



GR Georges
Riverkeeper
**GEORGES RIVER
REPORT CARD
2021 - 2022**

SPOTLIGHT ON SPOROBOLUS VIRGINICUS

Sporobolus virginicus goes by many common names including; seashore dropseed, salt couch grass, coastal rat-tail grass, sand couch, marine couch, salt-couch, saltwater couch, salt couch, salt-marsh couch-grass, just to name a few. *Sporobolus* is a spindly little grass with a pale green and yellow appearance. *Sporobolus* are part of the saltmarsh ecological community and are of great importance.

Sporobolus are an important food source for recreational and commercial fish species on the east coast of Australia. When *Sporobolus* decays into organic matter it is eaten by detritivores, like prawns and insect larvae, which play a key role in the food web of rivers and oceans.

Saltmarsh environments are a vital part of the ecology and balance our estuarine and coastal areas. Saltmarsh cope with higher salinities, dryer soils, greater sunlight and less tidal inundations than mangroves and are now recognised as essential. The absence of trees in saltmarsh areas means they are extremely vulnerable to damage from grazing, vehicles and development.

In the past the Georges Riverkeeper has been part of a program of active planting of *Sporobolus* and bush regeneration to give the *Sporobolus* and saltmarsh, more generally, a fighting chance.



SPOTLIGHT ON THE SYDNEY HAWK DRAGONFLY

The Sydney Hawk dragonfly *Austrocordulia leonardi* is a very distinctive dragonfly. It has an attractive black and yellow abdomen with clear wings studded with black tips. The wing span can be up to 70mm with an abdomen length of up to 40mm. The aquatic larvae can measure up to 24mm and they move through the water using jet propulsion by expelling water through their anus. Dragonfly larvae and adults are predatory. The larvae extend their toothed jaw to attack prey in a grabbing motion like a modified harpoon. Adult dragonflies are masters at aerial acrobatics; they can fly upwards, downwards, backwards, forwards, side to side, even hovering in mid air. Their large eyes can hone in on flying prey, like a stealth jet fighter.

Sydney Hawk dragonflies are a namesake of Sydney but unfortunately it is a species that is endangered in New South Wales and listed on the International Union for Conservation of Nature's Red List. Sydney Hawk dragonflies love deep shady pools of water and prefer to emerge into adults on sheer sandstone rock faces or overhangs (Grieve & Broom 2022). Their demise is due to habitat degradation caused by river regulation, riparian sedimentation, water pollution and climate change which have all contributed to the decline in its population.

To save this charismatic species we need to manage environmental water, reduce sediment loads, rehabilitate riparian and aquatic vegetation and protect their remaining habitat sites. Georges Riverkeeper are working with experts and Councils to track the habitats of the Sydney Hawk Dragonfly.



Photo by Adrian Grieve



Georges Riverkeeper acknowledges the Traditional Owners and Custodians of the Georges River, the Kamegal, Bedigal, Cabrogal, Cannemegal, Gweagal and Norongerral people of the Eora, Dharug and Dharawal nations and we pay our respects to their Elders past, present and future.

Georges Riverkeeper represents Member Councils in the Georges River catchment of southern Sydney, NSW, including Bayside Council, Campbelltown City Council, City of Canterbury Bankstown, Fairfield City Council, Georges River Council,

Liverpool City Council, Sutherland Shire Council and Wollondilly Shire Council.

Georges Riverkeeper have monitored river health since 2009 and reported litter collection on Georges Riverkeeper Report Cards since 2014. For past Report Cards, visit www.georgesriver.org.au.

Photos by Georges Riverkeeper. ©Georges River Report Card 2021 -2022.

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RIVER HEALTH GRADES

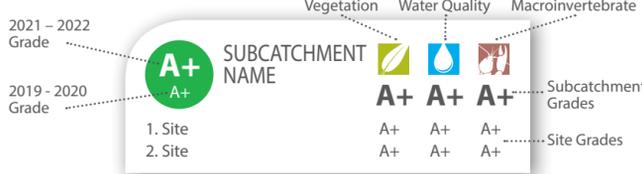
GRADING SYSTEM

River Health indicators are assessed against environmental guidelines allowing the award of a grade between A+ and F-.

GRADE	CONDITION
A+	EXCELLENT
A - B+	GOOD
B - C-	FAIR
D+ - F-	POOR

INTERPRETING GRADING ICONS

This diagram shows an example grading box.



MAP KEY

- Urban
- Forest
- Restricted Access
- Waterways
- Subcatchment Boundaries
- Council Boundaries

RIPARIAN VEGETATION

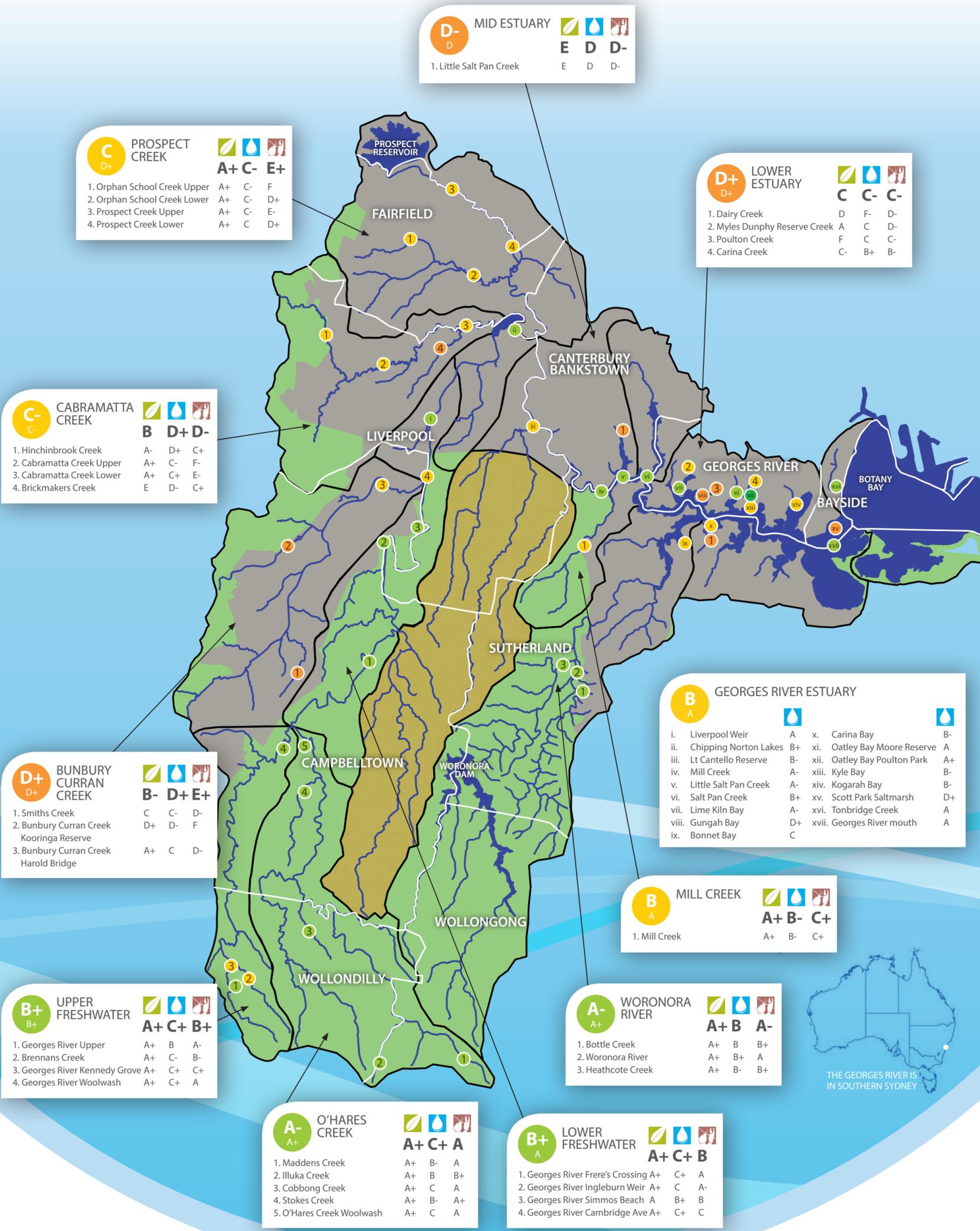
Riparian vegetation are plants living along the edge of waterways. Vegetation maintains waterways by stabilising the banks of rivers and creeks with a matrix of roots which binds the soil together and creates a living ecosystem of its own. Roots, leaves and branches falling into waterways, from riparian vegetation, creates habitats and food for aquatic animals. Riparian vegetation provides shade and can filter some pollutants from urban stormwater runoff that would otherwise enter the waterway.

WATER QUALITY

All aquatic plants and animals have specific water quality requirements to survive and exist in a healthy condition. All flora and fauna have a limit of tolerance to varying water quality conditions, and so will not survive or be in a healthy condition in water which is outside their level of tolerance. The Georges River Health Program monitors water quality along the Georges River, its tributaries and estuary within the Georges River catchment. Determining which water quality indicators are depleted and elevated at different locations, provides valuable information about the effects of various pollution types and impacts of land uses within the Georges River catchment.

FRESHWATER MACROINVERTEBRATES

Aquatic macroinvertebrates are small animals without backbones such as worms, snails and insects. Organisms that live in freshwater streams vary in their sensitivities to changes in water quality and habitat. The River Health Program surveys aquatic macroinvertebrates in the seasons of spring and autumn. Identifying & monitoring which macroinvertebrates can and cannot live at certain locations provides valuable information about the condition of various freshwater ecosystems across the Georges River catchment.



B- OVERALL FRESHWATER GRADE

B OVERALL ESTUARY GRADE

WHAT DO THE GRADES MEAN?

The amount of rainfall in 2021/2022 across the catchment was extreme. The graph below clearly shows the increase in rainfall this year, compared to the average rainfall, dating back to 1887. This unusual and abnormally frequent wetter period of flooding and higher than average rainfall during this time, throughout the Georges River catchment, has had a profound effect on the Georges River and its tributaries. Flooding generally has a deleterious effect on waterways causing increased contaminants, erosion and sediments flowing into the freshwater and estuarine environments.

The flooding and frequent rainfall events across the Georges River catchment this year has impacted the grades and may have skewed the results. Overall the Freshwater Grades were impacted, meaning the water quality is fair. Surprisingly, the more pristine bushland subcatchments at the headwaters were impacted with some of their grades reduced from excellent to good. Conversely, some of the urban subcatchments, such as Prospect Creek, improved their grade from poor to fair.

Overall the Estuary Grade was fair, dropping a grade since 2019/2020. This was probably caused by an increase in pollutants and nutrients being flushed from the urbanised area and entering the estuarine environments due to flooding and frequent rainfall events.

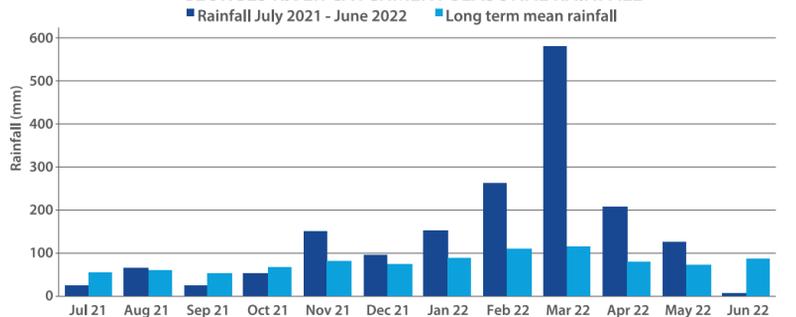
Floods and frequent rainfall events cause more sediment, pollutant and nutrient loads being washed from the heavily urbanised catchments and into the waterways. This contributes to lower diversity and abundance of aquatic macroinvertebrates. Macroinvertebrates can be washed downstream and populations and habitat can be smothered and degraded by increased sediment and declining water quality. Macroinvertebrate families are temporarily eliminated from some systems during floods and this may explain the decrease in grades across the bushland subcatchments this year.

Although an expected outcome of flooding and higher than usual rainfall is usually reduced water quality, this year's results, in some of the urbanised areas, are an improvement on the previous records from 2019/20. These urban improvements may be due to flushing of the Georges River system and purging the catchment by diluting the

urbanised pollutants and nutrient loads in those local tributaries.

More than likely, the improved riparian habitats, continuous litter collection, increasing installation of gross pollutant traps and at the time reduced community activity during the COVID-19 Greater Sydney Lockdowns may have resulted in a better result for urbanised areas this year. This is exciting news (not including the COVID-19 Greater Sydney Lockdowns) and should encourage Councils to continue their good work. Litter reduction and bush regeneration has feasibly improved water quality in some urban areas in 2021/2022.

GEORGES RIVER CATCHMENT SEASONAL RAINFALL





CLIMATE CHANGE, THE IMPACT ON THE GEORGES RIVER CATCHMENT

Australia has always been a land of droughts and flooding rains and this year was no exception. Climate change is now here. The outlook for the Australian environment is not good and we can already see the heavy impacts of climate change on the Georges River catchment.

The bad news is, as predicted, we are seeing an increase in temperatures, heavier and more frequent rainfall events, floods, pathogens and pest species. Waterways and marine environments are increasing in temperature and intermittent flows.

The Australian environment is very resilient to extreme conditions as it has always had to manage and respond to various extreme events, such as droughts, fires, floods, and cyclones to name a few. However, what has changed is the frequency or the rate of change, being too fast for the natural environment (flora, fauna, macroinvertebrates, fungi etc.) to adapt. Species cannot evolve fast enough to compete with the rate of climate change.

The definition of ecological resilience is the ability of the species or ecosystem to survive, recover and maintain ecosystem functions after

episodic destruction. To assist the environment to become more resilient there are several things we (the local community, visitors and governments) can do.

Governance is more important than ever and funding grants for environmental works need to be 3 years in duration, at a minimum, and ideally 10 to 20 years to ensure consistency and ecological resilience is established. We need to identify the natural areas in all urban, peri-urban, rural and regional locations, where we can save (through preservation, protection, enhancements, rehabilitation and legislation) and those we cannot (severely degraded). Areas which have any form of natural resilience should be identified and managed accordingly.

Regeneration projects which are going to survive in these extreme conditions should be identified, valued and frequently monitored. It would be wise to invest in many remediation and natural measures like artificial water sources, habitats, hollows and nesting sites to increase fecundity and ensure survival of as many species (flora and fauna) and ecological areas as possible.

Nevertheless, extreme weather events can present opportunities, like the recent floods, which emphasised the vulnerable and resilient areas of the catchment so we can target and manage these areas accordingly. Extreme weather events like bushfires means we can get into areas otherwise inaccessible and eradicate and/or reduce weed and pest species. Pathogens and pest species will also increase if climate changes continue on this predicted path without intervention, so it is best that we try and eradicate them now.

As we have seen around the world, during the COVID-19 pandemic lockdowns, plants and animals took advantage of the absence of people. Insects flourished, african penguins and loggerhead turtles bred more successfully, the famous Venetian canals ran crystal clear and the water quality improved in the Ganges River. There is still hope and possibility, however the window to slowing, stopping and reversing climate change is rapidly closing.

