Cooks River Ecological Health

Report Card 2015-2016

Cooks River Alliance

Bayside Council City of Canterbury-Bankstown City of Sydney Inner West Council Strathfield Council

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 Council's individual higher-resolution monitoring programs.

How we monitor

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

Freshwater 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, particularity nutrients and salinity. Diatoms also provide an important food source to benthic macroinvertbrates. The combination of monitoring both diatoms and macroinvertebrates provide detailed information on catchment, water quality, flow and habitat conditions.

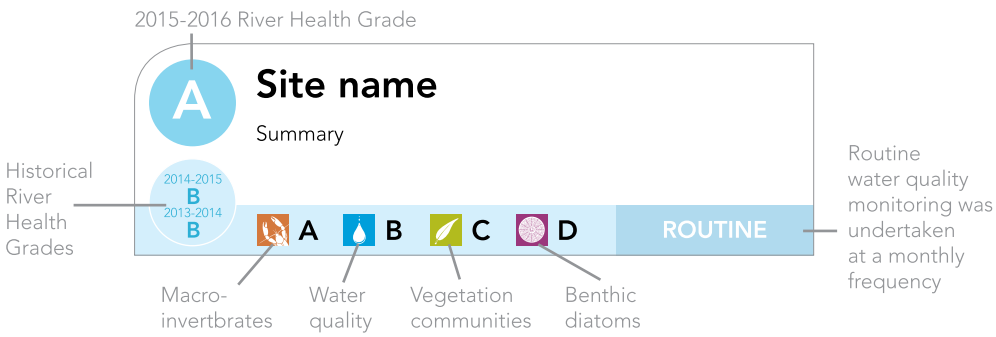
Sampling is based on subcatchments including five major freshwater subcatchments: Upper Cooks River, Cox's Creek, Cup and Saucer Creek, Wolli Creek and Bardwell Creek. Water quality only is also monitored throughout estuarine reaches of the catchment at three sites during the summer months: Upper Cooks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

GRADE	CONDITION
A+	Excellent
A to B+	Good
B to C-	Fair
D+ to F-	Poor



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 Turrella Weir is generally freshwater, and it is at the usual tidal limit of the estuary.

Upper Cooks River

D

2014-2015 E

2013-2014 D+

2012-2013 D+

Water quality was mostly compliant. Flooding events exacerbated bank scouring and erosion, causing increased turbidity and spikes in nutrients. The macroinvertebrate community is lower in diversity and the dominant species are pollution tolerant. The benthic diatom community reflects consistently high nutrient levels. Riparian vegetation in the upper freshwater is predominantly weeds with patches of native shrubs and remnant canopy trees. In the lower freshwater a dense groundcover of needles has suppressed weed growth. In-stream vegetation varies from mostly exotic species in upper section to a dominant cover of typha in the lower reach. Most of the upper Cooks River has been rock lined and therefore erosion is limited. The freshwater reach experiences regular high flow events resulting in bank scouring and erosion.

B+ | A- | D | F- | ROUTINE

Upper Cooks Estuary

E

Bardwell Creek

D

2014-2015 D-

Water quality was frequently in excess of regional guidelines, with elevated nutrients, electrical conductivity and turbidity results combined with low dissolved oxygen. Water quality was poor with degraded in-stream habitat and subject to high influxes of stormwater, litter and flash flooding. The macroinvertebrate and benthic diatom communities are both low in diversity and dominated by pollution and nutrient tolerant species. Riparian vegetation is restricted by urban land use and dominated by invasive weed species. The upper and mid reaches retain some remnant native bushland which varies in condition. In the lower reaches recent re-vegetation has occurred which has increased native vegetation cover.

Upper Bardwell Creek
2013-2014 C+
2012-2013 C+

Lower Bardwell Creek
2013-2014 D-
2012-2013 D-

C- | C | D+ | E- | ROUTINE

Cox's Creek

D

2014-2015 E+

2013-2014 D+

2012-2013 D-

Water quality was occasionally outside regional guidelines. Sections of the creek are buffered from high flows which is reflected by the presence of pollution sensitive macroinverbrates families. Elevated nutrients and salinity persist throughout the year, reflected in the benthic diatom community which is dominated by species with preference to nutrient enriched waters. The majority of Cox's Creek is a concrete lined stormwater channel. As a result, only a small reach of near natural creekline is assessed, where a confined patch of remnant native vegetation is present. The riparian zone is dominated by invasive weed species and in-stream vegetation is a mix of exotic and native species.

B+ | B- | D | F+ | ROUTINE

Alexandria Canal

D

Lower Cooks Estuary

D

Cup and Saucer Creek

E+

2014-2015 F+

A concrete lined stormwater channel that experiences very frequent, high velocity 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 guidelines, reflecting frequent large influxes of urban stormwater. Macroinvertebrates are not sampled as there is no natural creek bed, however the diatom community reflects high nutrient levels. Riparian vegetation is limited due to channelisation and intensive urbanisation. Cup and Saucer Wetland provides a small isolated patch of native vegetation which provides valuable refuge habitat for native species such as birds and reptiles.

B | F- | F- | ROUTINE

Wolli Creek

E+

2014-2015 F+

2013-2014 E

2012-2013 E

Water quality was frequently in excess of regional guidelines, with elevated nutrients, electrical conductivity and turbidity results combined with low dissolved oxygen. The degraded water quality, loss of in-stream habitat, high influxes of stormwater, litter and flash flooding 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. A large volume of litter is present with parts of the bank completely covered in plastic bottles and other litter. The upper Wolli Creek retains some remnant native trees and a mixture of native and non-native exotic understory and ground cover species. Riparian vegetation communities of the mid and lower reaches are dominated by invasive weed species. In-stream vegetation is absent along most of the creek which is a likely result of storm flows.

D | B | E+ | F | ROUTINE

Summary of results

In 2015/16 the ecological health of the Cooks River catchment was 'Poor'. The results summarised are all typical symptoms of what is known as 'the urban stream syndrome'.

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

Water quality across most freshwater sites was often compliant with regional guidelines. Throughout the Cooks River estuary however, non-compliance to guideline values for turbidity and chlorophyll-*a* were frequent. Heavy rainfall from mid December to early January caused an influx of sediment and nutrients entering the estuary in stormwater, resulting in turbid waters and excessive algal growth.

Riparian vegetation and creek channel condition was found to be degraded. This is reflected by a high degree of bank erosion, heavy cover of riparian weeds, lack of complex riparian and instream habitats, channelisation and litter.

AUBURN
STRATHFIELD
BURWOOD
ASHFIELD
BANKSTOWN
MARRICKVILLE
CITY OF SYDNEY
SYDNEY HARBOUR
CANTERBURY
ROCKDALE
HURSTVILLE
KOGARAH
BOTANY BAY
Coxs Creek
Cup And Saucer Creek
Glenore Creek
Wolli Creek
Bardwell Creek
Alexandra Canal
Sheas Creek
Cooks River
Muddy Creek

Cooks River

The Cooks River begins in Yagoona and flows east for 23 kilometres through the centre of Sydney to Botany Bay. It is joined by seven creeks and the catchment (the area of land which feeds water to the river), covers an area of approximately 100km^2.

Aboriginal people have lived along the Cooks River for more than a thousand generations and this rich cultural heritage is evident in locations along the river. In recent decades, Aboriginal people from around the country have made the Cooks River their home, and developed a strong sense of custodianship for Aboriginal heritage and the environment.

The health of our Cooks River

The Cooks River provides many benefits which contribute to our well-being and quality of life. The wetlands and bushland surrounding the Cooks River provide vital habitat for native plants, birds and other animals, as well as many parks and facilities for people. However, since European arrival and through 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 Cooks River faces many challenges including legacy problems such as bank channelisation and ageing infrastructure, as well as ongoing issues such as urban density and stormwater pollution.

The Cooks River catchment is 89% urbanised and the many hard and paved surfaces means that rainwater cannot easily soak into the ground – 68% of the rainfall in the catchment runs into the river as stormwater. It rushes from our roofs, roads and footpaths and flows into drains picking up pollution along the way, depositing litter, leaves, and chemical residues into the river. Actions within the catchment, far from the river itself, can therefore have a significant impact on the health of the Cooks River.

Community groups such as the Cooks River Valley Association, Mudcrabs, Wolli Creek Preservation Society, Inner West Environment Group, and Council bushcare groups are committed to helping the river. Community groups help restore wetlands and bush and remove litter, but all people living in the catchment can make a difference starting at their place by removing litter, leaves and other pollutants before they reach the river.

Improving the health of the Cooks River

What we're doing

The Cooks River Alliance, formed in 2011, 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:

Capturing rainwater

A raingarden is a garden designed specifically to capture rainwater, remove pollutants, and allow water to soak into the ground or to slow flow. The Cooks River Alliance is working with Councils to build raingardens across the catchment.

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

Remember that the river starts with you:

- Sweep up leaves and put them in the compost or bin, wash your car on the lawn and safely dispose of oils and chemicals. Rain carries pollution to the river.
- Build a raingarden, install a rainwater tank and reduce impervious surfaces to minimise stormwater running off your property. Visit our website for instruction sheets and more information.
- Plant locally native species in your garden to increase habitat for plants and animals.

Everyone can make a difference

- Visit the Cooks River to explore the many great water features around the catchment.
- Put your rubbish in the bin and pick up after pets so it doesn't end up in the river.
- Get involved in a local community group to help care for our river.

Find out more

Visit **cooksriver.org.au** to find out more and to sign up for our email newsletter.

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