

RIVER HEALTH REPORT CARD 2014 - 2015

A SNAP-SHOT OF RIVER HEALTH

The River Health Monitoring Program began in 2009 to compare the ecological condition of waterways across the Georges River catchment and to assess whether the ecological condition is changing over time. To measure the ecological condition each year, the River Health Program monitors three important ecological indicators: water quality, vegetation

and macroinvertebrates. In combination, these indicators provide a greater understanding of the relative ecological condition of the Georges River and its major tributaries, from the headwaters to Botany Bay. River Health engages community members in monitoring activities. Volunteers work alongside ecologists to learn more about their local

waterways and the methods used in waterway assessments. Over the past six years, volunteers have contributed over 4,200 hours of field work to the program while gaining valuable insight into the dynamic nature of the Georges River.

GEORGES RIVER COUNCILS ARE IMPROVING RIVER HEALTH



CAMPBELLTOWN CITY COUNCIL SUSTAINABLE CATCHMENTS WORKING PARTY

Campbelltown City Council delivered 'Catchments Connecting Communities' in partnership with the University of Western Sydney's Luv Your Lagoons program. Students from Campbelltown Performing Arts High School were guided through the development of management actions for Park Central wetlands, aimed at improving the environment, increasing community awareness and engaging local residents. Student projects are being brought to life, including an Eric the Eel Education Storybook and an Interactive Tile Game.

SUTHERLAND SHIRE COUNCIL ALBERT DELARDES RESERVE

Sutherland Shire Council improvements at Albert Delardes Reserve includes restoration of the old ferry wharf; with oyster shells embedded in the concrete finish to reflect the former presence of Aboriginal middens and oysters along the shore. Foreshore access was improved and indigenous native riparian trees planted. A plaque and interpretive signs reveal the historical use of the location by Aboriginals and as a pleasure ground accessible via ferry in the early 1900s.

WOLLONDILLY SHIRE COUNCIL KENNEDY CREEK IMPROVEMENT

Wollondilly Shire Council is improving the condition of Kennedy Creek, a headwater tributary of the Georges River. Council activities have included funding the Environmentors program at Appin Primary School to teach students about water quality and healthy catchments; weed removal and revegetation with Green Army; and, a community litter reduction program with First Appin Scouts that is co-funded by the EPA.

HURSTVILLE CITY COUNCIL LIME KILN BAY WETLANDS

Hurstville City Council has improved water circulation at Lime Kiln Bay wetlands by increasing hydraulic connectivity between ponds, removing sediment and revegetating the area around the wetlands. Thirty students from Oatley West Public School planted 400 plants at the wetlands. In addition to council funding, Greater Sydney Local Land Services provided \$50,000 from the Estuaries and Coastal Ecosystems Program to support the work.



KOGARAH CITY COUNCIL CARSS PARK ENVIRONMENTALLY FRIENDLY SEAWALL

Kogarah City Council is constructing an environmentally friendly shoreline that emulates the habitat variation present on a natural intertidal foreshore to replace the vertical concrete seawall. The creation of such a diverse intertidal habitat can facilitate the migration of organisms along the Georges River with the improvement of intertidal biodiversity throughout estuarine environments.



ROCKDALE CITY COUNCIL BICENTENNIAL PONDS REED BEDS

To remove excess water-borne nutrients in Bicentennial Ponds, Rockdale City Council has installed 160 m² of floating reed beds supported by a coconut fibre pontoon. The plants are cost-effective, require minimal maintenance and are self-seeding. Plants do not need replacement unless damaged by extreme climatic conditions or fauna. As they grow, the plants and associated microbes remove nutrients and reduce the growth of blue green algae, plus provide habitat and food for fauna in the ponds.



LIVERPOOL CITY COUNCIL AMALFI PARK STORMWATER DETENTION BASIN

Liverpool City Council has constructed a detention basin at Amalfi Park in Lurnea to ameliorate downstream flooding and improve stormwater quality. Sections of the creek have been naturalised through landscaping and revegetation. A permanent wetland has also been constructed for treatment of stormwater runoff from the surrounding urban area.



FAIRFIELD CITY COUNCIL ORPHAN SCHOOL CREEK REHABILITATION

Orphan School Creek is the most significant tributary of Prospect Creek and one of Fairfield City Council's most valuable natural assets. However, land clearing for urban development has increased stormwater runoff and led to significant erosion and weed infestation. Council's rehabilitation work across 800 m of the creek includes installation of sandstone and logs for erosion control and habitat, modification of stormwater outlets, and enhancing native vegetation with over 75,000 plantings.

BANKSTOWN CITY COUNCIL FETHERSTONE STREET RAINGARDEN

Bankstown City Council constructed a raingarden in Fetherstone Street, as part of streetscape improvements in its CBD. Stormwater runoff from the surrounding 3000 m² urbanised catchment is captured by the garden, allowing sediments, organic material and rubbish to settle. Before being directed to the Georges River, water is filtered as it soaks through specialised soil layers and native plants in the garden consume excess nutrients.



MACROINVERTEBRATES

Macroinvertebrates are small animals without a backbone, such as snails, worms, and dragonfly nymphs. They live in freshwater creeks and are particularly sensitive to changes in water quality and habitat. River Health surveys macroinvertebrates in spring and autumn each year. Monitoring these animals provides an increased understanding of how aquatic ecosystems within the Georges River catchment respond to environmental pressures.



WATER QUALITY

Water quality is an important factor to maintain a healthy ecosystem. River Health monitors water quality in the main channel, tributaries and estuary of the Georges River catchment throughout the year. Monitoring water quality is providing us with a better understanding of how urbanisation and changed land use practices are affecting the health of aquatic ecosystems.



VEGETATION

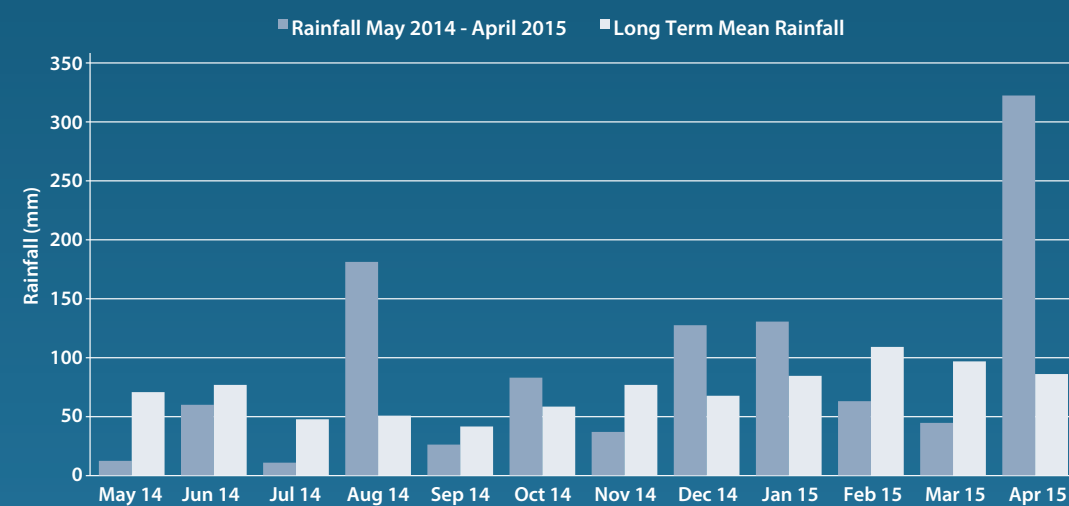
Healthy vegetation communities are important for maintaining a functioning ecosystem. Vegetation plays a major role in providing habitat, nutrient cycling, regulation of temperature and filtration of urban runoff. River Health assesses riparian (stream bank) and estuarine vegetation every three years. By monitoring these communities we are gaining a better understanding of their role in maintaining healthy ecosystems in the Georges River Catchment.

GEORGES RIVER

The Georges River catchment covers an area of approximately 960 km² and has a population of over 1 million people. It begins its journey 60km south west of Sydney near the town of Appin and flows north towards Liverpool, before turning east at Chipping Norton Lakes and enters the sea at Botany Bay.

The river has a number of important tributaries including Bunbury Curran Creek, Cabramatta Creek, Prospect Creek, Mill Creek and the Woronora River. Human land use within the catchment includes residential, industrial, agricultural and mining, while approximately 45% remains in natural or near natural condition.

GEORGES RIVER CATCHMENT SEASONAL RAINFALL



INTERPRETING GRADING ICONS

This diagram shows an example grading box.

GRADING SYSTEM

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

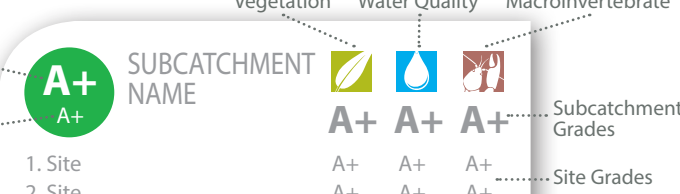
GRADE	CONDITION
A+	EXCELLENT
A - B+	GOOD
B - C-	FAIR
D+ - F-	POOR

2014 - 2015 Grade

A+

2013 - 2014 Grade

A+



The GRCCC represents member councils in the Georges River catchment of NSW including Bankstown, Campbelltown, Fairfield, Hurstville, Kogarah, Liverpool, Rockdale, Sutherland and Wollondilly.

The River Health Monitoring Program is being undertaken in association with Georges River Environmental Education Centre and the NSW Office of Environment and Heritage. River Health is funded by the member councils of the GRCCC.

Acknowledgments: The River Health Monitoring Program was developed by C. Tippler, A. Hanlon and P. Birtles and is modeled on the following existing programs: 1. EHMP (2008). Ecosystem Health Monitoring Program 2006-07 Annual Technical Report. South East Queensland Healthy Waterways Partnership, Brisbane. Centre for Environmental Management, Central Queensland University. 2. IWC (2009). Cobaki and Terranora Ecosystem Health Monitoring Program. 2009 technical report. International Water Centre, Brisbane. 3. Story A.W, Anderson L.E, Lynas J & Melville F (2007). Port Curtis Ecosystem Health Report Card. Port Curtis Integrated Monitoring Project (PCIMP). Cover Photography by David Reid. © 2014 - 2015 River Health Georges River Report Card.

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2014 - 2015 RIVER HEALTH GEORGES RIVER REPORT CARD



GEORGES RIVER CATCHMENT GRADES

GRADE	CONDITION		Stippling indicates land is mainly urban, otherwise land is mainly bushland.
A+	EXCELLENT		
A - B+	GOOD		
B - C-	FAIR		
D+ - F-	POOR		

	Not monitored, owing to restricted access.
	Council boundary
	Subcatchment boundary

D- CABRAMATTA CREEK

Grade	Condition	Condition	Condition
F+	A-	F+	
F-	D	F-	
F-	B	E	
C	A-	C	

- Hinchinbrook Creek
- Upper Cabramatta Creek
- Brickmakers Creek
- Lower Cabramatta Creek

E+ PROSPECT CREEK

Grade	Condition	Condition	Condition
F-	C	E+	
F	D-	E+	
F-	B-	D	
F-	C-	F+	

- Lower Prospect Creek
- Upper Prospect Creek
- Lower Orphan School Creek
- Upper Orphan School Creek

D LOWER GEORGES TRIBUTARIES

Grade	Condition	Condition	Condition
D+	B-	F-	
F-	B+	E-	
A+	B+	C-	
D	C	F-	
F-	A+	E-	

- Little Salt Pan Creek
- Dairy Creek
- Myles Dunphy Reserve Creek
- Poulton Creek
- Carina Creek

A MID GEORGES RIVER

Grade	Condition	Condition	Condition
A+	A+	A+	
A+	A+	A+	
A+	A	A+	
C+	A-	C	

- Frere's Crossing
- Ingleburn Weir
- Simmos Beach
- Cambridge Avenue

D+ BUNBURY-CURRAN CREEK

Grade	Condition	Condition	Condition
A	B	B	
F-	C-	C-	
E-	C+	E	

- Harold Bridge
- Kooringa Reserve
- Smiths Creek

B GEORGES RIVER ESTUARY

Grade	Condition	Condition	Condition
C			
C+			
C+			
B+			
B+			
A+			
E			
C+			

- Liverpool Weir
- Chipping Norton Lake
- Lt Cantello Reserve
- Little Salt Pan Creek
- Salt Pan Creek
- Botany Bay
- Tonbridge Creek

A MILL CREEK

Grade	Condition	Condition	Condition
A+	A+	A-	
A+	A+	A+	
A+	A+	B+	

- Barden Creek
- Mill Creek

A+ WORONORA RIVER

Grade	Condition	Condition	Condition
A+	A+	A-	
A+	A+	A	
A+	A+	B+	

- Heathcote Creek
- Woronora River

B+ UPPER GEORGES RIVER

Grade	Condition	Condition	Condition
A+	D	A	
A+	A-	A+	
C	C-	A	
A+	A	B+	

- Brennans Creek
- Georges River Upper
- Kennedy Grove
- Georges River Woolwash

A O'HARES CREEK

Grade	Condition	Condition	Condition
A+	A-	A+	
A+	A-	A	
A+	A-	A+	

- Maddens Creek
- Illuka Creek
- Cobbong Creek

B- OVERALL FRESHWATER GRADE

B OVERALL ESTUARY GRADE

OVERALL CATCHMENT HEALTH

The Georges River catchment is home to over one million people, with the majority of urbanisation in the middle to lower catchment. The overall ecological condition of freshwater reaches across the Georges River catchment in 2014 - 15 was 'Fair'. The grade of B- was similar to past years. As for past years, the highest grades occurred in those subcatchments where native forest has not been replaced by urbanisation, but this is the first year that subcatchment grades have been calculated.

The sites in those subcatchments that have large areas of intact native forest (i.e. Upper Georges River, Mid Georges River, O'Hares Creek, Woronora River and Mill Creek) generally had 'Good' to 'Excellent' ecological condition. These waterways are not detrimentally affected by stormwater from upstream and have relatively undisturbed riparian corridors, which act as buffers to protect streams from pollutants being washed in from surrounding land. In these subcatchments, the water quality usually complied with national guidelines and macroinvertebrate communities were relatively diverse. Those communities included animals sensitive to pollutants, such as mayflies and caddisflies.

Urban stormwater, combined with degraded and fragmented riparian vegetation corridors, negatively affect ecological condition. Sites in subcatchments that are predominantly urbanised (i.e. Bunbury Curran Creek, Cabramatta Creek,

Prospect Creek and the Lower Georges River tributaries) generally had 'Fair' water quality, but 'Poor' riparian vegetation and macroinvertebrate communities. In urban creeks, macroinvertebrate assemblages had low diversity, and were dominated by pollution tolerant animals, such as snails, fly larvae and worms. In such creeks, there were few pollutant-sensitive animals.

The ecological condition of the Georges River estuary, from Liverpool Weir to the mouth of the main channel at Botany Bay, was 'Fair'. The grade of B was lower than the A- grade of 2013 - 14. This was owing to declining water quality in the upper section of the estuary, from Liverpool Weir to Lieutenant Cantello Reserve at Hammondville. Conversely, the water quality remained similar or improved from that occurring in the previous year from Little Salt Pan Creek to Botany Bay. The lower sections of the estuary are regularly flushed by tidal water movement, whereas the upper sections are more influenced by pulses of stormwater from highly urbanised catchments. The upper estuary was susceptible to temporary increases in turbidity and phytoplankton in 2014 - 15.

