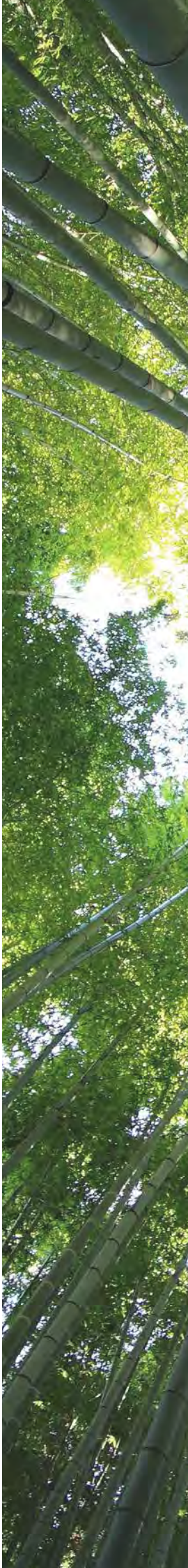
70% reduction in electricity for lighting from Dixon Library upgrades

22ha of conservation zones implemented on Armidale campus

Environmental Sustainability induction provided to all new staff members

Over 1,600 Aboriginal artefacts recorded and registered on UNE properties

Lake Zot remediation complete, providing an irrigation source for Sport UNE and a valuable teaching resource



03

UNE Operations

COVID-19 obviously had enormous impacts to the environment both globally and at UNE. The requirement to cease unnecessary travel, combined with non-essential staff being asked to work remotely saw a huge shift in UNE's operations. As a result, there have been many indirect environmental benefits relating to resource consumption.

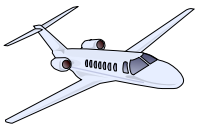
Air travel reduced by 83%, equivalent to over 3,600 tonnes of carbon. Similarly, fuel usage dropped by 45% as local and interstate travel became restricted. Compared to 2019 there was a significant reduction of in electricity use, which was further offset by the commissioning of the solar farm late in the year.

Gas used for heating buildings and hot water systems only reduced by 14%, despite approx. 90% of the students and staff working remotely for part or most of the year. This demonstrates the issues with the aging infrastructure and the inability to efficiently isolate vacant areas that do not require servicing.

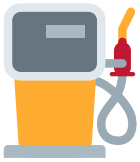
Water consumption was already significantly lower than last year, and this trend continued during the campus shut down, with savings of over 120,000,000L compared to 2019.

Waste and recycling figures also saw a significant decrease, down by 20% from 2019. It was clear that the online teaching and working models caused people to shift their behaviour around paper use, with most processes moving to 100% online.

Once the drought broke, the campus grounds also benefited from a reduced foot traffic, with the land regenerating back to pre-drought conditions.



83% reduction in corporate air travel, equivalent to 3,607 tonnes of carbon



45% reduction in petrol and diesel consumption

22% reduction in electricity from the grid

15% reduction in synthetic natural gas for heating and hot water

21% reduction in general waste; 200% increase in green waste composting

Water savings equivalent to 250 Sport UNE swimming pools

64% reduction in paper from developing innovative, digital alternatives

04

Aboriginal Culture & Heritage

During 2020 EBE made significant progress strengthening ties to the local Aboriginal community, in most part due to the EBE Aboriginal Cultural Advisors' (ACA) active role in engagement, land management and communication.

In early 2020 the repatriation of Ancestral remains from the UNE Archaeology Department to the Dunghutti Nation took place in a ceremony attended by both Dunghutti and Anaiwan Elders. This important event brought the Aboriginal and UNE communities together and demonstrated UNE's commitment to reconciliation.

Throughout 2020 the ACA identified and registered over 1,600 artefacts across UNE properties to ensure they can be protected and kept in situ on Country. The ACA was instrumental in the Solar Farm project, liaising with the Registered Aboriginal Parties to ensure site monitoring was undertaken in accordance with the Office of Heritage compliance requirements.

In late 2020 two Anaiwan Elders visited the UNE properties and shared traditional knowledge of several significant sites with the ACA. In a coup for EBE and UNE, the Uncles allowed the ACA to record their conversations, providing an invaluable record of the history of the land. This traditional knowledge will be extremely important in guiding how EBE manages the landscape in the future.

In 2020 the ACA spearheaded a number of collaborations with UNE departments, including guest lecturing in Archaeology to educate students about artefacts and Aboriginal history; and participating in the Growing Regional and Agricultural Students in Science (GRASS) personal development program for NSW school teachers. The ACA also represented UNE in NAIDOC week events with local primary schools, showcasing artefacts and teaching them about Aboriginal Culture and land management.

Gorgan Dance Group and Aboriginal Cultural Advisor, February 2020

05

Landscape & Biodiversity

Professor Jeremy Bruhl and Dr Ralph (Wal) Whalley Adjunct Associate Professor Undertaking Woody Weed Control

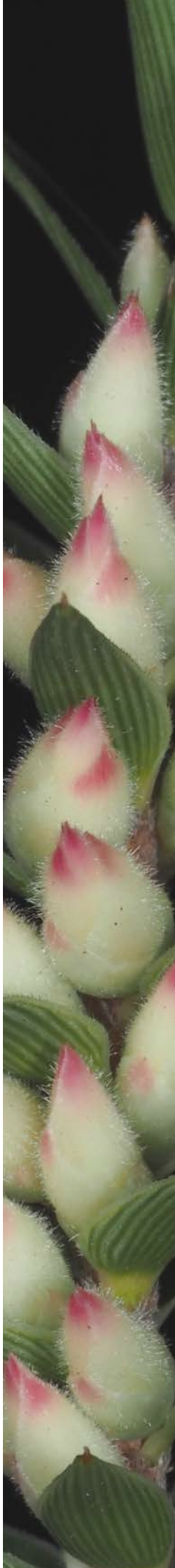
The framework for the new Landscape Management Plan has been developed by the Landscape Advisory Committee, which met five times in 2020. The following aims, purpose and function of UNE's Landscape Management Plan have been identified:

UNE aims at best practice and continual improvement in teaching, research, research training, research impact and outreach, reflected in and through a commitment to a living campus based on the principles and practices of biodiversity conservation, education, learning, knowledge, aesthetics and sustainability. UNE's landscape will:

- *Protect Indigenous flora, fauna and archaeological history*
- *Protect heritage plantings of trees and shrubs*
- *Establish a campus-wide botanical gardens that integrates with teaching and research*
- *Provide students and staff pleasure, protection, and facilitate learning and research*
- *Communicate widely (including students and staff) regarding information on the best-practice management of remnant woodlands at UNE; and*
- *Provide visitors and collaborators welcome, enjoyment and enrichment*

The severe drought that the region experienced in 2019 severely impacted many of the trees on the Armidale campus and as a result a number of trees had to be removed for WHS reasons. The Landscape Advisory Committee is developing an extensive planting list to be implemented in 2021.

The two conservation zones implemented to protect native endangered ecological communities have vastly improved during 2020, with the areas back to the pre-drought conditions. Controlled weed removal is undertaken in these zones to further regeneration activities.



06

Stakeholder Engagement

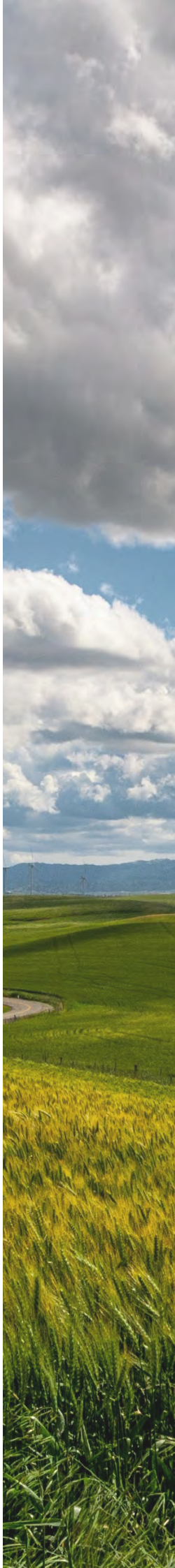
In early 2020, prior to the COVID lockdowns, EBE participated in a range of student engagement activities including hosting a stall at Lifesaver Day to showcase UNE's environmental sustainability initiatives; and providing an environmental presentation to all freshmen to encourage sustainable behaviour.

There have been a number of collaborations with Armidale Regional Council (ARC) including the Zero30 project, aiming to make the region carbon neutral by 2030; the Climate Emergency Working Group, identifying actions to improve sustainability and reduce environmental impacts; and participation in a number of drought and water supply forums.

An environmental sustainability induction was implemented for all new staff in 2020 and received very positive feedback from staff. The impacts of COVID restricted opportunities for face to face engagement, so EBE developed a number of virtual initiatives including the first ever staff and student Environmental Sustainability Survey which was taken by over 1,000 people. The results of the survey have assisted in identifying areas where more education is required and to gauge staff and student perception of UNE's commitment to sustainability.

EBE collaborated with the School of Environmental and Rural Science to use Lake Zot as a case study for the unit ENG327: Local Environmental Infrastructure. EBE staff working on the remediation project were interviewed as part of a lecture and did a Q&A with students.

A food packaging labelling program for local businesses to increase organic waste recycling for packaging that is compostable is being led by UNE after the success of the pizza box labelling. Armidale Regional Council have indicated that they would like to partner with UNE on this initiative in 2021.



07

2021: The Year Ahead

A number of environmental initiatives are planned for 2021, aiming to further reduce UNE's carbon footprint through the implementation of energy, waste and water saving programs, and the offsetting of carbon through an increase in planting and regeneration projects. EBE have committed to spending 6 months reviewing the UN Sustainable Development Goals to determine how to integrate appropriate objectives into UNE operations and what benchmarks and KPIs can be set to align to Future Fit.

Engagement with the local Aboriginal community will continue, with grants being pursued to bring Ceremony back to Country at the UNE owned portion of the sacred Aboriginal site, Mt Duval. A range of community and stakeholder engagement activities are also being planned, with contingencies in place for social distancing and the potential for further lock downs.

A new recycling contract will be implemented in February, EBE is optimistic that this will greatly improve recycling rates. Waste and recycling educational campaigns will continue to be delivered to students and staff; and EBE has plans to expand the UNE package labelling program to the wider community through a collaboration with Armidale Regional Council.

Wright Village will be targeted for energy saving projects, as it does not benefit from the solar farm, being connected to a separate high voltage network. Water projects will continue, with irrigation schedules to be developed in conjunction with Sport UNE to maximise the efficiency of irrigation from potable and non-potable sources.

A new Landscape Management Plan will be delivered to guide the landscaping and maintenance activities on the main campus. Significant new plantings are required to offset the tree removals from the past several years that were postponed due to drought conditions and the subsequent recovery of the landscape.

EBE will continue to engage closely on sustainability initiatives with the UNE and local community, and hopes to see sustainability become even more embedded in day to day operations. The lessons learnt during the COVID-19 response have demonstrated that there are countless opportunities for UNE to more efficiently utilise the infrastructure on campus; and embrace the technology that reduces the incidental carbon footprint relating to unnecessary travel, resource consumption and inefficient utilisation of facilities.

Mandy McLeod

From: Helen Stokes [redacted]
Sent: Tuesday, 23 February 2021 11:23 AM
To: Council
Cc: Elizabeth O'Hara
Subject: Attention: Mandy McLeod.
Attachments: ABR for SoE report.odt; Judith St Track for SoE report.odt

Dear Mandy,

Re: State of the environment report 2016-2020

I attach two summaries of environmental activities 2016-2020 for inclusion in the State of the environment report, if appropriate. I will leave a copy of the booklet about the Reserve at the Council desk for you today.

Regards,

Helen Stokes
Co-ordinator, Friends of Angophora Bushland Reserve ; and also of planting along the Judith Street Walking Track.

Angophora Bushland Reserve, 2016-2020

In 2014-2015 the Friends of the Reserve, a Southern New England Landcare group, had removed truckfuls of privet, pyracantha, elm suckers, cotoneasters and other woody weeds from the land and planted trees and shrubs endemic to the area.

In 2016-2018 the planting continued, the holes being individually prepared so as to disturb the groundcover as little as possible. This care paid off: by the end of 2019 the drought meant that we could not use town water, but most of the new plants survived.

In 2016 we extended the underground water pipe to the centre of the Reserve. The Reserve was gazetted and given its name officially. Then we prepared to open it to public use as planned. In 2017 we installed a picnic table in the south-west corner, and an entrance in the fence in Burgess Street. A circular walking path was mown, which passes both the picnic table, and the seat made by Harold Bradford for the north-east corner in 2015, and links with the walkway on the north side of the Reserve connecting the two sides of the hill. In 2019 a sign, similar to the ones erected in Snow Gums Reserve in north Armidale and Manna Gums Reserve near the overhead railway bridge, was put up. Margaret Duncan painted the artwork for it.

Ruth Trémont, a well-known ecologist, had advised us about plants and techniques during the project. A booklet by Ruth, with many photographs, and including some contributions by members of the group, was produced during 2019.

From the beginning of 2020 rain came, bringing a burst of growth in plantings and grass. We were lucky to have Back Track Youth offer to whippersnip the whole area as a public service. During the COVID-19 pandemic this little piece of bushland provided a pleasant short walk on flat ground, and was a boon to residents.

Judith Street Walking Track, 2019-2020

This project started in October 2019. As land along Kellys Plains Road was turned into large-lot housing estates and the road became busier, residents of the area realised that no public green space had been planned. The Council agreed to accept from the Crown Lands Department a rough track, the extension of Judith Street to the south, between Ross Street and Gentles Road, to be planted with wattles and other native shrubs, in the hope of preserving its present use as a walking track.

A small group of interested people has been formed to be members of a new Southern New England Landcare group to support the venture ; it is also promoted by the Wildlife Habitat Group of Sustainable Living Armidale. Due to the hilly, rocky nature of the track, the lack of water and inaccessibility by standard vehicles, preparation and planting is being done by an independent contractor. After a long drought, 2020 proved to be a La Niña year and although some of the plants have had to be replaced, many have survived on rainwater. About a third of the length of the track has been planted.

Mandy McLeod

From: [redacted]
Sent: Friday, 22 January 2021 10:45 AM
To: Mandy McLeod; Annette Kilarr
Subject: TRIM: Re: Further information for contribution to the State of the Environment report and CEWG report to Council website
Attachments: Threatened fauna background information.docx; Riparian birds in Dumaresq Creeklands (1).docx

Hi Mandy
Please find attached an excerpt from one of the drafts of the Framework for Climate Action relating to threatened species, with input from Karle Vernes at UNE relating to flying foxes, koalas and brush-tailed rock wallabies. I think that some of that information was not incuded in the final report. All of it is relevant to the State of Environment Report.
I have also attached a document on birds prepared by myself in consultation with Steve Debus and incorporating information from threatened species recovery plans.
The following paragraphs from the document are particularly relevant:

Riparian areas and their associated watercourses are ´keystone´ ecosystems, with the health of ecological communities elsewhere in the landscape dependent upon their health. They form natural corridors linking habitats and are particularly important drought refuges.[1] The fertile alluvial soils and moister conditions along Dumaresq Creek provide a more productive environment for both plants and animals than drier areas of lower soil fertility that tend to predominate in reserves such as Imbota and Yina Nature reserves. Riparian areas have been highly valued for agricultural and grazing purposes hence are in short supply for native species. Where riparian areas have been retained as public land outside the urban area, there is often substantial habitat degradation from other uses, in particular grazing, as can be seen at Gara River Reserve and Sunnyside Travelling Stock Route.

The extensive riparian lands that are publicly owned in Armidale provide a special opportunity for enhancement of wildlife habitat and have the potential to contribute significantly to connectivity between existing remnants and to survival of small woodland birds that are threatened by encroaching agricultural use in surrounding agricultural lands.

Restoration of natural conditions and native species along Dumaresq Creek also provides a special opportunity for park users to connect with and enjoy the natural environment in a way that is not available to many urban dwellers.

1 www.environment.act.gov.au ACT Aquatic species and riparian zone conservation strategy 2007 accessed 06/06/2018
Cheers, Helen

On Thu, Jan 21, 2021 at 8:55 PM Helen Webb [redacted] wrote:

2.1.2 Native fauna and flora / protection of threatened species and communities.

Local governments can help protect at risk flora and fauna species and communities by working with local experts and interested community groups, encouraging collaborative citizens' science projects, providing community education and through sensitive planning, policy development and project design. These help to engage the community and bring about an integrated response as well as avoiding impacts on nationally protected matters and minimising the need for Australian Government regulation of local projects.[1] Opportunities for measures to protect two threatened fauna species are provided below as examples of steps that Council and the community can take to reduce climate change risks to fauna and flora.

2.1.2.1 Koala, *Phascolarctos cinereuss*

In April 2012, the Australian Government declared the Koala as 'Vulnerable" under the Federal EPBC Act in New South Wales, the ACT and Queensland. Koalas are in serious decline suffering from the effects of habitat destruction, domestic dog attacks, bushfires and road accidents. Recent research indicates that the koala population in Armidale is relatively healthy, despite a significant and alarming decline in koala numbers in the drier slopes and plains of northern NSW. In light of this, it has been proposed that the New England Tableland potentially represents a key cool upland refugia that will be vital to regional koala populations with an increasingly warming climate. . This is significant in the context of substantial eucalypt die off in the area of Mt Duval (an important koala habitat area) during the 2019 drought and extensive death of koalas in south eastern Australia during the 2019-2020 bushfires.

Koalas are regularly seen in the vicinity of Armidale. A Council pamphlet entitled 'The survival of the koala is in our hands' lists the locations of koala sightings in the area[2]. It states that around Armidale, fragmentation of woodland on the urban rural fringe (peri-urban area) and the wider landscape, makes it harder for young koalas to find new home ranges and adult koalas to find mating partners.

Climate change has been clearly identified as a threat to koalas. The June 2020 New South Wales parliamentary inquiry of the Legislative Council into Koala populations and habitat in New South Wales[3] states that at every hearing, the committee received evidence that climate change was having an extremely detrimental effect on koala populations and that the International Union for Conservation of Nature recognises the koala as one of ten species most likely to be adversely impacted by climate change.

The Parliamentary Inquiry made a number of recommendations for action by the NSW Government that are relevant to koalas in the Armidale area. These are listed with their recommendation numbers as follows:

- Urgently prioritise the protection of koala habitat and corridors in the planning and implementation stages of urban growth areas.
- Fund and support local councils to conserve koala habitat, including by identifying pockets of urban bushland to include in the State's protected area network.
- Provide additional funding and support to community groups, so that they can plant trees and regenerate bushland along koala and wildlife corridors and explore mechanisms to protect these corridors in-perpetuity. This will assist in the maintenance of koala populations locally, and gene flow regionally.
- Ensure that in planning for future bushfires, conservation values and the protection of koala habitat is given greater priority.
- Increase funding to local councils to support the implementation of local koala conservation initiatives.
- In finalising the State Environmental Planning Policy (Koala Habitat Protection) 2019 framework, strengthen the ability of consent authorities to protect koala habitat.
- Require all councils with koala populations to develop comprehensive koala plans of management in a timely manner.
- Publish the final State Environmental Planning Policy (Koala Habitat Protection) Guideline as soon as practicable.

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1 https://www.environment.gov.au/resource/local-government-and-australian-environment-law

2 www.armidaleregional.nsw.gov.au › ArticleDocuments

3 LEGISLATIVE COUNCIL Portfolio Committee No. 7 - Planning and Environment Koala populations and habitat in New South Wales June 2020 Report 3 - June 2020. https://www.parliament.nsw.gov.au/lcdocs/inquiries/2536/Koala%20populations%20and%20habitat%20in%20New%20South%20Wales%20-%20Report%203.pdf

- Increase resources to local councils to support them in conducting mapping required for comprehensive koala plans of management.
- Work with willing landholders to identify koala habitat that is of outstanding biodiversity value under the Biodiversity Conservation Act 2016 in order to facilitate more koala habitat on private land being protected.
- Ensure that the NSW Koala Strategy: Bushfire Recovery Plan contains as its key focus, the protection of koala habitat.

Understanding the habitat needs of koalas at local and landscape levels, and the factors that influence occupancy of koalas in the region, is vital ecological information that will inform future management. Mapping, such as where koalas have been recorded and their habitat, is a critical component for local councils to develop comprehensive koala management plans. Further, by understanding how the Armidale region is physically (habitat) and genetically connected to populations elsewhere, we stand a stronger chance of maintaining strong koala populations in the face of impacts from climate change. Koala conservation must take priority over land clearing, regardless of the demand for that land. That principle might seem simple, but so far it's proved agonisingly difficult.
It is recommended that Armidale Regional Council develops a comprehensive koala plan of management and lobbies the NSW government to implement these recommendations, in particular increasing funding to local councils to support the implementation of local koala conservation initiatives and increasing resources to local councils to support them in conducting mapping.
https://www.parliament.nsw.gov.au/lcdocs/inquiries/2536/Koala%20populations%20and%20habitat%20in%20New%20South%20Wales%20-%20Report%203.pdf

2.1.2.2 Grey-headed Flying-fox, *Pteropus poliocephalus*
Anecdotal evidence from a local orchardist stated that flying foxes were common in the region in the past and that landowners used to seek out their roosts and shoot them.
https://www.armidaleregional.nsw.gov.au/news/news-2019/black-gully-weeds-cleared-for-flying-fox-plan A colony of grey-headed and little red flying foxes started forming at Black Gully in Armidale in October 2017 and reached a peak population of between 40,000 and 50,000 in December that year. Both species are protected under biodiversity protection laws. Neighbouring residents were concerned regarding noise, smell, droppings and damage to vegetation, raising issues on how to manage the site.
The colony left the city in early 2018 and Stage 1 works that year removed selected trees to create a buffer between flying fox habitat trees and neighbouring homes. A management plan for the flying-fox camp at Black Gully was adopted by Council at the Ordinary Council Meeting held on Wednesday 25 July 2018[4], allowing Council to take action to reduce the impact on residents if flying foxes return.
The Grey-headed Flying-fox is currently listed as vulnerable under the Environment Protection and Biodiversity Conservation Act.
A 2009 Draft Recovery plan for the species[5] states that climate change in the coming decades has the potential to affect food availability and heat related mortality in Grey-headed Flying-foxes. Exposure to high temperatures results in mortality in Grey-headed Flying-foxes (Parry-Jones 2000, Eby et al. unpublished, Welbergen et al. 2007). Mortality rates are low at ambient temperatures of 41 to 43.5° C but increase rapidly at temperatures > 43.5°C, particularly affecting flightless young. Climate change is also predicted to affect nectar food supplies as many eucalypts have a narrow range of tolerance to temperature and rainfall, and the predicted levels of change are expected to impact distribution and reproduction (Hughes et al. 1996, Hughes 2003).
It is possible that the cooler Armidale climate may enable flying foxes to persist in the region in the short term. Retained willows and native vegetation planted alongside Dumaresq Creek in 2011 are currently (June/July 2020) providing habitat for a small population of Grey-headed Flying-foxes. Expansion and maturation of plantings in the area could provide additional habitat while at the same time avoiding adverse impacts on residential areas.

Brush-tailed Rock-wallaby, *Petrogale penicillata*

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4 https://www.armidaleregional.nsw.gov.au/living-here/animals-and-pets/flying-foxes
5 http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=186#:~:text=Lack%20of%20foraging%20resources%20can,%2Dfoxes%20(Tidemann%20et%20al.

The brush-tailed rock-wallaby occurs in significant numbers in the gorges of northeastern NSW. The species is listed as Endangered in New South Wales, and some of the most important and intact populations occurs in Oxley Wild Rivers National Park and Guy Fawkes River National Parks, parts of each of these parks fall within the Armidale Regional LGA. Most brush-tailed rock-wallaby habitat burned in the recent summer fires. About 82% of all NSW habitat burned, including most habitat in the Armidale Regional LGA. Fires were so intense in many places that there was little to no food for many weeks after fire. Loss of ground cover probably led to higher rates of predation by cats and foxes, especially because animals would have venture further from the safety of the rocky refuges to seek food. Immediate conservation activities included air-dropping and hand-delivering food such as sweet potato and carrots to vulnerable populations. Medium to longer-term actions must address predation pressure by cats and foxes that will further threaten populations under predicted scenarios of increasingly intense and widespread bush fires in eastern Australia with climate change.

Great Glider, *Petauroides volans*

The Armidale LGA contains a nationally important population of the vulnerable-listed greater glider on Mount Duval, part of which is managed as a research station by the University of New England, and part of which falls within the National Parks estate (Duval Nature Reserve). This possum species is a hollow-dependent animal, requiring intact tracts of old-growth forest for food and shelter requirements. Recent research has indicated that Mount Duval's forests contain among the highest densities of greater gliders anywhere in Australia (Emerson et al. 2019). Furthermore, there have been sharp reduction seen in southeastern populations of this species (a decline of one third of the density in Victoria in the last decade) with local extinctions in some areas; thus far, such declines have not been seen on the New England Tableland. However, the impacts on greater gliders of tree death seen on Mount Duval in the recent drought are unknown; loss of tree cover and leaf nutrient quality may affect both the dietary ecology of the animals, and their ability to traverse the landscape. More research is required to understand how drought may have affected these animals, and how increasing impacts of climate change could threaten the population.

Providing Habitat for declining Woodlands Birds - Revegetation of Armidale Creeklands

Effective revegetation of the Dumaresq Creek riparian zone to reconstruct native vegetation communities is of particular value in the context of declining and threatened woodland birds in the New England area.

Key threats to these species are

- loss and fragmentation of habitat, leaving remnants of insufficient size to sustain populations and lacking connectivity to other habitat.
- degradation of habitat, in particular, loss of structural and floristic diversity with loss of mid-storey and shrub layer and of native ground cover and coarse litter.
- competitive exclusion by an overabundant, aggressive, increasing native species, the Noisy Miner (not to be confused with the introduced Common or Indian Myna)
- nest predation by the overabundant, increasing Pied Currawong, assisted by introduced berry-bearing plants in gardens (e.g. privet, hawthorn, firethorn, cotoneaster, ivy, Chinese pistacea, Chinese elm, camphor laurel)
- widespread pervasive factors such as impacts of climate change and disease.[1]

Key species that are declining or have been identified as being at risk of extinction in the New England area include [i] the

- Brown Treecreeper
- White-browed Scrubwren
- Diamond Firetail
- Double-barred Finch
- Speckled Warbler
- Brown Thornbill
- Spotted Pardalote
- Rufous Whistler
- Varied Sittella
- Jacky Winter
- Scarlet Robin
- Flame Robin
- Dusky Woodswallow

Loss of trees, shrubs and native groundcover species through clearing, die-back and grazing has led to loss of habitat that is of sufficient extent, quality and connectivity to enable these woodland birds to meet their needs for food and shelter and to breed successfully and disperse. A 2002 study by Leigh et al in the Wagga Wagga area identified heavy grazing by livestock (analogous to regular mowing) as being detrimental to birds such as Superb Fairy-wrens and Brown Treecreepers that rely on an understorey cover of logs and branches for foraging.[2]

Riparian areas and their associated watercourses are 'keystone' ecosystems, with the health of ecological communities elsewhere in the landscape dependent upon their health. They form natural corridors linking habitats and are particularly important drought refuges.[3] The fertile alluvial soils and moister conditions along Dumaresq Creek provide a more productive environment for both plants and animals than drier areas of lower soil fertility that tend to predominate in reserves such as Imbota and Yina Nature reserves. Riparian areas have been highly valued for agricultural and

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1 www.environment.nsw.gov.au/threatenedspeciesapp/profile Accessed 06/06/2018

2 Thompson L., Jansen A. & Robertson A. 2002 The Responses of Birds to Restoration of Riparian Habitat on Private Properties. Johnstone Centre Report No. 163, Land and Water Australia.

3 www.environment.act.gov.au ACT Aquatic species and riparian zone conservation strategy 2007 accessed 06/06/2018

grazing purposes. The ecological outcome of this is that many of the watercourses on private land are treeless or otherwise severely degraded hence provide unsuitable habitat for native species. Similarly, riparian areas on public land outside the urban area are often degraded by other uses, in particular grazing, as can be seen at Gara River Reserve and Sunnyside Travelling Stock Reserve. The extensive riparian lands that are publicly owned in Armidale provide a special opportunity for enhancement of wildlife habitat and have the potential to contribute significantly to connectivity between existing remnants and to survival of small woodland birds that are threatened by encroaching agricultural use in surrounding agricultural lands.

Restoration of natural conditions and native species along Dumaresq Creek also provides a special opportunity for park users to connect with and enjoy the natural environment in a way that is not available to many urban dwellers. Many local residents and visitors regularly walk along the Dumaresq Creeklands and speak positively of their enjoyment of the area. One resident who walks her dog adjacent to the Douglas Street plantings was recently delighted to share her photos of Yellow-tailed Black Cockatoos feeding on hakea fruits in the plantings there. Bird watching is a popular pastime by many local residents and provides an added attraction for visitors and tourists in the area.

The benefits of revegetation that is maturing along Dumaresq Creeklands are demonstrated by regular use by small birds including the White-browed Scrubwren and Superb Fairy-wrens as well as a number of other small bird species. Survey of bird species prior to and since revegetation has not been systematic but the data that are available indicate that small bird species not previously listed are now being found in the area east of Taylor Street including a Scarlet Robin (Threatened) and White-plumed Honeyeater which have recently been seen utilising the creeklands habitat.
A range of actions have been identified as enhancing bird habitats. A number of the actions are identified by the NSW Government in Critical Action plans for the recovery of threatened species. Inclusion of these actions in policy documents that guide revegetation works along Dumaresq Creeklands and associated ongoing financial support for expansion and maintenance of these works would clearly demonstrate Council's pro-active role in recovery of Threatened Species, as well as enhancing the environment and passive recreational opportunities for Armidale Residents.

Actions include:

- Protect and maintain existing high quality habitat, which includes open forest, woodland and grasslands with a diverse ground layer dominated by a mixture of grass species which seed at different times of the year (providing a year round food supply) and provides scattered shrubs for shelter. Examples of remnant vegetation that are currently protected include Snowgums Reserve, the reserves adjacent to the Arboretum on South Hill and adjacent to the cemetery and the reserve currently used by the Archery Club. There are also significant areas of bushland held in private ownership and it would be valuable for council to identify these and investigate options such as planning provisions or land purchases that would enable remnants providing significant habitat to be retained.
- Regenerate degraded habitat.
- Undertake revegetation using a diverse mix of locally appropriate native species[4], which will produce high quality habitat. Aim for a floristically and structurally diverse and spatially variable understorey in woodland patches. Revegetation efforts should focus on expanding areas of existing habitat, connecting isolated habitat patches (either through corridor or stepping stone plantings) or establishing additional habitat patches. Stepping stone plantings are of most value if at least 20x20 metres in area. Avoid gaps of greater than 100 metres between habitats and along linear remnants as wider gaps deter the passage of

4 Locally indigenous plant species have the potential to maximise the arthropod populations which provide a food source for ground foraging birds.

small birds. *Areas with access to water, especially riparian areas, are identified in Threatened Species Recovery Plans as being particularly important. Areas of riparian revegetation are of more value when at least 50 m wide.

- Where possible retain standing dead trees, fallen trees, coarse woody debris and logs in remnants and in plantings and place material from salvaged or fallen trees and logs into rehabilitated remnants and plantings.
- Apply augmentation planting of missing structural layers (e.g. mid-storey wattles, shrub layer species or coarse tussocky ground layer species) using locally indigenous species appropriate to the vegetation type and topographic position predicted for replanting sites.
- Design plantings to deter Noisy Miner birds by ensuring that corridors are sufficiently wide (see above) and varied in structure and composition (using a mix of canopy and mid-layer tree species, shrubs and tussocky ground layer species). Mown areas with scattered large trees favour birds such as currawongs that compete aggressively with small birds or prey on eggs and nestlings.
- Retain mistletoe and scattered patches of dense shrubs for nesting and feeding habitat particularly in areas close to water. Flowering mistletoe is of particular value for nectarivorous birds such as honeyeaters.
- Investigate the potential effectiveness of providing additional nesting materials such as coir in enhancing nesting success of small birds.
- Increase the prevalence and diversity of food plants by increasing and enhancing native ground cover. Undertake control of invasive exotic plant species that compete with native grasses. Replace areas of exotic perennial pasture grasses (e.g. Phalaris, cocksfoot and paspalum) or aggressive environmental weeds (e.g. African Love-grass, serrated tussock and Chilean needle-grass) with native grass species appropriate to the vegetation type.
- When using herbicide, avoid non-target impacts of herbicide use.
- Set aside unmown areas of native grasses to enable grasses to seed, providing a food source throughout the year for ground foraging birds.
- For species such as the Scarlet Robin, strategic patch burns are recommended to control build-up of ground layer biomass (particularly where there is a high cover of exotic annual pasture grasses such as oats, ryegrass, bromus and barley), burning up to 5% of a site per year. Illegal fires which are lit along the creeklands in Armidale, while undesirable, sometimes achieve a positive effect that is consistent with that of strategic patch burns. It may be possible in the future to work collaboratively with members of the community to support cultural and contemporary patch burn practices for healthy landscapes.
- Remove introduced fruit or berry producing plants (for example blackberry, hawthorn, cotoneaster, sweet briar-rose and privet) that provide a food supply for nest predators such as Pied Currawongs. Removal of non-native vegetation should be staged as it can provide valuable interim habitat and connectivity between areas of native vegetation (e.g. blackberry provides a refuge for small birds such as fairy wrens, and insectivorous birds will forage on privet and hawthorn or shelter from predatory birds in the dense foliage of deciduous trees). Care should be taken to avoid widespread removal of beneficial exotic woody vegetation without replacement. Replace removed thickets with locally indigenous species, particularly bipinnate wattles, prickly native shrubs such as Blackthorn (*Bursaria spinosa*), and She-oaks (*Casuarina* or *Allocasuarina* sp.) as appropriate.
- Raise public awareness of the potential for domestic cats and dogs to prey on or disturb small birds, as well as other fauna including lizards, possums and koalas. Encourage owners to confine cats to residential premises and to put dogs on a leash and move them away from wildlife.
- Raise awareness of the value of native plantings in providing habitat for birds and other native fauna.
- Engage in community education with a focus on threatened woodland birds.

- Establish additional 'mini arboretums' featuring locally threatened or significant trees, shrubs and ground plants (e.g. Blackbutt Candlebark and other New England endemics), at strategic locations with labelling and other interpretive material.
- Support the completion of connectivity of native riparian habitat along the Creeklands from UNE to Cooks Road, and explore prospects for lateral connectivity to parkland and urban bushland away from the Creeklands,
- Phase in native plantings in public urban parklands throughout Armidale.
- Encourage, with incentives, native plantings in private gardens (e.g. emphasise low maintenance and water demands).
- Implement a fox control program in order to limit predation by foxes on breeding waterbirds and other species.

It is encouraging to realise that many of these actions are already being implemented in native plantings along the urban reaches of Dumaresq creekland and that there is evidence that wildlife is responding to the improvement in the health and extent of the created habitat. It is also understood that implementation of some of the actions may not be consistent with other purposes for the land. For example, it is not possible for some of the areas of riparian vegetation to be 50 m wide due to constraints of human usage, paths etc. However, this is possible in some areas, for example the Urban Forest planting west of Cooks Road. Similarly, the placement of woody debris may not be appropriate in some areas due to the issue of flooding in the riparian zone, but may be appropriate where it can be effectively anchored or where planting sites are outside the flood zone. The use of woody debris following clearing of woody weeds along the creekline has been observed to provide refuge for small birds and it may be possible to delay removal of such debris until planted species have grown to a sufficient size to provide refuge and replace habitat that has been removed. These are just a few examples of the ways that actions recommended above could be incorporated into planning for further planting in the Dumaresq creek riparian zone.

Continued support for and commitment to ecological restoration of Dumaresq Creeklands in the Armidale urban area will complement extensive revegetation efforts that are being made throughout the community by private landholders and by community groups such as Armidale Urban Rivercare and Armidale Tree Group.

Potentially useful references on the bird profile of New England, revegetation for birds and soil health, and the problems of aggression by Noisy Miners and nest predation by Pied Currawongs (and solutions), include these local or regional studies conducted in New England/North West:

Debus, S.J.S. (2006). The role of intense nest predation in the decline of Scarlet Robins and Eastern Yellow Robins in remnant woodland near Armidale, New South Wales. *Pacific Conservation Biology* 12: 279-287.

Debus, S.J.S. (2008). The effect of Noisy Miners on small bush birds: an unofficial cull and its outcome. *Pacific Conservation Biology* 14: 185-190.

Debus, S.J.S., Ford, H.A. & Page, D. (2006). Bird communities in remnant woodland on the New England Tablelands, New South Wales. *Pacific Conservation Biology* 12: 50-63.

Debus, S.J.S., Martin, W.K. & Lemon, J.M. (2017). Changes in woodland bird communities as replanted woodland matures. *Pacific Conservation Biology* 23: 359-371.

These papers (and others on local woodland bird ecology) are available on request from sdebus@une.edu.au

–Prepared by Helen Webb with assistance from Dr Stephen Debus (Zoology, UNE)

i Brown Treecreeper *Climacteris picumnus* – Threatened (Vulnerable)
White-browed Scrubwren *Sericornis frontalis* – Shrub and groundcover dependent, declining
Diamond Firetail *Stagonopleura guttata* – Threatened (Vulnerable)
Speckled Warbler *Chthonicola sagittata* – Threatened (Vulnerable)
Varied Sittella *Daphoenositta chrysoptera* – Threatened (Vulnerable)
Jacky Winter *Microeca fascinans* – Declining
Scarlet Robin *Petroica boodang* – Threatened (Vulnerable)
Flame Robin *Petroica phoenicea* – Threatened (Vulnerable)
Dusky Woodswallow *Artamus cyanopterus* – Threatened (Vulnerable)
Brown Thornbill *Acanthiza pusilla* – Declining
Spotted Pardalote *Pardalotus punctatus* – Declining
Rufous Whistler *Pachycephala rufiventris* – Declining
Double-barred Finch *Taeniopygia bichenovii* – Declining

Mandy McLeod

From: [redacted]
Sent: Monday, 1 March 2021 10:02 PM
To: Council
Subject: Submission to the Armidale State of the Environment Report

To the General Manager, Armidale Regional Council, PO Box 75A, Armidale, NSW 2350

Submission to the Armidale State of the Environment Report

I am particularly concerned about wood smoke pollution and I write in support of the Australian Air Quality Group Submission. The real-life emissions of even new wood heaters have been shown to be eight times worse than when heaters are measured in the laboratory. New Zealand and Tasmanian research shows increased risk of damaging the health of people living nearby wood heaters. It is important that Armidale's State of the Environment Report acknowledge the evidence and the current unhealthy levels of pollution. The Council could make immediate no or low cost remedies to begin to improve the air quality – including not allowing new wood heaters to be installed in urban areas and requiring that wood heaters be removed when a house is sold as recommended in the Sydney Clean Air Plan.

In addition, local communities need to be educated about the health harms of particle pollution, to themselves and their neighbours from burning wood. The Launceston program offered incentives to replace wood heaters and showed greater uptake when people were informed about the health harms. This sort of community education could be embedded into other community education initiatives, reducing the cost, while ensuring reach into the community. It is important that people are provided with the facts about the health harms.

Regards

[redacted]
Vic 3070

PS: I would prefer my submission is anonymous or at the very least my address not be made public.
PSS: I submitted this earlier this evening but the email bounced back as the address was not quite correct – so hope you can accept this a minute past the cut off time!

Mandy McLeod

From: [redacted]
Sent: Monday, 1 March 2021 9:04 PM
To: Council
Subject: Attention: General Manager & Sustainability Officer: AAQG Submission on ARC's State of the Environment Report
Attachments: AAQG_submission_ARC_SOE_Feb_2021.docx

Dear Council,

Attached is a submission by the Australian Air Quality Group with some very relevant and useful information for the State of the Environment (SOE) Report.

As explained on your web page:
The SOE is a report to the community on progress with meeting environmental goals and targets in the Armidale Regional Council Community Strategic Plan 2017-2027.
Environmental goals set by the community relate to:
protecting and preserving the unique climate, landscape and environment of the region;
community participation in initiatives which contribute to a sustainable lifestyle;
reducing carbon and greenhouse gas emissions;
improving air quality;

In our submission, we argue that the SOE should first acknowledge the lack of progress in improving air quality, despite the recognised serious serious health effects, and then list measures that should be put in place to remedy the situation as a matter of urgency.

Please get in touch if you would like further information.

Yours sincerely,
Secretary, Australian Air Quality Group

Australian Air Quality Group Submission
State of the Environment Report, Armidale Regional Council

We are very concerned about the major environmental and health problems caused by Armidale's poor wintertime air quality and ARC's failure to comply with the principles of ecologically sustainable development.

Councils must comply with Ecologically Sustainable Development

NSW Councils are required by S.89(1)(c) of the Local Government Act 1993 to consider the principles of ecologically sustainable development and the protection of public health, safety and convenience - http://www5.austlii.edu.au/au/legis/nsw/consol_act/lga1993182/s89.html.

ARC's draft policy on the installation of new wood heaters[1] explains that the principles of ecologically sustainable development include:

a) the precautionary principle—that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for delay

b) inter-generational equity—that the present generation should ensure the health, diversity & productivity of the environment is maintained or enhanced for future generations and ...

i) polluter pays—those who generate pollution and waste should bear the cost of containment, avoidance or abatement.

Official stats: Armidale exceeded national $PM_{2.5}$ standard 32 times in 2018, with health costs of thousands of dollars per wood heater per year

A study of Armidale's wood smoke pollution, reviewed by experts and published in 2020,[2] concluded that:

1. After calibration, Armidale's PurpleAir measurements were almost identical to official NSW Government $PM_{2.5}$ measurements
2. Armidale's efforts to reduce levels of health-hazardous air pollution failed. The city still has many exceedances of National Air Quality Standards. In 2018, the daily average $PM_{2.5}$ standard of 25 ug/m^3 was exceeded 32 times at the NSW Government monitoring station and 63 times in one residential area
3. Wood heater pollution led to increased $PM_{2.5}$ exposure of 8.4 ug/m^3, equivalent to 10.5% increased mortality or 16.2 premature deaths per year, with health costs of thousands of dollars per heater year. Those who died in 2018 would have been expected to have lived a collective total of 165 years longer if the city had enjoyed clean air.

NZ: real-life emissions 8 times worse than lab tests, even 1 additional wood heater per hectare significantly increases risk to neighbours

There are no recent studies of real-life emissions in Australia, but in New Zealand (NZ), heaters satisfying more stringent emissions tests than currently required in Armidale were found to have real-life emissions nearly 8 times worse than laboratory measurements. There was little relationship between real-life and lab-test results, implying that real-life emissions of new heaters are almost as bad as existing models.[3]

Since 2005, all wood heaters installed in urban areas of NZ were required to satisfy more stringent lab tests than currently required in Australia. This has not solved NZ's problem. The '*Growing up in NZ*' study reported a 7% increased risk of non-accidental hospital-emergency presentations in children under 3 for every additional wood-heater per hectare.[4]

Tasmanian research: any wood smoke exposure above 4 ug/m^3 $PM_{2.5}$ (a tiny fraction of Armidale's measurements, or the current PM2.5 standard) increases the risk of hospital admission for heart failure

In Tasmania, air pollution is mainly associated with wood-burning for winter heating and from bushfires and planned burns at other times. Above a threshold of 4 ug/m^3, hospital admissions for heart failure increased by 14.5% for a 5 ug/m^3 increase in 3-day mean $PM_{2.5}$ concentrations.[5]

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[1] 'Local Approvals Policy for Solid Fuel Heating Appliances –POL134, on public exhibition, August 2018.
[2] https://www.mdpi.com/2073-4433/11/8/856
[3] http://woodsmoke.3sc.net/files/Health_Costs_Allowing_New_Wood_Heaters.pdf
[4] http://www.sciencedirect.com/science/article/pii/S0269749117322935
[5] https://bmjopen.bmj.com/content/bmjopen/8/5/e021798.full.pdf

Single brand-new wood heater can pollute 10 hectares in 10 hours

The substantial harmful effects of even a single wood heater complying with the stricter standard required in NZ (compared to Armidale's current requirements) are easy to understand, given the remarkably low threshold (4 ug/m^3) above which harmful effects are observed. Pollution of 6.5 grams per hour (the real-life emissions from brand-new wood heaters with average lab test emissions of 0.85 grams $PM_{2.5}$ per kg firewood) is enough to increase $PM_{2.5}$ concentration over 1 hectare (100 x 100) metres by 65 ug/m^3 to a height of 10 metres. In a valley where pollution builds up, 6.5 grams/hour over 10 hours could result in health-hazardous pollution of 65 ug/m^3 distributed over at least 10 hectares. Yet the Tasmanian research shows that even 5 ug/m^3 increased daily average $PM_{2.5}$ pollution increased the risk of hospital admissions for heart failure by 14.5%.

Reducing wood smoke pollution saves lives

Launceston's $2.08 million wood smoke program reduced deaths in winter from respiratory disease by 28% and cardiovascular disease by 20%.[6] Year round, for men, the reductions were 23% (respiratory), 18% (cardiovascular) and 11.4% (all deaths). Based on a population of 100,000, the cost of cleaning up the air was less than $21 per resident.

Health and air pollution experts: don't use wood heaters – phase them out

Nick Hopkinson, medical director, British Lung foundation & Asthma UK advised: '*To protect yourself and others, especially children who are particularly vulnerable as their lungs are smaller and still developing,* ***avoid buying a wood-burning stove or using an open fire if you have another source of fuel***'[7].

A Clean Air Plan for the Sydney Metro Areas, developed by 35 expert air pollution scientists, was published in a prestigious international journal.[8] The authors noted NSW Government-led research showing that "*Of the anthropogenic (human-made) sources, the most significant contributions to overall population-weighted PM2.5 in the NSW Greater Metropolitan Region come from* ***wood-heaters (31%)****, industry (26%), on-road motor vehicles (19%), power stations (17%), and non-road diesel and marine (6%).*"

Wood heating is therefore the largest single source of health-hazardous air pollution, despite only 4.4% of Sydneysiders using wood as main heating. The 35 authors recommended ***"that legislation be considered that works towards eliminating the use of wood-heaters in urban areas.***"

Allowing new wood heaters is incompatible with ecologically sustainable development

The serious health problems associated with Armidale's air pollution, the fact that real-life emissions from new wood heaters are little different to older models, that a new wood heater can increase $PM_{2.5}$ in the surrounding hectare by 65 ug/m^3 in just an hour (and therefore lead to a substantially increased risk of premature death and hospital admission for heart failure) clearly violate the above principle a) of ecologically sustainable development. Heart failure and premature death are serious, usually irreversible conditions.

The '*Growing up in NZ study*' found that even 1 additional modern wood heater per hectare resulted in a 7% increased risk of non-accidental hospital-emergency presentations in children under 3. As Dr Nick Hopkinson explained, protecting young children is especially important because their lungs are smaller and still developing. Allowing new wood heaters that can damage the health of young children violates principle b) of inter-generational equity.

Finally, allowing new wood heaters violates principle i) that polluters should pay. The cost is currently borne by taxpayers who fund the health system and by those living nearby who suffer health damage.

Recommendation

ARC's SOE should therefore note Armidale's many exceedances of national air quality standards and that there is no evidence of any recent improvements. It should recommend urgent actions, e.g. not allowing new wood heaters (because their real-life emissions are little different from existing models), setting up the Air Quality Working Group and applying for funding to implement the recommendations of health and air pollution experts.

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[6] https://menzies.utas.edu.au/news-and-events/media-releases/2013/reduction-in-air-pollution-from-wood-heaters-associated-with-reduced-risk-of-death

[7] https://www.theguardian.com/environment/2021/jan/01/avoid-using-wood-burning-stoves-if-possible-warn-health-experts.

[8] https://www.mdpi.com/2073-4433/10/12/774

Mandy McLeod

From: Kate Forster [redacted]
Sent: Monday, 1 March 2021 9:53 PM
To: Council
Subject: State of the Environment Report 2016-2020 - Community Submission

Submission on the Armidale Regional Council State of the Environment Report 2016-2020

In 2013 the Australian Government Senate inquiry **report August 2013: Impacts on health of air quality in Australia** stated:

6.40 The committee was disturbed by the disproportionate contribution made by wood smoke to urban air pollution, given the relatively small number of households using it as a heating source.
6.12 The NSW EPA reported that the additional health costs attributable to the impact of wood smoke by 2030 could be up to $8 billion in NSW alone.
The following recommendation was made:
6.44"The committee recommends that local councils continue to manage the use of wood heaters in their own jurisdictions through the use of bans, buybacks, minimum efficiency standards, and other mechanisms as appropriate to protect the health of their local communities.
Since then the research on air pollution and wood smoke air pollution has only added more associations with diverse diseases and impairment, and emphasised the cumulative harm caused to the body by tiny particulate air pollution PM2.5 which is high in woodsmoke.

Having read the Australian Air Quality Group Submission, I believe it is important for Armidale Regional Council to protect the health of Armidale residents and visitors by acting urgently to reduce and eliminate sources of woodsmoke pollution. Because real-life emissions of new wood heaters are 8 times worse than laboratory measurements, and the New Zealand and Tasmanian research shows increased risk of damaging the health of people living nearby, Council's State of the Environment Report should acknowledge the current unhealthy levels of pollution and seek urgent remedies, including not allowing new wood heaters to be installed in urban areas and, as recommended in the Sydney Clean Air Plan, phasing out existing wood heaters.

Woodsmoke is an urgent:

- **health issue**
- **wellbeing issue**
- **human rights issue**
- **social justice issue**
- **environmental justice issue**
- **neighbourhood safety issue**
- **village, town and city issue**
- **environment protection issue**

Please act to protect your community and visitors.

Kate Forster

Mandy McLeod

From: New England Greens <greens.ne@gmail.com>
Sent: Monday, 1 March 2021 4:10 PM
Subject: Attention: Mandy McLeod - State of the Environment submission; New England Greens
Attachments: NEGAT SoE 1 March_final.docx

Please find attached a submission from New England Greens Armidale Tamworth to Armidale Regional Council's State of the Environment report.
NEGAT thanks ARC for the opportunity to contribute to the NSW Government-mandated 'State of the Environment' (**SOE**) Report to the community *'on progress with meeting environmental goals and targets in the Armidale Regional Council Community Strategic Plan 2017-2027.*
NEGAT would be very happy to meet with you and discuss cooperative action to achieve our much-needed environmental goals.

Regards,
Elizabeth O'Hara
Co-convenor [redacted]
cc: Gaynor McGrath, Co-Convenor

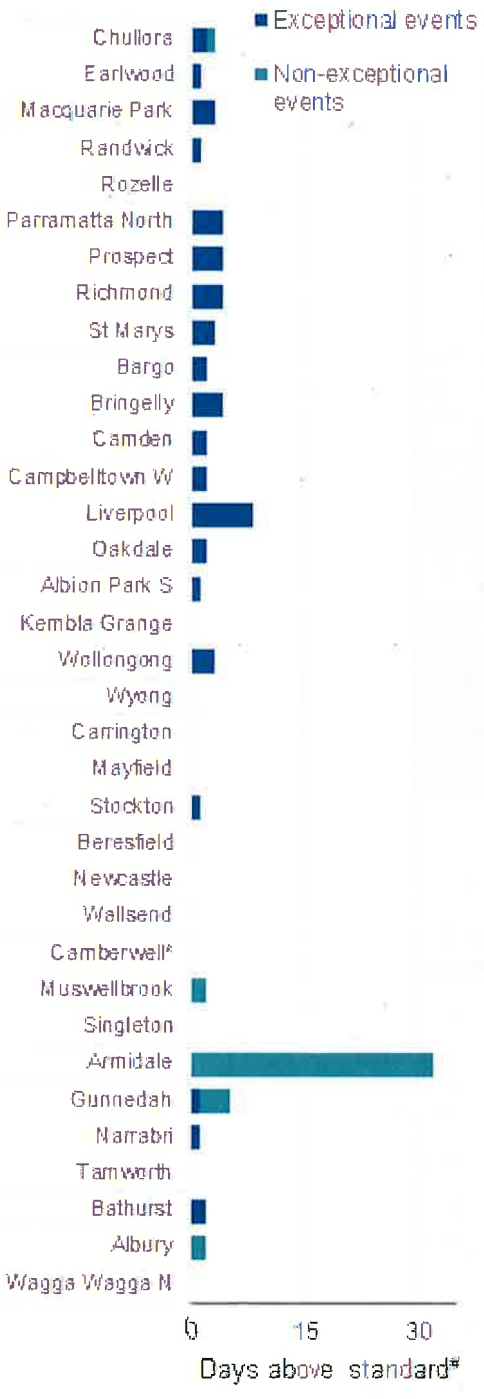
New England Greens Armidale Tamworth: **Recommendations**, SOE Report

New England Greens Armidale Tamworth (**NEGAT**) is actively engaged in achieving the environmental goals in the Community Strategic Plan 2017-2027 (**CSP**). We thank ARC for the opportunity to contribute to the NSW Government-mandated 'State of the Environment' (**SOE**) Report to the community *'on progress with meeting environmental goals and targets in the Armidale Regional Council Community Strategic Plan 2017-2027. We'd* be very happy to meet with you and discuss cooperative action to achieve our much-needed environmental goals.

CSP Key Theme: The CSP has 8 key themes/topics. One is **'Protection of the environment and reduced pollution'.** The CSP introduction highlights this key issue by stating: *"People in the region love the climate, weather and the unique 'seasons' experienced in this part of the world.* ***Fittingly, protecting the environment, reducing pollution and waste were mentioned as priorities for the community*** *throughout the consultation process.* ***Of particular concern to some was wood-smoke pollution****, and the impact this is having on the local air quality, which is said to have exceeded National Air Quality Standards on multiple occasions in recent times.*

"Other ideas for protection of the environment and encouraging climate friendly lifestyles included promoting eco-tourism (such as the introduction of a 'Rail-Trail'), increasing education to the community about environmental sustainability and also encouraging incentives for businesses to function in a more environmentally friendly manner. "

NSW Government data, days above the daily $PM_{2.5}$ standard, 2018.



*National standard = 25 µg/m^3

NEGAT recommends: that ARC's SOE includes the above text from the CSP describing this Key Environmental Theme. It should then detail any reductions in waste, list any other improvements in environmental sustainability (e.g. reductions in water consumption during the drought) due to community education programs on environmental sustainability and report ARC's failure to achieve its Delivery Program Outcome of Achieving National Air pollution Targets by 2020.

Official statistics (Figure left, from the NSW Government Annual Air Quality Statement 2018) show that Armidale had 32 exceedances of the National Daily Average $PM_{2.5}$ standard of 25 ug/m^3, all attributed to the non-exceptional event of winter wood heater pollution. Next worse in NSW was Liverpool, Sydney, with 8 exceedances from hazard-reduction burns and bushfires. Armidale's PurpleAir monitoring shows residential areas were even more polluted, with one residential area suffering 63 exceedances of National Standards.[1]

$PM_{2.5}$ is considered the most health-hazardous air pollutant that's responsible for more premature deaths and ill health than all other air pollutants combined. Published peer-reviewed research concluded that in 2018 the estimated increased exposure of 8.4 ug/m^3 from Armidale's wood smoke in 2018 corresponds to 10.5% increased mortality—an average of 16.2 premature deaths per year, with those who died in 2018 expected to have lived a collective total of 165 years longer if the city had enjoyed clean air. In 2019 and 2020, bushfire smoke added to the exceedances of the National $PM_{2.5}$ standard from winter wood heating.

The SOE should **list future initiatives** to achieve National Air Quality standards, e.g. setting up the Air Quality Working Group, applying for

funding for public education and to replace polluting heaters with non-polluting alternatives and not permitting installation of new wood heaters.

1. CSP Community Outcome 1: 'The unique climate, landscape and environment of the region is protected, preserved and made accessible'

Supporting Strategies:

1. Partner with local organisations and stakeholders to develop strategies for dealing with climate change impacts on the local agricultural sector
2. Tourism strategies and active, eco-tourism partnerships, promote the local landscape and natural attractions while considering potential impacts on the environment and ways to mitigate such impacts
3. Maintain and improve local waterways, lagoons and creek lands in partnership with community groups and other agencies
4. Partner with stakeholders to develop strategies and provide programs which improve air quality across the region, including the reduction of smoke pollution by using alternative energy sources
5. Investigate alternative sources of power generation to reduce the community's carbon footprint

Wood-smoke pollution, Armidale, 8 August 2016

NEGAT recommends that ARC's SOE:

1-2. Provides details of partnerships such as UNE Project Zero30 and other organizations developing strategies to deal with the impacts of climate change, and encouraging eco tourism.

3. Notes ARC's resolution (24 February 2021) to seek external funding to reinstate the water saving rebates and thus free up additional environmental water flows and ARC's plans to remediate, maintain and improve the Armidale Creeklands and Dumaresq Dam. ARC should also communicate with other councils about their

initiatives in protecting iconic species, e.g. platypus (https://www.campbelltown.nsw.gov.au/News/PlatypusUpdate , https://www.midcoast.nsw.gov.au/News-Media/Learn-more-about-the-elusive-MidCoast-platypus), investigate evidence of illegal logging in the Styx river (https://www.facebook.com/156271657717715/videos/508582596735832) and ensure that all regulations are being complied with.

4. Reports that, as yet, there have been no improvements in air quality, but that setting up the Air Quality Working Group, applying for funds for public education and to replace polluting heaters with non-polluting alternatives and recognizing that new heaters should not be permitted because they are almost as polluting as existing models[2], will help reduce the health costs of air pollution for our community.

5. Notes that the declaration of New England as a Renewable Energy Zone means we can expect abundant renewable energy within the next few years. Appropriate controls will, however, be needed to ensure the installations have no adverse environmental impacts.

6. advises residents what they can do:

- **Follow the recommendations of UNE Project Zero30**
- **Watch the short videos on air and wood smoke pollution by the New Scientist, the World Health Organization and UNICEF: https://sites.google.com/view/healthy-air/health-experts-recommend**
- **Follow the advice of Nick Hopkinson, medical director of the British Lung Foundation and Asthma UK: *"To protect yourself and others, especially children who are particularly vulnerable as their lungs are smaller and still developing, avoid buying a wood burning stove or using an open fire if you have another source of fuel* - https://www.theguardian.com/environment/2021/jan/01/avoid-using-wood-burning-stoves-if-possible-warn-health-experts**
- **Be aware that real-life emissions of new wood heaters are 8 times worse than lab-test measurements (i.e. new models are only marginally cleaner than older models) and that New Zealand (NZ) researchers showed even a single additional wood heater satisfying all the latest standards increased by 7% the risk that a child under 3 would need hospital emergency treatment for non-accidental causes.[3]**
- **Buy and use HEPA filters to help reduce the risk of damage to health, especially elderly people, those suffering a chronic disease and anyone with young children or planning a family**
- **Ask the NSW Government why, when $PM_{2.5}$ is considered the most health-hazardous air pollutant that's responsible for more premature deaths and ill health than all other air pollutants combined, when in 2019, the Sydney Clean Air Plan developed by 35 expert scientists recommended that "l*egislation be considered that works towards eliminating the use of wood-heaters in urban areas*", when Tasmanian research showed that any wood-smoke exposure over 4 ug/m^3 increase the risk of hospital admissions for heart attack,[4] and when NZ researchers found that even a single additional wood heater satisfying all the latest standards increased by 7% the risk that a child under 3 would need hospital emergency treatment for non-accidental causes, why nothing has been done to tackle the 32 exceedances of the National PM2.5 daily standard in Armidale, and what they propose to do in the future.**

2. CSP Community Outcome 2: 'The community can participate in initiatives which contribute to a sustainable lifestyle'

1. Provide educational programs to increase community awareness of climate change risks and enable the community to implement climate change adaptation and mitigation actions in daily life
2. Provide specific educational programs on waste reduction and recycling, including vegetation recycling, and support these programs through increased recycling services across the region
3. Prepare disaster management plans to reduce the impact of natural disasters
4. Develop a Sustainability Strategy which includes objectives for the region as a whole as well as Council operations
5. Provide incentives for eco-tourism operators to establish programs which promote sustainable living and attract tourists to the region
6. Advocate for cost-effective access to renewable energy for the local community and businesses

NEGAT recommends that ARC's SOE:

1-6 provides details of actions to achieve Community Outcome 2 (e.g. the adoption of the GreenPrint) and future plans to achieve these goals.

3. Community Outcome 3 'The community is provided with the essential and resilient infrastructure it requires for daily life, and has access to a prioritised schedule of infrastructure works'

1 Regular review of open space-related Asset Management Plans to ensure parks, sportsgrounds, water recreation facilities and other open space meets community needs and is provided to an acceptable level of service and accessibility standards

2 Develop a program for the provision of sustainable transport options, including additional cycleways and education programs to encourage sustainable transport

NEGAT recommends that ARC's SOE:

1. Reports progress on 1.

2. Affirms the EcoARC Transport Policy to: "*Undertake an overall bicycle strategy for all aspects of cycling for transport within the LGA, including a safe, connected network and attractive bicycle parking, in consultation with community groups*" and reports progress on funding applications for priority routes in Armidale's 2012 Bicycle Strategy and funding to review and update the Bicycle Strategy.

4. Community Outcome 4 'The community has access to transport which enables connectivity both locally and outside of the region'

1 Promote cycling for transport as a healthy, environmentally friendly option

2 Evaluate the role of electric vehicles, including driverless electric shuttles and autonomous vehicles, in future transport strategies

NEGAT recommends that ARC's SOE:

1-2. Reports progress on 1 and 2 above.

3. Affirms the EcoARC Transport Policy: "*Revise LEPs to encourage residential development within easy cycling and walking distance of major employment and business areas, and facilitate residential living within the CBD of Armidale",* notes that in 2013, an Australian Government Discussion paper: 'Walking, Riding and Access to Public Transport' reviewed the benefits of cycling and concluded: "the net health benefit (adjusted for injury) for each kilometre cycled is 75 cents[5], and the UK research, published in the BMJ in 2017, showed that, even on the UK's roads that are much busier than those in Armidale: "Cycle commuting was associated with a lower risk of CVD, cancer, and all cause mortality", implying that cyclists live longer than those who drive to work.[6]

4. advises ARC residents what they can do:

- **Consider cycling for transport to save money, live longer and enjoy better health.**
- **When purchasing a new vehicle, consider the lifetime benefits of electric-powered vehicles.**

5. The ARC's GreenPrint should be a supplementary report and the SOE should discuss how ARC can start implementing the GreenPrint goals as soon as possible.

6. We would be very happy to meet with you to discuss any of the ideas listed above and offer further assistance.

7. Additional Information

1. Robinson, D.L. Accurate, Low Cost PM2.5 Measurements Demonstrate the Large Spatial Variation in Wood Smoke Pollution in Regional Australia and Improve Modeling and Estimates of Health Costs. *Atmosphere* **2020**, *11*, 856.

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3. Lai, H.K.; Berry, S.D.; Verbiest, M.E.A.; Tricker, P.J.; Atatoa Carr, P.E.; Morton, S.M.B.; Grant, C.C. Emergency department visits of young children and long-term exposure to neighbourhood smoke from household heating – The Growing Up in New Zealand child cohort study. *Environmental Pollution* **2017**, *231*, 533-540, doi:https://doi.org/10.1016/j.envpol.2017.08.035.
4. Huynh, Q.L.; Blizzard, C.L.; Marwick, T.H.; Negishi, K. Association of ambient particulate matter with heart failure incidence and all-cause readmissions in Tasmania: an observational study. *BMJ Open* **2018**, *8*, e021798. doi: 021710.021136/bmjopen-022018-021798, doi:10.1136/bmjopen-2018-021798.
5. Australian Government. *Walking, Riding and Access to Public Transport. Supporting active travel in Australian communities. Ministerial statement*; Department of Infrastructure and Transport: 2013.
6. Celis-Morales, C.A.; Lyall, D.M.; Welsh, P.; Anderson, J.; Steell, L.; Guo, Y.; Maldonado, R.; Mackay, D.F.; Pell, J.P.; Sattar, N., et al. Association between active commuting and incident cardiovascular disease, cancer, and mortality: prospective cohort study. *BMJ* **2017**, *357*, doi:10.1136/bmj.j1456.

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1 March 21

RE: State of the Environment Submission 2021

Sustainable Living Armidale (SLA) is pleased to contribute the following information about the work undertaken by our members and working group to the Armidale Regional Council 2021 State of the Environment (SoE) Report.

During the time since the last SoE report, SLA has continued to hold monthly information forums, a monthly information stall at the Mall markets, twice-monthly farmers market stall and a weekly e-newsletter to over 500 community members. SLA has held large annual events such as the Sustainable House Tour and the Garden tour, as well as well-attended events at the Armidale Town Hall dealing with water security issues during the drought, community gardens and neighbourhood sustainability.

In 2020 SLA responded to Covid-19 restrictions by moving our regular information forums online.

SLA is a membership based organisation made of a range of specific issue groups known as 'working groups'. These groups focus on issues of local relevance and are well placed to provide ARC with information about community activity relevant to the 2021 State of the Environment Report.

Reports are provided by the following working groups:

- **Wildlife Habitat Group Working Group**
- **Armidale Action on Coal Seam Gas & Mining Working**
- **GroupClimate Emergency Working Group (CEWG)**
- **Transport working group**
- **Reduce, Reuse, Recycle working group**

Wildlife Habitat Group Working Group: State of the Environment

Wildlife Habitat Group, an action group of SLA, was formed in response to community opposition to the proposed development of Edgar Street in July 2018.

WHG notes that the *Community Strategic Plan 2017-2027* includes no pictures of the unique landscape; not one of the various reserves and parks around town, not even one of the iconic Central Park.

The capture adjacent from *Armidale Dumaresq State of the Environment Report 2014-15* p. 19. Goals were

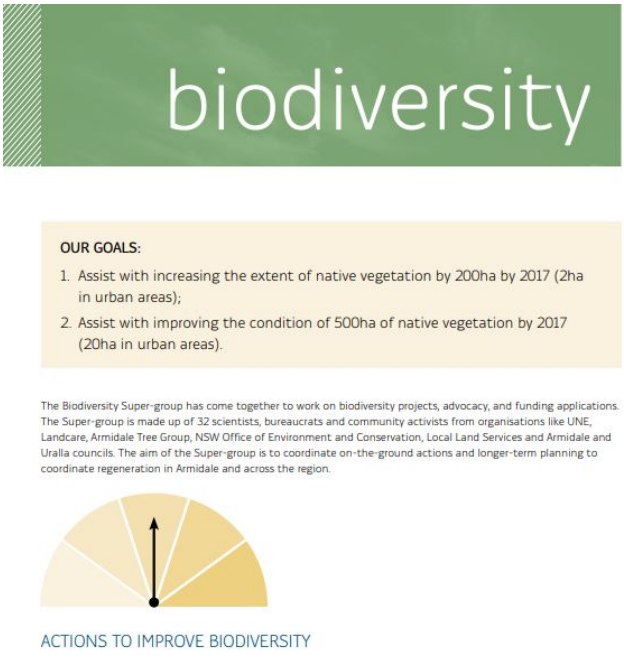
1.Assist with increasing the extent of native vegetation by 2017 (2 ha in urban area)

2. Assist with improving the condition of 500 ha of native vegetation by 2017 (20ha in urban area)

We wonder if these goals were met and whether any similar goals exist for 2017-2027 (see point 4.)

Of the 4 links, 2 (Urban Rivercare and SNELC) are not functioning.

We were surprised to read that a 'super-group' had been formed- in all our attempts to establish whether there was an 'umbrella' group for environmental groups such as ours NO ONE (from ARC, SNELC, Tree Group etc) mentioned such a super-group.



It is our understanding that, at the very least, 'wildlife corridors' must be sufficiently wide to minimise 'edge predation' and join larger areas of similar wildlife habitat. WHG is hoping to assist ARC to establish corridors across urban and peri-urban areas (on public and private land) and urge that provision be made for corridors and 'islands' at the planning stages of every development. Walking tracks are also vital.

Most of WHG's actions fall under **Community Outcome 1 The unique climate, landscape and environment of the region is protected, preserved and made accessible** and are focused on protecting and extending our unique natural habitat:

1. Edgar Street saved from development
2. Publicizing Koala sighting register on ARC website

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3. Participation in plans for a Koala Management Plan for ARC and in NSW Koala Strategy workshops; members attend SNELC events and participate in Northern Tablelands Koala Recovery Strategy meetings
4. Various meetings with ARC staff at which we expressed our concern that future development plans for Armidale indicate no reservations of green spaces or public lands set aside for recreation or environmental purposes; that no genuine protection against rezoning exists for peri-urban areas and that there is no consideration of 'wildlife corridors'; meeting with ARC's Environment and Sustainability Committee (see attachment)
5. 'Sponsored' SLA Forums e.g. ARC's Sustainability Officer, 7 Feb 2019; Koalas and Koala Plan of Management, 5 March 2020; Bush Kinder, (zoom) 2 April 2020
6. Many submissions including:
    a. TSR Review 2019 and again May 2020
    b. NSW Upper House Koala Inquiry
    c. Independent Review into *The Environment Protection and Biodiversity Conservation Act 1999*
    d. Armidale Regional Plan 2040
    e. Curtis Park development
    f. Draft Strategic Plan for Crown Land in NSW
7. Encouraged SLA to support 'Frog Dreaming' 2019- 'seed bomb' tree plantings
8. Children's Play (Nature Play/ Bush Kinder)
    a. Submissions to ARC's deliberations on Curtis Park and Creeklands
    b. ARC: Council Meeting, 28 October 2020 Nature

a) Endorse the submission of a funding application to the Department of Planning, Industry and Environment Everyone Can Play Program for Option 2 Extension of playground located at Curtis Park to incorporate a "Nature Playground" with total cost of $600,000.

    Playground application to DPIE
    c. Website, Play for Nature- devised during Covid19, especially lockdown- Wildlife Habitat Armidale (https://habitatarmidale.com/)
9. Attempts to save 'heritage trees' and limit roadside vandalism of protected species through discussion with ARC
10. Airport Clearing:
    a. loss of Yellow Box-Blakely's Red Gum Grassy Woodland, an endangered ecological community listed under both NSW and Commonwealth environmental legislation
    b. informed in a telephone communication with Ambrose Hallman on 29 January that a (voluntary) 'offset' area had been determined and will be implemented in the next 12 months- area below 'The Croft' to be fenced off- regeneration and some revegetation; 500 native trees will be planted in the 6 metre buffer zone between the Highway and airport (requirement of consent)

    c. ongoing concerns about possible loss of adjacent native vegetation (along Kia Ora Road)
11. Support for ARC's work to save Central Park trees from the worst of the drought and encouragement of native grass areas in parklands and reserves
12. Logging especially in Styx Forest- signing of petitions see https://www.nature.org.au/blog/2020/03/uncovered-logging-in-unburnt-forest-happening-now/
    - see Styx River brochure at Styx River State Forest - Armidale Regional Council here
13. Because we can't live in a bubble- broader Climate Actions; issues in Pilliga and Leard Forest – coal and csg activities destroying habitat on an industrial scale
14. Kosciusko Park and feral horses (similar local issue)
15. Crown Land -walking track joining 29-39 Braund Street and 22 Springhill Lane, WHG petitioned for transfer- encouraged that Council is now actively looking at acquiring other Crown lands
16. Facebook Wildlife Habitat Armidale (https://www.facebook.com/groups/142550803417679)
    - items on native plants and animals, petitions, activism, water, Ovens Pumped Hydro, Guyra wetlands, Armidale's walking tracks, regenerative planting along Dumaresq Creek and urban reserves, children's natural play areas, etc., with links to follow up further information
17. **Water issues** Community Outcome : **Maintain and improve local waterways, lagoons and creek lands in partnership with community groups and other agencies**
    a. Mother of Ducks and associated hanging lagoons including Little Langothlin- RAMSAR wetlands-bores (concerns about number, depth and extraction amounts; lack of knowledge of interconnectivity and effects of 'drawdown'), Costas DA-70-2020 for 2 dams; general sense of lack of transparency (which could be overcome with release of all agreements between Costas and Council(s)) and concern at apparent failure to observe Precautionary Principle
    b. Proposal to dam Moles Creek (near Tenterfield)- strongly oppose
    c. Preliminary discussions with ARC, SNELC re water monitoring/citizen science in Macleay headwaters 10 February 2021- see map of river health in headwaters of Macleay ('Eco-health- Macleay Catchment Report Card 2016')

REPORT: Armidale Action on Coal Seam Gas & Mining Working Group

Armidale Action on Coal Seam Gas & Mining became an action group of SLA in 2011. As ARC cannot operate as an island isolated from the climate impacts of the fossil fuel mining undertaken by our neighbours, AACSG&M's activities fall under Outcome 2 of the Environment and Infrastructure considerations of ARC's Community Strategic Plan 2017-

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2027 and particularly the 'supporting strategy' *to provide educational programs to increase community awareness of climate change risks* and the 'supporting strategy' *investigate alternative sources of power generation to reduce the community's carbon footprint.*

Since 2011 AACSG&M has hosted tours of The Pilliga Forest and participated in workshops (including in February 2021 in Armidale and via zoom throughout 2020) associated with the Narrabri Gas Project.

Coal mining activities across an area stretching from Maules Creek to Boggabri are also of concern to AACSG&M which appoints the Community Representative for the Community Consultative Committees for Maules Creek and Boggabri Mines. AACSG&M has fought the ongoing destruction of Leard Forest and counters threats to the Liverpool Plains from Shenhua mine.

AACSG&M disseminates information through a facebook page and a dedicated email list and undertakes submission writing as issues arise.

Report: Climate Emergency Working Group (CEWG)

Armidale Regional Council declared a Climate Emergency at the Ordinary Council Meeting on 23 October 2019 after receiving a petition of over 1,800 signatures calling for Council to declare a Climate Emergency, and a Global Strike for Climate in Armidale on 20 September 2019. The petition and subsequent submissions to Council was driven by the social network group Climate Action Armidale and members of SLA.

A report - A Framework for Climate Action - was subsequently prepared by a working group of the Environment and Sustainability Advisory Group (ESAC), the Climate Emergency Working Group (CEWG). The CEWG was made up of 7 members 3 of whom were SLA members; Helen Webb, Mahalath Halperin and Annette Kilarr. The other members of the CEWG were Cr Dorothy Robinson, Tom Davison (UNE, CSIRO, MLA), Suzannah Mitchell (UNE Environmental Sustainability Manager) and Dave Stellar (Armidale Tree Group and previous employee ARC). The report – A Framework for Climate Action was authored by Mahalath Halperin and Helen Webb with input from the working group members, other members of SLA and employees of SNELC

The report provides recommendations on current initiatives and additional future actions that may be undertaken in the short, medium and long term. The actions identified in this report provide independent advice to Council and is not considered to be an endorsed strategy of Council. Council has expressed its gratitude to the members of the CEWG for their commitment to providing expertise, advice and suggestions on future environmental sustainability strategies.

These include:

1. Reduce greenhouse emissions aiming, by 2030, for no additional contribution from our region to the global temperature rise;

2. Adapt to current and anticipated climate change impacts;

3. Reduce atmospheric concentrations of greenhouse gases, e.g. Sequester and store carbon in trees and soils.

The Climate Emergency Working Group (CEWG) was formed in March 2020 and an Interim report was provided to Council in April 2020 with their final report *A Framework for Climate Action (PDF 856.3KB)* tabled at the ESAC meeting on 10 August and as part of the committee minutes at the Ordinary Council Meeting on the 19 August 2020.

A $60,000 budget allocation in alignment to the Community Strategic Plan and Delivery Program was provided in the 2020/21 budget. Any further initiatives identified in the report developed by CEWG would need to be considered by Council and funding allocated in future budgets. The final funding split has been allocated to:

1. **Project 1** - Solar panels at Monckton Aquatic Centre - $41,573 (includes a 35% contingency that may be returned to the budget for expenditure on the "Implement Climate Emergency Action Plan").
2. **Project 2** - Community education "You can do it" household electricity efficiency - $5,000

   Following on from the success of SLA's "I Can Do It" program in 2011-2013, we will rerun a series of workshops to assist ARC residents and businesses to reduce their carbon footprint – both at home and at work.

   Sustainable Living Armidale (SLA) will host this grant.

Workshop program and outcomes

The workshop program will be re-vised from the previous "I can do it program"

Participants will leave with knowledge on how to change both their behaviour and the physical aspects of their homes or workplace to

- reduce their energy use,

- increase their thermal comfort at low or no cost,

- understand their energy bills, and

- appreciate the implications of reducing their carbon footprint

all in line with ARC's Climate Emergency Declaration.

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We will also produce updated materials, for example: a guide to the energy usage of household appliances, including different forms of heating; an outline of behaviours that help to reduce energy use; a checklist for people looking for rental accommodation; and a guide for how to read an electricity bill and find the most appropriate plan.

Future Projects

Our intent is to work collaboratively with agencies and organisations throughout the community, as we did in the past.

If we are able to attract funding for expansion in the next financial year we would be looking at:

- Workshops offered to members of local organisations, such as Rotary, CWA
- Workshops for An Aboriginal organisation
- Workshops for staff from local social welfare agencies

3. **Project 3** - Peri-Urban Dwellers and Climate Risk – Education and Capacity Building for Adaptation and Mitigation- $13,427.

We propose to draw on the experiences and knowledge of landholders on smaller lifestyle or hobby farm properties during the recent unprecedented drought, with respect to the risks and dangers they became aware of, and what they can do for the future. We will do this by partnering with Southern New England Landcare Ltd, to facilitate three 'pilot' workshops using participatory leadership processes.

We plan to hold 3 workshops in the following locations:

1. Kelly's Plains/Dangarsleigh
2. Black Mountain/Guyra
3. Dumaresq/Invergowrie

Southern New England Landcare Ltd will host this grant in partnership with Sustainable Living Armidale (SLA) through a Memorandum of Understanding. Peri-urban landholders are within Southern New England Landcare's remit, but are a niche group who are less supported due to insufficient resources.

Southern New England Landcare would engage and host the project officer and offer support and mentoring to run the workshop events. SLA membership and the Peri-urban and Landcare community members will provide in-kind volunteer contributions.

Expected outcomes of the project include:

1. A co-created a list of potential or actual climate change impacts (risks) from participants' own experience

2. Increased capacity among participants to identify and understand how climate change impacts affect them
3. Increased ability of participants to share and exchange information about climate change risks/impacts and potential practical mitigation strategies
4. A final report collating workshop outcomes, which can be disseminated to members of SLA, Southern New England Landcare and community members via various means.

Armidale Monthly Markets in the Mall

SLA has had a consistent presence at the Monthly Markets in the Mall over the last 14 years providing information about Local Food Production and the monthly SLA forums as well as yearly events such as Garden and the Sustainable Housing Tours. The Climate Action group will expand on this presence this year providing educational resources to increase community awareness of climate change risks and enable the community to implement climate change adaptation and mitigation actions in daily life. The stall will utilise the hands on and interactive approach taken at the successful Black Gully Festival 2019. In addition, it will provide education on Local, State, Federal and Global actions on Climate Change that the community can support and be a part of. This will be called Climate Action Education.

Report: Transport working group

The local transport environment of Armidale, in common with the vast majority of Australia, is overwhelmingly dominated by motorised private passenger vehicles (PPV). As virtually the entire PPV fleet continues to be directly powered by fossil fuels, PPVs are a major source of airborne and waterborne pollutants, including ongoing emissions of carbon dioxide and other gases contributing to the worsening climate change emergency.

Less pollutive forms of transportation also feature in the local transport environment. Although a minority of overall trips in the LGA, thousands of sustainable, non-PPV trips are undertaken every week. This provides the basis to increase the overall share of sustainable trips and decreasing the number of PPV trips and the volumes of pollutant emissions they generate.

- Within the Armidale urban area walking is common for many trips, particularly in and around the central areas **(2016 - ARC needs to look this up and report on the trends over the past three censuses: Armidale & Guyra urban areas and the 'rural balance' of the LGA)**
- Cycling is less common, although still accounts for approximately 1% of journeys-to-work (2016 Census)
- Scheduled bus services operate six days per week, including between the CBD and the University
- It is likely, along with national trends, there has been marginal growth in the numbers of hybrid petrol-electric and all-electric vehicles within the overall PPV fleet

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ARC offers no commitment to a broad sustainable transport agenda, to the extent that could achieve any measurable modal shift for trips made by PPVs to instead be walked or cycled. Mention of any aims or objectives in this area (for example, specific increases in active transport; decreases in PPV) are difficult for a member of the public to locate in any documents. There does not appear to any clear policy commitment to such specific outcomes.

In fact, for many decades until the present the local transport budget has been overwhelmingly dominated by a virtual 100% spent on road and road-related capital and maintenance works, that are designed to facilitate PPV and heavier motor vehicle movement and storage. This is in common with the broad, national state-of-affairs.

The 2014-2015 SoE report contains as a goal to increase the length of cycleway. Since then, two new lengths of off-road cycleway have been constructed, both fully-funded by private developers without any Council contribution:

- from the former eastern termination of the Creeklands Cycleway to meet Cookes Road, just north of the Dumaresq Creek bridge
- along the northern side of Waterfall Way from Cookes Road (south) to Lara Ave.

The former adds a new link to the extensive Creeklands Cycleway, certainly adding some value to the existing cycleway network (at least for recreational riding). The latter is a short, isolated length with no linkage to the existing cycleway network and is therefore unlikely to provide any benefit.

Over the years from 2014-2015, provision of maintenance for existing bicycle facilities has been a major concern. There appears to have been virtually no resurfacing (let alone any more major works) along several lengths that already had major deterioration, such as the Madgwick Drive on-road cycle lanes.

Reduce, Reuse, Recycle working group

The ‘Reduce, Reuse, Recycle’ group focussed on two campaigns during the reporting period – the use of plastic straws in commercial premises and the sale of bottled water at the retail outlets of a major employer in the LGA.

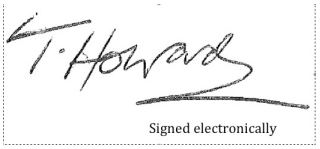
The first campaign saw only limited engagement from local hoteliers after they were sent a letter requesting they reconsider the use of plastic straws in their premises, the propensity of their use and if alternatives could be considered (including offering straws upon request).

The second campaign also only limited engagement from the business entity as a whole but there was some reduction in the distribution of bottled water in plastic as well as the purchase of portable water filter stations for major events.

The onset of COVID 19 has seriously set back attempts by groups such as Sustainable Living Armidale to continue to advocate for reductions and, in some cases, the eradication of the sale of single-use containers across the retail sector in our local region, especially take-away coffee cups.

Future campaigns may focus on more “grass-roots” campaigns to encourage activities such as the establishment of a “Repair Cafe” along the lines of the Marrickville LGA “Bower” facility.

Regards,



Tanya Howard

Convenor

SLA