



CRC for
Water Sensitive Cities

Sydney Water Bank Naturalisation

Location:
Sydney,
NSW



Case Study — Prepared by Cooperative Research
Centre for Water Sensitive Cities, September 2018



Australian Government
Department of Industry,
Innovation and Science

Business
Cooperative Research
Centres Programme

Insight

Naturalising the deteriorated sections of the concrete river banks along the Cooks River

Project description

The \$4.9 million naturalisation of 1.1km of riverbank along the Cooks River in Sydney involved demolishing and replacing steep, deteriorated concrete panels from the 1930s and 1940s with more gently sloped river banks, stabilised with sandstone and more than 80,000 local native plants. The works have created attractive activated spaces for the public and extra habitat for birds and aquatic life. This project included master planning, design and construction of an environmentally friendly riverbank to replace the deteriorated concrete channel at three sites along the Cooks River.



The drivers

Deteriorating condition of concrete channel presented opportunity for channel naturalisation as part of necessary repairs for the waterway

- **Repairs required** – Significant repairs were needed on the existing concrete channel which was built in the 1930s and 1940s. This created an opportunity for change, and greater overall project outcomes through bank naturalisation.
- **Improved river health** – The project was an opportunity to increase the natural character of the Cooks River, while maintaining the stability of the river banks and flood water capacity.



Former concrete channel along Cooks River, built in the 1930/40s.

What does this case study demonstrate?

Each case study has been selected to demonstrate specific solutions, benefits or enabling structures that support the creation of water sensitive cities. This case study focuses on:

Waterway naturalisation

Ecosystem health

The innovations




Naturalisation delivered through the removal of concrete, change of slope and revegetation

- **Preliminary planning and investigations (asset inspections)** – Sydney Water invested in early investigations and planning to identify sections of the Cooks River that were feasible for bank naturalisation.
- **Demolition of concrete channel and naturalisation of river banks** – The existing concrete channel was replaced with a gentler river bank using 80,000 local native plants, trees and sandstone. Bank stabilisation was achieved using sandstone keyed into the gentler bank edges, as well as relying on vegetation establishment to assist in long term bank stabilisation.
- **Local habitat and stormwater treatment wetlands** – A 2,500m² freshwater wetland with a fauna underpass underneath the adjacent cycleway was also constructed, which links to the Cooks River.
- **Inclusion of new paths, seats and interpretive signage** – Park infrastructure provided for landscape, amenity and education.
- **Dual-purpose and shared flood study** – A flood study was undertaken for design and analysis purposes, while concurrently working in partnership with local councils and other agencies. The flood study was then made available more broadly to assist local floodplain management.
- **Incorporation of endangered salt-marsh vegetation into newly naturalised banks**



Stabilised river bank, replaced with native plants, trees and sandstone

The outcomes

 Cities providing ecosystem services	 Cities as water supply catchments	 Cities comprising water sensitive communities
<ul style="list-style-type: none"> • Native vegetation – Over 28,000m² of new native vegetation to create habitat for both native birds and animals. Several vegetation communities were recreated including freshwater and brackish swamp communities; clay plain scrub forest; turpentine ironbark forest; coastal salt-marsh. • Stormwater treatment and habitat – 2,500m² freshwater wetland providing stormwater treatment and aquatic habitat. 		<ul style="list-style-type: none"> • Interpretive signage – Five signs explaining the benefits and history of river naturalisation. • Place making and social nexus – Opportunity for the community to reconnect with a natural river and somewhere to connect with other people. • Actively involved community – Opportunity to provide feedback in the consultation process through the design period created local area pride and positivity for the project results. Bushcare volunteers help maintain new native vegetation.

Business case

Costs	Benefits
<ul style="list-style-type: none"> \$4.9 million capital cost – Multiple funding sources, including Canterbury City Council (now City of Canterbury Bankstown), Australian Government and Sydney Water. 	<ul style="list-style-type: none"> Aging infrastructure replaced with resilient natural channel system with a longer asset life than concrete. Channel naturalisation can improve property value (research shows similar projects result in an increase between \$17,000 to \$26,000 above current property value trends). Shared costs of flood study, which will be used for local floodplain management.

The lessons

- Early investigations and planning** – Asset inspections and the master planning process were considered a valuable approach by Sydney Water because naturalisation is possible only where there is available adjacent open space, and where works would not affect underground and overhead services and flooding potential.
- Community engagement** – The master planning process provided an opportunity to consult with local councils and community groups along Cooks River, resulting in better engagement and community outcomes.
- Shared flood study** – The flood model was able to be procured for multiple purposes and in partnership with local councils and other agencies for both the design and analysis of the Cooks River naturalisation project. The result was a more broadly available flood model to assist in local floodplain management.

Transferability

Channel naturalisation projects have global transferability, where there is adequate room (width) for channel modifications. These projects are particularly beneficial / successful where they are located adjacent to open space, where ecological connectivity can be improved, and where the site is not overly constrained by underground or overhead services and /or flood behaviour. Constraints to channel naturalisation can typically be addressed through design, however, the degree of channel naturalisation and riparian restoration will vary depending on the limitations of the site.

Project collaborators

- Sydney Water
- Sydney Metropolitan Catchment Authority
- Australian Government
- Canterbury City Council
- Cooks River community
- Thompson Berrill Landscape Design
- Parsens Brinckerhoff
- Total Earth Care
- Josa Construction
- Toolijooa

Awards

- Excellence in Integrated Stormwater Design NSW Stormwater Industry Association 2017

Additional information

More information on the Sydney Water Bank Naturalisation project can be found at:

- [Fish Habitat Network: Cooks River naturalisation case study](#)
- [Mainway Project Management: Sydney Water Cooks River Bank Naturalisation](#)
- [Sydney Water News: August 2015 media release](#)
- [Australian Association of Bush Regeneration \(AABR\): Video recording of Dan Cunningham's AABR Seminar 2014 presentation](#)
- [Stormwater Australia 2010 Conference Proceedings: Contemporary Riverbank Renewal - Restoring the banks of the Cooks River, Sydney \(D Cunningham\)](#)

