Wingecarribee Shire Council

State of the Environment Report

2012-2016

Civic Centre, Elizabeth St, Moss Vale, NSW 2577. PO Box 141, Moss Vale. **t. (02) 4868 0888** f. (02)
e. mail@wsc.nsw.gov.au DX 4961 Bowral ABN 49

www.wsc.nsw.gov.au

1 Contents

TABLES

FIGURES

2 Introduction

This report has been produced in accordance with Section 428A of the Local Government Act (1993) which outlines Council's obligation to undertake State of the Environment (SOE) reporting. Early in 2012 the Division of Local Government sent a circular (No.12-06) to Councils with new requirements for SOE reporting. The circular stated "Councils should utilise the performance measures, indicators and assessment measures identified in their Community Strategic Plans as the basis for reporting on the State of the Environment."

This SOE report is structured to reflect this reporting requirement. It addresses the key environmental areas of interest to our community as outlined in the Wingecarribee 2031+ Community Strategic Plan (W2031+). It reports on Council's actions to improve, manage, or preserve aspects of these environmental focus areas, but also addresses aspects of the environment of which Council has a high degree of influence or interest.

2.1 Shire Overview

Wingecarribee Shire, also known as the Southern Highlands, covers an area of 2700 square kilometres.

The pattern of development is one of small towns and villages, separated by a semi-rural landscape. Council would like to retain this characteristic of the Shire.

The main towns of Mittagong, Bowral and Moss Vale are primarily low density residential with central retail businesses and small enclaves of industry at their outskirts.

Smaller villages can be found along the primary road (Hume Highway) running north/ south including Balmoral, Hill Top, Colo Vale, Willow Vale, Yerrinbool, Renwick, Werai, Exeter, Sutton Forest, Canyonleigh, Bundanoon, Penrose and Wingello. The Illawarra Highway runs east of Moss Vale and provides access to the villages of Avoca, Burrawang, Fitzroy Falls, and Robertson.

Large tracts of bushland, national parks and state forest surround primary production areas that are divided into 25 to 1000 acre lots. The Nattai National Park, Jellore State Forest, and Joadja Nature Reserve are to the North and North West, Belanglo State Forest to the West, Penrose State Forest to the South West, and Meryla and Wingello State Forests to the South. South East of the Illawarra Hwy is the Budderoo National Park.

The eastern parts of the Shire are bounded by the Illawarra Escarpment and Morton National Park, with some remnant rainforest and heathland.

The north of the Shire is characterised by rugged Eucalypt bushland, with gullies, gorges and sandy soils. Parts of the north east are WaterNSW 'special areas' which have restricted access as they form a key part of the catchment for Sydney's water supply.

The Wollondilly and Wingecarribee Rivers flow through the west of the Shire. This area is characterised by deep sandstone valleys with much of the area forming part of the Warragamba Dam catchment.

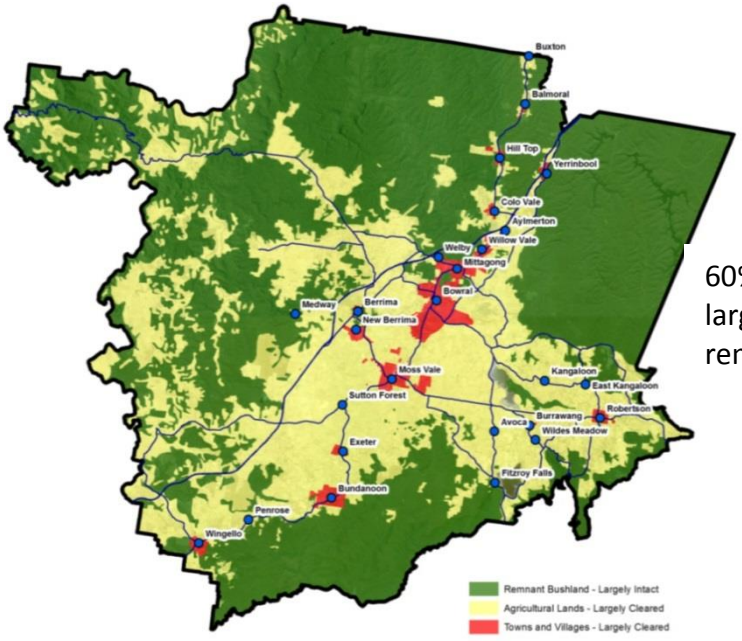
The south of the Shire is bounded by Uringalla Creek and includes the villages of Bundanoon, Wingello and Penrose. This area is a sandstone plateau dissected by deep gorges.

Primary industry consists mostly of beef cattle, with dairy farms along the Illawarra Highway to the east of the Shire. Cool climate vineyards are scattered throughout the primary production areas.

Coal mines originating in Wollondilly local government area (LGA) extend under some of the northern areas of the Shire, primarily in the Yerrinbool area. Testing for coal and coal seam gas has taken place in areas along the Hume Highway from Sutton Forest south to Belanglo State Forest.

The Shire has a temperate climate with mild-warm summers and cold winters with much of the Shire located at or above 640 metres above sea level.
(LEMC 2016)

Figure 1 60% of the Shire is largely intact remnant bushland



60% of the Shire is largely intact remnant bushland

2.2 Our Environmental Objectives

The Wingecarribee Community Strategic Plan W2031+ outlines the community's vision for the Shire in 2031 as

"A healthy and productive community learning and living in harmony, proud of our heritage and nurturing our environment"

It also outlines the aspirations, goals and priorities of our community, and the challenges we face.
Environmental Goals from the W2031+ plan include:

- **Goal 4.1Wingecarribee's distinct and diverse natural environment is protected and enhanced**
- **Goal 4.2 Wingecarribee communities live sustainably by choice**
- **Goal 4.3: Wingecarribee achieves continuous reduction in waste generation and disposal to landfill.**
- **Goal 4.4 Wingecarribee community has a carbon neutral economy**
- **Goal 3.5 Wingecarribee is recognised as a place of significant heritage conservation**

2.3 Our Environment Policy

Wingecarribee Shire Council's (WSC) Environment Policy was created in 2007 with the most recent update endorsed in 2015. The Policy outlines Council's commitment and responsibilities to protecting the environment, preventing pollution and continually improving the sustainability of Council operations. The Policy serves as the foundation for environmental matters for Council, Council staff, and the community.

2.4 Our Environment Levy

Wingecarribee Shire Council has had an Environment Levy in place since 2000. At this time it was identified that the Shire's natural environment had reached a critical stage.

In 2012 the Wingcarribee Environment Levy was extended for a further seven years. More recently, in May 2016, the State Government's Independent Pricing and Regulatory Tribunal (IPART) approved the continuation of the Environment Levy in perpetuity as part of Council's "Fit for the Future" special rate variation application.

The Environment Levy funds numerous programs that support the environmental goals in the Wingecarribee 2031+ Community Strategic Plan including works that:

- protect river health and wetlands
  - focusing on improving water quality in key rivers and creeks and improving the health and function of the surrounding riparian areas

- conserve biodiversity
  - focusing on the protection and restoration of natural ecosystems, improving connectivity between remnant bushland, controlling threats to biodiversity, and protecting threatened species like our Koalas, and our endangered habitats like Mt Gibraltar forest

- promote community sustainability
  - focusing on reducing waste, fossil fuel usage and improving efficiency while developing program to help our community to choose to live more sustainably

- support community environmental initiatives and educational events
  - Strengthening the capacity and commitment of the broader community to act together to address environmental issues.

An additional benefit of the Environment Levy is that it provides seed funding that helps Council to secure state and federal government environmental grants. Since 2012 over $600,000 in extra funding has been received from organisations like NSW Environmental Trust, Water NSW, South East Local Lands Services (SELLs), and NSW EPA.

2.5 Pressures on the Environment

Our Shire has a large percentage of protected land in the form of reserves and National Parks. Within these areas there are pressures on the environment stemming from climate change, invasive species (both plant and animal), and illegal activities such as forced entry by recreational vehicles, and harvesting of firewood (both living and dead material).

Outside of these areas our environment is under additional threat from development, with large areas cleared for agriculture and the increasing need for housing sites.

With increased population, housing, and more intensive land-use come a range of flow-on pressures including:

- deteriorating water quality in our waterways resulting from things such as sedimentation and oil load from urban roads and gutters; sedimentation from construction and in-proper use of stormwater systems for disposal of domestic liquid waste
- decrease in riparian vegetation through agriculture and development
- increasing litter
- increased pressure to clear roadside vegetation for widening/expanding the road network, and for roads and safety
- risk of run-off from industrial processes
- deterioration of the local ecosystems through invasion of remnant bushland and waterways by non-native plant species, including noxious weeds, pasture species and environmental weeds
- increased asset protection zones required to reduce bushfire risk, often requiring clearing of remanent bushland.

2.5.1 Climate Change – A threat to biodiversity

Climate Change poses a real threat to biodiversity and is listed as a key threatening process under the NSW Threatened Species Conservation Act 1995. We are already seeing the effects of Climate Change with average temperatures in NSW rising steadily since the 1950s (Climate Commission 2011).

Rare and threatened species, and those with small geographical ranges, will be particularly vulnerable to additional stresses from Climate Change such as temperature extremes, changes to rainfall patterns and wind events.

These additional stresses will add to the pressures already placed on biodiversity by human population growth and the resulting expansion of urban development (Climate Commission 2011).

In Wingecarribee Shire the key threats to biodiversity linked to climate change include:

- higher temperatures that will increase the likelihood of larger and more intense fires in our region. Australian ecosystems have evolved over millions of years with many benefiting from the occurrence of fire. If fires occur in higher frequency and intensity than normal it can disadvantage some species over others causing an in-balance in the ecosystem. Some plant species can become vulnerable to local extinction as the supply of seeds in the soil declines. (Be Prepared: Climate change and the NSW bushfire threat)

- animal population will be affected by increased bushfires. If they are restricted to localised habitats and cannot move quickly they may be at risk from intense large-scale fires that occur at short intervals (Yates et al. 2008)

- wind surges and extreme storms during summer rainfall events can cause increased tree fall, opening up the forest canopies and increasing the vulnerability of our bushland to invading species. Weed growth may also increase as CO2 levels increase

- severe and prolonged rainfall could cause landslip and destroy patches of forest communities

- loss of mature trees with hollows due to storms, landslip etc would reduce fauna habitat

- changes in weed communities may alter the flammability of communities (especially grasses) and therefore increase the frequency and intensity of understorey fires, which has implications for burning of canopy and tree crowns

- potential for changes in synergy of events. E.g. Christmas beetle larval emergence is linked to soil moisture and these pests are controlled by migratory birds – increased rainfall may mean larvae emerge before birds arrive leading to severe tree defoliation. OEH(2011).

3 Goal 4.1 Wingecarribee's distinct and diverse natural environment is protected and enhanced

3.1 Biodiversity in the Wingecarribee Shire

Our Shire's environment is unique with rich biodiversity, complex ecosystems, intricate waterways, a wide variety of landforms and soils. The Shire's landscape includes rainforests, escarpment forests, woodlands, waterfalls and wetlands. Our environment is highly valued by our community and makes our region a great place to live, work and play.

Remnant bushland is an important resource as it provides feeding, resting and roosting places for wildlife, and "ecosystem services" for our community such as clean air and water.



The Shire's biodiversity is made up of over 370 native mammals, reptiles and bird species, and around 1558 different plant species, making it one of the most diverse regions in Australian. However, there are around 128 native plants and 56 native animals that are endangered, plus several endangered ecological communities (EEC's) known to exist in the Shire including:

- Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions
- Mount Gibraltar Forest in the Sydney Basin Bioregion
- Robertson Basalt Tall Open-forest in the Sydney Basin Bioregion
- Robertson Rainforest in the Sydney Basin Bioregion
- Southern Highlands Shale Woodlands in the Sydney Basin Bioregion
- Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions

- Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions.

© Ford Cristo

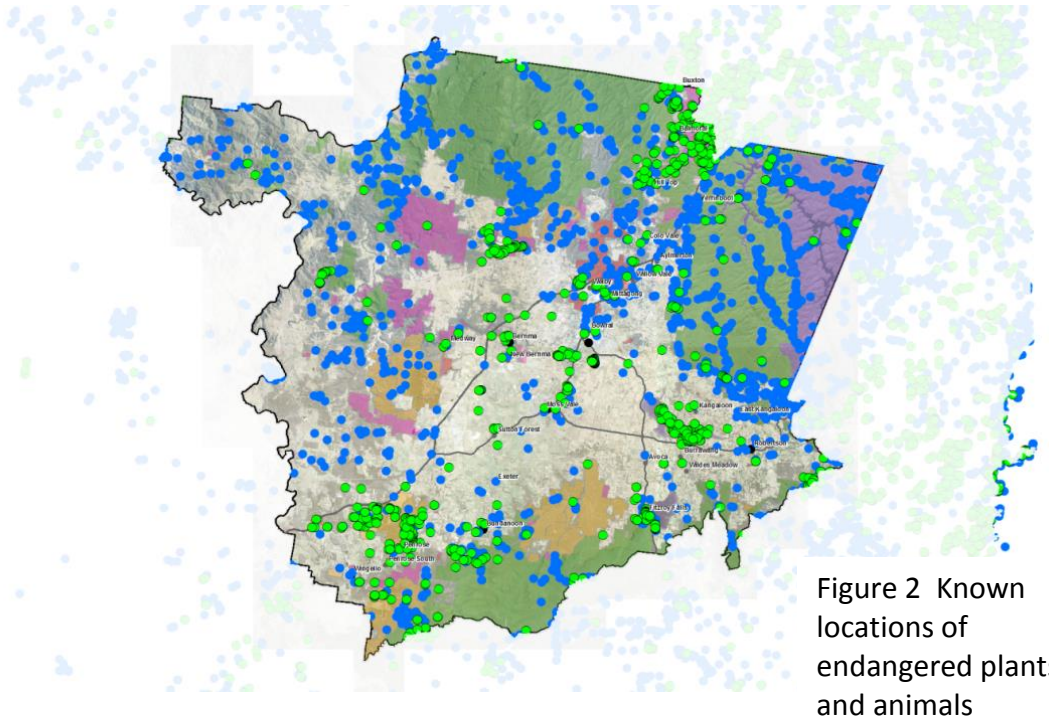


Figure 2 Known locations of endangered plants and animals

Southern Highlands Shale Woodland

Southern Highlands Shale Forest & Woodland is one of the region's most important ecological communities and has been listed as an ***endangered*** under NSW legislation since 2001. Based on advice from the Threatened Species Scientific Committee, and submissions from public, this community was also recently listed under federal legislation (EPBC Act) in the ***critically endangered*** category.

The intent of listing an EEC is to ensure:

- species and ecosystem functions are taken into account during major new developments
- the vegetation community receives priority support for conservation efforts.

This community typically appears as an open-forest, woodland or open woodland that transitions into grassland with low tree cover. It is known to occur in several locations in the Shire including:

- the western end of Sally's Corner Road- Exeter
- Southern Highlands Drive Wingello
- Golden Vale Rd Sutton Forest
- Werai Road in Werai,
- parts of Nowra Rd
- sites around Berrima and west Berrima, including Council managed land , plus environs along the Wingecarribee River.
- around Medway Rivulet.

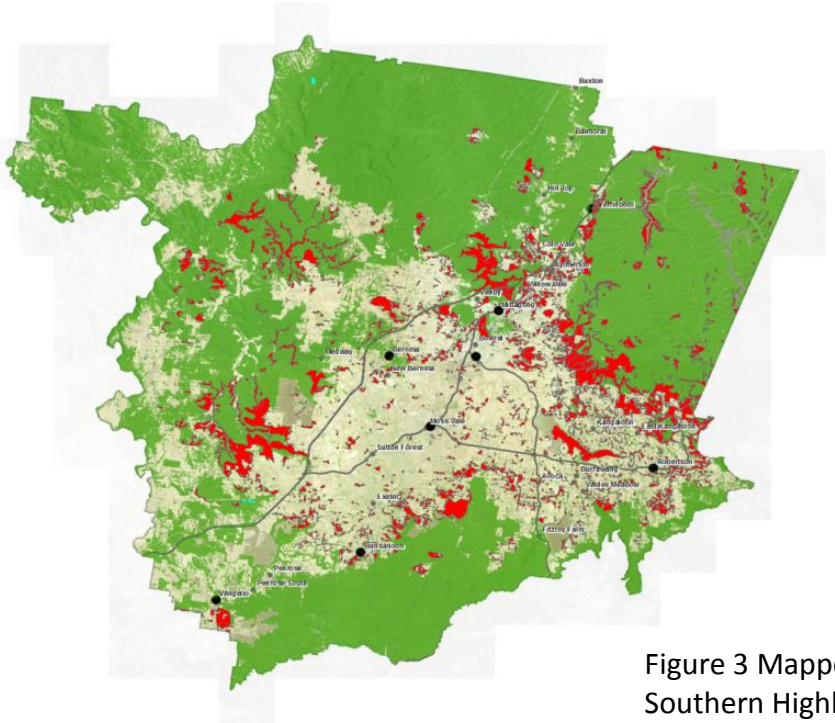


Figure 3 Mapped locations of Southern Highlands Shale Woodland- Indicated in Red

3.1.1 Natural Resource Management- A collaborative effort

Protecting the environment in Wingecarribee Shire is a collaborative effort. Ownership and land management responsibilities sit with local property owners and a number of different government agencies. The conservation and protection of the environment is only really achievable if the whole community gets involved.

The current spread of responsibilities for management of natural areas in our Shire is as follows:

- 45% National Parks and WaterNSW Catchment Lands
- 43% Privately Owned Land
- 5% Crown Land
- 5% State Forest
- 1% Council Managed Bushland

Strengthening the capacity and commitment of the broader community to act together to address environmental issues is a key focus area for Council's Environment Levy.

There are numerous organisations with an interest in delivering environmental outcomes in our Shire who work on community education, planning and on-ground actions. Council has worked closely with the following organisations throughout the reporting period.

3.1.2 Great Eastern Ranges

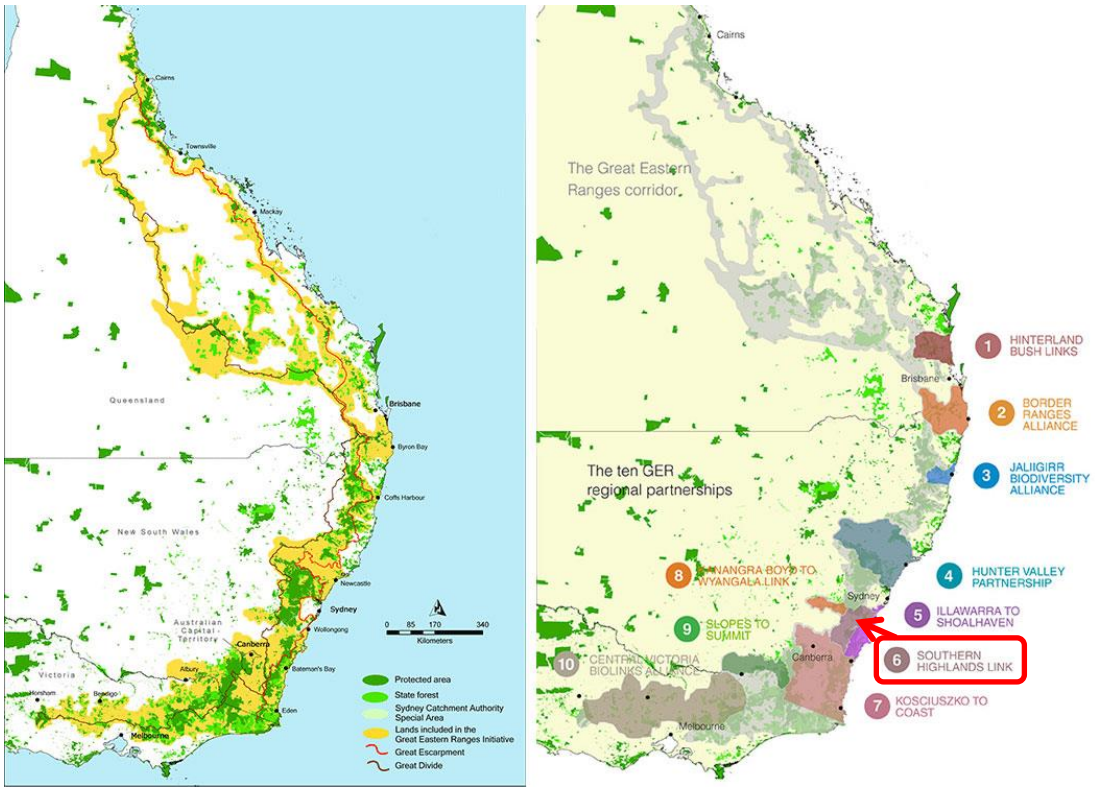


Figure 4 The Great Eastern Rangers focus areas and regional partnerships

Wingecarribee Shire forms a critical link in the Great Eastern Ranges (GER 2016).

The remaining vegetation in our Shire forms a series of stepping stones across private and public lands that connect the Blue Mountains World Heritage area, and catchment land in the north, to the Morton National Park in the south.

Our Shire also forms a valuable east west link for a number of coastal birds that travel inland during wetter seasons.

The Great Eastern Ranges Initiative (GERI) is bringing people and organisations together to protect, restore, and reconnect important areas of habitat. The corridor stretches 3,600 kilometres from western Victoria to far north Queensland. (GER 2016)

GERI is a strategic response to mitigate the potential impacts of Climate Change, invasive species, land clearing and other environmental changes on our richest biodiversity and iconic landscapes.

The GERI presented Council with the overarching goal of improving connectivity of the major corridors within our Shire. This initiaive is a collaboration between Councils , private landholders, agencies, non-government organisations, community and indigenous groups, reaserchers, and industry to collectively plan and carry out projects. Current projects supported by Council which are advancing the objectives of GERI include:

- **Green Web**
  discussed in more detail in section 3.1.7

- **Wall to Wollondilly Project**
  a 10 year collaborative project between Council and seven partner organisations to enhance east-west connectivity across the Shire, following the Wingecarribee River from the wall of the Wingecarribee Reservoir at Glenquarry to the confluence with the Wollondilly River

- **Thickening the Thin Green Line of the Illawarra Escarpment**
  a 10 year collaborative project run by the National Parks Association of NSW, Council and six other partners focussing on improving north-south connectivity along the Illawarra escarpment near Robertson on the eastern boundary of the Shire.

3.1.3 Private Land Conservation

Private landholders play a key role in the protection of our local environment and the broader scale resilience of the regional landscapes including the GER.

Wingecarribee's plants and animals cannot be conserved adequately by the public reserve system alone. Wingecarribee Shire Council is actively encouraging landholders within the Shire to be involved in conservation activities on their own properties.

The **Wingecarribee Biodiversity Strategy** (WBS, 2003) identified the need for private land conservation to achieve important biodiversity conservation outcomes for the Shire and NSW. Around 60% of the Shire is privately owned and many of the endangered ecological communities and threatened species are located on, or move through, private land.

A suite of projects were developed under our **Protect and Grow** program theme, which included a greater focus on wildlife conservation and community engagement with different entry points for landholders. The **Habitat for Wildlife** program is the entry point for urban and peri-urban landholders that don't meet the entry criteria for other programs. **Land for Wildlife**, the second tier, focusses on larger properties with >0.5 hectare of habitat to conserve. The **Vegetation Conservation Program** (VCP) is the third tier with >2 hectares of high conservation land where participants are engaged through 5-15 year management agreements which include a financial commitment from both parties.

Strategic direction and delivery of private land conservation programs is provided through the **Wingecarribee Private Land Conservation Strategic Plan** (2014-2019).

3.1.4 Habitat for Wildlife

Habitat for Wildlife targets urban and peri-urban properties. It assists residents in the Shire to provide a backyard garden that is wildlife-friendly.

The program provides participants with free information resources and tips on:

- managing pets
- garden design and native plants
- habitat features that help create a wildlife refuge.

The Habitat for Wildlife program was launched in Wingecarribee Shire on 5 June 2015 and currently has 150 local properties participating.

3.1.5 Land for Wildlife

Land for Wildlife is a free voluntary entry-level conservation program which encourages and assists private landholders to provide wildlife habitat on their properties, even though the property may be managed primarily for other purposes. Landholders are required to dedicate a minimum of 0.5 hectare (just over 1 acre) for nature conservation even if the property may be managed for other purposes such as agriculture.

The program aims to promote priority biodiversity corridors and continuity of habitat across landscapes. Private land conservation contributes to the long term viability of agricultural systems by helping to protect the ecological functioning of the landscape.

Within Wingecarribee Shire 87 property owners have current **Land for Wildlife** property registrations (with an additional 8 pending agreements). The total property area under these agreements is 3877 hectares with 2646 hectares dedicated for wildlife conservation.

3.1.6 Vegetation Conservation Program

The Vegetation Conservation Program(VCP) builds upon Land for Wildlife by providing additional financial incentives to protect, improve and restore high priority conservation areas. This program focusses on conserving:

- endangered ecological communities (EECs)
- forested areas located in priority regional or local biodiversity corridors
- habitat for known locations of threatened species.

The VCP management agreements require a greater commitment from the landholder with a shared financial responsibility with Council.

Since the program commenced, a total of 73 properties and landholders have actively managed 393 hectares of high priority vegetation communities to improve conservation and habitat values under a formal management agreement with Council. Currently 209 hectares are being actively managed under 32 agreements.

3.1.7 Green Web Project

Council's Green Web is an exciting new project that is a collaboration between Wingecarribee Shire Council and the NSW Office of Environment & Heritage.

The **Green Web Project** will help to ensure that our wildlife corridors connect with our neighbouring Councils and to the Great Eastern Ranges.

Protecting and investing in the **Green Web** across the Shire is essential for the long term survival of the many beautiful native plant and animal species which share our home in the Southern Highlands - especially endangered species such as our Koalas.

The project will:

- build on the native vegetation mapping project (see section 3.1.12) to create a map of high environmental value lands across the Shire, including important wildlife corridors; and
- map priority investment areas for biodiversity conservation, including private lands.

It is expected the Green Web Strategy project will be completed early 2017.

3.1.8 Weed Management

Weed species can overwhelm native vegetation and dominate an area to the point where native species are excluded and/or arable lands are depleted. **Noxious weeds** are plants declared under the Noxious Weeds Act (1993) and are required by law to be controlled by all landholders.

Weeds that are declared noxious are those that have potential to cause harm to the community and individuals, can be controlled by reasonable means, and most importantly have the potential to spread within an area and to other areas. (DPI 2012)

According the Department of Primary Industry's Noxious Weeds Database, there are 90 weeds declared as noxious in Wingecarribee Shire.

Noxious weeds are classed in five categories requiring different control measures ranging from complete eradication to restrictions on the sale, control, and movement of existing plants.

Council has also identified 48 other plant species that are a threat to our local environment due to their ability to readily colonise and overrun bushland areas. These plants are known as **Environmental Weeds**.

Factors influencing the introduction and spread of weeds include:

- disturbing or clearing land (including pasture)
- decline in ecological processes through increased fire and nutrient loads, and climatic changes
- arterial roads and railways entering the Shire from the north, south and west providing a pathway for weeds to enter the Shire
- introduction by livestock, contaminated feed and contaminated trucks movement
- lack of cooperation to coordinate efforts (100% cooperation from all affected landholders is required to successfully eradicate weeds).

Wingecarribee Shire Council's Noxious Weeds Officer is authorised under the Noxious Weeds Act 1993 to carry out inspections of high risk sites to look for new and emerging weeds. Council receives funding for this work under the NSW Weeds Action Program 2015-2020 (WAP1520).

The program aims to reduce the impact of weeds across the state. Inspections are carried out on both private and public land to ensure that new weeds are located and controlled before they become widespread and established.

Each year Council's Weeds Officer carries out inspections on over:

- 1500 kms of roadways
- 100 high risk sites
- 500 private and public properties.

3.1.9 Bushcare & Community Nursery Programs

Volunteer bush regenerators play an essential role in Council's management of the Shire's significant bushland reserves.

Council's Bushcare program combines the efforts of the volunteers, Council staff, contractors and other community groups to regenerate degraded bushland areas, increasing their health and long term viability.

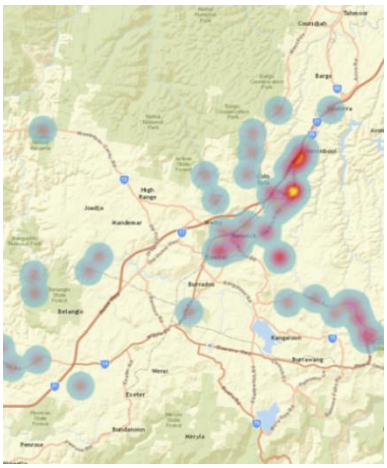
Bushcare volunteers also carry out fauna and flora monitoring, collect seed for the Community Nursery, and help educate the general community about the environmental values of our bushland. In 2015-16 our volunteers planted over 11,000 native plants grown by the Community Nursery volunteers from local provenance seed sources.

In 2015-16 there were 15 active Bushcare groups whose 210 active participants collectively contributed 3098 hours of Bushcare work valued at $108,448.

As a complement to the Bushcare program, Council has developed a Rivercare program which will focus on the protection and rehabilitation of our waterways. The Mittagong Creek Rivercare group, which is working on lower Mittagong Creek near Sherwood Village, is the first Rivercare group off the mark with another under development.

Council is currently refurbishing its Community Nursery with an insulated igloo and bottom-heated propagation beds, and new sun-hardening areas, which will permit a significant expansion in its annual production capacity to support our increasing revegetation efforts along Mittagong Creek, Wingecarribee River and Whites Creek.

3.1.10 Koala Conservation



The Southern Highlands Koala Conservation Project was established in 2014 with the aim to ensure that the Southern Highlands will have a healthy, connected, breeding population of Koalas well into the next century. Council is working with a number of key agencies on this project including the NSW Office of Environment & Heritage and Sydney University.

The objective of the project is to learn where Koalas are living in the Shire, their preferred habitats, and the way they move throughout the Southern Highlands. The project will also:

- use vegetation mapping to identify area high quality Koala habitat
- map the corridors that Koalas use to move about
- identify risks to Koalas by analysing injury and fatality data
- identify approaches that the community and government can take to ensure a viable breeding population of Koalas into the future.

Work undertaken to date includes:

- on-ground surveys to locate where Koala's are living in the Shire. This has been undertaken by ecologists and botanists. Results of the surveys have been uploaded to the NSW Wildlife Atlas "BioNet"
- fitting 20 Koalas with GPS tracking collars to monitor their activity over a six-month period
- establishment of a 'Koala Hotline' (4868 0888) and community sightings database
- installation of 6 Koala road signs at known hot-spots
- production of an 8-minute short film to help educate the community about the project. This short film has been presented to local groups and schools plus used at community events
- establishment of a Facebook page *www.facebook.com/SouthernHighlandsKoalas* to provide regular updates and receive Koala sightings from the community. The page has in excess of 1200 followers.

Work in progress includes:

- analysis of GPS tracking data
- identification and mapping of Koala habitat and movement corridors using vegetation mapping and occupancy data
- identification of risks to Koalas through analysis of disease, injury and fatality data
- identification of approaches that the community and government can take to ensure a viable breeding population of Koalas into the future
- writing of scientific papers analysing tree preferences, home range, chlamydia and survey methodology.

The project research and analysis is continuing and will feed into Council's Green Web Strategy. It is also envisaged that the project will result in the development of a comprehensive Koala Plan of Management for the Southern Highlands.

3.1.11 Vertebrate Pest Species Management

At least nine species of pest animals are contributing to the decline of native plant and animals in the Shire. Impacts include predation by the fox, feral cats, wild dogs and pigs, plus competition for food and degradation of the landscape by rabbits, feral goats, and deer. Vertebrate pest species may also have a significant impact on agricultural production.

Responsibility for vertebrate pest species management in the Shire is shared between several agencies, led by the NSW Department of Primary Industries and Local Land Services. Council has an obligation to manage **declared** vertebrate pest species on land owned, occupied or managed by Council. Declared vertebrate pest species include rabbits, wild dogs, feral pigs, foxes, camels and three species of locust. Furthermore, Council collaborates closely with other agencies and land managers to deliver co-ordinated and integrated pest control works as required.

The ***Southern Highlands Wild Dog Management Plan (2014-2018)*** has been prepared by the Wild Dog Working Group and provides clear direction on the co-ordinated and co-operative management of the impact of wild dogs on livestock enterprises across all tenures in the Shire. The wild dog working group represents all land management agencies, plus landholder representatives. Council is a signatory to the plan and is committed to monitoring, data collection and strategic control of wild dogs (as required) on Council owned, occupied and managed lands.

Council delivers wild rabbit baiting and warren fumigation on Council owned, occupied and managed lands on an as-needs basis. Baiting is only undertaken when it forms part of an integrated baiting program with adjoining land owners. Precautions are incorporated into all baiting delivery to minimise environmental and non-target species impacts. Council is also collaborating on the national release of the RHDV K5 rabbit biocontrol, with 7 sites across

the Shire where this new strain of “Calici” virus will be released in 2017. This release will boost the effectiveness of existing biological controls.

Vertebrate Pest Management Plans are currently being prepared by Council to provide a strategic direction for the control of declared vertebrate pest species on Council owned, occupied and managed lands.

3.1.12 Native Vegetation Mapping

Council in collaboration with the NSW Office of Environment and Heritage is undertaking a Native Vegetation Mapping Project that will:

- replace previous mapping undertaken in 2003
- create a new, fine scale vegetation map across all land in the Shire
- more accurately identify endangered ecological communities
- create an integrated native vegetation resource
- be maintained and improved into the future.

It is important that Council has this updated mapping to assist with making strategic decisions on how we manage and protect the Shire's native vegetation.

There are many different types of native vegetation across our landscapes that have evolved in response to different soil types, varying rainfall, and positions in the landscape. Some vegetation types are common, but as mentioned previously others are rare and endangered.

Understanding what types of vegetation we have, mapping where it is located, and calculating how much is remaining is essential for activities such as:

- land use planning
- environmental management
- impact assessment
- planning for bushfire management and hazard reduction.

The new native vegetation map will be freely available to the public and will create an integrated native vegetation information resource - the first of its kind in NSW. The map is also needed to enable the creation of the Wingecarribee Green Web strategy (see section 3.1.7).

3.2 Our Waterways

The Wingecarribee Shire has over 7200kms of waterways and sits within the Sydney Drinking Water Catchment area. Our Shire contains the major urban areas and some of the most intensive animal husbandry within the catchment. (GHD 2013)
WSC and other agencies undertake various projects and programs to monitor and reduce human induced impacts on the drinking water catchment. Many of these are discussed throughout this report.

3.2.1 Water Quality Monitoring

WaterNSW (formerly known as the Sydney Catchment Authority, SCA) is responsible for monitoring waterways within the Sydney Drinking Water Catchment.

They collect and analyse information on water quality and volume at four permanent stream sites within our Shire. Monitoring is done on a routine basis, during weather events, and for special projects to assess physio-chemical characteristics (e.g. turbidity, pH, and temperature), pathogens, algae, metals and pollutants such as pest control chemicals.

Wet weather samples provide information on pollutants associated with heavy rain and analysis of these samples helps to identifying potential pollution sources. (Sydney Catchment Authority 2012-13)
The most recent WaterNSW monitoring report publically available is for the 2012-13 period.

Table 1 presents information from the WaterNSW report for dry and wet weather sampling conducted at sites within our Shire. It shows the percentage of samples from each site that are outside the benchmarks for water quality in streams as set out in the Australia and New Zealand Water Quality Guidelines. (ANZECC, 2000)

The table shows that the sites monitored complied with the benchmark guidelines for all Turbidity samples (an indication of the clarity of the water) but poor compliance for nitrogen. Elevated nitrogen levels usually result from human activities such as agriculture and waste water treatment plants.

WaterNSW are also responsible for undertaking audits of the catchment every three years to assess its state. Water quality, catchment health and land use pressures are elements of this audit.

			Percentage of samples outside of the benchmark criteria of the Australian and New Zealand Drinking Guidelines					
Location	**Flow**	**Number of samples**	**Dissolved Oxygen(%Sat)**	**Turbidity (NTU)**	**pH**	**Phosphorus total**	**Nitrogen total**	**Chlorophyll-ά (ug/l)**
Gibbergunyah Creek at Braemar STP (E203)	Dry	12	25%	0%	0%	100%	100%	33%
	Wet	0%	NA	NA	NA	NA	NA	NA
Nattai River at the Crags (E206)	Dry	11%	9%	0%	0%	64%	100%	0%
	Wet	1%	0%	0%	0%	0%	100%	100%
Wollondilly River at Golden Valley(E450)	Dry	9%	22%	0%	56%	25%	100%	22%
	Wet	3%	0%	0%	33%	33%	100%	67%
Wingecarribee River at Berrima Weir (E332)	Dry	12%	58%	0%	8%	83%	100%	100%
	Wet	0%	NA	NA	NA	NA	NA	NA

Table 1 Results of sampling conducted by WaterNSW showing the percentage of samples that are outside the benchmarks for water quality in streams

Waterwatch Program

In addition to the WaterNSW catchment sampling program, Council conducts a Waterwatch program at five sampling sites on three urban waterways in Bowral, Mittagong and Moss Vale. Monitoring has been undertaken on a monthly basis since 2012 to evaluate trends over time for each site.

The water quality parameters tested are temperature, pH, electrical conductivity (salinity), and turbidity and dissolved oxygen.

Table 2 shows the percentage of samples that fall outside of the guideline values for rivers according to the Australian and New Zealand Environment Conservation Council Guidelines for Water Quality.

Whites Creek at Cosgrove Park has had consistently high conductivity results since testing started. The cause of these results is currently unknown but will be investigated further.

Mittagong Creek at Bradman Avenue Bowral had the highest incident of turbidity readings outside of the guideline values. This site is impacted from stormwater drainage coming from a large urban area in Bowral that enters the creek via a stormwater drain at the Bowral Street bridge.

Other environmental information collected includes weather, air temperature, recent rainfall, and the amount and type of litter. The litter monitoring shows that plastic pollution is a persistent problem for these sites.



Site	Water Quality Parameter & Acceptance limits	2013-2014 Percentage of samples outside of guideline value (sample n=12)	2014-2015 Percentage of samples outside of guideline value (sample n=11)	2015-2016 Percentage of samples outside of guideline value (sample n=12)
Cosgrove Park Whites Creek	**pH** (between 6.5 and 8.0)	8%	0%	0%
	Conductivity (< 350 µS/cm)	75%	81%	75%
	Turbidity (< 25 NTU)	0%	0%	0%
Mount Road Mittagong Creek	**pH** (between 6.5 and 8.0)	0%	0%	0%
	Conductivity (< 350 µS/cm)	50%	27%	16%
	Turbidity (< 25 NTU)	0%	9%	8%
Bradman Avenue Mittagong Creek	**pH** (between 6.5 and 8.0)	0%	0%	0%
	Conductivity (< 350 µS/cm)	33%	0	16%
	Turbidity (< 25 NTU)	8%	27%	25%
North Lake Alexandra	**pH** (between 6.5 and 8.0)	25%	0%	16%
	Conductivity (200-300µS/cm)	0%	0%	0%
	Turbidity (< 20 NTU)	0%	0%	8%
South Lake Alexandra	**pH** (between 6.5 and 8.0)	8%	0%	8%
	Conductivity (200-300 S/cm)	0%	0%	16%
	Turbidity (< 20 NTU)	0%	18%	0%

Table 2 Percentage of WSC Waterwatch samples that fall outside the guideline values for rivers according to the Australian and New Zealand Environment Conservation Council Guidelines for Water Quality.

3.2.2 Extractive impacts -Coal and Coal Seam Gas mining.

The 2010-2013 WaterNSW audit notes that 3 state significant extractive projects were approved in our Shire in 2012. Extractive projects have potential to impact water quality.

In 2011/12 the Hume Coal Exploration Project commenced in and around the Sutton Forest area. In response to this project, and other potential threats to our local environment from mining and coal seam gas projects Council adopted (2012/13) the following position statement on Coal and Coal seam Gas mining within our Shire.
The mining of Coal and other related activities such as Coal Seam Gas Exploration, have the potential to impact the viability of the Shire's rural industries and negatively impact on the Shire's unique scenic qualities. The Shire's location within the sensitive water catchment for Sydney's drinking water is critical consideration in determining the suitability of Wingecarribee for these activities.

Council has also passed a number of detailed resolutions on this matter. (Operation Plan 2012/13).

Council resolutions relevant include:
MN501/10, CW260/12, MN251/11, CW266/12,

3.2.3 Stormwater

Council's stormwater collection network consists of a mix of conventional drainage systems in the urban areas and grassed roadside verges and swales in non-urban areas. Within the Shire there are around 184km of stormwater pipes/channels, and 245 points where stormwater is discharged to waterways.

Stormwater from the urban settlements flow to the following waterways:

- Bowral stormwater flows to Mittagong Creek and the Wingecarribee River
- Mittagong stormwater flows to the Nattai River
- Moss Vale stormwater flows to Whites Creek and Wingecarribee River
- Robertson stormwater flows to the Wingecarribee River (majority), also Shoalhaven & Nepean Rivers
- Berrima stormwater flows to the Wingecarribee River
- Bundanoon stormwater flows to Paddy's River and Shoalhaven River
- Southern villages stormwater flows to the Wingecarribee River, Paddy's River, Shoalhaven River, and Whites Creek
- Northern villages stormwater flows to the Nattai and Nepean River

3.2.4 Water Sensitive Urban Design (WSUD)

Water sensitive design is incorporated into new developments under WaterNSW's Neutral or Beneficial Effect on water quality (NorBe) requirements (refer section 3.3.5). Examples of water sensitive design features include permeable pavements and surfaces, bioretentions basins, swales, rain-gardens and infrastructure to allow use of recycled water.

Water sensitive design features integrate stormwater treatment into the landscape resulting in:

- biodiversity benefits
- reduced stormwater pollution flowing into waterways
- reduced runoff and peak flows protecting water quality.

An example of water sensitive design used in our Shire is the rain-garden. Rain-gardens directed rainwater to them e.g. from a downpipe or paved area. Beneath the rain-garden are layers of sandy soil which help to slow the rate of stormwater entering creeks and rivers. Along with the vegetation growing in the rain-garden, these layers help remove pollutants such as, fertilisers, dust, leaves and animal droppings, which are washed off hard surfaces. (Water NSW n.d)

3.2.5 Waste Water Treatment

Council Sewer Treatment System

Council operates six sewer schemes within the Shire including Bowral, Mittagong / Northern Villages, Moss Vale, Berrima, Bundanoon and Robertson. Each of the treatment plants operates under a licence from the Environment Protection Authority (EPA) and discharge treated effluent into the waterways in accordance with set limits for quality and quantity.

Associated with these schemes is a 515km network of sewer mains which require ongoing maintenance and renewal. The sewer schemes are designed to be predominantly free from stormwater, however as assets age and deteriorate they are more susceptible to inflow/infiltration of stormwater during wet weather events.

Council identified that the Bowral scheme was highly impacted by inflow/infiltration during wet weather events resulting in higher amounts of flow through the system. In some instances this resulted in the Bowral Treatment Plant having to allow the inflow from the sewer network to bypass the plant.

Another consequence of large volumes of stormwater getting into the sewer network is that the mains can surcharge and overflow into the surrounding environment via the sewer manholes.

Council, in partnership with WaterNSW has undertaken a targeted sewer main renewal program within the Bowral catchment to reduce the level of infiltration and also assess the effectiveness of sewer main renewals on reducing infiltration.

WaterNSW, as part of their Healthy Catchments Strategy, provided $825,000(inc GST) in grant funding towards the over $1.6Million dollar project which saw 4.9km of the Bowral sewer mains renewed.

Infiltration levels were measured pre and post renewals using sewer flow gauging data and modelling. The reduction in the volume of infiltration was observed to be 184.5 Mega litre/year. This exceeded the expectations for the project.

The reduction in flow also represents a reduction in COs emissions and nutrient loading to the environment.

- 42 tonnes/year of CO2 emissions were estimated to be saved through reduced sewer pumping and sewer treatment processes (DPI Water CO2 emissions calculator).
- The total avoidable annual nutrient load on the receiving water was calculated as 1007.1kg.

The results of this project prove the benefits of such projects for Council, WaterNSW, the local environment and the community. Council is committed to continue with annual sewer main renewal programs.

Associated activities implemented by Council that support this project include:

- sewer hydraulic modelling including dry and wet weather Inflow/Infiltration (I/I) analysis
- dedicated In-house sewer main cleaning with CCTV used to do condition inspections
- smoke testing-this involves pumping smoke through the pipe network to identify leaks/breaks
- manhole inspections, rehabilitation and raising
- an annual sewer main renewal program
- development of an educational pamphlet to educate customers on the importance of keeping sewer and stormwater separate.

Construction of the Robertson Sewage Treatment System

A 2012 report into water quality at Caalong Creek in Robertson (SCA 2012b) showed evidence of water quality contamination, thought to be caused by failures in onsite household sewage collection systems. Prior to the construction of the Robertson Sewage Treatment Plant, properties in the Robertson area had either onsite septic systems or sewage collection tanks on their properties that required regular pump-outs. Both of these systems can fail if not correctly managed resulting in the potential to pollute local waterways.

There were approximately 310 households with onsite systems within the drainage area to Caalong Creek. The research for this report was conducted over a two year period and indicated that concentrations of contaminants such as total nitrogen, nitrates, and the indicator test of conductivity, increased significantly as the creek progressed through the town. The study also found the presence of common household chemicals, collectively termed “pharmaceuticals and personal care products” (PPCP’s), which were tested as indicators of domestic pollution in the waterway.

The former Sydney Catchment Authority (now WaterNSW) contributed to the $33.5 million cost of the construction of Council’s Robertson Sewage Treatment Plant. The plant which opened in September 2013 has improved the management of sewer disposal by reducing the environmental impacts of on-site sewer management systems

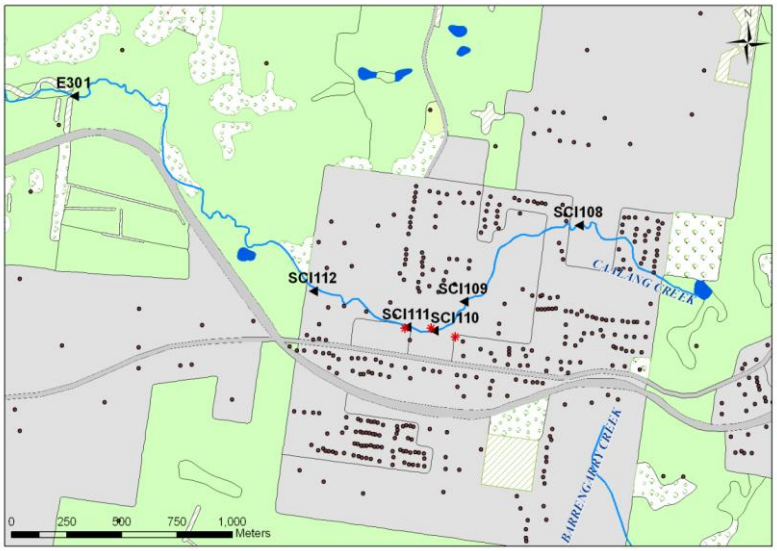


Figure 6 Map showing the location of sampling sites along Caalang Creek which flows through the village of Robertson. Black triangles show river and red asterisks show stormwater sampling sites.

.

3.3 River Health and Wetlands Program

Riparian vegetation is essential for healthy waterways. The Shire has areas where there are intact stands of native vegetation along the riparian corridors, particularly in the special catchment areas and National Parks. (DECCW and Water & State, 2010)
The lower reaches of the catchment include reserved lands such as the Cecil Hoskins Nature Reserve, offering a greater level of protection for riparian land. The areas where riparian vegetation is intact provide an effective buffer to pollution from land-based activities entering waterways. In addition, sediments are removed, nutrients sequestered and banks stabilised by riparian vegetation. There are other areas in the Shire with little or no standing vegetation cover along the waterways.

The major land use of the upper reaches of the Wingecarribee sub- catchment is agriculture. It is common to see damage to riparian vegetation in these areas from stock entering waterways.

Council has increased its focus, through the Environment Levy, on improving the water quality in our major rivers and creeks. This includes improving the health and functioning of the surrounding areas.
Council however is limited in what we can achieve alone due to issues of funding and land management. Of the 7821km of creeks and rivers that flow through our Shire Council "owns" less than 1%. Once again Council needs to foster collaboration between land holders and other agencies to achieve improvements in our river and wetland environments.

3.3.1 Mittagong Creek Rehabilitation Project

The Mittagong Creek Rehabilitation Project is a long-term plan to rehabilitate one of the most significant and treasured waterways in the Southern Highlands.

Mittagong Creek is a natural watercourse beginning its journey near Mansfield Reserve - a pristine pocket of native bushland at East Bowral. From here, the creek meanders for almost twelve kilometres, through a diverse landscape of rural properties, parks, bushland reserves, private backyards, industrial areas and the Bowral commercial district, before finally flowing into the Wingecarribee River at Burradoo.

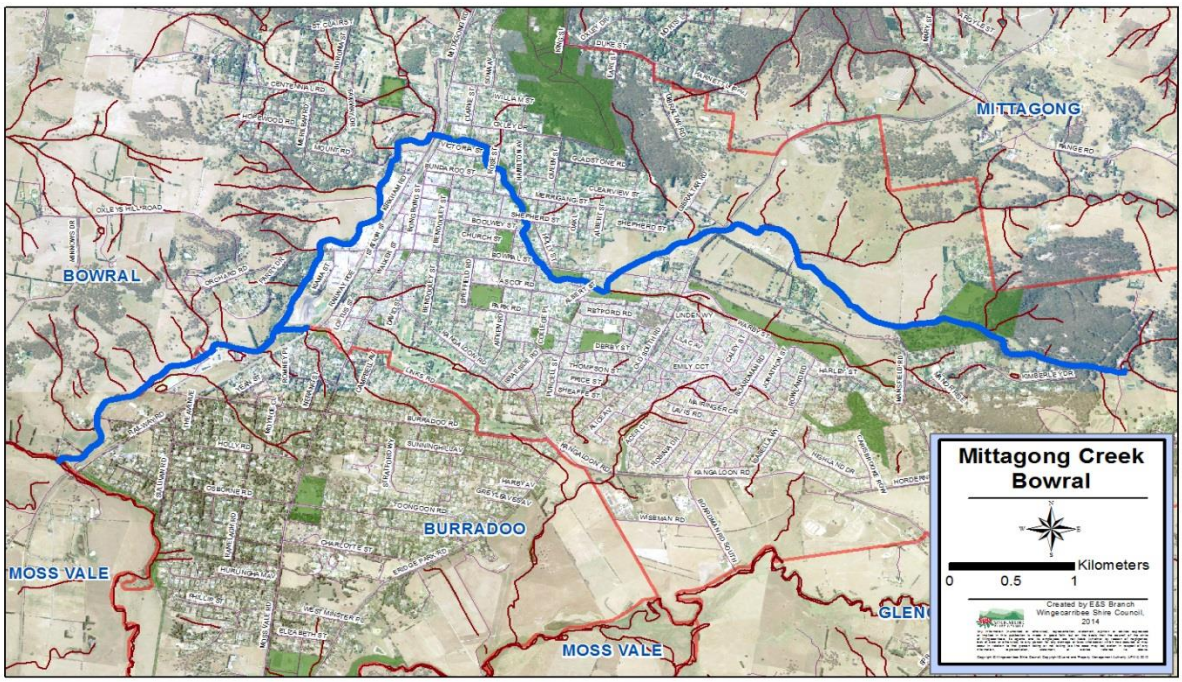


Figure 7 Mittagong Creek

Mittagong Creek is also an important part of the Sydney drinking water catchment, with much of the water flowing down the creek eventually finding its way to Warragamba Dam. This dam supplies drinking water to over 4.5 million people in the Sydney metropolitan area.

The rehabilitation of the creek is guided by the Mittagong Creek Riparian Management Plan which outlines key issues such as weed management, bank stability and sediment loading. Council is working with the community and other agencies such as Local Land Services (LLS) and WaterNSW to implement the actions outlined in the plan, helping to improve water quality, and the health and function of the surrounding riparian areas.

The following works have been undertaken along Mittagong Creek to support this project:

- Blackberry, woody weeds and other environmental weeds were removed along a 500m stretch of creek between Bowral Street and Shepherd Street. Revegetation work commenced in April 2016.
- Over 1km of new fencing was installed along a section of the creek adjacent to Bowral Street to exclude cattle which were causing significant erosion issues.
- Three in-stream structures (two v-notch weirs and a rock ramp) were constructed upstream of McDonald Street to help oxygenate the water and improve creek-bed stability.
- Approximately 6,000 native plants were planted between Bowral St and McDonald Street as native grassland and wetland habitat for water birds and other animals (National Tree Day and Frensham school planting sites).
- Extensive woody weed infestations (willows, black alder & hawthorn) were treated along a 1200m stretch of the creek between Old South Road & Albert Street. These woody weeds are due to be removed completely from the creek in 2016-17.

Figure 10 Rock ramp, one of three in-stream structures constructed in 2015.

Figure 9 Willows, hawthorn & black alder were treated on a 1200 stretch of the creek between Old South Road & Albert Street

Figure 11 In 2015 over 6,000 native seedlings were planted along Mittagong Creek with the help of community volunteers and local students .

Figure 12 Over 1000 meters of fencing was installed to exclude cattle which were causing significant erosion and bank stability issues to the creek.

3.3.2 Wingecarribee River Project

The Wingecarribee River flows through the heart of the Southern Highlands and is a key waterway in the Warragamba Dam catchment.

The river itself is a "Crown Waterway" meaning it is owned and managed by the NSW Department of Primary Industries.

It flows for around 80km from near Robertson in the east, until it joins the Wollondilly River on the western boundary of the Shire. Along its journey it passes through primarily privately owned land with mixed landuse including residential, rural and agricultural, to the more natural and rugged landscapes in the west near Wombeyan Caves.

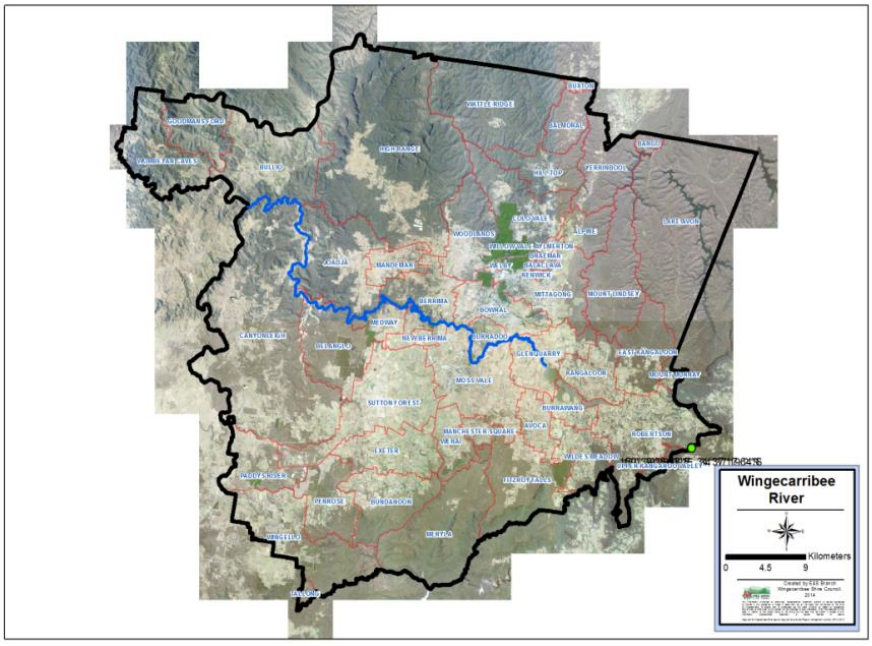


Figure 13 Wingecarribee River

Some important lands adjacent to this waterway are in public ownership including:

- **Wingecarribee Reservoir**, a major water supply for the Highlands managed by WaterNSW.
- **Cecil Hoskins Nature Reserve**, on the boundary of Moss Vale and Burradoo. The nature reserve is owned and managed by the NSW National Parks and Wildlife Service.
- **Bong Bong Common and Cycleway**, a beautiful and very popular walking track and cycleway between Cecil Hoskins Nature Reserve and the rail line at Burradoo. The common and cycleway are managed by Wingecarribee Shire Council.

Council is collaborating with seven partner organisation to deliver the Wall to Wollondilly project along the entire length of the Wingecarribee River (see section 3.1.2 for more details). Council and its partners are also undertaking a number of specific projects on the land along the 10km section of this river that is under our management. These are detailed in the following sections.

3.3.3 The Green Army

The Green Army is an Australian Government initiative that taps into local knowledge to meet local environmental challenges. Council was successful in getting two Green Army teams to undertake work along the Wingecarribee River with a focus on controlling invasive woody weeds such as Willows, Privet and Hawthorn; planting native trees, sedges and rushes to protect the riverbank from erosion whilst providing habitat for small native birds. Works commenced in September 2015 and will continue in a staged approach until early 2017.

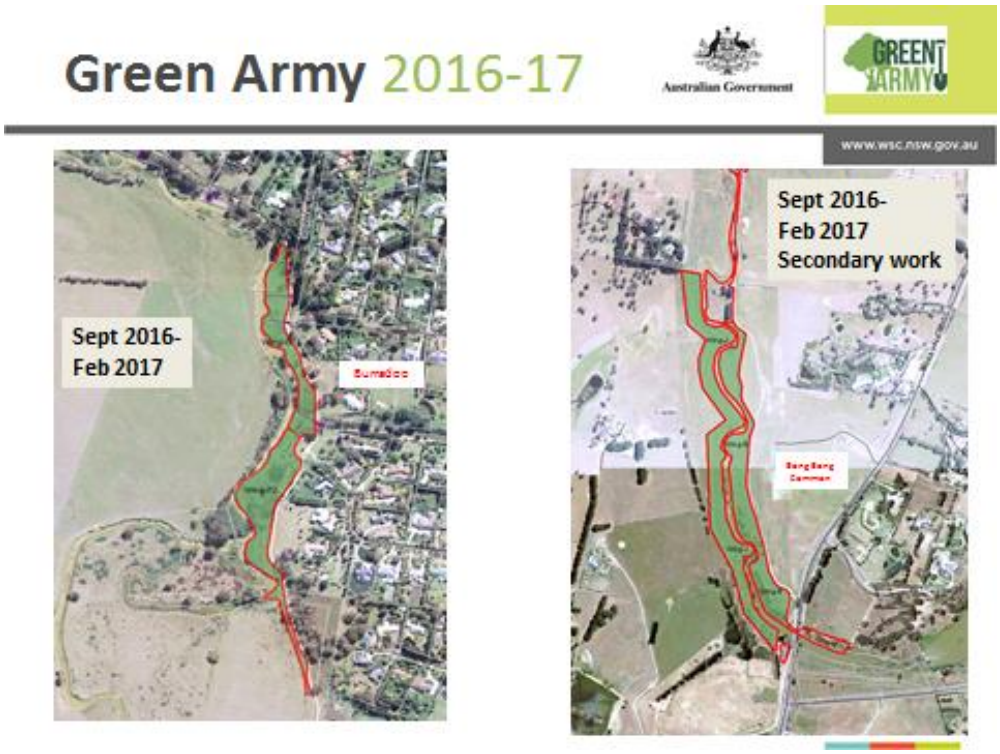
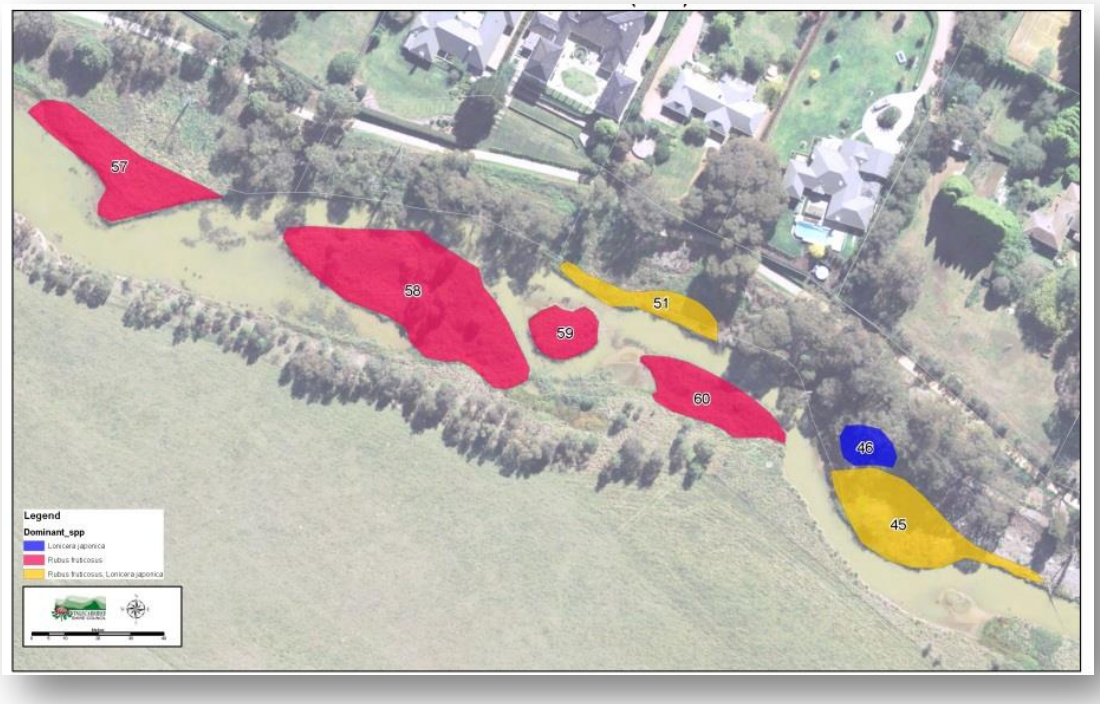


Figure 14 Green Army Sites

3.3.4 Burradoo Woody Weed removal

The Burradoo Weed removal project is collaboration between Council, South East Local Land Services and the NSW Department of Primary Industries (Crown Lands). Commencing in late 2015 it involves the control of large infestations of Blackberry and Willows along the banks and "islands" in the River at Burradoo. The project aims to assist the recovery of the threatened species *Eucalyptus macarthurii* and is ongoing.

Figure 15 Locations of treatment sites- Burradoo Woody Weed Project



3.3.5 Development Controls to protect our Waterways

The State Environmental Planning Policy (SEPP) Sydney Drinking Water Catchment 2011 is a key planning instrument for this Shire.

The SEPP sets out obligations relating to new development, and rectifying the effects of existing development, in the catchment. The SEPP requires councils situated in the catchment to ensure development proposals have a neutral or beneficial effect (NorBE) on water quality. It requires proposed development to implement water quality "current recommended practices and performance standards".

Within the period July 2010 –June 2013 a total of 276 development applications were sent by Wingecarribee Council to WaterNSW for their approval in regards to NorBE requirements.

The Renwick subdivision near Mittagong is a high profile example of where WaterNSW had input into the final outcomes. This site includes Water Sensitive Urban Design features (WSUD) including swales, bioretention basins, rain gardens and attenuation devices (Landcom 2009). In addition re-vegetation and stream bed stabilisations works were undertaken to improve the degraded state of the site, caused by the previous grazing landuse.

3.4 Illegal Dumping

Illegal dumping can have a significant impact on the environment. Apart from being a blight on our landscapes, this rubbish can lead to the death of both land and aquatic animals.

When it rains illegally dumped rubbish can impact proper drainage making areas more susceptible to flooding by blocking ravines, culverts and creeks. The run-off from improper disposal of toxic substances such as motor oil or household chemicals can contaminate lakes, streams and drinking water supplies.

Council responds to numerous complaints every year relating to instances of illegal dumping. Table 3 shows the number of illegal dumping reports received by Council over the last few years.

Table 3 Illegal dumping reports received by WSC

Year	Illegal Dumping Reports
2013/14	700
2014/15	703
2015/16	470
2016 to August	143

In a three month period in 2015 (Jan to Mar), the breakdown of categories for illegally dumped waste (in order of prevalence) was general household domestic waste, green waste, construction and demolition waste, household furniture, tyres, asbestos, mattresses and then TV's.

Council issued 31 fines related to illegal dumping to a total value of $34,665 in the 2014/15 financial year.

The state government has provided Council with funding for an Illegal Dumping Officer through the NSW EPA Rid program. This program also provides councils with reporting tools that enable regulatory staff to report, monitor and manage illegal dumping, and establish a baseline for illegal dumping across NSW.

The quantity of illegally dumped waste retrieved by Council in 2014/15 was 32.83 tonnes and in 2015/16 36.36 tonnes.

The Northern Villages of the Shire have been identified as a local hotspot for illegal dumping. Funding from NSW EPA's clean-up and prevention program has enabled Council to focus on combating illegal dumping in these areas. This has been facilitated through education, prevention infrastructure and enforcement.

Table 4 Illegal Dumping Reports for the northern villages

	Number of illegal dumping reports reports 2014/15	Number of reports 2015/16
Yerrinbool	120	77
Buxton	23	11
Balmoral	20	18
Hill Top	65	36
Colo Vale	16	21
Alpine	26	17
Aylmerton	8	8

Dumped Asbestos Waste

Asbestos was widely used in construction up until 2002 and manufacturing of asbestos was only banned in Australia in 1983. As a result, asbestos persists in many different kinds of buildings and materials. Because of its heat resistant properties, asbestos was also used in electric ovens and hotplate wiring and in buildings for its flame retardant and insulating properties. It can be found in carpet underlay, hot water piping or floor tiling. As such, a major source of asbestos is materials from household renovations for houses built pre-2002. (ACIL ALLEN 2016)
The illegal dumping of material containing asbestos poses a serious risk to the health of residents and visitors to our Shire, and the environment.

In the 2015/16 financial year $27,000 was spent on testing and clean-up of asbestos material dumped on Council land.

3.5 Noise

Council continues to respond to complaints about noise from the community.

Certain noises can intrude into our day to day lives and become a nuisance. Council has kept detailed records on the types of noise complaints received over the past 4 years with these presented in Figure 16 below. Barking dogs continue to be the biggest complaint in our Shire with around 80 complaints received for this issue over the last 4 years. Such complaints are expected to remain high and are closely linked to the rate of dog ownership, the level of ownership responsibility, and the number of houses left vacant during working hours.

The next most common source of noise complaints is from pumps and air conditioners. Residential intensification will increase the number of residential appliances such as air-conditioners, heat pumps, power tools so complaints of this nature are likely to continue.

Not all noise complaints fall into Council areas of control. Investigations of complaints are carried out by a number of agencies depending on the noise source. Council investigates complaints relating to land use conflict, time of use of certain equipment, and barking dogs. In the first instance Council encourages neighbours to speak and discuss noise matters between the affected parties. Council encourages the use of mediation services such as the Community Justice Centre (CJC), and provides advice about these services on its website.

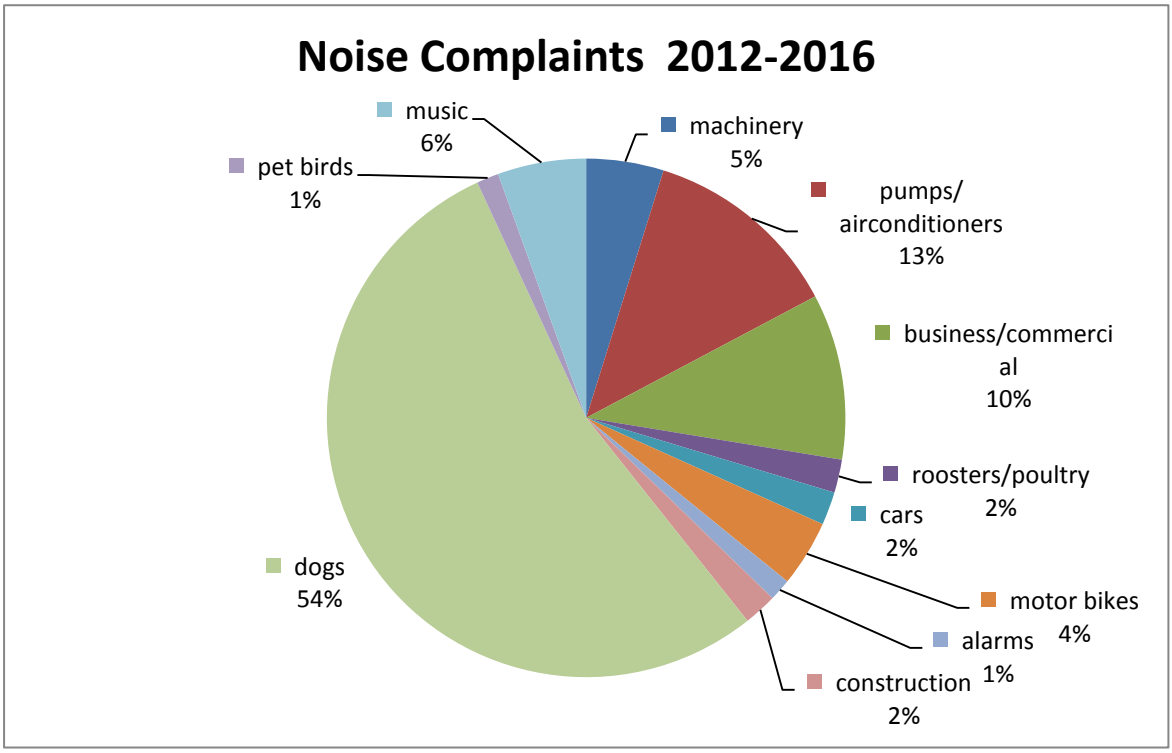


Figure 16 Noise complaints received by WSC 2012-2016

3.6 Management Plans and Process Development.

Council acknowledges that to fulfil its responsibilities in relation to the protection and management of the environment it is important that we review and continually improve our internal processes, procedures and management plans to ensure they are relevant and in line with current legislation. The following chapter provides a snapshot of key actions undertaken during the reporting period.

3.6.1 Council's Environmental Assessment Process

In July 2014 Council trained key staff in a new **Environmental Assessment** procedure developed with the assistance of an environmental legal professional. Following this procedure ensures Council is meeting its legislative requirement to consider the environmental impacts of its activities under Part 4 of the Environmental Planning and Assessment Act 1979.

The Environmental Assessment process is supported by GIS mapping tools which provide staff with the best available mapped information for our Shire relevant to the procedure.

Several positive environmental outcomes have resulted from the introduction of this procedure including:

- avoiding impact to local population of two threatened flora species (Mittagong Geebung & Hairy Geebung) during planning for an open space project
- minimising impact to habitat of a local population of a threatened fauna (Squirrel Glider) species during planning for a road construction project
- minimising impact to habitat of a local population of a threatened fauna (Fitzroy Falls Spiny Crayfish) species during planning for a road maintenance project
- identification of unrecorded threatened species in project areas. Such findings are added to state and internal mapping.

3.6.2 Plans of Management

Councils must complete Plans of Management for all community land in order to meet statutory requirements under the Local Government Act 1993 and Local Government Amendment (Community Land Management) Act 1998.

WSC's Plans of Management are used to outline the important features of community land. They articulate how Council will manage the land and how that open space is intended to be used, improved and managed in the future.

The framework through which a Plan of Management is developed provides an opportunity for Council to engage with the local community, unlocking the existing body of local knowledge and focus community discourse surrounding the role, values and expectations of the community in relation to the nominated parcel of community land.
WSC is currently in the process of completing a number of Plans of Management for community land.

A list of current and draft Plans of Management are included Table 5 with copies available on Council's Website
http://www.wsc.nsw.gov.au/current-plans-of-management

Table 5 Plans of Management

Current Plans of Management	Date of Adoption
Winifred West	Reviewed Feb 16
Bundanoon Oval and Jordans Crossing	Draft adopted Sept 2015
Sportsgrounds of Wingecarribee Shire	Dec-14
Alexandra Square	Nov-12
Loseby Park	Sep-12
Lake Alexandra	Aug-12
Leighton Gardens	Apr-12
Bong Bong Common Precinct- Reviewed	Feb-12
Southern Highlands Botanic Gardens	Dec-10
Children's Services & Community Halls	Oct-10
Exeter Park	Sep-10
Oxley Hill	Oct-09
Berrima River Reserve	Sep-09
Glebe Park	Aug-08
Eridge Park	Jan-08
Welby Heights Fields	Feb-05
Bowral Swimming Pool	Mar-04

3.6.3 Bushfire Risk Management

A Bush Fire Risk Management Plan covering the Wingecarribee Shire has been prepared by the Wollondilly/ Wingecarribee Bush Fire Management Committee. The Plan provides a strategic direction for the mitigation of the risk of bushfire to various community assets including built, environmental and ecological assets. This is particularly important as Climate Change predictions indicate the threat of bush fires will increase in our Shire into the future.

The Wollondilly / Wingecarribee Bush Fire Management Committee have recently reviewed the Bush Fire Risk Management Plan which is awaiting sign-off by the Bush Fire Co-ordinating Committee.

Council works closely with both the Rural Fire Service and Fire and Rescue NSW to coordinate bushfire management activities including:

- implementing actions in the Bushfire Management Plans for Mt Gibraltar, Gibbergunyah, Mt Alexandra Reserves and Small Reserves (Berrima, Yerrinbool, Medway, Leaver Park, Boronia Park)
- inspecting bushfire hazard complaints relating to Council managed land with the Rural Fire Service
- maintenance of 35ha Asset Protection Zones on Council owned / managed land pa.
- conducting an ongoing program of fuel reduction works on Council managed land to provide greater protection for vulnerable residences. Hazard reduction works occur within strategic fire advantage zones, land management zones and asset protection zones. 14017ha in the Wingecarribee Shire has been undergone hazard reduced works over the last 4 years
- pre and post hazard reduction weed control
- annual fire trail audit and maintenance, access restriction and fire trail signage
- community education – 200 residents attended 6 “Bush Fire Ready Workshops” rolled out within the Wingecarribee during 2014 and 2015. In 2016 Council and RFS are running an online campaign “Bush Fire Six Week Get Ready Challenge” – consisting of weekly emails for 6 weeks to prepare the Shire for the 2016- 2017 bushfire danger period.

3.6.4 Street Tree Master Plan

The Wingecarribee Street Tree Master Plan was adopted in 2016 and provides a sustainable and strategic framework for Council management of street tree assets. The Street Tree Master Plan was developed to ensure that the ongoing management of the Shire's street trees occurs in a manner that reflects the needs and preferences of local residents.

3.6.5 Draft Wingecarribee Shire Council Parks Strategy 2016

Council's parks network comprises a total of 3,036 hectares of land, which equates to just over 68 hectares per 1000 residents. Most of this area is bushland reserves, which has relatively low asset development and maintenance requirements. The area of actively maintained parkland (predominately urban parks) is around 299 hectares, which equates to just under 7 ha per 1000 residents.

Parks provide "green lungs" and help protect waterways and indigenous flora and fauna with our bushland reserves conserving large tracts of land.

Council has developed a Draft Parks Strategy which is a high level document which aims to :

- identify existing land assets
- identify the need for additional parkland to meet future demographic changes
- set levels of service
- support requirements for developer contributions.

3.6.6 Flood Management Plans

Under the NSW Flood Prone Land Policy the management of flood prone land is, primarily, the responsibility of councils. In response to this Council has developed a number of Flood Studies, and Flood Risk Management Plans in accordance with this Policy and the NSW Floodplain Development Manual. Plans completed to date are presented in Table 6.

The studies are used for decision making in regard to past and future development on flood prone land. Flood studies are available on Council's Website.

Table 6 Flood Studies completed

Catchment	Date adopted
Berrima Floodplain Risk Management Study & Plan	2002
Bowral Floodplain Risk Management Study & Plan	2009
Whites Creek Flood Study & Plan	2008
Burradoo BU2 Catchment Flood Study & Plan	2011
Gibbergunya Creek Flood Study	2013
Nattai River Flood Study	2014
Wingecarribee River Flood Study	2014

3.7 Events Focused on the Natural Environment

Council fosters the community's interest in the environment by holding a number of environmental events throughout the year. These events are planned to target different segments of the community. Details on key events follow.

3.7.1 Schools Environment Day

Wingecarribee Schools' Environment Day first commenced in October 2006 and has continued to grow to become an annual event that engages schools in a variety of environmental education activities. Each year approximately 600 students from local primary schools take part in a day of activities at no cost to the schools. WSC partners with local organisations including Local Land Services, Wingecarribee Landcare and Bushcare Network, NSW Rural Fire Service, Water NSW, Office of Environment and Heritage (NPWS) and the Southern Highlands Bird Watchers Group to design and facilitate environmental activities. Past activities have included worm farming, water quality monitoring, creating habitats for native wildlife in the backyard using old boots and pipes, interactions with live native fauna, environmental theatre, creating no dig vegetable gardens and making pizzas using solar energy.

3.7.2 World Environment Week

World Environment Week is held each year in the Southern Highlands to mark World Environment Day (5 June), the United Nations' most important day for encouraging worldwide awareness and action for the protection of our environment.

Council facilitates numerous activities throughout the week for to mark this important event as summarised in Table 7.

Table 7 World Environment Week Events

2014	2015	2016
170 people attended the screening of the film"project Wild Thing"	**200 people attended the screening of the film "Fair Food "**	Film screening of "Racing Extinction
600 people attended the opening of the Moss Vale Public School Bush Tucker Garden	**190 Children and Teachers attended the Habitat for Wildlife Launch at Hill Top public School**	**Go Wild! Photo Comp**
120 entries were received for an environmental Photography exhibition	**13 schools showcased environmental projects at a weeklong display held at Highlands Market Place Mittagong**	**Rivercare event at Mittagong Creek**
40 People attended a "Food Path Family Tour	**Council's Waste education Centre at the RRC was launched with 20 people attending the first workshop**	**Spotlighting with the Koala Conservation Team**
	Moss Vale Community Gardens hosted year 1 students from Moss Vale public school for various activities	**Birds in the Wild at Cecil Hoskins Nature Reserve with BirdLife Southern Highlands**
	Moss Vale Community Gardens hosted year 1 students from Moss Vale public school for various activities	Birds in the Wild at Cecil Hoskins Nature Reserve with Bird Life Southern Highlands
		Wildlife show at Bowral Markets
		Birds of Prey talk at Fitzroy Falls Visitors Centre

3.7.3 Threatened Species Day

Threatened Species Day is a national event held each year on September 7th to commemorate the death of the last remaining Tasmanian Tiger at Hobart Zoo in 1936.

Council marks this event with activities that focus attention on the plight of our own threatened animals and plants. Council aims to encourage greater community support and hands-on involvement to prevent further losses of Australia's unique natural heritage.

In 2015 this event was marked with a Koala Information Night and film screening attended by approximately 150 community memebers. This event supported Council's Koala Conservation Program (see section 3.1.10)

3.7.4 National Tree Day

National Tree Day is an annual event organised by *Planet Ark* with each region given the option of scheduling it to suit their local conditions. Council typically holds this event in October to make the most of the spring weather conditions.

Previous years sites include Whites Creek at Cosgrove Park in Moss Vale (2012, 2013, 2014) and Mittagong Creek at Bowral (2015). Hundreds of trees/shrubs are planted at this event each year by numerous volunteers. This event has a great community atmosphere with the Lions Club hosting a free BBQ lunch for participants.

4 Goal 4.4 Wingecarribee community has a carbon neutral economy

What does it mean to be Carbon Neutral?

Being “carbon neutral” is when a balance is achieved between the amount of greenhouse gas emissions being released into the atmosphere, and the amount of emissions that are sequestered or offset through purchasing carbon credits.

4.1 Why Reduce Greenhouse Gas Emissions.

According to the Bureau of Meteorology‘s 2014 State of the Climate Report, temperatures in the Australasian region are rising to their highest levels in more than a thousand years.

Since 1910 Australia’s climate has warmed by 0.9°C, extreme fire weather has increased and rainfall patterns have changed (BOM & CSIRO 2014).

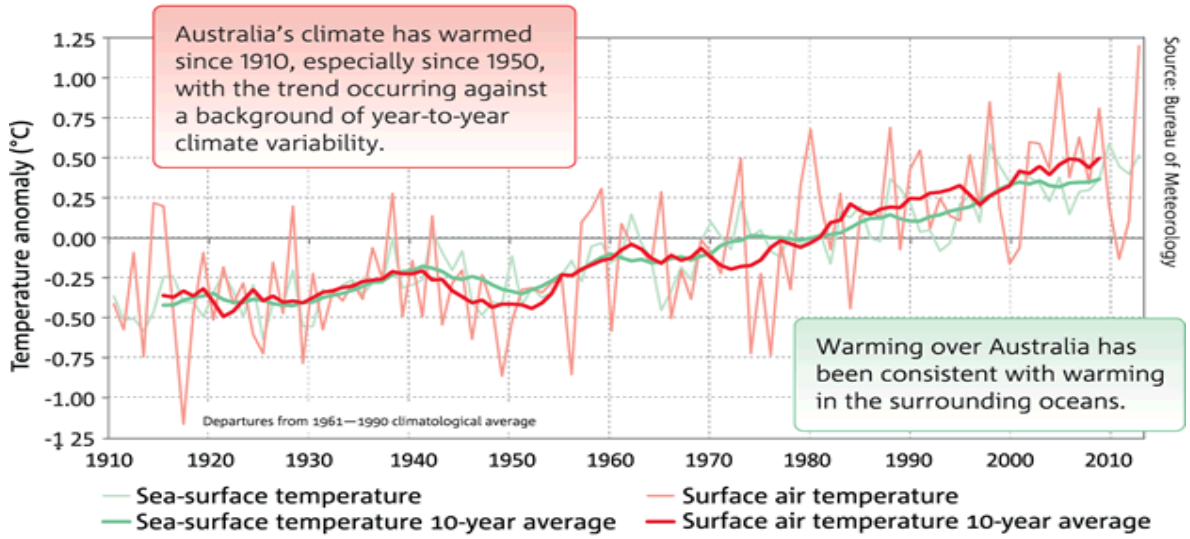


Figure 17 Time series of anomalies in sea-surface temperature and temperature over land in the Australian region. Anomalies are the departures from the 1961–1990 average climatological period. Sea-surface temperature values are provided for a region around Australia

Most scientists agree that the dominant cause of recent warming has been human-induced greenhouse gas emissions and not natural climate variability (BOM & CSIRO 2014).

As outlined in section 2.5.1, scientists around the world predict that the effects of global warming will include changes to patterns of precipitation, altered plant growing seasons, sea level rise, and more extreme weather events such as droughts and heatwaves.

In 1997 an agreement was negotiated by many countries to reduce the global production of greenhouse gases. This agreement was ratified by over 55 countries in 2005, however Australia did not ratify this until 2007. Ratifying this agreement carries legal obligations and effectively makes is a contractual arrangement. Known as the Kyoto Protocol this agreement commits Australia to cut emissions 5% below 2000 levels by 2020.(CARBONIFY 2016)

The Kyoto Protocol covers the 6 main greenhouse gases namely:

- Carbon dioxide (CO2)
- Methane (CH4)
- Nitrous oxide (N2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF6)

According to the 2014 Australian Governments National Inventory Report the energy sector was the largest source of greenhouse gas emission for that year comprising 77.6%. Figure 18 shows a breakdown of the main emission sources for Australia.

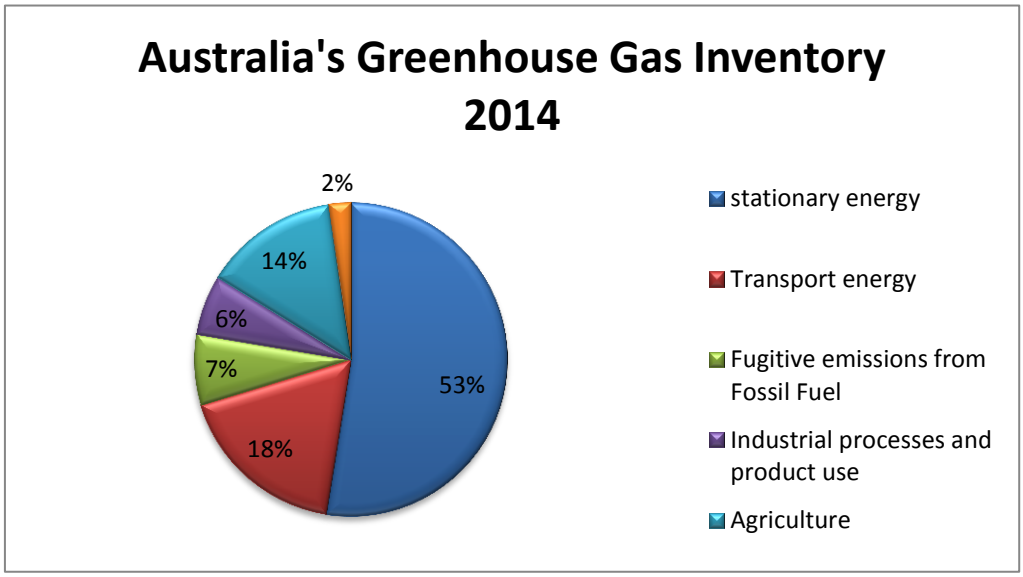


Figure 18 Main GHG emission sources for Australia 2014

To establish a carbon neutral economy for Wingecarribee Shire is a massive undertaking and one that Council cannot achieve alone. It requires the whole community to be working towards this goal. Sections below discuss actions taken by the community and council. Other measures undertaken to reduce GHG emissions are outlined in Section 5 under the Goal *Wingecarribee lives sustainably by choice*.

4.1.1 Solar Energy

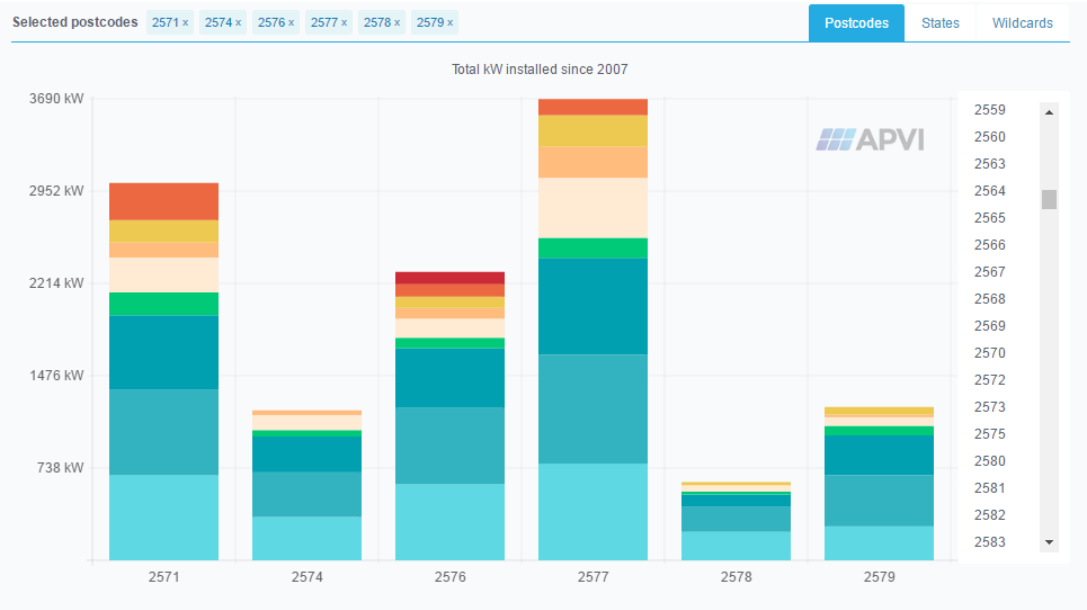
The installation of solar energy systems is one way some households in the Shire have reduced their carbon emissions. This renewable energy option is also a popular way to reduce household energy bills.

Figure 19 over page shows the total kW of solar installed for postcodes within our Shire.

Council has contributed to these totals through installation of solar energy systems at five sites. Three community groups that manage facilities on Council land have also installed solar including at the Mittagong Playhouse, The Queen Street Centre Moss Vale and at the Moss Vale Community Gardens.

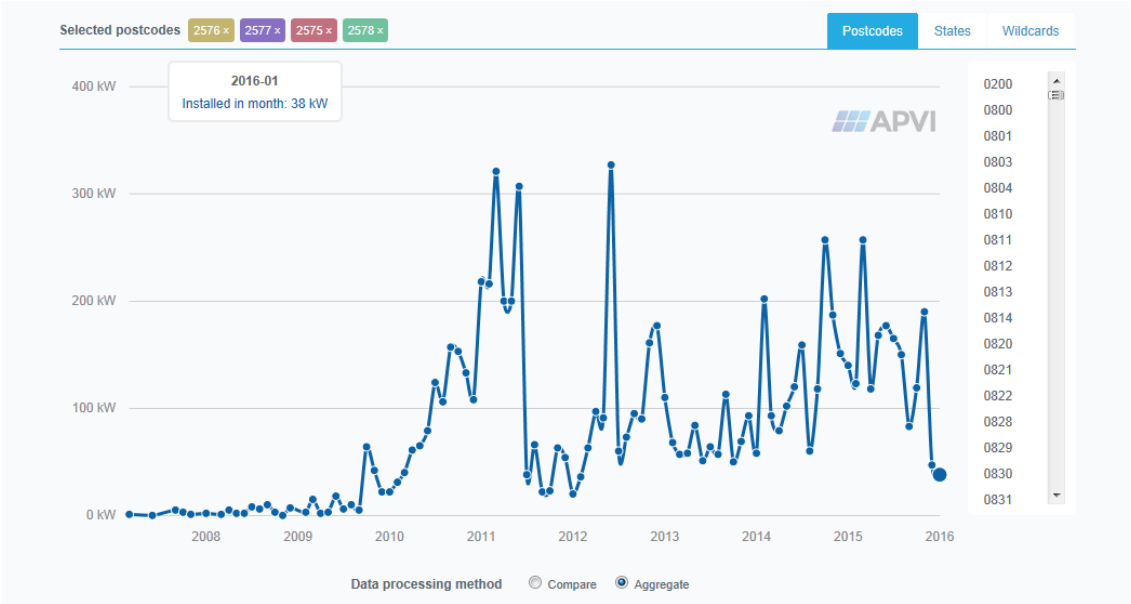
In 2015 Council partnered with the NSW Office of Environment and Heritage to hold "Solar Benefits Business" community presentation. The aim of this event was to provide information to assist the community to switch to solar energy. Around 40 Community members attended this presentation.

Figure 19 Total Solar installed by postcode in Wingecarribee Shire



Note some postcodes 2574 and 2571 cross into Wollongong and Wollondilly Shires.
Australian PV Institute (APVI) Solar Map, funded by the Australian Renewable Energy Agency, accessed from[pv-map.apvi.org.au](pv-map.apvi.org.au) on 6 July 2016.

Figure 20 Solar installed in our Shire over time



4.1.2 Transport

Council has supported the community to move to a low carbon economy by installing an electric vehicle recharge station and purchasing electric bikes in 2015. This will also help to promote sustainable tourism in the area. The electric vehicle recharge station has been used 45 times over nine months since its installation in late 2015 by visitors from Sydney, Wollongong, Canberra and the Gold Coast.

4.1.3 Monitoring our Energy Consumption.

Council has put substantial effort into improving the accuracy, completeness, and accessibility of its energy consumption data and billing information. This allows Council to prioritise options to reduce energy consumption.
Council will continue to develop its energy management plan and implement cost effective greenhouse gas emissions reductions activities.

4.1.4 Council's Greenhouse Gas Accounting

In 2015-16 WSC developed a greenhouse gas accounting process for the organisation, with reference to the GHG Protocol, the National Carbon Offset Standard (NCOS) and the Carbon Neutral Program Guidelines.
WSC has voluntarily reported greenhouse gas emissions from electricity, gas, fleet vehicles and street lighting since 2005. This reporting was based on data collated by a third party provider based on utility billing data, and fuel data supplied by Council. Greenhouse gas emissions remained relatively stable from 2005-06 to 2011-12, with electricity being the highest source of emissions.

Since 2012-13 there have been a number of factors that have changed WSC's greenhouse gas emissions. Changes that contribute to an increase in GHG emissions include the opening of the Moss Vale Indoor Aquatic Centre, and the Robertson Sewerage Treatment Scheme. Activities that have resulted in a reduction to GHG emissions include those outlined in section 4.1.5.

Reporting boundary 2015-16
WSC's greenhouse gas organisational boundary has been established in line with National Greenhouse and Energy Reporting Scheme and Greenhouse Gas Protocol using an operational control test for business unit activities and facilities. Figure 21 shows the activities and assets within the organisational reporting boundary. WSC's water and sewerage treatment activities are included within the reporting boundary, whereas facilities owned by WSC but wholly leased to third parties are not included. Community emissions, such as household waste are also not included as they are beyond the scope of the WSC's control.
Complete activity data for all of the emission sources for Council's operations are not currently available. The key greenhouse gas emissions sources of electricity and energy use are included and data quality management plans are in place for other priority sources. Sources will be progressively included based on their relevance, materiality and measurability in line with the GHG Protocol and NCOS.

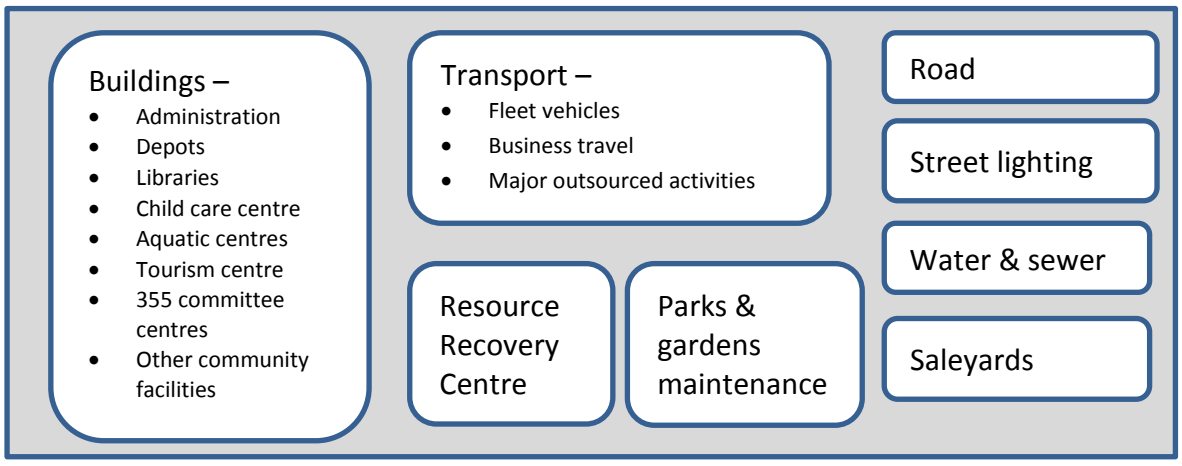


Figure 21 Wingecarribee Council's GHG organisation boundary 2015-16

Emissions Summary

WSC's 2015-16 greenhouse gas emissions total was 16,662 tCO2-e. The greenhouse gases covered by current reporting are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydro-fluorocarbons (HFCs), perfluorocarbons (PFCs). WSC does not have any sulphur hexafluoride (SF6) sources. Direct and indirect sources are included.
Electricity, fuel and street lighting were the highest sources of greenhouse gas emissions as seen in Figure 22. Emissions attributable to providing water and sewer, including electricity and fugitive emissions, account for 55 per cent of the total emissions. Table 9 provides a detailed breakdown of sources and Table 10 provides a comparison over the last two years.

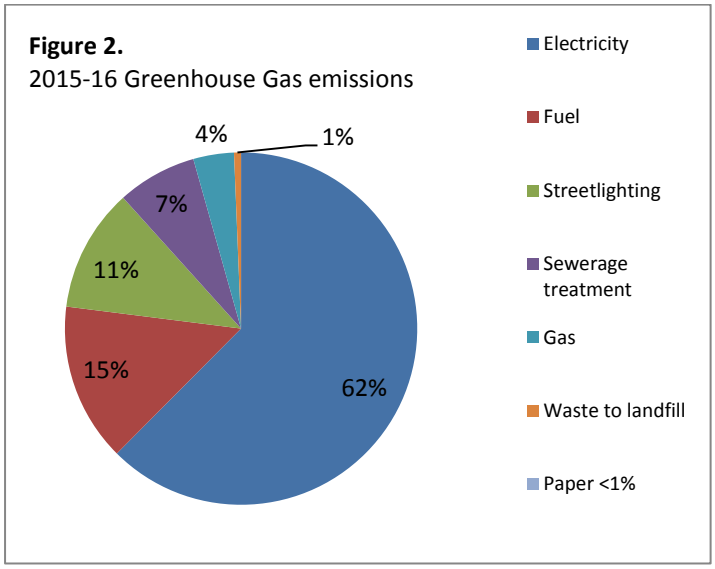


Figure 22. Wingecarribee Council 2015-1 GHG emissions distribution

Table 8 Water and Sewer Emission compared to rest of organisation 2015-16

2015-16 attributes	
Water and Sewer-electricity and fugitive emissions	9084 tCO_2-e
All other operations	7578 tCO_2-e

Table 9 2015-16 Greenhouse Gas Sources		
Source	Activity amount	tCO_2-e
Scope 1		
Fleet vehicles - diesel	710 (KL)	1933
Fleet vehicles - petrol	176 (KL)	379
Gas	9663 (GJ)	498
Wastewater treatment – fugitive	n/a	1216
Oils	26 (L)	0.01
Scope 2		
Electricity*#	10,749,006 (kWh)	9108
Scope 3		
Electricity - transmission and distribution	10,749,006 (kWh)	1290
Natural Gas -transmission and distribution	9663 (GJ)	124
Fleet vehicles – diesel extraction and distribution	710 (KL)	99
Fleet vehicles – petrol extraction and distribution	176 (KL)	10
Street lighting	1964000 (kWh)	1885
Paper ^	**9393 (kgs)**	**14**
Waste disposal to landfill	441 (t)	107
Total		**16662**

*Includes 79tCO_2-e from solar generation used on site for which the STCs were sold at the time of installation.
#The Scope 2 location and product electricity total are the same as no green electricity product is purchased.
^The majority of paper is NCOS carbon neutral certified, however the full emissions are reported here for transparency.

Table 10 Greenhouse gas emissions over time (tCO2-e)		
Scope	**2014-15**	**2015-16**
Scope 1	4087	4026
Scope 2	8966	9108
Scope 3	3699	3528
Total	**16752**	**16662**
tCO_2-e/FTE (375FTE)	n/a	44 tCO_2-e

Sources currently not included

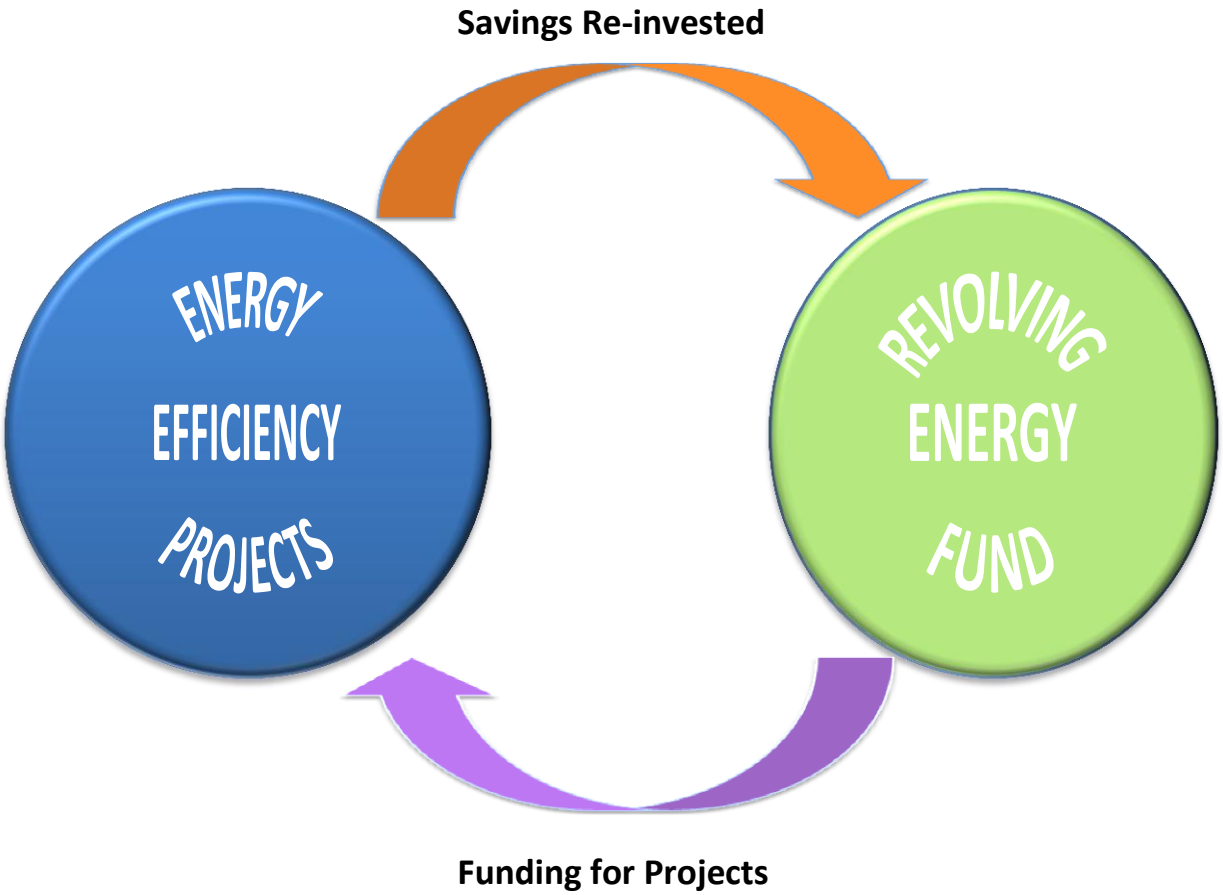
Several GHG sources have not yet been quantified for WSC. These sources are either unable to be determined with the data available or deemed not to be significant. Data improvements are planned for specific sources including:

- refrigerants from heating and cooling
- outsourcing printing
- staff commuting to work in personal vehicles
- business flights, taxis, rental vehicles, public transport and accommodation.
- embodied emissions from equipment
- fuel use from outsourced mowing and road maintenance
- road making materials
- freight and couriers
- mulch products sold

4.1.5 Reducing our Energy Consumption through the Revolving Energy Fund

Wingecarribee Shire Council's Revolving Energy Fund (REFund) was created in 2012 as a mechanism to generate ongoing funding to complete projects that save energy and/or reduce energy cost. Seed funding for the REFund came from various sources including the State Government's Waste and Sustainability Improvement Program (WaSIP), the Environment Levy, and Council's Property Development Reserve.

The REFund works on the principle that financial savings resulting from reduced electricity costs from a project are repaid back into the fund according to the projects payback period. The payback period is the amount of time it takes for the project costs to be fully recouped. After the project costs are recouped the budget of the particular facility benefits from the ongoing reduced energy costs. As the REFund is replenished, it is used to fund new energy saving projects across Council.



Six projects have now been completed through the REFund. A summary of financial and energy consumption savings for REFund projects is presented in Table 11

Table 11 REFund Projects

Project	Predicted energy & cost savings/year	Payback Period (in years)	Project completion
Bowral Library Lighting Upgrade	10582.16 kWh $1900.56r	3.9	2012
Mittagong Library Lighting Upgrade	1958.53kWh $351.75	4.3	2012
Welcome Centre Solar (9.75kW)	12000kWh $2000	5.8	2014
Bowral Library Solar (29.75kW) 2014	35000kWh $6000	6.5	2014
RFS Mittagong Solar (20kW)	26300kWh	5	2015
Civic Centre Lighting Upgrade	149755kWh $25460	3.3	2015

CASE STUDY: CIVIC CENTRE LIGHTING UPGRADE

The most recent project completed through the REFund is the Civic Centre Lighting Upgrade. The project involved the replacement of approximately 690 inefficient fluorescent light fixtures with 630 energy efficient LED lights. The project was completed during the 2015 Christmas shutdown period to avoid interruptions to customers and staff. An additional benefit of the lighting project is reduced maintenance of the lights.

Council used the NSW Government's Energy Saver Scheme to help reduce the costs of the project. This scheme, governed by NSW legislation, provides financial incentives for organisations to undertake energy efficiency actions. Council received a rebate of approx. $34,000 for the project through this scheme.

A summary of the final project costs and outcomes is provided in Table 12:

Table 12 Civic Centre Lighting Upgrade Project Summary

CC Lighting Upgrade Project Summary	
Expected financial savings/year Based on current electricity charged c/kwh)	$25,458
Energy savings per year (calculated by Energy Saver Scheme)	149,755 kWh
Greenhouse Gas Savings –tonnes $CO_{2\text{-}e}$ /year	125.80
Project payback period into REFund	3.1 years

Other Energy Efficiency Actions

Some of the other energy efficiency actions undertaken by Council outside of the REFund over the past 4 years are listed below.

- Mittagong Community Precinct Outdoor Lighting Upgrade. In May 2016 an outdoor lighting project was completed at the Mittagong Seniors Centre and Library precinct. 16 old inefficient halogen lights were replaced with 11 energy efficient LED fixtures. The project cost $5,646 and will reduced electricity consumption by 6,204 kWh per year, saving Council's library budget around $1,365 / year through reduced electricity costs. The project will pay itself off within 4.2 years and benefits the environment by reducing Council's greenhouse gas emissions by 5.2 tonnes of CO2 / year. The Environment Levy providing the majority of funding for this project.

- The Bowral Sewer main renewal project discussed in section 3.2.5 is estimated to reduce Council's carbon emissions by 42 tonnes / year through reduced sewer pumping and sewer treatment processes (DPI Water CO2 emissions calculator).

- Resource Recovery Centre outdoor LED lighting upgrade.

- A program to upgrade Water and Sewer Pumps to variable speed drives.

5 Goal 4.2 Wingecarribee communities live sustainably by choice

The concept of sustainability integrates nature and society. To live sustainably people need to understand the environment they live in and endeavour to limit their impact on its health, diversity and productivity to protect it for current and future generations.

Both the Federal and State Governments promote sustainability initiatives through the provision of policy, leadership and grant funding.

Council supports the sustainability focus areas of state and federal governments, and the goals and activities of our community.

5.1 Economic Development- Encouraging Sustainable Business

Council is identified in Wingecarribee 2031+ as an advocate and facilitator in encouraging sustainable business and industry to thrive within the Wingecarribee Shire. An Economic Development Summit was held in June 2015 to support this goal.

The Summit provided an opportunity for the community to talk about potential projects within Wingecarribee Shire with a focused on sustainable economic development.

Sector groups were formed covering the key economic areas of water, food, shelter, energy, transport, technology, the arts, recreation, business and learning.

Council continues to support the groups to develop projects that will help mitigate potential job losses in the future, and generate a sustainable economy.

Details of projects from sectors that directly support environmental sustainability in the Wingecarribee Shire follow.

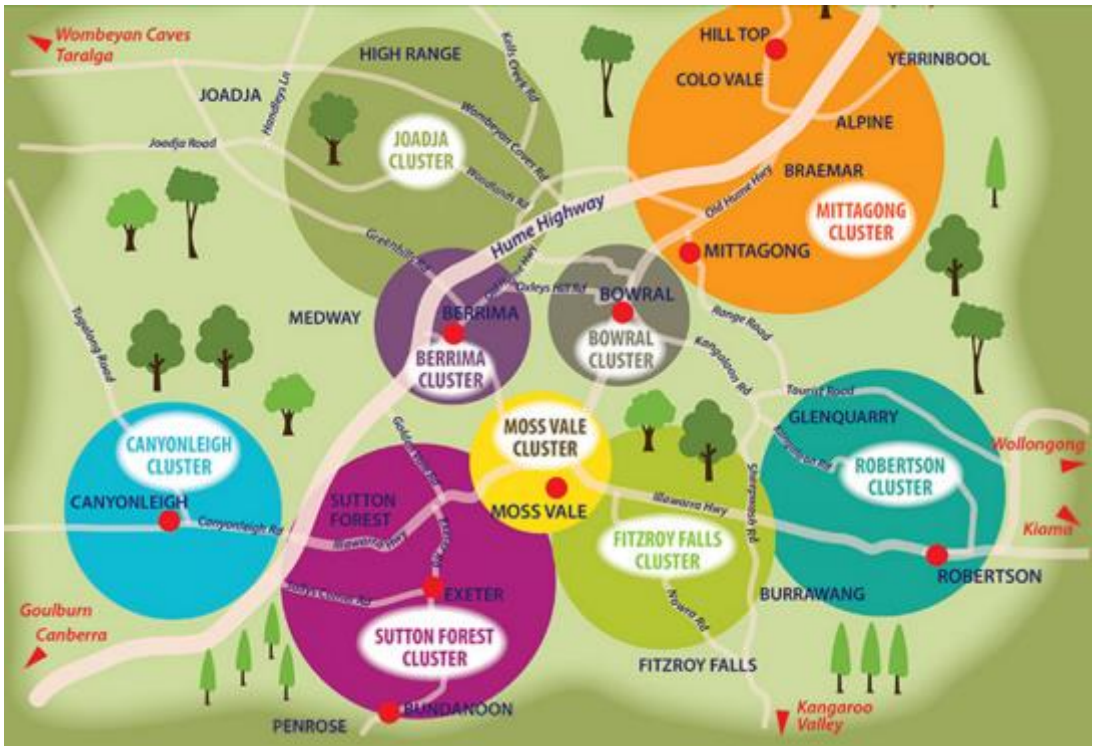
5.1.1 Food Sector

Southern Highlands Food & Wine Clusters.

The "Paddock to Plate" concept is becoming well established in the Southern Highlands as is demonstrated by the development of the Southern Highlands Food & Wine Clusters.

The nine geographical clusters are an initiative of the Moss Vale Rural Chamber of Commerce.

The clusters represent more than 100 regional growers and producers. Each cluster offers an authentic taste of the local lifestyle; sublime produce, historic ambience and gastronomic delights for which the region is renowned.



Source:http://southernhighlandsfoodandwineclusters.com.au/clusters/

Figure 23 Southern Highlands Food and Wine Clusters

It is estimated that the Food and Wine Cluster groups will create approximately 200-300 jobs over the next three years via collaboration between existing suppliers.

On the Grow

The On the Grow project is an overarching project that has seen the development of the Railway Street Farmers Markets. This weekly market began in early 2016 and is the first

weekly growers/producers market in the southern highlands. It provides the community with an opportunity to source fresh local seasonal produce, supporting our local producers. The 'On the Grow' sector has also been involved in community educational projects including the "Plant to Plate" program that engaged 12 local schools to encourage students to grow and eat home grown or local foods.

The group has plans to increase the amount of local food available in the region and develop an online purchasing and delivery service for the region.

5.1.2 Shelter Sector

This sector has plans to develop iconic sustainable housing developments that would be completely off grid.

5.1.3 Energy Sector

Community Renewable Energy Wingecarribee (CREW) – a company focused on renewable energy development in the highlands. This group is keen on developing multi-megawatt solar farms on land that remains unused by Council, and with corporate bodies within and outside of the Shire.

5.1.4 Recreation Sector

This sector group has established "Tracks, Trails and Streams" initiative which is designed to foster cooperation and collaboration between all forms of recreation.

The initial draft plan shows a significant potential to grow the number of visitors to the Wingecarribee each year, including mid-week overseas tourists, generating $10m per annum.

5.2 Southern Highlands Business Awards

The Environment Levy has supported the local Business Award since 2012 by sponsoring a Business Sustainability category. This category aims to acknowledge local businesses for their sustainability actions. Past winners have included:

- the Mittagong RSL
- Impact Smash Repairs
- Australian BioResources
- Tammie Ash @ Exclusive Hair & Beauty.

The Tammie Ash Hair and Beauty Salon won the 2015 award for their use of the Sustainable Salons Australia Resource Recovery Service. This service provides recycling infrastructure for the types of specialised waste products that come from hair salons, including chemical treatment bottles, hair and aluminum foil. The Tammie Ash salon also developed and

applied a social media strategy with the aim of reducing paper consumption at the salon, and amongst its clients.

5.3 Climate Change Risk Assessment and Adaptation Strategy

Wingecarribee Shire Council recognises the scientific evidence on Climate Change.

The likely effects of Climate Change on our shire have previously been discussed in section 2.5.1 and include increased variability in weather, and increases in intense weather patterns causing environmental, economic and social impacts.

In 2012, WSC undertook a **Climate Change Risk Assessment** across all areas of Council after recognising the need to be ready to adapt to the impacts of climate change on our operations..

Following the risk assessment, the **Climate Change Adaptation Strategy** was developed through a series of workshops. The strategy identifies 39 key risks and the current and future adaptation actions required across Council functional areas.

An audit of our progress towards the adaption actions was undertaken in 2016. This showed WSC is making progress with several of the actions already complete.
Many other actions have been incorporated into Council's operational planning.

Adaptation actions already implemented or underway include:

- enhancing strategies for alternate water supplies through a revised Integrated Water Cycle Management Strategy
- identifying and strengthening biodiversity corridors to allow movement of flora and fauna with temperature changes
- assessing council assets in bush fire prone areas
- undertaking flood risk assessments
- including climate adaptation actions in the street tree master plan
- adopting processes to adapt Tulip Time for seasonal changes and also for high wind purchasing additional backup generators to allow continued operation of water and sewer activities during hot weather electrical outages.

5.4 Other Community and Council Initiatives

5.4.1 Community Gardens

Wingecarribee Council supports community gardens in the Southern Highlands and has worked with the Bundanoon, Moss Vale and Bowral Community Gardens to encourage residents to create a self-provisioning economy by growing their own food.

In 2014 Council developed a guideline that outlines the process to obtain Council approval for the development of a Community Garden in the Wingecarribee Shire.

Common themes that community gardens share include:

- common ground to grow, cultivate and nurture fresh food
- inclusive places connecting people with food, supporting cultural diversity and providing social networks
- encouragement of organic and permaculture gardening philosophies
- supporting local food security by providing a local edible seed bank.

The Bundanoon Community Garden facilitates an annual Grow Cook Eat Festival which is a celebration of locally grown and produced food and wine. This festival is modelled on the "village fete" and provides sustainability themed presentations, and hands on demonstrations for both adults and children.

5.4.2 Clean Up Australia Day

Clean Up Australia Day is a national community based event that provides individuals and groups with an opportunity to actively participate in improving their local environment.

In 2016 Clean Up collections were registered at Alpine, Berrima, Canyonleigh, Colo Vale, Glenquarry, Hill Top, High Range, Mittagong, Moss Vale and Penrose. The most collected items were confectionary wrappers, coffee cups, and drink and takeaway containers.

Council supports this event through publicity, establishing sites, and by transporting rubbish collected

by community groups, at registered sites, to Council's Resource Recovery Centre.

Table 13 below shows the number of people participating and amount of litter collected for the 2013-2016 period.

Table 13 Participation & Collection details- Clean up Australia Day

Year	Number of sites	Number of participants	Tonnes collected
2016	17	35	1.3
2015	12	37	1.38
2014	24	53	6.16
2013	22	43	3.08

5.4.3 Household Chemical Clean-out.

Council has facilitated the Household Chemical Clean-out event over the past years in an effort to protect our environment, and landfill, from unwanted household and other toxic/hazardous chemicals.

The event is sponsored by the NSW EPA, who collect the chemicals and ensure they are disposed of in a way that minimises environmental damage.

In 2016 the most common chemicals surrendered were paints, gas cylinders, lead acid batteries, oils and pesticides. Table 14 below shows the quantity of chemicals collected and number of people attending the event each year during the reporting period.

Table 14 : Weight of chemicals collected

Year	kg collected	Attendance
2016	17,374	461
2015	39,427	680
2014	22,400	493
2013	15,778	365

5.4.4 Wingecarribee Home Composting Project

In 2015 Council commenced a ***Waste Wise in Wingecarribee Home Composting Project***. 576 residents participated in this year long project, funded through a grant from the Environmental Trust, as part of the NSW EPA's "*Waste Less, Recycle More*" initiative. The project involved 80 free events made up of workshops, presentations, community engagement activities, market stalls, parades, and shows. Activities were aimed at educating residents to change behaviours in regards to compostable waste, to reduce waste going to landfill.

A total of 2934 people engaged with the Home Composting information at these events, with 740 people attended the workshops.

Of the 576 participants directly involved in the project, 214 completed an initial survey which found that:

- 44% who were are already home composters were encountering problems including lack of understanding about the composting process
- 37% were new to home composting
- 25% had previously had a worm farm.

Site tours held at Council's Resource Recovery Centre (RRC) demonstrated the whole process of home composting. The project also involved the development of supporting materials to address common issues including several films made available on Council's website.

Eleven schools and three pre-schools also joined the project, allowing us to reach 3527 students and staff through presentations aimed at spreading the home composting messages. Worm farms and compost bins were set up in the schools.

5.4.5 Wood Smoke Reduction Program

In 2014 Council ran an "Ignite Right Burn Bright" program to address the impact of smoke pollution from home heating.

The program was funded by the NSW EPA and was supported by staff funded through Council's Environment Levy.

The program involved both community engagement and regulation.
Council Smoke Patrol Officers were active in the 2014 winter months when they:

- responded to 15 complaints
- provided 140 households with information on how to reduce excessive wood smoke emissions from their chimneys
- conducted 16 home visits to discuss solutions to wood smoke problems
- Issued 16 warning letters informing residents that additional action was required to reduce smoke.

The main causes of wood smoke pollution in our Shire from home heating were found to be:

- burning new timber - purchased and burnt within the same season
- burning wet wood
- shutting down oxygen supplies to wood heaters.

Continuing on from this program , Council has facilitated workshops for residents in 2015,2016 presented by the Australian Home Heating Association. In these sessions residents were provided with information on how to correctly operate their home wood fire heaters.

5.4.6 Environmental Grants

The Environment Levy supports environmentally focused community activities through the Community Assistance Grants. The grants provide funding for environmental projects and programs run by local community groups. Projects supported in the past two years include:

- community garden actions
- environmental educators network
- local resilience projects
- a local school's solar energy project
- a raptor rehabilitation project by Australian Raptor Care and Conservation Inc.

5.4.7 Sustainable House Day

Sustainable House day is an annual event focused on showcasing sustainable homes and building practices.
In September 2015 the Southern Highlands Welcome Centre participated in "Sustainable House Day" to showcase its new 9 kWh solar power system and other energy efficiency actions including:

- the use of LED lighting
- daylight sensors and air conditioning controls
- their rainwater tanks
- the promotion of locally made products.

5.4.8 Climate Action Now Wingecarribee (CANWin)

CANWin is a non-partisan community group that regularly holds public events such as speaker nights and film nights. They research and provide information for members, and the community, on scientific and technical matters that affect the sustainability of life in the Highlands.

5.4.9 Green Drinks- A Community Network

In 2015, Green Drinks Southern Highlands was established by the community. Green Drinks is an informal quarterly meeting of people working or participating in environmental activities, or interested in sustainability. The initiative aims to build a network of people to share ideas.

6 Goal 4.3: Wingecarribee achieves continuous reduction in waste generation and disposal to landfill.

WSC operates a Resource Recovery Centre (RRC) in Moss Vale which is a waste transfer and recovery facility with the following functions:

- Waste transfer to landfill outside the Shire
- Sorted material drop-off areas.
- Material processing areas.

Our kerbside waste collection service is provided to around 17,770 properties. The standard domestic collection services consist of:

- either one or two 80L general waste service bins (collected either weekly or fortnightly)
- a 240L recycling service (collected fortnightly) or a 140L recycling for residents on a fortnightly waste collection
- a 240L garden organics service (collected fortnightly).

In addition Council provides a drop-off service at the RRC for domestic waste and recycling, inert waste, problem household recyclables and sorted recyclable materials including garden organics and e-waste. Additional kerbside collection of hard and garden waste are offered for a charge.

Council has made some great progress over the last few years in reducing the amount of waste generated by our community that goes into landfill. Table 6 provides detail of the break-up of waste we are receiving and recycling as well as the percentage that was put into landfill.


Improvement actions implemented are as follows:

- Improvements in diversion of green waste from landfill. The 2014 roll-out of the garden organic bin has resulted in 9770 tonnes of green waste collected from the kerbside over 2014/15 and 2015/16 periods. In the same period 8977 tonnes of green waste was brought into the RRC directly by residents. Green waste is shredded

and composted according to Australian Standard AS 4454 prior to being sold back to the community for landscaping purposes.

- Council worked in partnership with EPA to construct a Community Recycling Centre (CRC) within the Resource Recovery Centre (RRC). This centre was funded through the *Waste Less Recycle More* initiative from the NSW Waste Levy.
  The CRC is a valuable community facility that supports recycling of household problem waste. It is designed to reduce contamination of recyclables by having a staff member on-site to assist the public, whilst providing residents with a safe, easily accessible site for disposal of tricky household waste. Since opening in March 2016 until July 2016 it received (weight in kg's):
    - Paint (Oil) - 12740
    - Paint (water) - 12709.5
    - Gas Cylinders and Fire Extinguishers – 4482.5
    - Fluorescent tubes – 390.5
    - Oil and fuels– 3139.5
    - Household Batteries – 950.5

  Residents can also drop off their soft/film plastics and x-rays for free recycling through the CRC

  Clean dry polystyrene packing foam is accepted for free recycling and put through a cold compressor that reduces it 40:1. The compressed polystyrene is than sent for reprocessing.

  Untreated pallets continue to be shredded on site and sold back to the community. Scrap metal is separated and sent for recycling.

- Cameras on the RRC weighbridge have proven very effective in controlling materials entering the site.

- Council has negotiated an agreement which enables us to accept TV's and computers at the RRC for free recycling. Through Mobile Muster we also collect mobile phones and accessories. Council aims to expand this collection to include other e-waste and negotiations continue under the National Product Stewardship scheme.

.

Table 6 Details of Waste to Landfill- detail of the break-up of waste we are receiving and recycling as well as the percentage that was put into landfill

Waste Type	2011/2012	2012/2013	2013/2014	2014/2015
Domestic Recycling	4748	4724	4662	4721
Building Waste Recycled	7309	4804	4447	4255
Green Waste Recycled	6253	5758	4881	6717
Putrescibles Recovered	3939	3956	3938	3956
Putrescibles Waste to Landfill	4814	4835	4813	4836
Inert Waste to Landfill	4308	6155	5501	5769
Total	**31350**	**30232**	**28242**	**30254**
Landfill	29.1%	36%	37%	35%
Recovered	71.0%	64%	63%	65%

Waste Education

Council recognises the importance of working in partnership with the community to manage, reduce and avoid waste.
Council's full time Waste Education Officer provides education sessions with residents, community groups and schools.

Waste education presentations and workshops include the following topics:

- The Three Bin Kerbside System: how it work and why
- Recycling: clearing up the mysteries
- Home Composting and Worm Farming explained
- Tricky waste and what to do with it

7 Goal 3.5 Wingecarribee is recognised as a place of significant heritage conservation

7.1 Aboriginal heritage

In spite of the impact of European settlement / colonisation of Australia, the Gundungarra and D'harawal Aboriginal heritage in the Southern Highlands has not been extinguished. Remnants of prehistoric and historic Aboriginal occupation exist throughout the Southern Highlands.
Wingecarribee Shire Council acknowledges the rich and diverse cultural heritage of Indigenous Australians in the Southern Highlands.

Council is in the process of erecting signage at 52 locations within the Shire to recognise the Gundungurra and D'harawal people as the traditional custodians. The signage also highlights the importance of Aboriginal people, culture, and land.

State Government records indicate over 400 significant Aboriginal sites within the Shire including 86 sites or objects that exist in the vicinity of Council managed land or roadside reserves.

This is not an exhaustive list and many more Aboriginal sites remain unrecorded, including sites known to Aboriginal communities.

There is one Aboriginal Place in Wingecarribee Shire, called Nungungnungulla (Jubilee Rocks). This is a culturally sensitive site and the exact location is not public information.

The Office of Environment and Heritage (OEH) is responsible for the protection and preservation of all Aboriginal objects and places in NSW under the National Parks and Wildlife Act. It is an offence to do any of the following things without their approval (penalties can apply).

- Disturb or move an Aboriginal object.
- Excavate land for the purpose of discovering an Aboriginal object.
- Knowingly destroy, damage or deface an Aboriginal object or Aboriginal place.
- Knowingly cause or permit the destruction, damage or defacement of, an Aboriginal object or Aboriginal place.

Council makes reference to the Aboriginal site register, via the OEH Aboriginal Heritage Information Management System (AHIMS) when undertaking our works. We also contact the Aboriginal Land Council and/or the Traditional Owners within the Aboriginal community who have knowledge of sites, prior to decision-making in relation to land use activities, development applications, and the creation of management plans.

Cultural Awareness

Council has provided a range of diverse experiences, opportunities and partnering projects that promote a greater understanding of Aboriginal culture, including

- NAIDOC week celebrations
- connecting to Elders for Cultural advice on lores and protocols
- the Aboriginal Community Possum Skin Cloak cultural renewal project
- traditional indigenous games workshop
- cultural awareness training
- support of the NAIDOC school initiatives
- local aboriginal businesses
- school cultural days
- advice on cultural lores and protocols.

The WSC Aboriginal Community Development Officer attends and supports the Wingecarribee Cluster group that represents the Shires Aboriginal and Torres Strait Islander community. The purpose of this Cluster Group is to provide an effective, strategic representative and participatory mechanism to express the group's views/needs and ways to achieve their aspirations. The Wingecarribee Cluster Group will represent this community in negotiations with government, non-government, and corporate sectors.

Council's annual NAIDOC flag raising ceremony for 2016 attracted around 180 community members. The event also launched the unveiling of the Aboriginal Community Possum Skin Cloak, and The Williams and Cosgrove Aboriginal and Torres Strait Islander Scholarship. The Possum skin cloak was a Cultural Renewal Project conceived by Jo Albany and, funded by Wingecarribee Shire Council. The project commenced in July 2014 at the NAIDOC week family fun day.

Thirty six possum pelts were sourced from New Zealand where the animal is considered an introduced pest. Elders Aunty Val, Aunty Eleanor, Aunty Annie and Uncle Peter Swain along with other community elders planned and designed the shape of the cloak.
The dreaming story they chose to represent was **Gurangatch** and **Mirrangan,** which plays an important role in the dreamtime creation story of the **Gundungurra** people. Inscribed within the cloak are totems, images and stories. Workshops with Aboriginal students, service providers, and community members were held throughout the Shire over an 18 months period to ensure all were provided the opportunities to contribute to, and experience the making of, the **Aboriginal Community Possum Skin Cloak**.

7.2 Non aboriginal Heritage

Local government is the principal manager of heritage in NSW, mainly through Local Environmental Plan (LEP).Clause 5.10 of the WLEP contains the heritage provisions for the Shire and provides protection for heritage items and buildings in heritage conservation areas.The plan contains schedules or lists of properties, buildings, places considered to be of local significance.

The Environmental Planning and Assessment Act (1979) provides protection through a requirement to consider impacts on heritage in land use planning decisions.

The Wingecarribee Shire Heritage Strategy 2014-2017 was prepared in accordance with the NSW Office of Environment and Heritage publication "Recommendations for local council heritage management" and was adopted on 9 April 2014.

There are 328 items of heritage identified in the Wingecarribee Local Environmental Plan (WLEP) 2010. Of these 39 items are of State Heritage Significance and also subject to controls under the NSW Heritage Act 1977. In addition to the listed heritage items, the WLEP 2010 also contains eight archaeological sites and 16 heritage conservation areas covering the following areas:

- Berrima
- Berrima Landscape
- Bowral
- Bundanoon
- Anglewood, Burradoo
- Burradoo Landscape
- Burrawang
- Joadja
- Mittagong
- The Maltings, Mittagong
- Five conservation areas in the central section of Moss Vale, and
- Throsby Park, Moss Vale.

Council identified approximately 90 new heritage items proposed for inclusion in the LEP. A recent planning proposal was adopted by Council to enable the exhibition of the proposed heritage items, and the final report to have the items gazetted was presented to Council at its meeting of the 22 June 2016. The Planning Proposal is due to be completed and the LEP amended by the end of 2016

Council works to continually promote and maintain the heritage aspects of the towns and villages within the Shire by providing ongoing heritage advice and funding through the annual Heritage Assistance Grants Scheme. This scheme is open to owners of recognised heritage properties and helps fund minor repairs, maintenance work and works to meet Building Code of Australia upgrades.

For the 2016-17 period Grants were awarded to all five (5) property owners who applied. The total value of these grants is $21,069, funded by Council and the Office of Environment and Heritage.

8 References

ACIL ALLEN (2016) *Illegal asbestos dumping, Review of issues and initiatives- Final discussion paper* https://www.asbestossafety.gov.au (accessed July 2016)

Bureau of Meteorology and CSIRO (2014), *State of the Climate Report 2014*, Bureau of Meteorology and CSIRO, Canberra. www.bom.gov.au/state-of-the-climate (accessed 15/07/2016)

CARBONIFY (n.d.), *Global Warming Resources*. http://www.carbonify.com/articles/kyoto-protocol.htm (accessed 01/10/2016)

Climate Commission (2011), *The Critical Decade: Illawarra/NSW South Coast Impacts.* https://climatecommission.angrygoats.net/report/illawarransw-south-coast-climate-change-impacts/ (accessed 15/07/2016)

Environment Protection Authority (2016), *NSW EPA State of the Environment Report* http://www.epa.nsw.gov.au/soe/soe2015/05Greenhouse-Gas.htm (accessed 15/07/2016)

Great Eastern Ranges (n.d.), *The Great Eastern Ranges: Connecting people connecting nature.*(http://www.greateasternranges.org.au/about-the-corridor/the-landscapes/) (accessed 22/07/2016)

Local Emergency Management Committee (2016), *Wingecarribee Shire LEMC Local Emergency Management Plan 2016.* http://www.wsc.nsw.gov.au/uploads/3036/wsc-emergency-management-plan-2016-reducted.pdf

Sydney Catchment Authority (2012), *Sydney Catchment Authority Water Quality Management Framework 2012 – 2017* http://www.waternsw.com.au/__data/assets/pdf_file/0011/55982/WQMF-2012-2017.pdf (accessed 12/07/2016)

Sydney Catchment Authority (2012-2013) *Sydney Catchment Authority Annual Water Quality Monitoring Report 2012-13)* http://www.waternsw.com.au/__data/assets/pdf_file/0008/62297/Annual-Water-Quality-Monitoring-Report-2012-13.pdf (accessed July 2016)

Sydney Catchment Authority (2012b), *Robertson and Kangaroo Valley Onsite Sewage Disposal Evaluation Report 3: final report,* Sydney Catchment Authority.

GHD (2013) 2013 *Audit of Sydney Drinking Water Catchment* http://www.waternsw.com.au/about/legislation/catchment-audits (accessed July 2016)

Water NSW (n.d) Water Sensitive Design http://www.waternsw.com.au/water-quality/catchment/living/stormwater/water-sensitive-design) (accessed July 2016)