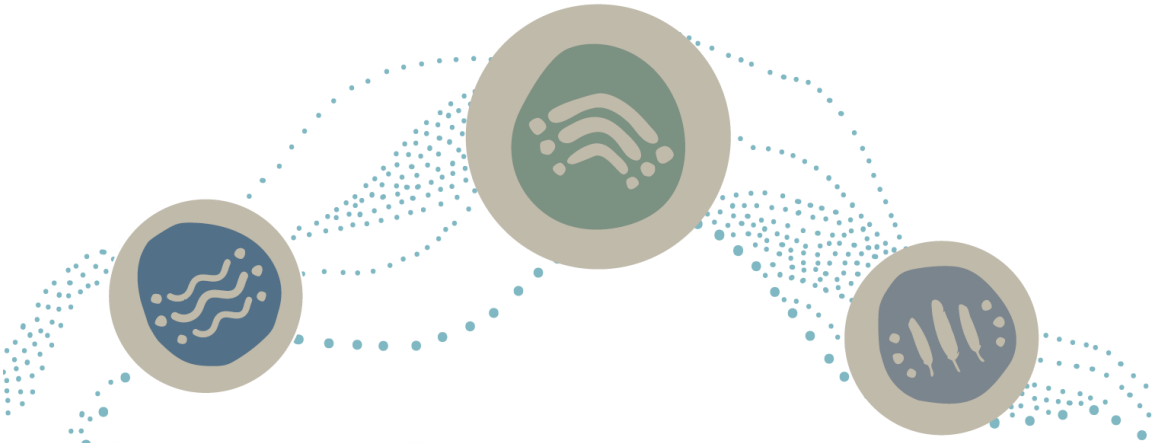
Macedon Ranges Shire Council | Strategic Planning & Environment

Annual Environment Report 2021/22

Contents

Acknowledgement of Country 2
Introduction 3
Theme 1: Climate Emergency 4
Theme 2: Biodiversity 16
Theme 3: Water 31
Theme 4: Waste 37
2021 Storm Recovery - Environment Response 43



Acknowledgement of Country

Macedon Ranges Shire Council acknowledges the Dja Dja Wurrung, Taungurung and Wurundjeri Woi Wurrung Peoples as the Traditional Owners and Custodians of this land and waterways. Council recognises their living cultures and ongoing connection to Country and pays respect to their Elders past, present and emerging.

Council also acknowledges local Aboriginal and/or Torres Strait Islander residents of Macedon Ranges for their ongoing contribution to the diverse culture of our community.

Introduction

The 2021-22 Annual Environment Report provides a summary of Council's environment activities and reports on the indicators included in Council's *Environment Strategy Refreshed 2021*.

In some cases, data collection and methodology for some indicators has been amended or changed, as a result, the 2021-22 report sets the baseline data for some indicators. In other cases, data has been added and compiled to support previous data with the aim of determining trends over time. For some indicators, no data is currently available to enable reporting. This data will need to be collected as a part of future projects.

The 2021-22 year had some big influences on our local environment. The storm events in 2021 had huge impact on our natural environment, and COVID-19 continued to impact the way we work and live.

Highlights from our 2021-22 Annual Environment report include:

- Sourcing all of Council's electricity from renewable sources on 1 July 2021, through the Victorian Energy Collaboration.
- Completing the Snow Gum Project that identified that the Macedon Ranges is an 'epicentre for low lying Snow Gums'.
- 22,245 people exposed to the environmental messages from the Kyneton Museum exhibit, 'A Biodiversity Crisis: Animals and Plants of the Macedon Ranges'.
- Our Healthy Landscapes program winning the Premiers Choice Sustainability Award in 2021.
- Our shire wide response to the 2021 Storm Events.

Dja Dja Wurrung Smoking Ceremony at Malmsbury Common Reserve as a part of the launch of the Reconciliation Action Plan during the Shire Autumn Festival and Reconciliation Week.

Theme 1: Climate Emergency

Highlights

- ✓ Commenced sourcing all of Council's electricity as 100% renewable energy on 1 July 2021, through the Victorian Energy Collaboration.
- ✓ Completed community climate change action plans for Romsey and Lancefield, Gisborne and Riddells Creek (partnering with Riddells Creek Neighbourhood House).
- ✓ Adopted the Sustainable Buildings Policy in October 2021.
- ✓ Commenced replacement of cost shared street lights with energy efficient LEDs.
- ✓ Secured funds to install three public, fast charging electric vehicle charging stations in Macedon, Kyneton and Lancefield.
- ✓ Secured funds to install charging stations at Council offices in Gisborne, Kyneton and Woodend to support fleet transition.
- ✓ Conducted Bridging the Divide, a project that explored inter-generational health and wellbeing concerns about climate change
- ✓ Commenced development of a Zero Net Emissions Plan for Council operations, including investigations to reduce emissions from high use sites

Indicator 1: Greenhouse gas emissions from Council operations

1.1 Total Council emissions

A new target

Council's original target to reduce emissions from its operations by 25% from the baseline year of 2014-2015 was exceeded at 30 June 2021. Council is now working towards a target for Zero Net Emissions for Council Operations by 2030. A Zero Net Emissions Plan will guide Council to meet this target.

The new target requires a new baseline from which Council can measure its progress in reducing emissions. The new baseline in the forthcoming Zero Net Emissions Plan will be set at 30 June 2022, when emissions from Council's operations is proposed to be calculated to be 3,260.6 tonnes $CO2^{-e}$.

Council's original target was measured from a limited greenhouse gas emissions profile, which only included emissions Council was directly responsible for generating in undertaking its operations. The proposed new baseline is based on an expanded emissions profile, including emissions that Council is indirectly responsible for generating, via contracted services for the collection and transportation of different waste streams from across the shire. The baseline figure will ultimately be set by Council's Zero Net Emissions Plan when adopted but will also need to be amended over time, as information about other indirect sources of emissions associated with Council operations becomes available and can be included in the greenhouse gas emissions inventory.

The proposed new baseline excludes electricity as a source of greenhouse emissions, as all of Council's electricity is now sourced through a Power Purchase Agreement for 100% renewable energy, the Victorian Energy Collaboration (VECO).

Future annual environment reports will report on emissions reduction from the new baseline when set.

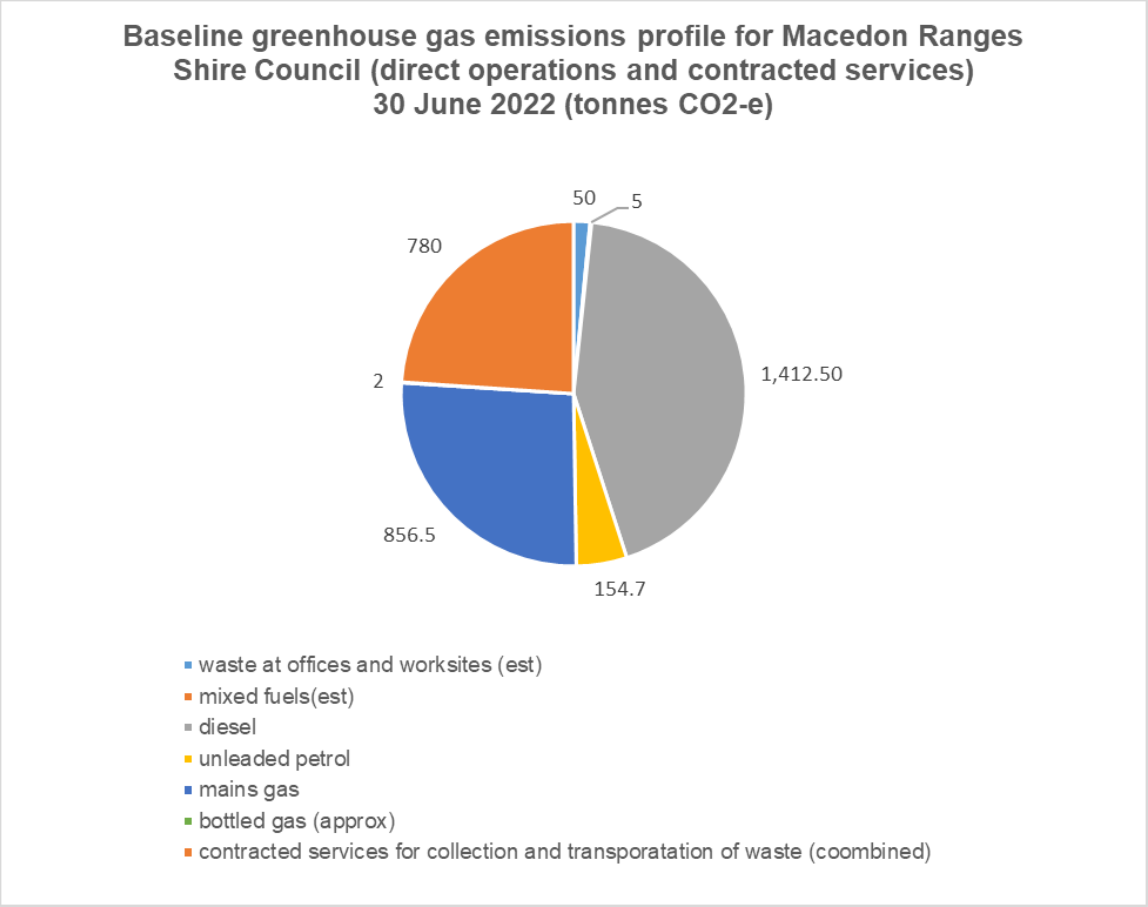


Figure 1: Emissions from Council operations at 30 June 2022 (tonnes $CO2^{-e}$ by source)

1.2 Council emissions from electricity

As noted above, the Victorian Energy Collaboration (VECO) enables Council to source its electricity requirements as 100% renewable energy, effectively meaning that there are no emissions are associated with electricity usage at Council managed facilities.

However, this is not a reason for Council to stop investing in energy efficiency or reducing electricity consumption. Council still needs to pay for electricity, and any costs avoided can be allocated to ongoing investment in assets to improve their environmental performance.

Council can measure progress in improving energy efficiency through its total consumption of electricity. In 2021-2022, Council used approximately 3,312MWh to power its buildings and streetlights, equating to 3,543.8 tonnes $CO2^{-e}$.

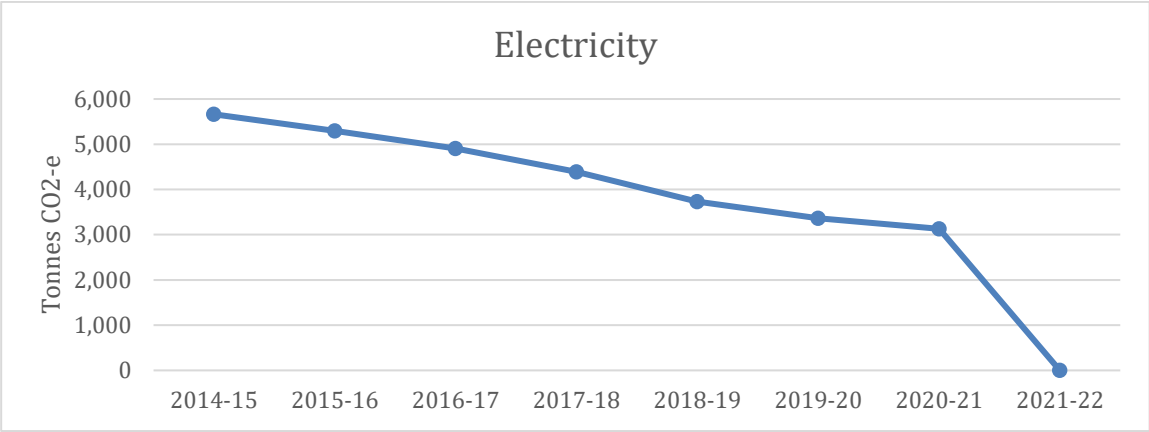


Figure 2: Council emissions from electricity

1.3 Council emissions from fuel

Figure 3 below shows that in 2021-2022, emissions associated with the use of unleaded petrol and diesel for fleet vehicles and heavy vehicles increased from 2020-2021. The use of unleaded petrol and the corresponding amount of greenhouse gas emissions decreased in 2021-2022.

These changes are largely attributable to reduced travel by staff due to pandemic-induced restrictions. The increases in the use of diesel and the corresponding amount of emissions can be attributed to increased use of heavy vehicles for storm recovery works throughout the shire since the June 2021 and October 2021 storm events.

Note: An additional 69.5 tonnes $CO2^{-e}$ is proposed to be included in the new baseline shown in Figure 1, corresponding to emissions associated with the production of unleaded petrol and diesel used by Council in its operations (Scope 3 emissions). This has been omitted from Figure 3 to allow for direct comparison with data from previous years.

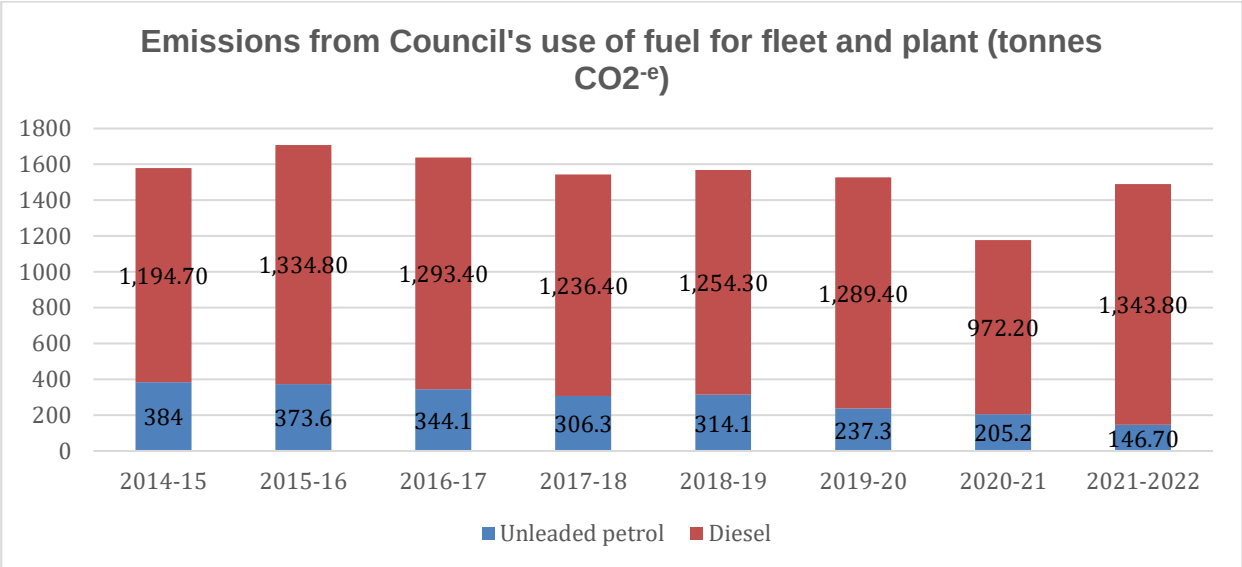


Figure 3: Emissions from Council's use of fuel for fleet and heavy vehicles (plant)

1.4 Council emissions from mains gas and LPG

In 2021-2022, Council's use of mains gas resulted in 794.8 tonnes $CO2^{-e}$ of greenhouse gas emissions. Allowing for an estimated 2 tonnes $CO2^{-e}$ from the use of bottled gas by Council, 796.8 tonnes $CO2^{-e}$ is shown in Figure 4, to enable direct comparison with previous years.

The increase of 17.4% in emissions is likely to be due to Council's high gas use sites (the two aquatic centres) being open more in 2021-2022 than in 2020-2021, reflecting changes in pandemic-induced restrictions.

Note: An additional 61.7 tonnes $CO2^{-e}$ is included in the proposed new baseline shown in Figure 1, corresponding to emissions associated with the transmission of mains gas used by Council in its operations (Scope 3 emissions). This has been omitted from Figure 4 to allow for direct comparison with data from previous years.

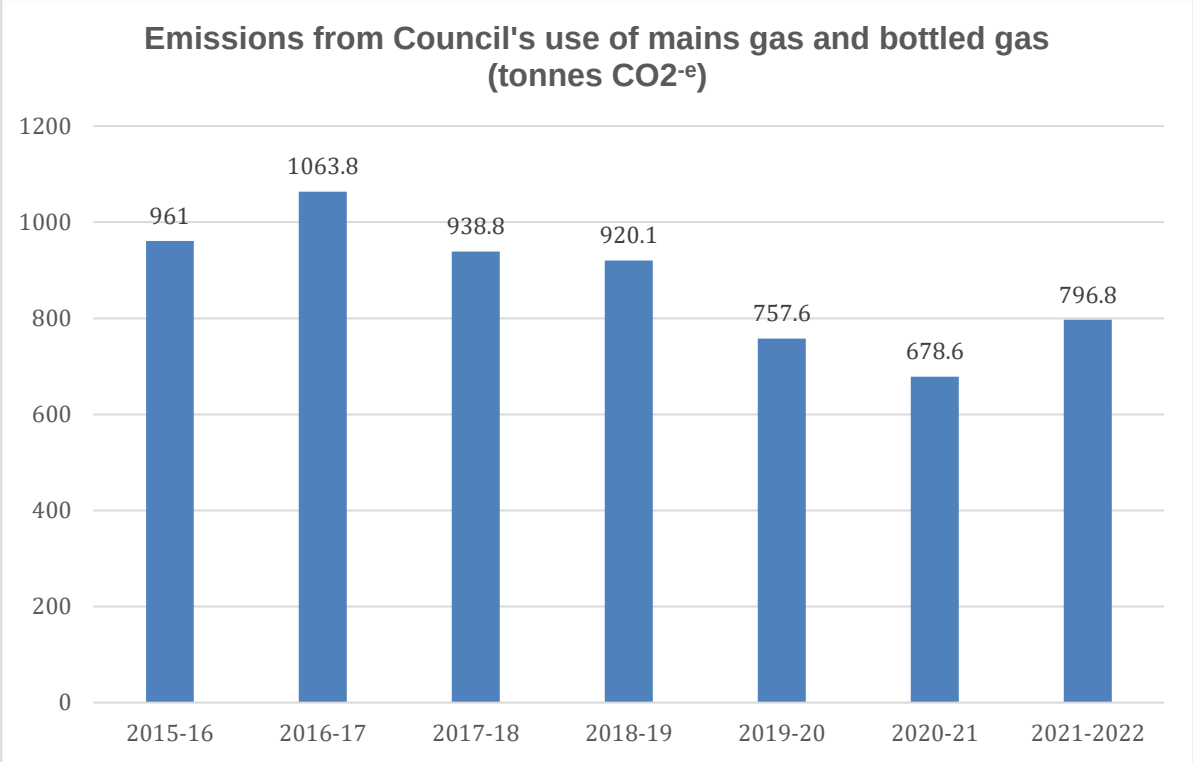


Figure 4: Emissions from Council's use of mains gas and bottled gas (LPG)

1.5 Emissions from collection and transportation of waste streams by contracted services

Council engages contractors to collect and transport various waste streams from across the shire. Council has not reported on this source of emissions in previous years, as it was not included in the original greenhouse gas emissions profile. Emissions associated with these services can be calculated where enough information is provided by contractors about distances travelled, vehicle type, fuel type, and fuel consumption.

Figure 5 below shows emissions based on available information at 30 June 2022. The figures may change in future years (meaning the baseline will change) as reporting and accounting methods are refined.

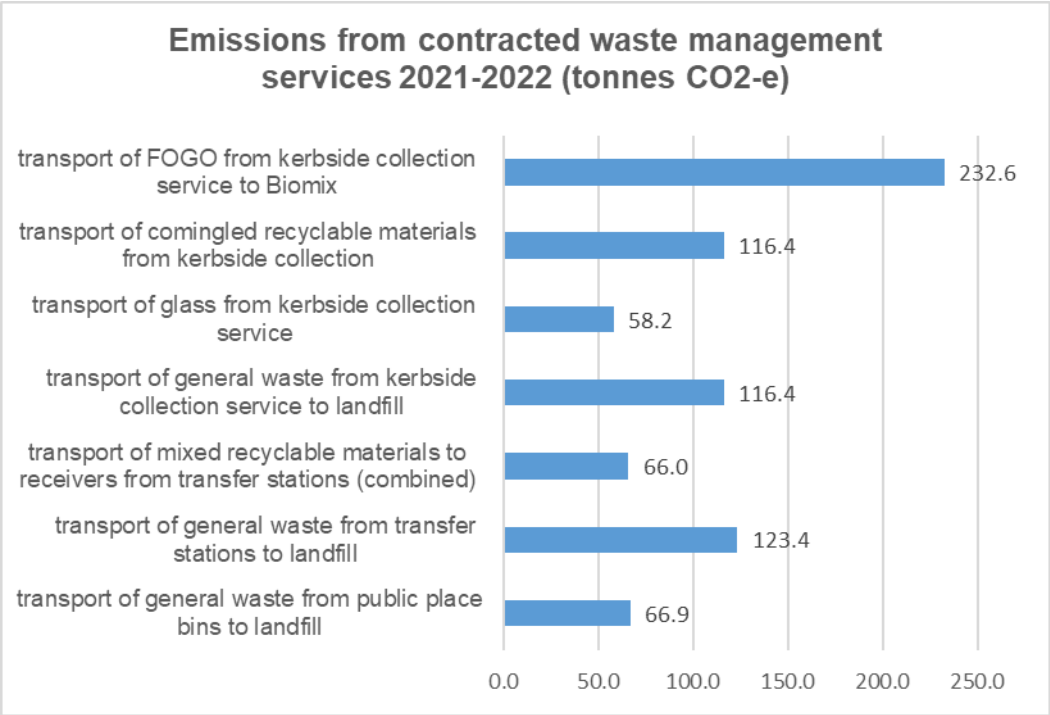


Figure 5: Emissions from waste management services contracted by Council 2021-2022

1.6 Council emissions from kerbside waste

Council currently does not account for emissions associated from the disposal of the four streams of kerbside waste, as the waste is generated by the community and waste management facilities are located outside of the shire. Emissions associated with the collection and transportation of kerbside waste from contracted services commissioned by Council are reported in 1.5 above.

Indicator 2: Greenhouse gas emissions across the shire

2.1 Total community emissions

Snapshot Climate provides the most reliable readily available source of data for emissions from across the shire. This data was compiled by consultants Ironbark Sustainability working with Beyond Zero Emissions for 2019-20 in accordance with the Global Protocol for community-scale greenhouse gas inventories. Data shown is the most recent available and is an update on last year's environment report.

Snapshot Climate estimates that total emissions for Macedon Ranges Shire was 642,000 tonnes $CO2^{-e}$ for 2019-2020. More recent data is not yet available. Figure 6 demonstrates how these community emissions by sector over the past three years.

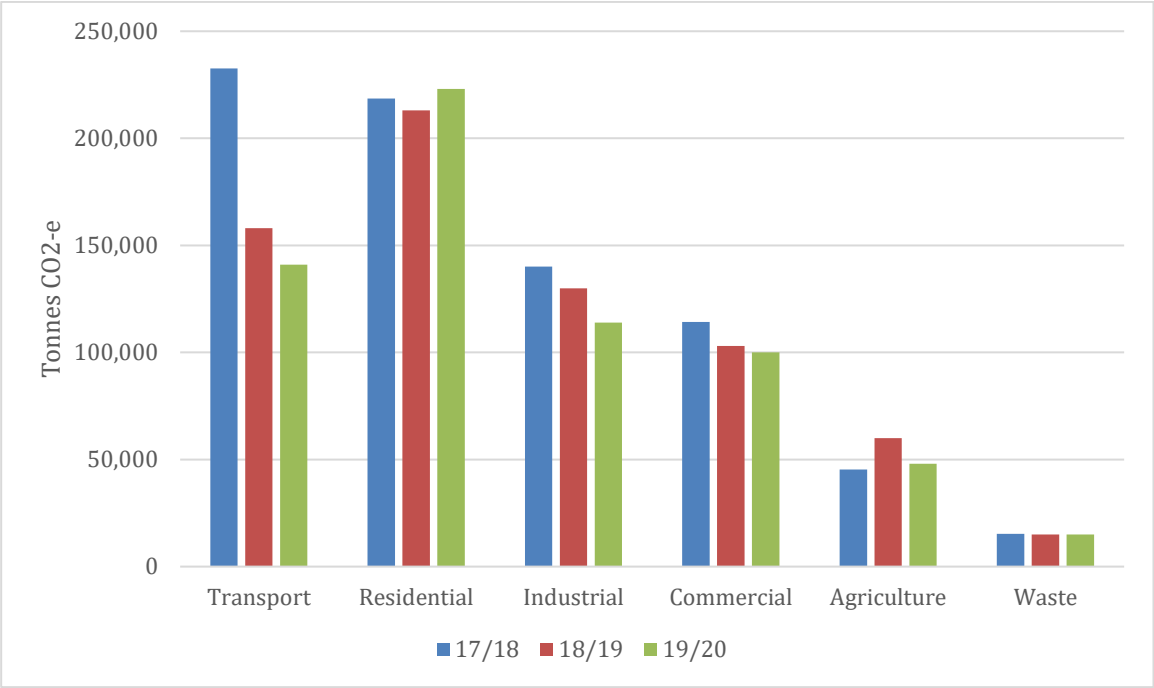


Figure 6: Community emissions by sector 2017-2018 to 2019-2020
Source: snapshotclimate.com.au

2.2 Community emissions from residential uses

For 2019-20, total emissions from the residential sector was 223,000 tonnes $CO2^{-e}$, an increase of 4,385 up from 2017-2018 data – as seen in Figure 6. Figure 7 shows gas use results in 30% of residential emissions.

2.3 Community emissions from commercial and industrial uses

For 2019-20, total emissions from the commercial sector was 100,000 tonnes $CO2^{-e}$, 14,279 tonnes down from 2017-18 emissions. Total emissions from the industrial sector was 114, 000 tonnes $CO2^{-e}$, 26,043 tonnes down from 2017-18 emissions. Together, emissions from the commercial and industrial sectors accounted for 34% of the shire's emissions.

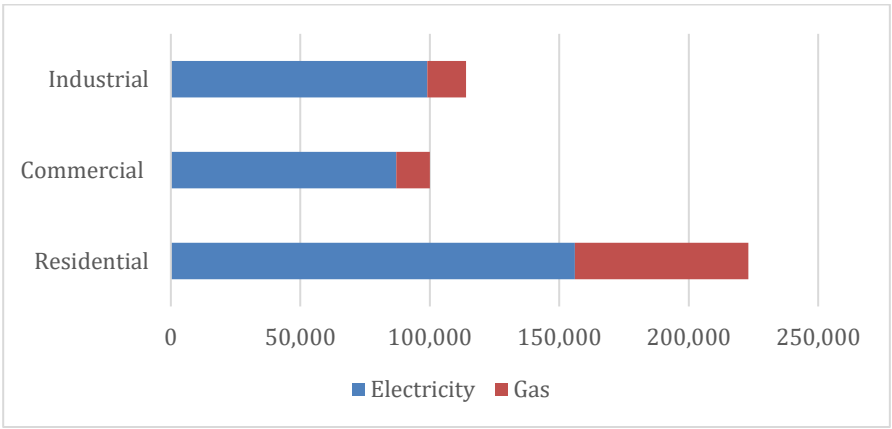


Figure 7: Community emissions by sector and source 2019-2020
Source: snapshotclimate.com.au

2.4 Community emissions from transport

For 2019-20, total emissions from transport was 143,000 tonnes $CO2^{-e}$, an 89,586 tonne reduction on 2017-18 data. This figure accounts for emissions from on-road transport only. The model takes into account travel from vehicles registered within the shire as well as inbound and outbound travel. The reduction in emissions may be due to hybrid work models and change in travel due to COVID-19.

Indicator 3: Extent of the shire's transition to sustainable transport

3.1 Extent of the shire's cycling network (on road)

Council continues to support sustainable transport by improving infrastructure and facilities. In this reporting period, an additional 2km of wide shared pathways were added to support cycle transport, expanding to a total of 10km of on road cycling tracks.

Macedon Ranges Shared Trails Project
Work has progressed on the $11.24 million Macedon Ranges Shared Trails Project that will deliver a 24 kilometre trail for walking, running, low-volume cycling and commuting. The first stage of the trail will extend from Woodend in the north to Riddells Creek in the south. The project is expected to take approximately two years to construct, with completion scheduled for mid-2024. The Macedon Ranges Shared Trails Project is supported by the Victorian Government through the Crisis Committee of Cabinet – Infrastructure Stimulus Fund.

Proposed section for the Macedon Ranges Shared Trail in Macedon.

3.2 Extent of the shire's walking network

In 2021-22, Council maintained 227 kilometres of footpaths and 65 footbridges. This financial year saw the construction of 15.93 km of new footpaths across the Shire.

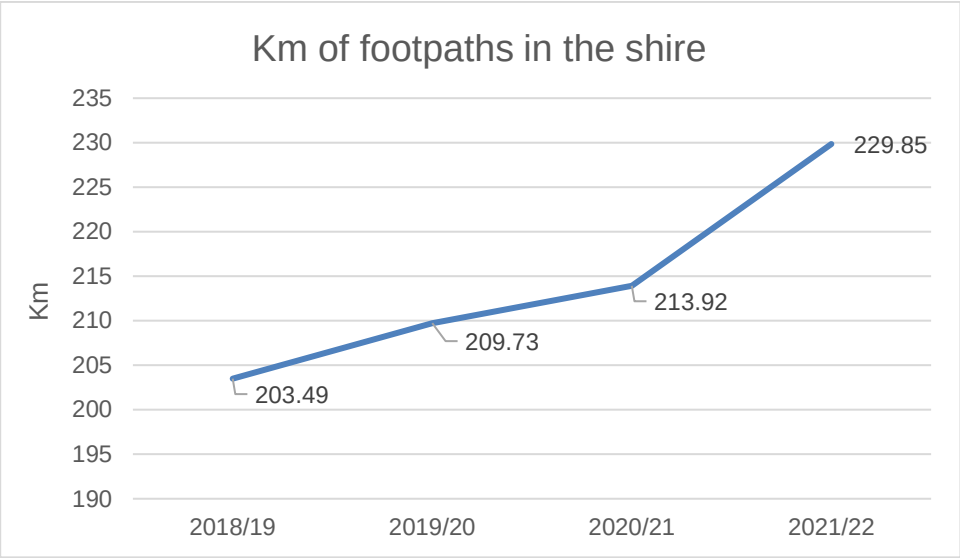


Figure 8: Km of footpaths in the shire

3.3 Number of public electric vehicle charging stations in the shire

Currently, there are two public universal electric vehicle charging stations in the shire. One located in Kyneton and one in Woodend. A third exclusive Tesla charging station is also available for public use in Kyneton.

At time of reporting in September 2022, Council is supporting the installation of three additional public charging stations in Macedon, Kyneton and Lancefield by an infrastructure provider. Council is continuing to seek funding for charging stations in Malmsbury, Romsey, Gisborne and Riddells Creek to ensure regional electric vehicle connectivity.

State Government funding has also been secured for charging stations at all three of Council office locations (Gisborne, Kyneton & Woodend) to assist the commencement of Council's passenger fleet transition.

3.4 Use of public electric vehicle charging stations

The Kyneton electric vehicle charging station data indicates a total energy usage of 11,264 kWh in 2021-22, equating to 18,599 minutes of charging time and a saving of 10,96 tonnes $CO2^{-e}$. The growing usage of the Kyneton charging station over the past 12 months is shown in Figure 9.

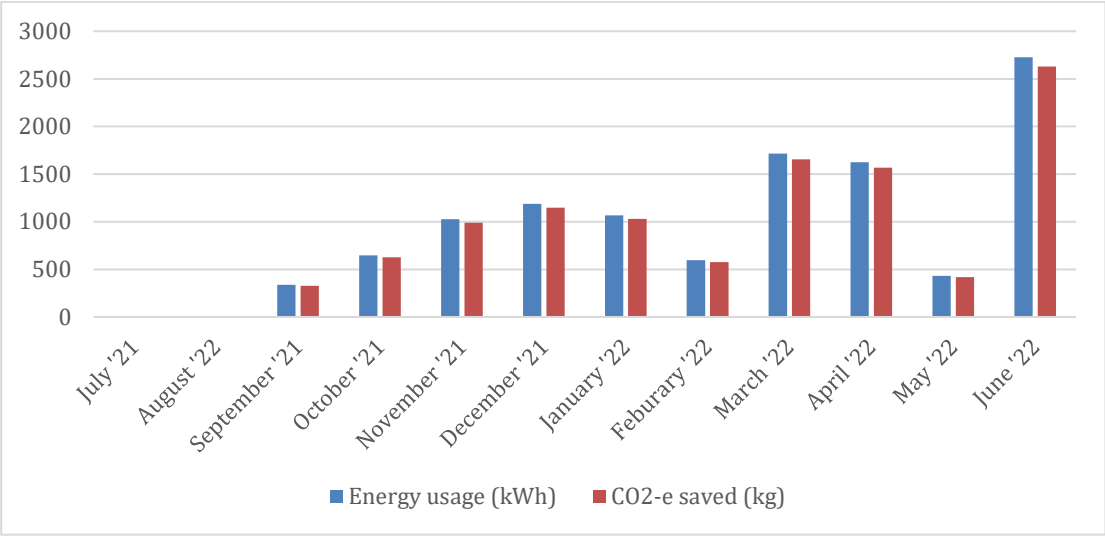


Figure 9: Energy used/ $CO2^{-e}$ saved by Kyneton EV Charging Station

The Woodend electric vehicle charging station data indicates a total energy usage of 6918 kWh in from 2021-22, equating to 10,502 minutes of charging time and 6764 kg saving in in $CO2^{-e}$. Figure 10 shows a decline in use in Woodend in April-June 2022 due to a fault in the station. This has now been rectified.

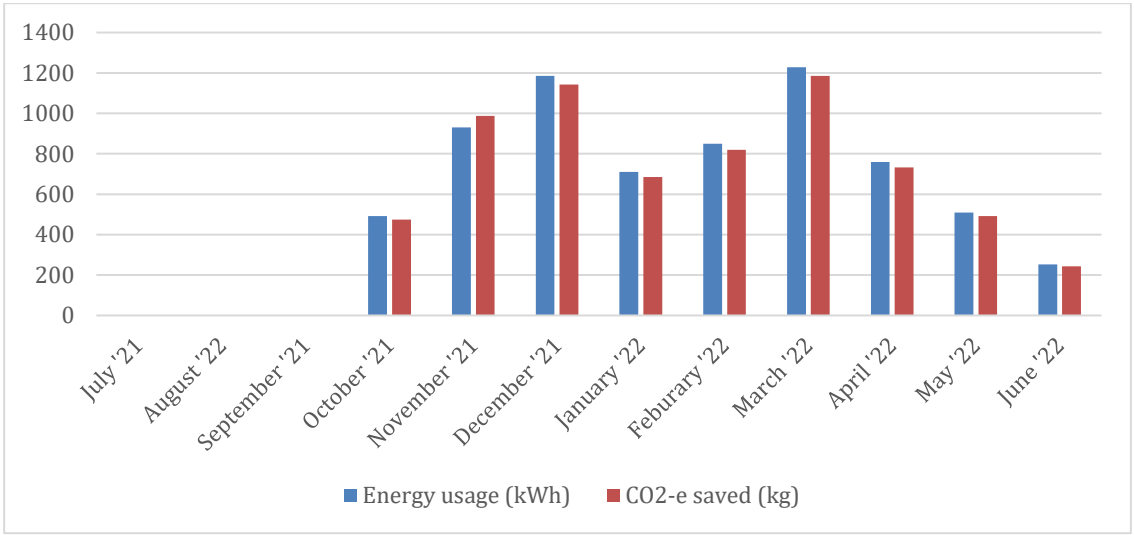


Figure 10: Energy used/ CO2-e saved by Woodend EV Charging Station

3.2 Number of electric vehicles in Council fleet

As of 30 June 2021 there were no electric vehicles in Council's fleet. Council has 20 hybrid vehicles and 1 plug in hybrid vehicle in the fleet.

Indicator 4: Community climate change action

4.1 Number of buildings powered by renewable energy

Roof top solar

According to the Australian Photovoltaic Institute (APVI), at the time of reporting there were 7,364 roof top solar systems within the shire, an increase of 756 new solar system installations since the 2020-21 report.

Residential rooftop solar equates to approximately 32.6% of total available roofs 20,573. This data is for roof top solar systems only and, therefore, does not capture solar arrays installed at ground level such as the system installed at Hardwicks Meatworks in Kyneton.

Table 2: No. roof top solar systems in the shire as of 20 July 2022

Size of solar system	2019-20	2020-21*	2021-22	Increase
Less than 10kW (residential)	4,977	6,131	6,714	583
10kW - 100kW (commercial)	258	474	648	174
Greater than 100kW (commercial)	3	3	2	-1*
Total	**5,238**	**6,608**	**7,364**	**756**

*This figure seems unlikely. It is expected that previous years have been reported incorrectly.

More Australian Solar Homes (MASH)

In 2021-22, solar systems were installed on 14 residential buildings in the shire totaling 97kW and 8 batteries through the not-for-profit solar bulk buy and installation program, MASH.

Table 3: No. roof top solar systems installed by MASH on homes in the shire in past two years

Year	2020/2021	Aug-21	Oct-21	Mar-22	Apr-22	May-22	Jun-22	Whole Program Total
No. homes with solar systems	**64**	3	2	0	3	4	2	**136**
Kw	**294.28**	19.98	13.32	0	16.38	35.88	11.7	**594.7**
No. Batteries	**6**	1	0	1	0	5	1	**14**

Note: Above data only includes active months. Source: MRSG

Community Climate Action Planning - Cool Changes

In 2020-21, Council continued to deliver this community-led, place-based program. Three additional community climate action plans were created for the townships of Romsey & Lancefield, Gisborne and Riddells Creek.

Romsey & Lancefield

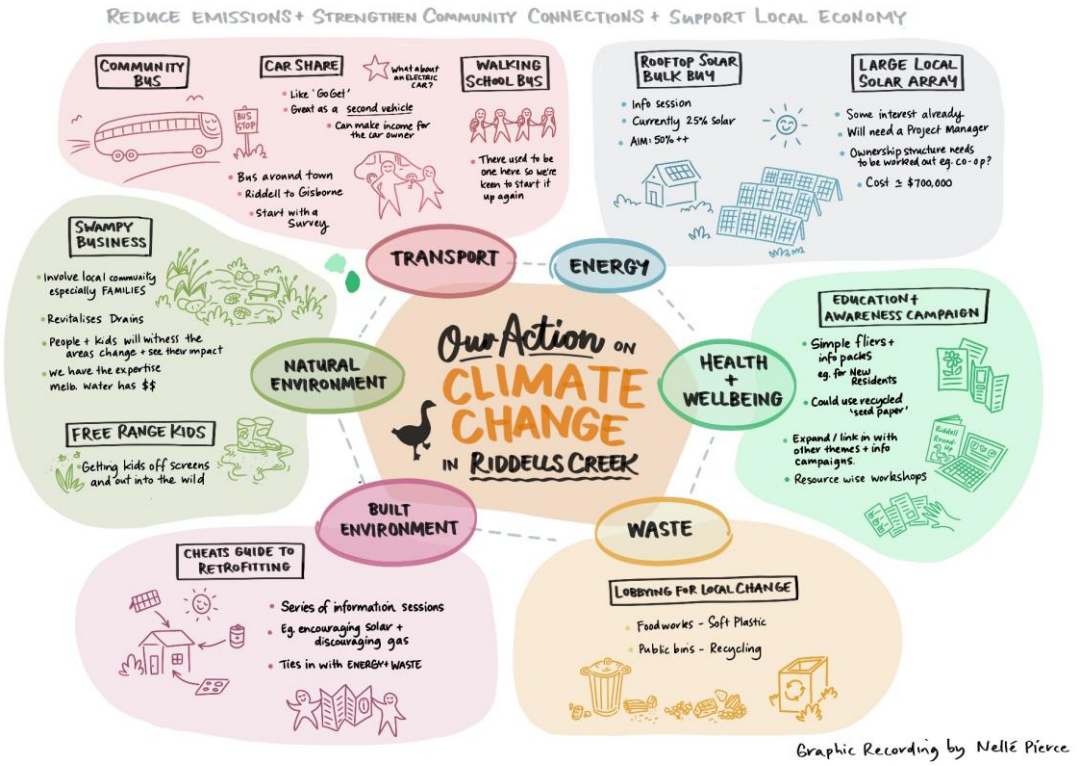
Approximately 25 participants actively engaged in the program. Actions shone a spotlight on grassroots community action groups and discussions centered on supporting them to increase their impact. Both Romsey and Lancefield Neighborhood Houses played an integral role in the program delivery. Since completion, a Gardens for Wildlife and Regenerative Agriculture groups have formed.

Gisborne

Approximately 30 participant actively engaged in the program. Some actions included creating a sustainability focused community hub, providing community-led educational suites for primary and secondary students, net zero emissions on electricity usage by 2039 and “Buy & Shop Local” campaigns.

Riddells Creek

Council partnered with Riddells Creek Neighbourhood House to co-design the program for the community. This had an immensely positive influence on program participation and input with approximately 45 participants. Participants framed the climate action plan around the two principals of *“connected community”, “working together to reduce emissions”*



Actions from the Riddells Creek Climate Action Plan: “This program has reignited my passion and belief in my community” Riddells Creek resident

Actions identified by the Riddells Creek community included home retrofitting workshops, community-owned solar array, provide soft plastic collection, community-led nature connection program for local kids and biodiversity regeneration projects, among others.

Council plans to conduct the Cool Changes program in Kyneton and Macedon/Mt Macedon in late 2022. In addition, the themes and priorities identified in these Community Climate Action Plans will be used in 2023 to shape a shire-wide Climate Emergency Response Plan.

Table 4: Participants engaged with the Cool Changes Program at public events and tailored workshops.

What	When	Where	Attendees
Riddells Creek Farmers Market stall	19-Feb-22	Riddells Creek	~100
RCNH Community Group Expo	25-Mar	Riddells Creek	~100
Cool Changes: Romsey & Lancefield	2-Sept-22	Romsey & Lancefield	25
Cool Changes: Riddells Creek	21-Apr	Riddells Creek	39
Cool Changes: Gisborne	17-May	Gisborne	27

Theme 2: Biodiversity

Highlights

Fauna monitoring

- ✓ Completion of nest-box surveys, Bird Blitz and community spotlighting events.

Flora monitoring

- ✓ Completion of surveys for Clover Glycine at Bald Hill and Black Hill reserves.
- ✓ Completion of the Snow Gum Project that identified that the Macedon Ranges is an 'epicentre for low lying Snow Gums', due to the large number of the trees recorded.

Plans and assessments

- ✓ Completion of Dalton Street Reserve Network Environmental Management Plan.
- ✓ Update of Hanging Rock Reserve Environment Management Plan.
- ✓ Completion of Kangaroo Management Action Plan for Hanging Rock Reserve.
- ✓ Completed an ecological assessment and commenced development of the Woodend Five Mile Creek Master Plan with Woodend Landcare.

Healthy Landscapes – Practical Regenerative Agricultural Communities Program

- ✓ Collaborated with Hepburn Shire, City of Greater Bendigo, Melbourne Water and North Central Catchment Management Authority to continue this popular program for our rural landholders.
- ✓ In the Macedon Ranges, the Healthy Landscapes program saw: 27 property visits; 2 equine farm walks, 1 online discussion group,5 field days/workshops, and a total of approximately 350 participants registered for events.

Conservation Reserves

- ✓ Storm recovery responses and tree hazards works at Hanging Rock, Bald Hill and Ashbourne Road Reserve.
- ✓ Bald Hill Reserve – Community surveys identified an additional 500 Clover Glycine (*Glycine latrobeana*) plants. This represents an increase in the known population of this nationally threatened species by approximately 25%.
- ✓ Completed Malmsbury Common landscape and Djaara cultural planting areas.
- ✓ Improved protection of Barrm Birrm through the installation of gates and signage.
- ✓ Installed a picnic shelter at Bald Hill and completed track upgrades at Black Hill.

Community involvement

- ✓ 22,245 people exposed to the environmental messages as part of the '*A Biodiversity Crisis: Animals and Plants of the Macedon Ranges'* exhibition.
- ✓ 905 participants in our biodiversity related events.
- ✓ Supported the establishment of the Stanley Park Community Asset Committee.
- ✓ Developed a Guide to the Insects of Central Victoria in partnership with Upper Campaspe Landcare Network.

Vegetation protection

- ✓ Developed a Native Vegetation Awareness Campaign to ensure community members are aware of the natural values of the shire and the requirements set out under the planning scheme to protect it.
- ✓ Provided environment responses to 231 planning permit referrals ensuring native vegetation removal is kept to a minimum.

Indicator 1: Biodiversity across the shire

1.1 Presence and abundance of biodiversity indicator species

Biodiversity Monitoring Program

Council's Biodiversity Monitoring Program assesses how Council is tracking against the five objectives in the *Biodiversity Strategy 2018*. Four species are used as indicators of broader ecosystem health – the Brush-tailed Phascogale, Powerful Owl, Greater Glider and the Brown Treecreeper (as part of the temperate Woodland Bird Community).

To monitor these species, Council undertakes the following annual activities:

Monitoring activity	No. sites	Target species
Nest box checks (x144)	48 sites	Brush-tailed Phascogale
Spotlight surveys	16 sites	Brush-tailed Phascogale, Greater Glider and Powerful Owl
Bird Blitz surveys	84 sites	Woodland birds

The monitoring sites have been selected based on a stratification of Council's six biolink areas plus two forest blocks (Wombat and Cobaw state forests). Additional monitoring activities occur on and ad hoc or as needs basis to monitor the presence and population health of specific species.

Birds

On Saturday 23 October 2021 Council coordinated 84 bird surveys across the shire as part of the third annual Bird Blitz event. The event recorded 83 species with greater species diversity observed in the Mount William, Upper Coliban and Cobaw Biolinks, a shown in Figure 11.

Some notable findings were:

- The Crimson Rosella and Australian Magpie were the two most observed species.
- A pair of nesting Bassian Thrush were detected on Mount Macedon. This is the first record of this species on the mount.
- A rare, all-white (leucistic) Grey Currawong was spotted in Lancefield.
- Satin Flycatchers were detected at several sites with few official records of this species prior to our surveys.
- A Brown Quail was also recorded at Mount Gisborne with only 7 official records of this species in the shire

The outcomes of Council's annual Bird Blitz will become more meaningful each year as annual data is able to be compared and trends are able to be observed.

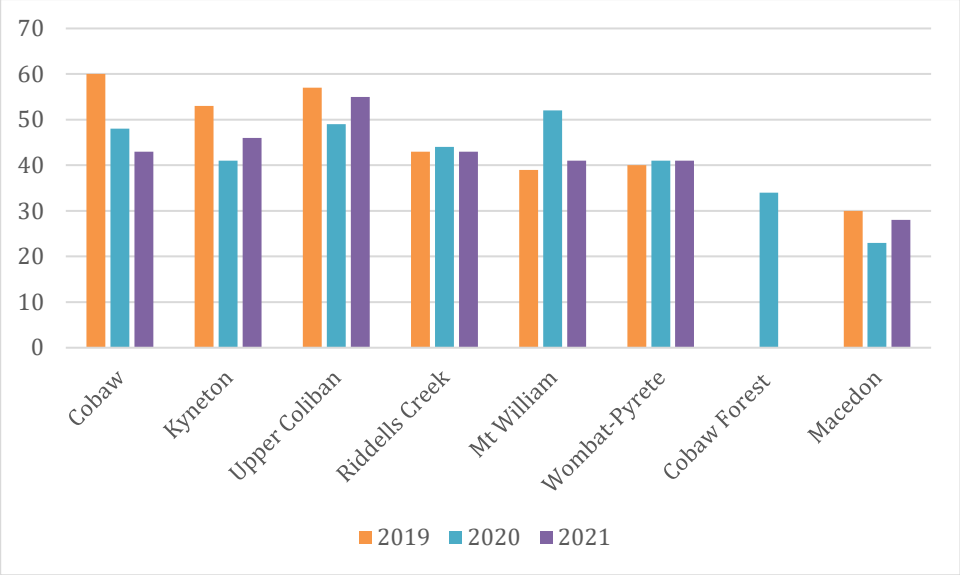


Figure 11: Number of bird species recorded during the annual Bird Blitz events by biolink

Brown-headed Honeyeater was the only member of the Threatened Woodland Bird Community observed in Cobaw, Kyneton Woodlands and Mt William biolinks. These biolinks contain woodland bird habitat, whereas Macedon, Riddell, Wombat Pyrete are forest bird habitat. As Figure 11 indicates, the Upper Coliban Biolink is very diverse in bird species. However, it is lacking in arboreal mammals. Whether this is due to site selection or other factors will be investigated.

Low numbers of introduced bird species were recorded across all biolink areas.

Table 5: Threatened species and introduced birds recorded during 2021 Bird Blitz

Biolink	Threatened Species	Introduced birds
Cobaw	Brown-headed Honeyeater	Common Blackbird, European Starling
Kyneton Woodlands	Brown-headed Honeyeater	-
Macedon	-	Common Blackbird
Mount William	Brown-headed Honeyeater	Common Myna
Riddell	-	Common Blackbird, Common Myna
Upper Coliban	Gang-gang Cockatoo	Common Blackbird, Common Myna
Wombat Pyrete	-	European Starling
Total	2 species	3 species

Sadly there is a newly listed threatened species in our region – the Gang-gang Cockatoo, which is now considered Endangered under the federal Environment Protection and Biodiversity Conservation Act 1999. The Gang-gang Cockatoo is known to occur in the forest areas of the Macedon Ranges and was recorded in the Upper Coliban Biolink during the 2021 Bird Blitz.

Gang-gang Cockatoo, a beautiful and iconic threatened species recorded during the 2021 Bird Blitz

Council's Nest Box and Spotlighting Programs

Nest box monitoring

The 2021-2022 nest box monitoring was restricted to storm affected areas – especially the Cobaws and Wombat-Pyrete Biolinks. This was to assess any storm damage/ loss of nest boxes ready for the return to full survey in 2022-223.

The outcomes of this survey are shown below.

Biolink	No. sites	No of boxes damaged	Occupancy
Cobaw	48 sites	0	Brush-tailed Phascogale
Wombat Pyrete	16 sites	2	

Spotlighting Program

In April 2022, spotlighting surveys in six of our biolink areas counted 108 individuals of 11 species – show in figure 12. Our most common mammal sighting was the Common Ringtail Possum – 57 Ringtails spotted!

Spotlighting surveys also recorded the threatened Brush-tailed Phascogale. The Brush-tailed Phascogale is an indicator of a healthy ecosystem, and is the target species for the Council's nest box program. This shy animal is rarely seen while spotlighting so participants on the Cobaw and Mount William Range Biolink nights were very lucky indeed.

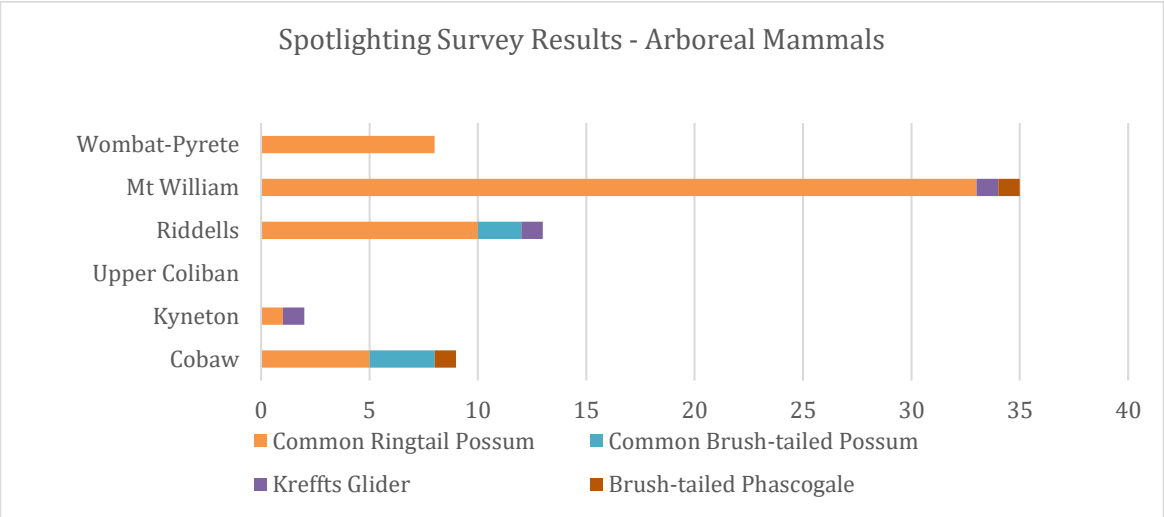


Figure 12: Species and numbers of mammals observed by biolink area

Data added to Victorian Biodiversity Atlas

During the 2021-22 reporting period, there has been little input on the Victorian Biodiversity Atlas for key indicator species in the Macedon Ranges. All the Bird Blitz records from 2022 were uploaded. There was one Brush-tailed Phascogale sighting that has been added to the Victorian Biodiversity Atlas, recorded on the 21st August 2021.

A pair of Ringtail Possums photographed by volunteer and photographer Helen Evans in March 2022 at Bald Hill Reserve, Kyneton.

Snow Gum Project
A Snow Gum monitoring program that harnessed community participation and resulted in an insightful report was made possible by funding received from the DELWP climate adaptation program, ADAPT Loddon Mallee.

Local ecologists, Karl Just and Tim D'Ombrain, in partnership with Newham & District Landcare Group, Baynton–Sidonia Landcare Group and Ashbourne Landcare Group undertook assessments on public and private land to record and map the size, health and location of Snow Gums across the shire.

The resulting report *Assessment of the Distribution, Health and Ecology of Snow Gum populations in the Macedon Ranges* highlights a number of discoveries, including learning that *Eucalyptus pauciflora* is much more resilient and widespread than previously thought. The study found that the Macedon Ranges is an 'epicentre for low lying Snow Gums', due to the large number of the trees recorded in the region.

In addition, 50 community members participated in the project, recording Snow gums on private property and sending their results to contribute to the report. The successful public launch of the report had over fifty community members attend, indicating the value of place based research projects. Furthermore, this project and report has provided a great example and resource for managing eucalypts and other flora and collaborating with the community into the future.

Snow Gum identification workshop participants April 2022.

Indicator 2: Conservation value of Council managed land

2.1 Treated weeds on roadsides

Roadside weed control program

Council continued the vital roadside weed control program. 2021-22 saw a similar number of sites treated as the previous year but a smaller area of weed cover treated overall. This has been the continuous trend over the years - as highlighted in figure 13.

Table 6: Roadside weed control for the past two years

	2020-21	2021-22
Number of Sites treated	182	187
Area Treated (Hectares)	4.7 ha	3.3 ha

The Roadside Weed Program began with a mixture of treatment methods targeting large weed infestation with mainly grooming and spot spraying. Over the years, Council has gradually moved into a maintenance phase with sites predominantly requiring spot spraying.

In alignment with the Roadside Conservation Management Plan, 140 of the allocated sites were prioritised for their medium to very high conservation value. This enables Council to meeting the objectives under the Plan to further enhance and improve biodiversity conservation values on roadsides as well as being a strategic and efficient cost effective approach.

Figure 13: Roadside weed control program since 2014-15

Targeted weeds

Council continued a focus on treating Nasella grass species (Serrated Tussock, Chilean Needle Grass and Texan Needle Grass) with 93 roadside sites identified for treatment. The 2021-22 weed treatment program also targeted specific invasive environmental weeds. Wild Watsonia was treated across 25 council managed roadsides and approximately 4km of roadside.

2.2 Conservation value of bushland and conservation reserves

Council has continued to control and eradicate invasive weeds and monitor and manage indigenous flora in Bushland and Conservation Reserves. Works have included the protection and monitoring of rare and significant flora species, such as Slender Tick Trefoil (*Desmodium varians)* and Clover Glycine (*Glycine latrobeana)* found at Bald Hill Reserve.

Bushland and Conservation Reserve activities undertaken in 2021-22 include:

- **Hobbs Road Reserve** - completed repairs of heavy duty bollards and fencing upgrades to prevent vehicle access and rubbish dumping.
- **Stanley Park Reserve** – replaced boardwalk section at the base of the steps, preventing damage to the waterway and risk of injury to the public.
- **Stanley Park** - Supported the establishment of the Community Asset Committee.
- **Ashbourne Reserve** – negotiated change to maintenance access and associated mowing, protecting a native grassland from vehicle and mowing damage.
- **Magnet Hill Reserve** – Installed rabbit fencing as part of an Integrated Pest Animal project to protect remnant scoria cone vegetation.
- **Black Hill** - 1.8km of tracks were repaired at Black Hill Reserve during 2021-22. Works included the installation of two metal boardwalk sections, granite rock walling of pipe ends, replacement and installation of new pipes, and installation and compaction of 500 tonnes of road base quarry material. Taungurung Land and Waters Council were engaged during the project development and contributed significantly to the scope of works.
- **Malmsbury Common** - completed the landscape and Djaara cultural planting areas, increasing flora diversity in the reserve and education of environment and culturally significant plants.
- **Barrm Birrm** - improved protection of significant flora and tracks through the installation of gates and signage which has reduced or eliminated vehicle damage.
- **Hanging Rock Reserve** – completed woody weed control programs across the reserve, completed stage 1 of erosion control on the summit, mapped rabbit warrens and completed fumigation program along Smokers Creek and the Racecourse Grassland and expanded the tree protection areas throughout the recreation zone utilizing logs and mulch from the storm damage.
- **Bald Hill** – Commenced stage 2 of the master plan including installation of a picnic shelter.

In the 2021-2022, flora surveys were completed across 32 fixed monitoring plots in Black Hill, Bald Hill and Mt Gisborne. Fixed monitoring plots provide an opportunity to closely monitor incremental changes overtime, forming a longitudinal data set, which will inform adaptive management of the bushland reserve assets. These will complement the existing fauna monitoring to increase our understanding of how environments are changing.

There were a number of flora discoveries during the 2020-2021 flora monitoring program:

Black Hill Reserve

- Overall weed populations appear to be stable except for Sweet Vernal (*Anthoxanthum odoratum*), which is expanding its presence. This is most likely due to the increased rainfall, which may have a climate change influence. This is concerning as it is a perennial grassy weed that impacts the growth of other species. Long term this is likely to have an impact on species abundance and diversity.
- South African Weed Orchid (*Disa bracteata*) has also established a presence in two new locations (in and adjacent to survey plots).
- Wood-rush (*Luzula meridionalis*), a small charismatic native rush, has increased in multiple locations.
- Targeted Gorse control (*Ulex europaeus*) work has achieved a significant reduction in populations of this classified weed species.

Bald Hill Reserve

- Bald Hill Reserve has had 8 plots surveyed for the 2nd year in a row with support from Friends of Bald Hill Reserve volunteers.
- Slender Tick Trefoil (*Desmodium varians*), considered rare, was identified in 2019 to have an extensive population on the Bald Hill northern aspect of the volcanic outcrop. This is thought to be the largest population in the shire. The survey in 2021 identified one specimen (found by a community survey volunteer) on the Granitic outcrops. This is a very significant find as it suggested the species is more adaptable to varying soil types and the population may be larger than first thought.
- Lots of kangaroo disturbance (grazing and scats) was observed in multiple plots and the north east corner (granitic soils) had extensive digging disturbance by echidnas. This indicates very healthy populations in the area.
- Both Wattle Mat-rush's (*Lomandra filiformis)* subspecies were identified in 2020; with the additional *Lomandra. nana* found in 2021.
- The volume of the Gorse (*Ulex europaeus*) population has been reduced as a result of multiple years of treatment.
- Sweet Vernal (*Anthoxanthum odoratum*) appears to be expanding its presence in most plots. This is most likely due to the increased rainfall, which may have a climate influence. This is concerning as it's a perennial grassy weed that impacts on the potential growth of other native species.

Mt Gisborne Reserve

- Mt Gisborne Reserve has had 6 plots surveyed for the 2nd time in 2021, continuing to establish a baseline to inform future changes.
- Serrated Tussock (*Nassella trichotoma*) has been treated extensively in the past but only a small presence was identified in one plot.
- Kangaroo grazing appears to be having a minimal impact with extensive rain is supporting continuous growth of native grasses further restricting the presence of Capeweed (*Arctotheca calendula*)

Bullengarook Capping / Tip Site

- The site remains dominated by indigenous species: exotic plants only made up 26% of the recorded cover at the site. Indigenous plants made up 30%, while the

remainder was mostly cryptogams (mosses, lichens, algae etc) at about 33%, with just 10% being leaf litter.
- The only significant change since the 2020 survey is a decline in the coverage of Wallaby Grass (*Rytidosperma spp*.). This, however, is matched by an increase in the cover of cryptogams and the native Common Bog-sedge (*Schoenus apogon*). Spring 2021 was wet and cool which has probably affected foliage growth in all these species and categories.
- Two Wallaby Grass species were identified: *Rytidosperma pilosum* and *R. setaceum*. These are both common, widespread grasses and probably most of the Wallaby Grass on the site is of these two species.
- The only Spear Grass species at the site was identified as *Austrostipa rudis*, also a common and widespread species.

Woodend Grassland

- Woodend Grassland has now been surveyed for 5 years and will be rested to enable surveying of other areas. A follow up survey will be initiated in 2025 to make comparison with the baseline and assess change over that period.

Hanging Rock Reserve

The Hanging Rock Racecourse Grassland assessment in 2021 found that all three plots were in similar condition to spring 2020.

- A notable difference was that Sweet Vernal-grass (**Anthoxanthum odoratum*) had a lower cover in all plots, particularly in Plot 1 (60% cover in 2020 compared to 5% in 2021). The reason for this is not entirely clear, as the total rainfall between the two years between January and September was very similar. It could possibly be explained by the timing of the rainfall, for example April 2021 was well below average (15mm compared to 58mm average).
- Heavy kangaroo grazing within the control sites is depleting native grass cover, particularly Kangaroo Grass (*Themeda triandra*). Within the plots, Kangaroo Grass and other native grasses have significantly declined in vigour due to the accumulation of dense leaf litter and thatch, which has also excluded most of the of native forbs and small shrubs.
- It is therefore recommended that the fenced plots are subject to an ecological burn in the next six months to reduce biomass and stimulate the growth of inter-tussock forbs. This will then allow comparison between heavily grazed and unburnt sites (the controls) and those subject to fencing and ecological burning.

For the remainder of the racecourse site, additional measures should be investigated such as:

- Excluding kangaroos entirely for 6-8 months of the year, or only allowing a small number to inhabit the site across the whole year.
- Permanent exclusion from the entire site may have some benefits, but the grass cover would then have to be burnt regularly (every 2-3 years) to reduce fire risk and prevent dense thatch accumulation and senescing of grass tussocks.
- Creation of larger exclusion fences (e.g. one hectare) which can then be subject to regular burning (every 3-5 years).

Table 7: Summary of weed impacts in Bushland Reserves

Reserve	Increase	Decline
Black Hill Reserve	Sweet Vernal South African Weed Orchid	Blackberry Capeweed Gorse
Bald Hill Reserve	Sweet Vernal	Hawthorn Briar Rose Gorse South African Weed Orchid
Mt Gisborne Reserve		Serrated Tussock Capeweed

2.3 Ecological and cultural burns completed

Completion of a 2.1ha planned ecological burn at Malmsbury Common Reserve in collaboration with Bushland Contractor and Malmsbury CFA.

Council's Bushland Reserves Officer presented 'Local Government Ecological Burning' Webinar to increase awareness and education of ecological burning as a land management tool to manage biodiversity.

Indicator 3: Community involvement in conservation

3.1 Participation in land management workshops

In 2021-2022 Council continued to deliver the *Healthy Landscapes – Practical Regenerative Agricultural Communities* program in collaboration with Hepburn Shire, the City of Greater Bendigo, Melbourne Water and North Central Catchment Management Authority.

In 2021-2022, the Healthy Landscapes program:

- ✓ Delivered 36 events including;
  - eleven conducted as part of the holistic grazing management course
  - six with the local farmer series
  - four with the grass identification series
  - three conducted for the small property grazing course and
  - twelve other events
- ➢ Registered 1551 participants for events representing over 900 individual properties.
- ➢ Engaged over 875 participants directly with the program events.
- ➢ 780 views of the webinar recordings.
- ➢ Responded to 91 property visit requests, with demand almost double the capacity of the program.
- ➢ Subscribed 800+ follows to the newsletter

Table 8: Engagement activities for Healthy Landscapes Program within the Macedon Ranges

Target	Delivered
20 property visits	27 property visits
4 discussion group	2 equine farm walk - 30 participants 1 online discussion group - 6 participants
2 field days	5 field days/workshops - 114 participants
Courses	30 properties
Total participation	~350 registered for events

3.2 Attendance at biodiversity events

In 2021-22 Council focused on broadening face-to-face engagement, working with School groups and citizens science activities. In total, 905 participants took part in Council's biodiversity focused events in 2021-22.

Table 9: Biodiversity focused events 2021-22

What	When	Where	Attendees
Biodiversity in Crisis – Scouts visit	08-Feb-22	Kyneton Museum	17
Biodiversity in Crisis – Scouts visit	28-Feb-22	Kyneton Museum	18
Landcare and friends meet and greet	04-Mar-22	Kyneton Museum	31
Habitat Education	17-Mar-22	Macedon PS	30
SWIFFT seminar: nature at home and in my landscape	24-Mar-22	Online	~200
Habitat Education	24-Mar-22	Macedon PS	30
Creatures of the night spotlighting surveys	29-Mar-22	Bullengarook	10
Creatures of the night spotlighting surveys	31-Mar-22	Cobaw	9
Biodiversity in Crisis – Schools visits	01-Apr-22	Kyneton Museum	84
Creatures of the night spotlighting surveys	05-Apr-22	Kyneton	12
Kids Teaching Kids - Nestbox's	05-Apr-22	Hesket PS	20
Creatures of the night spotlighting surveys	07-Apr-22	Lauriston	16
Snow Gum Citizen Science event	10-Apr-22	Newham	23
Creatures of the night spotlighting surveys	12-Apr-22	Riddells Creek	14
Creatures of the night spotlighting surveys	14-Apr-22	Mt William	15
Biodiversity Exhibition holiday program	19-Apr-22	Kyneton Museum	21
Rabbit Control Workshop – Gisborne	04-May-22	Gisborne	43

Rabbit Control Workshop – Lancefield	05-May-22	Lancefield	32
Jocks Gully Biolink Planting event	07-May-22	Ashbourne	40
UL Daly Reserve walk	10-May-22	Daly Reserve	26
Bald Hill - Sacred Heart Secondary	12-May-22	Bald Hill	9
Macedon Ranges PS- nestbox walk	12-May-22	Macedon	26
Pipers Creek Landcare AGM	14-May-22	Ashbourne	22
Jocks Gully Biolink Planting event	14-May-22	Ashbourne	20
Newham PS- biodiversity presentation	01-Jun-22	Newham PS	55
Friends of Baldhill Reserve meeting	04-Jun-22	Bald Hill	12
Snow Gum Project presentation	17-Jun-22	Newham Hall	50
Nature Stewards Graduation	18-Jun-22	Melton Botanic Gardens	20

Biodiversity in Crisis Exhibition

1319 visitors attended the engaging Biodiversity in Crisis exhibition at Kyneton Museum from 1 October 2021 to 24 of April 2022. During the exhibition, the environment unit delivered guided education sessions and holiday programs to scout groups, school groups and families In addition, the associated touring program entitled ‘On the Prowl’ were rotated through four different venues around the shire (Gisborne Library, Woodend Library, Romsey Library, Kyneton Visitor Information Centre) and viewed by an estimated 20,895 people. This resulted in a combined total of 22,245 people exposed to the environmental messages contained in the project ‘A Biodiversity Crisis: Animals and Plants of the Macedon Ranges’.

Kyneton Museum Biodiversity in Crisis Exhibit

Nature Stewards

Council celebrated the graduation of the second Nature Stewards group, whereby Council partnered with the City of Melton and Hume City Council to deliver the program to twenty participants, seven of which reside in Macedon Ranges, in environmental leadership. Initially Macedon Ranges had 13 enrolments, but due to COVID, a number of participants were unable to commit to the program.

Nature Stewards participants from the cities of Hume and Melton and the Shire of Macedon Ranges 2022.

3.3 Health and activity of Landcare and Friends Groups

Each year Landcare and Friends groups fill out a “health check” survey if they apply for funding from their relevant Catchment Management Authority. In 2021-22, 9 out of 23 groups applied for funding and, therefore, completed the “health check” survey – the results of which are sown in figure 14.

Feedback is that many groups may have decided not to apply for funding due to the difficulty in conducting working bees and meetings as a result of pandemic induced restrictions. However, of the groups that did apply, they responded that their group was “moving forward” or “thriving”.

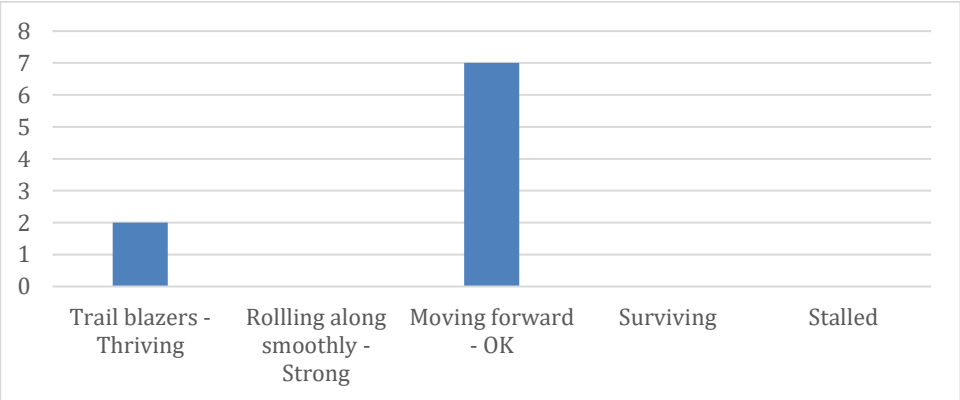


Figure 14: 2021-22 Landcare Group Health Check

Source: Melbourne Water and North Central Catchment Management Authority

Guide to the Insects of Central Victoria

In 2020-21 Council partnered with the Upper Campaspe Landcare Network to develop a new Guide to the Insects of Central Victoria. This handy booklet is in the same format as Council's flora, weeds and bird guides, and features over 220 local insect species in full colour.

The Upper Campaspe Landcare Network led the project to develop the guide, with partners Wombat Forestcare and local councils including Macedon Ranges Shire Council. The guide features insects that are likely to be observed in local gardens and nearby bushland – with a surprising number of native bee species, moths and native flies.

The guide is available at Council offices and on the Council website (https://www.mrsc.vic.gov.au/Live-Work/Environment/Animals-of-the-Macedon-Ranges/Insects) and is being distributed by Landcare groups.

Theme 3: Water

Highlights

- ✓ Councils new waterway restoration program, in partnership with Melbourne Water, delivered significant weed control and revegetation along Council-managed waterways within the Shire.
- ✓ The Healthy Coliban Catchment project achieved 11 new On-Ground Works Agreements and installing 6.6km of fencing, 13 off-stream systems, 27ha of woody weed control and 3.8ha of revegetation.
- ✓ Large scale woody weed removal along Jacksons Creek and Bunjil Creek in Gisborne, Deep Creek in Darraweit Guim, and Five Mile Creek in Romsey as part of Melbourne Waters capital works program.

Indicator 1: Water consumption from Council operations

1.1 Consumption of potable water

Council used 55,805 kL of potable water in 2021-2022, approximately 13,095kL (or 19%) less than the volume of potable water used in 2020-2021, possibly reflecting reduced services and use of facilities due to pandemic-induced restrictions. However, the decrease in the volume of potable water used was not consistent in the north and south of the shire, as shown in Figure 15.

1.2 Consumption of recycled water

In 2021-2022, Council used 55,920kL of recycled water, sourced from Greater Western Water's waste water treatment plant for sports grounds and open space. As shown in Figure 15, this volume is comparable to the 58,008 kL of recycled water used by Council in 2022-2021.

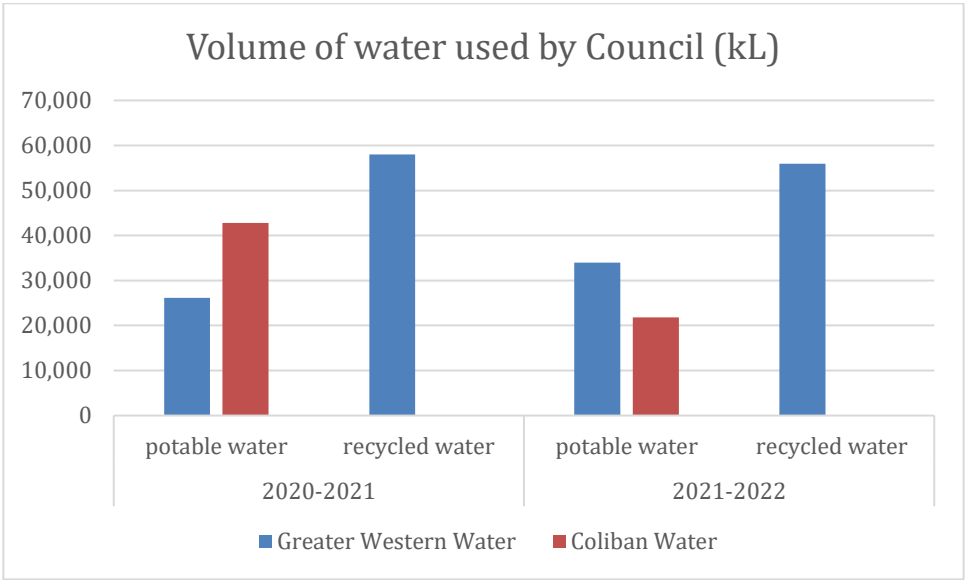


Figure 15: Volume and source of water used by Council from 2020 - 2022

Indicator 2: Extent of waterway restoration works conducted

Restoring vital waterways across the shire has been a focus for Council, our partner organisations and community groups over the past twelve months.

Working in partnership with Melbourne Water, extensive weed control and revegetation is occurring along Jacksons Creek and Bunjil Creek in Gisborne, Deep Creek in Darraweit Guim, and Five Mile Creek in Romsey. Smaller waterway reserves are receiving attention too, such as Riddells Creek in Macedon, Monument Creek in Rochford and Dry Creek in Riddells Creek.

To the north of the shire, Council is working closely with community groups and the North Central Catchment Management Authority (NCCMA) to undertake planning and works along the Campaspe River in Kyneton and Five Mile Creek in Woodend.

In addition, the Healthy Coliban Catchment Project focuses on the health of the Coliban River and its tributaries upstream of Malmsbury Reservoir. Led by Coliban Water, the NCCMA and Dja Dja Wurrung Clans Aboriginal Corporation, the project has achieved 11 new On-Ground Works Agreements and installing 6.6km of fencing, 13 off-stream systems, 27ha of woody weed control and 3.8ha of revegetation. Council supports this project through representation on the project reference group and through the delivery of the Healthy Landscapes program.

2.1 Weed control

In 2021-2022 Council delivered weed control programs on 5 waterway reserves as guided by the Environmental Works Plans for Waterways - Port Phillip & Westernport catchments. High threat weeds including Blackberry, Broom, Gorse, Willow's and Boneseed have been targeted and will be follow up over the next two years.

Table 10: Weed control conducted along Council managed waterway reserves in 2021-22

Waterway	Reserve	Locality	Comments
Jacksons Creek	Jacksons Creek A, B, C & D	Gisborne	Elm, Pine, Willow, Poplar & Blackberry removal. Melbourne Water Capital Works Program
Jacksons Creek	Rotary Park Waterway Reserve	Gisborne	Blackberry, Pine, Broom, Elm, Agapanthus & Ivy
Bunjil Creek	Bunjil Creek Waterway Reserve 05, 08, 09 & 10	Gisborne	Blackberry, Willow, Broom, Serrated Tussock, Hemlock and pasture grasses
Howey Creek	Howey Creek 3 & 4	Gisborne	Blackberry, Gorse & Broom removal program
Marram Bulok Creek	Dalton Street Reserve	Gisborne	Broom, Gorse, Bluebell Creeper & Blackberry control program
Riddell's Creek & Railway Creek	Tony Clarke Reserve 1 & 2	Macedon	Blackberry, Gorse, Boneseed, Willow, Hawthorn, Pine & Broom control program
Deep Creek	3 Chain Road Waterway Reserve	Newham	Blackberry, Broom & Gorse control program

Dry Creek	Kathryn Court Waterway Reserve	Riddells Creek	Blackberry, Gorse, Boneseed, Willow, Hawthorn, Pine & Broom control program
Monument Creek	Pascall's Lane Waterway Reserve	Rochford	Blackberry & Broom control program.
Monument Creek	Monument Creek Waterway Reserve	Rochford	Elm, Broom & Blackberry control program
Romsey Five Mile Creek	Romsey Five Mile Creek Reserve	Romsey	Willow, Blackberry & Pine removal Melbourne Water Capital Works Program
Riddells Creek tributary	Bruce St No 3	Macedon	Blackberry, Broom & Pittosporum removal program.

2.2 Revegetation

The major revegetation project completed in 2021-22 was along Romsey Five Mile Creek and Jackson's Creek in Gisborne with co-funding by Melbourne Water Capital Works Program.

Table 11: Revegetation conducted along Council managed waterway reserves

Waterway	Locality	No. plants	Comments
Smokers Creek	Hanging Rock Reserve	250	Funded by DELWP as per EMP action
Deep Creek	Darraweit Guim	2000	Melbourne Water Capital Works Program
Jacksons Creek	Jacksons Creek A, B, C & D	21,887	Gisborne (Melbourne Water) Capital Works Program
Romsey Five Mile Creek	Romsey	10,500	Melbourne Water Capital Works Program

Indicator 3: Waterway quality in local creeks and rivers

3.1 Water quality for the Upper Maribyrnong catchment

Environmental water quality objectives developed in the State Environment Protection Policy (SEPP Waters) are used to evaluate monitoring results. The Victorian Environmental Protection Authority (EPA) developed a Water Quality Index (WQI) based on SEPP Waters which amalgamates the multiple measures of water quality together in a single index.

The following charts show the water quality index (WQI) score for the monitoring in the Deep Creek Upper Catchment and Barringo Creek, Macedon. This data shows an overall improvement in water quality at both monitoring station over time.

This following data is from Melbourne Water. It is the most up to date data available.

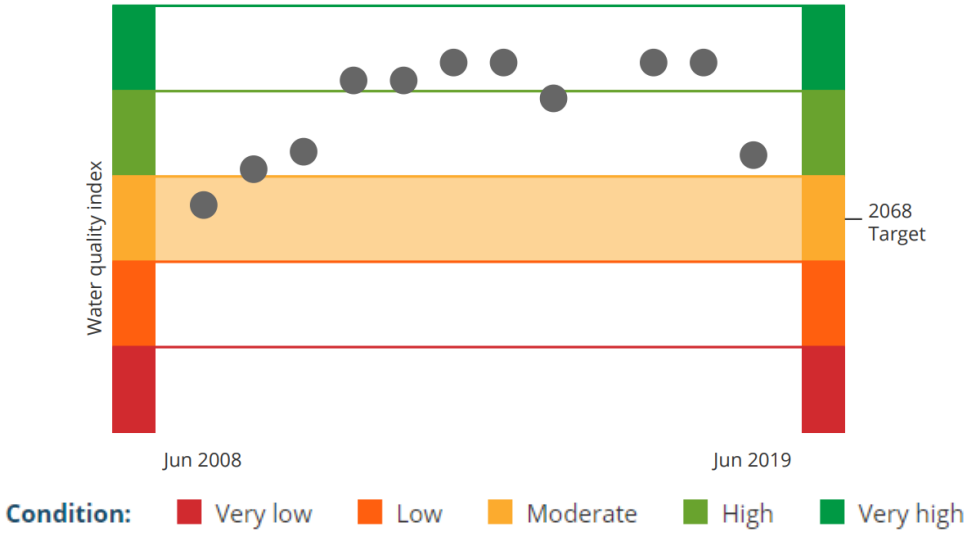


Figure 16: Water Quality Index scores for Barringo Creek at Wooling Road, Macedon
Source: Melbourne Water, https://healthywaterways.com.au/waterway-conditions/water-quality

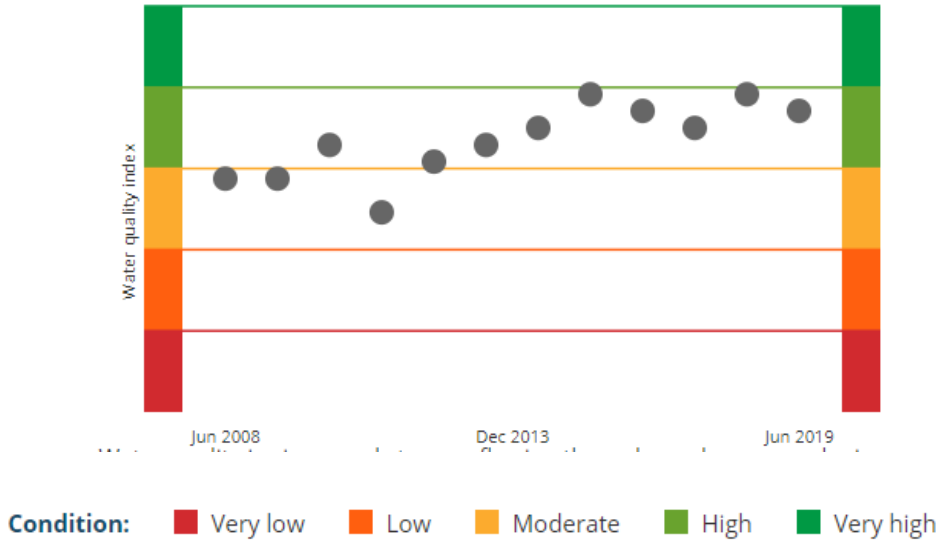


Figure 17: Water Quality Index scores for Deep Creek at Kennedy's Lane, Romsey
Source: Melbourne Water, https://healthywaterways.com.au/waterway-conditions/water-quality#monitoring

3.2 Storm water quality

In 2021-22 Council maintained 282 kilometres of storm water pipes with 10,373 storm water pits in a sustainable and efficient manner.

To improve storm water quality, harvesting is a key performance objective outlined in the Healthy Waterways Strategy. The objective aim is for every hectare of new impervious area harvest 5ML/y, which equates to 169 ML over the life of the Strategy.

Planning has continued for a large-scale stormwater-harvesting scheme, an Integrated Water Management (IWM) project being led by Macedon Ranges Shire Council. Melbourne Water have initiated planning and investigation in this priority area (Source: Healthy Waterways).

Further information will be available when preparation of a shire-wide Storm Water Management Strategy that assesses the quality of storm water entering local creeks and rivers and identifies priority locations for different types of treatments and interventions.

3.3 Water quality for waterways in the North Central catchment

The River Health Snapshot report 2021, *A Healthy Coliban Catchment Citizen Science Project*, provides data on river and waterway health in the North Central Catchment area. In the first few years of the Healthy Coliban Catchment Project, volunteers have been establishing a baseline dataset to help to monitor change in the catchment over time.

Results indicate waterway health in the upper reaches of the Coliban catchment have good water quality and waterbug ratings. Results vary among waterways, but overall catchment and waterway health declines further downstream.

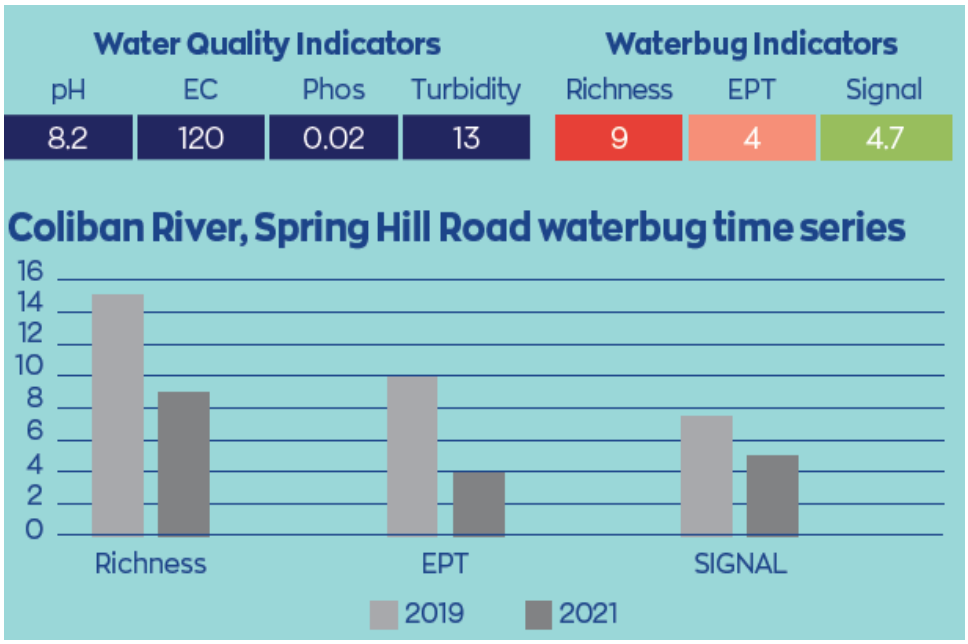


Figure 18: Coliban River, Spring Hill Road. Excellent water quality results were recorded at this site for all four parameters**.**

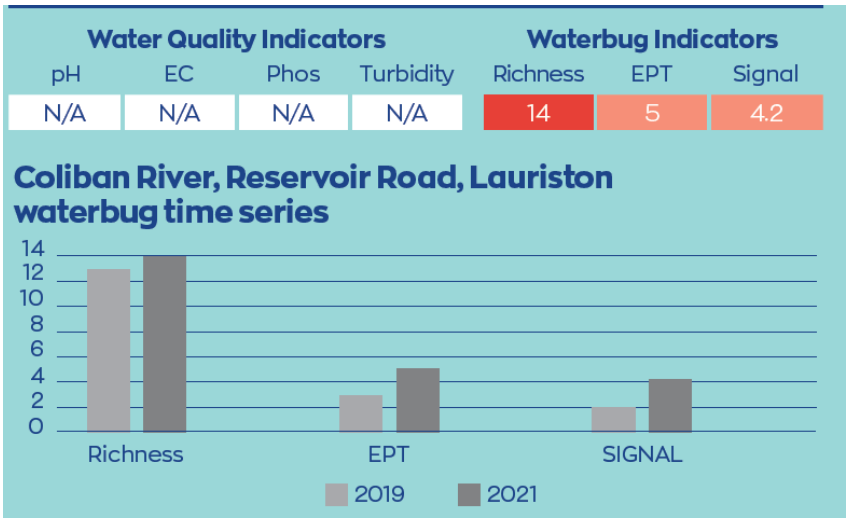


Figure 19: Coliban River, Reservoir Road. Insufficient water quality data was collected for this site during the reporting period.

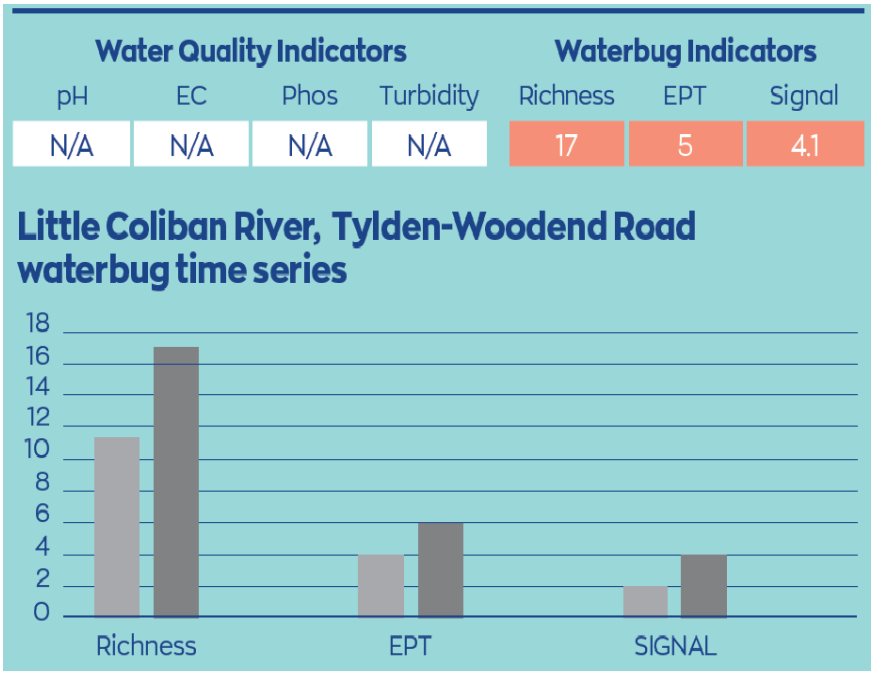


Figure 20: Little Coliban River, Tylden-Woodend Road. Insufficient water quality data was collected for the site during the reporting period.

Source: North Central Catchment Management Authority 2022

Note: restrictions due to the COVID-19 pandemic saw limited opportunities for water quality monitors to collect data during the reporting period.

Theme 4: Waste

Highlights

- ✓ Completed roll-out of a four bin kerbside collection service.
- ✓ Completion of a Towards Zero Single-use Plastics Action Plan.
- ✓ Delivered several waste education programs that reached of 500 participants.
- ✓ Significant reduction in household items received at our transfer station.

Indicator 1: Waste diverted from landfill in the community

1.1 Waste received at transfer stations

Total waste received at transfer stations

In 2020-21 8,834 tonnes of waste (combined weight of nine waste streams) was received at Councils transfer stations. For several waste streams, there was a higher amount of materials deposited at transfer stations during 2021-22 compared to 2020-21, particularly in regards to garden waste, paper and cardboard, and aluminium and steel. There was, however, significant reductions in recycled materials and household items such as e-waste, mattresses and tyres.

Waste transferred to landfill

Waste diverted from landfill from transfer stations in 2021-22 increased slightly in total, compared with 2020-21 figures, although the percentage of diverted waste remained stable at 28%.

Glass and E-waste

The level of glass deposited at transfer stations was lower than the previous reporting period, which is possibly due to behaviour change and uptake usage of the glass disposal bins at all serviced properties, implemented during 2020-21 reporting period.

Table 12 shows that the amount of e-waste deposited at transfer stations during 2021-22 has continued to decrease, likely given it has not been accepted at landfill sites since 1 July 2019. This may be due to both improved recycling services by industry and improved practices by residents.

1.2 Sales at Kyneton Tip Shop

Sales at the Kyneton Tip Shop in 2021-2022 were comparable with 2020-21, however lower than previous years. Sales in the past two years could be a result of intermittent closures of the tip shop due to pandemic induced restrictions. Council has commenced plans to establish a tip shop at the Romsey Transfer Station, and the shop is expected to be operational by July 2023.

Table 12: Waste received at Transfer Stations

Waste stream	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	*Unit*
Paper and cardboard	224.6	235.5	319.88	220.68	256.84	278.99	*tonnes*
Aluminium and steel	1,135.30	1609.55	1,709.56	1,683.90	1,729.00	1959.44	*tonnes*
Comingled recycling	107.8	135.53	149.6	122.1	83.92	79.314	*tonnes*
e-waste	86.5	103.1	118.84	146.26	105.35	87.82	*tonnes*
Glass	unknown	unknown	unknown	197.56	166.96	142.32	*tonnes*
Garden Waste	unknown	24,273	22,605	34,186	38,512	39411	*cubic meters*
Oil	18,500	16,900	22,200	13,800	20,550	24,052	*litres*
Tyres	1,391	1,065	1,102	1,821	3,046	2005	*number*
Mattresses	1,183	1,423	1,447	1,861	2,583	2447	*number*
Total diverted from landfill	1,553.93	2,083.68	2,297.88	2,566.92	2,342.00	2,547.88	*tonnes*
% diverted from landfill	24.40%	32.60%	37.80%	44.80%	28.80%	28.80%	*%*
Total disposed of in landfilled	4,812.30	4,314.06	3,789.00	3,162.81	5,789.64	6,286.09	*tonnes*
Total (all items) (excludes green waste)	**6,366.23**	**6,397.74**	**6,086.88**	**5,729.73**	**8,131.64**	**8,833.97**	***tonnes***

Table 13: Sales from Kyneton Tip Shop

Category	2020-21		2021-22	
	Qty	Revenue ($)	Qty	Revenue ($)
Bicycles	**79**	$437	76	$650
Books	**2**	$4	1	$2
DVDs & CDs	**35**	$303	21	$192
Electrical	**58**	$377	48	$290
Furniture	**48**	$515	72	$755
Lawn Mowers	**4**	$31	5	$52
Miscellaneous	**108**	$658	185	$1257
Steel	**169**	$1,366	100	$878
Toys	**6**	$28	2	$4
Revenue (inc GST)		**$4,090.90**		**$4,080.00**

Table 14: Waste from kerb side collections

Waste stream	2016-2017		2017-2018		2018-2019		2019-2020		2020-21		2021-22	
	Total weight (tonnes)	Weight / serviced property (kg)	Total weight (tonnes)	Weight / serviced property (kg)	Total weight (tonnes)	Weight / serviced property (kg)	Total weight (tonnes)	Weight / serviced property (kg)	Total weight (tonnes)	Weight / serviced property (kg)	Total weight (tonnes)	Weight / serviced property (kg)
General waste	9,180	505	8,983	481	9,222	484	8,351	428	7,170	345	6366	316
Green waste / FOGO	3,275	325	3,033	279	2,969	267	5,259	365	8,505	586	10816	534
Re-cyclable materials	4,251	234	4,261	228	4,509	237	3,503	180	2,716	132	2875	142
Glass							832	43	1,903	92	1955	96
Total	**16,705**	**1,064**	**16,277**	**988**	**16,701**	**988**	**17,945**	**1,016**	**20,293**	**1,155**	**22,012**	**1,087**

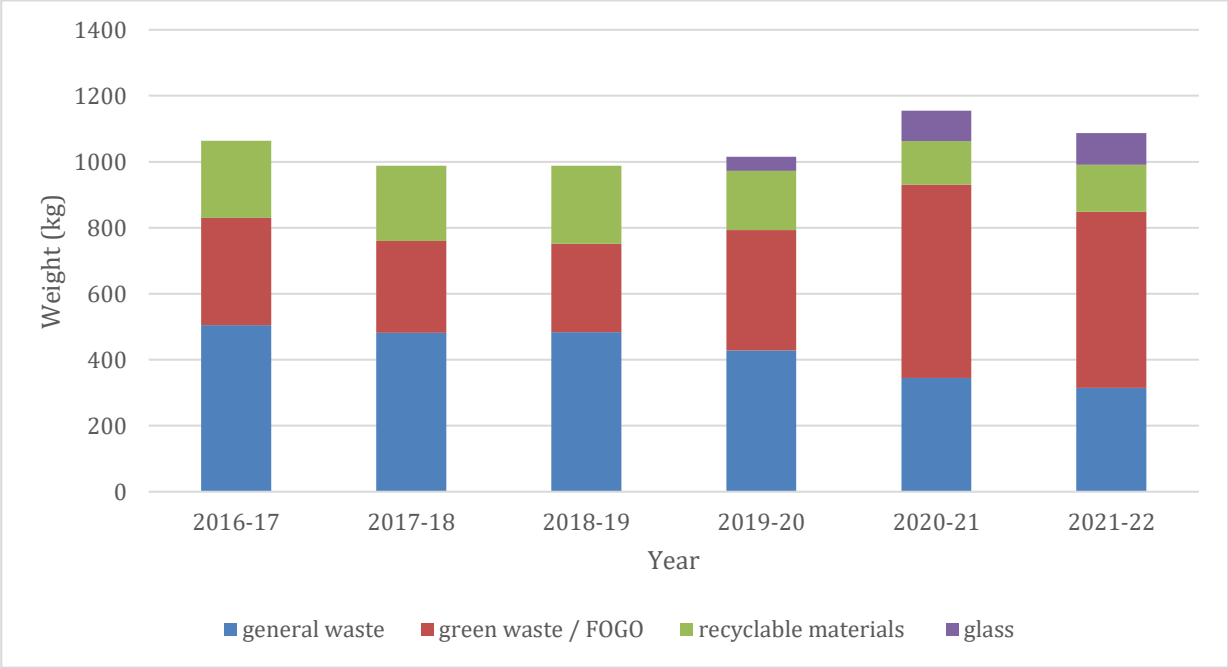


Figure 21: Kerbside waste collected from 2016-2017 to 2021-2022 by waste stream.
Note: 5222 rural properties were brought into FOGO in 2021-22, which is roughly 25% of the municipality.

1.3 Waste from public places and events

Not available. Currently Council's waste contractors are not required to report on waste collected from public places or sports facilities. This may change for 2022-23.

Indicator 2: Resource efficiency within Council operations

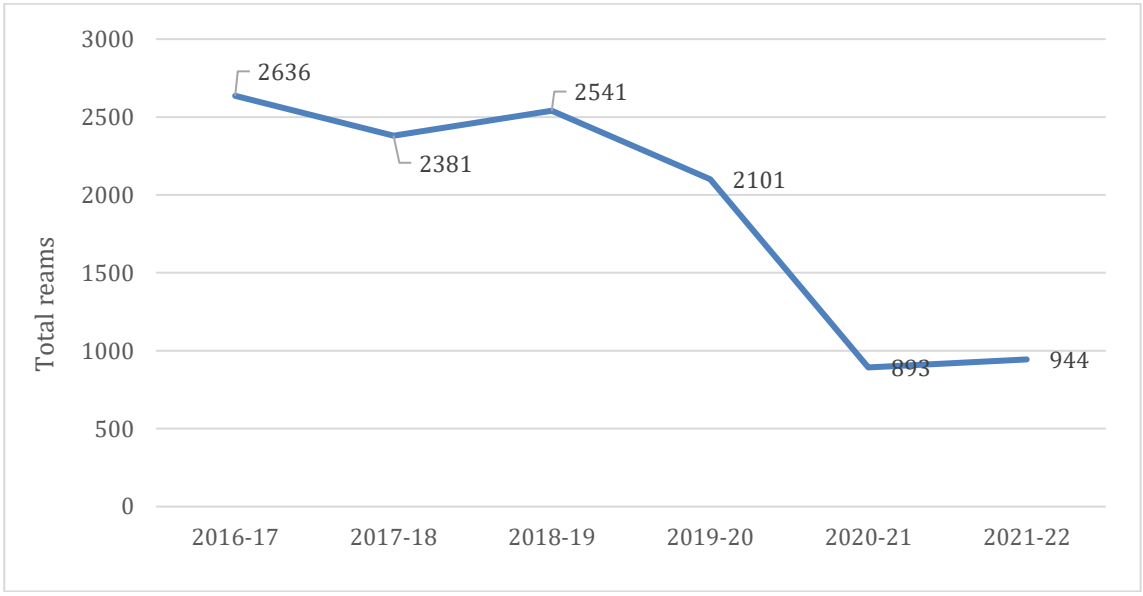
2.1 Waste collected from Council facilities

Not available. Waste from Council facilities is collected as a part of Council's general kerbside collection service and is not separated. This means that data for waste from Council facilities is currently not available. Council will aim to conduct audits of worksites to determine the volumes of waste generated at council facilities.

2.2 Paper use

In 2022 Council's paper use increased by 6% on the previous year. This includes all A4, A3 and coloured paper. This is likely to be attributable to the increase of staff returning to work from the office and increase in customer activity due to less pandemic related restrictions.

Figure 22: Council paper use



Indicator 3: Community engagement with waste education

3.1 Number of waste education events hosted by Council

COVID-19 has continued to impact face-to-face events and education sessions. However, the Waste Team have managed to increase their activity and engagement significantly.

Table 15: Waste Education Events 2020-21

What	When	Where	Attendees
Waste Education Session	14 July	Gisborne Secondary School	40
Council stall and presentation at the Community Expo	26 March	Riddells Creek Neighbourhood house	20
Waste education session – Kerby visit and mini bin demo	31 March and 1 April	Macedon Kindergarten	60
Waste education session - Kerby visit and mini bin demo	7 April	Kyneton Kindergarten	70
Waste education session- Presentation	26 May	Riddell Creel Primary school	60-70
Waste education session- Presentation	31 May – 4 sessions	Macedon Primary School	100-120
Waste education session – Audit and Q&A session	7 June	Gisborne Primary School	40
Waste education session – Kerby visit and mini bin demo	14 and 15 June	Macedon Ranges Montessori Preschool	60
Waste education session – Kerby visit and mini bin demo	21 June	Rothschild Rd Kinder	30

3.2 Use of the Wash Against Waste Trailer

The Wash Against Waste trailer is regularly used at the monthly Woodend Community Farmers' Market for the past year. Unfortunately, the dishwasher has been in repair for the past three months. Council is working with the Macedon ranges sustainability group to get the trailer back into action as there is increased community interest.

Going forward, use of the Wash against Waste trailer has a growing demand with several bookings in the Macedon Ranges in the year ahead.

WASH AGAINST WASTE is a joint venture of Macedon Ranges Sustainability Group and Macedon Ranges Shire Council.

2021 Storm Recovery - Environment Response

2021-22 Storm Events

The Macedon Ranges Shire and parts of Victoria endured a severe storm event on June 9 and 10, 2021. Prior to the weather event, weeks of unseasonal rainfall resulted in a very wet soil profile, with the root system of trees becoming saturated and potentially unstable. The event resulted in wide spread devastation to our forest environments and single standing trees. Impacted townships included Carlsruhe, Newham, Woodend, Trentham, Macedon and Mt Macedon.

Unfortunately the Macedon Ranges endured two more storm and flood events in November of 2021 and January 2022. Fortunately, these were not so severe, with a smaller number of residents impacted.

Ashbourne Road following the 10 June 2022 Storm

As part of recovery, the Storm Recovery Team contacted over 1400 MRSC residents to determine the extent of the storm impacts and their recovery needs. The Environment Unit have actively supported residents with environment recovery, responded to the damages caused in Bushland reserves and along roadsides, and also assisted with the Storm Recovery Habitat Kit Project.

DELWP Storm Recovery Habitat Kit Project

This project, funded by DELWP, saw fifty storm-effected residents received a Storm Recovery Habitat Kit with a further 20 residents receive a selection of free plants. Each Kit contained a box of native plants and two nest boxes made from recycled storm timber. A great partnership was developed with Woodend Men's Shed who built the 100 nest boxes using reclaimed pine timber from the storm. Most of the recipients attended a workshop on environment storm recovery topics to increase understanding of local fauna and flora, habitat restoration and the installation and use of nest boxes.

Romsey Storm Recovery Site

The Romsey Wood Processing Site recycled fallen trees from Council managed roadsides. Wood products were created and shared throughout Victoria. These products included fence posts for residents, fire wood, mulch, and tree stakes. The site is managed in partnership with Council and Bushfire Recovery Victoria. The market value of the products produced from Romsey has been estimated at a total of $27,542,731.

Table 16: Storm Recovery Recycled Timber Products

Product	Size	Market Value	Quantity Delivered	total value
Fence Posts	125 x 125 x 2.4	$ 44.50	10,204	$ 454,078.00
Corner Posts	200 x 200 x 2.4	$ 127.50	693	$ 88,357.50
Droppers	50 x 40 x 1.1	$ 2.75	6576	$ 18,084.00
Fence Rails	150 x 50 x 2.4-7	$ 30.06	690	$ 20,741.40
Tree stakes	40 x 40 1.8	$ 4.10	18,300	$ 75,030.00
Log Seats	800 dia x 2- 3M	$ 119.00	30	$ 3,570.00
Sleeepers	200 x 75 x 2.4	$ 33.45	3,480	$ 116,406.00
Bollards	125 x 125 x 1.6	$ 44.50	485	$ 21,582.50
Timber slabs	600 x 50 x 2M	$ 100.00	292	$ 29,200.00
Bird box kits	Assorted kit sizes	$ 28.99	32	$ 927.68
Mulch	1M M/3	$ 79.00	300,000	$ 23,700,000.00
Random logs	300-600 x 3-5M	$ 100.00	80	$ 8,000.00
Root balls & Hollow logs	202 truck loads	$ 100.00	1100	$ 110,000.00
Kindilings Bags	20 kg	$ 19.98	2,300	$ 45,954.00
Saw Dust Bags	1M M/3	$ 150.00	472	$ 70,800.00
Firewood	2m	$ 400.00	6,950	$ 2,780,000.00

Bushland and Conservation Reserves Storm Recovery
Following the June storm, twenty-one Bushland and Conservations Reserves required tree works to mitigate risk and reinstate access tracks. Works focused primarily on access tracks and high target potential areas. To protect the natural values of the conservation areas, the environment response aimed to retain large logs, restrict the use of machinery to avoid excessive disturbance and damage to understory vegetation, and remove tree heads only (where access could be facilitated).

The post storm works provided a great insight in the benefit of proactive tree works in the protecting environmental assets and reduced cost from storm impacts. The Black Hill storm damage response provides an indicator of financial benefit and reduced risk from proactive tree works. Black Hill and Bald Hill are relatively close in distance size. Black Hill had approximately 400 tree hazards mitigated in 2020. Bald Hill had no works undertaken. Post storm, Black Hill had 15 trees down on tracks and 15 hazards identified by an assessor which required work. Bald Hill had 20 trees identified as hazardous and over 130 requiring works before the reserve could be opened again. Black Hill was opened after 2 weeks, Bald Hill required months of works and 4 times the budget allocation.

Hanging Rock Reserve Storm Recovery
Hanging Rock Reserve was severely impacted by the storms on 11 June and 29 October 2021, with over 100+ large trees lost and many badly damaged due to these two weather events. Where possible all trees were left in situ to provide cover and niches for regenerating plants. The mulch was spread across bare areas and extra logs were used to define the pedestrian and conservation areas on the summit walk and enhance the tree protection areas throughout the reserve.

The storm recovery planting program was focused on the areas with the most severe damage throughout Central Forest and Smokers Creek. In total 4,100 trees, shrubs and grasses where planted throughout the core conservation zones increasing biodiversity and soil stability while the site recovered. This also minimised the soil erosion in the following months of heavy rain events and provided a physical barrier to reduce the creation of informal paths through sensitive areas.

Hanging Rock Central Forest in June 2021 (left) and July 2022 (right)

As evidenced in the Central Valley at Hanging Rock, many indigenous colonizing plant species have taken up the space and thrived post storms. This is a positive indicator of recovery and shows the resilience of the natural environment.

Roadsides Storm Recovery

The storm event had a huge impact on roadsides across the Shire. Soil disturbance and loss of understorey from recovery efforts to remove fallen and dangerous trees has resulted in a loss of biodiversity. Consequently roadsides vegetation has reduced conservation values with significant impacts to native animals and plants. In response, Councils Environment Unit and Arborist Team worked together to retain and distribute habitat logs on roadsides.

Following the storm events, there was a rise in the illegal collection of firewood on roadsides which raised concerns for further loss of roadside habitat and public safety. In response, signage was installed along high value roadsides across the shire with associated media release to highlight the importance of fallen timber on roadsides.

Soil disturbance and loss of understory plants as a result of storm recovery works on roadsides.

Long term impacts of the storm may include erosion, weed invasion and habitat connectivity. Over 51 very high to medium value conservation roadsides have been identified requiring restoration works across the shire including Trentham East, Ashbourne, Riddells Creek, Lauriston and Hesket.