

LITTER PREVENTION STRATEGY FOR GEORGES RIVER CATCHMENT

FINAL

PREPARED BY CIVILLE
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Georges River Litter Prevention Strategy

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1 INTRODUCTION

The Georges River Litter Prevention Strategy provides strategic directions for Georges Riverkeeper to tackle litter prevention in partnership with its members and other stakeholders in the catchment.

Civille has been engaged by Georges Riverkeeper to prepare the Georges River Litter Prevention Strategy, a high-level strategy that participating organisations can use as a starting point to reduce littering in public places in the Georges River catchment to contribute to the state government targets of a 30% reduction in plastic litter by 2025 and 60% reduction in litter by 2030.

This Litter Prevention Strategy presents the where and how to tackle litter, a business case for litter prevention in the Georges River catchment, strategic directions for Georges Riverkeeper and its members, and options for monitoring and evaluation.

The Georges River catchment is shown in Figure 1. This also shows the council areas in the catchment. Six councils covering the majority of the catchment area (Campbelltown, Canterbury-Bankstown, Fairfield, Georges River, Liverpool and Sutherland) are all actively participating in the development of the Georges River Litter Prevention Strategy. They have provided information for this report and attended three Project Reference Group meetings in July, September, and November 2022.

The Georges River Litter Prevention Strategy has also been informed by consultation with Georges Riverkeeper staff, site visits to local litter hotspots, and review of relevant publications.

This document includes the following:

- Section 2 presents background information on litter

and litter prevention in the NSW context.

- Section 3 describes where to tackle litter, including information on where litter comes from, where it is typically found and what types of litter are most common.
- Section 4 describes how to tackle litter, including information on what is currently being done about litter, what has been tried in the past and opportunities to tackle litter more effectively.
- Section 5 makes a high-level case for investing in litter prevention.
- Section 6 examines who can play a role in litter prevention and considers the drivers for different organisations to get involved.
- Section 8 presents Georges Riverkeeper's vision and goals for litter prevention.
- Section 9 presents strategic directions for litter prevention in the catchment.
- Section 10 presents options for monitoring and evaluation.

Georges Riverkeeper intends to follow up on this strategy by completing a 'litter prevention roadmap', which will flesh out the strategic directions and monitoring and evaluation framework into a more specific action plan for the next five years.



Georges River catchment

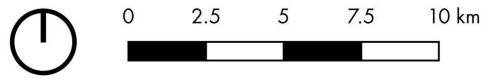


Figure 1: Georges River catchment and council area boundaries

2 BACKGROUND

In NSW, there is established legislation, guidance, policy direction and a state-wide strategic plan for litter prevention.

2.1 A DEFINITION OF LITTER

Litter is refuse, debris or rubbish deposited in a place. It is defined in NSW legislation (section 144A of the Protection of the Environment Operations Act 1997) as:

- a) *“any solid or liquid domestic or commercial refuse, debris or rubbish including any glass, metal, cigarette butts, paper, fabric, wood, food, abandoned vehicles, abandoned vehicle parts, construction or demolition material, garden remnants and clippings, soil, sand or rocks, deposited in or on a place, whether or not it has any value when or after being deposited in or on the place; and*
- b) *“any other material, substance or thing deposited in or on a place if its size, shape, nature or volume makes the place where it has been deposited disorderly or detrimentally affects the proper use of that place.”*

While this definition of litter is very broad, the Georges River Litter Prevention Strategy is focused on litter up to the size of a shopping bag. The strategy will not specifically address illegal dumping, which involves larger items, although litter and illegal dumping often occur together.

Note that the definition of litter above also includes fine particulate materials such as sediment, which has a range of sources in the urban environment. However, the Georges River Litter Prevention Strategy will focus on items deposited in a place by people, rather than materials which are derived from erosion,

wear of surfaces, or atmospheric deposition. While litter can be a stormwater pollutant, the strategy will not attempt to cover all types of stormwater pollutants.

2.2 THE LITTER JOURNEY

NSW EPA (NSW Environment Protection Authority, 2022a) describes litter’s journey from production to the environment (Figure 2). This conceptualises the steps that result in litter in the environment, including:

1. **Production** of goods including their packaging
2. **Supply** of goods to retailers
3. **Sale** of goods to consumers
4. **Use** of goods, at which point waste is generated
5. **Disposal**, which may follow an appropriate path towards landfill/recycling/reuse, otherwise there is the potential for waste to become litter
6. **Littering** occurs when waste is left in a place where it can enter the environment
7. **Hotspots** are places where litter is deposited in greater quantities
8. **Litter flows** from where it is deposited into the wider environment, via wind, water, and other forces
9. **In the wider environment**, litter can persist for many years, where it may disperse widely, breaking up into smaller pieces and multiplying its impacts.



Figure 2: Litter journey (NSW Environment Protection Authority, 2022a)

2.3 NSW LITTER PREVENTION FRAMEWORK

Figure 2 showed how litter takes a journey from production into the environment, and litter prevention intervenes at multiple points in this journey to reduce the likelihood of litter entering the environment.

Figure 3 shows the NSW EPA’s litter prevention framework. This includes five approaches to litter prevention, which target litter from the use of goods to hotspots:

1. **Rewarding responsible behaviour:** For example, the Container Deposit Scheme rewards appropriate disposal behaviour, and has resulted in a significant drop in the number of beverage containers found in the litter stream.
2. **Education and awareness:** For example, the NSW EPA’s Tosser! campaign raises awareness of litter and aims to influence decisions and action around disposal. There are also many other examples of education and awareness programs run by other organisations with more a more local focus or targeted at more specific audiences.
3. **Regulation and enforcement:** The main law concerning litter is the Protection of the Environment Operations Act 1997 (POEO Act). It can be enforced via litter penalty notices, which include fines. Penalty notices can be issued by state agencies and local government. Anyone can report littering from vehicles, and the EPA can issue penalty notices based on these

- public reports.
4. **Infrastructure and cleaning:** This is about providing infrastructure such as well-designed, clean, well-maintained bins, that make it easy to dispose of waste correctly. It is also about ‘cleaning up’ littered sites - not simply to remove litter, but to invest in public infrastructure upgrades and maintenance (e.g. pavement cleaning, new furniture, graffiti removal, public art) This signals that these places are cared for and not places to leave litter.
 5. **Evaluation and monitoring:** The measurement of litter anywhere throughout its journey. NSW EPA has developed tools which are accessible to anyone to assist with evaluation and monitoring, including the Local Litter Check and Butt Litter Check. The new Key Littered Items Study measures litter in waterways and a dashboard has been created by the NSW EPA so that its partners, such as community groups and councils, can view and investigate the data. The Australian Litter Measure, which will measure litter on public land, is also currently in development.

Note that at the upstream end of the litter journey, the NSW Government is also taking action targeting production, supply and sale – this is discussed in Section 1.1 below. Also, at the downstream end of the journey, others take action targeting the flow of litter (e.g. local councils install and maintain gross pollutant traps in the stormwater system) and its dispersal in the environment (e.g. the Georges Riverkeeper and others clean up litter from the river and its foreshores. These activities are discussed in Section 4.1 **Error! Reference source not found.**

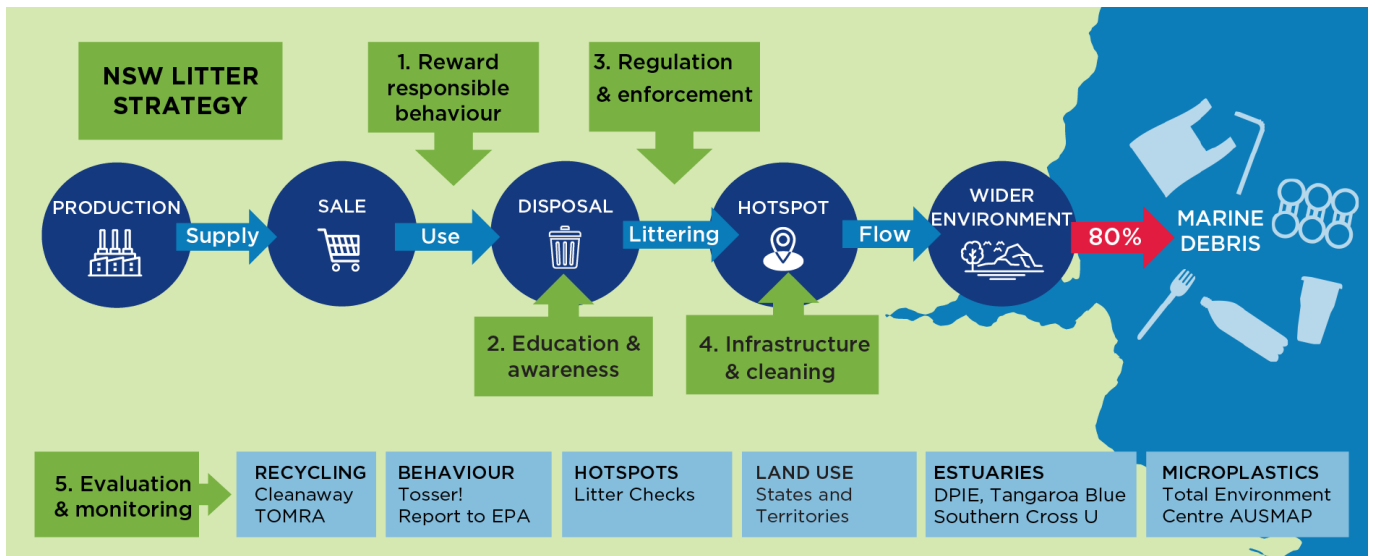


Figure 3: Five litter prevention strategies (NSW Environment Protection Authority, 2022a)

2.4 NSW GOVERNMENT LITTER TARGETS AND ACTIONS

The NSW State Government is taking action to stop litter at the source and support local litter prevention, as well as action focused on the marine environment and the impacts of litter there. The NSW Marine Estate Management Strategy (NSW Government, 2018) identifies litter, waste, debris and microplastics as one of the top three threats or stressors to social, cultural and economic benefits of the marine estate. It includes an initiative to improve water quality and reduce litter, including an action to implement a targeted marine litter campaign and establish a Marine Litter Working Group.

In 2015, litter reduction became a NSW Government commitment with a target set to reduce litter by 40% by 2020 (based on volume and a 2013-14 baseline). The 40% reduction target was exceeded in 2020, with a 43% reduction achieved (NSW Department of Planning, Industry and Environment, 2021a). To reach this goal, the NSW Government provided grant funding and developed tools to help people tackle litter in local places. Several projects have been funded within the Cooks River catchment.

The NSW Waste and Sustainable Materials Strategy 2041 (NSW Department of Planning, Industry and Environment, 2021a) sets new targets for litter reduction including:

- A new overall litter reduction target of 60% by 2030
- A plastic litter reduction target of 30% by 2025

The Waste and Sustainable Materials Strategy makes a number of commitments to support these targets including support for local litter prevention:

- \$38 million for litter prevention programs over the next six years. The strategy indicates that this will be used to establish partnerships “designed to support capacity building and empower industry, community organisations and stakeholders to take ownership of local litter”.
- Continued support for councils’ litter reduction and illegal dumping prevention activities with more than \$10 million in grants.
- A new litter data framework.

Actions that tackle litter at the source, including phasing out problematic plastics and tackling problem littered items, are detailed in the Plastics Action Plan 2021 (NSW Department of Planning, Industry and Environment, 2021b). This action plan:

- sets out a timetable to phase out lightweight shopping bags from June 2022 and various other single use plastics from November 2022 (including plastic straws, stirrers, cutlery, expanded polystyrene food service items, and cotton buds with plastic sticks).
- promises to investigate a new Extended Producer Responsibility scheme that will make tobacco companies take responsibility for the litter impacts of their products (to align with the Australian Government’s recently announced taskforce on cigarette butt litter).
- commits \$500,000 to help plastic manufacturers install systems to prevent nurdles (very small pellets of plastic used as raw material in manufacturing plastic products) entering our waterways and to provide guidance for councils that regulate plastics manufacturers about best-practice management of nurdles.

All the actions outlined above are summarised in Table 1. They will all help support litter prevention efforts in the Georges River catchment.

2.5 NSW LITTER PREVENTION STRATEGY

A new NSW litter prevention strategy has recently been released (NSW Environment Protection Authority, 2022b). It outlines seven approaches to litter prevention:

1. Source control
2. Diversion to a circular economy
3. Education, awareness and engagement
4. Regulation and enforcement
5. Infrastructure and clean-up
6. Targeted programs to stop litter dispersal
7. Monitoring, evaluation and research

These are shown in Figure 4.

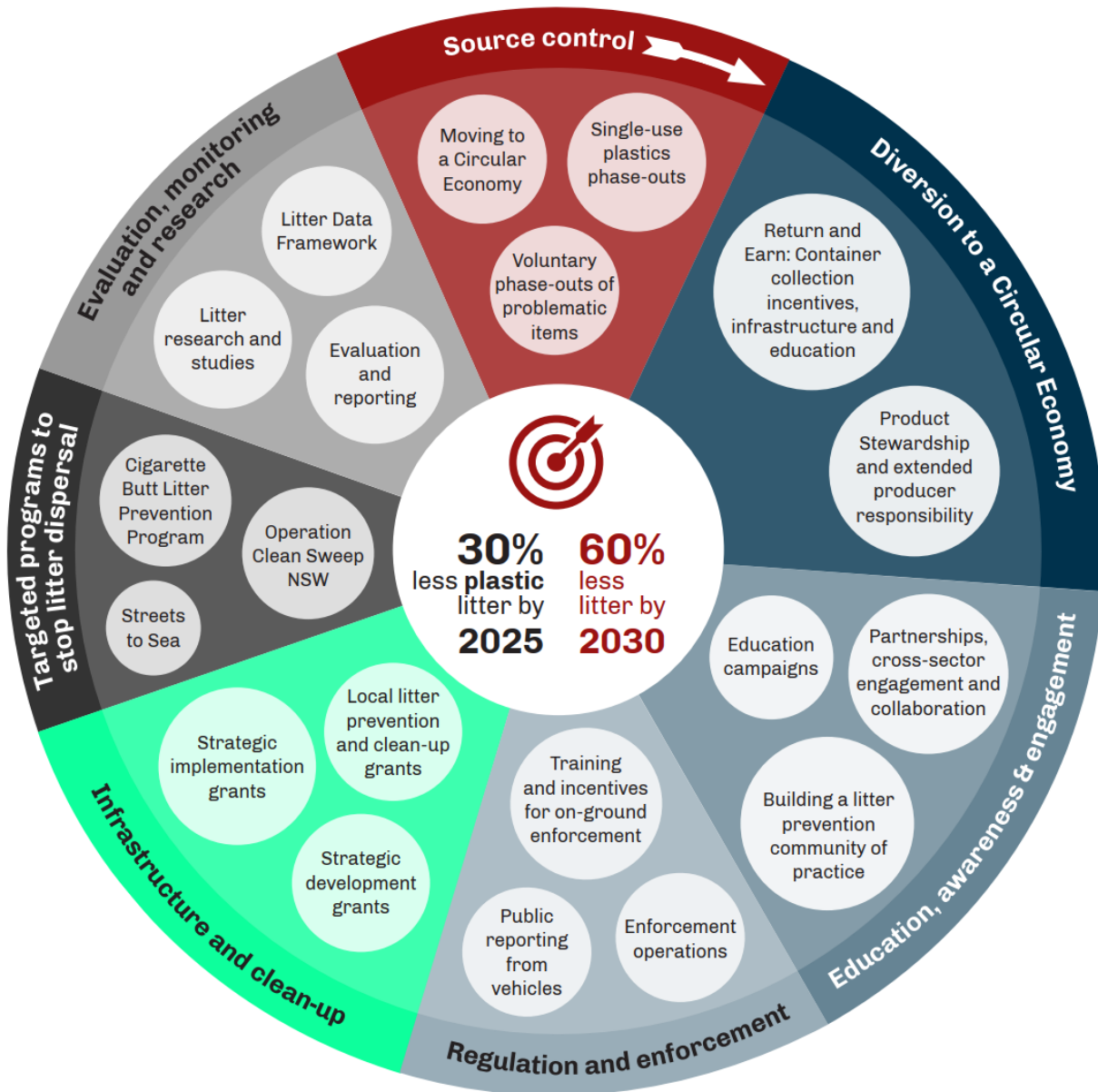


Figure 4: NSW litter prevention framework 2022-30 (NSW Environment Protection Authority, 2022b)

Table 1: NSW Government commitments to litter prevention.

NSW Government programs	Litter targets	Commitments		
		Stopping litter at the Source	Supporting local litter prevention	Reducing litter in the marine environment
NSW Marine Estate Management Strategy (NSW Government, 2018)				Targeted marine litter campaign and Marine Litter Working Group
NSW Waste and Sustainable Materials Strategy 2041 and the NSW Plastics Action Plan 2021	Overall litter reduction target of 60% by 2030 Plastic litter reduction target of 30% by 2025	Phase out of problematic plastics (including single-use plastics); Investigation of cigarette butt Extended Producer Responsibility; Action on nurdles	\$38 million for litter prevention programs to 2027; \$10 million in council grants; New litter data framework	Progress to litter reduction targets is monitored using a marine litter measure (Key Littered Items)

The new NSW litter prevention strategy (NSW Environment Protection Authority, 2022b) proposes actions under each of these approaches. Of particular relevance for the Georges River litter prevention strategy are the following proposed actions:

- **Partnerships, cross-sector engagement and collaboration** (pp.14-15): "To support this strategy the NSW EPA will develop a Litter Prevention Partnership Strategy outlining how best we can work with partners to build long-term ownership and action on litter prevention."
- **Building a litter prevention community of practice** (p.15): "NSW [EPA] will deliver and support regular targeted workshops and forums to build stakeholder capacity. This will include dedicated support for stakeholders during the litter prevention grant application and delivery phases."
- **Grant funding** (p.20): "The NSW EPA will continue to support stakeholders to take ownership and act on litter prevention through collaborative litter prevention grant funding programs."
- **Streets to Sea – Catchment-based approaches to litter prevention** (p.22): "The NSW EPA will establish a cross-government working group to develop and implement the Streets to Sea approach."
- **Research** (p.26): "The NSW EPA will complete a new study into the drivers of litter. This will involve a detailed exploration into how waste leaks into the environment. It will cover littering behaviour (including deliberate v accidental), overflowing bins, bin scavenging, animals, weather and waste collection services."

3 WHERE TO TACKLE LITTER

Litter is more prevalent in some locations than others. There are hotspots where litter is deposited in the catchment and hotspots where litter accumulates in the river.

The following section includes:

- A brief analysis of how litter enters public places within the catchment.
- A characterisation of the most littered public places in the catchment based on land use.
- Identification of known litter hotspots, based on local information provided by GRK and its member councils.
- A review of the most littered items in the catchment based on existing data.

This information has been compiled to determine spatially where litter prevention activities would be best focused.

3.1 SOURCES OF LITTER

All litter originates from people. Figure 5 illustrates various sources of litter, and central to this picture is littering behaviour. Whether litter comes from dumping, events, vehicles or pedestrians, people's behaviour is at the heart of the problem. Therefore, to understand where litter originates and how to prevent it, it is important to understand littering behaviour, and behaviour change methods.

There is a significant body of research on littering behaviour. Based on this body of research, NSW EPA's Litter Prevention Kit includes a document "Things you should know about litter and litterers" (NSW Environment Protection Authority, 2013) to capture the important findings that are useful to understand when planning litter prevention projects. This makes the point that "Everyone litters – somewhere, some thing, some time", meaning that there are many causes of littering, which differ from place to place, person to person and depend on the type of litter. Littering behaviour research has found that different people have different ideas about what litter is, and their views can change depending on the context.

Table 2 summarises what the littering behaviour research has found about the contexts in which people are more likely to litter. This shows that littering behaviour depends on:

- The type of item
- The type of place and its cleanliness
- Whether bins are available and signage is clear
- What they understand about where their litter may end up
- What other people are doing

People are most likely to litter cigarette butts, as shown in Table 2, partly because they may be seen as 'only small'. NSW EPA explains that "size, mess and degradability are some factors that influence what people perceive as litter" (NSW Environment Protection Authority, 2013):

- Organic litter (such as apple cores, orange peel) can be seen as more acceptable than other types of litter.
- Messy rubbish (such as a cup with some coffee remaining in it) can be difficult to carry, so is seen by some as more justifiable to litter.
- Small pieces of litter are more likely to be littered because they can be littered discreetly.

People are most likely to litter in places where:

- they think they will not be seen
- it is not clean or appears uncared for (e.g. where there is graffiti and vandalism)
- there are no bins nearby or when they can't find a bin
- where bins are dirty and/or overflowing
- it is clear that others are also littering (See Table 2)
- they think that someone else will clean it up.

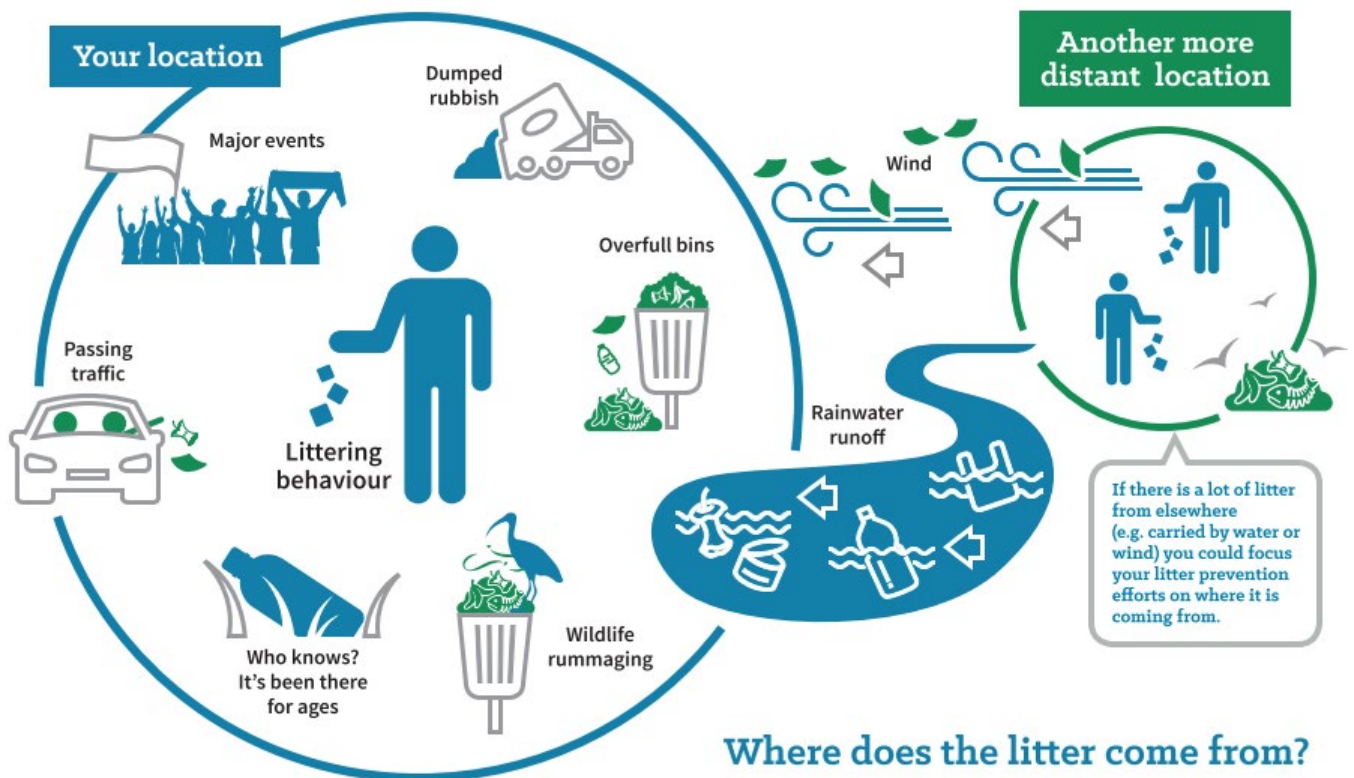


Figure 5: Sources of litter (NSW Environment Protection Authority, 2019a, p. 5)

Table 2: Littering behaviour cues (NSW Environment Protection Authority, 2022b)

Behaviour cue	Outcomes
Type of item	People are most likely to litter cigarette butts, probably because there is no bin nearby or butts are seen as 'only small'
Type of place	People are more likely to litter in places such as bus stops or where they think they will not be seen
Cleanliness of the place	People are less likely to litter somewhere that is clean, with well cared-for street furniture and bins, and no graffiti or vandalism
Bins	People are less likely to litter if there is a bin nearby, however they are more likely to do so if the bin itself is dirty
Signs	People are more likely to put waste in the right place if there are clear, consistent and relevant signs nearby
Knowledge	People may be less likely to litter when they understand where their litter ends up
What others are doing	People will litter if others do. For example, people may leave litter piled next to a bin or under stadium seats because others have

3.2 LITTERED PLACES

The National Litter Index (NLI) currently provides the best available long-term data on litter in Australia. It has been conducted twice annually for 15 years and has provided quantitative data including:

- Litter volume
- Number of littered items
- Types of items littered
- Litter quantities for different types of sites

Selected NSW NLI data for 2020 is summarised in Figure 6. This indicates that the places where the largest number of littered items are likely to be found are:

- Industrial areas
- Retail areas
- Car parks
- Highways
- Shopping centres

Figure 7 shows where these land uses are located in the Georges River catchment. There are substantial areas of industrial land in the catchment. There are smaller areas of retail, car parks and shopping centres, however many of these are clustered together.

Note that a new measure of land-based litter will soon replace the NLI – the Australian Litter Measure (ALM). ALM data collection has commenced and the first data is expected to be released in 2022.

3.3 LITTER HOTSPOTS

Georges Riverkeeper and several of the catchment councils provided information on litter hotspots – specific locations where

litter is deposited in high quantities. There are hotspot maps included in Figure 8 to Figure 10.

These hotspot maps are not a complete picture of all the places where litter is a problem in the catchment – litter problems are widespread and there are both other hotspots that have not been identified here, as well as litter that is distributed throughout the urban area, rather than being concentrated in one place.

The hotspot maps also reflect the fact that different councils provided different types of information about litter hotspots:

- Campbelltown City Council provided a substantial list of hotspots based on data from their cleansing team, who identified sites where they are frequently called out to respond to 'loose litter' requests.
- Liverpool City Council listed three parks as litter hotspots.
- Fairfield City Council provided a general description of the types of places where litter is a problem, including outdoor eating areas, fast food store car parks, picnic areas, creek corridors, industrial areas. The specific hotspots on the map in the Fairfield LGA were identified by Georges Riverkeeper.
- Canterbury-Bankstown Council listed 10 litter hotspots including 6 parks, 2 streets, a laneway and a bus interchange.
- Georges River Council simply listed the Kogarah and Hurstville CBDs as litter hotspots, as well as parks in general. The Kogarah town centre is not in the Georges River catchment and only a small part of the Hurstville town centre is in the catchment.
- Sutherland Shire Council listed only two specific sites as hotspots (Bangor Bypass and Woronora Bridge) but otherwise made general reference to high profile parks, remote locations and industrial areas.

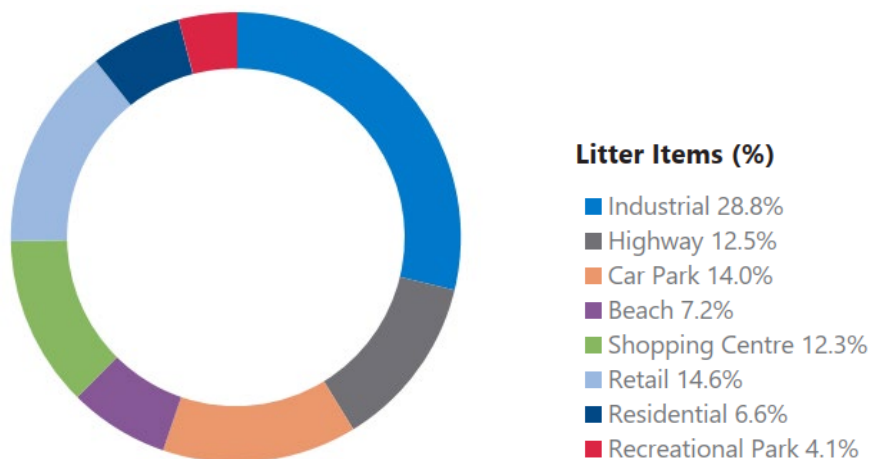
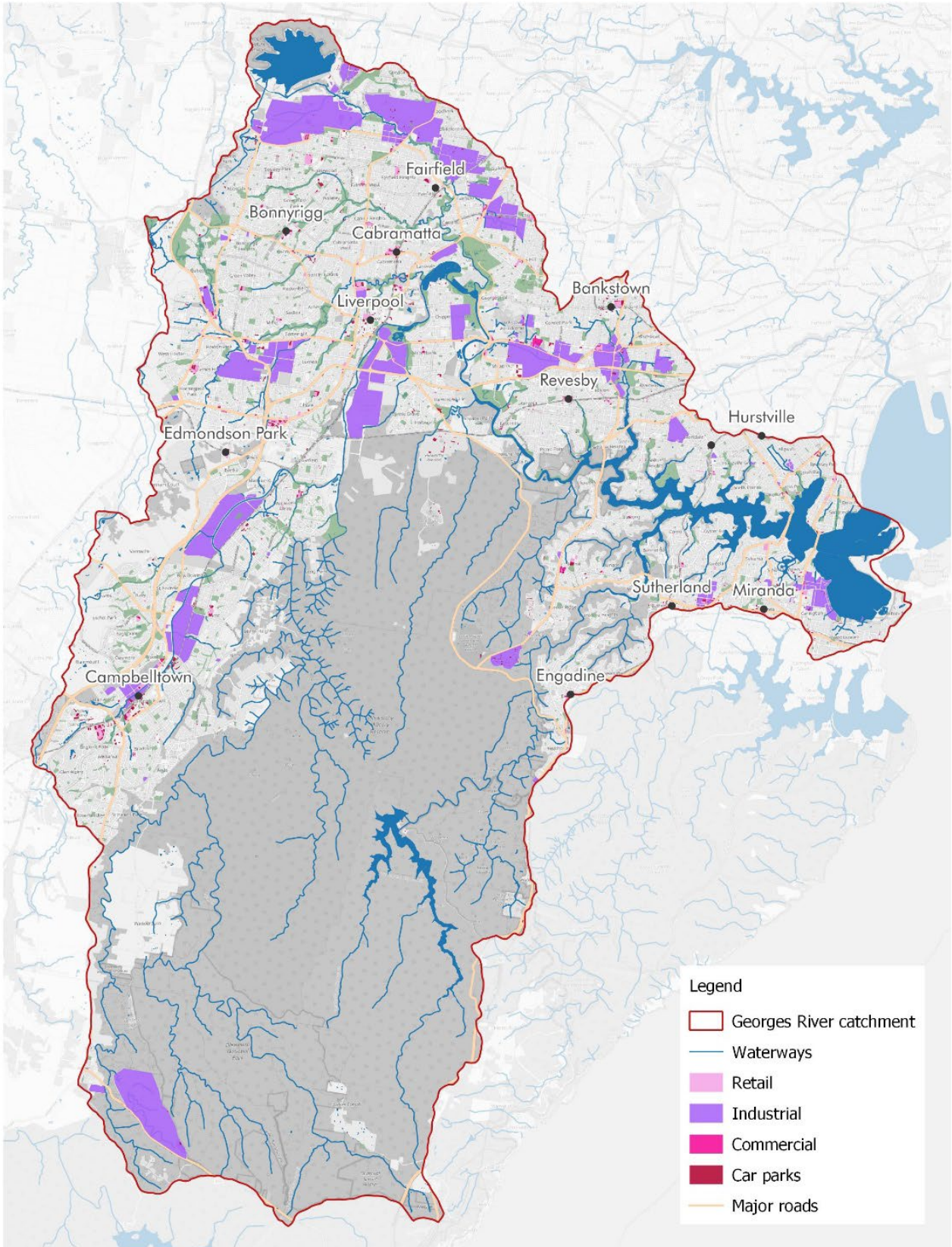


Figure 6: Quantity of littered items across site types in NSW in 2020 (NSW Government, 2021)



Georges River catchment

Figure 7: Georges River catchment land use map

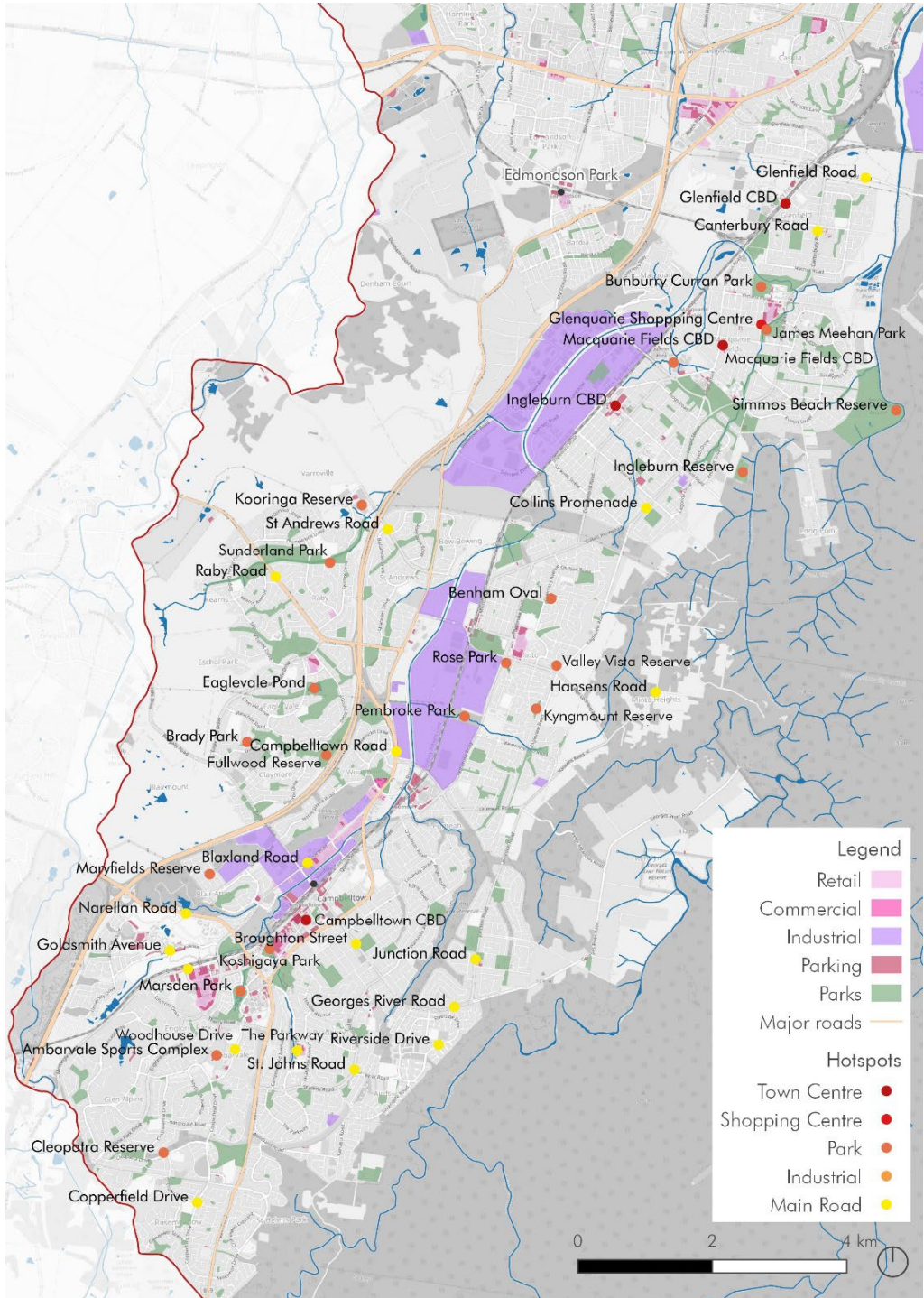


Figure 8: Litter hotspots in the southern part of the catchment

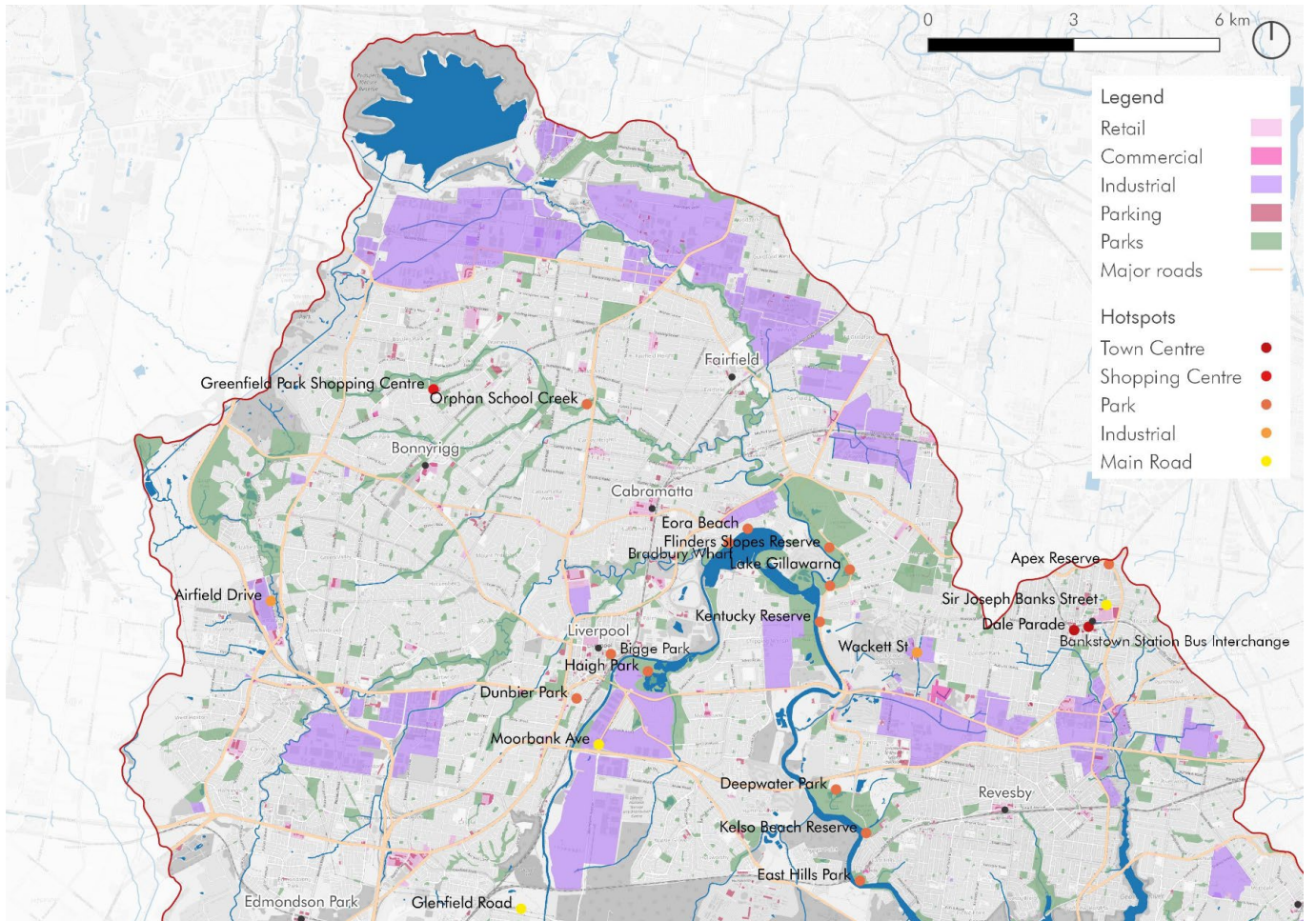


Figure 9: Litter hotspots in the northern part of the catchment

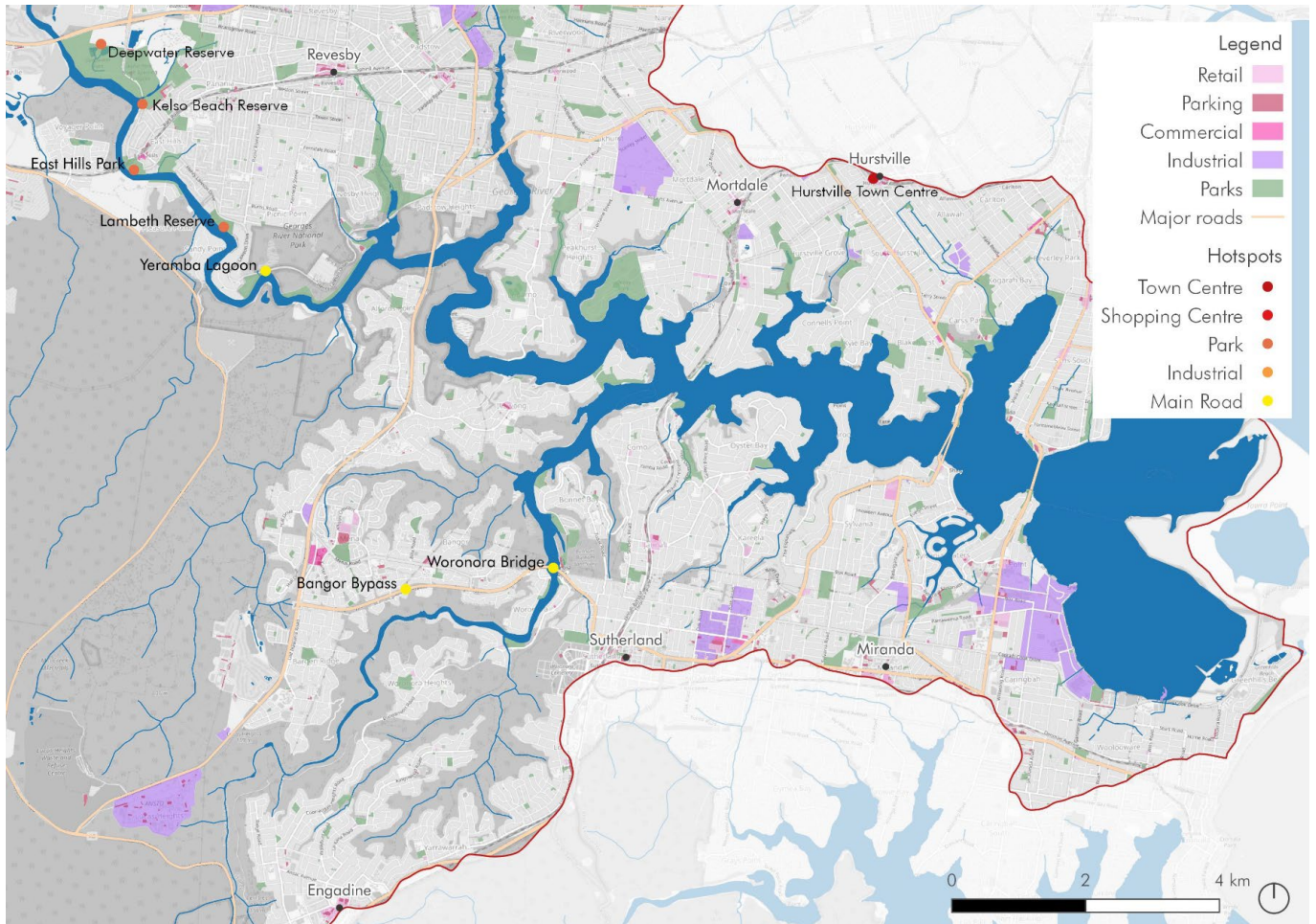


Figure 10: Litter hotspots in the eastern part of the catchment

Not shown in these hotspot maps are locations where litter accumulates in creeks, riparian areas, and foreshores. The focus is on locations where litter originates rather than the places it is transported to.

Focusing on litter source hotspots can be a useful way to build a more grounded, place-based understanding of a widespread issue, by focusing on how it manifests at specific locations.

Parks feature prominently among the hotspots mentioned by the councils. According to the data in Figure 6, parks have relatively low quantities of litter overall, however they are often places where litter is more visible to the community and where councils focus more effort on cleaning up.

Other location types identified as hotspots include town centres, shopping centres, industrial areas and roads. These are all consistent with the land use types in Figure 6.

3.4 LITTER TYPES

3.4.1 NATIONAL LITTER INDEX DATA

The NLI data mentioned above also includes a breakdown of litter types, this is shown in Figure 11. This shows the prevalence of cigarette [butts], takeaway containers and beverage containers. However, it also shows a large proportion of miscellaneous litter items.

Note that the NLI is being replaced by the Australian Litter Measure (ALM), which will be a new measure of land-based litter. The first tranche of ALM data is due to be released in 2023, based on monitoring conducted in 2022.

3.4.2 KEY LITTERED ITEMS STUDY

The NSW EPA has also recently commenced measurement of litter in estuaries. The first Key Littered Items Study (KLIS) report for NSW (NSW Environment Protection Authority, 2022c) includes more detailed information on the litter items accumulating in estuaries, broken down into more types of individual items (Figure 12) as well as categories of items (Figure 13). These figures show:

- Confectionary wrappers and snack bags, straws and other food packaging items are the top three litter items, accounting for more than a quarter of all litter items.
- The takeaway and beverage and confectionary and snacks categories account for over 50% of all litter items.

Being more recent, the KLIS data better represents litter composition since the Container Deposit Scheme (CDS) was implemented. The KLIS report states: "Since Return and Earn was introduced in 2017, eligible CDS beverage container litter has fallen in both the number of items (by 54%) and in volume (by 52%)" (NSW Environment Protection Authority, 2022c, p. 8).

The KLIS data shows some other differences in the composition of litter compared to the NLI data, for example fewer cigarette butts and more plastic items. This is thought to be due to the sampling methodology. The physical properties of cigarette butts, paper, metal and glass items mean they are less likely to accumulate at the KLIS survey sites than most types of plastic litter (the survey sites are mangrove areas in urban areas as well as some remote beaches).

With a more rigorous classification of litter items, the KLIS shows a smaller proportion of miscellaneous items (note that the 'other' items in Figure 12 are mostly known types of litter that have not been plotted in this chart).

3.4.3 SEA TO SOURCE DATA

Conservation Volunteers Australia's (CVA's) #SeaToSource project has involved litter counts at monthly clean-up events in the

Georges River estuary, one of eight rivers and urban waterways which has been the focus of this program.

CVA's 2021 #SeaToSource summary for the Georges River is shown in Figure 14. This was based on 9,546 items of litter counted at clean-up events involving 78 participants and 349 kg total litter removed. Litter data has been classified using CSIRO's marine debris item categories. (CVA, 2021). The summary shows that plastics made up 90% of all items, and the top 10 most common items were:

1. Food wrapper/label
2. Hard plastic fragments
3. Plastic bottle cap/lid
4. Soft plastic fragments
5. Plastic straws
6. Polystyrene
7. Plastic bags
8. Food packaging
9. Cigarette butts
10. Lollipop stick/ear bud

These findings by CVA are clearly consistent with the KLIS findings (noting that the KLIS reports separately on identifiable litter 'items', which represent about half of all litter items counted, and litter 'fragments', which represent the other half).

3.5 TRANSPORT AND FATE OF LITTER IN THE ENVIRONMENT

Figure 5 (above) illustrates that there are several non-human factors in spreading litter, for example:

- Wildlife rummaging in bins and dispersing litter
- Litter overflowing from overfull bins
- Wind dispersing litter
- Stormwater runoff moving litter from one place to another

Stormwater runoff is a key process which transports litter from the catchment into the Georges River. Once in the river, significant quantities accumulate at the river's edges, particularly in mangroves and salt marsh areas (Figure 15). Significant quantities are also likely to be transported out to sea, where "it is estimated that, on average, around 80–90% of ocean plastic comes from land-based sources, including via rivers, with a smaller proportion arising from ocean-based sources such as fisheries, aquaculture and commercial cruise or private ships." (Gallo, et al., 2018).

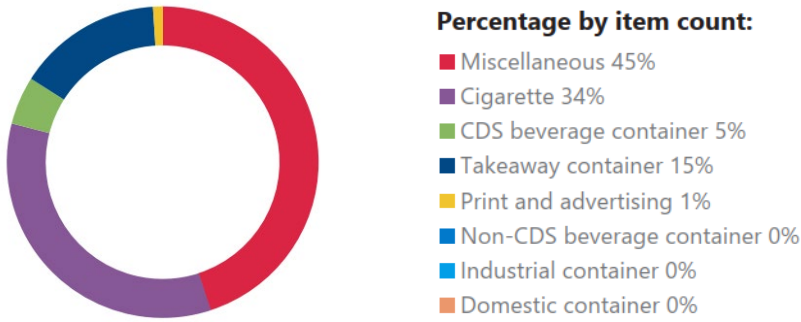


Figure 11: Types of littered items across all surveyed NLI sites in NSW in 2020 (NSW Government, 2021).

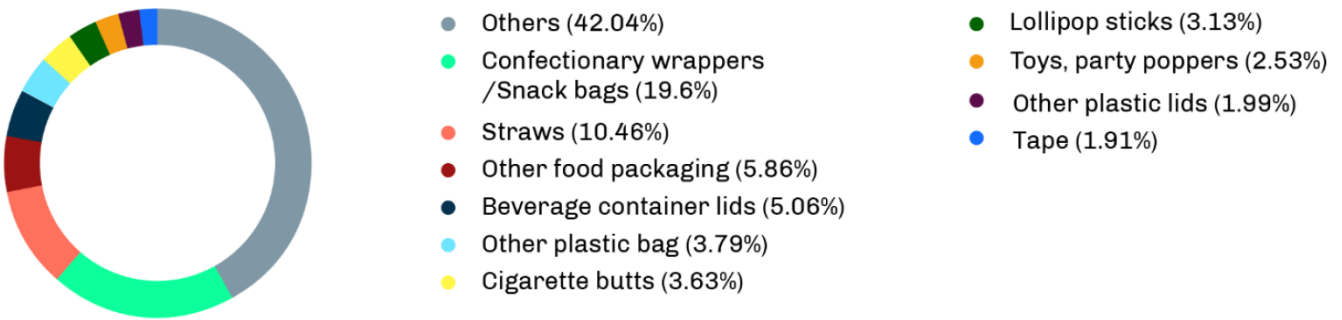


Figure 12: Composition of NSW litter by item, based on KLIS 2020-21 (NSW Environment Protection Authority, 2022c).

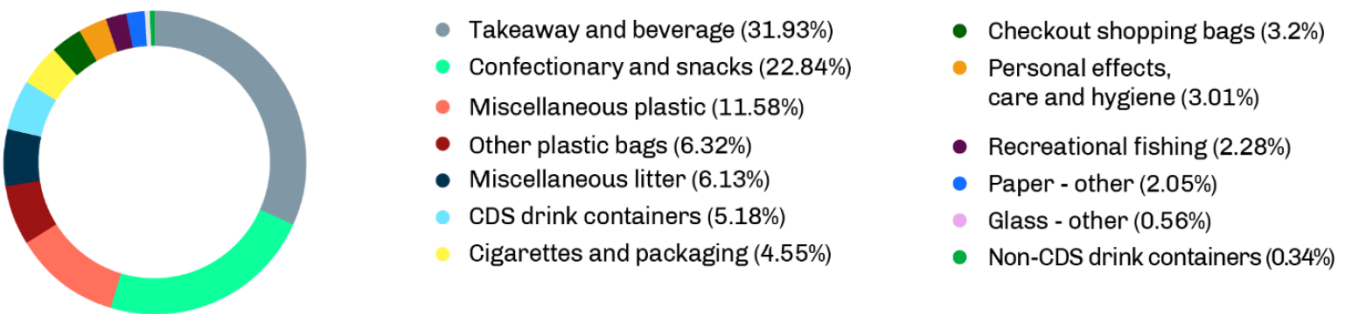


Figure 13: Composition of NSW litter by category, based on KLIS 2020-21 (NSW Environment Protection Authority, 2022c).

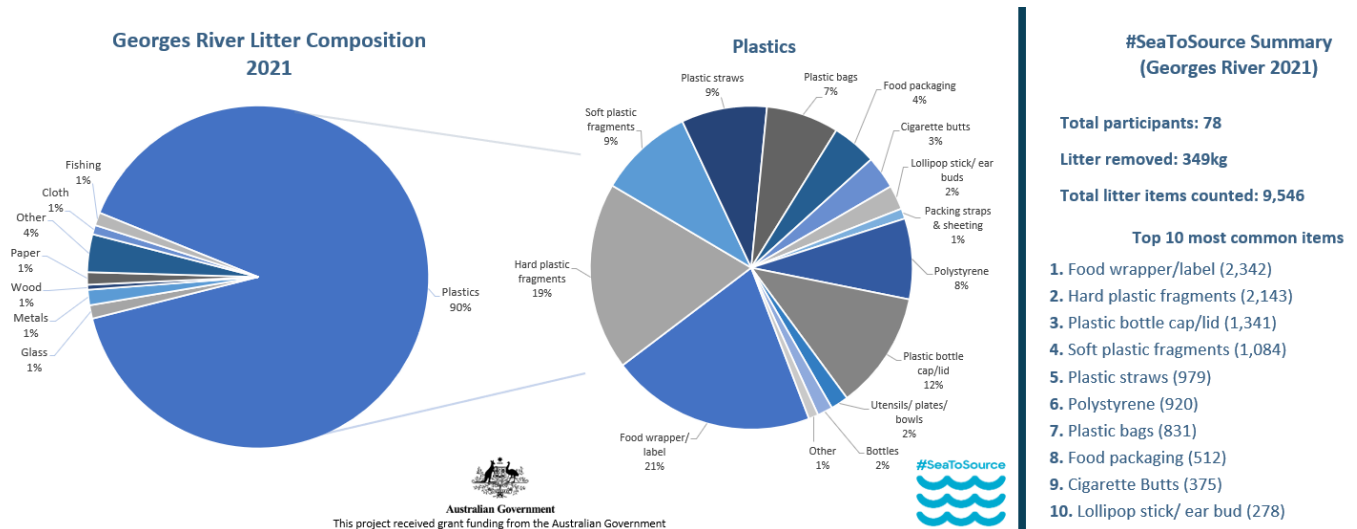


Figure 14: #SeaToSource summary for Georges River (Conservation Volunteers Australia)



Figure 15: Litter accumulates in mangrove and salt marsh areas at the edges of the Georges River.

4 HOW TO TACKLE LITTER

Georges Riverkeeper and its member councils are already active in managing litter, however the focus is more on clean-up than prevention.

The following section includes:

- Review and analysis of current litter prevention activities undertaken by the Georges Riverkeeper and councils in the catchment.
- A brief introduction to designing effective litter prevention initiatives.
- An overview of past litter prevention projects and initiatives relevant to the catchment.
- An assessment of litter prevention opportunities for the catchment, including ideas from elsewhere that are relevant to the local context.
- Identification of potential pilot projects for the first stage of strategy implementation.

4.1 EXISTING LITTER PREVENTION

Georges Riverkeeper has a long track record of litter removal from the Georges River and surrounding parklands, removing up to 100 tonnes of litter and dumped rubbish each year (Georges Riverkeeper, 2022a). However, this cannot be described as a 'litter prevention' approach.

Georges Riverkeeper is aiming to shift their efforts more towards litter prevention. Recently Georges Riverkeeper was the recipient of a \$700,000 Australian Government Environmental Restoration Fund grant for the "**Zero Litter in Georges River**" initiative (to run to 2023), which includes a litter education program for schools as well as several projects aiming to improve the performance of GPTs across the catchment, including GPT research, audits, restoration, upgrades and new installations.

Councils undertake a wide range of activities that help prevent litter, including:

- Community education and awareness initiatives (this could include engagement with residents, businesses and other organisations – schools are a common target audience).
- Design of public places to discourage littering and

encourage appropriate disposal of waste (this could include signage, placement of bins, urban design to improve passive surveillance and avoid creating spaces that attract litter).

- Installation, servicing and maintenance of public bins (including provision of appropriate bin infrastructure, servicing according to need and routine maintenance to ensure continued functionality).
- Cleaning up litter from public places including parks, town centres and streets (this includes litter picking, street sweeping).
- Supporting community clean ups (including Clean Up Australia Day).
- A wide range of routine maintenance activities such as graffiti removal, maintenance of street and park furniture, and landscape maintenance also contribute to clean, well-maintained public places that tend to discourage littering.
- Council rangers can enforce anti-littering regulations (although councils noted the challenges with enforcement in practice).
- Responding to public complaints about litter (e.g. Campbelltown Council's 'loose litter requests' – refer to Section 3.3).
- Managing residential waste to minimise litter escaping from bins.

The diagram in Figure 3 included five litter prevention strategies, and most of the activities listed above could be organised within 3 of these 5 strategies: education and awareness, infrastructure and cleaning, and enforcement. The State Government are more active in rewarding responsible behaviour (via the container deposit scheme) and evaluation and monitoring (via various elements in the litter data framework), however the Georges Riverkeeper and local councils do provide support to both these activities, for example via:

- Providing Return and Earn collection locations in public places and supporting the scheme with signage and communications.

- Contributing to litter data collection by monitoring their own litter prevention and clean up activities.

Note that the NSW EPA’s new litter prevention strategy includes additional activities shown in the diagram in Figure 4:

- Rewarding responsible behaviour has been replaced with two elements – source control and diversion to a circular economy.
- Targeted programs to stop litter dispersal.

Source control/diversion to a circular economy remain principally a domain for State Government action (including initiatives such as product phase-outs, product stewardship and extended producer responsibility) where local government can play a supporting role.

Targeted programs to stop litter dispersal include the following examples in the new NSW litter prevention strategy (NSW Environment Protection Authority, 2022b):

- Operation clean sweep, including guidance for

councils on best practice nurdle regulation and management.

- Cigarette Butt Litter Prevention Program, including resources for local land managers to use in smoking areas, supported by a targeted grants program.
- Streets to Sea – Catchment-based approaches to litter prevention.

Within the Streets to Sea approach, EPA notes that “it is relevant to include drainage and stormwater infrastructure in our thinking” (NSW Environment Protection Authority, 2022b, p. 22), which is highly relevant to the Georges Riverkeeper and its member councils, who are very active in this area, particularly via the **Zero Litter in Georges River** project mentioned above and councils’ other work installing and maintaining Gross Pollutant Traps (GPTs) and other types of stormwater treatment systems.

The main activities discussed in this section are plotted in the litter prevention framework diagram in Figure 16.



Figure 16: Georges Riverkeeper and council litter prevention activities, organised into the EPA’s litter prevention framework

4.2 EFFECTIVE LITTER PREVENTION INITIATIVES

EPA provides guidance on designing litter prevention initiatives in its Litter Prevention Kit , which includes four components:

- **Part 1: Things you should know about litter and litterers** (NSW Environment Protection Authority, 2013) covers the laws, behaviours, publication perceptions and trends behind littering in NSW.
- **Part 2: Delivering effective local prevention projects** (NSW Environment Protection Authority, 2019a) covers the information, actions, and partners you'll need to engage in your community to tackle litter, as well as tools to measure your success.
- **Part 3: Local Litter Check Guidelines** tools to help you gather evidence to find out about litter in your local area.

- **Part 4: Butt Litter Check Guidelines** tool to understand why smokers may be littering cigarette butts, and to develop evidence-based interventions to prevent cigarette butt litter.

Part 2 (NSW Environment Protection Authority, 2019a) sets out five steps for litter prevention projects, shown in Figure 17.

At the first step, the Local Litter Check and/or Butt Litter Check can be used to gather evidence about the problem and possible solutions. These provide a framework to assess a site in terms of five key factors: cleanliness, infrastructure, education and awareness, enforcement and involvement (Figure 18), helping to identify actions that are likely to succeed (Step 2). The litter check can also be used to measure effectiveness during and after the litter prevention initiative (Step 3).

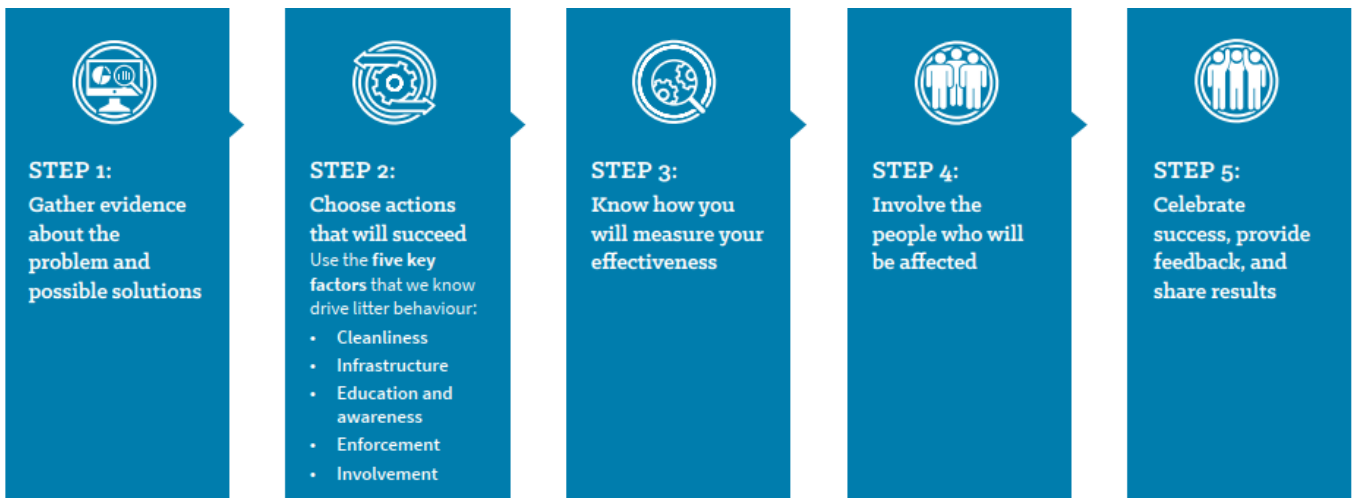


Figure 17: Five steps for an effective litter prevention project (NSW Environment Protection Authority, 2019a)



Figure 18: Five key factors for litter prevention (NSW Environment Protection Authority, 2019a)

Another useful resource for planning litter prevention initiatives is the handbook 'Litterology' (Spehr & Curnow, 2015). This book is helpful for understanding on littering behaviour, presenting outcomes of behavioural research, explaining who litters, how they litter and why they do it. The illustrations of positive and negative behaviours (Figure 19) are memorable.

'Litterology' also explains the key factors that encourage positive disposal behaviours: care of place, personal responsibility,

penalties and rewards, with many examples. Each chapter concludes with 'checklist questions' to help apply the book's content to a particular place and/or a particular litter prevention initiative, encouraging holistic thinking to address littering behaviour, including who could be involved in caring for places, and how to encourage personal responsibility by establishing positive social norms.



Figure 19: A selection of positive and negative disposal behaviours illustrated in 'Litterology' (Spehr & Curnow, 2015)

4.3 PAST LITTER PREVENTION PROJECTS

Past litter prevention projects in the catchment are summarised in Table 3. These provide a snapshot of which organisations have previously been active in litter prevention in the catchment area, and the litter problems they have focused on.

Previously, Regional Organisations of Councils (ROCs) have taken a significant role in litter prevention in the region. The Georges River catchment councils are (or have previously been) members of at least three different Regional Organisations of Councils (ROCs) including:

- Southern Sydney Regional Organisation of Councils (SSROC) – including Bayside, Canterbury-Bankstown, Georges River, and Sutherland Councils).
- Western Sydney Regional Organisation of Councils (WSROC) – including Cumberland and Liverpool Councils.
- The former Macarthur Regional Organisation of Councils (MACROC) and the Macarthur Strategic Waste Alliance - including Campbelltown Council.

In 2016, both SSROC and WSROC prepared regional litter plans (Southern Sydney Regional Organisation of Councils, 2016) (Western Sydney Regional Organisation of Councils, 2016). MACROC also prepared a regional litter plan which is referred to in the more recent Macarthur Region WARR Strategy (Macarthur Strategic Waste Alliance, 2019).

Each of these regional plans provides information about litter prevention priorities, as seen by their member councils at the time that these plans were prepared.

SSROC (2016) identified that sports and recreation areas and town centres were the two types of hotspots which should be the focus of their plan, and they identified the following priority projects:

- Town centre bus stop litter
- Regional partnerships with sporting clubs
- Regional foreshore parks and beaches
- Technology based bin research
- Regional guidelines for bin selection and placement
- Public and private bin use by Town Centre SME's
- Product stewardship guidelines for local business
- Regional litter datasets and overall evaluation

WSROC (2016) identified the following litter priorities:

- Cigarette butts in shopping precincts/CBD locations.
- Food and drink packaging/containers in recreational parks.
- Food and drink packaging/containers littering arterial roads.
- Awareness levels across council internal stakeholders of the litter issue and cost.

Macarthur Strategic Waste Alliance (2019) note that the previous MACROC plan identified that roadsides were the biggest litter sites in all three of their member council areas. In Campbelltown, the main littered items at roadsides were cigarette butts and beverage containers including paper cups. Macarthur Strategic Waste Alliance (2019) indicate that actions in the MACROC plan were focused on litter prevention from building sites and vehicles, and that they would continue to focus on the same priorities during 2019-2021.

Projects implemented by SSROC, WSROC, MACROC and the Macarthur Strategic Waste Alliance over 2016-2020 all followed on from their regional plans and provide a local track record of litter prevention methods that have been applied successfully in the local area. Where possible, Table 3 includes links to further information about each specific project.

Table 3 also lists projects undertaken by individual councils and other organisations in the catchment area including TAFE NSW and the Macarthur Diversity Services Initiative. Note that projects outside the Georges River catchment area have been excluded (for example, Canterbury-Bankstown Council has undertaken other litter prevention projects in other parts of their LGA – a complete list is available on their [website](#)).

The list of past projects in Table 3 illustrate experience gained in the catchment area with litter prevention, particularly in town centres, parks and roadsides. It also illustrates experience with specific approaches including smart bins, cigarette butt bins, and ash bins. There have been several school education projects including projects by Sutherland and Georges River Councils listed in Table 3 and the current schools program by Georges Riverkeeper, mentioned in Section 4.1 above. The Macarthur Diversity Services Initiative (MDSI) 'Litterbusters' projects are a notable example for their community development approach, potentially relevant to other similar sites.

Table 3: Past litter prevention projects in the Georges River catchment

Organisation	Date	Project name	Details
SSROC	2014-15	Trash Your Ash - A Picnic-Based Approach: Applying Resident Research to Charcoal Disposal Bin Solutions	\$124,990 EPA grant. Local research, purpose-built bins designed and installed.
	2016	Our Places: Recreation and Retail: A Litter Prevention Plan for the Southern Sydney Region 2016 - 2021	Regional litter plan
	2016-17	Bus Stop Litter Data Baseline and Stop! Bus Stop Litter	\$140,000 EPA grant. Part 1: quantify the extent and types of litter discarded at transport interchanges and bus stops Part 2: litter reduction program incorporating infrastructure, education and enforcement
	2019-20	Cost baseline	\$40,000 EPA grant. Assessment of "smart technologies" and user experiences that specifically manage and provide efficiencies related to public place litter bins.
WSROC	2016	Western Sydney Regional Litter Plan 2016-2021	Regional litter plan
	2016-17	Driver Education: Fines Apply For Littering	\$139,828 EPA grant. Targeting littering on arterial roads in the WSROC region, including RMS and council stakeholders. Tossert! campaign and enforcement blitz.
	2017-18	Reducing cigarette butt litter in shopping strips	\$148,155 EPA grant. Butt bins, engagement including CALD, enforcement blitz.
	2019-20	Reducing food and drink containers and packaging in recreational areas	\$85,000 EPA grant. Targeting food and drink container litter at high-use weekend recreational parks in Western Sydney. New bins, floor stencils and signs. Education, engagement and enforcement.
MACROC	2016	Regional litter plan	Regional litter plan
	2017-18	Operation 40	\$20,000 EPA grant. Reducing the volume of containers, take-a-way wrappers and coffee cup litter being dropped from vehicles. Including roadside signs to help educate road users and assist in monitoring and enforcement.
	2017-18	Project Building Solutions	\$38,000 EPA grant. Reducing the volume of containers, take-a-way wrappers and coffee cup litter being dropped from vehicles and blowing from building sites in suburban areas and residential roads across the Macarthur region. Including engagement with managers and owners of building companies.
Macarthur Strategic Waste Alliance	2019-20	Operation 40: Part 2	\$56,850 EPA grant. Targeting three additional roadside litter hotspots in Wollondilly, Campbelltown and Camden councils.
Fairfield City Council	2014-15	I Sustain - LOTS (Litter off the Streets) Campaign	\$78,000 EPA grant. Working in conjunction with the council's 'Litter off the Streets' program including the installation of bigger bins and new cigarette butt bins, as well as education.
Campbelltown Council	2021	Smart bins	Campbelltown has also installed 47 Solar Bins in the CBD locations of Campbelltown (30) and Ingleburn (17), which have reduced overflowing litter and reduced the staff time associated with servicing these high use bins.
Canterbury-Bankstown Council	2014-15	We Like Our Park Litter Free	\$124,585 EPA grant. Focused on four recreational reserves and associated car parks, including infrastructure, service standards and community education to reduce littering during peak usage on weekends.

Organisation	Date	Project name	Details
	2016-17	Tackling Takeaway Litter in Bankstown	\$58,100 EPA grant. Focused on takeaway wrappers and beverage containers at carparks. Community based social marketing approach, including prompts and pledges to encourage greater community engagement with the problem of littering.
	Ongoing	Bottle Refill Stations	Twelve permanent bottle refill stations have been installed at parks across the City, with 8 more planned to be installed.
	Ongoing	Litter Bin Sensor Program	Sensors have been placed in 60 bins across the City, providing real-time information.
	Ongoing	Glutton litter machine	The 'Glutton' is a litter removal machine that vacuums up litter in hard to reach places. It is being used in the Campsie and Bankstown town centres.
Georges River Council	2019	Targeted litter reduction program in Hurstville CBD	Trial program which involved a partnership with Hurstville Public School and resulted in the delivery of a Litter Art Competition and a Schoolyard Litter Audit.
Sutherland Council	2008	No Tossers at our School	With DECC
Macarthur Diversity Services Initiative	2020-21	Airds and Claymore Litterbusters (refer MDSI 2018 Annual Report)	2 x \$5,000 EPA grants. Two projects with a community development approach to tackling litter in locations close to local shops.
TAFE NSW Western Sydney Cluster	2019-2020	TAFE NSW Cigarette Butt Litter Prevention	Multiple EPA grants to tackle cigarette butt litter at various TAFE sites. Including stakeholder engagement, butt bins, signage, communication campaign.

5 WHY INVEST IN LITTER PREVENTION?

Litter is a persistent and harmful pollutant, which is costly to clean up. More focus on prevention could reduce costs and minimise its impacts.

5.1 LITTER HAS HARMFUL IMPACTS

Litter causes environmental and social impacts from local to regional and global scales.

Litter impacts the amenity of the **urban environment** (Figure 20) including parks, plazas, car parks and streetscapes. It detracts from people's ability to use and enjoy these public places.

If litter is present in the urban environment, then it can be mobilised in stormwater runoff and washed into **local waterways** and the **Georges River**, impacting on human use and enjoyment of these waterways, water quality, and the health of wildlife and ecosystems. Once litter has made its way into waterways, it becomes more difficult to clean up. In local creeks litter is often caught in riparian vegetation (Figure 21). In the Georges River, floating litter tends to accumulate in the intertidal zone, including in mangroves and salt marshes (Figure 22).

Litter that is not able to be removed from waterways flows to the broader marine environment where some materials can persist for many decades. Over its lifetime, litter can be transported far from its source, causing widespread impacts on marine life.

Anthropogenic litter is increasingly recognised as an important pollutant of waterways and the marine environment. As well as an aesthetic issue, anthropogenic litter is now understood to be extremely harmful in aquatic environments. Some plastic items are particularly harmful due to their tendency to cause entanglement, many are easily ingested, and most are extremely persistent in the environment. Instead of 'breaking down' in the environment, plastics 'break up' into microplastics, accumulating in the food chain and releasing toxic substances along the way. Microplastics are a particular concern in the marine environment due to their ease of ingestion and accumulation in the food web.

The NSW Marine Estate Management Strategy (NSW Government, 2018) identifies litter, waste, debris and microplastics as one of the top three threats or stressors to social, cultural and economic benefits of the marine estate. In the ocean, plastic makes up the vast majority of marine debris, and 80-90% of ocean plastic comes from land-based sources including litter (Gallo, et al., 2018).



Figure 20: Litter at Lake Gillawarna in Georges Hall



Figure 21: Litter in Orphan School Creek, Fairfield LGA



Figure 22: Litter in the Georges River, Henry Lawson Reserve

5.2 LITTER CLEAN UP IS COSTLY

In the Georges River catchment, significant effort and expense is invested in cleaning up litter, including:

- Street sweeping
- Picking up litter by hand
- Capturing litter in gross pollutant traps (GPTs)
- Removing litter from the waterway itself by boat

The annual cost of litter management in NSW in 2014/15 has been estimated as \$162.6 million. This would include clean-up costs as well as costs associated with maintaining public bins and disposing of litter. Of the total, approximately \$135.3 million (83%) was borne by councils (MRA Consulting Group, 2015, p. 5). This study could only utilise limited survey responses, so the true cost of litter both in 2015 and now in 2022 is likely higher. MRA said “The results are conservative, as they do not seek to estimate the cost of the sub groups for which data was not provided (e.g. private businesses: supermarkets), or for sub groups that robust extrapolation methods could not be derived for (e.g. community organisations)” (MRA Consulting Group, 2015, p. 5).

In the Georges River catchment, Local councils and other organisations invest significant resources cleaning up litter. Litter clean-up costs are not fully known, but it is clear that significant effort is invested by Georges Riverkeeper, the catchment councils and others in cleaning up litter. Clean up costs include staff costs, infrastructure (capital and maintenance), equipment costs, contractor fees and waste disposal expenses. These costs are not all itemised in the organisations’ annual reports and it is not straightforward to extract the components that can be attributed to managing litter. Sutherland Shire Council provided a figure of \$3.9 million per year for street cleaning and public litter bins, which is approximately 1.3% of the council’s total budget.

Other available information provides some indication of the scale of litter clean up efforts:

- Councils in the catchment play a critical role in keeping public places clean, including emptying public litter bins, street sweeping and picking up litter to keep public areas clean. **Box 1** provides a snapshot of the work undertaken by Campbelltown Council’s City Cleansing Team. **Box 2** lists annual litter management costs estimated by Canterbury-Bankstown Council.
- Councils’ natural area maintenance/bush regeneration staff and contractors also pick up litter as part of their work.
- Councils also maintain hundreds of gross pollutant traps (GPTs) across the catchment. These are discussed in Section 5.3 below.
- Corrective Services NSW cleans up litter in the catchment at hundreds of sites. In their 2020-21 annual report, Georges Riverkeeper notes that during the financial year, Corrective Services NSW cleaned up at 234 sites including beaches, parks, mangroves and creek-lines, collecting 58 tonnes of litter, equivalent to 17 full garbage trucks (Georges Riverkeeper, 2021)
- Georges Riverkeeper, the catchment councils, and other organisations also support community litter clean ups across the catchment including Clean Up Australia Day and other events. Conservation Volunteers Australia (CVA) has been organising litter clean ups in the catchment as part of their #SeaToSource program where the Georges River is one of eight waterways included in the initiative (Georges Riverkeeper, 2021).
- Georges Riverkeeper also organises waterway clean ups. In 2021 they ran a Paddle Against Plastic event and partnered with Ocean Crusaders for a hard core clean up of the Georges River (Georges Riverkeeper, 2021).

Box 1: Campbelltown case study

Campbelltown Council’s City Operations - City Cleansing team undertakes most of the work relating to litter clean up in the LGA. Campbelltown Council staff provided the following information about what this team’s work includes:

- **Emptying public litter bins:** Campbelltown has 238 standard bins (a mixture of 240L, 120L, and 80L sizes) used for litter in public locations. Campbelltown has also installed 47 Solar Bins in the CBD locations of Campbelltown (30) and Ingleburn (17). These have 240L capacity and include a compactor, which increases the quantity of litter they can contain. They also send an alert when they require emptying, reducing the manual requirement to empty bins. The team has three compactor trucks servicing bins and picking up other bagged litter.
- **Street sweeping:** Plant includes two street sweepers, and one footpath sweeper. Staff work with blowers to complement the street sweepers.
- **Litter picking:** this is undertaken either ad hoc when loose litter is identified during allocated tasks, or in response to ‘loose litter requests’ reported to council. In the time since 2020, the team has received 758 loose litter requests, accounting for about 40% of the team’s work allocation.

Box 2: Canterbury-Bankstown case study

City of Canterbury-Bankstown Council staff provided the following estimates of their main annual litter management costs:

Areas of investment	Infrastructure costs	Running costs (e.g. staff, equipment)	Litter disposal costs
Litter bins	\$100,000	\$750,000	\$491,000
Litter picking		\$2.1 M	
Street sweeping		\$2.1 M	\$386,000
GPTs	\$195,000 total spend		
Litter education and community engagement		\$90,000	
Support to community litter prevention/clean up activities		\$15,000 – Litter scavange \$97,000 – GRK	

5.3 GPTS ARE COSTLY

Gross pollutant traps (GPTs), designed to trap litter (as well as other pollutants) in the stormwater system, are widespread across the catchment. Not all the councils provided information on their GPTs, but Campbelltown Council noted that they have approximately 81 GPTs in their LGA, and Liverpool Council has more than 75. Sutherland Council have 250 Stormwater Quality Improvement Devices (SQIDs).

The Georges Riverkeeper “Zero Litter in Georges River” project has a strong focus on GPTs as a key part of the solution to stop litter entering waterways. However, as stated by Georges Riverkeeper (Georges Riverkeeper, 2022b), GPTs “are not perfect; they are expensive to construct and maintain, can’t be placed over every stormwater outlet, get full quickly, are often overwhelmed in times of high and fast stormwater flow, and may impact stream flow and sedimentation.”

Therefore, Georges Riverkeeper’s Zero Litter in Georges River project is investing in GPT audits, upgrades, research, performance assessment, and guidelines for catchment managers to improve GPT planning and implementation.

However, GPTs remain a partial solution to the problem of litter in waterways. GPTs:

- Cannot be installed everywhere, leaving many areas untreated.
- Cannot filter all stormwater flows. Larger storm events are likely to mobilise more debris and can often exceed the capacity of GPTs.
- Cannot capture all pollutants – anthropogenic litter includes a wide range of materials with different properties.
- Are costly to install and maintain.

Field observations suggest that many GPTs are not working as predicted, and their performance is affected by factors that remain poorly understood. A review of GPTs in the Georges River Catchment (Byrnes, Duffield, George, & Moseley, 2021)

found that cost, maintenance, safety and inappropriate locations caused inefficiencies and issues with GPT performance. There were also discrepancies between manufacturers claims and in-situ performance. GPTs have been planned and designed based on scant information about predicted pollutant quantities, little information about actual field performance (hydraulic and water quality) in real-world installations, and optimistic assumptions about maintenance.

Most GPTs are maintained by local councils. Recently, many councils (including the Georges River councils) have completed GPT audits which have identified issues to be rectified. Following these audits, councils are investing in GPT upgrades, renewals and corrective maintenance. For example, in a questionnaire completed for this project, Fairfield City Council noted that since completing an audit of their GPTs in 2018/19, they have invested \$130,000 in GPT repairs and upgrades, with a further \$250,000 planned for the current financial year (2022/23).

Also following these audits, maintenance contracts are being renewed with more robust conditions. In councils, however, funding for operations and maintenance a perennial challenge. The Stormwater Management Service Charge (a charge that can be levied by councils on ratepayers and allocated to stormwater management costs) has remained fixed since 2006, while councils’ stormwater management costs have increased with inflation. There is increasing pressure on councils to ensure their financial sustainability, and this means most councils are reluctant to install new stormwater treatment assets, as even if capital works are funded by grants, they would need to fund additional operation, maintenance and future renewal/decommissioning of additional assets.

5.4 EXTERNAL COSTS ARE SIGNIFICANT

Despite investment in litter management, clean up and GPTs, litter still makes its way into the environment where it causes significant impacts. These can be quantified as ‘external costs’ of litter.

In their analysis of international case studies, MRA found that some countries have analysed costs of litter and have identified

a wide array of direct impacts and externalities (MRA Consulting Group, 2015). These include:

- Loss of property value and amenity value of public space
- Loss of environmental capital
- Increases in crime
- Impacts on mental health
- Impacts on private property and infrastructure, such as damage to rail infrastructure, car punctures and indirect costs to businesses
- Residual greenhouse gas costs

The Centre for International Economics (CIE) estimated total costs of litter in Australia in 2021, estimating that in an Australian context, the costs of litter on the environment, both marine and from invasive weeds from illegal dumping, approached \$778 million to \$2 billion (Centre for International Economics, 2021).

5.5 THE COMMUNITY WANTS LESS LITTER

Across NSW, community surveys indicate that people are willing to pay more to reduce litter. CIE estimates that the total willingness to pay for NSW residents to reduce litter to zero would be \$310 million per year, with a further \$300 million to reduce illegal dumping to zero (Centre of International Economics, 2022). In their research, CIE also determined that the community prefers reducing the number of sites that have noticeable litter over reducing the amount of litter at sites with noticeable litter, willingness to pay for reduced litter outcomes is

highest in natural environments (for example, around waterways), and NSW in general has a higher willingness to pay for litter reduction initiatives compared to Victoria and Queensland.

In the Georges River catchment, councils' Community Strategic Plans (CSPs) provide insight into the local community's aspirations. Current CSPs were reviewed for the six Georges River catchment councils participating in the development of the litter prevention strategy, with a focus on the specific goals and objectives identified in these plans.

Table 4 includes the relevant wording from each of the six councils' current CSPs. Four themes were identified which are related to litter prevention:

- **Healthy waterways:** the CSPs all include natural environment objectives, and 3 of the 6 specifically include waterway health.
- **Clean public places:** the CSPs all call for clean or attractive public spaces.
- **Sustainable community:** the CSPs all call for sustainable practices; many connecting this with encouraging behaviour change, community education and individual action.
- **Improved services:** the CSPs all include service provision objectives in some form, 2 of the 6 specifically mentioning waste services.

Table 4: Litter-related themes in the goals and objectives in current council Community Strategic Plans

Councils	Healthy waterways	Clean public places	Sustainable community	Improved services
Campbelltown	Implement and advocate for initiatives that conserve the city's natural environment	Safe, well maintained, activated and accessible public spaces	Promote and educate our community on sustainable practices and encourage practicable take up of more sustainable life-choices	Ensure that service provision supports the community to achieve and meets their needs
City of Canterbury Bankstown	Improve local waterway health	A cool, clean and sustainable city with healthy waterways and natural areas	An attractive, sustainable, affordable built environment	Clean the city using advanced recycling and waste services
Fairfield	Natural environments are clean and preserved	Inviting and well-used open space; Attractive and lively City	An environmentally aware and active community	Community assets and infrastructure are well managed into the future
Georges River	Our waterways are healthy and accessible.	Our town centres are green, clean, vibrant and activated and have good amenities.	Our environmentally sustainable practices inspire us all to protect and nurture the natural environment.	The three spheres of government work together to improve services and facilities in our area.
Liverpool	Manage stormwater and drainage infrastructure to mitigate risk to the environment and the community	Deliver a beautiful, clean and inviting city for the community to enjoy	Deliver and advocate for a sustainable, cool and green city	Manage waste effectively and maximise recycling opportunities
Sutherland	Manage catchments effectively to improve the cleanliness, health and biodiversity of our waterways.	Provide streetscapes and public places that are cool, attractive and where people feel safe.	Promote programs and partnerships that encourage awareness about sustainable practices and behavioural change within individuals, businesses and residents.	Deliver community services and facilities that respond to the changing needs of our community

5.6 LITTER PREVENTION WORKS

In Section 2, Figure 2 and Figure 3 showed how litter takes a journey from production into the environment, and litter prevention intervenes at multiple points in this journey to reduce the likelihood of litter entering the environment.

At the upstream end of the litter journey, actions that stop litter at the source (e.g. bans on single use plastic items), reward responsible behaviour (e.g. the return and earn scheme) and improve infrastructure (e.g. investing in bin infrastructure) have the potential to create lasting changes to reduce the quantity of litter getting into the environment, which could reduce ongoing clean-up costs and downstream impacts.

Actions that reduce litter dispersal could also reduce clean-up costs and downstream impacts. As litter moves from urban areas into the natural environment, it becomes increasingly dispersed and difficult to clean up, so actions closer to the source have the potential to reduce downstream costs.

Therefore, in theory it should be possible to demonstrate a positive cost-benefit ratio for investing in litter prevention initiatives. However, in practice this can be difficult:

- Clean up costs can be difficult to separate from other costs (e.g. to identify the portion of staff time, equipment costs and disposal costs attributable to cleaning up litter).
- Cleaning up may be undertaken by other organisations and volunteers.
- Litter may not be cleaned up, so its costs become externalised.

The other challenge with taking action further upstream is that it does require some knowledge of effective litter prevention strategies. NSW EPA has been running litter prevention grants since 2014 and has gathered significant information on strategies that work. Their guideline '*Delivering effective local litter prevention projects*' (NSW Environment Protection Authority, 2019a) recommends five key factors for litter prevention: cleanliness, infrastructure, education and awareness, enforcement and involvement.

Case studies of past litter prevention projects outline strategies that have worked elsewhere. Section 4.3 included a list of past litter prevention projects in the Georges River catchment, with links to further information where available. Note that there are many more case studies for litter prevention projects completed in other locations available on the NSW EPA's [website](#).

NSW EPA has also published results of a trial which tested several different strategies for reducing cigarette butt litter (NSW Environment Protection Authority, 2019b).

5.7 FUNDING IS AVAILABLE

With new targets in place for NSW to reduce plastic litter 30% by 2025 and all litter 60% by 2030, the NSW State Government is continuing to invest in litter prevention projects via grants programs. The NSW Waste and Sustainable Materials Strategy commits \$38 million for litter prevention programs over the next six years (NSW Department of Planning, Industry and Environment, 2021a). NSW EPA's current litter prevention grant guidelines (NSW Environment Protection Authority, 2022d) provides information about how funding will be allocated across three streams:

1. **Local litter prevention and clean-up grants** for targeted on-ground litter prevention projects that use an integrated approach to clean up litter hotspots, upgrade infrastructure, and deliver local campaigns and enforcement.
2. **Strategic development grants** to develop strategic initiatives that engage stakeholder networks and create business cases and approaches to link up and boost litter prevention action across whole regions, communities, industries or sectors.
3. **Strategic implementation grants** to implement litter prevention strategies developed in stream 2, including longer-term funding with more flexibility (up to \$450,000 over 3 years).

6 WHO CAN PLAY A ROLE?

Litter prevention works best when undertaken as a collaborative effort between organisations with different strengths, working in partnership.

Previous sections of this document outlined action already being taken by the State Government (Section 2.4), Georges Riverkeeper and its member councils (Section 4.1) to tackle litter from the state to the local catchment area. The following sections consider who has the capacity to play a greater role in litter prevention in the Georges River catchment area, what would motivate them to get involved, and what would lower the barriers to participation.

6.1 STATE GOVERNMENT

State government has policy, a strategic plan, and resources for litter prevention, and plays a leading role as outlined in Section 2.4. However, state government lacks the local presence to achieve site-specific results at local scale. Therefore, they rely on partnerships with local councils and community groups to deliver litter prevention outcomes in local places.

6.2 GEORGES RIVERKEEPER

Georges Riverkeeper is actively involved in education, awareness and engagement and cleaning up litter. These two areas of work fit into the Georges Riverkeeper's current strategic plan under 'catchment actions' and 'education & capacity building' as shown in Table 5.

Other focus areas of Georges Riverkeeper's strategic plan are Operations Management, River Health & Research, and Stormwater & Sewage Programs. Currently, none of these includes a clear focus on litter, however they do suggest areas where a more strategic approach to litter prevention would align well with the Georges Riverkeeper's existing programs.



In **Operations Management**, Georges Riverkeeper's long-term goal is: "To be a resilient, innovative and sustainable industry leading Catchment Group". This includes organisational governance, operational management, evidence-based advocacy and reporting. Strategic litter prevention initiatives that could fit in here include:

- Reviewing litter data gathered by the EPA in the catchment and communicating key findings, to raise

awareness of litter issues and assist catchment managers improve litter prevention practices.

- Building a partnership with NSW EPA, in particular the Litter Prevention Unit (LPU). Note that Georges Riverkeeper already has Sydney Water as a Financial Partner of the organisation.
- Advocating for more action on litter prevention, including setting a litter prevention target that is shared by all stakeholders.



In **River Health and Research**, Georges Riverkeeper's long-term goals are:

- "Act as a secure custodian of Georges River catchment environmental data.
- "Drive research to increase the evidence-base required to support best practice waterway and catchment management.
- "Become recognised as a best practice urban waterway monitoring Program."

The River Health and Research program includes river health monitoring and research to aid evidence-based best practice management of urban waterways. This aligns well with the EPA's approach to managing litter with the support of the litter data framework, including monitoring of litter in catchments and estuaries. Strategic litter prevention initiatives that could fit in to the Georges Riverkeeper's River Health and Research program include:

- Learning to use litter monitoring tools and resources including the Australian Litter Measure (ALM), Key Littered Items Study (KLIS), Local Litter Checks (LLCs) and Butt Litter Checks.
- In partnership with the EPA, establishing at least one KLIS monitoring site in the Georges River estuary.
- Reporting on progress towards litter prevention targets for the Georges River.



The **Stormwater & Sewage** Program long-term goals are:

- “Contribute to State and National Stormwater policy.
- “Increase strategic WSUD uptake in members on-ground works across the catchment.
- “Improved water quality from fewer point source inputs by maintaining or improving compliance of dry weather overflows and improve Sydney Water’s response to incidents.”



As a major factor in the transport of litter from the catchment into waterways, stormwater management can play an important role in reducing litter dispersal. Georges Riverkeeper’s Zero Litter to

the River project is focused here, but could be better integrated with litter prevention initiatives. NSW EPA is thinking along these lines as well, with the ‘Streets to Sea’ initiative proposed in their new Litter Prevention Strategy (NSW Environment Protection Authority, 2022b).

Strategic litter prevention initiatives that could fit in to the Georges Riverkeeper’s Stormwater & Sewage program include:

- Partner with EPA to develop a better understanding of the transport of litter in the stormwater system and its interception in GPTs and other stormwater devices.
- Support councils in implementing best practice stormwater management including measures to intercept litter.

Table 5: Elements of Georges Riverkeeper’s current strategic plan relevant to litter prevention (Georges Riverkeeper, 2022c)

Focus areas	Catchment Actions 	Education & Capacity Building 
Existing roles of Georges Riverkeeper	<p>Leader: Georges Riverkeeper will lead the removal of litter from around waterways of the Georges River catchment.</p> <p>Partner: Georges Riverkeeper will partner with Corrective Services NSW in the delivery of on-ground litter removal, Councils and other relevant stakeholders to implement litter prevention projects.</p> <p>Advocate: Georges Riverkeeper will advocate for issues where the intended outcome is reduced litter, preserved and protected biodiversity, and improved natural resource management.</p>	<p>Leader: Georges Riverkeeper will lead the development of materials to educate a range of audiences about the values and threats for waterways in the Georges River catchment.</p> <p>Facilitator: Georges Riverkeeper will facilitate regular events to increase the capacity of member councils to implement best practice waterway management across departments.</p> <p>Supporter: Georges Riverkeeper will support groups wishing to disseminate information aimed at reaching a shared understanding of waterway issues and solutions across stakeholder groups in the Georges River catchment.</p>
Goals	<p>Long-term goal: A cleaner catchment through reduced litter.</p> <p>Intermediate outcome: Reducing the volume of litter within the Georges River, tributaries and catchment.</p>	<p>Long term goals: Support the community in changing attitudes and behaviours to achieve a liveable urban river. Increased understanding and on-ground best practice environmental management across the catchment through implementation of better plans and policies.</p> <p>Intermediate outcomes: Implementation of best practice environmental and urban river management.</p>
Outputs	<ul style="list-style-type: none"> • Rubbish removed from the environment • WHS approved worksites by Georges Riverkeeper and Corrective Services • Statistics reported to Members, Financial Partners and stakeholders. • Litter prevention projects implemented. 	<ul style="list-style-type: none"> • Increased community understanding of what is required and what is being done to achieve a liveable urban river. • Educators implementing the Georges Riverkeeper Education Modules. • Increased knowledge and capacity of Council and Partner staff and Councillors regarding urban river management.
Existing activities	<ul style="list-style-type: none"> • Annual WHS approval of worksites • Review of worksites and addition or removal of worksites as required • Rubbish collection at Corrective Services NSW sites • Partner with a Member to deliver a Clean Up Australia Day event annually • Development and implementation of a Litter Prevention Strategy 	<ul style="list-style-type: none"> • Targeted community education. • Provide capacity building opportunities for Council and Partner staff that are relevant and beneficial to carry out their role and better protect the Georges River and its catchment.

6.3 LOCAL GOVERNMENT

The catchment councils have an essential role in managing litter in public places, by providing important infrastructure and routine maintenance services. In terms of the seven litter prevention strategies that were shown in Figure 16, local government plays an essential role in the following areas, which would all be considered core business for local government:

- **Infrastructure** (e.g. providing public bins)
- **Clean-up** (e.g. street sweeping)
- **Stopping litter dispersal** (e.g. by installing and maintaining GPTs).

Local government can also play a role in the other litter prevention areas that were shown in the diagram, however in these activities councils may work in more of a supporting or enabling role, in partnership with others:

- Local government can support **source control** (e.g. by demonstrating the use of alternatives to single use plastics at council events) and **circular economy** measures (e.g. by providing infrastructure to support return-and-earn facilities).
- Local government can play a role in **education, awareness and engagement**. Several of the councils have past or current involvement in litter education programs.
- In terms of **enforcement**, council rangers can issue fines for littering, but rangers often report that it is rare to spot people littering, awkward to confront them about it and difficult to enforce a fine in locations where it is not clear how to dispose of litter appropriately or what the penalties are for littering.
- Council maintenance staff often have reasonable knowledge of litter hotspots, but do not always capture information about litter in a systematic manner which could be considered as **evaluation, monitoring or research**.

Georges Riverkeeper should consider how they can support councils in some of these roles, for example by providing materials/templates for education and engagement, and a framework for councils to contribute litter-related information to monitoring and research. Potentially Georges Riverkeeper could help councils to work more closely with EPA on enforcement – training more enforcement officers via EPA’s training programs and targeting enforcement to align with EPA anti-littering campaigns.

6.4 ROCS: REGIONAL ORGANISATIONS OF COUNCILS

Southern Sydney Regional Organisation of Councils (SSROC) and Western Sydney Regional Organisation of Councils (WSROC) have previously taken an active role in litter prevention, including previous regional litter prevention plans for Southern Sydney (SSROC, 2016) and Western Sydney (WSROC, 2016).

6.5 ENVIRONMENTAL NGOS

Environmental NGOs are involved in many aspects of litter prevention, particularly source control, education, awareness and engagement, clean-up and evaluation, monitoring and research.

There are some environmental non-government organisations (NGOs) who are active in litter prevention and already have a presence in the Georges River catchment, including Conservation Volunteers Australia (CVA) and Sustainable Organisations of the Sutherland Shire (SO Shire).

CVA’s #SeaToSource program includes the Georges River. The program includes regular macro litter monitoring, community clean-ups, trialling of source reduction infrastructure, schools engagement, a National Day of Action and a leadership program (Riviere, 2021).

SO Shire has a mission “to protect and enhance the natural environment by educating the public, mobilising volunteers, advising and promoting environmentally sustainable businesses within the Sutherland Shire.” (SO Shire, 2022) They run environmental programs including Plastic Free Sutherland Shire, which has been focused on reducing single use plastics.

Other organisations active in litter prevention but without (yet) a strong presence in the Georges River catchment include:

- **Taronga Conservation Society** runs initiatives focused on reducing litter in the environment, including [‘Litter Free Rivers’ resources](#) for NSW regional schools and businesses and [green grants, including grants for projects focused on plastic pollution](#). Past recipients include Seaside Scavenge, the Last Straw and Take 3 for the Sea.
- **Take 3 for the Sea** is focused on reducing litter reaching the ocean. Their recent [Ground Swell project](#) provides practical guidance to visitor economy businesses to help them reduce litter.
- **OceanWatch** is focused on advancing sustainability in the Australian seafood industry and operates community based coastal habitat restoration programs. Current programs include [‘Litter Free Estuaries’](#) focused on benthic litter in estuaries, two

[source reduction](#) plans focussed on fishing-related bait bags and professional fishing-related light sticks, and [Tangler bins](#) for fishing line.

- **OzFish** is focused on fish habitat restoration and this includes several [litter prevention initiatives](#). They are active in source control of fishing litter including tangle bins, clean up days and education campaigns. They are also currently developing a litter prevention strategy for the Macquarie River in the Dubbo LGA.
- **AUSMAP** (the Australian Microplastic Assessment Project) has recruited citizen scientists to sample microplastics in the environment.
- **Tangaroa Blue** runs the Australian Marine Debris Initiative and their work includes clean ups, data collection, research, and source control initiatives.

Many of these environmental NGOs are small and lack a notable presence in the Georges River catchment area, however they form a loose network of organisations with shared interests, with opportunities to share ideas and resources. Some of these organisations often work in partnership with others and may be interested in partnership initiatives with the Georges Riverkeeper.

6.6 COMMUNITY GROUPS

Community groups include social groups, environmental groups, youth groups, sports clubs, groups representing CALD communities and special interests. For community groups, even though litter prevention may not be their first priority, a litter prevention project can be a means for them to meet other community-building objectives. Litter prevention projects can provide community-building opportunities, including opportunities to develop a sense of connection to local community, place, and environment.

Community groups can get involved in the following areas of litter prevention:

- **Cleaning up** litter is an easy way for people to get involved, it can be social, fun, and satisfying for participants. Community groups can use clean up events to bring community members together for a shared purpose. The NSW EPA litter prevention grants will cover a once-off clean-up with an amount up to \$5,000 per site.
- **Education, awareness and engagement:** community groups are ideally placed to engage with their

communities. Past projects run by the Macarthur Diversity Services Initiative are good examples. On [EPA's website](#) there are many other examples of past projects which have received community litter grants, often with a focus on education, awareness and engagement.

- Community groups can get involved in **evaluation, monitoring and research** as part of citizen science programs. For example, community groups are assisting with data collection for the KLIS on the south coast. There is potential for this to be implemented on the Georges River, under the guidance of Georges Riverkeeper.

Community groups can also support circular economy outcomes (e.g. with advocacy and support) and enforcement activities (anyone can report littering from a vehicle).

Beyond cleaning up litter, a feature of most of the other examples above is that they involve more significant barriers to entry – for example, they require knowledge of litter prevention, training in sampling methods, and more coordination between individuals and groups. Some positive factors that may motivate community groups to get involved include:

- Alignment with their purpose, or at least some opportunity for meeting their community-building or other objectives via involvement in litter prevention.
- Lower barriers to participation when there is an organised program in place, clear pathways to involvement and the potential to begin with simpler actions.
- A sense that their contribution is part of a coordinated effort and contributes to a greater outcome.
- Access to knowledge/training.

Georges Riverkeeper could play a role in establishing a network of community groups interested in litter prevention, and creating opportunities for involvement from this sector.

As a possible starting point, councils are often connected to community groups and already work in collaboration on certain initiatives. For example, both Liverpool and Fairfield Councils have strategies focused on supporting refugees and vulnerable migrants in the local area, as these LGAs are major destinations for new arrivals settling in Australia (Fairfield City Council, 2017) (Liverpool City Council, 2022). Fairfield's strategy was developed in partnership with various agencies, NGOs and community groups and seeks their involvement in its implementation. It includes an extensive list of contacts.

7 CURRENT SITUATION

Georges Riverkeeper and its member councils can build their capacity in litter prevention.

7.1 GEORGES RIVERKEEPER

In 2022, Georges Riverkeeper completed a litter prevention capacity assessment using the EPA's Own it and Act tool. This highlighted that the organisation's current litter prevention strengths are in leadership and commitment, in particular:

- Public promotion of litter prevention
- Understanding the benefits of a commitment to long-term litter prevention
- Being committed to litter prevention outcomes for our community and the environment

Importantly, litter prevention is an existing activity identified within the Georges Riverkeeper's current Strategic Plan under 'catchment actions' and 'education & capacity building' (refer to Table 5 in Section 6.2). This means that certain litter prevention activities are established within the organisation's scope and have been endorsed by the Executive.

Key limitations were in permission and process, in particular the organisation does not currently have:

- Formal litter prevention roles and position descriptions
- Induction or training in litter prevention
- A track record of litter prevention using the Local Litter Check
- Monitoring and evaluation of litter prevention initiatives
- A practice of celebrating litter prevention successes and sharing outcomes

Several of these gaps are due to the organisation's small size and its role in the catchment. As an organisation of member councils, the Georges Riverkeeper does not replicate the functions of its members, but focuses on specific roles caring for the Georges River and its tributaries, which cross council boundaries.

7.2 MEMBER COUNCILS

Georges Riverkeeper has eight member councils and six of these, covering the majority of the catchment area

(Campbelltown, Canterbury-Bankstown, Fairfield, Georges River, Liverpool and Sutherland) all participated in the development of the Georges River Litter Prevention Strategy.

The participating councils are involved in litter prevention to varying degrees. Each provided some information on their current litter prevention capacity.

7.2.1 CAMPBELLTOWN COUNCIL

Staff from Campbelltown Council completed a preliminary OIAA status check, which showed their current litter prevention capacity as relatively low overall. However, certain strengths were evident in their responses including:

- There have been recent improvements to bin infrastructure (47 solar compactor bins installed in CBD locations), which have reduced public bin overflow and litter in high use public spaces.
- There is a system for responding to 'loose litter requests' and data is available from this system (refer to **Box 1** in Section 5.2). Therefore Campbelltown has some useful information about known litter hotspots.
- The compliance team were involved in the Cigarette butt 'Tosser' campaign up until 2019.
- Litter forms a component of water quality education provided by Council's Environmental Education Officer.
- There is support provided to community clean up events including several groups who clean up regularly.

Staff provided substantial information, indicating their willingness to support the Georges River Litter Prevention Strategy, and they also mentioned they are hoping the Strategy will provide some actionable points for Council to follow up on. Staff comments also gave some indication of broader organisational support – e.g. comments that "Litter prevention is seen as a business/operational focus to maintain attractive places" and "Compliance would like to re-engage in the education space to assist with litter prevention."

Therefore, overall Campbelltown Council seems likely to take an active role as a partner in implementing the Georges River Litter Prevention Strategy.

7.2.2 CITY OF CANTERBURY-BANKSTOWN

Staff from The City of Canterbury-Bankstown completed a preliminary OIAA status check, which showed relatively high capacity for litter prevention, across most areas of the framework. Key strengths include:

- The development of the Clean City Strategic Plan, which clarifies Council’s vision for litter prevention.
- Following on from this plan, they are expecting to formalise budget and responsibility for litter prevention, building on a small existing budget that has been dedicated to litter prevention initiatives in previous Operational Plans.
- There is a strong platform for internal collaboration, with an internal steering group to drive actions from the Clean City Strategic Plan.
- Council has a strong track record of past litter prevention projects using EPA’s litter prevention framework and tools.
- Staff are active in external engagement and have experience working in partnership with other organisations on litter prevention initiatives.

Specific areas for improvement were identified as:

- Enabling staff to take ownership of litter prevention
- Support for a strategic approach to litter prevention (this is expected to improve as the Clean City Strategic Plan is implemented)
- Systematic understanding of litter types and spatial distribution in the local area
- Monitoring and evaluation of litter management activities.

Overall, the City of Canterbury-Bankstown is already taking an active role in litter prevention and would be almost certain to take an active partnership role in implementing the Georges River Litter Prevention Strategy.

7.2.3 FAIRFIELD COUNCIL

Fairfield Council currently has limited capacity for litter prevention. They did not complete a preliminary OIAA status check. Staff identified their main litter prevention activity as the presentation of a catchment model and resources for Moon festivals, Youth festivals and schools.

Beyond this, Fairfield Council is focused on litter issues in their creeks. Fairfield Council’s regular proactive creek cleaning sites include:

- Green Valley Creek

- Bonnyrigg Wetlands
- Prospect Creek
- Burns Creek
- Orphan School Creek – Stockdale Reserve
- Orphan School Creek – Cowpasture Road through to Sweethaven Road, Edensor Park
- Clear Paddock Creek
- Long Creek
- Cabramatta Creek
- Orphan School Creek (section) Parklea Pde – Cumberland Hwy

Fairfield Council has existing GPTs and is re-investing in renewal of GPTs to capture litter before it enters their creeks, but also noted there are many sources of litter downstream of GPTs, including parks and cycleways along the creeks, properties backing onto creeks, and creek banks in public areas where dumping occurs. Currently Fairfield Council does not have capacity to address all these issues.

Therefore, Fairfield Council could be considered an interested observer at this stage, with ongoing communication with key staff members. Fairfield Council would potentially be a future partner in implementing the Georges River Litter Prevention Strategy.

7.2.4 GEORGES RIVER COUNCIL

In 2020, Georges River Council adopted a target of “zero litter originating from terrestrial locations above the high-water mark within the Georges River Local Government Area by 2030”. This is a relatively recent position, and therefore Georges River Council are still developing their program and building their capacity, but this target means that their vision is clear, they are reporting on progress publicly, and there is a clear driver for the organisation to improve litter prevention practices and make litter prevention a core activity. Therefore staff noted leadership as a strength.

A 2022 progress report (Georges River Council, 2022) outlines existing activities related to litter prevention. Much of the report focuses on the Georges Riverkeeper’s activities. It outlines Council’s existing litter prevention activities, which are fairly typical of other councils, including managing street litter bins and Return and Earn facilities, supporting the RID Squad (illegal dumping), running a waste education program, supporting Clean Up Australia Day. Georges River Council also maintains GPTs and other stormwater treatment systems.

The report also outlines several proposed initiatives which are more focused on litter prevention and would go beyond business-as-usual:

- A Litter Reduction Program for schools across the entire LGA is likely to be considered from 2023 onwards,

based on a 2019 project targeting litter reduction in Hurstville CBD in partnership with Hurstville Public School.

- Environmentally sustainable event guidelines were drafted in 2022.
- Installation of smart sensors on bins and consideration of bin sensor and radio-frequency detection (labelling and scanning) technology in the next waste collection tender.
- Location-specific education campaigns at litter hotspot areas within CBDs.
- A targeted litter education program.

The report notes that many of these proposed initiatives are dependent on funding and they would look to apply for grant funding. Given this current position, Georges River Council seems likely to take an active role as a partner in implementing the Georges River Litter Prevention Strategy.

7.2.5 LIVERPOOL COUNCIL

Liverpool City Council provided little information on litter prevention initiatives, suggesting their current capacity is low. Staff explained that they currently have 3 vacant positions in waste education, limiting their capacity to get involved in litter prevention recently.

Staff also mentioned:

- Previous involvement in WSROC's Regional Litter Plan

(Fairfield Council was also part of this).

- Potential for greater community involvement in litter prevention in the LGA, including involvement of schools, bushcare groups, CALD community groups and other community groups. Community engagement was generally seen as a strength in the LGA, although it is not currently focused on litter.

Overall, Liverpool Council is in an uncertain position due to their current staffing shortfall. If they are able to bring staff on board in 2023, they may be able to take an active role in the medium-term as a partner in implementing the Georges River Litter Prevention Strategy.

7.2.6 SUTHERLAND SHIRE COUNCIL

Sutherland Council staff indicated strong alignment and support for litter prevention, but current activities are fairly routine including litter picking, bin infrastructure, Return and Earn facilities, GPTs, support for Clean Up Australia Day.

Past involvement in litter prevention has included:

- No Tossers at Our School, 2008 (with DECC)
- NSW EPA Report a Tosser campaign
- Involvement in SSROC litter prevention projects.
- Don't be a Tosser 20-21

Sutherland Council may or may not be ready to take an active role as a partner in implementing the Georges River Litter Prevention Strategy in the short term.

8 VISION AND GOALS

Georges Riverkeeper has an established vision and has set goals for litter prevention in its Strategic Plan.

8.1 VISION

The Georges Riverkeeper aspirational goal, which incorporates the organisation's vision and mission, is:

'Best practice environmental management for a liveable urban river'

(Georges Riverkeeper, 2022c, p. 4).

8.2 GOALS

Within the organisation's Strategic Plan, there are goals established under each of the five strategic programs. Litter prevention goals come under the 'Catchment Actions Program', which has as its main goal: "Protect the aesthetics and biodiversity of the Georges River and its catchment" (Georges Riverkeeper, 2022c, p. 9). There are two parts to this: litter and biodiversity. Under litter, the Strategic Plan identifies:

- The long-term goal as "A cleaner catchment through reduced litter."
- An intermediate outcome as "Reducing the volume of litter within the Georges River, tributaries and catchment."

There are also goals under other programs with relevance to litter prevention – these are identified in Section 6.2.

8.3 OWN IT AND ACT GOALS

Georges Riverkeeper drafted the following intentions as part of their Own it and Act assessment in 2022:

- Collaborate with member councils and other

organisations to engage in on-ground litter prevention activities.

- Find efficiencies in litter collection to increase the staff time available for litter prevention.
- With member council support, consider applying for funding for a litter prevention officer role.
- Continue to develop relationships within member councils (e.g. waste teams) to work together to implement litter prevention activities.
- Develop implementation program for the Litter Prevention Strategy.
- Continue to apply for grant funding for litter prevention projects.
- Include SMART objectives when developing projects.
- Include litter prevention activities in the Georges Riverkeeper Annual Workplan.
- Investigate actions in litter prevention that don't require a budget. E.g. some capacity building - partnering with member councils for educational activities.
- In collaboration with stakeholders, implement the monitoring framework to come out of the Litter Prevention Strategy.
- Publicly promote litter prevention to stakeholders - website, news articles etc.
- Consider doing presentation at the Litter Congress.
- Continue to advocate for better regulation around litter.

9 STRATEGIC DIRECTIONS

Strategic directions have been identified in consultation with the Project Reference Group.

At the Project Reference Group workshop on 29 September, litter prevention opportunities were discussed, with a particular emphasis on opportunities for Georges Riverkeeper and its member councils to work together on litter prevention initiatives.

An initial set of ten ideas emerged from this discussion and subsequent conversations with participants:

1. **Bringing attention to the significant costs of cleaning up/removing litter** from public places, from the stormwater system, from creeks and from the river. This should highlight the work councils are doing, to strive for community aspirations for cleaner public places and a cleaner natural environment. This could be coupled with information highlighting and visualising the effects of litter on waterways. Targeting riverfront / creekfront, high visitation parklands and coupled with infrastructure, signage could bring attention to both the environmental impacts and what councils are doing to clean up litter from the creeks and the river.
2. **Putting litter prevention back on the agenda**, as it has tended to fall away while other priorities take precedence for councils' waste teams, including illegal dumping and waste management in general.
3. **Planning for litter prevention in the context of significant development** in the catchment, including the blue-green grid.
4. **Building on councils' existing knowledge and litter management data** (e.g. from previous projects) to make informed decisions about litter prevention.
5. **Building on the experience of Georges Riverkeeper and councils engaging with schools** on litter prevention, noting that schools remain litter hotspots in some parts of the catchment and Georges Riverkeeper's member councils are keen to see the program continue. Funding for the current program is limited to the four-year Environment Restoration Fund Program 2019-20 to 2022-23, being funded by a grant from the Australian Government. Georges Riverkeeper should investigate ongoing funding opportunities including EPA litter prevention grants. The program may need to be modified to align with other funding opportunities, and Georges Riverkeeper has noted an opportunity to improve how its outcomes are monitored.
6. **Working with community groups with shared interests** related to litter prevention (e.g. SO Shire, CVA), to facilitate greater community involvement.
7. **Developing an improved understanding and approach to involving CALD communities at litter hotspots** in the catchment area. This should include local Aboriginal perspectives. Georges Riverkeeper has started conversations with Liverpool Council about how they work with CALD communities on a range of issues. The Satyam Ghaat at Haig Park Moorebank is a potential pilot project site.
8. **Working with other organisations** who manage public places (e.g. Transport for NSW as the manager of main roads) and involving them in a coordinated approach to litter prevention in the catchment.
9. **Focusing attention on litter prevention in industrial areas**, which are prevalent in the catchment, are known in general to be significant sources of litter, but have not been paid much attention in past litter prevention projects in the catchment. In these locations, litter and illegal dumping are both notable issues, which may need to be tackled together.
10. **Continue the approach commenced with the 'Zero Litter' project**, where litter prevention is planned in conjunction with stormwater management measures to reduce the quantity of litter reaching waterways.

At their November meeting, the Project Reference Group revisited these ideas to consider the following questions about each one:

- Why is this important?
- How can the strategy help?
- What future actions should be recommended within the strategy?

Figure 23 shows how the ten ideas have been organised into three main areas, and the following sections outline each initiative in more detail, including potential actions.

Note that the following sections on each initiative describe roles for Georges Riverkeeper and its member councils, as well as identifying other relevant stakeholders who might play a role in litter prevention initiatives. For each initiative, possible actions are also suggested. However at this stage actions have not yet been assigned to any specific organisation. Some clearly fit best with a particular organisation’s role, but others are likely to require collaborative effort.



Figure 23: The ten ideas have been grouped into three areas

9.1 BUILD AWARENESS AND KNOWLEDGE OF LITTER PREVENTION

Initiative 1.1 Putting litter prevention back on the agenda	
Main idea:	Some of the GRK member councils mentioned that litter prevention has dropped off their agenda recently. Mergers (for some), Covid-19 and extreme weather have all been disruptive. With the State Government refreshing its litter targets and litter prevention grants program, it is timely to get litter prevention back on the agenda. The Georges River Litter Prevention Strategy has the potential to be a catalyst for action over the coming years.
Benefits:	If the Georges Riverkeeper and several of its member councils can build some shared momentum based on the Litter Prevention Strategy, there is greater potential for networking, coordinated efforts and partnerships, and potential to achieve more together.
Key considerations:	<p>Each of GRK's member councils is on their own litter prevention journey and it is not realistic to get all the councils working together on the same things at the same time. Georges Riverkeeper cannot direct their member councils' agendas, but when these agendas align, GRK can facilitate networking, coordinated action and partnerships with and between their members. This is similar across all Georges Riverkeeper's programs.</p> <p>In communications and engagement with the broader community, consider:</p> <ul style="list-style-type: none"> • Target groups for litter prevention messages, e.g. school leavers • Target times for litter prevention messages – evenings, weekends • Raising awareness and managing expectations, e.g. floods and storm events can shift significant quantities of litter, well beyond the capacity of GPTs; clean ups can't get all the small fragments of litter.
Councils' role:	<p>It is up to each individual council exactly how and when they engage in litter prevention. Some already have litter prevention firmly on the agenda, others are waiting for the right opportunity. Councils seeking to get litter prevention back on the agenda can:</p> <ul style="list-style-type: none"> • Continue to participate in the Georges River litter prevention project steering group • Build internal support for litter prevention initiatives • A possible next step is a WASM litter prevention Stream 1 project (small-scale, on-ground projects including cigarette butt and general litter prevention projects).
Georges Riverkeeper role:	<p>With their focus on the Georges River, where they see the impacts of litter on the waterway, Georges Riverkeeper can keep litter prevention on the agenda via the following channels:</p> <ul style="list-style-type: none"> • With their Committee, who meets quarterly • In their engagement with member council staff • By meeting with other catchment groups implementing/coordinating litter prevention to share ideas, lessons learned and potentially partner on projects • In their engagement with other organisations including local community groups and NGOs • In their communications and engagement with the broader catchment community
Other key stakeholders:	Community groups and NGOs can also (and already do) play a role keeping litter prevention in their communications and on their agenda for local community engagement.

Possible actions:

- Seeking GRK Committee sign off and member council endorsement of the Georges River Litter Prevention Strategy
- Completing a public facing version of the strategy
- Following the strategy's completion, celebrate this via GRK and council communication channels (and where appropriate, highlight that further action should follow)
- When councils update their Community Strategic Plans, advocate for litter prevention to be included
- Applying for future WASM litter prevention grants: GRK should consider applying for Stream 2 or 3 (strategic development, capacity building and strategic implementation). A short-term Stream 2 project would fund the development of a roadmap and then with this roadmap, GRK could apply for a 3-year program under Stream 3. Member councils should consider applying for Stream 1, 2 or 3 projects.
- Formalise a Georges River litter prevention working group that exists beyond the formation of the strategy
- Maintaining the focus on litter prevention in GRK annual workplans
- When the GRK Strategic Plan next comes up for review, refreshing the focus on litter prevention in there

Initiative 1.2 Understanding the costs of litter

Main idea:	State-based research has shown significant costs associated with managing litter, most of which are borne by councils. However, state-level data is of limited use for local planning, and local data is patchy. Local cost of litter information would help in planning and making the case for litter prevention initiatives, and EPA is looking for more information on the costs of litter in their grant application process.
Benefits:	<p>A greater understanding of local litter management, clean up and removal costs could shed greater light on:</p> <ul style="list-style-type: none"> • The scale of the litter problem in the catchment • The time spent dealing with litter and potential for more strategic use of resources • The places which need extra attention and times (e.g. events, holidays) when litter issues spike
Key considerations:	Include time spent on communications and dealing with litter complaints, as well as the time spent physically cleaning up litter.
Councils' role:	<p>GRK member councils should:</p> <ul style="list-style-type: none"> • Seek to understand their own litter-related costs • Use this information to make the case for strategic investment in litter prevention
Georges Riverkeeper role:	<p>Georges Riverkeeper should:</p> <ul style="list-style-type: none"> • Keep track of their own litter management costs (e.g. river clean ups) • Aggregate council and other partners' cost of litter data for future grant funding applications (this is called for in EPA's Roadmap template) • Review data for potential insights that emerge at catchment scale across multiple LGAs
Other key stakeholders:	<p>Some of the work managing litter and cleaning up is done by other stakeholders, e.g.:</p> <ul style="list-style-type: none"> • Transport for NSW (maintenance of main roads, railway stations, other transport nodes) • Corrective Services (litter picking – unpaid work) • Community organisations (local clean ups by volunteers – also unpaid) <p>Unpaid work cleaning up litter is relevant to the complete picture, and can be captured in terms of the hours of time spent.</p>
Possible actions:	<ul style="list-style-type: none"> • Localised cost of litter studies (e.g. individual councils) for the purposes of grant applications • Catchment-based cost of litter summary • Identify insights worth sharing to raise awareness of litter issues (see 1.1 above).

Initiative 1.3 Building on councils' existing knowledge and litter management data

Main idea: Information on past litter prevention projects is distributed in different organisations and some may be hard to access. There are also multiple sources of litter data (e.g. litter types found in the catchment and in the river) from past and ongoing initiatives.

Benefits: Anyone planning litter prevention initiatives should have access to relevant information and use the best available data to inform their planning. They would benefit from understanding what worked and lessons learned. Past projects may have developed useful resources that can be adapted and reused.

Key considerations: A list of past litter prevention projects was compiled in Section 4.3 (Table 3). Where further information was available online, this includes links.

While there is some good data on litter types found in the river recently (e.g. the #SeatoSource dataset, also referenced in Section 3.4.3), there is currently no Key Littered Items Study (KLIS) site in the Georges River catchment, which is an important gap considering the size of the catchment, how urbanised it is (i.e. there are significant sources of litter) and how important the waterway is for recreational use and aquatic ecosystems. A KLIS site would provide an ongoing measure of litter types and quantities in the Georges River, enabling changes to be tracked over time.

Councils' role: Continue to share relevant information with Georges Riverkeeper.
Check for relevant data and information on past projects when planning litter prevention initiatives.

Georges Riverkeeper role: Georges Riverkeeper can play a role collating locally relevant information and sharing it across the catchment. Some of this information and some datasets will grow over time, so GRK should develop a protocol with our council members for collecting, storing and sharing relevant data as it becomes available.

With their local knowledge, Georges Riverkeeper could help identify an appropriate local site for the KLIS. GRK would not have the capacity to do the KLIS monitoring on their own, but GRK would assist the study team if they do establish a KLIS site in the catchment.

Other key stakeholders: EPA, Georges Riverkeeper, councils, ROCs, NGOs and community groups all potentially have useful datasets and information on past projects. DPIE runs the KLIS and ideally they would be best placed to add a new site to the study.

Possible actions:

- Gather information and resources from past litter prevention initiatives and make them available to GRK member councils. This should include following up on the past projects listed in Section 4.3 (Table 3).
- Gather relevant environmental litter data (e.g. hotspot locations, litter counts).
- Organise access to the EPA's KLIS data dashboard and ALM dashboard when this becomes available.
- Investigate the potential to set up a KLIS site in the Georges River catchment.

9.2 INVOLVE PARTNERS

Initiative 2.1	Building on the experience of Georges Riverkeeper and councils engaging with schools
Main idea:	Education resources that can be shared and reused across the catchment, building on those already developed under the Environment Restoration Fund grant. There is the potential to roll out the same program to other primary schools, or to create new resources appropriate to other audiences (e.g. high school students).
Benefits:	The primary school program has been popular and there is interest in seeing it continue. Schools are still perceived as litter hotspots.
Key considerations:	Add a monitoring component to the program so that there is a quantitative measure to evaluate its success.
Councils' role:	Assist in identifying schools who are keen to participate. Identifying other potential audiences to which the program could be expanded.
Georges Riverkeeper role:	Seek funding and if possible, continue to coordinate the program. Monitor the program's outcomes.
Other key stakeholders:	Georges River Environmental Education Centre
Possible actions:	<ul style="list-style-type: none"> • Seek funding for the program to continue. • Consider extending the program to other audiences, noting this would need new/modified resources to be developed, as the current program is specifically designed for primary schools (Stage 3 students). • Develop a method to monitor the program's outcomes. • Continue to identify schools/other audiences keen to participate.

Initiative 2.2 Working with community groups with shared interests

Main idea:	Enable community groups to play a supporting role in litter prevention initiatives. Community groups can potentially play a greater role in litter prevention education, awareness and engagement, but this is only likely to happen when they are provided with support to do so. Cleaning up litter is an easy way for community groups to get involved, but litter prevention requires more in-depth knowledge and a different set of skills.
Benefits:	Community group representatives may be much better placed than staff from councils or GRK to engage directly with people in their local community.
Key considerations:	This is a diverse sector. Different community groups and organisations have different strengths, e.g. some are more locally focused but less interested in litter prevention, while some are more strongly focused on litter prevention but have less local presence.
Councils' role:	<p>Build relationships with relevant community groups.</p> <p>Identify potential partnership initiatives.</p> <p>Invite participation in shared projects.</p> <p>Better collaboration with community groups using council facilities</p>
Georges Riverkeeper role:	<p>Build relationships with relevant community groups.</p> <p>Identify potential partnership initiatives.</p> <p>Invite participation in shared projects.</p>
Other key stakeholders:	<p>SO Shire and CVA have been consulted during the strategy's development, as they are both currently active in litter campaigns in the catchment.</p> <p>Other community groups who could potentially get involved include the following that Georges Riverkeeper could approach:</p> <ul style="list-style-type: none"> • Take 3 for the Sea – who already have a strong litter prevention focus • OzFish – representing recreational fishers and already active in litter prevention <p>There are also many local organisations that member councils could approach, for example:</p> <ul style="list-style-type: none"> • Sports clubs – who often already have a role in caring for the places they use • Bushcare/Landcare and similar groups, who are also focused on caring for places • Community development organisations, who may be interested in community building initiatives (e.g. the Macarthur Diversity Services Initiative has been involved in past projects).
Possible actions:	<ul style="list-style-type: none"> • Build a list of community groups and identify contacts. • Survey groups to gauge interest and seek sign ups to a mailing list. • Encourage community groups to action litter prevention within their own organisation as a starting point. • Send a quarterly update in existing newsletters to keep in touch and make sure these organisations are aware of opportunities relevant to them (including WASM litter prevention grants). • Seek partnerships as appropriate.

Initiative 2.3 **Developing an improved understanding and approach to involving CALD communities at litter hotspots**

Main idea: The Georges River catchment is culturally and linguistically diverse (CALD) and the experience of staff working in the area is that broad community engagement does not always reach CALD communities. To target litter hotspots in CALD neighbourhoods, GRK and its members will need locally appropriate approaches. Researching the target audience and appropriate messaging is very important.

Benefits: Engagement approaches that work in the local context.

Key considerations: Local communities vary across the Georges River catchment. As well as cultural and language background, there will also be other factors to consider in local engagement, e.g. community demographics and socio-economic context.

Site-specific litter prevention projects will require detailed understanding of and engagement with the local community who uses the site. This will be different from project to project and needs to be a targeted, localised approach.

Councils' role: Councils have important local knowledge and experience. Councils generally will already have experience working with CALD communities in their area (not necessarily on litter prevention but on other topics) and will understand who lives in their local community, their demographics, socio-economic context, and other factors important to consider in community engagement.

Georges Riverkeeper role: Working at catchment scale and focused on the river, GRK only has a high-level understanding of the catchment community, but would need to rely on councils when a more local approach is needed. When GRK gets involved in litter prevention projects at specific litter hotspots, this should always be in partnership with the relevant local council, who would be expected to bring knowledge and experience of working with the local community.

Other key stakeholders: Note that EPA is also proposing more community research in their current NSW Litter Prevention Strategy 2022-2030.

Ethnic Communities' Council of NSW (ECCNSW) has relevant experience - The NSW Department of Planning, Industry, and Environment (NSW DPIE) is currently funding Ethnic Communities' Council of NSW (ECCNSW) to implement a project at Sydney Olympic Park where bilingual educators will engage with park users on weekends, to instigate discussions about litter in Arabic, Chinese and Korean. They will provide park visitors with cornstarch rubbish bags printed with litter information.

- Possible actions:**
- Consider a pilot project at Satyam Ghaat, Haig Park Moorebank (Liverpool LGA).
 - Consider developing some basic guidance that gives litter prevention project officers a starting point when they need to engage with CALD communities in the local area. Learn from councils' community engagement experience on other topics, and identify the key considerations for litter prevention.
 - When local litter prevention projects engage with local CALD communities, capture the lessons and resources which could be valuable to other projects.
 - ECCNSW could potentially be engaged for a similar program to the Sydney Olympic Park project, targeting high visitation parks in the Georges River Catchment.

Initiative 2.4 Working with other organisations	
Main idea:	There are other significant public land managers in the catchment, particularly Transport for NSW (who are responsible for main roads, railway stations, bus interchanges – these are often significant litter hotspots). A holistic approach should include these major land managers.
Benefits:	Councils often report that it is hard to engage with TfNSW on litter management and prevention. A catchment-based regional scale approach supported by the EPA may have more hope of cutting through.
Key considerations:	<p>TAFE NSW has previously run litter prevention initiatives on their campuses, setting an example relevant to other similar land managers.</p> <p>When ALM data becomes available, it is expected to provide more information on litter types and quantities associated with different land uses, including main roads.</p>
Councils' role:	Provide information about the local litter issues/hotspots where the cooperation of other public land managers is needed in order to tackle litter problems.
Georges Riverkeeper role:	Georges Riverkeeper can serve as a conduit between their member councils and state agencies, but Georges Riverkeeper does not currently have established relationships with agencies who are key land managers and therefore relevant to litter prevention. Therefore, Georges Riverkeeper should seek to work in partnership with EPA to engage with relevant agencies, including TfNSW. Regional Organisations of Councils could also be included to strengthen partnerships between councils and state government.
Other key stakeholders:	EPA should play a key role to bring other major public land managers to the table.
Possible actions:	<ul style="list-style-type: none"> • Identify land areas managed by TfNSW and others, and gather evidence on the nature of the litter problem in these locations. Councils would need to assist with this. • In partnership with EPA, engage with TfNSW and others, with an aim to initiate constructive action. • TfNSW could increase the visibility of "Tosser!" campaign material with prominent signage on main roads and at transport nodes.

9.3 TAKE A STRATEGIC APPROACH

Initiative 3.1 Focusing attention on litter prevention in industrial areas	
Main idea:	Based on existing NLI data, industrial areas are known to have larger quantities of litter than other land uses. ALM data is expected to confirm this and add more detail. Councils in the catchment are concerned about litter in industrial areas, and its impact on downstream waterways, but industrial areas are largely out of sight for most of the community, and there is an expectation that councils will focus litter prevention efforts in places like town centres and parks. A catchment-based strategy should be holistic and GRK, working from the perspective of the river, is potentially able to push for greater focus on the places where the greatest litter loads are arising.
Benefits:	Industrial areas are a significant source of litter at catchment scale and litter prevention here has the potential for significant benefits in the waterways downstream.
Key considerations:	<p>On general litter in industrial areas:</p> <ul style="list-style-type: none"> • Much of the litter in industrial areas is general consumer items (e.g. takeaway food packaging) with sources in the public domain (e.g. the streets), rather than industrial litter arising on business premises. • Illegal dumping is also an issue in industrial areas. The untidy look of these areas may influence littering behaviours. • ALM data should provide useful information on specific litter types and locations, when it becomes available from EPA. • Strathfield Council's past litter prevention projects are potentially useful examples – they have focused on industrial areas. <p>On nurdles (small plastic pellets used as a raw material in the manufacture of plastic products):</p> <ul style="list-style-type: none"> • Nurdles are readily observed at the foreshore locations where litter accumulates, and Georges Riverkeeper's sampling using the AUSMAP method has shown that nurdles make up a significant proportion of microplastics sampled at local sites.
Councils' role:	<p>On general litter in industrial areas: Councils would be expected to lead on-ground projects in industrial areas, particularly those focused on general street litter. Given their responsibilities in public streets and their role in compliance, council involvement would be essential.</p> <p>On nurdles: Councils could also play a role in addressing nurdles, this would likely be a supporting role to EPA's Operation Clean Sweep program (see below).</p>
Georges Riverkeeper role:	<p>On general litter in industrial areas: with their point of view focused on the river and taking a whole of catchment perspective, GRK can draw attention to the importance of industrial areas as sources of litter, and support litter prevention projects in these locations.</p> <p>On nurdles: GRK could also support EPA's Operation Clean Sweep program, targeting nurdles.</p>
Other key stakeholders:	<p>On general litter in industrial areas: businesses may have an interest in keeping their street frontage clean.</p> <p>On nurdles: EPA is developing 'Operation Clean Sweep', which includes \$500,000 to help plastic manufacturers improve their systems and providing guidance for councils about best practice nurdle management.</p>

Possible actions:

On general litter in industrial areas:

- Review ALM data when available, as well as other local litter observations (e.g. from councils) to identify industrial area hotspots of concern.
- Survey hotspots (e.g. with Local Litter Checks) to better understand the litter problems (litter types, sources, causal factors) at specific hotspots in industrial areas, and plan effective litter prevention initiatives
- Consider a pilot project within industrial areas, targeting one industrial hotspot in each member council area. Trial litter prevention initiatives including cleanliness, infrastructure, education and awareness, enforcement and involvement. Demonstrate effective action and present results to the Georges Riverkeeper Committee, asking member councils to continue the program in other hotspots.

On nurdles:

- Support the Operation Clean Sweep program targeting nurdles.

Initiative 3.2 Planning for litter prevention in the context of significant development	
Main idea:	The catchment is experiencing significant new development, and with this comes investment in upgrading public areas including parks, green grid links, streets and town centres. This is an opportunity to build best-practice litter management in at the planning and design stages.
Benefits:	Avoid litter problems by design. For example, consistent litter bin infrastructure and placement can encourage better litter disposal behaviour, as it makes it easier for the community to find a bin when they need one and use it appropriately.
Key considerations:	<p>An observation from the working group was that they expect design standards in parks, streets and town centres to be reasonably good, but green grid links potentially need more attention.</p> <p>Blacktown Council (via their Clean Cities program) has put significant effort into improving public domain design standards to get the details right and avoid creating litter hotspots. Their standards would be a useful reference.</p> <p>WSROC and SSROC have both done previous work providing guidance on choosing and using appropriate litter bin infrastructure.</p>
Councils' role:	Councils are the key organisations controlling planning and design standards for public places and infrastructure, therefore they would need to take a leading role in driving this action.
Georges Riverkeeper role:	<p>Georges Riverkeeper could play a supporting role to member councils, including:</p> <ul style="list-style-type: none"> Identifying good practices and sharing information. With input from member councils, Georges Riverkeeper could collect information on new litter management infrastructure and litter prevention practices being implemented by each council and share knowledge with other members. Raising awareness of effective planning strategies and design options. Celebrate the best examples and promote good practices.
Other key stakeholders:	Other agencies with public land management responsibilities.
Possible actions:	<ul style="list-style-type: none"> Review how litter management is currently considered in public domain upgrades, and what kind of outcomes are being achieved in different contexts. Identify opportunities for improvement. If there is a need to improve practices, develop guidance on planning for litter prevention in the planning and design process. Incorporate guidance already developed in past projects. Initiative 1.3 should improve access to existing guidance documents.

Initiative 3.3 Support EPA's proposed Streets to Sea initiative

Main idea:	<p>EPA is developing a new 'Streets to Sea' initiative, including strategic initiatives to stem flows of litter from urban streets into creeks, rivers and estuaries via rainwater runoff (stormwater).</p> <p>While it is not yet clear exactly what EPA's initiative will include, Georges Riverkeeper has relevant experience to contribute, having completed the major 'Zero Litter in Georges River' initiative over the past 3 years. This has funded GPT audits and upgrades in several council areas and a new GPT planning/design manual for member councils, but also highlighted gaps and remaining questions.</p> <p>There is potential for ongoing programs in the Georges River project to continue the work from the Zero Litter initiative and integrate it with EPA's Streets to Sea initiative.</p>
Benefits:	<p>Maintain momentum, ensure that findings from the Zero Litter project are carried over into the next initiative.</p>
Key considerations:	<p>A key question for litter managers, waterway managers and stormwater managers is that there is still a need to better understand the flows of litter from catchments to waterways, and how to use GPTs and other stormwater management interventions (e.g. street sweeping) most effectively.</p> <p>A key challenge is gathering relevant data. Information on activities like litter picking, street sweeping and GPT maintenance is mostly held by councils but does not often include much detail on the quantities or types of litter collected. Useful information may not be readily available, and it may take a new initiative to collect relevant information at a useful level of detail. This was recently attempted in the Cumberland Council area with limited success.</p>
EPA's role	<p>EPA is leading the Streets to Sea initiative. Work with EPA to understand their 'Streets to Sea' initiative and how to support their approach.</p>
Councils' role:	<p>As the key stormwater managers in the catchment, Georges Riverkeeper member councils would be essential partners.</p>
Georges Riverkeeper role:	<p>Georges Riverkeeper could play a coordinating role between EPA and councils.</p>
Other key stakeholders:	<p>Research institutions.</p>
Possible actions:	<p>Depending on EPA's objectives, Georges Riverkeeper could provide support by:</p> <ul style="list-style-type: none"> • Sharing lessons learned from the 'Zero Litter in Georges River' initiative. • Assisting to gather data from councils on litter flows – including quantities of litter captured by street sweeping, GPTs and other stormwater management measures across the catchment. • Assisting with targeted monitoring of litter flows and litter removal in stormwater management measures, to fill data gaps.

10 MONITORING AND EVALUATION

Monitoring and evaluation of litter prevention initiatives can occur at multiple levels, from individual projects to whole-of-catchment.

10.1 LITTER DATA SOURCES AND MONITORING TOOLS

NSW EPA has developed a set of litter monitoring tools which are summarised in Figure 24. These include:

- The Australian Litter Measure, which is a methodology for measuring litter in different land uses, such as residential, retail, recreational parks or beaches. ALM data will be collected by EPA and it is understood that it will be made available to GRK, its members and other litter managers. The methodology will also be made available so it will be possible for local land managers to add to the data with their own local measurements.
- The Key Littered Items Study, which is measuring litter quantities in urban and remote estuaries. The data for urbanised estuaries is in a dashboard (available to GRK and other litter managers) that shows litter trends over the years, its distribution between sites and regions along the coast, and the relative quantities of different types of litter.
- The Local Litter Check and Butt Litter Check: tools for assessing litter hotspots. These are used locally for site-specific monitoring.

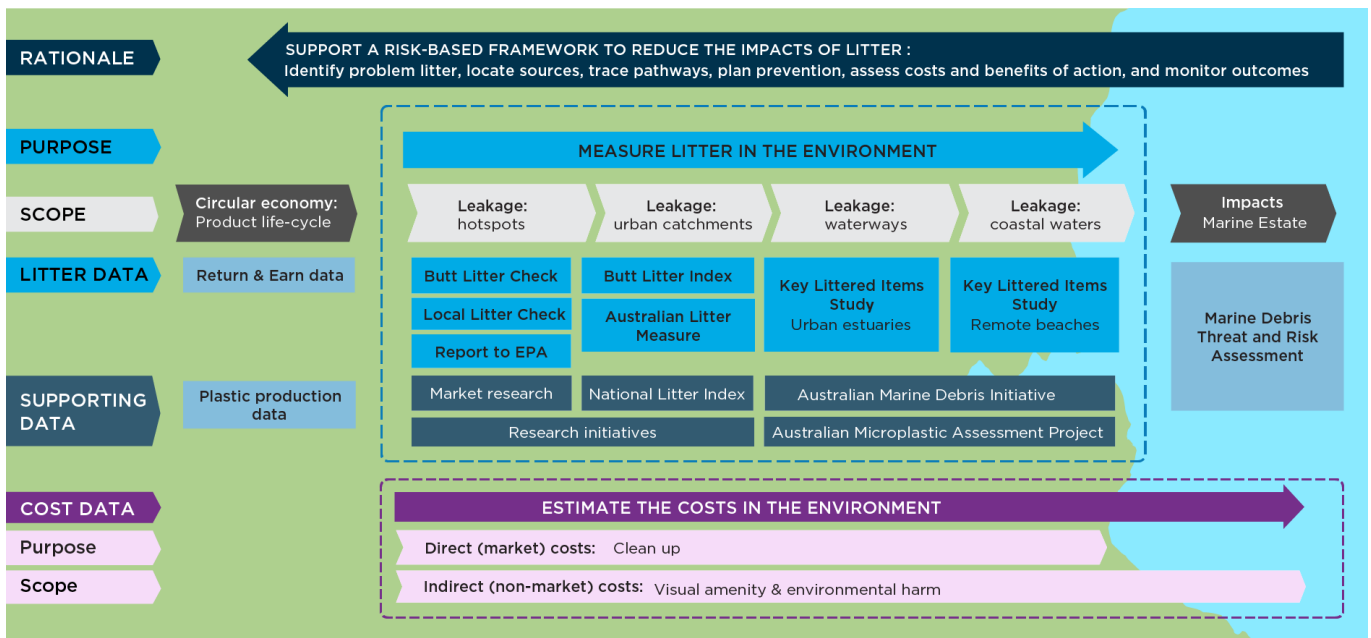


Figure 24: EPA's litter data framework (NSW Environment Protection Authority, 2021)

10.2 OPTIONS FOR MONITORING AND EVALUATION

10.2.1 CATCHMENT-WIDE LITTER MONITORING

NSW Government has set state-wide targets for litter prevention: a 30% reduction in plastic litter items by 2025 and a 60% reduction in all litter items by 2030. The KLIS will be used to monitor progress towards these targets across the state. The Georges River Litter Prevention Strategy should play a supporting role contributing to these targets, however, with no KLIS site in the Georges River catchment, KLIS data will not be able to be used for a local litter target.

Before specific quantitative litter prevention targets can be set for the Georges River, first there is a need for improved local monitoring of litter quantities. This could include:

- Setting up a local KLIS site.
- ALM data once this is available.
- Other data on litter flows, if Initiative 3.3 goes ahead.

10.2.2 SITE-SPECIFIC LITTER CHECKS

Site specific litter prevention projects can use the Local Litter Check or Butt Litter Check to monitor their outcomes at site scale.

10.2.3 OTHER MEASURABLE OUTCOMES

As part of developing a roadmap for the Georges River, this should identify measurable outcomes to be targeted, so that GRK

can report progress over time. These should be 'SMART' (Specific, Measurable, Achievable, Relevant, and Time-Bound) but need not involve direct measurement of litter in the environment. For example, measurable outcomes could include:

- Number of councils who have endorsed the Litter Prevention Strategy
- Number of councils participating in the Georges River litter prevention steering group
- Number of on-ground litter prevention projects completed or underway in the catchment

Councils need to report on progress towards adopted goals and targets, however when it comes to litter these are often fairly high-level and rely on indicators such as Community Satisfaction Survey outcomes (e.g. level of satisfaction with the cleanliness of public places) to measure success.

10.2.4 OWN IT AND ACT

The EPA's Own it and Act assessment tool can be used as a semi-quantitative measure of organisational capacity and has been designed so that it can be used to assess progress over time based on repeated organisational status checks.

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