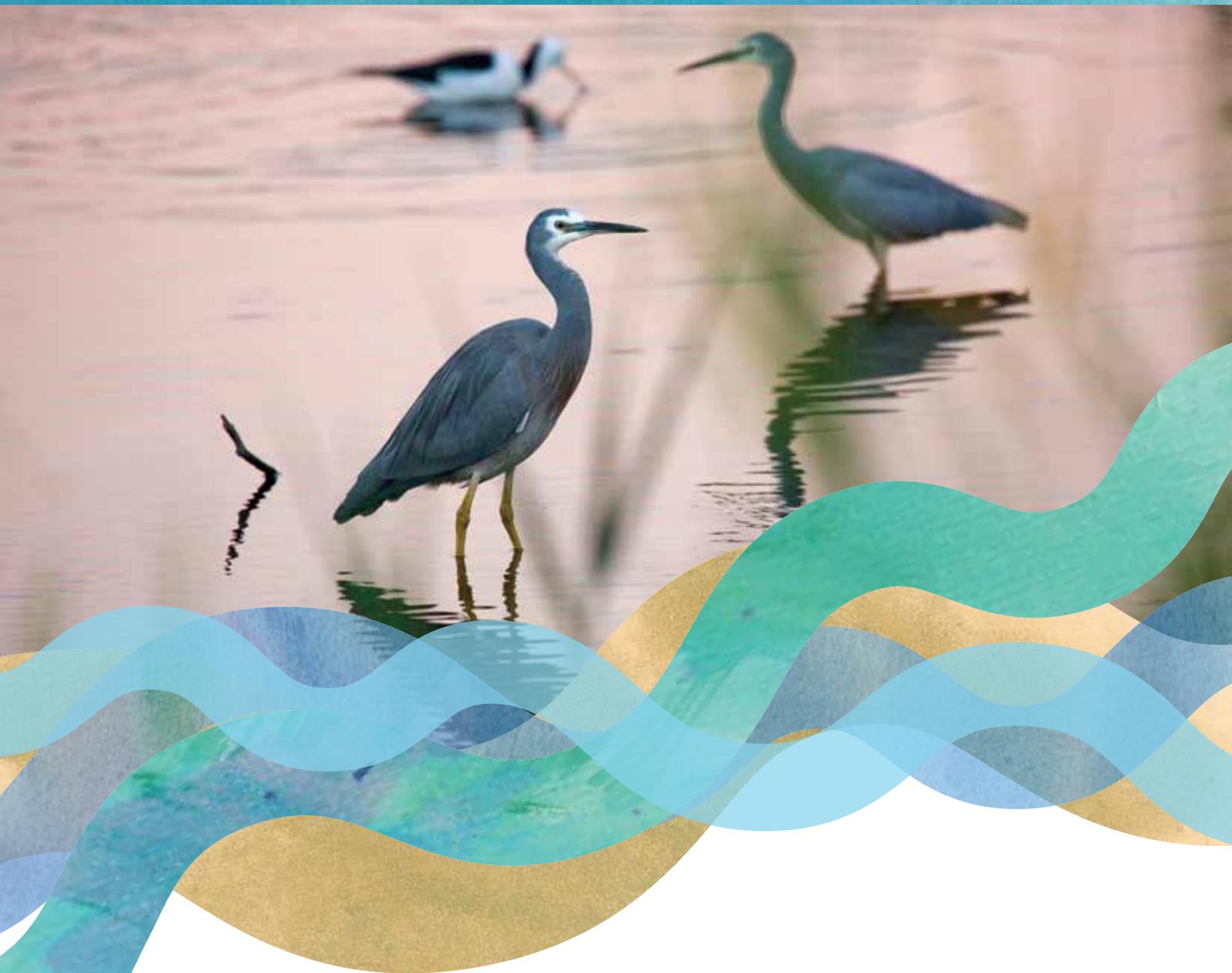


# Cooks River Ecological Health Report Card 2016-2017



 **Cooks River**  
ALLIANCE



# Cooks River

The Cooks River begins in Yagoona and flows east for 23 kilometres through the inner south west suburbs of Sydney to Botany Bay. As the Cooks River makes its way from Yagoona to Botany Bay it's joined by seven creeks.

The Cooks River catchment (the area of land which feeds water to the river) covers an area of approximately 100km<sup>2</sup>.

## The health of our Cooks River

The Cooks River provides many benefits which contribute to our well-being and quality of life. For example, the wetlands and bushland surrounding the Cooks River provide vital habitat for native plants, birds and other animals. The river and catchment also provide many parks and recreational facilities for people. However, since colonisation and industrialisation, much of the river and its creeks have been significantly degraded and modified. Natural areas of bush have been removed over the years, though small vibrant pockets of native habitat remain.

The many hard and paved surfaces in the river catchment means that rainwater cannot easily soak into the ground. It rushes from our roofs, roads and footpaths, picking up pollution along the way. It all ends up in the river.

Today, together with councils, community groups such as the Cooks River Valley Association, Mudcrabs, Wollie Creek Preservation Society, Inner West Environment Group, Botany Bay and Catchment Alliance, and Council bushcare groups, are committed to helping the River. Community groups help restore wetlands and bush, and remove litter.



# Monitoring the ecological health of the Cooks River

## Our monitoring program

We benchmark, monitor and evaluate the ecological health of the Cooks River catchment to increase knowledge and understanding, and to support member councils' individual higher-resolution monitoring programs.

## How we monitor

Our program undertakes routine scientifically robust monitoring of the following ecological indicators:



**Freshwater Benthic Macroinvertebrates:** Monitoring the macroinvertebrate community, which includes animals such as snails, worms, dragonflies and flies, provides an understanding of the condition of the aquatic ecosystem and how it responds to environmental pressures. Macroinvertebrates are commonly used as ecological indicators as they are particularly sensitive to changes in land use, water quality and flows.



**Water Quality:** Monitoring water quality provides an understanding of how urbanisation and other stressors affect the health of the aquatic ecosystems.



**Riparian Vegetation and Creek Channel Condition:** Assessing the condition of the riparian vegetation community and creek channel condition provides an understanding of creek bank and bed conditions and allows for targeted and effective on-ground works to improve and maintain healthy aquatic ecosystems.



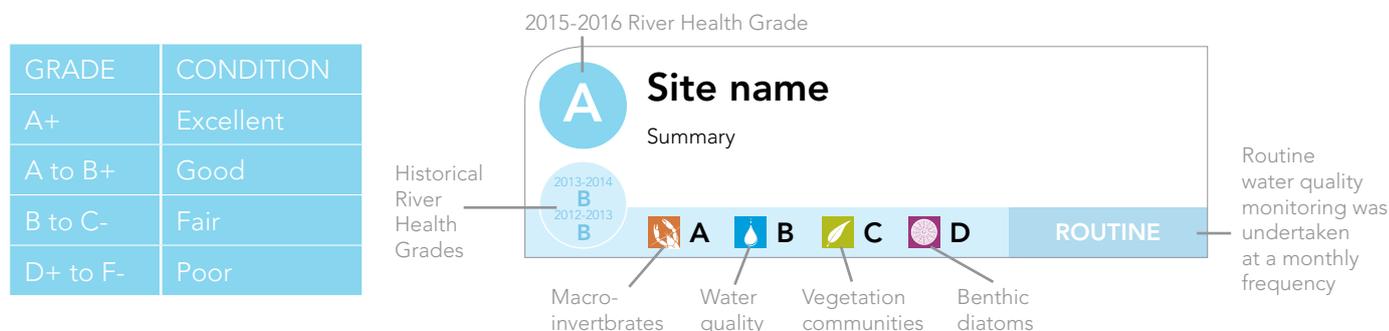
**Benthic Diatoms:** These microscopic algae are indicators sensitive to changes in water quality, particularly nutrients and salinity. Diatoms also provide an important food source to benthic macroinvertebrates. The combination of monitoring both diatoms and macroinvertebrates provide detailed information on catchment, water quality, flow and habitat conditions.

Sampling is based on subcatchments including five major freshwater subcatchments: Upper Cooks River, Cox's Creek, Cup and Saucer Creek, Wolli Creek and Bardwell Creek. Water quality only is also monitored throughout estuarine reaches of the catchment at three sites during the summer months: Upper Cooks Estuary, Lower Cooks Estuary and Alexandria Canal.

The ecological indicators monitored by the Alliance are commonly used in waterway assessments and together are reliable indicators of the ecological condition or 'health' of a catchment. Results provide valuable information to the Alliance and allow strategic and targeted on-ground activities to improve the condition of the Cooks River catchment.

River Health indicators are assessed against locally derived environmental and ecological guidelines which enable the calculation of River Health grades which range from A+ and F-. The approach applied by the Alliance is consistent with other River Health assessments undertaken across the Sydney metropolitan area.

For more detail on the methodology, please refer to our accompanying Report Card Methods Information Sheet which can be downloaded online at [www.cooksriver.org.au/publications/report-card-method-information-sheet/](http://www.cooksriver.org.au/publications/report-card-method-information-sheet/).



*The estuary is where freshwater from the Cooks River and streams mixes with ocean water.*

*Estuaries are influenced by the tides. Note, Cup and Saucer Wetland is freshwater because it receives water from the freshwater Cup and Saucer creek. Wolli Creek at Trurrella Weir is generally freshwater, and it is at the usual tidal limit of the estuary.*

D

### Upper Cooks River

Water quality was mostly compliant however elevated levels of nitrogen and phosphorus were recorded. The macroinvertebrate community is lower in diversity compared to reference streams, and although some species show moderate tolerances to pollution, most are pollution tolerant. This reflects an absence of diverse instream habitat and exposure to frequent high velocity stormwater flows. The benthic diatom community is typical of those influenced by nutrient enriched urban stormwater. The riparian vegetation buffer is narrow and weed dominated. Some remnant canopy trees are present however most native vegetation in this reach has been planted as part of urban park landscaping. In parts of the riverbank, Casuarina needles form a dense groundcover which suppresses weed growth. In the lower reach, Typha beds which were present in the past have been removed by high velocity stormwater flows.

2015-2016  
D

2014-2015  
E

2013-2014  
D+

2012-2013  
D+

C- A F+ F- ROUTINE

E+

### Coxs Creek

In 2016-2017, pH, conductivity and nutrients were frequently non-compliant with regional guideline limits. Sections of Coxs Creek are buffered from high flows and flash flooding which is reflected by the presence of pollution sensitive macroinvertebrates families. However, due to high levels of nutrients and salinity that persist throughout the year, the benthic diatom community is dominated by species which prefer nutrient enriched waters. The majority of Coxs Creek is a concrete-lined stormwater channel. As a result, only a small reach of near natural creek line is assessed where a confined patch of remnant native vegetation is present consisting of Eucalyptus and Melaleuca species. However, the riparian zone is dominated by invasive weed species. Instream vegetation is a mix of exotic and native species.

2015-2016  
D

2014-2015  
E+

2013-2014  
D+

2012-2013  
D-

A- C+ F- F- ROUTINE

E+

### Cup and Saucer Creek

This is a concrete-lined stormwater channel that experiences frequent high velocity stormwater flows. Water quality reflects the channel infrastructure with pH, dissolved oxygen and turbidity mostly achieving target guideline ranges. Electrical conductivity and nutrients are consistently elevated and exceed guideline values throughout the year. The macroinvertebrate and diatom community reflects the stormwater flows and high nutrient levels frequently recorded in the creek. Riparian vegetation is limited due to channelisation and intensive urbanisation. Cup and Saucer Creek Wetland provides a small isolated patch of native vegetation which offers valuable refuge habitat for native species such as birds and reptiles.

2015-2016  
E+

2014-2015  
F+

D B- F- E- ROUTINE

### Cooks River Estuary

Throughout the Cooks River Estuary non-compliance to guideline values for turbidity and chlorophyll-a were frequent. The highest turbidity and chlorophyll-a levels were recorded in late March 2017 and the lowest in early January 2017. These results reflected the rainfall during these periods with falls of 158 mm and 232 mm recorded in February and March, a significant contrast to 48 mm recorded in January. Heavy rainfall across the catchment results in an influx of sediment laden, nutrient enriched urban stormwater entering the estuary causing elevated turbidity and excessive algal growth.

2015-2016  
D

2015-2016  
D

2015-2016  
D

Upper Cooks Estuary Lower Cooks Estuary Alexandria Canal

D+

### Bardwell Creek

Water quality was frequently in excess of regional guidelines. Elevated nutrients, electrical conductivity and turbidity results combined with low dissolved oxygen were consistent throughout the monitoring period. Degraded water quality, minimal in-stream habitat and frequent high velocity stormwater flows influence the macroinvertebrate community which is low in diversity and dominated by pollution tolerant species. The benthic diatom community reflects the excessive nutrient levels which are frequently recorded in this waterway. Riparian vegetation across the sub-catchment is often restricted by urban land use and dominated by invasive weed species. However, the upper and mid reaches retain a narrow riparian buffer which varies in condition.

2015-2016  
D

2014-2015  
D-

2013-2014  
D

2012-2013  
D

C- C+ C+ F ROUTINE

E

### Wolli Creek

Water quality was frequently non-compliant with regional guidelines. Elevated nutrients, electrical conductivity and turbidity results combined with low dissolved oxygen were consistent throughout the monitoring period. The combination of degraded water quality, limited in-stream habitat and frequent high velocity is reflected by the macroinvertebrate and benthic diatom communities which were found to be low in diversity and dominated by pollution and nutrient tolerant species. In upper Wolli Creek, a narrow riparian buffer is present with remnant native vegetation patches containing large native trees and a mix of native and exotic understory and ground cover species. In contrast, riparian vegetation communities in the mid and lower reaches are dominated by invasive species. The creek channel is degraded with eroded banks and a scoured bed which is a result of exposure to frequent stormwater flows.

2015-2016  
E+

2014-2015  
F+

2013-2014  
E

2012-2013  
E

D- C+ F F- ROUTINE

## Summary of results

In 2016/17 the ecological health of the Cooks River catchment was 'Poor'. The results summarised are symptoms of what is known as the 'urban stream syndrome'.



These communities indicate conditions within the creeks are affected by excessive nutrient concentrations, lack of complex aquatic habitats and frequent high velocity stormwater flows.



Water quality at all freshwater sites was degraded compared to regional guideline limits. Results show nutrients, conductivity, turbidity and dissolved oxygen were frequently non-compliant. Estuary reaches show signs of degradation with excessive algae concentrations and turbidity.



Across the catchment, riparian vegetation and creek channel condition is degraded with severe bank erosion, exotic weed invasion, lack of complex riparian and instream habitats, channelisation and large volumes of litter frequently observed.

# Improving the health of the Cooks River

## What we're doing

The Cooks River Alliance was formed in 2011 and is a partnership of councils working together with communities for a healthy Cooks River catchment. The Alliance builds upon previous Cooks River council partnerships and projects. Alliance plans for improving the river include:

### **Water sensitive urban design**

Alliance councils are implementing sustainable urban water management through building raingardens, conserving wetlands and changing practices.

### **Connecting and coordinating stakeholders**

A challenge for management of the Cooks River is that the river crosses multiple local government boundaries. The Cooks River Alliance assists local councils to work together and coordinate activities to protect this precious asset.

### **Supporting and engaging communities to take action**

Local communities have long worked hard to improve the Cooks River. Community groups have helped restore wetlands and bush, and removed huge amounts of litter. The Cooks River Alliance undertakes a wide range of community engagement programs, seeking to involve a broad spectrum of community groups, including culturally and linguistically diverse communities, and Aboriginal communities.

## What you can do



Visit the Cooks River and explore the parks and creeks.



Plant locally native plants in your garden to increase habitat for animals.



Pick up any rubbish before it gets washed into drains.



Sweep up leaves and put them in the bin before they go down the drain.



Pick up after pets so their waste doesn't end up in the river.



Build a raingarden to slow and filter stormwater before it reaches the river.



Wash your car on the lawn and safely dispose of oils and chemicals. Rain carries pollution to the river.



Install a rainwater tank to reduce stormwater flowing to the river.



Get involved in a local community group or join your Council's bushcare group.



Follow the Cooks River Alliance to find out more and to sign up for our email newsletter.

## Find out more

Visit [cooksriver.org.au](http://cooksriver.org.au) to find out more and visit our social media channels.



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